Appendix A – Notice of Preparation and Initial Study

NOTICE OF PREPARATION
AND PUBLIC SCOPING MEETING

TO: State Clearinghouse
P.O. Box 3044
Sacramento, CA 95812-3044

FROM: City of Chino Hills
14000 City Center Drive
Chino Hills, California 91709

SUBJECT: Notice of Preparation of a Draft Environmental Impact Report and Public Scoping Meeting

Notice is hereby given that the City of Chino Hills Community Development Department will be the Lead Agency and will prepare an Environmental Impact Report (EIR) for the project identified above. The project is the General Plan Update for the City of Chino Hills. The General Plan Update would update and supersede the City's current General Plan, which was adopted in September 13, 1994 and subsequently amended. The General Plan Update encompasses all text and figures of six General Plan Elements: Land Use Element, Circulation Element, Conservation Element, Safety Element, Noise Element and Economic Development Element. The environmental review for the General Plan Update is expected to encompass proposed changes to these six elements and associated changes to the City of Chino Hills Zoning Map and Municipal Code to maintain consistency with the General Plan Update.

Pursuant to Section 21083.9 of the Public Resources Code, a Scoping Meeting for responsible agencies will be held to discuss the proposed project EIR and assist the City in identifying the range of actions, alternatives, mitigation measures, and significant effects to be analyzed in depth in the EIR. The Scoping Meeting will be held at the time, date and place indicated below:

Time: 4:30 p.m.
Date: June 4, 2013
Place: City of Chino Hills Council Chambers, 14000 City Center Drive, Chino Hills, CA 91709

Responsible public agencies are invited to attend the scoping meeting and/or review and comment on the project Initial Study, which contains a description of the project, its location and probable environmental effects. A copy of the project Initial Study is attached.

Due to the time limits mandated by State law, your complete and detailed response prepared pursuant to California Code of Regulations Title 14, Section 15082(b) should be sent at the earliest possible date, but not later than thirty (30) days after the date below.

Please send your response to Mr. Jerrod Walters, Associate Planner, City Hall, 14000 City Center Drive, Chino Hills, California 91709.

We will need the name of a contact person in your agency.

Project Title: **City of Chino Hills General Plan Update #13GPA02**
Project Applicant: **City of Chino Hills**
Project Location: **City wide**

Date: May 23, 2013 **Signature:** Joann Lombardo

Joann Lombardo, Community Development Director
City of Chino Hills

Telephone: Mr. Jerrod Walters, Associate Planner at (909) 364-2753
Email: jwalters@chinohills.org

Reference: California Code of Regulations, Title 14, Section 15082(a), 15103, and 15375.

INITIAL STUDY

CITY OF CHINO HILLS GENERAL PLAN UPDATE 13GPA02

Prepared by:

City of Chino Hills
Community Development Department
14000 City Center Drive
Chino Hills, CA 91709

Attention: Jerrod Walters, Associate Planner

May 22, 2013

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CITY OF CHINO HILLS

GENERAL PLAN UPDATE 13GPA02
INITIAL STUDY

Executive Summary:

This Initial Study assesses the potential environmental impacts of the General Plan Update for the City of Chino Hills. The General Plan Update would update and supersede the City's current General Plan, which was adopted in September 13, 1994 and subsequently amended. The General Plan Update encompasses all text and figures of six General Plan Elements: Land Use Element, Circulation Element, Conservation Element, Safety Element, Noise Element and Economic Development Element. The environmental review for the General Plan Update is expected to encompass proposed changes to these six elements and associated changes to the City of Chino Hills Zoning Map and Municipal Code to maintain consistency with the General Plan Update. Referred to within this document as the proposed "Project," the General Plan Update plans for the City of Chino Hills' continued development during the next twenty years.

This Initial Study finds that consistent with Section 15168 of the California Environmental Quality Act (CEQA) Guidelines, a Program EIR will be prepared for the General Plan Update. A program EIR will be used to assess the comprehensive nature of the General Plan Update and will serve as a resource from which the potential environmental impacts of future development activities in the City can be evaluated. The Program EIR will address the following topics identified as potentially significant within this Initial Study: Air Quality, Biological Resources, Cultural Resources, Geology/Soils, Greenhouse Gas, Hazards/Hazard Materials, Hydrology/Water Quality, Land Use and Planning, Noise, Population/Housing, Public Services, Recreation, Transportation/Traffic and Utilities/Service Systems. In addition, although potential impacts relative to Aesthetics are not identified, the Program EIR will present a review of existing City scenic resources and visual character and how the General Plan Update will affect the resources and character.

Project Description:

1. ***Project title***: City of Chino Hills General Plan Update.

2. ***Lead agency name and address***: City of Chino Hills, 14000 City Center Drive, Chino Hills, CA 91709

3. ***Contact person and phone number***: Jerrod Walters, Associate Planner, Community Development Department (909) 364-2753, jwalters@chinohills.org.

4. ***Project location:*** Chino Hills is located in the Chino Valley within the County of San Bernardino. As shown in Figure 1, *Chino Hills Regional Location* Map, it is uniquely located at the extreme southwestern corner of San Bernardino County, where the boundaries of four counties meet. Chino Hills is bordered by Los Angeles County on the north and west, by Orange

County on the south and west, and by Riverside County on the south and east. Surrounding cities include Chino, Pomona, Diamond Bar, Brea, Yorba Linda and Corona.

5. ***Project sponsor's name and address:*** Community Development Department, City of Chino Hills, 14000 City Center Drive, Chino Hills, CA 91709

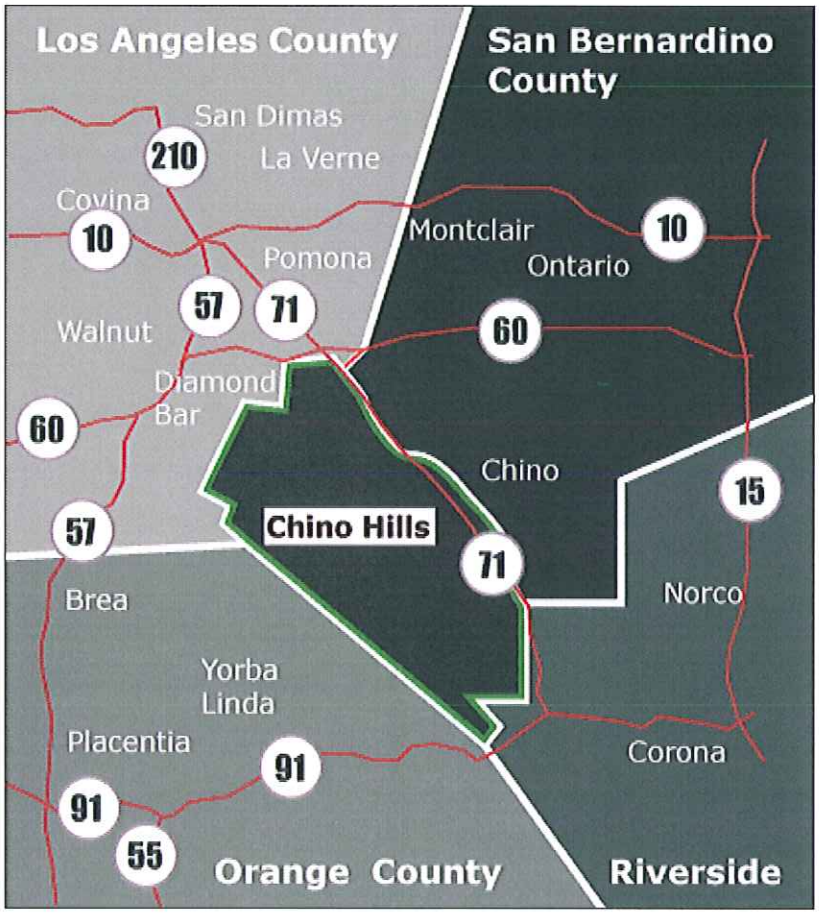

Figure 1, *Chino Hills General Plan Regional Location Map*

6. ***Description of project: (Describe the whole action involved, including but not limited to later phases of the project, and any secondary, support, or off-site features necessary for its implementation.)***

PROJECT BACKGROUND

Incorporated on December 1, 1991, it's been over twenty years since Chino Hills laid out its vision for the future. Following the desires of its citizens, Chino Hills set out to be a community with high quality residential and commercial areas in a rural setting, a high level of public services, and a pleasing environment in which to live, work and shop. Today, Chino Hills has achieved its vision.

Chino Hills is known for its high quality of life and beautiful rural atmosphere. The community, with its current population of 74,799[1], has access to 3,420 acres of publicly owned open space, 40 parks, 38 miles of trails, and 5 community buildings. Its city boundaries encompass approximately 28,816 acres, 7,366 acres of which are part of the Chino Hills State Park of land area.

The General Plan Update plans for the City of Chino Hills' continued development during the next twenty years. To this end, the General Plan addresses the critical issues that will shape Chino Hills' future, specifically:

- Are there opportunities for new commercial and employment generating land uses?
- Where will future growth occur?
- What are the opportunities to enhance the community's sustainability through transit and mixed-use development?
- How will Chino Hills ensure its older and special neighborhoods continue to be maintained?
- How will Chino Hills ensure its special and cohesive community identity is retained?
- How will the City maintain its rural setting?
- How will the City be able to designate space for its State-mandated allocation of housing units under the Regional Housing Needs Assessment?"
- Is traffic adequately managed?
- How should the community maintain its open spaces?
- Are there opportunities for additional open space and recreational facilities?
- How can the City support more energy efficient facilities and practices?
- What can the community do to support healthy living?

GENERAL PLAN CONTENTS

Every California city must adopt a comprehensive, long-term general plan. The General Plan must cover a local jurisdiction's entire planning area and address the broad range of issues associated with the City's development. The General Plan is the City's constitution or blueprint for its long-range physical development. California law requires every general plan to cover, at minimum, seven major issue areas: land use, circulation, housing, conservation, open space, noise and public safety. Within the City of Chino Hills General Plan, these issue areas are addressed in the following seven chapters (referred to as elements). In addition, the City General Plan includes one optional element which addresses economic development.

1. **Land Use Element**: The Land Use Element is required by State law. It designates all lands within the City for specific uses such as housing, commercial, industrial, and open space uses. The Land Use Element also provides development regulations for each land use category, and overall land use policies for the City.

[1] 2010 U.S. Census Report, Profile of General Population and Housing Characteristics.

2. **Circulation Element**: The Circulation Element is required by State law. It specifies the general location and extent of existing and proposed major streets and other transportation facilities. It also specifies infrastructure facilities that carry water, wastewater, and storm water.

3. **Housing Element**: The Housing Element is required by State law and requires separate review by the State Department of Housing and Community Development (HCD). Housing Elements are required to be updated every eight years.

4. **Parks, Recreation and Open Space Element**: Although the Parks and Recreation components of this Element are not required by State law, the Open Space component is required. This Element provides guidance for development of future park and recreation facilities and programs, and the preservation, acquisition, management, and use of open space in the City.

5. **Conservation Element**: The Conservation Element is required by State law. It addresses land resources, biological resources, cultural resources, air quality and greenhouse gas emissions, water resources, and drainages.

6. **Safety Element**: The Safety Element is required by State law. It addresses protection of the community from risks associated with the effects of flooding, seismic and other geologic hazards, hazardous materials and wild land fires.

7. **Noise Element**: The Noise Element is required by State law. It addresses existing and potential noise concerns in the community.

8. **Economic Development Element**: While not required by State law, the Economic Development Element is included to promote a diversified economy and to promote sound fiscal policies.

The General Plan Update covers six of these elements: Land Use Element, Circulation Element, Conservation Element, Safety Element, Noise Element and Economic Development Element. The Housing Element and the Parks, Recreation and Open Space Element are not included.

Schedules for Housing Element updates are established by the California Government Code and promulgated by the State Department of Housing and Community Development (HCD). According to these schedules, the City's current 2006-2014 Housing Element was adopted on September 12, 2012. The next Housing Element schedule requires all cities and counties within the Southern California Association of Governments (SCAG) region to submit drafts of their 2014-2021 Housing Element to HCD by October 2013. In compliance with this requirement, the City of Chino Hills submitted its draft to HCD on March 5, 2013.

The City's current Parks, Recreation and Open Space Element was adopted on June 10, 2008. This element guides the development of future park and recreation facilities and programs; the preservation, acquisition, management, and use of open space in the City; and the planning of trails. No changes to the Parks, Recreation and Open Space Element are proposed as part of the General Plan Update; therefore, the element is not included.

Planning Area: The Planning Area for the Chino Hills General Plan encompasses the approximately 28,816 acres (45 square miles) that are contained within the City boundaries,

shown in Figure 2, *Draft General Plan Update Land Use Map*. The City has no sphere of influence outside its borders.

Planning Horizon: This General Plan provides the goals, policies and actions that will guide the City during its next twenty years, placing the horizon for this General Plan at about 2030. In accordance with state general plan guidelines, the horizon year does not mark an end point, but rather provides a general context from which the City can make shorter-term decisions. Planning is a continuous process, and the City of Chino Hills commits to reviewing this General Plan regularly to ensure consistency with new information and changes in community needs and values.

LAND USE PLAN

The Land Use Plan describes graphically the location and size of designated land uses. Figure 2, *Draft General Plan Update Land Use Map,* presents the proposed City of Chino Hills General Plan Land Use Plan. Boundaries of the Map define the planning area addressed by the General Plan Update and this environmental document.

Table LU-1, *Draft General Plan Update Land Use Plan Designations & Acreages*, presents the estimated area for each of the proposed General Plan land use designations within the City.

Figure 2, *Draft General Plan Update Land Use Map*

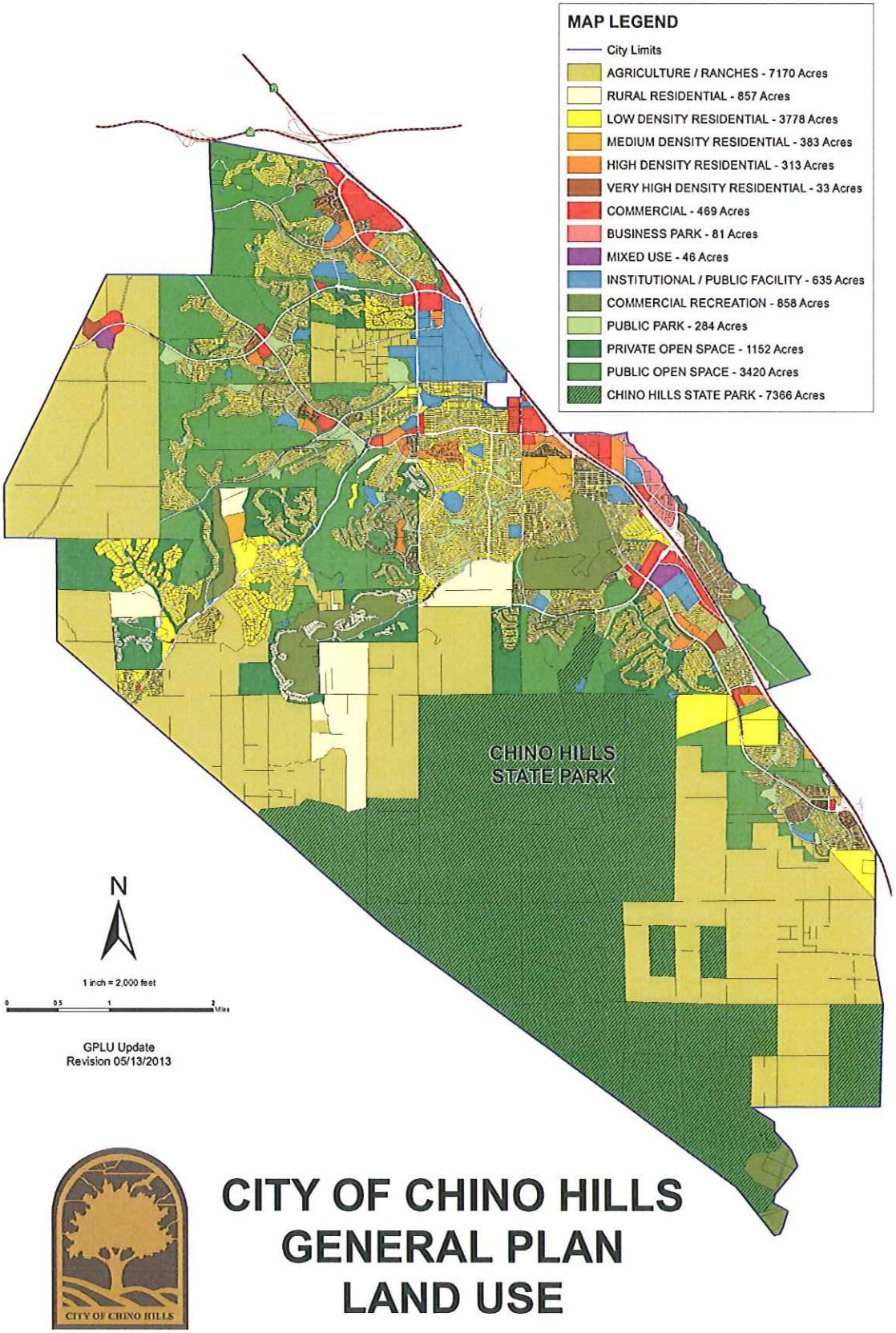

Table LU-1 DRAFT GENERAL PLAN UPDATE LAND USE PLAN DESIGNATIONS AND ACREAGES		
Land Use Category	**General Plan Acres**	**Percent of Total Acres**
Agriculture/Ranches	7,170	26.7
Rural Residential	857	3.2
Low Density Residential	3,778	14.1
Medium Density Residential	383	1.4
High Density Residential	313	1.2
Very High Density Residential	33	0.1
Subtotal Residential	**12,534**	**46.7**
General Commercial	469	1.7
Business Park	81	0.3
Commercial Recreation	858	3.2
Subtotal Commercial	**1,408**	**5.2**
Public Park	284	1.1
Public Open Space	3,420	12.7
Private Open Space	1,152	4.3
State Park	7,366	27.4
Subtotal Open Space	**12,222**	**45.5**
Institutional / Public Facility	635	2.4
Mixed Use	46	0.2
TOTALS	**26,845[1]**	**100**

Notes:
[1] The 26,845-acre figure represents the total acreage of properties within the City that are provided with Land Use Designations in the General Plan Land Use Map. Public and private streets and State Route 71 are not provided with a Land Use Designation and are not included within the Total General Plan Acres figure. Public and private right-of-way occupies an additional 1,971 acres within the City's boundaries. The City's total area, including properties with Land Use Designations and right-of-way, is 28,816 acres (or approximately 45 square miles).

ZONING MAP

The Zoning Map converts the Land Use Plan into designations consistent with the City of Chino Hills Municipal Code. Changes to the Zoning Map and Municipal Code to maintain consistency with the General Plan Update will be assessed as part of this environmental review process.

7. ***Existing setting, including existing General Plan, land uses, transportation, infrastructure, geology, biological resources and cultural resources in the City of Chino Hills Area:***

EXISTING GENERAL PLAN

Physical development in the City of Chino Hills is currently governed by the City's existing (1994, and as amended) General Plan. The existing General Plan disaggregates the City according to the land use designations listed in Table LU-2, which summarizes the current distribution of Chino Hills area by existing General Plan land use designation and by percent of City total acreage.

Table LU-2

EXISTING GENERAL PLAN LAND USE BY DESIGNATION, ACREAGE AND PERCENT OF TOTAL ACREAGE

Land Use Category	General Plan Acres	Percent of Total Acres
Agriculture/Ranches	8,681	29.2
Rural Residential	1,964	6.6
Low Density Residential	4,035	13.6
Medium Density Residential	760	2.6
High Density Residential	605	2.0
Very High Density Residential	52	0.2
Subtotal Residential	**16,097**	**54.2**
Commercial	562	1.9
Business Park	104	0.3
Commercial Recreation	954	3.2
Subtotal Commercial	**1,620**	**5.4**
Public Open Space	3,817	12.8
State Park	7,326	24.6
Subtotal Open Space	**11,143**	**37.4**
Institutional / Public Facility	866	3.0
TOTALS	**29,726[1]**	**100**

Notes:

[1] The 29,726-acre figure represents the total acreage of land within the City on the existing General Plan Land Use map. Please note that the existing General Plan Land Use map included acreage counts from public and private streets and State Route 71 as well as acreage counts from previous mapping errors that have now been corrected. Figure 2 and Table LU-1 reflects the correct total acreage figures for the Draft Update General Plan Land Use Map.

EXISTING LAND USES

Table LU-3, below, summarizes the currently developed Chino Hills land by existing General Plan land use designation, land use acreage, and by percent of total dwelling units and/or non-residential square footage area currently developed. For residential, there are approximately 23,793 total existing dwelling units, which represents 84.6% of the existing General Plan dwelling unit buildout and 80.3% of the proposed General Plan residential buildout. For non-residential square footage, specifically commercial, there are approximately 4,070,810

commercial square feet of development, which represents 80.8% of the existing General Plan commercial square footage buildout and 81.1% of the proposed General Plan commercial buildout.

Table LU-3

EXISTING DEVELOPED LAND USE BY LAND USE DESIGNATION, ACREAGE AND PERCENT OF TOTAL AREA DEVELOPED

Land Use Category	General Plan Acres	Square Feet (Non-Residential)	Percent of Total Square Feet (Non-Residential) Developed	Dwelling Units	Percent of Total Dwelling Units Developed
Agriculture/Ranches	8,681	9,039	0.1	63	0.3
Rural Residential	1,964	0	0.0	283	1.2
Low Density Residential	4,035	28,156	0.5	15,027	63.2
Medium Density Residential	760	0	0.0	3,370	14.2
High Density Residential	605	159,461	2.6	4,596	19.3
Very High Density Residential	52	134,633	2.2	91	0.4
Subtotal Residential	**16,097**	**331,289**	**5.4**	**23,430**	**98.5**
Commercial	562	3,386,649	54.8	194	0.8
Business Park	104	467,733	7.6	1	0.0
Commercial Recreation	954	216,428	3.5	0	0.0
Subtotal Commercial	**1,620**	**4,070,810**	**65.9**	**195**	**0.8**
Public Open Space	3,817	0	0.0	145	0.6
State Park	7,326	0	0.0	0.0	0
Subtotal Open Space	**11,143**	**0**	**0.0**	**145**	**0.6**
Institutional / Public Facility	866	1,775,042	28.7	23	0.1
Subtotal Institutional / Public Facility	**866**	**1,775,042**	**28.7**	**23**	**0.1**
TOTALS	**29,726**	**6,177,141**	**100**	**23,793**	**100**

TRANSPORTATION

Roadways: The City's roadway system is comprised of the State Route 71 Freeway and its interchanges, 6-Lane Major Arterials, 4-Lane Major Highways, 4-Lane Secondary Highways, 4-Lane Commercial Collectors, and 2-Lane Collectors. Local streets connect to these roadways, providing access to Chino Hills neighborhoods and non-residential developments.

Transit: Omnitrans is the largest public transit provider in San Bernardino County, serving over 15 million passengers each year throughout 16 cities and unincorporated areas. In Chino Hills, Omnitrans provides bus service from Chino Hills Parkway and Pipeline Avenue to the TransCenter in the city of Montclair and extends service to Chino Hills locations such as Ayala and Chino Hills High Schools, Chino Campus of Chaffey College, Chino Spectrum, and City Hall. Omnitrans also operates a demand-response transportation system known as OmniLink, which provides curb-to-curb service for the general public.

Bicycle and Pedestrian Ways: Bike lanes are marked on all arterial, highway and collector streets in the City. Pedestrian ways connect neighborhoods to schools, commercial areas and parks and open spaces.

INFRASTRUCTURE

Water, sewer and storm drainage infrastructure (wet utilities) and electricity, natural gas, and telecommunications infrastructure (dry utilities) comprise the City infrastructure system. Such infrastructure is typically installed in conjunction with development to serve that development or be reasonably related to it. Utility systems usually follow the street system and are installed within the public right of way. Planning and maintenance of wet utilities is the City's responsibility. The City of Chino Hills Storm Drain Master Plan and Water, Recycled Water, and Sewer Master Plan anticipate the infrastructure improvements needed to serve current and expected development.

GEOLOGY

The City of Chino Hills is located in the eastern Puente Hills, in the northern portion of the Peninsular Ranges geomorphic province. The Peninsular Ranges province is characterized by a series of northwest to southeast-oriented valleys, hills, and mountains separated by faults associated with, and parallel to the San Andreas Fault System. Two of these faults, the Chino and the Whittier, are located in and near the City of Chino Hills, respectively. These faults, and the bedrock and sediment types that occur in the Chino Hills area, control to a large extent the potential geologic impacts that could occur in the City.

Other geologic conditions within the City include liquefaction and landslides. Liquefaction is a soil strength and stiffness loss phenomenon that typically occurs in loose, saturated cohesionless soils as a result of strong ground shaking during earthquakes.

BIOLOGICAL RESOURCES

Chino Hills is home to a wide diversity of plant and animal species, often located in the canyons. Native and non-native vegetation occur within the eleven following vegetation communities:

1. Annual Grasslands,
2. Diegan Coastal Sage Scrub,
3. Coast Live Oak Woodland,
4. Chaparral, Southern Willow Scrub,
5. Walnut Woodland,
6. Coast Live Oak Riparian Forest,
7. Riverine,
8. Coastal Sage Scrub/Chaparral Ecotone,
9. Freshwater Emergent Wetland,
10. Sycamore-Alder Riparian Woodland,
11. Open Water.

Within these vegetation communities are a number of special-status animal species that inhabit the native plants communities within Chino Hills. Special-status animals include fish, birds, reptiles and mammals that are listed by the United States Fish and Wildlife Services (USFWS) and/or California Department of Fish and Wildlife (CDFW) as either endangered, threatened or a species of concern. Special-status animals identified by the California Natural Diversity Database (CNDDB) also occur in Chino Hills.

CULTURAL RESOURCES

All of Chino Hills is within the traditional tribal territory of the Tongva/Gabrielino, which is believed to have inhabited the area beginning in the Milling Stone or Intermediate period, approximately 3000 years before present. These people are believed to have established the village of Pashiinonga that was located on a rise above Chino Creek. This village would have been a base with smaller satellite villages and seasonal camps in the vicinity. Because of this history, the entire City is sensitive for prehistoric resources. A records search at the San Bernardino Archaeological Information Center at the San Bernardino County Museum identified 121 recorded cultural resources within the City of Chino Hills (records search June 9-11, 2010 by Molly Valasik of Cogstone). Twenty-six are prehistoric-era sites, 55 are historic-era sites, 38 are prehistoric isolates and 2 are historic isolates within the city limits of Chino Hills. Two of the historic-era sites have additional listings. The Ranch Chino Adobe site is a California State Historical Landmark and the Battle of Chino marker is a California Point of Interest.

Known paleontological resources in the City consist of Miocene Epoch (15-9 million years old) and Pleistocene Epoch (1.8 million to 10 thousand years old) fossils. Miocene fossils represented the time period when Chino Hills was ocean floor and includes many kinds of marine life but also leaves from terrestrial plants that were washed into the ocean by streams and rivers. The Miocene marine fossils include marine mammals of 8 types, boney fishes of 41 types, cartilaginous fishes of 4 types, marine invertebrates of 18 types and marine plants of 10 types. Miocene land plants of 32 types are represented along with freshwater snails. The single most scientifically significant fossil is the Chino Hills Dolphin, *Atocetus anguloi,* recovered during construction excavations for Vellano in Soquel Canyon. This dolphin is a new and previously unknown species and has no living relatives.

Pleistocene terrestrial mammals are represented by 8 types, including a prehistoric bison, horse, giant horse, Mammoth, deer, two types of ground sloths and rodent.

8. ***Surrounding land uses and setting: (Briefly describe the project's surroundings)***

Areas surrounding the City generally follow similar development patterns. To the north is the City of Pomona, where land uses adjacent to Chino Hills include undeveloped land, State Route (SR) 60 and residential. To the east are SR 71, the City of Chino and portions of unincorporated Riverside County and the City of Corona. The adjacent land uses within the City of Chino consist of a mix of residential, commercial and industrial. Within the unincorporated County, the adjacent land use is the Prado Dam flood control basin. Within the City of Corona, the adjacent land uses are undeveloped land and SR 71. To the south are the SR 91, then undeveloped land and residential land uses within the cities of Corona, Yorba Linda and Brea. To the west are undeveloped land and residential land within the cities of Yorba Linda and Diamond Bar.

9. ***Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement.)***

Once the General Plan Update is adopted by the Chino Hills City Council, there will be no other permits necessary from other public agencies, including responsible agencies, in order for General Plan Update to become effective.

Environmental Factors Potentially Affected:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

- ☐ Aesthetics
- ☐ Agriculture/ Forest Resources
- ☑ Air Quality
- ☑ Biological Resources
- ☑ Cultural Resources
- ☑ Geology/Soils
- ☑ Greenhouse Gas Emissions
- ☑ Hazards/Hazard Materials
- ☑ Hydrology/Water Quality
- ☑ Land Use and Planning
- ☐ Mineral Resources
- ☑ Noise
- ☑ Population/Housing
- ☑ Public Services
- ☑ Recreation
- ☑ Transportation/Traffic
- ☑ Utilities/Service Systems
- ☑ Mandatory Findings of Significance

Determination: (To be completed by the Lead Agency)

On the basis of this initial evaluation:

	I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
	I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures described on the attached pages have been added to the project. A MITIGATED NEGATIVE DECLARATION will be prepared.
	I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
x	I find that the proposed project MAY have a significant effect(s) on the environment; and a **PROGRAM ENVIRONMENTAL IMPACT REPORT** is required.
	I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable legal standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Joann Lombardo
Signature

5-22-2013
Date

Joann Lombardo — Printed Name
Community Development Director — Title
City of Chino Hills — Agency

Evaluation of Environmental Impacts:

An Environmental Checklist Form (Form) has been used to evaluate the potential environmental impacts associated with the proposed project. The Form has been prepared by the Resources Agency of California to assist local governmental agencies, such as the City of Chino Hills, in complying with the requirements of the Statutes and Guidelines for implementing the California Environmental Quality Act. In the Form, environmental effects are evaluated as follows:

1. A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in its response. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
2. All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
3. Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is "Potentially Significant," "Less Than Significant With Mitigation," or "Less Than Significant." "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.
4. "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from an "Earlier Analyses," as described in #5 below, may be cross-referenced).
5. Earlier analyses may be used where, pursuant to tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. In this case, a brief discussion should identify the following:
   (a) Earlier Analysis Used. Identify and state where they are available for review.
   (b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
   (c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.
6. Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances).
7. Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.
8. The explanation of each issue should identify:

(a) The significance criteria or threshold, if any, used to evaluate each question.
(b) The mitigation measure identified, if any, to reduce the impact to less than significant.

Environmental Impacts Checklist:

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
I. AESTHETICS. Would the project:				
a) Have a substantial adverse effect on a scenic vista?				X
b) Substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				X
c) Substantially degrade the existing visual character and quality of the site and its surroundings?				X
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?				X
Explanation: I. a-d. *Potentially Significant.* The existing General Plan and Municipal Code identifies scenic vistas and resources within the City, contains policies and standards to protect the visual character of the community, and provides standards to control light and glare. The General Plan Update proposes to maintain and strengthen the policies and standards that address community aesthetics, and is not expected to result in adverse impacts relative to this topic. However, because community aesthetics are a vital part of the City of Chino Hills character, the Program EIR will present a review of existing City scenic resources and visual character and how the General Plan Update will affect the resources and character.				
II. AGRICULTURAL AND FOREST RESOURCES. *In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.* **Would the project:**				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				X
b) Conflict with existing zoning for agricultural use,				X

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
or a Williamson Act contract?				
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?				X
d) Result in the loss of forest land or conversion of forest land to non-forest use?				X
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?				X

Explanation: II. a-e. *No Impact.* According to the California Department of Conservation 2010 Important Farmland Map for San Bernardino County, Figure 3, the majority of Chino Hills is classified as Grazing Land and Urban and Built-Up Land. Grazing Land is defined by the state as land on which the existing vegetation is suited to the grazing of livestock. In Chino Hills, Grazing Lands are located primarily within the hillside areas on properties with Open Space and Agriculture/Ranches land use designations. The existing General Plan defines an Agriculture/Ranches land use classification that allows a residential density of up to 0.2 dwelling units per acre, along with equestrian estates, agricultural uses and cattle grazing. The proposed General Plan Update maintains this classification, and clarifies that equestrian uses, agricultural uses and cattle grazing may be permitted as a primary land use.

Urban and Built-Up Land is defined by the state as land that is occupied by structures with a building density of at least one unit to 1.5 acres, or approximately six structures to a 10-acre parcel. Common examples include residential, industrial commercial, institutional, golf courses and infrastructure facilities. In Chino Hills, these urban lands are primarily located on relatively flat land near the S-R 71 and other arterial roadways.

Prime Farmland is identified on portions of the Boys Republic property, which consists of approximately 196 acres, most of which is used for grazing and alfalfa or hay production to feed the cattle. Prime Farmland is defined by the state as land with the best combination of physical and chemical features to be able to sustain long-term agricultural projections. This land has the soil quality, growing season and moisture needed to produce sustained high yields. Land must have been used for irrigated agricultural project at some time during the four years prior to the mapping date. The General Plan Update does not propose to alter any of the uses or land use designations within the identified Grazing Land properties or Boys Republic. No properties within the City remain in an agricultural preserve.

Timberland is defined by PRC Section 4526 as land, other than federal land, which is available for, and capable of, growing a crop of trees of any commercial species used to produce lumber and other forest products including Christmas trees. There is no timberland and no designated forest lands within Chino Hills. Consequently, no impacts relative to the conversion of farmlands, timberlands or forest land will occur as a result of the General Plan Update. This topic will not be addressed with the Program EIR.

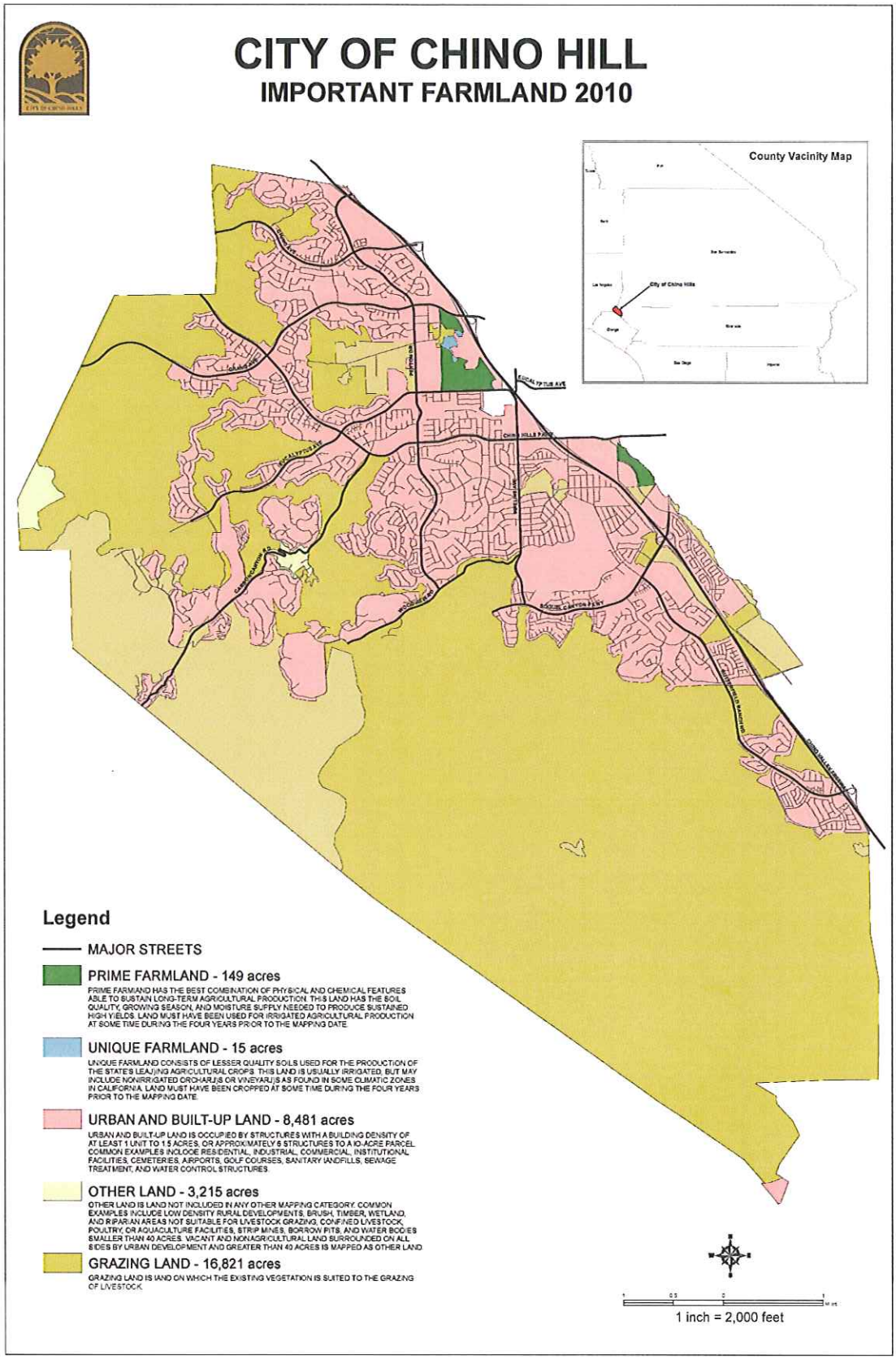

Figure 3, *California Department of Conservation 2010 Important Farmland Map for San Bernardino County*

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
III. AIR QUALITY. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	X			
b) Violate any air quality standard or contribute to an existing or projected air quality violation?	X			
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	X			
d) Expose sensitive receptors to substantial pollutant concentrations?	X			
e) Create objectionable odors affecting a substantial number of people?	X			

Explanation: III. a-e. *Potentially Significant.* Chino Hills is within the South Coast Air Basin (the Basin), which is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). As the local air quality management agency, the SCAQMD is required to monitor air pollutant levels to ensure that state and federal air quality standards are met and, if they are not met, to develop strategies to meet the standards. Depending on whether or not the standards are met or exceeded, the Basin is classified as being in "attainment" or "nonattainment." The part of the Basin within which Chino Hills is located is in nonattainment for both the federal and state standards for ozone, PM10, and PM2.5, as well as the state standard for nitrogen dioxide (California Air Resources Board, Area Designations Maps/State and National, May 2012). Thus, the Basin currently exceeds several state and federal ambient air quality standards and is required to implement strategies to reduce pollutant levels to recognized acceptable standards. This non-attainment status is a result of several factors, the primary ones being the naturally adverse meteorological conditions that limit the dispersion and diffusion of pollutants, the limited capacity of the local airshed to eliminate pollutants from the air, and the number, type, and density of emission sources within the Basin.

Build-out of the City consistent with the General Plan Update could conflict with implementation of the SCAQMD air quality plan, violate applicable air quality standards and contribute substantially to existing air quality violations; expose sensitive receptors (including children, elderly and the infirmed) to substantial pollutant contributions; and create objectionable odors affecting substantial numbers of people. The Program EIR will identify whether or not development pursuant to the General Plan Update would impact the above-listed air quality issues. Where appropriate, the EIR will recommend mitigation measures to reduce potential impacts to air quality.

IV. BIOLOGICAL RESOURCES. Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modification, on any species identified as candidate, sensitive or special status species in local or regional plans,	X			

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
policies or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife?				
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife?	X			
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling hydrological interruption, or other means?	X			
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	X			
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	X			
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservancy Conservation Plan, or other approved local, regional, or state habitat conservation plan?	X			
Explanation: *IV. a-f. Potentially Significant.* As discussed in Section 7 of this Initial Study, Chino Hills contains numerous vegetation communities and species listed by the USFWS and/or CDFW as either endangered, threatened or a species of concern. Continued development of the City pursuant to the General Plan Update could potentially impact these resources. The Program EIR will identify whether or not development pursuant to the General Plan Update would impact the above-listed biological resource issues. Where appropriate, the EIR will recommend mitigation measures to reduce potential impacts to biological resources.				
V. CULTURAL AND RESOURCES. Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	X			
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	X			

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	X			
d) Disturb any human remains including those interred outside of formal cemeteries?	X			
Explanation: *V. a-d. Potentially Significant.* As discussed in Section 7 of this Initial Study, Chino Hills contains potential historical sites and archeological and paleontological resources. There is reasonable expectation that internment sites could exist. Continued development of the City pursuant to the General Plan Update could potentially impact these resources. The Program EIR will identify whether or not development pursuant to the General Plan Update would impact the above-listed cultural resource issues. Where appropriate, the EIR will recommend mitigation measures to reduce potential impacts to cultural resources.				
VI. GEOLOGY AND SOILS. Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving: i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	X			
ii) Strong seismic ground shaking?	X			
iii) Seismic-related ground failure, including liquefaction?	X			
iv) Landslides?	X			
b) Result in substantial soil erosion or the loss of topsoil?	X			
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	X			
d) Be located on expansive soil, as defined in Table LU-18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	X			
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers	X			

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
are not available for the disposal of wastewater?				

Explanation: *VI. a-e. Potentially Significant.* Geographically, Chino Hills is susceptible to seismic activity, landslides, erosion, liquefaction, expansive soils. Current City development policies allow septic tanks in certain large hillside residential areas. Continued development of the City could potentially impact these geologic and soils conditions. The Program EIR will identify whether or not development pursuant to the General Plan Update would impact the above-listed geology and soils issues. Where appropriate, the EIR will recommend mitigation measures to reduce potential impacts to geology and soils.

VII. GREENHOUSE GAS EMISSIONS. Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	X			
b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?	X			

Explanation: *VII. a-b. Potentially Significant.* In 2005, in recognition of California's vulnerability to the effects of climate change, Governor Schwarzenegger established Executive Order S-3-05, which sets forth a series of target dates by which statewide emission of greenhouse gas (GHG) would be progressively reduced, as follows:

- By 2010, reduce GHG emissions to 2000 levels;
- By 2020, reduce GHG emissions to 1990 levels; and
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

In 2006, California passed the California Global Warming Solutions Act of 2006 (AB 32; California Health and Safety Code Division 25.5, Sections 38500, et seq.), which requires the California Air Resources Board (CARB) to design and implement emission limits, regulations, and other measures, such that feasible and cost-effective statewide greenhouse gas emissions are reduced to 1990 levels by 2020 (representing an approximate 25 percent reduction in emissions).

To provide guidance to local lead agencies on determining significance for GHG emissions in their CEQA documents, the SCAQMD has convened a GHG CEQA Significance Threshold Working Group. The SCAQMD is in the process of establishing a threshold for GHG emissions to determine a project's regional contribution toward global climate change impacts for California. On December 5, 2008, SCAQMD adopted a threshold of 3,000 metric tons (MTons) of CO2e[2] per year for residential and commercial projects for which it is the lead agency under CEQA. These levels were reaffirmed by SCAQMD in 2010. The Program EIR will identify whether or not development pursuant to the General Plan Update would generate significant levels of GHG and would comply with applicable state and regional GHG policies. Where appropriate, the EIR will recommend mitigation measures to reduce potential impacts to GHG.

[2] CO2e, or carbon dioxide equivalent, is a standard unit for measuring carbon footprints.

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
VIII. HAZARDS AND HAZARDOUS MATERIALS. Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	X			
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	X			
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	X			
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	X			
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the Project Area?	X			
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the Project Area?				X
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	X			
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	X			

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
Explanation: *VIII. a-e, g-h. Potentially Significant.* Chino Hills does not contain known hazardous materials producing industries, and the General Plan Update does not propose to alter currently designated industrial sites within the City. According to the State of California Department of Toxic Substances Control (DTSC) Envirostor database (accessed May 2, 2013), the Aerojet Chino Hills Facility is the only active site in the City currently monitored by DTSC. Aerojet is a former munitions assembly and test facility that operated from 1954 until the facility closed in November 1995. It is located on approximately 800 acres in an undeveloped area adjacent to Chino Hills State Parks. Ordnance assembled and tested at the Facility included high explosive incendiary (HEI) rounds, armor piercing incendiary (API) rounds containing depleted uranium and a wide variety of fuses. Solid rocket motors containing perchlorate were tested in one area of the facility. Aerojet has been working with DTSC on corrective actions to complete clean-up of the site and plan for its future use. To address potential impacts associated with the Aerojet clean-up process as well as other potential hazardous materials in or adjacent to the City, the Program EIR will review the adequacy of General Plan Update policies to address these hazardous materials issues. Other potential hazard issues of concern for Chino Hills is the Chino Airport which is located approximately 6 miles from the Chino Hills' eastern border, and risk of wildland fires in the hillside and less developed areas of the City. The Program EIR will review the adequacy of General Plan Update policies to address these hazards and the City's emergency response plans. Where appropriate, the EIR will recommend mitigation measures to reduce potential impacts to hazards and hazardous materials.				
Explanation: *VIII. f. No Impact.* No private airstrips are located within or adjacent to the City. Therefore, no hazard impacts relative to private airstrips will occur as a result of the General Plan Update. This topic will not be addressed with the Program EIR.				
IX. HYDROLOGY AND WATER QUALITY. Would the project:				
a) Violate any water quality standards or waste discharge requirements?	X			
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	X			
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	X			
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of stream or river, or substantially increase the rate or amount of	X			

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
surface runoff in a manner which would result in flooding on- or off-site?				
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	X			
f) Otherwise substantially degrade water quality?	X			
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	X			
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	X			
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	X			
j) Inundation by seiche or mudflow?	X			

Explanation: *IX. a-j. Potentially Significant.* Current and planned development in the City will generate substantial runoff which could impact water quality as well as existing drainage patterns. Portions of the City water supply come from groundwater. There is potential for continued growth to deplete groundwater sources or interfere with groundwater discharge. Portions of the City of Chino Hills have been mapped by the Federal Insurance & Mitigation Administration (FIMA) as part of the National Flood Insurance program. Areas on both sides of Carbon Canyon Creek and Little Chino Creek within the City have been mapped as having some potential for flooding during storm events. Risks of flooding from inundation occur from the two reservoirs within the City: Los Serranos Lake (also known as Rancho Cielito Reservoir) and Chino Ranch No. 1 Dam (also known as Arnold Reservoir). During a seismic event, flooding from inundation could occur due to water or stormwater facility failure. The Program EIR will identify whether or not development pursuant to the General Plan Update would impact the above-listed hydrology and water quality issues. Where appropriate, the EIR will recommend mitigation measures to reduce potential impacts to hydrology and water quality.

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
X. LAND USE AND PLANNING. Would the project:				
a) Physically divide an established community?	X			
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	X			
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?				X

Explanation: *X. a-b. Potentially Significant.* The General Plan Update includes changes to the Land Use Map and the Land Use Element text. The updated Land Use Map contains the following major changes:

1. Delineation of Open Space into Public Open Space, Private Open Space and Public Park land use categories.
2. Designation of Very High Residential Sites in compliance with state mandated Regional Housing Needs Allocation (RHNA) obligation.
3. Addition of a Mixed Use land use category.
4. Correction of land use designations for sites that have developed or are expected to develop at uses or densities that differ substantially from their existing General Plan land use category.
5. Correction of mapping errors.

The preliminary draft of the updated Land Use Element text reorganizes the goals and policies of the existing General Plan and promulgates the following major changes:

1. Transition Planned Development Plan designated properties to traditional zoning consistent with developed use and/or General Plan land use designation and Measure U and other applicable law.
2. Permit clustering of Agricultural/Ranch and Rural Residential properties to protect environmental and visual resources, allowing for reduced minimum lot sizes provided the overall density of the parcel is not increased.
3. Create Mixed Use land use policies.

The Program EIR will identify whether changes to the Land Use Element and other General Plan Elements would impact established communities or conflict with other applicable planning documents

Explanation: *X. c. No Impact.* There is no habitat conservation or natural community plans within the City applicable to current or proposed land use plans. Therefore, no impacts relative to habitat conservation or natural community plans will occur as a result of the General Plan Update. This topic will not be addressed with the Program EIR.

XI. MINERAL RESOURCES. Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				X

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				X

Explanation: XI. *a-b. No Impact.* According to the California Division of Mines and Geology, no significant mineral deposits are known to exist in Chino Hills. Immediately outside the City limits in the extreme southeast corner, Mines and Geology has classified sand and gravel resources along the Santa Ana River wash as "MRZ-2," defined as "areas where adequate information indicates that significant mineral deposits are present ... or where it is judged that a high likelihood for their presence exists." Much of this area is within Chino Hills State Park.

Within the Chino Hills city limits, oil has been produced since the late 1800s. Minor oil production continues in the Chino-Soquel Oil Field and the Mahala Oil Field. The existing oilfields within the City are within undeveloped lands designated Agriculture/Ranches. Oil exploration, drilling and production are conditionally permitted uses under the Agricultural/Ranches zoning designation. Many plugged oil and gas wells remain in the City. Most wells plugged after the late 1970s were abandoned to current standards. Wells abandoned prior to that time were likely not abandoned to current California Division of Oil, Gas and Geothermal Resources (CDOGGR) regulations. If development is planned for an area known to have plugged and/or abandoned oil wells, the City is required to submit building permit applications to the Long Beach office of the CDOGGR for inspection and proper abandonment. Corrective action typically includes requiring the property owner to have all wells slurry filled to minimize future problems. Oilfield related hazards that may require remediation and mitigation include venting of gases, petroleum-saturated soils and soils contaminated with diesel, heavy metals or other hazardous substances.

The General Plan Update does not propose policies or other actions that would change the nature of oil production in the City. Therefore, no impacts relative to mineral resources will occur as a result of the General Plan Update. This topic will not be addressed with the Program EIR.

XII. NOISE. Would the project:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	X			
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	X			
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	X			
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	X			
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or	X			

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
public use airport, would the project expose people residing or working in the Project Area to excessive noise levels?				
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the Project Area to excessive noise levels?				X
Explanation: *XII. a-e. Potentially Significant.* Existing sources or noise in Chino Hills include vehicular traffic, truck traffic, construction, entertainment and other noises associated with urban development. Chino Airport is located approximately 6 miles from Chino Hills. The Program EIR will identify whether or not the development pursuant to the General Plan Update would result in noise related impacts. Where appropriate, the EIR will recommend mitigation measures to reduce potential impacts to noise.				
Explanation: XII. *f. No Impact.* No private airstrips are located within or adjacent to the City. Therefore, no noise impacts relative to private airstrips will occur as a result of the General Plan Update. This topic will not be addressed with the Program EIR.				
XIII. POPULATION AND HOUSING. Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	X			
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	X			
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	X			
Explanation: *XIII. a-c. Potentially Significant.* Since its incorporation, the City of Chino Hills has grown from a population of 48,041 persons to a 2010 Census count of 74,799 persons, an increase of 26,758 persons or 56%. The General Plan Update plans for continued residential development within the City. To ensure that continued residential development will not induce growth, or displace substantial numbers of existing housing or people, the Program EIR will assess how the General Plan Update would impact the above-listed population and housing issues. Where appropriate, the EIR will recommend mitigation measures to reduce potential impacts to population and housing.				
XIV. PUBLIC SERVICES. Would the project: result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant Environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
a) Fire protection?	X			

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
b) Police protection?	X			
c) Schools?	X			
d) Parks?	X			
e) Other public facilities?	X			
Explanation: *XIV. a-e. Potentially Significant.* The City of Chino Hills residential population has increased 56% since its incorporation. The General Plan Update plans for continued residential as well as nonresidential development within the City. To ensure that continued development will not adversely impact public services, the Program EIR will assess how the General Plan Update would impact fire protection, police protection, schools, parks and other public facilities. Where appropriate, the EIR will recommend mitigation measures to reduce potential impacts to public services.				
XV. RECREATION:				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	X			
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	X			
Explanation: *XV. a-b. Potentially Significant.* The General Plan Update plans for continued residential as well as nonresidential development within the City. To ensure that continued development will not adversely impact current or future recreational facilities in the City, the Program EIR will assess how the General Plan Update would impact these above-listed recreation issues. Where appropriate, the EIR will recommend mitigation measures to reduce potential impacts to recreation.				
XVI. TRANSPORTATION/ TRAFFIC. Would the project:				
a) Exceed the capacity of the existing circulation system, based on an applicable measure of effectiveness (as designated in a general plan policy, ordinance, etc.) taking into account all relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	X			
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the County Congestion Management Agency for designated roads or	X			

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
highways?				
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	X			
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	X			
e) Result in inadequate emergency access?	X			
f) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	X			
Explanation: XVI. *a-f. Potentially Significant.* The General Plan Update plans for continued residential as well as nonresidential development within the City. To assess how continued development will impact the City's circulation system, regional transportation plans, air traffic plans, roadway hazards, emergency evacuation plans and alternative transportation, the Program EIR will address each of the above-listed transportation and traffic issues. Where appropriate, the EIR will recommend mitigation measures to reduce potential impacts to transportation and traffic.				
XVII. UTILITIES AND SERVICE SYSTEMS. Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	X			
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	X			
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project as projected demand in addition to the provider's existing commitments?	X			
d) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	X			
e) Have sufficient water supplies available to serve the project from existing entitlements and resources, or new or expanded entitlements	X			

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
needed?				
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	X			
g) Comply with federal, state and local statutes and regulations related to solid waste?	X			
Explanation: *XVII. a-g. Potentially Significant.* Continued development within the City pursuant to the General Plan Update could impact utilities, inclusive of wastewater treatment facilities, storm drainage facilities, water supply, and solid waste capacity and compliance with applicable regulations. The Program will assess how the General Plan Update would impact these above-listed utility issues. Where appropriate, the EIR will recommend mitigation measures to reduce potential impacts to utilities.				
XVIII. MANDATORY FINDINGS OF SIGNIFICANCE				
A. Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or an endangered threatened species, or eliminate important examples of the major periods of California history or prehistory?	X			
Explanation: *XVIII. A. Potentially Significant.* Land within the City contains important biological resources and cultural resources that could be degraded by future development pursuant to the proposed General Plan Update. This mandatory finding of signficance will be evaluated in the EIR.				
B. Does the project have impacts that are individually limited, but cumulatively considerable? (Are the incremental effects of the project considerable when viewed in connection with those of past projects, those of other current projects, and those of probable future projects?)	X			
Explanation: *XVIII. B. Potentially Significant.* Development pursuant to the proposed General Plan Update could contribute to impacts that are individually limited but potentially cumulatively considerable, specifically in regard to issues such as air quality, greenhouse gas, traffic, and utilities. Further analysis in the EIR will be provided to determine potential cumulative impacts from Project implementation.				
C. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	X			

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
Explanation: XVIII. C. *Potentially Significant.* Development pursuant to the proposed General Plan Update could potentially adversely affect human beings, either directly or indirectly, specifically in regard to air quality, greenhouse gas, noise and hazards. Additional analysis in the EIR will evaluate the significance of any effects on human beings in light of more detailed analyses.				

Appendix B – Comments Received in Response to the Notice of Preparation

Joann Lombardo

From: Swenson, Daniel P SPL <Daniel.P.Swenson@usace.army.mil>
Sent: Thursday, May 30, 2013 10:55 AM
To: Jerrod Walters
Subject: City of Chino Hills Draft General Plan Update (Corps No. SPL-2013-394) (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Dear Mr. Walters:

It has come to our attention you are proposing the City of Chino Hills Draft General Plan Update, potentially including zoning changes to allow for increased development within waters of the U.S. and special aquatic sites (for example, wetlands and streams within open space along Grand Avenue at the intersection with Tonner Canyon Road). This activity may require a U.S. Army Corps of Engineers permit.

A Corps of Engineers permit is required for the discharge of dredged or fill material into, including any redeposit of dredged material other than incidental fallback within, "waters of the United States" and adjacent wetlands pursuant to Section 404 of the Clean Water Act of 1972. Examples include, but are not limited to,

1. creating fills for residential or commercial development, placing bank protection, temporary or permanent stockpiling of excavated material, building road crossings, backfilling for utility line crossings and constructing outfall structures, dams, levees, groins, weirs, or other structures;

2. mechanized land clearing, grading which involves filling low areas or land leveling, ditching, channelizing and other excavation activities that would have the effect of destroying or degrading waters of the United States;

3. allowing runoff or overflow from a contained land or water disposal area to re-enter a water of the United States;

4. placing pilings when such placement has or would have the effect of a discharge of fill material;

An application for a Department of the Army permit is available on our website: http://www.spl.usace.army.mil/Missions/Regulatory/PermitProcess.aspx. In addition, we encourage applicants to consider avoidance and minimization of impacts to aquatic resources in the pre-application (planning) stage as well as the use of a functional/condition assessment method (for example, CRAM), when practicable, to evaluate aquatic resources. If you have any questions, please contact me (contact information below). Please refer to this letter and SPL-2013-394 in your reply.

sincerely,

Daniel P. Swenson, D.Env.
Chief, LA & San Bernardino Counties Section U.S. Army Corps of Engineers
Attn: Regulatory Division
915 Wilshire Blvd.
Los Angeles, CA 90017

213-452-3414
213-452-4196 fax
http://www.spl.usace.army.mil/Missions/Regulatory.aspx

Classification: UNCLASSIFIED
Caveats: NONE

STATE OF CALIFORNIA

Edmund G. Brown, Jr.Governor

NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Boulevard, Suite 100
West Sacramento, CA 95691
(916) 373-3715
Fax (916) 373-5471
Web Site www.nahc.ca.gov
Ds_nahc@pacbell.net

June 12, 2013

RECEIVED
JUN 14 2013
CITY OF CHINO HILLS
COMMUNITY DEVELOPMENT DEPARTMENT

Mr. Jerrod Walters, Associate Planner
City of Chino Hills
Community Development Department
14000 City Center Drive
Chino Hills, 91709

Sent by U.S. Mail
No. of Pages: 3

RE: State Clearinghouse No. SCH#2013051082 CEQA Notice of Preparation (NOP); draft environmental Impact Report (DEIR) and Native American Consultation pursuant to California Government Code Section 65352.3, *et seq.* for the proposed "**City of Chino Hills General Plan Update 13GPA02;**" located in the City Chino Hills; San Bernardino County, California.

Dear Mr. Walters:

Government Code Section 65352.3 requires local governments to consult with California Native American tribes identified by the Native American Heritage Commission (NAHC) for the purpose of protecting and/or mitigating impacts to cultural places. The Native American Heritage Commission (NAHC) is the state 'agency with responsibilities for Native American cultural resources.

In the 1985 Appellate Court decision (170 Cal App 3rd 604), the court held that the NAHC has jurisdiction and special expertise, as a state agency, over affected Native American resources impacted by proposed projects, including archaeological places of religious significance to Native Americans, and to Native American burial sites. Note that the NAHC does NOT APPROVE General or Specific Plan; rather, it provides a list of tribal governments with which local jurisdictions must consult concerning any proposed impact to cultural resources as a result of the proposed action.

An NAHC Sacred Lands File search was conducted and failed to indicate the presence of Native American traditional cultural place(s) in the immediate project area of potential effect (APE). Also, the absence of specific site information in the sacred

lands file does not preclude their existence. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Attached is a consultation list of tribal governments with traditional lands or cultural places located in the vicinity of the Project Area (APE). The tribal entities on the list are for your guidance for **government-to-government consultation** purposes.

A Native American tribe or individual may be the only source of the presence of traditional cultural places. For that reason, a list of Native American Contacts is enclosed as they may have knowledge of cultural resources and about potential impact, if any, of the proposed project.

If you have any questions, please let me know.

Best regards,

Dave Singleton
Program Analyst

Attachment

California Tribal Government Consultation List
San Bernardino County
June 12, 2013

Ramona Band of Cahuilla Mission Indians
Joseph Hamilton, Chairman
P.O. Box 391670 Cahuilla
Anza , CA 92539
admin@ramonatribe.com
(951) 763-4105

Morongo Band of Mission Indians
Robert Martin, Chairperson
12700 Pumarra Rroad Cahuilla
Banning , CA 92220 Serrano
(951) 849-8807
(951) 755-5200

San Manuel Band of Mission Indians
Carla Rodriguez, Chairwoman
26569 Community Center Drive Serrano
Highland , CA 92346
(909) 864-8933
(909) 864-3724 - FAX

Pechanga Band of Mission Indians
Mark Macarro, Chairperson
P.O. Box 1477 Luiseno
Temecula , CA 92593
(951) 770-6100
hlaibach@pechanga-nsn.gov

Soboba Band of Mission Indians
Rosemary Morillo, Chairperson; Attn: Carrie Garcia
P.O. Box 487 Luiseno
San Jacinto , CA 92581
carrieg@soboba-nsn.gov
(951) 654-2765

Serrano Nation of Mission Indians
Goldie Walker, Chairwoman
P.O. Box 343 Serrano
Patton , CA 92369

(909) 528-9027 or
(909) 528-9032

Gabrieleno/Tongva San Gabriel Band of Mission
Anthony Morales, Chairperson
PO Box 693 Gabrielino Tongva
San Gabriel , CA 91778
GTTribalcouncil@aol.com
(626) 286-1632
(626) 286-1758 - Home
(626) 483--3564 cell

Gabrielino Tongva Nation
Sam Dunlap, Cultural Resources Director
P.O. Box 86908 Gabrielino Tongva
Los Angeles , CA 90086
samdunlap@earthlink.net

(909) 262-9351 - cell

Kern Valley Indian Council
Robert Robinson, Co-Chairperson
P.O. Box 401 Tubatulabal
Weldon , CA 93283 Kawaiisu
brobinson@iwvisp.com Koso
Yokuts
(760) 378-4575 (Home)
(760) 549-2131 (Work)

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is applicable only for consultation with Native American tribes under Government Code Section 65352.3. and 65362.4. et seq.

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

RECEIVED
JUN 17 2013
CITY OF CHINO HILLS
COMMUNITY DEVELOPMENT DEPARTMENT

June 14, 2013

Jerrod Walters, Associated Planner
City Hall
14000 City Center Drive
Chino Hills, CA 91709

Notice of Preparation of a CEQA Document for the
Chino Hills General Plan Update

The South Coast Air Quality Management District (SCAQMD) appreciates the opportunity to comment on the above-mentioned document. The SCAQMD's comments are recommendations regarding the analysis of potential air quality impacts from the proposed project that should be included in the draft CEQA document. Please send the SCAQMD a copy of the Draft EIR upon its completion. Note that copies of the Draft EIR that are submitted to the State Clearinghouse are not forwarded to the SCAQMD. Please forward a copy of the Draft EIR directly to SCAQMD at the address in our letterhead. **In addition, please send with the draft EIR all appendices or technical documents related to the air quality and greenhouse gas analyses and electronic versions of all air quality modeling and health risk assessment files. These include original emission calculation spreadsheets and modeling files (not Adobe PDF files). Without all files and supporting air quality documentation, the SCAQMD will be unable to complete its review of the air quality analysis in a timely manner. Any delays in providing all supporting air quality documentation will require additional time for review beyond the end of the comment period.**

Air Quality Analysis
The SCAQMD adopted its California Environmental Quality Act (CEQA) Air Quality Handbook in 1993 to assist other public agencies with the preparation of air quality analyses. The SCAQMD recommends that the Lead Agency use this Handbook as guidance when preparing its air quality analysis. Copies of the Handbook are available from the SCAQMD's Subscription Services Department by calling (909) 396-3720. The lead agency may wish to consider using land use emissions estimating software such as the recently released CalEEMod. This model is available on the SCAQMD Website at: http://www.aqmd.gov/ceqa/models.html.

The Lead Agency should identify any potential adverse air quality impacts that could occur from all phases of the project and all air pollutant sources related to the project. Air quality impacts from both construction (including demolition, if any) and operations should be calculated. Construction-related air quality impacts typically include, but are not limited to, emissions from the use of heavy-duty equipment from grading, earth-loading/unloading, paving, architectural coatings, off-road mobile sources (e.g., heavy-duty construction equipment) and on-road mobile sources (e.g., construction worker vehicle trips, material transport trips). Operation-related air quality impacts may include, but are not limited to, emissions from stationary sources (e.g., boilers), area sources (e.g., solvents and coatings), and vehicular trips (e.g., on- and off-road tailpipe emissions and entrained dust). Air quality impacts from indirect sources, that is, sources that generate or attract vehicular trips should be included in the analysis.

The SCAQMD has developed a methodology for calculating PM2.5 emissions from construction and operational activities and processes. In connection with developing PM2.5 calculation methodologies, the SCAQMD has also developed both regional and localized significance thresholds. The SCAQMD requests that the lead agency quantify PM2.5 emissions and compare the results to the recommended PM2.5 significance thresholds. Guidance for calculating PM2.5 emissions and PM2.5 significance thresholds can be found at the following internet address: http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html.

In addition to analyzing regional air quality impacts the SCAQMD recommends calculating localized air quality impacts and comparing the results to localized significance thresholds (LSTs). LST's can be used in addition to the

recommended regional significance thresholds as a second indication of air quality impacts when preparing a CEQA document. Therefore, when preparing the air quality analysis for the proposed project, it is recommended that the lead agency perform a localized significance analysis by either using the LSTs developed by the SCAQMD or performing dispersion modeling as necessary. Guidance for performing a localized air quality analysis can be found at http://www.aqmd.gov/ceqa/handbook/LST/LST.html.

In the event that the proposed project generates or attracts vehicular trips, especially heavy-duty diesel-fueled vehicles, it is recommended that the lead agency perform a mobile source health risk assessment. Guidance for performing a mobile source health risk assessment ("Health Risk Assessment Guidance for Analyzing Cancer Risk from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis") can be found on the SCAQMD's CEQA web pages at the following internet address: http://www.aqmd.gov/ceqa/handbook/mobile_toxic/mobile_toxic.html. An analysis of all toxic air contaminant impacts due to the decommissioning or use of equipment potentially generating such air pollutants should also be included.

Mitigation Measures

In the event that the project generates significant adverse air quality impacts, CEQA requires that all feasible mitigation measures that go beyond what is required by law be utilized during project construction and operation to minimize or eliminate significant adverse air quality impacts. To assist the Lead Agency with identifying possible mitigation measures for the project, please refer to Chapter 11 of the SCAQMD CEQA Air Quality Handbook for sample air quality mitigation measures. Additional mitigation measures can be found on the SCAQMD's CEQA web pages at the following internet address: www.aqmd.gov/ceqa/handbook/mitigation/MM_intro.html Additionally, SCAQMD's Rule 403 – Fugitive Dust, and the Implementation Handbook contain numerous measures for controlling construction-related emissions that should be considered for use as CEQA mitigation if not otherwise required. Other measures to reduce air quality impacts from land use projects can be found in the SCAQMD's Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning. This document can be found at the following internet address: http://www.aqmd.gov/prdas/aqguide/aqguide.html. In addition, guidance on siting incompatible land uses can be found in the California Air Resources Board's Air Quality and Land Use Handbook: A Community Perspective, which can be found at the following internet address: http://www.arb.ca.gov/ch/handbook.pdf. CARB's Land Use Handbook is a general reference guide for evaluating and reducing air pollution impacts associated with new projects that go through the land use decision-making process. Pursuant to state CEQA Guidelines §15126.4 (a)(1)(D), any impacts resulting from mitigation measures must also be discussed.

Data Sources

SCAQMD rules and relevant air quality reports and data are available by calling the SCAQMD's Public Information Center at (909) 396-2039. Much of the information available through the Public Information Center is also available via the SCAQMD's World Wide Web Homepage (http://www.aqmd.gov).

The SCAQMD staff is available to work with the Lead Agency to ensure that project-related emissions are accurately identified, categorized, and evaluated. If you have any questions regarding this letter, please call Ian MacMillan, Program Supervisor, CEQA Section, at (909) 396-3244.

Sincerely,

Ian V. MacMillan

Ian MacMillan
Program Supervisor, CEQA Inter-Governmental Review
Planning, Rule Development & Area Sources

IM
SBC130528-04
Control Number

State of California • Natural Resources Agency
Edmund G. Brown Jr., *Governor*

DEPARTMENT OF PARKS AND RECREATION
Major General Anthony L. Jackson, USMC (Ret), *Director*
Inland Empire District
17801 Lake Perris Drive
Perris, CA 92571
(951) 443-2423

June 20, 2013

Jerrod Walters
Associate Planner
City Hall
14000 City Center Drive
Chino Hills, CA 91709

Subject: Comments on the Notice of Preparation of a Draft Environmental Impact Report for the City of Chino Hills General Plan

Dear Mr. Walters:

The Inland Empire District of the Department of Parks and Recreation (State Parks) appreciates the opportunity to comment on the aforementioned project. State Parks is a trustee agency as defined by the California Environmental Quality Act (CEQA). State Parks' mission in part is to provide for the health, inspiration, and education of the people of California by preserving the state's extraordinary biodiversity and creating opportunities for high quality outdoor recreation. As the office responsible for the stewardship of Chino Hills State Park (Chino Hills SP), we have an interest and concern about contemplated alterations of land use adjacent to the park.

The Chino Hills SP General Plan, which can be found at http://www.parks.ca.gov/pages/21299/files/chino%20hills%20finalgp.pdf provides the only land use Management Zones that govern land within the park. The park exists primarily to preserve the natural landscape features, its biological diversity, and low impact recreation. Therefore, grazing of any kind is strictly prohibited within the park. We suggest that the Draft EIR incorporate Figure 6 from the Chino Hills State Park General Plan in an effort to distinguish the park as an area not governed by the city.

Thank you again for coordinating this project with us. For further discussion, please contact me or Enrique Arroyo at (951) 453-6848.

Sincerely,

Enrique Arroyo for

Ron Krueper
District Superintendent
Inland Empire District

cc: State Clearinghouse
Andrea Gullo, Habitat Authority
Judi Tamasi, WCCA
Claire Schlotterbeck, Hills For Everyone

OmniTrans
Connecting Our Community.

1700 W. Fifth St.
San Bernardino, CA 92411
909-379-7100
www.omnitrans.org

June 21, 2013

Mr. Jerrod Walters
Associate Planner
Chino Hills City Hall
14000 City Center Drive
Chino Hills, CA 91709

Subject: Comments regarding Notice of Preparation (NOP) of a Draft Environmental Impact Report for the General Plan Update for the City of Chino Hills

Dear Mr. Walters,

Thank you for providing Omnitrans, the public transportation provider for the San Bernardino Valley, the opportunity to offer comments with respect to the City of Chino Hills' General Plan Update (GPU). Omnitrans supports General Plan goals and policies that support connectivity of various modes of transportation, including bus, walking, and cycling. Following are some policies that may be considered, if not already included, in the general plan update text:

> Continue to consult with regional transit operators related to new projects or development plans in the City.
>
> Require that new and substantially renovated office, retail, industrial, and multi-family developments implement transit amenities, including bus turnouts, transit shelters, and other streetscape elements, as appropriate.
>
> Continue to consult with regional transit operators to provide attractive and convenient bus stops, including shade/weather protection, seats, transit information, and bus shelters as appropriate.
>
> Enhance pedestrian and bicycle access to local and regional transit, including facilitating connections to transit.
>
> Continue to require that the siting and architectural design of new development, infill, or redevelopment projects promotes safety, pedestrian-friendly design, and access to transit facilities.
>
> Continue to design and operate arterials and intersections for the safe operation of all modes of transportation, including transit, bicyclists, and pedestrians.

The city may also want to consider transit-oriented development in the General Plan, including providing additional development-related incentives for projects that promote transit use.

Omnitrans always looks forward to assisting our member cities in providing their residents with transportation options. We look forward to continuing to work with the City of Chino Hills to help accomplish your City's goals for mobility and quality of life. For additional information, feel free to contact me at (909) 379-7256 or Anna.Rahtz@Omnitrans.org.

Respectfully,

Anna Rahtz
Planning Project Manager

OC Public Works
Integrity, Accountability, Service, Trust

Ignacio G. Ochoa, P.E., Interim Director
300 N. Flower Street
Santa Ana, CA 92703

P.O. Box 4048
Santa Ana, CA 92702-4048

Telephone: (714) 667-8800
Fax: (714) 967-0896

NCL 13-022

June 18, 2013

Mr. Jerrod Walters, Associate Planner
City of Chino Hills
14000 City Center Drive
Chino Hills, California 91709

SUBJECT: Notice of Preparation of a Draft Environmental Impact Report (EIR) and Public Scoping Meeting for the Chino Hills General Plan Update

Dear Mr. Walters:

The County of Orange has reviewed the Notice of Preparation of a Draft Environmental Impact Report and Public Scoping Meeting for the Chino Hills General Plan Update for the City of Chino Hills and has no comments at this time. We would like to be advised of any further developments, therefore, please keep us on the distribution list for future notifications related to this project.

Sincerely,

Polin Modanlou, Manager
Strategic Land Planning Division
OC Public Works/OC Planning
300 North Flower Street
Santa Ana, California 92702-4048
Polin.modanlou@ocpw.ocgov.com

RECEIVED
JUN 24 2013
CITY OF CHINO HILLS
COMMUNITY DEVELOPMENT DEPARTMENT

PM/yj

SOUTHERN CALIFORNIA

ASSOCIATION of GOVERNMENTS

Main Office

818 West Seventh Street

12th Floor

Los Angeles, California

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t (213) 236-1800

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www.scag.ca.gov

Officers

President
Glen Becerra, Simi Valley

First Vice President
Greg Pettis, Cathedral City

Second Vice President
Carl Morehouse, San Buenaventura

Immediate Past President
Pam O'Connor, Santa Monica

Executive/Administration Committee Chair

Glen Becerra, Simi Valley

Policy Committee Chairs

Community, Economic and Human Development
Paula Lantz, Pomona

Energy & Environment
Cheryl Viegas-Walker, El Centro

Transportation
Keith Millhouse, Ventura County Transportation Commission

June 24, 2013

Mr. Jerrod Walters
Associate Planner
City of Chino Hills
14000 City Center Drive
Chino Hills, CA 91709
Jwalters@chinohills.org

RE: SCAG Comments on the Notice of Preparation of a Draft Environmental Impact Report for the City of Chino Hills General Plan Update [I20130134]

Dear Mr. Walters:

Thank you for submitting the Notice of Preparation of a Draft Environmental Impact Report for the City of Chino Hills General Plan Update to the Southern California Association of Governments (SCAG) for review and comment. SCAG is the authorized regional agency for Inter-Governmental Review (IGR) of programs proposed for federal financial assistance and direct development activities, pursuant to Presidential Executive Order 12372. Additionally, SCAG reviews the Environmental Impact Reports of projects of regional significance for consistency with regional plans pursuant to the California Environmental Quality Act (CEQA) and CEQA Guidelines.

SCAG is also the designated Regional Transportation Planning Agency under state law, and is responsible for preparation of the Regional Transportation Plan (RTP) including its Sustainable Communities Strategy (SCS) component pursuant to SB 375. As the clearinghouse for regionally significant projects per Executive Order 12372, SCAG reviews the consistency of local plans, projects, and programs with regional plans.[1] Guidance provided by these reviews is intended to assist local agencies and project sponsors to take actions that contribute to the attainment of the regional goals and policies in the RTP/SCS.

SCAG staff has reviewed the Notice of Preparation of a Draft Environmental Impact Report for the City of Chino Hills General Plan Update. The proposed project would update and supersede the City of Chino Hills' current General Plan and provide plans for the City's continued development during the next twenty years. As set forth in the attached, SCAG recommends that the draft EIR include a review and consideration of the adopted RTP/SCS goals and that the analyses reflect the most recently adopted growth forecasts.

When available, please send environmental documentation to SCAG's *office in Los Angeles or by email to leep@scag.ca.gov* providing, at a minimum, the full comment period for review. If you have any questions regarding the attached comments, please contact Pamela Lee at (213) 236-1895 or leep@scag.ca.gov. Thank you.

Sincerely,

Jonathan Nadler
Manager, Compliance and Performance Assessment

[1] SB 375 amends CEQA to add Chapter 4.2 Implementation of the Sustainable Communities Strategy, which allows for certain CEQA streamlining for projects consistent with the RTP/SCS. Lead agencies (including local jurisdictions) maintain the discretion and will be solely responsible for determining "consistency" of any future project with the SCS. Any "consistency" finding by SCAG pursuant to the IGR process should not be construed as a finding of consistency under SB 375 for purposes of CEQA streamlining.

COMMENTS ON THE NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT STATEMENT/ENVIRONMENTAL IMPACT REPORT FOR THE CITY OF CHINO HILLS GENERAL PLAN UPDATE [SCAG NO. I201300134]

CONSISTENCY WITH RTP/SCS

SCAG reviews environmental documents for regionally significant projects for their consistency with the adopted RTP/SCS.

RTP/SCS Goals

The 2012-20135 RTP/SCS links the goal of sustaining mobility with the goals of fostering economic development, enhancing the environment, reducing energy consumption, promoting transportation-friendly development patterns, and encouraging fair and equitable access to residents affected by socio-economic, geographic and commercial limitations (see http://rtpscs.scag.ca.gov). The goals included in the 2012 RTP/SCS may be pertinent to the proposed project. These goals are meant to provide guidance for considering the proposed project within the context of regional goals and policies. Among the relevant goals of the 2012-2035 RTP/SCS are the following:

SCAG 2012-2035 RTP/SCS GOALS	
RTP/SCS G1:	*Align the plan investments and policies with improving regional economic development and competitiveness*
RTP/SCS G2:	*Maximize mobility and accessibility for all people and goods in the region*
RTP/SCS G3:	*Ensure travel safety and reliability for all people and goods in the region*
RTP/SCS G4:	*Preserve and ensure a sustainable regional transportation system*
RTP/SCS G5:	*Maximize the productivity of our transportation system*
RTP/SCS G6:	*Protect the environment and health for our residents by improving air quality and encouraging active transportation (non-motorized transportation, such as bicycling and walking)*
RTP/SCS G7:	*Actively encourage and create incentives for energy efficiency, where possible*
RTP/SCS G8:	*Encourage land use and growth patterns that facilitate transit and non-motorized transportation*
RTP/SCS G9:	*Maximize the security of the regional transportation system through improved system monitoring, rapid recovery planning, and coordination with other security agencies*

For ease of review, we encourage the use of a side-by-side comparison of SCAG goals with discussions of the consistency, non-consistency or non-applicability of the policy and supportive analysis in a table format. Suggested format is as follows:

SCAG 2012-2035 RTP/SCS Goals		
Goal		**Analysis**
RTP/SCS G1:	*Align the plan investments and policies with improving regional economic development and competitiveness.*	*Consistent: Statement as to why* *Not-Consistent: Statement as to why* *or* *Not Applicable: Statement as to why* *DEIR page number reference*
RTP/SCS G2:	*Maximize mobility and accessibility for all people and goods in the region.*	*Consistent: Statement as to why* *Not-Consistent: Statement as to why* *or* *Not Applicable: Statement as to why* *DEIR page number reference*
RTP/SCS G3:	*Ensure travel safety and reliability for all people and goods in the region.*	*Consistent: Statement as to why* *Not-Consistent: Statement as to why* *or* *Not Applicable: Statement as to why* *DEIR page number reference*
etc.	etc.	etc.

Regional Growth Forecasts

The Notice of Preparation of an Environmental Impact Report for the City of Chino Hills General Plan Update should reflect the most recently adopted SCAG forecasts (see http://scag.ca.gov/forecast/index.htm), which are the 2012-2035 RTP/SCS population, household and employment forecasts. The forecasts for the region and applicable jurisdictions are below.

	Adopted SCAG Region Wide Forecasts		**Adopted City of Chino Hills Forecasts**	
Forecast	**Year 2020**	**Year 2035**	**Year 2020**	**Year 2035**
Population	19,663,000	22,091,000	76,600	78,400
Households	6,458,000	7,325,000	24,000	25,600
Employment	8,414,000	9,441,000	10,500	12,900

MITIGATION

SCAG staff recommends that you review the SCAG 2012-2035 RTP/SCS Final Program EIR List of Mitigation Measures Appendix for additional guidance, as appropriate. The SCAG List of Mitigation Measures may be found here: http://scag.ca.gov/igr/pdf/SCAG_IGRMMRP_2012.pdf

Puente Hills
Habitat Preservation Authority
Endowment Provided by the Puente Hills Landfill

June 27, 2013

Mr. Jerrod Walters
Associate Planner
City Hall
14000 City Center Drive
Chino Hills, CA 91709

Comments on the Notice of Preparation of a Draft Environmental Impact Report, Initial Study – City of Chino Hills General Plan Update #13GPA02

Dear Mr. Walters:

The Puente Hills Habitat Preservation Authority (Habitat Authority) appreciates the opportunity to comment on the Notice of Preparation of a Draft Environmental Impact Report (DEIR), Initial Study (dated May 22, 2013) for the City of Chino Hills General Plan Update #13GPA02.

The Habitat Authority is a joint powers authority established pursuant to California Government Code Section 6500 *et seq.* with a Board of Directors consisting of the City of Whittier, County of Los Angeles, Sanitation Districts of Los Angeles County, and the Hacienda Heights Improvement Association. According to its mission, the Habitat Authority is dedicated to the acquisition, restoration, and management of open space in the Puente Hills (Puente Hills Preserve) for preservation of the land in perpetuity, with the primary purpose to protect the biological diversity. Additionally, the agency endeavors to provide opportunities for outdoor education and low-impact recreation. The Habitat Authority owns and or manages over 3,800 acres which lie within the Cities of Whittier and La Habra Heights, as well as in the County unincorporated areas of the Puente Hills known as Hacienda Heights and Rowland Heights. The Puente Hills Preserve is an integral part of the Puente-Chino Hills Wildlife Corridor, an unbroken zone of natural habitat extending nearly 31 miles from the Cleveland National Forest in Orange County to the west end of the Puente Hills and Whittier Narrows.

The Habitat Authority looks forward to providing more substantive comments on the DEIR. In the meantime, we have provided some comments on the Initial Study and recommendations for the DEIR.

Project Description

The Habitat Authority recommends the development of a more detailed project description. Currently, the Initial Study lists the six elements that will be covered in the General Plan Update, but

A Joint Powers Agency created pursuant to California Government Code §6500 *et seq.*
7702 Washington Avenue, Suite C, Whittier, California 90602 • Phone: 562 / 945-9003 • Fax: 562 / 945-0303

Printed on recycled paper

information about how those elements will change needs to be provided in order to determine if impacts will occur and to determine the significance level of potential impacts.

Thresholds of Significance

The Habitat Authority encourages the lead agency to develop and publish thresholds of significance used in the determination of the significance of environmental effects.

Environmental Impacts Checklist

I. Aesthetics:

Not enough information has been provided in the Project Description to indicate "no impacts" would occur to aesthetics. A more detailed project description and information in the General Plan Update are needed to evaluate if environmental factors would potentially be affected. In the Draft EIR, please consider that the Chino Hills State Park is a respite for the metropolitan area and undisturbed ridgelines are important to aesthetics which contribute to the enjoyment of the visitor.

IV. Biological Resources

Due to their importance biologically and very restricted range of walnut woodlands, please consider potential impacts to woodlands in the Draft EIR. Woodland habitat is naturally rare in lowland Southern California, making it especially valuable in the region for the suite of species dependent on it. The Southern California black walnut holds status designation 4 by the California Native Plant Society, indicating this plant has limited distribution and should be monitored regularly as well as evaluated for consideration while preparing CEQA documents. The Chino-Puente Hills is a major center of distribution for this species.

Remaining corridors of undeveloped land within the Puente-Chino Hills provide a rare opportunity to preserve a functional ecosystem and impacts to this wildlife movement corridor should be considered in the Draft EIR. Covering more than 30,000 acres of land, the Puente-Chino Hills Wildlife Corridor supports a wide variety of habitats and vegetation that provides habitat for a unique assemblage of plants and animals. Biologically, this area preserves a microcosm of the California Floristic Province, an identified biodiversity hot spot in North America and a genetic reserve for the continent. As a result, the Puente-Chino Hills Wildlife Corridor is regionally and globally significant as a prime example of this unique habitat web, yet it occurs in an area that is almost completely surrounded by existing development, with the attendant human influences. This wildlife corridor provides food, cover, breeding grounds, and refugia in the event of a large disturbance, and contributes to species diversity, dispersal routes for juveniles, home ranges, and the transfer of genetic material, which help maintain healthy populations. Corridors are important in sustaining populations of both animals and plants.

X. Land Use and Planning

Please indicate if the density for each residential land use category has changed. Changes to the density of residences in each land use category could affect the impact evaluation for numerous sections, including aesthetics.

As confirmed in an email from you on June 18, 2013, thank you for your consideration of our comments received after the close of the comment period ending on June 22, 2013. We look forward to providing comments on the DEIR. Feel free to contact me or Andrea Gullo, Executive Director, at (562) 945-9003 for further discussion.

Sincerely,

Bob Henderson
Chairman

cc: Board of Directors
Citizens Technical Advisory Committee

STATE OF CALIFORNIA

Governor's Office of Planning and Research

State Clearinghouse and Planning Unit

Edmund G. Brown Jr.
Governor

Ken Alex
Director

Notice of Preparation

May 29, 2013

To: Reviewing Agencies

Re: General Plan Update
SCH# 2013051082

Attached for your review and comment is the Notice of Preparation (NOP) for the General Plan Update draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Jerrod Walters
City of Chino Hills
14000 City Center Drive
Chino Hills, CA 91709

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

Scott Morgan
Director, State Clearinghouse

Attachments
cc: Lead Agency

RECEIVED
JUN 3 2013
CITY OF CHINO HILLS
COMMUNITY DEVELOPMENT DEPARTMENT

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
TEL (916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

SCH# 2013051082
Project Title General Plan Update
Lead Agency Chino Hills, City of

Type NOP Notice of Preparation

Description The project is the General Plan Update for the City of Chino Hills. The General Plan Update would update and supersede the City's current General Plan, which was adopted in September 13, 1994 and subsequently amended. The General Plan Update encompasses all text and figures of six General Plan Elements: Land Use Element, Circulation Element, Conservation Element, Safety Element, Noise Element and Economic Development Element. The environmental review for the General Plan Update is expected to encompass proposed changes to these six elements and associated changes to the City of Chino Hills Zoning Map and Municipal Code to maintain consistency with the General Plan Update.

Lead Agency Contact

Name Jerrod Walters
Agency City of Chino Hills
Phone 909 364 2753 **Fax**
email
Address 14000 City Center Drive
City Chino Hills **State** CA **Zip** 91709

Project Location

County San Bernardino
City Chino Hills
Region
Cross Streets
Lat / Long
Parcel No.
Township **Range** **Section** **Base**

Proximity to:

Highways
Airports
Railways
Waterways
Schools
Land Use

Project Issues

Reviewing Agencies

Date Received 05/29/2013 **Start of Review** 05/29/2013 **End of Review** 06/27/2013

Note: Blanks in data fields result from insufficient information provided by lead agency.

NOP Distribution List

County: San Bernardino SL SCH# 2013051(2

Resources Agency

- [x] Resources Agency
  Nadell Gayou
- [ ] Dept. of Boating & Waterways
  Nicole Wong
- [ ] California Coastal Commission
  Elizabeth A. Fuchs
- [ ] Colorado River Board
  Gerald R. Zimmerman
- [x] Dept. of Conservation
  Elizabeth Carpenter
- [ ] California Energy Commission
  Eric Knight
- [x] Cal Fire
  Dan Foster
- [ ] Central Valley Flood Protection Board
  James Herota
- [ ] Office of Historic Preservation
  Ron Parsons
- [x] Dept of Parks & Recreation
  Environmental Stewardship Section
- [ ] California Department of Resources, Recycling & Recovery
  Sue O'Leary
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  Steve McAdam
- [x] Dept. of Water Resources Resources Agency
  Nadell Gayou

Fish and Game

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  Environmental Services Division
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  Donald Koch
- [ ] Fish & Wildlife Region 1E
  Laurie Harnsberger
- [ ] Fish & Wildlife Region 2
  Jeff Drongesen
- [ ] Fish & Wildlife Region 3
  Charles Armor
- [ ] Fish & Wildlife Region 4
  Julie Vance
- [ ] Fish & Wildlife Region 5
  Leslie Newton-Reed
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- [x] Fish & Wildlife Region 6
  Gabrina Gatchel
  Habitat Conservation Program
- [ ] Fish & Wildlife Region 6 I/M
  Brad Henderson
  Inyo/Mono, Habitat Conservation Program
- [ ] Dept. of Fish & Wildlife M
  George Isaac
  Marine Region

Other Departments

- [ ] Food & Agriculture
  Sandra Schubert
  Dept. of Food and Agriculture
- [ ] Depart. of General Services
  Public School Construction
- [ ] Dept. of General Services
  Anna Garbeff
  Environmental Services Section
- [ ] Dept. of Public Health
  Jeffery Worth
  Dept. of Health/Drinking Water
- [ ] Delta Stewardship Council
  Kevan Samsam

Independent Commissions,Boards

- [ ] Delta Protection Commission
  Michael Machado
- [x] Cal EMA (Emergency Management Agency)
  Dennis Castrillo
- [x] Native American Heritage Comm.
  Debbie Treadway
- [ ] Public Utilities Commission
  Leo Wong
- [ ] Santa Monica Bay Restoration
  Guangyu Wang
- [ ] State Lands Commission
  Jennifer Deleong
- [ ] Tahoe Regional Planning Agency (TRPA)
  Cherry Jacques

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  Philip Crimmins
- [ ] Caltrans - Planning
  Terri Pencovic
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Dept. of Transportation

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- [ ] Caltrans, District 3
  Gary Arnold
- [ ] Caltrans, District 4
  Erik Alm
- [ ] Caltrans, District 5
  David Murray
- [ ] Caltrans, District 6
  Michael Navarro
- [ ] Caltrans, District 7
  Dianna Watson
- [x] Caltrans, District 8
  Dan Kopulsky
- [ ] Caltrans, District 9
  Gayle Rosander
- [ ] Caltrans, District 10
  Tom Dumas
- [ ] Caltrans, District 11
  Jacob Armstrong
- [ ] Caltrans, District 12
  Marlon Regisford

Cal EPA

Air Resources Board

- [ ] Airport/Energy Projects
  Jim Lerner
- [ ] Transportation Projects
  Douglas Ito
- [ ] Industrial Projects
  Mike Tollstrup
- [ ] State Water Resources Control Board
  Regional Programs Unit
  Division of Financial Assistance
- [ ] State Water Resources Control Board
  Student Intern, 401 Water Quality Certification Unit
  Division of Water Quality
- [ ] State Water Resouces Control Board
  Phil Crader
  Division of Water Rights
- [ ] Dept. of Toxic Substances Control
  CEQA Tracking Center
- [ ] Department of Pesticide Regulation
  CEQA Coordinator

Regional Water Quality Control Board (RWQCB)

- [ ] RWQCB 1
  Cathleen Hudson
  North Coast Region (1)
- [ ] RWQCB 2
  Environmental Document Coordinator
  San Francisco Bay Region (2)
- [ ] RWQCB 3
  Central Coast Region (3)
- [ ] RWQCB 4
  Teresa Rodgers
  Los Angeles Region (4)
- [ ] RWQCB 5S
  Central Valley Region (5)
- [ ] RWQCB 5F
  Central Valley Region (5)
  Fresno Branch Office
- [ ] RWQCB 5R
  Central Valley Region (5)
  Redding Branch Office
- [ ] RWQCB 6
  Lahontan Region (6)
- [ ] RWQCB 6V
  Lahontan Region (6)
  Victorville Branch Office
- [ ] RWQCB 7
  Colorado River Basin Region (7)
- [x] RWQCB 8
  Santa Ana Region (8)
- [ ] RWQCB 9
  San Diego Region (9)

- [ ] Other _____

- [ ] _____
  Conservancy

Last Updated 01/08/2013

Appendix C – Air Quality Study, Prepared by Rincon Consultants, Inc. dated January 2014

City of Chino Hills

Chino Hills General Plan Update

Air Quality Study

January 2014

rincon

Environmental Scientists Planners Engineers

Chino Hills General Plan Update

Air Quality Study

Prepared for:

City of Chino Hills
14000 City Center Drive
Chino Hills, CA 91709

Prepared by:

Rincon Consultants, Inc.
180 North Ashwood Avenue
Ventura, California 93003

January 2014

Chino Hills General Plan Update
Air Quality Study

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CHINO HILLS GENERAL PLAN UPDATE
CHINO HILLS, CA
AIR QUALITY STUDY

This report is an analysis of the potential air quality impacts of the proposed General Plan Update for the City of Chino Hills, California. The report has been prepared by Rincon Consultants, Inc. under contract to the City of Chino Hills for use in support of the environmental documentation being prepared pursuant to the California Environmental Quality Act (CEQA). The purpose of this study is to analyze the proposed General Plan Update's effects on air quality emissions and the associated impacts. This study analyzes both temporary air quality impacts relating to construction activity and possible long-term air quality impacts associated with General Plan build-out. The analysis herein is based partially on the traffic impact study prepared by Minagar & Associates, Inc. (June 2013).

PROJECT DESCRIPTION

The City of Chino Hills is located in the Chino Valley within San Bernardino County. Chino Hills has a current population of 76,240 (as estimated by multiplying the California Department of Finance's [May 2013] vacancy rate and number of persons per household by the number of housing units in the City) and its boundaries encompass approximately 28,744 acres.

Chino Hills is currently updating its General Plan. The General Plan is the long-range policy document that guides physical community development throughout the City. The General Plan establishes goals and objectives to guide decision-making by City officials and staff. The General Plan Update would update and supersede the City's current General Plan, which was adopted on September 13, 1994, and has a planning horizon from 1994 to 2013. The General Plan includes eight elements: Land Use; Circulation; Housing; Parks, Recreation, and Open Space; Conservation; Safety; Noise; and Economic Development. The proposed General Plan Update covers six of these elements; the Housing Element and the Parks, Recreation, and Open Space Element are not included in the update. Air Quality issues are primarily addressed in the Conservation Element, though other elements (i.e.: Land Use and Circulation) also relate to air quality. The proposed General Plan Update would have a planning horizon from 2014 to 2035.

The General Plan Update includes changes to the Land Use Map and would facilitate residential and commercial development. Table 1 summarizes the increase in residential units and commercial and institutional space as a result of buildout of the General Plan Update.

Table 1
Existing and Future Development in Chino Hills

Land Use	Existing Chino Hills Development	Proposed General Plan Buildout	Change as a Result of Proposed General Plan
Residential			
Single Family Units	19,863 units	22,917 units	3,054 units
Multi-Family Units	3,930 units	6,698 units	2,768 units
		Total	**5,822 units**
Commercial/Institutional			
Mixed Use (non-residential)	None	33,087 sf	33,087 sf
Commercial	3,386,649 sf	4,737,574 sf	1,350,925 sf
Business Park	467,733 sf	836,733 sf	369,000 sf
Commercial Recreation	216,428 sf	216,428 sf	0
Institutional/Public Facility	1,775,042 sf	2,132,563 sf	357,521 sf
		Total	**2,110,533 sf**

sf= square feet
Source: City of Chino Hills

SETTING

Air Pollution Regulation

The federal and state governments have authority under the federal and state Clean Air Acts to regulate emissions of airborne pollutants and have established ambient air quality standards (AAQS) for the protection of public health. The U.S. Environmental Protection Agency (EPA) is the federal agency designated to administer air quality regulation, while the California Air Resources Board (ARB) is the state equivalent in California. Federal and state standards have been established for six criteria pollutants, including ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulates less than 10 and 2.5 microns in diameter (PM_{10} and $PM_{2.5}$), and lead (Pb). Table 2 lists the current federal and state standards for each of these pollutants. California has also set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. Standards have been set at levels intended to be protective of public health. California standards are more restrictive than federal standards for each of these pollutants except lead and the eight-hour average for CO.

Local control in air quality management is provided by the ARB through county-level or regional (multi-county) Air Pollution Control Districts (APCDs). The ARB establishes air quality standards and is responsible for control of mobile emission sources, while the local APCDs are responsible for enforcing standards and regulating stationary sources. The ARB has established

14 air basins statewide. Chino Hills is located within the South Coast Air Basin (Basin), which is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). The SCAQMD is required to monitor air pollutant levels to ensure that air quality standards are met and, if they are not met, to develop strategies to meet the standards. Depending on whether the standards are met or exceeded, the local air basin is classified as being in "attainment" or "non-attainment." The Basin is a non-attainment area for both the federal and state standards for ozone, PM_{10} and $PM_{2.5}$ as well as the state standard for NO_2. The Basin is in attainment for the state and federal standards for CO and SO_X. For lead, only the Los Angeles County portion of the basin is in non-attainment. Characteristics of ozone, CO, NO_2, and suspended particulates (PM_{10} and $PM_{2.5}$) are described below.

Table 2
Current Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Primary Standards	California Standard
Ozone	1-Hour	---	0.09 ppm
	8-Hour	0.075 µg/m^3	0.070 µg/m^3
PM_{10}	24-Hour	150 µg/m^3	50 µg/m^3
	Annual	---	20 µg/m^3
$PM_{2.5}$	24-Hour	35 µg/m^3	---
	Annual	12 µg/m^3	12 µg/m^3
Carbon Monoxide	8-Hour	9.0 ppm	9.0 ppm
	1-Hour	35.0 ppm	20.0 ppm
Nitrogen Dioxide	Annual	0.053 ppm	0.030 ppm
	1-Hour	0.100 ppm	0.18 ppm
Sulfur Dioxide	24-Hour	---	0.04 ppm
	3-Hour	0.5 ppm (secondary)	---
	1-Hour	0.075 ppm (primary)	0.25 ppm
Lead	30-Day Average	---	1.5 µg/m^3
	3-Month Average	0.15 µg/m^3	---

ppm = parts per million µg/m^3 = micrograms per cubic meter
Source: California Air Resources Board, http://www.arb.ca.gov/research/aaqs/aaqs2.pdf, last updated June, 2013

Ozone. Ozone is produced by a photochemical reaction (triggered by sunlight) between nitrogen oxides (NO_X) and reactive organic gases (ROG). Nitrogen oxides are formed during the combustion of fuels, while reactive organic compounds are formed during combustion and evaporation of organic solvents. Because ozone requires sunlight to form, it mostly occurs in concentrations considered serious between the months of April and October. Ozone is a pungent, colorless, toxic gas with direct health effects on humans including respiratory and eye

irritation and possible changes in lung functions. Groups most sensitive to ozone include children, the elderly, people with respiratory disorders, and people who exercise strenuously outdoors.

Carbon Monoxide. CO is a local pollutant that is found in high concentrations only near the source. The major source of carbon monoxide, a colorless, odorless, poisonous gas, is automobile traffic. Elevated concentrations, therefore, are usually only found near areas of high traffic volumes. Carbon monoxide's health effects are related to its affinity for hemoglobin in the blood. At high concentrations, carbon monoxide reduces the amount of oxygen in the blood, causing heart difficulties in people with chronic diseases, reduced lung capacity, and impaired mental abilities.

Nitrogen Dioxide. NO_2 is a by-product of fuel combustion, with the primary source being motor vehicles and industrial boilers and furnaces. The principal form of nitrogen oxide produced by combustion is nitric oxide (NO), but NO reacts rapidly to form NO_2, creating the mixture of NO and NO_2 commonly called NO_X. Nitrogen dioxide is an acute irritant. A relationship between NO_2 and chronic pulmonary fibrosis may exist, and an increase in bronchitis in young children at concentrations below 0.3 parts per million (ppm) may occur. Nitrogen dioxide absorbs blue light and causes a reddish brown cast to the atmosphere and reduced visibility. It can also contribute to the formation of PM_{10} and acid rain.

Suspended Particulates. PM_{10} is particulate matter measuring no more than 10 microns in diameter, while $PM_{2.5}$ is fine particulate matter measuring no more than 2.5 microns in diameter. Suspended particulates are mostly dust particles, nitrates and sulfates. Both PM_{10} and $PM_{2.5}$ are by-products of fuel combustion and wind erosion of soil and unpaved roads, and are directly emitted into the atmosphere through these processes. Suspended particulates are also created in the atmosphere through chemical reactions. The characteristics, sources, and potential health effects associated with the small particulates (those between 2.5 and 10 microns in diameter) and fine particulates ($PM_{2.5}$) can be very different. The small particulates generally come from windblown dust and dust kicked up from mobile sources. The fine particulates are generally associated with combustion processes as well as being formed in the atmosphere as a secondary pollutant through chemical reactions. Fine particulate matter is more likely to penetrate deeply into the lungs and poses a health threat to all groups, but particularly to the elderly, children, and those with respiratory problems. More than half of the small and fine particulate matter that is inhaled into the lungs remains there. These materials can damage health by interfering with the body's mechanisms for clearing the respiratory tract or by acting as carriers of an absorbed toxic substance.

Local Air Quality

California's weather is heavily influenced by a semi-permanent high-pressure system west of the Pacific coast. The Mediterranean climate of the region and the coastal influence produce moderate temperatures year round, with rainfall concentrated in the winter months. The sea breeze, which is the predominant wind, is a primary factor in creating this climate and typically flows from the west-southwest in a day-night cycle with speeds generally ranging from 5 to 15 miles per hour.

The City of Chino Hills is located within the South Coast Air Basin (Basin). Air quality in the Basin is affected by the emission sources located in the region, as well as by three natural factors:

1. A **natural terrain barrier** to emission dispersion north and east of the metropolitan Los Angeles area.
2. A **dominant on-shore flow** transports and disperses air pollution by driving air pollution originating in industrial areas along the coast toward the natural terrain barrier, limiting horizontal dispersion. The effect of this flow is a gradual degradation of air quality from coastal to inland areas. The greatest impacts can be seen in the San Gabriel Valley and near Riverside at the foot of the San Gabriel Mountains.
3. **Atmospheric inversions** limit dispersion of air pollution on a vertical scale. Temperature typically decreases with altitude. However, under inversion conditions temperature begins to increase at some height above the ground. This height is called the base of the inversion. The temperature increase continues through an unspecified height (the vertical height of the layer varies) after which the temperature change with height returns to standard conditions. The inversion layer is typically very stable and acts as a cap to the vertical dispersions of pollutants.

The SCAQMD operates a network of air quality monitoring stations throughout the South Coast Basin. The purpose of the monitoring stations is to measure ambient concentrations of the pollutants and determine whether the ambient air quality meets the California and federal standards. The monitoring station located closest to the project site is the Pomona station, located at 924 N. Garey Avenue, approximately 5 miles north of Chino Hills. Table 3 indicates the number of days that each of the standards has been exceeded at the Pomona station. However, this station does not monitor PM_{10} emissions; therefore data for PM_{10} emissions were obtained from the Ontario monitoring station, which is the second-closest station and is located approximately 10 miles northeast of Chino Hills.

As shown in Table 3, the ozone 1-hour and 8-hour standards were exceeded multiple times between 2010 and 2012. The PM_{10} concentration exceeded the state standards 24 times in 2010, 18 times in 2011, and 24 times in 2012 and did not exceed the federal standards in 2010, 2011 or 2012. The $PM_{2.5}$ concentration exceeded federal standards on 3 days in 2010 and 7 days in 2011. It did not exceed standards in 2012. No exceedances of either the state or federal standards for NO_2 or CO have occurred in the last three years. Background CO levels are generally low.

Air Quality Management Plan

Under state law, the SCAQMD is required to prepare a plan for air quality improvement for pollutants for which the District is in non-compliance. The SCAQMD updates the plan every three years. Each iteration of the SCAQMD's Air Quality Management Plan (AQMP) is an update of the previous plan and has a 20-year horizon. The most-recently adopted AQMP is the 2012 AQMP, which was adopted in December 2012. The AQMP demonstrates attainment of the federal 24-hour $PM_{2.5}$ standard by 2014 through adoption of all feasible measures and updates the EPA approved 8-hour ozone control plan with new measures.

Table 3
Ambient Air Quality Data

Pollutant	2010	2011	2012
Ozone, ppm - Worst Hour	0.115	0.119	0.117
Number of days of State exceedances (>0.09 ppm)	9	15	21
Ozone, ppm – Worst 8 Hours	0.082	0.096	0.093
Number of days of State exceedances (>0.070 ppm)	12	24	30
Number of days of Federal exceedances (>0.075 ppm)	4	16	15
Carbon Monoxide, ppm - Worst 8 Hours	1.80	1.60	1.47
Number of days of State/Federal exceedances (>9.0 ppm)	0	0	0
Nitrogen Dioxide, ppm - Worst Hour	0.097	0.087	0.061
Number of days of State exceedances (>0.25 ppm)	0	0	0
Particulate Matter <10 microns, $\mu g/m^3$ Worst 24 Hours*	87.0	70.0	57.0
Estimated Number of Days of State exceedances (>50 $\mu g/m^3$) *	24	18	24
Number of samples of Federal exceedances (>150 $\mu g/m^3$) *	0	0	0
Particulate Matter <2.5 microns, $\mu g/m^3$ Worst 24 Hours*	46.1	52.9	35.2
Estimated Number of Days of Federal exceedances (>35 $\mu g/m^3$) *	3	7	0

Pomona Monitoring Station unless otherwise noted.
** Ontario – 1408 Francis Street Monitoring Station*
Source: California Air Resources Board, 2010, 2011, 2012 Annual Air Quality Data Summaries available at http://www.arb.ca.gov/adam/topfour/topfour1.php

Sensitive Receptors

Ambient air quality standards have been established to represent the levels of air quality considered sufficient, with an adequate margin of safety, to protect public health and welfare. They are designed to protect that segment of the public most susceptible to respiratory distress, such as children under 14, the elderly over 65, persons engaged in strenuous work or exercise, and people with cardiovascular and chronic respiratory diseases. The majority of sensitive receptor locations are therefore residences, schools and hospitals. Sensitive receptors are located throughout Chino Hills.

IMPACT ANALYSIS

Methodology and Significance Thresholds

This analysis of the General Plan Update air quality impacts follows the guidance and methodologies in SCAQMD's *Guidance Document for Addressing Air Quality Issues in General*

Plans and Local Planning (2005), SCAQMD's *CEQA Air Quality Handbook* (1993) as well as Appendix G of the *State CEQA Guidelines.*

Significance Thresholds. The criteria used to determine the significance of impacts are taken from the checklist contained in Appendix G of the *State CEQA Guidelines*. According to the Guidelines, General Plan implementation would result in a significant impact to air quality if it would:

- *Conflict with or obstruct implementation of the applicable air quality plan;*
- *Violate any air quality standard or contribute substantially to an existing or projected air quality violation;*
- *Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed qualitative thresholds for ozone precursors);*
- *Expose sensitive receptors to substantial pollutant concentrations; or*
- *Create objectionable odors affecting a substantial number of people.*

The SCAQMD has developed specific numeric thresholds that apply to projects within the South Coast Air Basin. The SCAQMD has established the following significance thresholds for construction activities within the South Coast Air Basin:

- *75 pounds per day of ROG*
- *100 pounds per day of* NO_X
- *550 pounds per day of CO*
- *150 pounds per day of* PM_{10}
- *55 pounds per day of* $PM_{2.5}$

The SCAQMD has also established the following significance thresholds for project operations within the South Coast Air Basin:

- *55 pounds per day of ROG*
- *55 pounds per day of* NO_X
- *550 pounds per day of CO*
- *150 pounds per day of* SO_X
- *150 pounds per day of* PM_{10}
- *55 pounds per day of* $PM_{2.5}$

Per the SCAQMD *CEQA Air Quality Handbook* (1993), the following indicators address the General Plan's consistency with the 2012 AQMP:

- *Whether the project would result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the 2012 AQMP; and*
- *Whether the project would exceed the 2012 AQMP assumptions for 2035 or yearly increments based on the year of the project buildout.*

Methodology. The construction activities associated with development would generate diesel emissions and dust. Construction equipment that would generate criteria air pollutants includes excavators, graders, dump trucks, and loaders. Some of this equipment would be used during grading activities as well as when structures are constructed. It is assumed that all construction equipment used would be diesel-powered. The regional construction emissions associated with development of the proposed project were calculated – using the California Emissions Estimator Model (CalEEMod) software developed for the SCAQMD – by estimating the types and number of pieces of equipment that would be used on-site during each of the construction phases. These construction emissions are analyzed using the regional thresholds established by the SCAQMD and published in the CEQA Air Quality Handbook.

Operational emissions associated with General Plan Update development were estimated using CalEEMod. Operational emissions include mobile source emissions, energy emissions, and area source emissions. Mobile source emissions are generated by the increase in motor vehicle trips associated with operation of development. Emissions attributed to energy use include electricity and natural gas consumption in buildings for space and water heating. Area source emissions are generated by landscape maintenance equipment, consumer products and architectural coatings. To determine whether a significant regional air quality impact would occur, the increase in emissions is compared with the SCAQMD's recommended regional thresholds for operational emissions. As the traffic study for the General Plan Update (Minagar & Associates, Inc., June 2013) did not include average daily traffic (ADT) estimates for full General Plan buildout, trip generation rates built into CalEEMod were used to estimate trip generation and associated mobile source emissions. CalEEMod trip generation rates are based on the Institute of Transportation Engineers (ITE), which are also utilized in the traffic study.

CO Hotspot Analysis. SCAQMD recommends that a local CO hotspot analysis be conducted if an intersection meets one of the following criteria:

1) The intersection is at Levels of Service (LOS) D or worse and where the project increases the volume to capacity ratio by 2 percent; or
2) The project decreases LOS at an intersection to D or worse.

A CO hotspot is a localized concentration of CO that is above the state or national 1-hour or 8-hour CO ambient air standards. Localized CO "hotspots" can occur at intersections with heavy peak hour traffic. Specifically, hotspots can be created at intersections where traffic levels are sufficiently high such that the local CO concentration exceeds the federal AAQS of 35.0 parts per million (ppm) or the state AAQS of 20.0 ppm. Potential carbon monoxide impacts at roadway intersections were estimated using the CALINE4 version 2.1 modeling program.

AQMP Consistency

Vehicle use, energy consumption, and associated air pollutant emissions are directly related to population growth. A project may be inconsistent with the AQMP if it would generate population, housing or employment growth exceeding the forecasts used in the development of the AQMP. The 2012 AQMP, the most recent AQMP adopted by the SCAQMD, uses socioeconomic forecast projections of regional population, housing, and employment growth

from the Southern California Association of Government's (SCAG) 2012 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS).

SCAG's population projection for Chino Hills is 78,400 in the year 2035. Total population with growth as a result of buildout of the General Plan Update (year 2035) is expected to be 94,895. This estimate exceeds SCAG's 2035 growth forecast for the City by 16,495 people. It should be noted, however, that the maximum buildout estimate assumes that every developable property would be developed by 2035. Further, SCAG population estimates are periodically updated based on General Plan updates, at which time any inconsistencies between regional planning documents and the population growth anticipated under the Chino Hills General Plan Update would be rectified. Nevertheless, because development facilitated by full buildout of the 2014-2035 General Plan would exceed SCAG growth forecasts, it would also be inconsistent with the 2012 AQMP population growth assumptions.

Impacts associated with AQMP consistency would be reduced through implementation of the following mitigation:

AQ-1 City of Chino Hills Community Development Department shall work closely with San Bernardino Associated Governments (SANBAG) and SCAG to ensure the 2016-2040 RTP/SCS correctly incorporates the City of Chino Hills General Plan Update land use projections for population, households and employment.

Residual Impacts

With incorporation of AQ-1, impacts associated with AQMP consistency would be less than signficant.

Construction Impacts

Construction activity that would be facilitated by the General Plan Update would cause temporary emissions of various air pollutants. Ozone precursors NO_X and CO would be emitted by the operation of construction equipment, while fugitive dust (PM_{10}) would be emitted by activities that disturb the soil, such as grading and excavation, road construction and building construction. As previously stated, the Basin is in non-attainment for both the federal and state standards for ozone, PM_{10}, and $PM_{2.5}$. Although no specific attainment goal has been established, the potential release of asbestos or other toxic air contaminants could also occur within the City, especially during building demolition.

SCAQMD Rule 403 identifies measures to reduce fugitive dust and is required to be implemented at all construction sites located within the South Coast Air Basin. These measures include:

1. **Minimization of Disturbance.** Construction contractors should minimize the area disturbed by clearing, grading, earth moving, or excavation operations to prevent excessive amounts of dust.

2. **Soil Treatment.** Construction contractors should treat all graded and excavated material, exposed soil areas, and active portions of the construction site, including unpaved on-site roadways to minimize fugitive dust. Treatment shall include, but not necessarily be limited to, periodic watering, application of environmentally safe soil stabilization materials, and/or roll compaction as appropriate. Watering shall be done as often as necessary, and at least twice daily, preferably in the late morning and after work is done for the day.

3. **Soil Stabilization.** Construction contractors should monitor all graded and/or excavated inactive areas of the construction site at least weekly for dust stabilization. Soil stabilization methods, such as water and roll compaction, and environmentally safe dust control materials, shall be applied to portions of the construction site that are inactive for over four days. If no further grading or excavation operations are planned for the area, the area shall be seeded and watered until landscape growth is evident, or periodically treated with environmentally safe dust suppressants, to prevent excessive fugitive dust.

4. **No Grading During High Winds.** Construction contractors should stop all clearing, grading, earth moving, and excavation operations during periods of high winds (20 miles per hour or greater, as measured continuously over a one-hour period).

5. **Street Sweeping.** Construction contractors should sweep all on-site driveways and adjacent streets and roads at least once per day, preferably at the end of the day, if visible soil material is carried over to adjacent streets and roads.

As stated in the Project Description, the proposed General Plan Update would facilitate development of an estimated 5,822 housing units and 2,110,533 square feet of commercial/institutional space. Construction emissions associated with this amount of development are shown in Table 4. Table 4 provides a per day average estimate of emissions (in pounds per day) from all construction associated with the General Plan based on the total emissions (in tons) for the entire planning horizon from 2014 to 2035.

Table 4 provides an overall estimate of emissions from construction activity associated with the General Plan Update buildout. As shown, average daily emissions, both with and without compliance with SCAQMD Rule 403, would be below SCAQMD thresholds. As shown in Table 4, Rule 403 compliance by individual property owners, developers, or contractors would reduce temporary construction-related air pollutant emissions related to PM_{10} and $PM_{2.5}$, although emissions for ROG, NO_x, and CO would remain the same.

Table 4
Estimated Construction Emissions

	ROG	NO_x	CO	PM_{10*}	$PM_{2.5*}$
Total Emissions (tons)	83.3	166.6	517.3	146.2	37.0
Average Daily Emissions (pounds/day)	**22.8**	**45.7**	**141.7**	**40.1**	**10.1**
Total Emissions assuming compliance with SCAQMD Rule 403 (tons)*	83.3	166.6	517.3	121.4	33.4
Average Daily Emissions assuming compliance with SCAQMD Rule 403 (pounds/day)*	**22.8**	**45.7**	**141.7**	**33.3**	**9.1**
SCAQMD Thresholds (pounds/day)	***75***	***100***	***550***	***150***	***55***

Notes: See Table 2.1 "Overall Construction-unmitigated" and "Overall Construction-mitigated" of CalEEMod annual modeling results in appendix. Assumes 2,768 multi-family units, 3,054 single-family units, 33,087 sf of mixed use (strip mall), 1,350,925 sf of commercial (strip mall), 369,000 sf of business park (office park), 357,521 sf of institutional/public facility (general office).Totals include worker trips, construction vehicle emissions and fugitive dust. Architectural Coating phase anticipated emissions reductions include the standards in SCAQMD Rule 1113.

[Average daily emissions (in pounds per day)] = [Total emissions (in tons) during entire Planning Horizon 2014-2035 (assuming construction takes place over 20 years between 2015 and 2034)] ÷ [20 years of construction] ÷ [365 days per year] × [2,000 pounds per ton]

**Includes requirements of SCAQMD Rule 403 to reduce fugitive dust listed previously.*

However, because the proposed General Plan Update identifies future land uses and does not contain specific development proposals, construction-related emissions that may occur at any one time are speculative and cannot be accurately determined at this stage of the planning process. Table 4 provides a per day average estimate of emissions from all construction associated with the General Plan. Depending upon the development type, size, and development timeframe, maximum daily construction emissions associated with individual projects could be higher than the estimated averages in Table 4 and could potentially exceed SCAQMD significance thresholds.

Further, the proposed General Plan Update would add a mixed-use development land use designation and would allow for more multi-family housing units compared to the existing General Plan. Therefore, the proposed General Plan Update would increase density and construction activity, which may be located in areas with existing sensitive receptors such as residences, schools, and hospitals.

In order to quantify the level of emissions associated with individual development projects, specific information regarding the size and type of development and the location of receptors would be needed. Therefore, impacts related to construction emissions are potentially significant. Mitigation measures are required for construction activities associated with the project.

Mitigation Measures

Individual development projects that are subject to CEQA would have to go through CEQA review which would include an evaluation to determine whether potential air pollutant emissions generated could result in a significant impact to air quality. The significance level of

these impacts would be determined during review and project-specific mitigation measures would be developed as appropriate.

Temporary construction impacts associated with the General Plan Update would be reduced through implementation of the following mitigation:

AQ-2 **Conservation Element Policies and Actions for Construction Emissions.** The following policy and actions should be added to the General Plan Update Conservation Element.

Policy CN-6.3 *Reduce air pollution emissions from construction activities.*

Action CN-6.3.1 The City shall require developers of projects subject to CEQA to prepare an air quality analysis that analyzes construction-related air quality impacts using the latest available air emissions model or other analytical method determined in conjunction with SCAQMD. If such analyses identify potentially significant regional or local air quality impacts, the City shall require the incorporation of appropriate mitigation to reduce such impacts.

Action CN-6.3.2 Encourage large construction projects to mitigate diesel exhaust emissions through the use of alternative fuels and control devices.

Action CN-6.3.3 Require dust abatement actions for all new construction and redevelopment projects.

Residual Impacts

Construction emissions associated with General Plan Update buildout would create temporary air pollution emissions. Mitigation Measure AQ-2 would incorporate policies into the General Plan to reduce emissions from construction. However, there is the possibility that maximum daily construction emissions associated with individual projects could be higher than the estimated averages in Table 4 and that imposition of Mitigation Measure AQ-2 would not reduce impacts to less than significant levels. Therefore impacts would remain significant and unavoidable.

Long-Term Regional Impacts

Regional Pollutant Emissions

Long-term emissions associated with future development in Chino Hills in accordance with the General Plan Update would be those associated with mobile (vehicle trips), area sources (landscaping and architectural coating), and energy sources (electricity and natural gas consumption). As stated in the Project Description, the proposed General Plan Update would facilitate the development of approximately 5,822 housing units and 2,110,533 square feet of

commercial/institutional space. Table 5 shows the estimated emissions associated with operation of development facilitated by the General Plan Update.

At full buildout of the General Plan Update, total operational emissions for the potential additional development associated with the General Plan would exceed ROG, NO_X, CO, PM_{10} and $PM_{2.5}$ emissions thresholds. However, the SCAQMD thresholds are designed for individual development projects, not for a General Plan which considers the cumulative effect of all individual projects within the City. In order to quantify the level of emissions associated with individual development projects, specific information regarding the size and type of development and the location of receptors would be needed. Emissions associated with the operation of individual projects, depending on project type and size, could exceed project-specific thresholds established by the SCAQMD.

Table 5
Estimated Daily Operational Emissions

	ROG	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Area Emissions (pounds/day)	245.5	5.5	478.8	0.03	2.7	2.7
Energy Emissions (pounds/day)	4.2	35.9	15.9	0.23	2.9	2.9
Mobile Emissions (pounds/day)	205.5	410.4	1,917.5	7.6	476.6	134.7
Total Emissions (pounds/day)	**455.2**	**451.8**	**2,412.2**	**7.9**	**482.1**	**140.3**
SCAQMD Thresholds (pounds/day)	***55***	***55***	***550***	***150***	***150***	***55***

Source: See Table 2.2, "Overall Operational-mitigated" of CalEEMod –summer modeling results in appendix. Assumes 2,768 multi-family units, 3,054 single-family units, 33,087 sf of mixed use (strip mall), 1,350,925 sf of commercial (strip mall), 369,000 sf of business park (office park), 357,521 sf of institutional/public facility (general office).

The General Plan Update includes goals, policies, and actions that would help reduce the significance of impacts from individual development projects. A goal of the General Plan Update is to "Promote clean air to reduce adverse effects on human health and the environment" (Goal CN-6). As such, the General Plan Update includes the following policies and actions aimed to improve air quality:

Policy CN-6.1 *Reduce air pollution through coordinated land use, transportation, and energy use planning.*

Action CN-6.1.1 *Endorse regional air quality and transportation management plans in order to reduce air pollution emissions and vehicle trips.*

Action CN-6.1.2 *Encourage multi-family development to develop close to existing/planned transit and commercial areas to encourage pedestrian and nonautomobile traffic.*

Action CN-6.1.3 *Promote transit that serves the City and links to adjacent cities and counties.*

Action CN-6.1.4 *Provide commercial areas that are conducive to pedestrian and bicycle circulation.*

Action CN-6.1.5 *Provide a coordinated system of pedestrian and bike ways.*

Action CN-6.1.6: *Encourage businesses to alter truck delivery routes and local delivery schedules to off-peak hours.*

Policy CN-6.2 *Reduce air pollution impacts on health.*

Action CN-6.2.1 *Encourage compliance with the California Air Resources Board (CARB) "Air Quality and Land Use Handbook: A Community Health Perspective", which provides guidelines for siting new sensitive land uses in proximity to air pollutant emitting sources.*

Action CN-6.2.2 *Require businesses to limit air pollution emissions in compliance with state and regional regulations and to reduce health impacts on sensitive land uses.*

As shown in Table 5, mobile source emissions are the largest emissions source in Chino Hills for all pollutants except for ROG. Actions CN-6.1.1 through CN-6.1.6 would reduce mobile source emissions. Additional policies and actions in the Circulation and Land Use Element emphasize infill development and the use of alternative transportation such as walking, bicycling, and public transit (Policy CIRC-3.1, Actions CIRC-3.1.1 through CIRC-3.1.4, Policy CIRC-3.2, Actions CIRC 3.2.1 through CIRC-3.2.3, Action LU-3.2.3, Policy LU-5.1). These policies would reduce vehicle miles traveled and associated air emissions.

The Conservation Element also includes a policy to "endorse green building design in new and existing construction" (Policy CN-3.1) and includes actions to encourage new development to be energy efficient and reduce energy consumption (Actions CN 3.1-1 through CN 3.1.4). These policies and actions would reduce air pollution emissions from area and stationary sources. Therefore, General Plan Update goals, policies, and actions included above would reduce citywide air pollutant emissions compared to a business-as-usual approach.

CEQA review of individual development projects would include an evaluation to determine whether potential air pollutant emissions generated would exceed SCAQMD significance thresholds. The significance level of these impacts would be determined during review and appropriate mitigation measures would be developed to reduce emissions to the degree feasible. However, due to the overall magnitude of citywide development potential and associated air quality impacts, impacts would be potentially significant.

Mitigation Measures

Individual development projects that are subject to CEQA would have to go through CEQA review which would include an evaluation to determine whether potential air pollutant emissions generated could result in a significant impact to air quality. The significance level of

these impacts would be determined during review and project-specific mitigation measures would be developed as appropriate.

Operational impacts associated with the General Plan Update would be reduced through implementation of the following mitigation:

AQ-3 **Conservation Element Policies and Actions for Operational Emissions.** The following policy and action should be added to the General Plan Update Conservation Element.

Policy CN-6.4 Reduce air pollution emissions from new development.

Action CN-6.4.1 The City shall require developers of projects subject to CEQA to prepare an air quality analysis that analyzes operational air quality impacts using the latest available air emissions model or other analytical method determined in conjunction with SCAQMD. If such analyses identify potentially significant regional or local air quality impacts, the City shall require the incorporation of appropriate mitigation to reduce such impacts.

Residual Impacts

Operational emissions associated with General Plan Update buildout would increase air pollutant emissions throughout Chino Hills. Mitigation Measure AQ-3 would incorporate policies into the General Plan to reduce operational emissions from new development associated with the General Plan Update. Nonetheless, impacts would remain significant and unavoidable.

Local Carbon Monoxide Emissions

As previously discussed, carbon monoxide is a colorless, odorless, poisonous gas that may be found in high concentrations near areas of high traffic volumes. CO emissions are a function of vehicle idling time, meteorological conditions, and traffic flow. The South Coast Air Basin is in attainment of state and federal CO standards. At the Pomona monitoring station, the station closest to Chino Hills, the maximum 8-hour CO level recorded in 2011 was 1.6 parts per million (ppm) and it was 1.47 ppm in 2012, approximately one-fifth of the 9 ppm state and federal 8-hour standard.

Although CO is not expected to be a major air quality concern in Chino Hills over the planning horizon, elevated CO levels can occur at or near intersections that experience severe traffic congestion. A project's localized air quality impact is considered significant if the additional CO emissions resulting from the project create a "hot spot" where the California 1-hour standards of 20.0 ppm or the 8-hour standard of 9 ppm is exceeded. This typically occurs at severely congested intersections. Screening for possible elevated CO levels should be conducted for severely congested intersections experiencing levels of service E or F with project traffic where a significant project traffic impact may occur. The SCAQMD recommends a quantified assessment of CO hot spots when a project increases the volume to capacity (V/C) ratio by 0.02 (2%) for any intersection with an existing Level of Service (LOS) D or worse (SCAQMD, 2003).

According to the Traffic Impact Study (prepared by Minagar & Associates, Inc., June 2013), there are eight study area intersections that operate at LOS D or worse and would have a V/C ratio increase of 2% as a result of the proposed General Plan. These intersections are listed here and were analyzed for CO hot spots using the CALINE4 air quality model:

- *Soquel Canyon Parkway at Butterfield Ranch Road (AM hour only)*
- *Soquel Canyon Parkway at Pomona Rincon Road (AM hour only)*
- *Chino Hills Parkway at Pipeline Avenue (AM and PM hours)*
- *Chino Hills Parkway at Peyton Drive (AM and PM hours)*
- *Chino Hills Parkway at Carbon Canyon Road (AM and PM hours)*
- *Peyton Drive at Grand Avenue (AM and PM hours)*
- *Peyton Drive at Eucalyptus Avenue (AM and PM hours)*
- *Pipeline Avenue at Woodview Road (AM and PM hours)*
- *Peyton Drive at Chino Avenue (AM Hour only)*

The results of the CO hot spot model for the proposed project are shown in Table 6 (more detailed results are contained in the Appendix). As shown, CO levels at these intersections would not exceed federal or state AAQS for CO. Therefore, impacts would be less than significant.

Table 6
Intersection Carbon Monoxide (CO) Concentration

Intersection	Peak Hour	Peak Hour CO Levels With Project	Ambient Air Quality Standards Federal/ State	Exceeds State or Federal AAQS?
Soquel Cnyn Pkwy. at Butterfield Ranch Rd.	AM	2.1	35.0 ppm/ 20.0 ppm	No
Soquel Canyon Pkwy. at Pomona Rincon Dr.	AM	2.4	35.0 ppm/ 20.0 ppm	No
Chino Hills Pkwy. at Pipeline Ave.	AM	2.3	35.0 ppm/ 20.0 ppm	No
	PM	2.5		
Chino Hills Pkwy. at Peyton Dr.	AM	2.5	35.0 ppm/ 20.0 ppm	No
	PM	2.7		
Chino Hills Pkwy. at Carbon Canyon Rd.	AM	2.3	35.0 ppm/ 20.0 ppm	No
	PM	2.6		
Grand Ave. at Peyton Dr.	AM	2.3	35.0 ppm/ 20.0 ppm	No
	PM	2.3		
Eucalyptus Ave. at Peyton Dr.	AM	2.2	35.0 ppm/ 20.0 ppm	No
	PM	2.4		
Pipeline Rd. at Woodview Rd.	AM	2.2	35.0 ppm/ 20.0 ppm	No

Source: LOS data from Minagar & Associates, 2013; CO concentration data from CALINE4 version 2.1 modeling program. See appendix for modeling results.

Objectionable Odors

The proposed General Plan Update would facilitate development. Some commercial and industrial uses developed pursuant to the General Plan Update may generate odors that could affect the public. Examples of commercial uses that have the potential to cause odor impacts include fast food restaurants, photographic studios, and laundry facilities. Industrial uses also have the potential to generate odors. However, odors from new commercial and industrial uses would be similar to uses existing throughout the city and they would be confined to the immediate vicinity of new buildings. Further, the General Plan Update includes Action CN-6.2.3, which would "require businesses to limit odor emissions to eliminate or reduce nuisance impacts on sensitive land uses." As such, significant odor impacts are not anticipated.

Construction activities could also generate temporary airborne odors during the operation of diesel powered construction vehicles and the application of architectural coatings. However, these odors are generally not considered especially offensive. Emissions would be temporary and would be confined to the immediate vicinity of the construction site. Emission reduction strategies, including SCAQMD Rule 402 and 403, that specifically designed to reduce nuisance air quality and odor emissions would be applied to all new development in the City. With appropriate controls, significant odor impacts would not be anticipated and impacts would be less than significant.

Cumulative Analysis

By its nature, a general plan considers cumulative impacts insofar as it considers cumulative development that could occur within a city's plan area. Therefore, the analysis of the General Plan Update's impacts also constitutes the cumulative analysis and this AQ analysis does not contain a separate analysis of cumulative impacts. In accordance with SCAQMD methodology, projects that exceed daily threshold values could add significantly to a cumulative impact. Because the overall magnitude of citywide development potential and associated air quality impacts would be potentially significant and unavoidable, cumulative air quality impacts associated with City buildout would also be potentially significant and unavoidable.

REFERENCES

Association of Environmental Professionals. *California Environmental Quality Act (CEQA) Statute and Guidelines.* 2013.

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Appendix

CalEEMod Air Emissions Modeling Results
CALINE4 CO Modeling Results

Chino Hills General Plan Update

Los Angeles-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	357.52	1000sqft	8.21	357,521.00	0
Office Park	369.00	1000sqft	8.47	369,000.00	0
Apartments Mid Rise	2,768.00	Dwelling Unit	72.84	2,768,000.00	7916
Single Family Housing	3,054.00	Dwelling Unit	991.56	5,497,200.00	8734
Strip Mall	1,384.01	1000sqft	31.77	1,384,012.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	10			**Operational Year**	2035
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	630.89	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - GP update involves 2,768 multi-family units, 3,054 single-family units, 33,087 sf of mixed use (strip mall), 1,350,925 sf of commercial (strip mall), 369,000 sf of business park (office park), 357,521 sf of institutional/public facility (general office).

Construction Phase - Estimated 20 year construction schedule

Architectural Coating - Per SCAQMD Rule 1113

Construction Off-road Equipment Mitigation -

Mobile Land Use Mitigation -

Waste Mitigation -

Area Coating - Per SCAQMD Rule 1113

Area Mitigation - Per SCAQMD Rule 1113

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	150.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	150.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	150
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	250	150
tblConstructionPhase	NumDays	11,000.00	390.00
tblConstructionPhase	NumDays	155,000.00	4,000.00
tblConstructionPhase	NumDays	10,000.00	200.00
tblConstructionPhase	NumDays	15,500.00	300.00
tblConstructionPhase	NumDays	11,000.00	200.00
tblConstructionPhase	NumDays	6,000.00	120.00
tblGrading	AcresOfGrading	750.00	38,750.00
tblLandUse	LandUseSquareFeet	357,520.00	357,521.00
tblLandUse	LandUseSquareFeet	1,384,010.00	1,384,012.00
tblProjectCharacteristics	OperationalYear	2014	2035

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	0.6212	6.5859	5.0583	5.4700e-003	1.1064	0.3395	1.4459	0.6018	0.3154	0.9173	0.0000	510.8473	510.8473	0.1368	0.0000	513.7203
2016	0.8153	9.1841	6.3452	7.7400e-003	22.5624	0.4490	23.0114	3.3184	0.4131	3.7315	0.0000	723.8416	723.8416	0.2117	0.0000	728.2864
2017	2.3907	13.8520	30.9744	0.0650	25.2868	0.4338	25.7206	3.7435	0.4019	4.1454	0.0000	5,161.9718	5,161.9718	0.3168	0.0000	5,168.6236
2018	3.0465	15.2884	42.6780	0.0996	6.1635	0.3889	6.5524	1.6523	0.3619	2.0142	0.0000	7,618.2132	7,618.2132	0.3499	0.0000	7,625.5607
2019	2.8109	14.0210	39.9336	0.0992	6.1637	0.3531	6.5168	1.6523	0.3286	1.9809	0.0000	7,373.5494	7,373.5494	0.3315	0.0000	7,380.5103
2020	2.6487	12.5314	37.9819	0.0996	6.1874	0.3194	6.5068	1.6587	0.2971	1.9558	0.0000	7,154.9430	7,154.9430	0.3188	0.0000	7,161.6387
2021	2.4978	10.9430	36.0539	0.0993	6.1638	0.2861	6.4499	1.6524	0.2661	1.9184	0.0000	7,055.3599	7,055.3599	0.3071	0.0000	7,061.8086
2022	2.3677	9.9269	34.2518	0.0989	6.1402	0.2641	6.4043	1.6460	0.2455	1.8916	0.0000	6,953.0919	6,953.0919	0.2965	0.0000	6,959.3181
2023	2.2185	8.4190	32.5738	0.0987	6.1402	0.2483	6.3886	1.6460	0.2307	1.8767	0.0000	6,874.7772	6,874.7772	0.2859	0.0000	6,880.7813
2024	2.1461	8.2333	31.5961	0.1000	6.1875	0.2395	6.4269	1.6587	0.2223	1.8810	0.0000	6,901.0475	6,901.0475	0.2826	0.0000	6,906.9828
2025	2.0552	7.9548	30.3975	0.0996	6.1639	0.2280	6.3919	1.6524	0.2115	1.8639	0.0000	6,819.8294	6,819.8294	0.2749	0.0000	6,825.6033
2026	1.9803	7.7362	29.4217	0.0996	6.1639	0.2234	6.3873	1.6524	0.2073	1.8597	0.0000	6,770.9831	6,770.9831	0.2689	0.0000	6,776.6298
2027	1.9246	7.6302	28.6191	0.0996	6.1639	0.2238	6.3877	1.6524	0.2077	1.8601	0.0000	6,728.7583	6,728.7583	0.2639	0.0000	6,734.3010
2028	1.8643	7.4954	27.8075	0.0992	6.1403	0.2224	6.3627	1.6461	0.2064	1.8524	0.0000	6,666.5493	6,666.5493	0.2585	0.0000	6,671.9768
2029	1.8190	7.4399	27.1941	0.0996	6.1640	0.2234	6.3874	1.6524	0.2073	1.8597	0.0000	6,660.3936	6,660.3936	0.2551	0.0000	6,665.7507

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2030	1.7617	6.7750	26.5915	0.1001	6.1640	0.1743	6.3383	1.6524	0.1622	1.8147	0.0000	6,673.0275	6,673.0275	0.1940	0.0000	6,677.1009
2031	1.7175	6.7050	26.0582	0.1003	6.1640	0.1738	6.3378	1.6524	0.1618	1.8142	0.0000	6,658.2613	6,658.2613	0.1908	0.0000	6,662.2684
2032	1.2364	4.9776	18.7506	0.0722	4.3754	0.1357	4.5111	1.1729	0.1272	1.3001	0.0000	4,800.8391	4,800.8391	0.1373	0.0000	4,803.7214
2033	16.6849	0.6091	2.4226	9.2600e-003	0.5761	0.0263	0.6023	0.1530	0.0259	0.1789	0.0000	585.6778	585.6778	0.0241	0.0000	586.1829
2034	30.6491	0.3213	2.5995	0.0137	1.0452	0.0115	1.0567	0.2776	0.0109	0.2885	0.0000	797.2156	797.2156	0.0308	0.0000	797.8617
Total	**83.2562**	**166.6293**	**517.3091**	**1.5667**	**141.2227**	**4.9642**	**146.1870**	**32.3941**	**4.6109**	**37.0051**	**0.0000**	**109,489.1778**	**109,489.1778**	**4.7357**	**0.0000**	**109,588.6276**

2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	0.6212	6.5859	5.0583	5.4700e-003	0.5102	0.3395	0.8497	0.2741	0.3154	0.5895	0.0000	510.8467	510.8467	0.1368	0.0000	513.7197
2016	0.8153	9.1841	6.3452	7.7400e-003	10.1685	0.4490	10.6174	1.4974	0.4131	1.9104	0.0000	723.8408	723.8408	0.2117	0.0000	728.2856
2017	2.3907	13.8520	30.9744	0.0650	13.4890	0.4338	13.9228	2.2502	0.4019	2.6521	0.0000	5,161.9712	5,161.9712	0.3168	0.0000	5,168.6230
2018	3.0465	15.2884	42.6780	0.0996	6.1635	0.3889	6.5524	1.6523	0.3619	2.0142	0.0000	7,618.2129	7,618.2129	0.3499	0.0000	7,625.5603
2019	2.8109	14.0210	39.9336	0.0992	6.1637	0.3531	6.5168	1.6523	0.3286	1.9809	0.0000	7,373.5491	7,373.5491	0.3315	0.0000	7,380.5100
2020	2.6487	12.5314	37.9819	0.0996	6.1874	0.3194	6.5068	1.6587	0.2971	1.9558	0.0000	7,154.9427	7,154.9427	0.3188	0.0000	7,161.6383
2021	2.4978	10.9430	36.0539	0.0993	6.1638	0.2861	6.4499	1.6524	0.2661	1.9184	0.0000	7,055.3595	7,055.3595	0.3071	0.0000	7,061.8082

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	2.3677	9.9269	34.2518	0.0989	6.1402	0.2641	6.4043	1.6460	0.2455	1.8916	0.0000	6,953.0915	6,953.0915	0.2965	0.0000	6,959.3177
2023	2.2185	8.4190	32.5738	0.0987	6.1402	0.2483	6.3886	1.6460	0.2307	1.8767	0.0000	6,874.7768	6,874.7768	0.2859	0.0000	6,880.7809
2024	2.1461	8.2333	31.5961	0.1000	6.1875	0.2395	6.4269	1.6587	0.2223	1.8810	0.0000	6,901.0472	6,901.0472	0.2826	0.0000	6,906.9824
2025	2.0552	7.9548	30.3975	0.0996	6.1639	0.2280	6.3919	1.6524	0.2115	1.8639	0.0000	6,819.8291	6,819.8291	0.2749	0.0000	6,825.6029
2026	1.9803	7.7362	29.4217	0.0996	6.1639	0.2234	6.3873	1.6524	0.2073	1.8597	0.0000	6,770.9827	6,770.9827	0.2689	0.0000	6,776.6295
2027	1.9246	7.6302	28.6191	0.0996	6.1639	0.2238	6.3877	1.6524	0.2077	1.8601	0.0000	6,728.7579	6,728.7579	0.2639	0.0000	6,734.3006
2028	1.8643	7.4954	27.8075	0.0992	6.1403	0.2224	6.3627	1.6461	0.2064	1.8524	0.0000	6,666.5489	6,666.5489	0.2585	0.0000	6,671.9765
2029	1.8190	7.4399	27.1941	0.0996	6.1640	0.2234	6.3874	1.6524	0.2073	1.8597	0.0000	6,660.3932	6,660.3932	0.2551	0.0000	6,665.7503
2030	1.7617	6.7750	26.5915	0.1001	6.1640	0.1743	6.3383	1.6524	0.1622	1.8147	0.0000	6,673.0271	6,673.0271	0.1940	0.0000	6,677.1004
2031	1.7175	6.7050	26.0582	0.1003	6.1640	0.1738	6.3378	1.6524	0.1618	1.8142	0.0000	6,658.2609	6,658.2609	0.1908	0.0000	6,662.2680
2032	1.2364	4.9776	18.7506	0.0722	4.3754	0.1357	4.5111	1.1729	0.1272	1.3001	0.0000	4,800.8387	4,800.8387	0.1373	0.0000	4,803.7210
2033	16.6849	0.6091	2.4226	9.2600e-003	0.5761	0.0263	0.6023	0.1530	0.0259	0.1789	0.0000	585.6776	585.6776	0.0241	0.0000	586.1828
2034	30.6491	0.3213	2.5995	0.0137	1.0452	0.0115	1.0567	0.2776	0.0109	0.2885	0.0000	797.2156	797.2156	0.0308	0.0000	797.8617
Total	**83.2562**	**166.6293**	**517.3091**	**1.5667**	**116.4348**	**4.9642**	**121.3990**	**28.7520**	**4.6109**	**33.3630**	**0.0000**	**109,489.1701**	**109,489.1701**	**4.7357**	**0.0000**	**109,588.6198**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**17.55**	**0.00**	**16.96**	**11.24**	**0.00**	**9.84**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	63.7871	1.1743	96.4358	0.0614		5.8922	5.8922		5.8913	5.8913	618.4074	1,286.4938	1,904.9012	1.9377	0.0420	1,958.6047
Energy	0.7655	6.5584	2.9056	0.0418		0.5289	0.5289		0.5289	0.5289	0.0000	25,814.6166	25,814.6166	0.9836	0.3124	25,932.1004
Mobile	37.4620	94.1154	415.6377	1.7432	109.8691	2.5118	112.3809	29.4625	2.3179	31.7804	0.0000	113,703.9847	113,703.9847	3.0549	0.0000	113,768.1376
Waste						0.0000	0.0000		0.0000	0.0000	1,417.5042	0.0000	1,417.5042	83.7721	0.0000	3,176.7182
Water						0.0000	0.0000		0.0000	0.0000	193.8329	3,488.2756	3,682.1085	20.0688	0.5033	4,259.5640
Total	**102.0146**	**101.8482**	**514.9791**	**1.8464**	**109.8691**	**8.9330**	**118.8020**	**29.4625**	**8.7382**	**38.2007**	**2,229.7445**	**144,293.3707**	**146,523.1151**	**109.8171**	**0.8576**	**149,095.1249**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	43.9837	0.6905	59.8560	3.1700e-003		0.3331	0.3331		0.3331	0.3331	0.0000	98.1272	98.1272	0.0935	0.0000	100.0906
Energy	0.7655	6.5584	2.9056	0.0418		0.5289	0.5289		0.5289	0.5289	0.0000	25,814.6166	25,814.6166	0.9836	0.3124	25,932.1004
Mobile	34.0335	72.0909	339.2678	1.2215	75.8714	1.8044	77.6758	20.3457	1.6653	22.0110	0.0000	79,676.1425	79,676.1425	2.1784	0.0000	79,721.8891
Waste						0.0000	0.0000		0.0000	0.0000	708.7521	0.0000	708.7521	41.8861	0.0000	1,588.3591
Water						0.0000	0.0000		0.0000	0.0000	193.8329	3,488.2756	3,682.1085	20.0652	0.5025	4,259.2548
Total	**78.7828**	**79.3399**	**402.0294**	**1.2664**	**75.8714**	**2.6663**	**78.5377**	**20.3457**	**2.5273**	**22.8730**	**902.5850**	**109,077.1618**	**109,979.7468**	**65.2067**	**0.8149**	**111,601.6939**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**22.77**	**22.10**	**21.93**	**31.41**	**30.94**	**70.15**	**33.89**	**30.94**	**71.08**	**40.12**	**59.52**	**24.41**	**24.94**	**40.62**	**4.98**	**25.15**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2015	10/7/2015	5	200	
2	Site Preparation	Site Preparation	10/8/2015	3/23/2016	5	120	
3	Grading	Grading	3/24/2016	5/17/2017	5	300	
4	Building Construction	Building Construction	5/18/2017	9/15/2032	5	4000	
5	Paving	Paving	9/16/2032	6/22/2033	5	200	
6	Architectural Coating	Architectural Coating	6/23/2033	12/20/2034	5	390	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 38750

Acres of Paving: 0

Residential Indoor: 16,737,030; Residential Outdoor: 5,579,010; Non-Residential Indoor: 3,165,800; Non-Residential Outdoor: 1,055,267 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Demolition	Excavators	3	8.00	162	0.38
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Excavators	2	8.00	162	0.38
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	125	0.42
Paving	Rollers	2	8.00	80	0.38
Demolition	Rubber Tired Dozers	2	8.00	255	0.40
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Graders	1	8.00	174	0.41
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Paving Equipment	2	8.00	130	0.36
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	3,768.00	968.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	754.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Demolition - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4508	4.8363	3.6074	3.9900e-003		0.2451	0.2451		0.2286	0.2286	0.0000	374.4127	374.4127	0.1015	0.0000	376.5441
Total	**0.4508**	**4.8363**	**3.6074**	**3.9900e-003**		**0.2451**	**0.2451**		**0.2286**	**0.2286**	**0.0000**	**374.4127**	**374.4127**	**0.1015**	**0.0000**	**376.5441**

3.2 Demolition - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.2700e-003	0.0106	0.1103	2.1000e-004	0.0164	1.7000e-004	0.0166	4.3700e-003	1.5000e-004	4.5200e-003	0.0000	16.5931	16.5931	9.9000e-004	0.0000	16.6138
Total	**7.2700e-003**	**0.0106**	**0.1103**	**2.1000e-004**	**0.0164**	**1.7000e-004**	**0.0166**	**4.3700e-003**	**1.5000e-004**	**4.5200e-003**	**0.0000**	**16.5931**	**16.5931**	**9.9000e-004**	**0.0000**	**16.6138**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4508	4.8363	3.6074	3.9900e-003		0.2451	0.2451		0.2286	0.2286	0.0000	374.4122	374.4122	0.1015	0.0000	376.5437
Total	**0.4508**	**4.8363**	**3.6074**	**3.9900e-003**		**0.2451**	**0.2451**		**0.2286**	**0.2286**	**0.0000**	**374.4122**	**374.4122**	**0.1015**	**0.0000**	**376.5437**

3.2 Demolition - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.2700e-003	0.0106	0.1103	2.1000e-004	0.0164	1.7000e-004	0.0166	4.3700e-003	1.5000e-004	4.5200e-003	0.0000	16.5931	16.5931	9.9000e-004	0.0000	16.6138
Total	**7.2700e-003**	**0.0106**	**0.1103**	**2.1000e-004**	**0.0164**	**1.7000e-004**	**0.0166**	**4.3700e-003**	**1.5000e-004**	**4.5200e-003**	**0.0000**	**16.5931**	**16.5931**	**9.9000e-004**	**0.0000**	**16.6138**

3.3 Site Preparation - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0840	0.0000	1.0840	0.5958	0.0000	0.5958	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1605	1.7351	1.3003	1.1900e-003		0.0942	0.0942		0.0867	0.0867	0.0000	113.7684	113.7684	0.0340	0.0000	114.4817
Total	**0.1605**	**1.7351**	**1.3003**	**1.1900e-003**	**1.0840**	**0.0942**	**1.1782**	**0.5958**	**0.0867**	**0.6825**	**0.0000**	**113.7684**	**113.7684**	**0.0340**	**0.0000**	**114.4817**

3.3 Site Preparation - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.6600e-003	3.8700e-003	0.0404	8.0000e-005	6.0200e-003	6.0000e-005	6.0800e-003	1.6000e-003	6.0000e-005	1.6500e-003	0.0000	6.0731	6.0731	3.6000e-004	0.0000	6.0807
Total	**2.6600e-003**	**3.8700e-003**	**0.0404**	**8.0000e-005**	**6.0200e-003**	**6.0000e-005**	**6.0800e-003**	**1.6000e-003**	**6.0000e-005**	**1.6500e-003**	**0.0000**	**6.0731**	**6.0731**	**3.6000e-004**	**0.0000**	**6.0807**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4878	0.0000	0.4878	0.2681	0.0000	0.2681	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1605	1.7351	1.3003	1.1900e-003		0.0942	0.0942		0.0867	0.0867	0.0000	113.7683	113.7683	0.0340	0.0000	114.4815
Total	**0.1605**	**1.7351**	**1.3003**	**1.1900e-003**	**0.4878**	**0.0942**	**0.5820**	**0.2681**	**0.0867**	**0.3548**	**0.0000**	**113.7683**	**113.7683**	**0.0340**	**0.0000**	**114.4815**

3.3 Site Preparation - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.6600e-003	3.8700e-003	0.0404	8.0000e-005	6.0200e-003	6.0000e-005	6.0800e-003	1.6000e-003	6.0000e-005	1.6500e-003	0.0000	6.0731	6.0731	3.6000e-004	0.0000	6.0807
Total	**2.6600e-003**	**3.8700e-003**	**0.0404**	**8.0000e-005**	**6.0200e-003**	**6.0000e-005**	**6.0800e-003**	**1.6000e-003**	**6.0000e-005**	**1.6500e-003**	**0.0000**	**6.0731**	**6.0731**	**3.6000e-004**	**0.0000**	**6.0807**

3.3 Site Preparation - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0840	0.0000	1.0840	0.5958	0.0000	0.5958	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1498	1.6117	1.2126	1.1500e-003		0.0867	0.0867		0.0798	0.0798	0.0000	108.7875	108.7875	0.0328	0.0000	109.4766
Total	**0.1498**	**1.6117**	**1.2126**	**1.1500e-003**	**1.0840**	**0.0867**	**1.1707**	**0.5958**	**0.0798**	**0.6756**	**0.0000**	**108.7875**	**108.7875**	**0.0328**	**0.0000**	**109.4766**

3.3 Site Preparation - 2016

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3200e-003	3.3900e-003	0.0353	7.0000e-005	5.8200e-003	6.0000e-005	5.8700e-003	1.5500e-003	5.0000e-005	1.6000e-003	0.0000	5.6779	5.6779	3.2000e-004	0.0000	5.6846
Total	**2.3200e-003**	**3.3900e-003**	**0.0353**	**7.0000e-005**	**5.8200e-003**	**6.0000e-005**	**5.8700e-003**	**1.5500e-003**	**5.0000e-005**	**1.6000e-003**	**0.0000**	**5.6779**	**5.6779**	**3.2000e-004**	**0.0000**	**5.6846**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4878	0.0000	0.4878	0.2681	0.0000	0.2681	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1498	1.6117	1.2126	1.1500e-003		0.0867	0.0867		0.0798	0.0798	0.0000	108.7873	108.7873	0.0328	0.0000	109.4764
Total	**0.1498**	**1.6117**	**1.2126**	**1.1500e-003**	**0.4878**	**0.0867**	**0.5745**	**0.2681**	**0.0798**	**0.3479**	**0.0000**	**108.7873**	**108.7873**	**0.0328**	**0.0000**	**109.4764**

3.3 Site Preparation - 2016

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3200e-003	3.3900e-003	0.0353	7.0000e-005	5.8200e-003	6.0000e-005	5.8700e-003	1.5500e-003	5.0000e-005	1.6000e-003	0.0000	5.6779	5.6779	3.2000e-004	0.0000	5.6846
Total	**2.3200e-003**	**3.3900e-003**	**0.0353**	**7.0000e-005**	**5.8200e-003**	**6.0000e-005**	**5.8700e-003**	**1.5500e-003**	**5.0000e-005**	**1.6000e-003**	**0.0000**	**5.6779**	**5.6779**	**3.2000e-004**	**0.0000**	**5.6846**

3.4 Grading - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					21.4505	0.0000	21.4505	2.7152	0.0000	2.7152	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.6544	7.5562	4.9629	6.2300e-003		0.3620	0.3620		0.3331	0.3331	0.0000	587.7768	587.7768	0.1773	0.0000	591.5000
Total	**0.6544**	**7.5562**	**4.9629**	**6.2300e-003**	**21.4505**	**0.3620**	**21.8125**	**2.7152**	**0.3331**	**3.0482**	**0.0000**	**587.7768**	**587.7768**	**0.1773**	**0.0000**	**591.5000**

3.4 Grading - 2016

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.8200e-003	0.0129	0.1344	2.8000e-004	0.0221	2.1000e-004	0.0224	5.8800e-003	2.0000e-004	6.0800e-003	0.0000	21.5994	21.5994	1.2300e-003	0.0000	21.6252
Total	**8.8200e-003**	**0.0129**	**0.1344**	**2.8000e-004**	**0.0221**	**2.1000e-004**	**0.0224**	**5.8800e-003**	**2.0000e-004**	**6.0800e-003**	**0.0000**	**21.5994**	**21.5994**	**1.2300e-003**	**0.0000**	**21.6252**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					9.6527	0.0000	9.6527	1.2218	0.0000	1.2218	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.6544	7.5562	4.9629	6.2300e-003		0.3620	0.3620		0.3331	0.3331	0.0000	587.7761	587.7761	0.1773	0.0000	591.4993
Total	**0.6544**	**7.5562**	**4.9629**	**6.2300e-003**	**9.6527**	**0.3620**	**10.0147**	**1.2218**	**0.3331**	**1.5549**	**0.0000**	**587.7761**	**587.7761**	**0.1773**	**0.0000**	**591.4993**

3.4 Grading - 2016

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.8200e-003	0.0129	0.1344	2.8000e-004	0.0221	2.1000e-004	0.0224	5.8800e-003	2.0000e-004	6.0800e-003	0.0000	21.5994	21.5994	1.2300e-003	0.0000	21.6252
Total	**8.8200e-003**	**0.0129**	**0.1344**	**2.8000e-004**	**0.0221**	**2.1000e-004**	**0.0224**	**5.8800e-003**	**2.0000e-004**	**6.0800e-003**	**0.0000**	**21.5994**	**21.5994**	**1.2300e-003**	**0.0000**	**21.6252**

3.4 Grading - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					21.4505	0.0000	21.4505	2.7152	0.0000	2.7152	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2989	3.4100	2.2935	3.0200e-003		0.1625	0.1625		0.1495	0.1495	0.0000	280.6422	280.6422	0.0860	0.0000	282.4480
Total	**0.2989**	**3.4100**	**2.2935**	**3.0200e-003**	**21.4505**	**0.1625**	**21.6131**	**2.7152**	**0.1495**	**2.8647**	**0.0000**	**280.6422**	**280.6422**	**0.0860**	**0.0000**	**282.4480**

3.4 Grading - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.8300e-003	5.6600e-003	0.0589	1.4000e-004	0.0107	1.0000e-004	0.0108	2.8500e-003	9.0000e-005	2.9400e-003	0.0000	10.0862	10.0862	5.5000e-004	0.0000	10.0978
Total	**3.8300e-003**	**5.6600e-003**	**0.0589**	**1.4000e-004**	**0.0107**	**1.0000e-004**	**0.0108**	**2.8500e-003**	**9.0000e-005**	**2.9400e-003**	**0.0000**	**10.0862**	**10.0862**	**5.5000e-004**	**0.0000**	**10.0978**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					9.6527	0.0000	9.6527	1.2218	0.0000	1.2218	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2989	3.4100	2.2934	3.0200e-003		0.1625	0.1625		0.1495	0.1495	0.0000	280.6419	280.6419	0.0860	0.0000	282.4476
Total	**0.2989**	**3.4100**	**2.2934**	**3.0200e-003**	**9.6527**	**0.1625**	**9.8153**	**1.2218**	**0.1495**	**1.3714**	**0.0000**	**280.6419**	**280.6419**	**0.0860**	**0.0000**	**282.4476**

3.4 Grading - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.8300e-003	5.6600e-003	0.0589	1.4000e-004	0.0107	1.0000e-004	0.0108	2.8500e-003	9.0000e-005	2.9400e-003	0.0000	10.0862	10.0862	5.5000e-004	0.0000	10.0978
Total	**3.8300e-003**	**5.6600e-003**	**0.0589**	**1.4000e-004**	**0.0107**	**1.0000e-004**	**0.0108**	**2.8500e-003**	**9.0000e-005**	**2.9400e-003**	**0.0000**	**10.0862**	**10.0862**	**5.5000e-004**	**0.0000**	**10.0978**

3.5 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2513	2.1389	1.4685	2.1700e-003		0.1443	0.1443		0.1355	0.1355	0.0000	193.9781	193.9781	0.0477	0.0000	194.9807
Total	**0.2513**	**2.1389**	**1.4685**	**2.1700e-003**		**0.1443**	**0.1443**		**0.1355**	**0.1355**	**0.0000**	**193.9781**	**193.9781**	**0.0477**	**0.0000**	**194.9807**

3.5 Building Construction - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.6427	6.5360	8.8174	0.0172	0.4811	0.0960	0.5771	0.1372	0.0883	0.2255	0.0000	1,536.0395	1,536.0395	0.0113	0.0000	1,536.2761
Worker	1.1940	1.7615	18.3362	0.0425	3.3445	0.0309	3.3754	0.8883	0.0285	0.9168	0.0000	3,141.2258	3,141.2258	0.1712	0.0000	3,144.8211
Total	**1.8367**	**8.2975**	**27.1536**	**0.0597**	**3.8256**	**0.1269**	**3.9524**	**1.0255**	**0.1168**	**1.1423**	**0.0000**	**4,677.2652**	**4,677.2652**	**0.1825**	**0.0000**	**4,681.0972**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2513	2.1389	1.4685	2.1700e-003		0.1443	0.1443		0.1355	0.1355	0.0000	193.9779	193.9779	0.0477	0.0000	194.9804
Total	**0.2513**	**2.1389**	**1.4685**	**2.1700e-003**		**0.1443**	**0.1443**		**0.1355**	**0.1355**	**0.0000**	**193.9779**	**193.9779**	**0.0477**	**0.0000**	**194.9804**

3.5 Building Construction - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.6427	6.5360	8.8174	0.0172	0.4811	0.0960	0.5771	0.1372	0.0883	0.2255	0.0000	1,536.0395	1,536.0395	0.0113	0.0000	1,536.2761
Worker	1.1940	1.7615	18.3362	0.0425	3.3445	0.0309	3.3754	0.8883	0.0285	0.9168	0.0000	3,141.2258	3,141.2258	0.1712	0.0000	3,144.8211
Total	**1.8367**	**8.2975**	**27.1536**	**0.0597**	**3.8256**	**0.1269**	**3.9524**	**1.0255**	**0.1168**	**1.1423**	**0.0000**	**4,677.2652**	**4,677.2652**	**0.1825**	**0.0000**	**4,681.0972**

3.5 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3483	3.0355	2.2880	3.5000e-003		0.1950	0.1950		0.1833	0.1833	0.0000	308.9844	308.9844	0.0756	0.0000	310.5723
Total	**0.3483**	**3.0355**	**2.2880**	**3.5000e-003**		**0.1950**	**0.1950**		**0.1833**	**0.1833**	**0.0000**	**308.9844**	**308.9844**	**0.0756**	**0.0000**	**310.5723**

3.5 Building Construction - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.9727	9.6767	13.6356	0.0276	0.7752	0.1456	0.9209	0.2211	0.1340	0.3551	0.0000	2,433.8399	2,433.8399	0.0181	0.0000	2,434.2191
Worker	1.7255	2.5761	26.7544	0.0685	5.3883	0.0482	5.4365	1.4311	0.0446	1.4758	0.0000	4,875.3889	4,875.3889	0.2562	0.0000	4,880.7692
Total	**2.6982**	**12.2528**	**40.3900**	**0.0961**	**6.1635**	**0.1939**	**6.3574**	**1.6523**	**0.1786**	**1.8308**	**0.0000**	**7,309.2288**	**7,309.2288**	**0.2743**	**0.0000**	**7,314.9884**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3483	3.0355	2.2880	3.5000e-003		0.1950	0.1950		0.1833	0.1833	0.0000	308.9841	308.9841	0.0756	0.0000	310.5720
Total	**0.3483**	**3.0355**	**2.2880**	**3.5000e-003**		**0.1950**	**0.1950**		**0.1833**	**0.1833**	**0.0000**	**308.9841**	**308.9841**	**0.0756**	**0.0000**	**310.5720**

3.5 Building Construction - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.9727	9.6767	13.6356	0.0276	0.7752	0.1456	0.9209	0.2211	0.1340	0.3551	0.0000	2,433.8399	2,433.8399	0.0181	0.0000	2,434.2191
Worker	1.7255	2.5761	26.7544	0.0685	5.3883	0.0482	5.4365	1.4311	0.0446	1.4758	0.0000	4,875.3889	4,875.3889	0.2562	0.0000	4,880.7692
Total	**2.6982**	**12.2528**	**40.3900**	**0.0961**	**6.1635**	**0.1939**	**6.3574**	**1.6523**	**0.1786**	**1.8308**	**0.0000**	**7,309.2288**	**7,309.2288**	**0.2743**	**0.0000**	**7,314.9884**

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3069	2.7359	2.2342	3.5000e-003		0.1677	0.1677		0.1577	0.1577	0.0000	305.5302	305.5302	0.0743	0.0000	307.0913
Total	**0.3069**	**2.7359**	**2.2342**	**3.5000e-003**		**0.1677**	**0.1677**		**0.1577**	**0.1577**	**0.0000**	**305.5302**	**305.5302**	**0.0743**	**0.0000**	**307.0913**

3.5 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.9218	8.9230	13.1860	0.0275	0.7754	0.1384	0.9138	0.2212	0.1273	0.3485	0.0000	2,383.8784	2,383.8784	0.0177	0.0000	2,384.2494
Worker	1.5822	2.3621	24.5134	0.0682	5.3883	0.0470	5.4353	1.4311	0.0436	1.4747	0.0000	4,684.1409	4,684.1409	0.2395	0.0000	4,689.1696
Total	**2.5040**	**11.2851**	**37.6994**	**0.0957**	**6.1637**	**0.1854**	**6.3491**	**1.6523**	**0.1709**	**1.8232**	**0.0000**	**7,068.0192**	**7,068.0192**	**0.2571**	**0.0000**	**7,073.4191**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3069	2.7359	2.2342	3.5000e-003		0.1677	0.1677		0.1577	0.1577	0.0000	305.5299	305.5299	0.0743	0.0000	307.0909
Total	**0.3069**	**2.7359**	**2.2342**	**3.5000e-003**		**0.1677**	**0.1677**		**0.1577**	**0.1577**	**0.0000**	**305.5299**	**305.5299**	**0.0743**	**0.0000**	**307.0909**

3.5 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.9218	8.9230	13.1860	0.0275	0.7754	0.1384	0.9138	0.2212	0.1273	0.3485	0.0000	2,383.8784	2,383.8784	0.0177	0.0000	2,384.2494
Worker	1.5822	2.3621	24.5134	0.0682	5.3883	0.0470	5.4353	1.4311	0.0436	1.4747	0.0000	4,684.1409	4,684.1409	0.2395	0.0000	4,689.1696
Total	**2.5040**	**11.2851**	**37.6994**	**0.0957**	**6.1637**	**0.1854**	**6.3491**	**1.6523**	**0.1709**	**1.8232**	**0.0000**	**7,068.0192**	**7,068.0192**	**0.2571**	**0.0000**	**7,073.4191**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2766	2.5000	2.2019	3.5100e-003		0.1458	0.1458		0.1371	0.1371	0.0000	302.1514	302.1514	0.0736	0.0000	303.6973
Total	**0.2766**	**2.5000**	**2.2019**	**3.5100e-003**		**0.1458**	**0.1458**		**0.1371**	**0.1371**	**0.0000**	**302.1514**	**302.1514**	**0.0736**	**0.0000**	**303.6973**

3.5 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.8841	7.8335	12.8763	0.0276	0.7785	0.1269	0.9054	0.2221	0.1167	0.3388	0.0000	2,339.6979	2,339.6979	0.0174	0.0000	2,340.0629
Worker	1.4880	2.1979	22.9037	0.0685	5.4090	0.0467	5.4557	1.4366	0.0433	1.4799	0.0000	4,513.0938	4,513.0938	0.2278	0.0000	4,517.8785
Total	**2.3721**	**10.0314**	**35.7800**	**0.0961**	**6.1874**	**0.1736**	**6.3610**	**1.6587**	**0.1601**	**1.8187**	**0.0000**	**6,852.7917**	**6,852.7917**	**0.2452**	**0.0000**	**6,857.9414**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2766	2.5000	2.2019	3.5100e-003		0.1458	0.1458		0.1371	0.1371	0.0000	302.1510	302.1510	0.0736	0.0000	303.6969
Total	**0.2766**	**2.5000**	**2.2019**	**3.5100e-003**		**0.1458**	**0.1458**		**0.1371**	**0.1371**	**0.0000**	**302.1510**	**302.1510**	**0.0736**	**0.0000**	**303.6969**

3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.8841	7.8335	12.8763	0.0276	0.7785	0.1269	0.9054	0.2221	0.1167	0.3388	0.0000	2,339.6979	2,339.6979	0.0174	0.0000	2,340.0629
Worker	1.4880	2.1979	22.9037	0.0685	5.4090	0.0467	5.4557	1.4366	0.0433	1.4799	0.0000	4,513.0938	4,513.0938	0.2278	0.0000	4,517.8785
Total	**2.3721**	**10.0314**	**35.7800**	**0.0961**	**6.1874**	**0.1736**	**6.3610**	**1.6587**	**0.1601**	**1.8187**	**0.0000**	**6,852.7917**	**6,852.7917**	**0.2452**	**0.0000**	**6,857.9414**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2471	2.2629	2.1582	3.5000e-003		0.1246	0.1246		0.1172	0.1172	0.0000	301.0339	301.0339	0.0725	0.0000	302.5568
Total	**0.2471**	**2.2629**	**2.1582**	**3.5000e-003**		**0.1246**	**0.1246**		**0.1172**	**0.1172**	**0.0000**	**301.0339**	**301.0339**	**0.0725**	**0.0000**	**302.5568**

3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.8494	6.6360	12.4894	0.0275	0.7755	0.1151	0.8906	0.2212	0.1059	0.3271	0.0000	2,328.9773	2,328.9773	0.0174	0.0000	2,329.3435
Worker	1.4013	2.0441	21.4064	0.0683	5.3883	0.0464	5.4347	1.4311	0.0430	1.4742	0.0000	4,425.3488	4,425.3488	0.2171	0.0000	4,429.9083
Total	**2.2507**	**8.6801**	**33.8957**	**0.0958**	**6.1638**	**0.1615**	**6.3253**	**1.6524**	**0.1489**	**1.8013**	**0.0000**	**6,754.3260**	**6,754.3260**	**0.2346**	**0.0000**	**6,759.2517**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2471	2.2629	2.1582	3.5000e-003		0.1246	0.1246		0.1172	0.1172	0.0000	301.0335	301.0335	0.0725	0.0000	302.5565
Total	**0.2471**	**2.2629**	**2.1582**	**3.5000e-003**		**0.1246**	**0.1246**		**0.1172**	**0.1172**	**0.0000**	**301.0335**	**301.0335**	**0.0725**	**0.0000**	**302.5565**

3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.8494	6.6360	12.4894	0.0275	0.7755	0.1151	0.8906	0.2212	0.1059	0.3271	0.0000	2,328.9773	2,328.9773	0.0174	0.0000	2,329.3435
Worker	1.4013	2.0441	21.4064	0.0683	5.3883	0.0464	5.4347	1.4311	0.0430	1.4742	0.0000	4,425.3488	4,425.3488	0.2171	0.0000	4,429.9083
Total	**2.2507**	**8.6801**	**33.8957**	**0.0958**	**6.1638**	**0.1615**	**6.3253**	**1.6524**	**0.1489**	**1.8013**	**0.0000**	**6,754.3260**	**6,754.3260**	**0.2346**	**0.0000**	**6,759.2517**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2209	2.0197	2.1226	3.4900e-003		0.1047	0.1047		0.0986	0.0986	0.0000	299.9946	299.9946	0.0718	0.0000	301.5017
Total	**0.2209**	**2.0197**	**2.1226**	**3.4900e-003**		**0.1047**	**0.1047**		**0.0986**	**0.0986**	**0.0000**	**299.9946**	**299.9946**	**0.0718**	**0.0000**	**301.5017**

3.5 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.8269	6.0012	12.1194	0.0273	0.7726	0.1134	0.8859	0.2204	0.1043	0.3247	0.0000	2,318.1444	2,318.1444	0.0178	0.0000	2,318.5172
Worker	1.3199	1.9059	20.0098	0.0681	5.3677	0.0460	5.4137	1.4257	0.0427	1.4683	0.0000	4,334.9529	4,334.9529	0.2070	0.0000	4,339.2992
Total	**2.1468**	**7.9071**	**32.1292**	**0.0954**	**6.1402**	**0.1594**	**6.2996**	**1.6460**	**0.1470**	**1.7930**	**0.0000**	**6,653.0973**	**6,653.0973**	**0.2247**	**0.0000**	**6,657.8164**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2209	2.0197	2.1226	3.4900e-003		0.1047	0.1047		0.0986	0.0986	0.0000	299.9943	299.9943	0.0718	0.0000	301.5013
Total	**0.2209**	**2.0197**	**2.1226**	**3.4900e-003**		**0.1047**	**0.1047**		**0.0986**	**0.0986**	**0.0000**	**299.9943**	**299.9943**	**0.0718**	**0.0000**	**301.5013**

3.5 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.8269	6.0012	12.1194	0.0273	0.7726	0.1134	0.8859	0.2204	0.1043	0.3247	0.0000	2,318.1444	2,318.1444	0.0178	0.0000	2,318.5172
Worker	1.3199	1.9059	20.0098	0.0681	5.3677	0.0460	5.4137	1.4257	0.0427	1.4683	0.0000	4,334.9529	4,334.9529	0.2070	0.0000	4,339.2992
Total	**2.1468**	**7.9071**	**32.1292**	**0.0954**	**6.1402**	**0.1594**	**6.2996**	**1.6460**	**0.1470**	**1.7930**	**0.0000**	**6,653.0973**	**6,653.0973**	**0.2247**	**0.0000**	**6,657.8164**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2036	1.8606	2.1072	3.4900e-003		0.0906	0.0906		0.0852	0.0852	0.0000	300.0980	300.0980	0.0713	0.0000	301.5949
Total	**0.2036**	**1.8606**	**2.1072**	**3.4900e-003**		**0.0906**	**0.0906**		**0.0852**	**0.0852**	**0.0000**	**300.0980**	**300.0980**	**0.0713**	**0.0000**	**301.5949**

3.5 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.7674	4.7693	11.6701	0.0272	0.7726	0.1119	0.8845	0.2204	0.1030	0.3234	0.0000	2,307.1981	2,307.1981	0.0160	0.0000	2,307.5334
Worker	1.2476	1.7891	18.7965	0.0681	5.3677	0.0458	5.4135	1.4257	0.0425	1.4681	0.0000	4,267.4811	4,267.4811	0.1987	0.0000	4,271.6530
Total	**2.0150**	**6.5584**	**30.4666**	**0.0952**	**6.1403**	**0.1577**	**6.2980**	**1.6461**	**0.1455**	**1.7915**	**0.0000**	**6,574.6792**	**6,574.6792**	**0.2146**	**0.0000**	**6,579.1864**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2036	1.8606	2.1072	3.4900e-003		0.0906	0.0906		0.0852	0.0852	0.0000	300.0976	300.0976	0.0713	0.0000	301.5946
Total	**0.2036**	**1.8606**	**2.1072**	**3.4900e-003**		**0.0906**	**0.0906**		**0.0852**	**0.0852**	**0.0000**	**300.0976**	**300.0976**	**0.0713**	**0.0000**	**301.5946**

3.5 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.7674	4.7693	11.6701	0.0272	0.7726	0.1119	0.8845	0.2204	0.1030	0.3234	0.0000	2,307.1981	2,307.1981	0.0160	0.0000	2,307.5334
Worker	1.2476	1.7891	18.7965	0.0681	5.3677	0.0458	5.4135	1.4257	0.0425	1.4681	0.0000	4,267.4811	4,267.4811	0.1987	0.0000	4,271.6530
Total	**2.0150**	**6.5584**	**30.4666**	**0.0952**	**6.1403**	**0.1577**	**6.2980**	**1.6461**	**0.1455**	**1.7915**	**0.0000**	**6,574.6792**	**6,574.6792**	**0.2146**	**0.0000**	**6,579.1864**

3.5 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1920	1.7524	2.1135	3.5200e-003		0.0800	0.0800		0.0752	0.0752	0.0000	302.4646	302.4646	0.0714	0.0000	303.9643
Total	**0.1920**	**1.7524**	**2.1135**	**3.5200e-003**		**0.0800**	**0.0800**		**0.0752**	**0.0752**	**0.0000**	**302.4646**	**302.4646**	**0.0714**	**0.0000**	**303.9643**

3.5 Building Construction - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.7591	4.7768	11.5017	0.0275	0.7785	0.1129	0.8915	0.2221	0.1039	0.3260	0.0000	2,330.0727	2,330.0727	0.0163	0.0000	2,330.4146
Worker	1.1951	1.7041	17.9810	0.0691	5.4090	0.0466	5.4555	1.4366	0.0432	1.4798	0.0000	4,268.5103	4,268.5103	0.1949	0.0000	4,272.6038
Total	**1.9542**	**6.4808**	**29.4827**	**0.0965**	**6.1875**	**0.1595**	**6.3470**	**1.6587**	**0.1471**	**1.8058**	**0.0000**	**6,598.5829**	**6,598.5829**	**0.2112**	**0.0000**	**6,603.0185**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1920	1.7524	2.1135	3.5200e-003		0.0800	0.0800		0.0752	0.0752	0.0000	302.4642	302.4642	0.0714	0.0000	303.9639
Total	**0.1920**	**1.7524**	**2.1135**	**3.5200e-003**		**0.0800**	**0.0800**		**0.0752**	**0.0752**	**0.0000**	**302.4642**	**302.4642**	**0.0714**	**0.0000**	**303.9639**

3.5 Building Construction - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.7591	4.7768	11.5017	0.0275	0.7785	0.1129	0.8915	0.2221	0.1039	0.3260	0.0000	2,330.0727	2,330.0727	0.0163	0.0000	2,330.4146
Worker	1.1951	1.7041	17.9810	0.0691	5.4090	0.0466	5.4555	1.4366	0.0432	1.4798	0.0000	4,268.5103	4,268.5103	0.1949	0.0000	4,272.6038
Total	**1.9542**	**6.4808**	**29.4827**	**0.0965**	**6.1875**	**0.1595**	**6.3470**	**1.6587**	**0.1471**	**1.8058**	**0.0000**	**6,598.5829**	**6,598.5829**	**0.2112**	**0.0000**	**6,603.0185**

3.5 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1777	1.6195	2.0948	3.5000e-003		0.0685	0.0685		0.0645	0.0645	0.0000	301.4019	301.4019	0.0707	0.0000	302.8874
Total	**0.1777**	**1.6195**	**2.0948**	**3.5000e-003**		**0.0685**	**0.0685**		**0.0645**	**0.0645**	**0.0000**	**301.4019**	**301.4019**	**0.0707**	**0.0000**	**302.8874**

3.5 Building Construction - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.7435	4.7254	11.2665	0.0273	0.7756	0.1131	0.8886	0.2212	0.1040	0.3253	0.0000	2,321.2959	2,321.2959	0.0163	0.0000	2,321.6379
Worker	1.1340	1.6099	17.0363	0.0688	5.3883	0.0464	5.4347	1.4311	0.0430	1.4742	0.0000	4,197.1316	4,197.1316	0.1879	0.0000	4,201.0779
Total	**1.8775**	**6.3353**	**28.3027**	**0.0961**	**6.1639**	**0.1595**	**6.3233**	**1.6524**	**0.1471**	**1.7994**	**0.0000**	**6,518.4275**	**6,518.4275**	**0.2042**	**0.0000**	**6,522.7158**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1777	1.6195	2.0948	3.5000e-003		0.0685	0.0685		0.0645	0.0645	0.0000	301.4015	301.4015	0.0707	0.0000	302.8871
Total	**0.1777**	**1.6195**	**2.0948**	**3.5000e-003**		**0.0685**	**0.0685**		**0.0645**	**0.0645**	**0.0000**	**301.4015**	**301.4015**	**0.0707**	**0.0000**	**302.8871**

3.5 Building Construction - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.7435	4.7254	11.2665	0.0273	0.7756	0.1131	0.8886	0.2212	0.1040	0.3253	0.0000	2,321.2959	2,321.2959	0.0163	0.0000	2,321.6379
Worker	1.1340	1.6099	17.0363	0.0688	5.3883	0.0464	5.4347	1.4311	0.0430	1.4742	0.0000	4,197.1316	4,197.1316	0.1879	0.0000	4,201.0779
Total	**1.8775**	**6.3353**	**28.3027**	**0.0961**	**6.1639**	**0.1595**	**6.3233**	**1.6524**	**0.1471**	**1.7994**	**0.0000**	**6,518.4275**	**6,518.4275**	**0.2042**	**0.0000**	**6,522.7158**

3.5 Building Construction - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1777	1.6195	2.0948	3.5000e-003		0.0685	0.0685		0.0645	0.0645	0.0000	301.4019	301.4019	0.0707	0.0000	302.8874
Total	**0.1777**	**1.6195**	**2.0948**	**3.5000e-003**		**0.0685**	**0.0685**		**0.0645**	**0.0645**	**0.0000**	**301.4019**	**301.4019**	**0.0707**	**0.0000**	**302.8874**

3.5 Building Construction - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.7203	4.5832	11.0575	0.0273	0.7756	0.1083	0.8839	0.2212	0.0997	0.3209	0.0000	2,320.8183	2,320.8183	0.0158	0.0000	2,321.1497
Worker	1.0824	1.5336	16.2694	0.0688	5.3883	0.0466	5.4349	1.4311	0.0432	1.4744	0.0000	4,148.7629	4,148.7629	0.1824	0.0000	4,152.5927
Total	**1.8026**	**6.1168**	**27.3269**	**0.0961**	**6.1639**	**0.1549**	**6.3188**	**1.6524**	**0.1429**	**1.7953**	**0.0000**	**6,469.5812**	**6,469.5812**	**0.1982**	**0.0000**	**6,473.7424**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1777	1.6195	2.0948	3.5000e-003		0.0685	0.0685		0.0645	0.0645	0.0000	301.4015	301.4015	0.0707	0.0000	302.8871
Total	**0.1777**	**1.6195**	**2.0948**	**3.5000e-003**		**0.0685**	**0.0685**		**0.0645**	**0.0645**	**0.0000**	**301.4015**	**301.4015**	**0.0707**	**0.0000**	**302.8871**

3.5 Building Construction - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.7203	4.5832	11.0575	0.0273	0.7756	0.1083	0.8839	0.2212	0.0997	0.3209	0.0000	2,320.8183	2,320.8183	0.0158	0.0000	2,321.1497
Worker	1.0824	1.5336	16.2694	0.0688	5.3883	0.0466	5.4349	1.4311	0.0432	1.4744	0.0000	4,148.7629	4,148.7629	0.1824	0.0000	4,152.5927
Total	**1.8026**	**6.1168**	**27.3269**	**0.0961**	**6.1639**	**0.1549**	**6.3188**	**1.6524**	**0.1429**	**1.7953**	**0.0000**	**6,469.5812**	**6,469.5812**	**0.1982**	**0.0000**	**6,473.7424**

3.5 Building Construction - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1777	1.6195	2.0948	3.5000e-003		0.0685	0.0685		0.0645	0.0645	0.0000	301.4019	301.4019	0.0707	0.0000	302.8874
Total	**0.1777**	**1.6195**	**2.0948**	**3.5000e-003**		**0.0685**	**0.0685**		**0.0645**	**0.0645**	**0.0000**	**301.4019**	**301.4019**	**0.0707**	**0.0000**	**302.8874**

3.5 Building Construction - 2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.7129	4.5460	10.9419	0.0273	0.7756	0.1086	0.8842	0.2213	0.0999	0.3212	0.0000	2,320.9919	2,320.9919	0.0158	0.0000	2,321.3241
Worker	1.0340	1.4647	15.5825	0.0688	5.3883	0.0467	5.4350	1.4311	0.0433	1.4745	0.0000	4,106.3645	4,106.3645	0.1774	0.0000	4,110.0895
Total	**1.7469**	**6.0107**	**26.5243**	**0.0961**	**6.1639**	**0.1553**	**6.3192**	**1.6524**	**0.1433**	**1.7956**	**0.0000**	**6,427.3564**	**6,427.3564**	**0.1932**	**0.0000**	**6,431.4136**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1777	1.6195	2.0948	3.5000e-003		0.0685	0.0685		0.0645	0.0645	0.0000	301.4015	301.4015	0.0707	0.0000	302.8871
Total	**0.1777**	**1.6195**	**2.0948**	**3.5000e-003**		**0.0685**	**0.0685**		**0.0645**	**0.0645**	**0.0000**	**301.4015**	**301.4015**	**0.0707**	**0.0000**	**302.8871**

3.5 Building Construction - 2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.7129	4.5460	10.9419	0.0273	0.7756	0.1086	0.8842	0.2213	0.0999	0.3212	0.0000	2,320.9919	2,320.9919	0.0158	0.0000	2,321.3241
Worker	1.0340	1.4647	15.5825	0.0688	5.3883	0.0467	5.4350	1.4311	0.0433	1.4745	0.0000	4,106.3645	4,106.3645	0.1774	0.0000	4,110.0895
Total	**1.7469**	**6.0107**	**26.5243**	**0.0961**	**6.1639**	**0.1553**	**6.3192**	**1.6524**	**0.1433**	**1.7956**	**0.0000**	**6,427.3564**	**6,427.3564**	**0.1932**	**0.0000**	**6,431.4136**

3.5 Building Construction - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1770	1.6133	2.0867	3.4900e-003		0.0683	0.0683		0.0642	0.0642	0.0000	300.2471	300.2471	0.0705	0.0000	301.7269
Total	**0.1770**	**1.6133**	**2.0867**	**3.4900e-003**		**0.0683**	**0.0683**		**0.0642**	**0.0642**	**0.0000**	**300.2471**	**300.2471**	**0.0705**	**0.0000**	**301.7269**

3.5 Building Construction - 2028

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.7010	4.4848	10.7937	0.0272	0.7727	0.1075	0.8802	0.2204	0.0989	0.3193	0.0000	2,312.1304	2,312.1304	0.0157	0.0000	2,312.4597
Worker	0.9863	1.3973	14.9271	0.0685	5.3677	0.0466	5.4143	1.4257	0.0433	1.4689	0.0000	4,054.1719	4,054.1719	0.1723	0.0000	4,057.7902
Total	**1.6873**	**5.8821**	**25.7207**	**0.0957**	**6.1403**	**0.1541**	**6.2945**	**1.6461**	**0.1422**	**1.7882**	**0.0000**	**6,366.3022**	**6,366.3022**	**0.1880**	**0.0000**	**6,370.2499**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1770	1.6133	2.0867	3.4900e-003		0.0683	0.0683		0.0642	0.0642	0.0000	300.2467	300.2467	0.0705	0.0000	301.7266
Total	**0.1770**	**1.6133**	**2.0867**	**3.4900e-003**		**0.0683**	**0.0683**		**0.0642**	**0.0642**	**0.0000**	**300.2467**	**300.2467**	**0.0705**	**0.0000**	**301.7266**

3.5 Building Construction - 2028

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.7010	4.4848	10.7937	0.0272	0.7727	0.1075	0.8802	0.2204	0.0989	0.3193	0.0000	2,312.1304	2,312.1304	0.0157	0.0000	2,312.4597
Worker	0.9863	1.3973	14.9271	0.0685	5.3677	0.0466	5.4143	1.4257	0.0433	1.4689	0.0000	4,054.1719	4,054.1719	0.1723	0.0000	4,057.7902
Total	**1.6873**	**5.8821**	**25.7207**	**0.0957**	**6.1403**	**0.1541**	**6.2945**	**1.6461**	**0.1422**	**1.7882**	**0.0000**	**6,366.3022**	**6,366.3022**	**0.1880**	**0.0000**	**6,370.2499**

3.5 Building Construction - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1777	1.6195	2.0948	3.5000e-003		0.0685	0.0685		0.0645	0.0645	0.0000	301.4019	301.4019	0.0707	0.0000	302.8874
Total	**0.1777**	**1.6195**	**2.0948**	**3.5000e-003**		**0.0685**	**0.0685**		**0.0645**	**0.0645**	**0.0000**	**301.4019**	**301.4019**	**0.0707**	**0.0000**	**302.8874**

3.5 Building Construction - 2029

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.6956	4.4797	10.7135	0.0273	0.7757	0.1081	0.8837	0.2213	0.0994	0.3207	0.0000	2,321.1073	2,321.1073	0.0158	0.0000	2,321.4383
Worker	0.9457	1.3407	14.3859	0.0688	5.3883	0.0468	5.4351	1.4311	0.0435	1.4746	0.0000	4,037.8845	4,037.8845	0.1686	0.0000	4,041.4250
Total	**1.6413**	**5.8204**	**25.0993**	**0.0961**	**6.1640**	**0.1549**	**6.3189**	**1.6524**	**0.1429**	**1.7953**	**0.0000**	**6,358.9917**	**6,358.9917**	**0.1844**	**0.0000**	**6,362.8633**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1777	1.6195	2.0948	3.5000e-003		0.0685	0.0685		0.0645	0.0645	0.0000	301.4015	301.4015	0.0707	0.0000	302.8871
Total	**0.1777**	**1.6195**	**2.0948**	**3.5000e-003**		**0.0685**	**0.0685**		**0.0645**	**0.0645**	**0.0000**	**301.4015**	**301.4015**	**0.0707**	**0.0000**	**302.8871**

3.5 Building Construction - 2029

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.6956	4.4797	10.7135	0.0273	0.7757	0.1081	0.8837	0.2213	0.0994	0.3207	0.0000	2,321.1073	2,321.1073	0.0158	0.0000	2,321.4383
Worker	0.9457	1.3407	14.3859	0.0688	5.3883	0.0468	5.4351	1.4311	0.0435	1.4746	0.0000	4,037.8845	4,037.8845	0.1686	0.0000	4,041.4250
Total	**1.6413**	**5.8204**	**25.0993**	**0.0961**	**6.1640**	**0.1549**	**6.3189**	**1.6524**	**0.1429**	**1.7953**	**0.0000**	**6,358.9917**	**6,358.9917**	**0.1844**	**0.0000**	**6,362.8633**

3.5 Building Construction - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1702	1.0333	2.1051	4.0200e-003		0.0193	0.0193		0.0193	0.0193	0.0000	341.5281	341.5281	0.0137	0.0000	341.8160
Total	**0.1702**	**1.0333**	**2.1051**	**4.0200e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**341.5281**	**341.5281**	**0.0137**	**0.0000**	**341.8160**

3.5 Building Construction - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.6882	4.4601	10.6344	0.0273	0.7757	0.1082	0.8839	0.2213	0.0996	0.3209	0.0000	2,321.1325	2,321.1325	0.0158	0.0000	2,321.4639
Worker	0.9032	1.2816	13.8519	0.0688	5.3883	0.0468	5.4351	1.4311	0.0434	1.4745	0.0000	4,010.3669	4,010.3669	0.1645	0.0000	4,013.8209
Total	**1.5915**	**5.7417**	**24.4864**	**0.0961**	**6.1640**	**0.1550**	**6.3190**	**1.6524**	**0.1430**	**1.7954**	**0.0000**	**6,331.4994**	**6,331.4994**	**0.1803**	**0.0000**	**6,335.2848**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1702	1.0333	2.1051	4.0200e-003		0.0193	0.0193		0.0193	0.0193	0.0000	341.5277	341.5277	0.0137	0.0000	341.8156
Total	**0.1702**	**1.0333**	**2.1051**	**4.0200e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**341.5277**	**341.5277**	**0.0137**	**0.0000**	**341.8156**

3.5 Building Construction - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.6882	4.4601	10.6344	0.0273	0.7757	0.1082	0.8839	0.2213	0.0996	0.3209	0.0000	2,321.1325	2,321.1325	0.0158	0.0000	2,321.4639
Worker	0.9032	1.2816	13.8519	0.0688	5.3883	0.0468	5.4351	1.4311	0.0434	1.4745	0.0000	4,010.3669	4,010.3669	0.1645	0.0000	4,013.8209
Total	**1.5915**	**5.7417**	**24.4864**	**0.0961**	**6.1640**	**0.1550**	**6.3190**	**1.6524**	**0.1430**	**1.7954**	**0.0000**	**6,331.4994**	**6,331.4994**	**0.1803**	**0.0000**	**6,335.2848**

3.5 Building Construction - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1702	1.0333	2.1051	4.0200e-003		0.0193	0.0193		0.0193	0.0193	0.0000	341.5281	341.5281	0.0137	0.0000	341.8160
Total	**0.1702**	**1.0333**	**2.1051**	**4.0200e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**341.5281**	**341.5281**	**0.0137**	**0.0000**	**341.8160**

3.5 Building Construction - 2031

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.6852	4.4464	10.5795	0.0273	0.7757	0.1078	0.8834	0.2213	0.0991	0.3204	0.0000	2,322.3659	2,322.3659	0.0159	0.0000	2,322.6992
Worker	0.8620	1.2254	13.3737	0.0689	5.3883	0.0468	5.4351	1.4311	0.0434	1.4746	0.0000	3,994.3673	3,994.3673	0.1612	0.0000	3,997.7532
Total	**1.5473**	**5.6718**	**23.9531**	**0.0962**	**6.1640**	**0.1546**	**6.3185**	**1.6524**	**0.1426**	**1.7950**	**0.0000**	**6,316.7332**	**6,316.7332**	**0.1771**	**0.0000**	**6,320.4524**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1702	1.0333	2.1051	4.0200e-003		0.0193	0.0193		0.0193	0.0193	0.0000	341.5277	341.5277	0.0137	0.0000	341.8156
Total	**0.1702**	**1.0333**	**2.1051**	**4.0200e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**341.5277**	**341.5277**	**0.0137**	**0.0000**	**341.8156**

3.5 Building Construction - 2031

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.6852	4.4464	10.5795	0.0273	0.7757	0.1078	0.8834	0.2213	0.0991	0.3204	0.0000	2,322.3659	2,322.3659	0.0159	0.0000	2,322.6992
Worker	0.8620	1.2254	13.3737	0.0689	5.3883	0.0468	5.4351	1.4311	0.0434	1.4746	0.0000	3,994.3673	3,994.3673	0.1612	0.0000	3,997.7532
Total	**1.5473**	**5.6718**	**23.9531**	**0.0962**	**6.1640**	**0.1546**	**6.3185**	**1.6524**	**0.1426**	**1.7950**	**0.0000**	**6,316.7332**	**6,316.7332**	**0.1771**	**0.0000**	**6,320.4524**

3.5 Building Construction - 2032

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1206	0.7324	1.4922	2.8500e-003		0.0137	0.0137		0.0137	0.0137	0.0000	242.0793	242.0793	9.7200e-003	0.0000	242.2834
Total	**0.1206**	**0.7324**	**1.4922**	**2.8500e-003**		**0.0137**	**0.0137**		**0.0137**	**0.0137**	**0.0000**	**242.0793**	**242.0793**	**9.7200e-003**	**0.0000**	**242.2834**

3.5 Building Construction - 2032

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.4831	3.1420	7.4742	0.0194	0.5498	0.0765	0.6263	0.1568	0.0704	0.2272	0.0000	1,646.1805	1,646.1805	0.0113	0.0000	1,646.4171
Worker	0.5796	0.8331	9.1716	0.0488	3.8193	0.0331	3.8524	1.0144	0.0307	1.0451	0.0000	2,817.1028	2,817.1028	0.1118	0.0000	2,819.4512
Total	**1.0627**	**3.9751**	**16.6458**	**0.0682**	**4.3691**	**0.1096**	**4.4787**	**1.1712**	**0.1011**	**1.2723**	**0.0000**	**4,463.2834**	**4,463.2834**	**0.1231**	**0.0000**	**4,465.8683**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1206	0.7324	1.4922	2.8500e-003		0.0137	0.0137		0.0137	0.0137	0.0000	242.0790	242.0790	9.7200e-003	0.0000	242.2831
Total	**0.1206**	**0.7324**	**1.4922**	**2.8500e-003**		**0.0137**	**0.0137**		**0.0137**	**0.0137**	**0.0000**	**242.0790**	**242.0790**	**9.7200e-003**	**0.0000**	**242.2831**

3.5 Building Construction - 2032

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.4831	3.1420	7.4742	0.0194	0.5498	0.0765	0.6263	0.1568	0.0704	0.2272	0.0000	1,646.1805	1,646.1805	0.0113	0.0000	1,646.4171
Worker	0.5796	0.8331	9.1716	0.0488	3.8193	0.0331	3.8524	1.0144	0.0307	1.0451	0.0000	2,817.1028	2,817.1028	0.1118	0.0000	2,819.4512
Total	**1.0627**	**3.9751**	**16.6458**	**0.0682**	**4.3691**	**0.1096**	**4.4787**	**1.1712**	**0.1011**	**1.2723**	**0.0000**	**4,463.2834**	**4,463.2834**	**0.1231**	**0.0000**	**4,465.8683**

3.6 Paving - 2032

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0522	0.2687	0.5975	1.0600e-003		0.0125	0.0125		0.0125	0.0125	0.0000	90.8087	90.8087	4.2600e-003	0.0000	90.8981
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0522**	**0.2687**	**0.5975**	**1.0600e-003**		**0.0125**	**0.0125**		**0.0125**	**0.0125**	**0.0000**	**90.8087**	**90.8087**	**4.2600e-003**	**0.0000**	**90.8981**

3.6 Paving - 2032

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.6000e-004	1.3800e-003	0.0152	8.0000e-005	6.3300e-003	5.0000e-005	6.3800e-003	1.6800e-003	5.0000e-005	1.7300e-003	0.0000	4.6677	4.6677	1.9000e-004	0.0000	4.6716
Total	**9.6000e-004**	**1.3800e-003**	**0.0152**	**8.0000e-005**	**6.3300e-003**	**5.0000e-005**	**6.3800e-003**	**1.6800e-003**	**5.0000e-005**	**1.7300e-003**	**0.0000**	**4.6677**	**4.6677**	**1.9000e-004**	**0.0000**	**4.6716**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0522	0.2687	0.5975	1.0600e-003		0.0125	0.0125		0.0125	0.0125	0.0000	90.8086	90.8086	4.2600e-003	0.0000	90.8980
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0522**	**0.2687**	**0.5975**	**1.0600e-003**		**0.0125**	**0.0125**		**0.0125**	**0.0125**	**0.0000**	**90.8086**	**90.8086**	**4.2600e-003**	**0.0000**	**90.8980**

3.6 Paving - 2032

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.6000e-004	1.3800e-003	0.0152	8.0000e-005	6.3300e-003	5.0000e-005	6.3800e-003	1.6800e-003	5.0000e-005	1.7300e-003	0.0000	4.6677	4.6677	1.9000e-004	0.0000	4.6716
Total	**9.6000e-004**	**1.3800e-003**	**0.0152**	**8.0000e-005**	**6.3300e-003**	**5.0000e-005**	**6.3800e-003**	**1.6800e-003**	**5.0000e-005**	**1.7300e-003**	**0.0000**	**4.6677**	**4.6677**	**1.9000e-004**	**0.0000**	**4.6716**

3.6 Paving - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0833	0.4293	0.9544	1.6900e-003		0.0199	0.0199		0.0199	0.0199	0.0000	145.0581	145.0581	6.8000e-003	0.0000	145.2009
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0833**	**0.4293**	**0.9544**	**1.6900e-003**		**0.0199**	**0.0199**		**0.0199**	**0.0199**	**0.0000**	**145.0581**	**145.0581**	**6.8000e-003**	**0.0000**	**145.2009**

3.6 Paving - 2033

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4600e-003	2.1300e-003	0.0236	1.3000e-004	0.0101	9.0000e-005	0.0102	2.6800e-003	8.0000e-005	2.7700e-003	0.0000	7.4249	7.4249	2.9000e-004	0.0000	7.4310
Total	**1.4600e-003**	**2.1300e-003**	**0.0236**	**1.3000e-004**	**0.0101**	**9.0000e-005**	**0.0102**	**2.6800e-003**	**8.0000e-005**	**2.7700e-003**	**0.0000**	**7.4249**	**7.4249**	**2.9000e-004**	**0.0000**	**7.4310**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0833	0.4293	0.9544	1.6900e-003		0.0199	0.0199		0.0199	0.0199	0.0000	145.0579	145.0579	6.8000e-003	0.0000	145.2007
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0833**	**0.4293**	**0.9544**	**1.6900e-003**		**0.0199**	**0.0199**		**0.0199**	**0.0199**	**0.0000**	**145.0579**	**145.0579**	**6.8000e-003**	**0.0000**	**145.2007**

3.6 Paving - 2033

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4600e-003	2.1300e-003	0.0236	1.3000e-004	0.0101	9.0000e-005	0.0102	2.6800e-003	8.0000e-005	2.7700e-003	0.0000	7.4249	7.4249	2.9000e-004	0.0000	7.4310
Total	**1.4600e-003**	**2.1300e-003**	**0.0236**	**1.3000e-004**	**0.0101**	**9.0000e-005**	**0.0102**	**2.6800e-003**	**8.0000e-005**	**2.7700e-003**	**0.0000**	**7.4249**	**7.4249**	**2.9000e-004**	**0.0000**	**7.4310**

3.7 Architectural Coating - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	16.5092					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.9600e-003	0.0587	0.1232	2.0000e-004		1.3900e-003	1.3900e-003		1.3900e-003	1.3900e-003	0.0000	17.4898	17.4898	7.1000e-004	0.0000	17.5047
Total	**16.5181**	**0.0587**	**0.1232**	**2.0000e-004**		**1.3900e-003**	**1.3900e-003**		**1.3900e-003**	**1.3900e-003**	**0.0000**	**17.4898**	**17.4898**	**7.1000e-004**	**0.0000**	**17.5047**

3.7 Architectural Coating - 2033

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0820	0.1190	1.3215	7.2400e-003	0.5660	4.8800e-003	0.5709	0.1503	4.5300e-003	0.1549	0.0000	415.7051	415.7051	0.0163	0.0000	416.0464
Total	**0.0820**	**0.1190**	**1.3215**	**7.2400e-003**	**0.5660**	**4.8800e-003**	**0.5709**	**0.1503**	**4.5300e-003**	**0.1549**	**0.0000**	**415.7051**	**415.7051**	**0.0163**	**0.0000**	**416.0464**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	16.5092					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.9600e-003	0.0587	0.1232	2.0000e-004		1.3900e-003	1.3900e-003		1.3900e-003	1.3900e-003	0.0000	17.4898	17.4898	7.1000e-004	0.0000	17.5046
Total	**16.5181**	**0.0587**	**0.1232**	**2.0000e-004**		**1.3900e-003**	**1.3900e-003**		**1.3900e-003**	**1.3900e-003**	**0.0000**	**17.4898**	**17.4898**	**7.1000e-004**	**0.0000**	**17.5046**

3.7 Architectural Coating - 2033

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0820	0.1190	1.3215	7.2400e-003	0.5660	4.8800e-003	0.5709	0.1503	4.5300e-003	0.1549	0.0000	415.7051	415.7051	0.0163	0.0000	416.0464
Total	**0.0820**	**0.1190**	**1.3215**	**7.2400e-003**	**0.5660**	**4.8800e-003**	**0.5709**	**0.1503**	**4.5300e-003**	**0.1549**	**0.0000**	**415.7051**	**415.7051**	**0.0163**	**0.0000**	**416.0464**

3.7 Architectural Coating - 2034

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	30.4877					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0165	0.1083	0.2274	3.8000e-004		2.5700e-003	2.5700e-003		2.5700e-003	2.5700e-003	0.0000	32.2987	32.2987	1.3100e-003	0.0000	32.3261
Total	**30.5043**	**0.1083**	**0.2274**	**3.8000e-004**		**2.5700e-003**	**2.5700e-003**		**2.5700e-003**	**2.5700e-003**	**0.0000**	**32.2987**	**32.2987**	**1.3100e-003**	**0.0000**	**32.3261**

3.7 Architectural Coating - 2034

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1449	0.2130	2.3721	0.0134	1.0452	8.9700e-003	1.0542	0.2776	8.3300e-003	0.2859	0.0000	764.9170	764.9170	0.0295	0.0000	765.5356
Total	**0.1449**	**0.2130**	**2.3721**	**0.0134**	**1.0452**	**8.9700e-003**	**1.0542**	**0.2776**	**8.3300e-003**	**0.2859**	**0.0000**	**764.9170**	**764.9170**	**0.0295**	**0.0000**	**765.5356**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	30.4877					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0165	0.1083	0.2274	3.8000e-004		2.5700e-003	2.5700e-003		2.5700e-003	2.5700e-003	0.0000	32.2986	32.2986	1.3100e-003	0.0000	32.3261
Total	**30.5043**	**0.1083**	**0.2274**	**3.8000e-004**		**2.5700e-003**	**2.5700e-003**		**2.5700e-003**	**2.5700e-003**	**0.0000**	**32.2986**	**32.2986**	**1.3100e-003**	**0.0000**	**32.3261**

3.7 Architectural Coating - 2034

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1449	0.2130	2.3721	0.0134	1.0452	8.9700e-003	1.0542	0.2776	8.3300e-003	0.2859	0.0000	764.9170	764.9170	0.0295	0.0000	765.5356
Total	**0.1449**	**0.2130**	**2.3721**	**0.0134**	**1.0452**	**8.9700e-003**	**1.0542**	**0.2776**	**8.3300e-003**	**0.2859**	**0.0000**	**764.9170**	**764.9170**	**0.0295**	**0.0000**	**765.5356**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

Increase Diversity

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	34.0335	72.0909	339.2678	1.2215	75.8714	1.8044	77.6758	20.3457	1.6653	22.0110	0.0000	79,676.1425	79,676.1425	2.1784	0.0000	79,721.8891
Unmitigated	37.4620	94.1154	415.6377	1.7432	109.8691	2.5118	112.3809	29.4625	2.3179	31.7804	0.0000	113,703.9847	113,703.9847	3.0549	0.0000	113,768.1376

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	18,241.12	19,818.88	16801.76	62,400,240	43,091,231
General Office Building	3,936.30	847.32	350.37	9,608,775	6,635,454
Office Park	4,213.98	605.16	280.44	10,597,138	7,317,980
Single Family Housing	29,226.78	30,784.32	26783.58	99,440,000	68,669,479
Strip Mall	61,339.32	58,183.78	28275.32	106,859,458	73,793,074
Total	116,957.50	110,239.46	72,491.47	288,905,610	199,507,218

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
General Office Building	16.60	8.40	6.90	33.00	48.00	19.00	77	19	4
Office Park	16.60	8.40	6.90	33.00	48.00	19.00	82	15	3
Single Family Housing	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Strip Mall	16.60	8.40	6.90	16.60	64.40	19.00	45	40	15

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.491908	0.059855	0.185077	0.131229	0.044940	0.007356	0.019164	0.046757	0.003019	0.003347	0.004084	0.000506	0.002760

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	18,238.4733	18,238.4733	0.8384	0.1735	18,309.8499
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	18,238.4733	18,238.4733	0.8384	0.1735	18,309.8499
NaturalGas Mitigated	0.7655	6.5584	2.9056	0.0418		0.5289	0.5289		0.5289	0.5289	0.0000	7,576.1433	7,576.1433	0.1452	0.1389	7,622.2504
NaturalGas Unmitigated	0.7655	6.5584	2.9056	0.0418		0.5289	0.5289		0.5289	0.5289	0.0000	7,576.1433	7,576.1433	0.1452	0.1389	7,622.2504

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Office Building	1.30495e+006	7.0400e-003	0.0640	0.0537	3.8000e-004		4.8600e-003	4.8600e-003		4.8600e-003	4.8600e-003	0.0000	69.6372	69.6372	1.3300e-003	1.2800e-003	70.0610
Office Park	1.13283e+006	6.1100e-003	0.0555	0.0467	3.3000e-004		4.2200e-003	4.2200e-003		4.2200e-003	4.2200e-003	0.0000	60.4521	60.4521	1.1600e-003	1.1100e-003	60.8200
Single Family Housing	1.03124e+008	0.5561	4.7518	2.0220	0.0303		0.3842	0.3842		0.3842	0.3842	0.0000	5,503.0986	5,503.0986	0.1055	0.1009	5,536.5896
Strip Mall	3.21091e+006	0.0173	0.1574	0.1322	9.4000e-004		0.0120	0.0120		0.0120	0.0120	0.0000	171.3463	171.3463	3.2800e-003	3.1400e-003	172.3891
Apartments Mid Rise	3.31987e+007	0.1790	1.5297	0.6510	9.7600e-003		0.1237	0.1237		0.1237	0.1237	0.0000	1,771.6091	1,771.6091	0.0340	0.0325	1,782.3908
Total		**0.7655**	**6.5584**	**2.9056**	**0.0417**		**0.5289**	**0.5289**		**0.5289**	**0.5289**	**0.0000**	**7,576.1433**	**7,576.1433**	**0.1452**	**0.1389**	**7,622.2504**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Office Park	1.13283e+006	6.1100e-003	0.0555	0.0467	3.3000e-004		4.2200e-003	4.2200e-003		4.2200e-003	4.2200e-003	0.0000	60.4521	60.4521	1.1600e-003	1.1100e-003	60.8200
Single Family Housing	1.03124e+008	0.5561	4.7518	2.0220	0.0303		0.3842	0.3842		0.3842	0.3842	0.0000	5,503.0986	5,503.0986	0.1055	0.1009	5,536.5896
Strip Mall	3.21091e+006	0.0173	0.1574	0.1322	9.4000e-004		0.0120	0.0120		0.0120	0.0120	0.0000	171.3463	171.3463	3.2800e-003	3.1400e-003	172.3891
Apartments Mid Rise	3.31987e+007	0.1790	1.5297	0.6510	9.7600e-003		0.1237	0.1237		0.1237	0.1237	0.0000	1,771.6091	1,771.6091	0.0340	0.0325	1,782.3908
General Office Building	1.30495e+006	7.0400e-003	0.0640	0.0537	3.8000e-004		4.8600e-003	4.8600e-003		4.8600e-003	4.8600e-003	0.0000	69.6372	69.6372	1.3300e-003	1.2800e-003	70.0610
Total		**0.7655**	**6.5584**	**2.9056**	**0.0417**		**0.5289**	**0.5289**		**0.5289**	**0.5289**	**0.0000**	**7,576.1433**	**7,576.1433**	**0.1452**	**0.1389**	**7,622.2504**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	1.06702e+007	3,053.4571	0.1404	0.0290	3,065.4069
General Office Building	3.8219e+006	1,093.7011	0.0503	0.0104	1,097.9813
Office Park	4.11435e+006	1,177.3908	0.0541	0.0112	1,181.9985
Single Family Housing	2.34536e+007	6,711.6497	0.3085	0.0638	6,737.9158
Strip Mall	2.16736e+007	6,202.2747	0.2851	0.0590	6,226.5474
Total		**18,238.4733**	**0.8384**	**0.1735**	**18,309.8499**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	1.06702e+007	3,053.4571	0.1404	0.0290	3,065.4069
General Office Building	3.8219e+006	1,093.7011	0.0503	0.0104	1,097.9813
Office Park	4.11435e+006	1,177.3908	0.0541	0.0112	1,181.9985
Single Family Housing	2.34536e+007	6,711.6497	0.3085	0.0638	6,737.9158
Strip Mall	2.16736e+007	6,202.2747	0.2851	0.0590	6,226.5474
Total		**18,238.4733**	**0.8384**	**0.1735**	**18,309.8499**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	43.9837	0.6905	59.8560	3.1700e-003		0.3331	0.3331		0.3331	0.3331	0.0000	98.1272	98.1272	0.0935	0.0000	100.0906
Unmitigated	63.7871	1.1743	96.4358	0.0614		5.8922	5.8922		5.8913	5.8913	618.4074	1,286.4938	1,904.9012	1.9377	0.0420	1,958.6047

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	5.4334					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	37.4927					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	19.0697	0.4838	36.5798	0.0582		5.5592	5.5592		5.5583	5.5583	618.4074	1,188.3667	1,806.7741	1.8442	0.0420	1,858.5142
Landscaping	1.7913	0.6905	59.8560	3.1700e-003		0.3331	0.3331		0.3331	0.3331	0.0000	98.1272	98.1272	0.0935	0.0000	100.0906
Total	**63.7871**	**1.1743**	**96.4358**	**0.0614**		**5.8922**	**5.8922**		**5.8913**	**5.8913**	**618.4074**	**1,286.4938**	**1,904.9012**	**1.9377**	**0.0420**	**1,958.6047**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	4.6997					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	37.4927					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.7913	0.6905	59.8560	3.1700e-003		0.3331	0.3331		0.3331	0.3331	0.0000	98.1272	98.1272	0.0935	0.0000	100.0906
Total	**43.9837**	**0.6905**	**59.8560**	**3.1700e-003**		**0.3331**	**0.3331**		**0.3331**	**0.3331**	**0.0000**	**98.1272**	**98.1272**	**0.0935**	**0.0000**	**100.0906**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	3,682.1085	20.0652	0.5025	4,259.2548
Unmitigated	3,682.1085	20.0688	0.5033	4,259.5640

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	180.346 / 113.697	1,090.6956	5.9241	0.1486	1,261.1638
General Office Building	63.5434 / 38.9459	380.7547	2.0871	0.0523	440.8038
Office Park	65.5838 / 40.1965	392.9808	2.1542	0.0540	454.9580
Single Family Housing	198.98 / 125.444	1,203.3903	6.5362	0.1639	1,391.4719
Strip Mall	102.517 / 62.8331	614.2871	3.3673	0.0844	711.1667
Total		**3,682.1085**	**20.0688**	**0.5033**	**4,259.5640**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	180.346 / 113.697	1,090.6956	5.9230	0.1484	1,261.0725
General Office Building	63.5434 / 38.9459	380.7547	2.0868	0.0522	440.7716
Office Park	65.5838 / 40.1965	392.9808	2.1538	0.0539	454.9248
Single Family Housing	198.98 / 125.444	1,203.3903	6.5350	0.1637	1,391.3712
Strip Mall	102.517 / 62.8331	614.2871	3.3667	0.0843	711.1148
Total		**3,682.1085**	**20.0652**	**0.5025**	**4,259.2548**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	708.7521	41.8861	0.0000	1,588.3591
Unmitigated	1,417.5042	83.7721	0.0000	3,176.7182

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	1273.28	258.4643	15.2748	0.0000	579.2352
General Office Building	332.49	67.4925	3.9887	0.0000	151.2550
Office Park	343.17	69.6604	4.1168	0.0000	156.1135
Single Family Housing	3580.94	726.8985	42.9585	0.0000	1,629.0263
Strip Mall	1453.21	294.9885	17.4333	0.0000	661.0882
Total		**1,417.5042**	**83.7721**	**0.0000**	**3,176.7182**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	636.64	129.2322	7.6374	0.0000	289.6176
General Office Building	166.245	33.7462	1.9944	0.0000	75.6275
Office Park	171.585	34.8302	2.0584	0.0000	78.0567
Single Family Housing	1790.47	363.4492	21.4792	0.0000	814.5132
Strip Mall	726.605	147.4943	8.7167	0.0000	330.5441
Total		**708.7521**	**41.8861**	**0.0000**	**1,588.3591**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

Chino Hills General Plan Update

Los Angeles-South Coast County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	357.52	1000sqft	8.21	357,521.00	0
Office Park	369.00	1000sqft	8.47	369,000.00	0
Apartments Mid Rise	2,768.00	Dwelling Unit	72.84	2,768,000.00	7916
Single Family Housing	3,054.00	Dwelling Unit	991.56	5,497,200.00	8734
Strip Mall	1,384.01	1000sqft	31.77	1,384,012.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	10			**Operational Year**	2035
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	630.89	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - GP update involves 2,768 multi-family units, 3,054 single-family units, 33,087 sf of mixed use (strip mall), 1,350,925 sf of commercial (strip mall), 369,000 sf of business park (office park), 357,521 sf of institutional/public facility (general office).

Construction Phase - Estimated 20 year construction schedule

Architectural Coating - Per SCAQMD Rule 1113

Construction Off-road Equipment Mitigation -

Mobile Land Use Mitigation -

Waste Mitigation -

Area Coating - Per SCAQMD Rule 1113

Area Mitigation - Per SCAQMD Rule 1113

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	150.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	150.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	150
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	250	150
tblConstructionPhase	NumDays	11,000.00	390.00
tblConstructionPhase	NumDays	155,000.00	4,000.00
tblConstructionPhase	NumDays	10,000.00	200.00
tblConstructionPhase	NumDays	15,500.00	300.00
tblConstructionPhase	NumDays	11,000.00	200.00
tblConstructionPhase	NumDays	6,000.00	120.00
tblGrading	AcresOfGrading	750.00	38,750.00
tblLandUse	LandUseSquareFeet	357,520.00	357,521.00
tblLandUse	LandUseSquareFeet	1,384,010.00	1,384,012.00
tblProjectCharacteristics	OperationalYear	2014	2035

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	5.3497	57.0013	44.0081	0.0421	18.2675	3.0903	21.3578	9.9840	2.8431	12.8271	0.0000	4,340.6002	4,340.6002	1.2406	0.0000	4,366.6526
2016	6.5685	74.9259	50.5248	0.0646	143.2269	3.5864	146.8133	18.1603	3.2995	21.4597	0.0000	6,660.7850	6,660.7850	1.9484	0.0000	6,701.7007
2017	25.6415	122.7308	347.3530	0.7870	143.2269	3.3425	146.5462	18.1603	3.1098	21.2140	0.0000	68,193.2231	68,193.2231	3.1310	0.0000	68,258.9750
2018	23.2716	111.5985	320.9872	0.7865	48.1575	2.9752	51.1327	12.8886	2.7690	15.6575	0.0000	66,185.6526	66,185.6526	2.9534	0.0000	66,247.6740
2019	21.4959	102.3671	299.7912	0.7834	48.1585	2.7018	50.8603	12.8890	2.5141	15.4031	0.0000	64,050.7650	64,050.7650	2.7979	0.0000	64,109.5207
2020	20.1895	91.1504	283.5121	0.7832	48.1597	2.4346	50.5943	12.8894	2.2650	15.1544	0.0000	61,906.0174	61,906.0174	2.6809	0.0000	61,962.3155
2021	19.1243	79.8667	269.7065	0.7841	48.1598	2.1892	50.3491	12.8895	2.0361	14.9255	0.0000	61,272.2988	61,272.2988	2.5917	0.0000	61,326.7245
2022	18.2074	72.6962	257.0512	0.7838	48.1599	2.0287	50.1887	12.8895	1.8860	14.7755	0.0000	60,609.6513	60,609.6513	2.5118	0.0000	60,662.3982
2023	17.0613	61.7192	244.1578	0.7827	48.1600	1.9072	50.0673	12.8895	1.7720	14.6615	0.0000	59,923.2299	59,923.2299	2.4221	0.0000	59,974.0938
2024	16.3837	59.9168	234.9657	0.7870	48.1601	1.8252	49.9852	12.8895	1.6946	14.5841	0.0000	59,692.1482	59,692.1482	2.3760	0.0000	59,742.0438
2025	15.7506	58.1232	226.7320	0.7869	48.1602	1.7441	49.9043	12.8895	1.6182	14.5077	0.0000	59,210.5272	59,210.5272	2.3202	0.0000	59,259.2505
2026	15.1743	56.5811	219.2347	0.7868	48.1603	1.7093	49.8696	12.8896	1.5863	14.4758	0.0000	58,782.1220	58,782.1220	2.2691	0.0000	58,829.7720
2027	14.7422	55.8504	213.0380	0.7868	48.1605	1.7123	49.8728	12.8896	1.5890	14.4787	0.0000	58,411.7556	58,411.7556	2.2272	0.0000	58,458.5266
2028	14.3292	55.1167	207.5770	0.7868	48.1608	1.7078	49.8686	12.8897	1.5849	14.4746	0.0000	58,091.1335	58,091.1335	2.1893	0.0000	58,137.1079
2029	13.9206	54.5399	202.0551	0.7868	48.1610	1.7092	49.8702	12.8898	1.5861	14.4760	0.0000	57,812.6758	57,812.6758	2.1525	0.0000	57,857.8790

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2030	13.4702	49.5103	197.3513	0.7907	48.1611	1.3326	49.4937	12.8898	1.2406	14.1304	0.0000	57,911.0452	57,911.0452	1.6362	0.0000	57,945.4046
2031	13.1209	49.0347	193.1767	0.7919	48.1608	1.3292	49.4900	12.8897	1.2375	14.1272	0.0000	57,782.7736	57,782.7736	1.6095	0.0000	57,816.5736
2032	12.7440	48.6007	189.4648	0.7919	48.1607	1.3294	49.4901	12.8897	1.2376	14.1273	0.0000	57,608.7481	57,608.7481	1.5804	0.0000	57,641.9369
2033	242.3715	7.0105	22.3770	0.1132	8.4279	0.3248	8.5195	2.2351	0.3247	2.3216	0.0000	7,263.3019	7,263.3019	0.2730	0.0000	7,269.0345
2034	242.3179	2.3411	21.8123	0.1132	8.4279	0.0912	8.5192	2.2351	0.0861	2.3213	0.0000	7,238.2641	7,238.2641	0.2681	0.0000	7,243.8942
Total	**771.2346**	**1,270.6813**	**4,044.8765**	**12.9193**	**1,043.9783**	**39.0709**	**1,082.7926**	**244.1173**	**36.2800**	**280.1029**	**0.0000**	**992,946.7185**	**992,946.7185**	**41.1791**	**0.0000**	**993,811.4786**

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	5.3497	57.0013	44.0081	0.0421	8.3310	3.0903	11.4213	4.5222	2.8431	7.3652	0.0000	4,340.6002	4,340.6002	1.2406	0.0000	4,366.6526
2016	6.5685	74.9259	50.5248	0.0646	64.5751	3.5864	68.1614	8.2047	3.2995	11.5042	0.0000	6,660.7850	6,660.7850	1.9484	0.0000	6,701.7007
2017	25.6415	122.7308	347.3530	0.7870	64.5751	3.3425	67.8943	12.8883	3.1098	15.9981	0.0000	68,193.2231	68,193.2231	3.1310	0.0000	68,258.9750
2018	23.2716	111.5985	320.9872	0.7865	48.1575	2.9752	51.1327	12.8886	2.7690	15.6575	0.0000	66,185.6526	66,185.6526	2.9534	0.0000	66,247.6740
2019	21.4959	102.3671	299.7912	0.7834	48.1585	2.7018	50.8603	12.8890	2.5141	15.4031	0.0000	64,050.7650	64,050.7650	2.7979	0.0000	64,109.5207
2020	20.1895	91.1504	283.5121	0.7832	48.1597	2.4346	50.5943	12.8894	2.2650	15.1544	0.0000	61,906.0174	61,906.0174	2.6809	0.0000	61,962.3155
2021	19.1243	79.8667	269.7065	0.7841	48.1598	2.1892	50.3491	12.8895	2.0361	14.9255	0.0000	61,272.2988	61,272.2988	2.5917	0.0000	61,326.7245

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	18.2074	72.6962	257.0512	0.7838	48.1599	2.0287	50.1887	12.8895	1.8860	14.7755	0.0000	60,609.6513	60,609.6513	2.5118	0.0000	60,662.3982
2023	17.0613	61.7192	244.1578	0.7827	48.1600	1.9072	50.0673	12.8895	1.7720	14.6615	0.0000	59,923.2299	59,923.2299	2.4221	0.0000	59,974.0938
2024	16.3837	59.9168	234.9657	0.7870	48.1601	1.8252	49.9852	12.8895	1.6946	14.5841	0.0000	59,692.1482	59,692.1482	2.3760	0.0000	59,742.0438
2025	15.7506	58.1232	226.7320	0.7869	48.1602	1.7441	49.9043	12.8895	1.6182	14.5077	0.0000	59,210.5272	59,210.5272	2.3202	0.0000	59,259.2505
2026	15.1743	56.5811	219.2347	0.7868	48.1603	1.7093	49.8696	12.8896	1.5863	14.4758	0.0000	58,782.1220	58,782.1220	2.2691	0.0000	58,829.7720
2027	14.7422	55.8504	213.0380	0.7868	48.1605	1.7123	49.8728	12.8896	1.5890	14.4787	0.0000	58,411.7556	58,411.7556	2.2272	0.0000	58,458.5266
2028	14.3292	55.1167	207.5770	0.7868	48.1608	1.7078	49.8686	12.8897	1.5849	14.4746	0.0000	58,091.1335	58,091.1335	2.1893	0.0000	58,137.1079
2029	13.9206	54.5399	202.0551	0.7868	48.1610	1.7092	49.8702	12.8898	1.5861	14.4760	0.0000	57,812.6758	57,812.6758	2.1525	0.0000	57,857.8790
2030	13.4702	49.5103	197.3513	0.7907	48.1611	1.3326	49.4937	12.8898	1.2406	14.1304	0.0000	57,911.0452	57,911.0452	1.6362	0.0000	57,945.4046
2031	13.1209	49.0347	193.1767	0.7919	48.1608	1.3292	49.4900	12.8897	1.2375	14.1272	0.0000	57,782.7736	57,782.7736	1.6095	0.0000	57,816.5736
2032	12.7440	48.6007	189.4648	0.7919	48.1607	1.3294	49.4901	12.8897	1.2376	14.1273	0.0000	57,608.7481	57,608.7481	1.5804	0.0000	57,641.9369
2033	242.3715	7.0105	22.3770	0.1132	8.4279	0.3248	8.5195	2.2351	0.3247	2.3216	0.0000	7,263.3019	7,263.3019	0.2730	0.0000	7,269.0345
2034	242.3179	2.3411	21.8123	0.1132	8.4279	0.0912	8.5192	2.2351	0.0861	2.3213	0.0000	7,238.2641	7,238.2641	0.2681	0.0000	7,243.8942
Total	**771.2346**	**1,270.6813**	**4,044.8765**	**12.9193**	**876.7381**	**39.0709**	**915.5525**	**223.4279**	**36.2800**	**259.4697**	**0.0000**	**992,946.7184**	**992,946.7184**	**41.1791**	**0.0000**	**993,811.4785**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**16.02**	**0.00**	**15.45**	**8.48**	**0.00**	**7.37**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1,775.1155	44.2309	3,405.2291	4.6811		447.3972	447.3972		447.3273	447.3273	54,534.1989	105,661.3334	160,195.5323	163.4560	3.7014	164,775.5409
Energy	4.1947	35.9367	15.9210	0.2288		2.8982	2.8982		2.8982	2.8982		45,760.3749	45,760.3749	0.8771	0.8389	46,038.8649
Mobile	226.4181	533.1004	2,410.8880	10.8433	674.4145	15.1143	689.5288	180.5560	13.9474	194.5034		777,344.5220	777,344.5220	20.2720		777,770.2335
Total	**2,005.7283**	**613.2680**	**5,832.0382**	**15.7532**	**674.4145**	**465.4096**	**1,139.8242**	**180.5560**	**464.1729**	**644.7289**	**54,534.1989**	**928,766.2303**	**983,300.4292**	**184.6051**	**4.5403**	**988,584.6394**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	245.5218	5.5240	478.8483	0.0254		2.6644	2.6644		2.6644	2.6644	0.0000	865.3334	865.3334	0.8245	0.0000	882.6478
Energy	4.1947	35.9367	15.9210	0.2288		2.8982	2.8982		2.8982	2.8982		45,760.3749	45,760.3749	0.8771	0.8389	46,038.8649
Mobile	205.4694	410.3801	1,917.4839	7.5955	465.7250	10.8501	476.5751	124.6851	10.0141	134.6992		544,668.3733	544,668.3733	14.4487		544,971.7950
Total	**455.1859**	**451.8407**	**2,412.2533**	**7.8497**	**465.7250**	**16.4126**	**482.1376**	**124.6851**	**15.5767**	**140.2618**	**0.0000**	**591,294.0816**	**591,294.0816**	**16.1502**	**0.8389**	**591,893.3077**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**77.31**	**26.32**	**58.64**	**50.17**	**30.94**	**96.47**	**57.70**	**30.94**	**96.64**	**78.24**	**100.00**	**36.34**	**39.87**	**91.25**	**81.52**	**40.13**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2015	10/7/2015	5	200	
2	Site Preparation	Site Preparation	10/8/2015	3/23/2016	5	120	
3	Grading	Grading	3/24/2016	5/17/2017	5	300	
4	Building Construction	Building Construction	5/18/2017	9/15/2032	5	4000	
5	Paving	Paving	9/16/2032	6/22/2033	5	200	
6	Architectural Coating	Architectural Coating	6/23/2033	12/20/2034	5	390	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 38750

Acres of Paving: 0

Residential Indoor: 16,737,030; Residential Outdoor: 5,579,010; Non-Residential Indoor: 3,165,800; Non-Residential Outdoor: 1,055,267 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Demolition	Excavators	3	8.00	162	0.38
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Excavators	2	8.00	162	0.38
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	125	0.42
Paving	Rollers	2	8.00	80	0.38
Demolition	Rubber Tired Dozers	2	8.00	255	0.40
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Graders	1	8.00	174	0.41
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Paving Equipment	2	8.00	130	0.36
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	3,768.00	968.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	754.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Demolition - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	4.5083	48.3629	36.0738	0.0399		2.4508	2.4508		2.2858	2.2858		4,127.1934	4,127.1934	1.1188		4,150.6886
Total	**4.5083**	**48.3629**	**36.0738**	**0.0399**		**2.4508**	**2.4508**		**2.2858**	**2.2858**		**4,127.1934**	**4,127.1934**	**1.1188**		**4,150.6886**

3.2 Demolition - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0740	0.0930	1.1469	2.1800e-003	0.1677	1.6800e-003	0.1693	0.0445	1.5300e-003	0.0460		190.7132	190.7132	0.0109		190.9418
Total	**0.0740**	**0.0930**	**1.1469**	**2.1800e-003**	**0.1677**	**1.6800e-003**	**0.1693**	**0.0445**	**1.5300e-003**	**0.0460**		**190.7132**	**190.7132**	**0.0109**		**190.9418**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	4.5083	48.3629	36.0738	0.0399		2.4508	2.4508		2.2858	2.2858	0.0000	4,127.1934	4,127.1934	1.1188		4,150.6886
Total	**4.5083**	**48.3629**	**36.0738**	**0.0399**		**2.4508**	**2.4508**		**2.2858**	**2.2858**	**0.0000**	**4,127.1934**	**4,127.1934**	**1.1188**		**4,150.6886**

3.2 Demolition - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0740	0.0930	1.1469	2.1800e-003	0.1677	1.6800e-003	0.1693	0.0445	1.5300e-003	0.0460		190.7132	190.7132	0.0109		190.9418
Total	**0.0740**	**0.0930**	**1.1469**	**2.1800e-003**	**0.1677**	**1.6800e-003**	**0.1693**	**0.0445**	**1.5300e-003**	**0.0460**		**190.7132**	**190.7132**	**0.0109**		**190.9418**

3.3 Site Preparation - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	5.2609	56.8897	42.6318	0.0391		3.0883	3.0883		2.8412	2.8412		4,111.7444	4,111.7444	1.2275		4,137.5225
Total	**5.2609**	**56.8897**	**42.6318**	**0.0391**	**18.0663**	**3.0883**	**21.1545**	**9.9307**	**2.8412**	**12.7719**		**4,111.7444**	**4,111.7444**	**1.2275**		**4,137.5225**

3.3 Site Preparation - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0888	0.1116	1.3763	2.6200e-003	0.2012	2.0100e-003	0.2032	0.0534	1.8400e-003	0.0552		228.8559	228.8559	0.0131		229.1301
Total	**0.0888**	**0.1116**	**1.3763**	**2.6200e-003**	**0.2012**	**2.0100e-003**	**0.2032**	**0.0534**	**1.8400e-003**	**0.0552**		**228.8559**	**228.8559**	**0.0131**		**229.1301**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.1298	0.0000	8.1298	4.4688	0.0000	4.4688			0.0000			0.0000
Off-Road	5.2609	56.8897	42.6318	0.0391		3.0883	3.0883		2.8412	2.8412	0.0000	4,111.7444	4,111.7444	1.2275		4,137.5224
Total	**5.2609**	**56.8897**	**42.6318**	**0.0391**	**8.1298**	**3.0883**	**11.2181**	**4.4688**	**2.8412**	**7.3100**	**0.0000**	**4,111.7444**	**4,111.7444**	**1.2275**		**4,137.5224**

3.3 Site Preparation - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0888	0.1116	1.3763	2.6200e-003	0.2012	2.0100e-003	0.2032	0.0534	1.8400e-003	0.0552		228.8559	228.8559	0.0131		229.1301
Total	**0.0888**	**0.1116**	**1.3763**	**2.6200e-003**	**0.2012**	**2.0100e-003**	**0.2032**	**0.0534**	**1.8400e-003**	**0.0552**		**228.8559**	**228.8559**	**0.0131**		**229.1301**

3.3 Site Preparation - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	5.0771	54.6323	41.1053	0.0391		2.9387	2.9387		2.7036	2.7036		4,065.0053	4,065.0053	1.2262		4,090.7544
Total	**5.0771**	**54.6323**	**41.1053**	**0.0391**	**18.0663**	**2.9387**	**21.0049**	**9.9307**	**2.7036**	**12.6343**		**4,065.0053**	**4,065.0053**	**1.2262**		**4,090.7544**

3.3 Site Preparation - 2016

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0802	0.1009	1.2487	2.6200e-003	0.2012	1.9000e-003	0.2031	0.0534	1.7500e-003	0.0551		221.2238	221.2238	0.0120		221.4767
Total	**0.0802**	**0.1009**	**1.2487**	**2.6200e-003**	**0.2012**	**1.9000e-003**	**0.2031**	**0.0534**	**1.7500e-003**	**0.0551**		**221.2238**	**221.2238**	**0.0120**		**221.4767**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.1298	0.0000	8.1298	4.4688	0.0000	4.4688			0.0000			0.0000
Off-Road	5.0771	54.6323	41.1053	0.0391		2.9387	2.9387		2.7036	2.7036	0.0000	4,065.0053	4,065.0053	1.2262		4,090.7544
Total	**5.0771**	**54.6323**	**41.1053**	**0.0391**	**8.1298**	**2.9387**	**11.0685**	**4.4688**	**2.7036**	**7.1724**	**0.0000**	**4,065.0053**	**4,065.0053**	**1.2262**		**4,090.7544**

3.3 Site Preparation - 2016

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0802	0.1009	1.2487	2.6200e-003	0.2012	1.9000e-003	0.2031	0.0534	1.7500e-003	0.0551		221.2238	221.2238	0.0120		221.4767
Total	**0.0802**	**0.1009**	**1.2487**	**2.6200e-003**	**0.2012**	**1.9000e-003**	**0.2031**	**0.0534**	**1.7500e-003**	**0.0551**		**221.2238**	**221.2238**	**0.0120**		**221.4767**

3.4 Grading - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					143.0034	0.0000	143.0034	18.1010	0.0000	18.1010			0.0000			0.0000
Off-Road	6.4795	74.8137	49.1374	0.0617		3.5842	3.5842		3.2975	3.2975		6,414.9807	6,414.9807	1.9350		6,455.6154
Total	**6.4795**	**74.8137**	**49.1374**	**0.0617**	**143.0034**	**3.5842**	**146.5876**	**18.1010**	**3.2975**	**21.3985**		**6,414.9807**	**6,414.9807**	**1.9350**		**6,455.6154**

3.4 Grading - 2016

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0891	0.1121	1.3874	2.9100e-003	0.2236	2.1100e-003	0.2257	0.0593	1.9400e-003	0.0612		245.8043	245.8043	0.0134		246.0853
Total	**0.0891**	**0.1121**	**1.3874**	**2.9100e-003**	**0.2236**	**2.1100e-003**	**0.2257**	**0.0593**	**1.9400e-003**	**0.0612**		**245.8043**	**245.8043**	**0.0134**		**246.0853**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					64.3515	0.0000	64.3515	8.1455	0.0000	8.1455			0.0000			0.0000
Off-Road	6.4795	74.8137	49.1374	0.0617		3.5842	3.5842		3.2975	3.2975	0.0000	6,414.9807	6,414.9807	1.9350		6,455.6154
Total	**6.4795**	**74.8137**	**49.1374**	**0.0617**	**64.3515**	**3.5842**	**67.9358**	**8.1455**	**3.2975**	**11.4430**	**0.0000**	**6,414.9807**	**6,414.9807**	**1.9350**		**6,455.6154**

3.4 Grading - 2016

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0891	0.1121	1.3874	2.9100e-003	0.2236	2.1100e-003	0.2257	0.0593	1.9400e-003	0.0612		245.8043	245.8043	0.0134		246.0853
Total	**0.0891**	**0.1121**	**1.3874**	**2.9100e-003**	**0.2236**	**2.1100e-003**	**0.2257**	**0.0593**	**1.9400e-003**	**0.0612**		**245.8043**	**245.8043**	**0.0134**		**246.0853**

3.4 Grading - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					143.0034	0.0000	143.0034	18.1010	0.0000	18.1010			0.0000			0.0000
Off-Road	6.0991	69.5920	46.8050	0.0617		3.3172	3.3172		3.0518	3.0518		6,313.3690	6,313.3690	1.9344		6,353.9915
Total	**6.0991**	**69.5920**	**46.8050**	**0.0617**	**143.0034**	**3.3172**	**146.3206**	**18.1010**	**3.0518**	**21.1528**		**6,313.3690**	**6,313.3690**	**1.9344**		**6,353.9915**

3.4 Grading - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0801	0.1014	1.2570	2.9100e-003	0.2236	2.0300e-003	0.2256	0.0593	1.8700e-003	0.0612		236.6055	236.6055	0.0124		236.8652
Total	**0.0801**	**0.1014**	**1.2570**	**2.9100e-003**	**0.2236**	**2.0300e-003**	**0.2256**	**0.0593**	**1.8700e-003**	**0.0612**		**236.6055**	**236.6055**	**0.0124**		**236.8652**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					64.3515	0.0000	64.3515	8.1455	0.0000	8.1455			0.0000			0.0000
Off-Road	6.0991	69.5920	46.8050	0.0617		3.3172	3.3172		3.0518	3.0518	0.0000	6,313.3690	6,313.3690	1.9344		6,353.9915
Total	**6.0991**	**69.5920**	**46.8050**	**0.0617**	**64.3515**	**3.3172**	**67.6687**	**8.1455**	**3.0518**	**11.1973**	**0.0000**	**6,313.3690**	**6,313.3690**	**1.9344**		**6,353.9915**

3.4 Grading - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0801	0.1014	1.2570	2.9100e-003	0.2236	2.0300e-003	0.2256	0.0593	1.8700e-003	0.0612		236.6055	236.6055	0.0124		236.8652
Total	**0.0801**	**0.1014**	**1.2570**	**2.9100e-003**	**0.2236**	**2.0300e-003**	**0.2256**	**0.0593**	**1.8700e-003**	**0.0612**		**236.6055**	**236.6055**	**0.0124**		**236.8652**

3.5 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.1024	26.4057	18.1291	0.0268		1.7812	1.7812		1.6730	1.6730		2,639.8053	2,639.8053	0.6497		2,653.4490
Total	**3.1024**	**26.4057**	**18.1291**	**0.0268**		**1.7812**	**1.7812**		**1.6730**	**1.6730**		**2,639.8053**	**2,639.8053**	**0.6497**		**2,653.4490**

3.5 Building Construction - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	7.4579	77.2222	92.3990	0.2125	6.0394	1.1797	7.2191	1.7186	1.0850	2.8036		20,976.9405	20,976.9405	0.1514		20,980.1204
Worker	15.0812	19.1029	236.8249	0.5477	42.1174	0.3815	42.4989	11.1697	0.3518	11.5215		44,576.4773	44,576.4773	2.3299		44,625.4056
Total	**22.5391**	**96.3251**	**329.2239**	**0.7601**	**48.1567**	**1.5613**	**49.7180**	**12.8883**	**1.4369**	**14.3252**		**65,553.4178**	**65,553.4178**	**2.4813**		**65,605.5260**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.1024	26.4057	18.1291	0.0268		1.7812	1.7812		1.6730	1.6730	0.0000	2,639.8053	2,639.8053	0.6497		2,653.4490
Total	**3.1024**	**26.4057**	**18.1291**	**0.0268**		**1.7812**	**1.7812**		**1.6730**	**1.6730**	**0.0000**	**2,639.8053**	**2,639.8053**	**0.6497**		**2,653.4490**

3.5 Building Construction - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	7.4579	77.2222	92.3990	0.2125	6.0394	1.1797	7.2191	1.7186	1.0850	2.8036		20,976.9405	20,976.9405	0.1514		20,980.1204
Worker	15.0812	19.1029	236.8249	0.5477	42.1174	0.3815	42.4989	11.1697	0.3518	11.5215		44,576.4773	44,576.4773	2.3299		44,625.4056
Total	**22.5391**	**96.3251**	**329.2239**	**0.7601**	**48.1567**	**1.5613**	**49.7180**	**12.8883**	**1.4369**	**14.3252**		**65,553.4178**	**65,553.4178**	**2.4813**		**65,605.5260**

3.5 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6687	23.2608	17.5327	0.0268		1.4943	1.4943		1.4048	1.4048		2,609.9390	2,609.9390	0.6387		2,623.3517
Total	**2.6687**	**23.2608**	**17.5327**	**0.0268**		**1.4943**	**1.4943**		**1.4048**	**1.4048**		**2,609.9390**	**2,609.9390**	**0.6387**		**2,623.3517**

3.5 Building Construction - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	7.0253	70.9990	88.2620	0.2123	6.0401	1.1114	7.1515	1.7189	1.0223	2.7412		20,630.4693	20,630.4693	0.1506		20,633.6317
Worker	13.5775	17.3387	215.1926	0.5475	42.1174	0.3695	42.4869	11.1697	0.3419	11.5116		42,945.2443	42,945.2443	2.1641		42,990.6906
Total	**20.6029**	**88.3377**	**303.4546**	**0.7597**	**48.1575**	**1.4809**	**49.6384**	**12.8886**	**1.3642**	**14.2528**		**63,575.7136**	**63,575.7136**	**2.3147**		**63,624.3223**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6687	23.2608	17.5327	0.0268		1.4943	1.4943		1.4048	1.4048	0.0000	2,609.9389	2,609.9389	0.6387		2,623.3517
Total	**2.6687**	**23.2608**	**17.5327**	**0.0268**		**1.4943**	**1.4943**		**1.4048**	**1.4048**	**0.0000**	**2,609.9389**	**2,609.9389**	**0.6387**		**2,623.3517**

3.5 Building Construction - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	7.0253	70.9990	88.2620	0.2123	6.0401	1.1114	7.1515	1.7189	1.0223	2.7412		20,630.4693	20,630.4693	0.1506		20,633.6317
Worker	13.5775	17.3387	215.1926	0.5475	42.1174	0.3695	42.4869	11.1697	0.3419	11.5116		42,945.2443	42,945.2443	2.1641		42,990.6906
Total	**20.6029**	**88.3377**	**303.4546**	**0.7597**	**48.1575**	**1.4809**	**49.6384**	**12.8886**	**1.3642**	**14.2528**		**63,575.7136**	**63,575.7136**	**2.3147**		**63,624.3223**

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3516	20.9650	17.1204	0.0268		1.2850	1.2850		1.2083	1.2083		2,580.7618	2,580.7618	0.6279		2,593.9479
Total	**2.3516**	**20.9650**	**17.1204**	**0.0268**		**1.2850**	**1.2850**		**1.2083**	**1.2083**		**2,580.7618**	**2,580.7618**	**0.6279**		**2,593.9479**

3.5 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	6.6677	65.5046	85.0634	0.2112	6.0412	1.0564	7.0976	1.7193	0.9718	2.6911		20,207.3719	20,207.3719	0.1473		20,210.4642
Worker	12.4766	15.8975	197.6074	0.5454	42.1174	0.3603	42.4777	11.1697	0.3340	11.5037		41,262.6313	41,262.6313	2.0227		41,305.1086
Total	**19.1443**	**81.4021**	**282.6709**	**0.7566**	**48.1585**	**1.4168**	**49.5753**	**12.8890**	**1.3058**	**14.1948**		**61,470.0032**	**61,470.0032**	**2.1700**		**61,515.5728**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3516	20.9650	17.1204	0.0268		1.2850	1.2850		1.2083	1.2083	0.0000	2,580.7618	2,580.7618	0.6279		2,593.9479
Total	**2.3516**	**20.9650**	**17.1204**	**0.0268**		**1.2850**	**1.2850**		**1.2083**	**1.2083**	**0.0000**	**2,580.7618**	**2,580.7618**	**0.6279**		**2,593.9479**

3.5 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	6.6677	65.5046	85.0634	0.2112	6.0412	1.0564	7.0976	1.7193	0.9718	2.6911		20,207.3719	20,207.3719	0.1473		20,210.4642
Worker	12.4766	15.8975	197.6074	0.5454	42.1174	0.3603	42.4777	11.1697	0.3340	11.5037		41,262.6313	41,262.6313	2.0227		41,305.1086
Total	**19.1443**	**81.4021**	**282.6709**	**0.7566**	**48.1585**	**1.4168**	**49.5753**	**12.8890**	**1.3058**	**14.1948**		**61,470.0032**	**61,470.0032**	**2.1700**		**61,515.5728**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1113	19.0839	16.8084	0.0268		1.1128	1.1128		1.0465	1.0465		2,542.4799	2,542.4799	0.6194		2,555.4880
Total	**2.1113**	**19.0839**	**16.8084**	**0.0268**		**1.1128**	**1.1128**		**1.0465**	**1.0465**		**2,542.4799**	**2,542.4799**	**0.6194**		**2,555.4880**

3.5 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	6.3786	57.3274	82.5244	0.2111	6.0423	0.9651	7.0074	1.7197	0.8879	2.6076		19,757.3476	19,757.3476	0.1442		19,760.3760
Worker	11.6996	14.7391	184.1792	0.5454	42.1174	0.3566	42.4740	11.1697	0.3307	11.5004		39,606.1899	39,606.1899	1.9172		39,646.4514
Total	**18.0782**	**72.0665**	**266.7036**	**0.7564**	**48.1597**	**1.3217**	**49.4814**	**12.8894**	**1.2185**	**14.1080**		**59,363.5375**	**59,363.5375**	**2.0614**		**59,406.8275**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1113	19.0839	16.8084	0.0268		1.1128	1.1128		1.0465	1.0465	0.0000	2,542.4799	2,542.4799	0.6194		2,555.4880
Total	**2.1113**	**19.0839**	**16.8084**	**0.0268**		**1.1128**	**1.1128**		**1.0465**	**1.0465**	**0.0000**	**2,542.4799**	**2,542.4799**	**0.6194**		**2,555.4880**

3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	6.3786	57.3274	82.5244	0.2111	6.0423	0.9651	7.0074	1.7197	0.8879	2.6076		19,757.3476	19,757.3476	0.1442		19,760.3760
Worker	11.6996	14.7391	184.1792	0.5454	42.1174	0.3566	42.4740	11.1697	0.3307	11.5004		39,606.1899	39,606.1899	1.9172		39,646.4514
Total	**18.0782**	**72.0665**	**266.7036**	**0.7564**	**48.1597**	**1.3217**	**49.4814**	**12.8894**	**1.2185**	**14.1080**		**59,363.5375**	**59,363.5375**	**2.0614**		**59,406.8275**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8931	17.3403	16.5376	0.0268		0.9549	0.9549		0.8979	0.8979		2,542.7817	2,542.7817	0.6126		2,555.6462
Total	**1.8931**	**17.3403**	**16.5376**	**0.0268**		**0.9549**	**0.9549**		**0.8979**	**0.8979**		**2,542.7817**	**2,542.7817**	**0.6126**		**2,555.6462**

3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	6.1653	48.7639	80.1541	0.2109	6.0425	0.8788	6.9213	1.7198	0.8085	2.5283		19,742.2318	19,742.2318	0.1451		19,745.2797
Worker	11.0659	13.7626	173.0148	0.5464	42.1174	0.3555	42.4729	11.1697	0.3297	11.4994		38,987.2853	38,987.2853	1.8340		39,025.7987
Total	**17.2312**	**62.5265**	**253.1689**	**0.7573**	**48.1598**	**1.2344**	**49.3942**	**12.8895**	**1.1382**	**14.0277**		**58,729.5171**	**58,729.5171**	**1.9791**		**58,771.0784**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8931	17.3403	16.5376	0.0268		0.9549	0.9549		0.8979	0.8979	0.0000	2,542.7817	2,542.7817	0.6126		2,555.6462
Total	**1.8931**	**17.3403**	**16.5376**	**0.0268**		**0.9549**	**0.9549**		**0.8979**	**0.8979**	**0.0000**	**2,542.7817**	**2,542.7817**	**0.6126**		**2,555.6462**

3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	6.1653	48.7639	80.1541	0.2109	6.0425	0.8788	6.9213	1.7198	0.8085	2.5283		19,742.2318	19,742.2318	0.1451		19,745.2797
Worker	11.0659	13.7626	173.0148	0.5464	42.1174	0.3555	42.4729	11.1697	0.3297	11.4994		38,987.2853	38,987.2853	1.8340		39,025.7987
Total	**17.2312**	**62.5265**	**253.1689**	**0.7573**	**48.1598**	**1.2344**	**49.3942**	**12.8895**	**1.1382**	**14.0277**		**58,729.5171**	**58,729.5171**	**1.9791**		**58,771.0784**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6992	15.5364	16.3276	0.0268		0.8057	0.8057		0.7581	0.7581		2,543.7497	2,543.7497	0.6085		2,556.5286
Total	**1.6992**	**15.5364**	**16.3276**	**0.0268**		**0.8057**	**0.8057**		**0.7581**	**0.7581**		**2,543.7497**	**2,543.7497**	**0.6085**		**2,556.5286**

3.5 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	6.0413	44.2748	78.1772	0.2106	6.0426	0.8692	6.9118	1.7198	0.7997	2.5195		19,725.9930	19,725.9930	0.1483		19,729.1071
Worker	10.4670	12.8850	162.5465	0.5463	42.1174	0.3538	42.4712	11.1697	0.3281	11.4979		38,339.9086	38,339.9086	1.7550		38,376.7625
Total	**16.5083**	**57.1598**	**240.7237**	**0.7570**	**48.1599**	**1.2230**	**49.3829**	**12.8895**	**1.1278**	**14.0173**		**58,065.9016**	**58,065.9016**	**1.9032**		**58,105.8696**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6992	15.5364	16.3276	0.0268		0.8057	0.8057		0.7581	0.7581	0.0000	2,543.7497	2,543.7497	0.6085		2,556.5286
Total	**1.6992**	**15.5364**	**16.3276**	**0.0268**		**0.8057**	**0.8057**		**0.7581**	**0.7581**	**0.0000**	**2,543.7497**	**2,543.7497**	**0.6085**		**2,556.5286**

3.5 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	6.0413	44.2748	78.1772	0.2106	6.0426	0.8692	6.9118	1.7198	0.7997	2.5195		19,725.9930	19,725.9930	0.1483		19,729.1071
Worker	10.4670	12.8850	162.5465	0.5463	42.1174	0.3538	42.4712	11.1697	0.3281	11.4979		38,339.9086	38,339.9086	1.7550		38,376.7625
Total	**16.5083**	**57.1598**	**240.7237**	**0.7570**	**48.1599**	**1.2230**	**49.3829**	**12.8895**	**1.1278**	**14.0173**		**58,065.9016**	**58,065.9016**	**1.9032**		**58,105.8696**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5661	14.3126	16.2093	0.0268		0.6967	0.6967		0.6557	0.6557		2,544.6262	2,544.6262	0.6044		2,557.3191
Total	**1.5661**	**14.3126**	**16.2093**	**0.0268**		**0.6967**	**0.6967**		**0.6557**	**0.6557**		**2,544.6262**	**2,544.6262**	**0.6044**		**2,557.3191**

3.5 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.5978	35.3073	75.0602	0.2096	6.0427	0.8583	6.9010	1.7198	0.7896	2.5094		19,633.1894	19,633.1894	0.1331		19,635.9852
Worker	9.8974	12.0992	152.8884	0.5462	42.1174	0.3522	42.4696	11.1697	0.3267	11.4965		37,745.4143	37,745.4143	1.6845		37,780.7894
Total	**15.4952**	**47.4066**	**227.9486**	**0.7559**	**48.1600**	**1.2105**	**49.3705**	**12.8895**	**1.1164**	**14.0059**		**57,378.6037**	**57,378.6037**	**1.8177**		**57,416.7747**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5661	14.3126	16.2093	0.0268		0.6967	0.6967		0.6557	0.6557	0.0000	2,544.6262	2,544.6262	0.6044		2,557.3191
Total	**1.5661**	**14.3126**	**16.2093**	**0.0268**		**0.6967**	**0.6967**		**0.6557**	**0.6557**	**0.0000**	**2,544.6262**	**2,544.6262**	**0.6044**		**2,557.3191**

3.5 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.5978	35.3073	75.0602	0.2096	6.0427	0.8583	6.9010	1.7198	0.7896	2.5094		19,633.1894	19,633.1894	0.1331		19,635.9852
Worker	9.8974	12.0992	152.8884	0.5462	42.1174	0.3522	42.4696	11.1697	0.3267	11.4965		37,745.4143	37,745.4143	1.6845		37,780.7894
Total	**15.4952**	**47.4066**	**227.9486**	**0.7559**	**48.1600**	**1.2105**	**49.3705**	**12.8895**	**1.1164**	**14.0059**		**57,378.6037**	**57,378.6037**	**1.8177**		**57,416.7747**

3.5 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4653	13.3774	16.1332	0.0268		0.6106	0.6106		0.5744	0.5744		2,545.1154	2,545.1154	0.6009		2,557.7349
Total	**1.4653**	**13.3774**	**16.1332**	**0.0268**		**0.6106**	**0.6106**		**0.5744**	**0.5744**		**2,545.1154**	**2,545.1154**	**0.6009**		**2,557.7349**

3.5 Building Construction - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.5069	35.0997	73.4959	0.2101	6.0427	0.8592	6.9019	1.7198	0.7905	2.5103		19,676.3371	19,676.3371	0.1348		19,679.1675
Worker	9.4115	11.4397	145.3366	0.5501	42.1174	0.3554	42.4728	11.1697	0.3297	11.4995		37,470.6956	37,470.6956	1.6403		37,505.1414
Total	**14.9184**	**46.5394**	**218.8325**	**0.7601**	**48.1601**	**1.2146**	**49.3747**	**12.8895**	**1.1202**	**14.0097**		**57,147.0327**	**57,147.0327**	**1.7751**		**57,184.3089**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4653	13.3774	16.1332	0.0268		0.6106	0.6106		0.5744	0.5744	0.0000	2,545.1154	2,545.1154	0.6009		2,557.7349
Total	**1.4653**	**13.3774**	**16.1332**	**0.0268**		**0.6106**	**0.6106**		**0.5744**	**0.5744**	**0.0000**	**2,545.1154**	**2,545.1154**	**0.6009**		**2,557.7349**

3.5 Building Construction - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.5069	35.0997	73.4959	0.2101	6.0427	0.8592	6.9019	1.7198	0.7905	2.5103		19,676.3371	19,676.3371	0.1348		19,679.1675
Worker	9.4115	11.4397	145.3366	0.5501	42.1174	0.3554	42.4728	11.1697	0.3297	11.4995		37,470.6956	37,470.6956	1.6403		37,505.1414
Total	**14.9184**	**46.5394**	**218.8325**	**0.7601**	**48.1601**	**1.2146**	**49.3747**	**12.8895**	**1.1202**	**14.0097**		**57,147.0327**	**57,147.0327**	**1.7751**		**57,184.3089**

3.5 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3615	12.4097	16.0518	0.0269		0.5250	0.5250		0.4939	0.4939		2,545.8905	2,545.8905	0.5975		2,558.4386
Total	**1.3615**	**12.4097**	**16.0518**	**0.0269**		**0.5250**	**0.5250**		**0.4939**	**0.4939**		**2,545.8905**	**2,545.8905**	**0.5975**		**2,558.4386**

3.5 Building Construction - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.4228	34.8618	72.3152	0.2101	6.0429	0.8635	6.9064	1.7198	0.7945	2.5143		19,677.3287	19,677.3287	0.1353		19,680.1704
Worker	8.9663	10.8517	138.3650	0.5500	42.1174	0.3555	42.4729	11.1697	0.3298	11.4996		36,987.3079	36,987.3079	1.5873		37,020.6416
Total	**14.3891**	**45.7135**	**210.6802**	**0.7600**	**48.1602**	**1.2190**	**49.3793**	**12.8895**	**1.1243**	**14.0138**		**56,664.6367**	**56,664.6367**	**1.7226**		**56,700.8120**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3615	12.4097	16.0518	0.0269		0.5250	0.5250		0.4939	0.4939	0.0000	2,545.8905	2,545.8905	0.5975		2,558.4386
Total	**1.3615**	**12.4097**	**16.0518**	**0.0269**		**0.5250**	**0.5250**		**0.4939**	**0.4939**	**0.0000**	**2,545.8905**	**2,545.8905**	**0.5975**		**2,558.4386**

3.5 Building Construction - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.4228	34.8618	72.3152	0.2101	6.0429	0.8635	6.9064	1.7198	0.7945	2.5143		19,677.3287	19,677.3287	0.1353		19,680.1704
Worker	8.9663	10.8517	138.3650	0.5500	42.1174	0.3555	42.4729	11.1697	0.3298	11.4996		36,987.3079	36,987.3079	1.5873		37,020.6416
Total	**14.3891**	**45.7135**	**210.6802**	**0.7600**	**48.1602**	**1.2190**	**49.3793**	**12.8895**	**1.1243**	**14.0138**		**56,664.6367**	**56,664.6367**	**1.7226**		**56,700.8120**

3.5 Building Construction - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3615	12.4097	16.0518	0.0269		0.5250	0.5250		0.4939	0.4939		2,545.8905	2,545.8905	0.5975		2,558.4386
Total	**1.3615**	**12.4097**	**16.0518**	**0.0269**		**0.5250**	**0.5250**		**0.4939**	**0.4939**		**2,545.8905**	**2,545.8905**	**0.5975**		**2,558.4386**

3.5 Building Construction - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.2549	33.8316	70.9256	0.2100	6.0429	0.8274	6.8703	1.7198	0.7612	2.4810		19,673.2995	19,673.2995	0.1311		19,676.0518
Worker	8.5579	10.3398	132.2573	0.5500	42.1174	0.3570	42.4743	11.1697	0.3312	11.5009		36,562.9320	36,562.9320	1.5405		36,595.2816
Total	**13.8128**	**44.1714**	**203.1829**	**0.7600**	**48.1603**	**1.1843**	**49.3446**	**12.8896**	**1.0923**	**13.9819**		**56,236.2315**	**56,236.2315**	**1.6715**		**56,271.3334**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3615	12.4097	16.0518	0.0269		0.5250	0.5250		0.4939	0.4939	0.0000	2,545.8905	2,545.8905	0.5975		2,558.4386
Total	**1.3615**	**12.4097**	**16.0518**	**0.0269**		**0.5250**	**0.5250**		**0.4939**	**0.4939**	**0.0000**	**2,545.8905**	**2,545.8905**	**0.5975**		**2,558.4386**

3.5 Building Construction - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.2549	33.8316	70.9256	0.2100	6.0429	0.8274	6.8703	1.7198	0.7612	2.4810		19,673.2995	19,673.2995	0.1311		19,676.0518
Worker	8.5579	10.3398	132.2573	0.5500	42.1174	0.3570	42.4743	11.1697	0.3312	11.5009		36,562.9320	36,562.9320	1.5405		36,595.2816
Total	**13.8128**	**44.1714**	**203.1829**	**0.7600**	**48.1603**	**1.1843**	**49.3446**	**12.8896**	**1.0923**	**13.9819**		**56,236.2315**	**56,236.2315**	**1.6715**		**56,271.3334**

3.5 Building Construction - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3615	12.4097	16.0518	0.0269		0.5250	0.5250		0.4939	0.4939		2,545.8905	2,545.8905	0.5975		2,558.4386
Total	**1.3615**	**12.4097**	**16.0518**	**0.0269**		**0.5250**	**0.5250**		**0.4939**	**0.4939**		**2,545.8905**	**2,545.8905**	**0.5975**		**2,558.4386**

3.5 Building Construction - 2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.2060	33.5627	70.2017	0.2100	6.0432	0.8295	6.8727	1.7199	0.7631	2.4831		19,674.7711	19,674.7711	0.1314		19,677.5294
Worker	8.1748	9.8780	126.7846	0.5500	42.1174	0.3578	42.4752	11.1697	0.3320	11.5017		36,191.0940	36,191.0940	1.4983		36,222.5586
Total	**13.3807**	**43.4407**	**196.9863**	**0.7599**	**48.1605**	**1.1873**	**49.3478**	**12.8896**	**1.0951**	**13.9848**		**55,865.8651**	**55,865.8651**	**1.6297**		**55,900.0881**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3615	12.4097	16.0518	0.0269		0.5250	0.5250		0.4939	0.4939	0.0000	2,545.8905	2,545.8905	0.5975		2,558.4386
Total	**1.3615**	**12.4097**	**16.0518**	**0.0269**		**0.5250**	**0.5250**		**0.4939**	**0.4939**	**0.0000**	**2,545.8905**	**2,545.8905**	**0.5975**		**2,558.4386**

3.5 Building Construction - 2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.2060	33.5627	70.2017	0.2100	6.0432	0.8295	6.8727	1.7199	0.7631	2.4831		19,674.7711	19,674.7711	0.1314		19,677.5294
Worker	8.1748	9.8780	126.7846	0.5500	42.1174	0.3578	42.4752	11.1697	0.3320	11.5017		36,191.0940	36,191.0940	1.4983		36,222.5586
Total	**13.3807**	**43.4407**	**196.9863**	**0.7599**	**48.1605**	**1.1873**	**49.3478**	**12.8896**	**1.0951**	**13.9848**		**55,865.8651**	**55,865.8651**	**1.6297**		**55,900.0881**

3.5 Building Construction - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3615	12.4097	16.0518	0.0269		0.5250	0.5250		0.4939	0.4939		2,545.8905	2,545.8905	0.5975		2,558.4386
Total	**1.3615**	**12.4097**	**16.0518**	**0.0269**		**0.5250**	**0.5250**		**0.4939**	**0.4939**		**2,545.8905**	**2,545.8905**	**0.5975**		**2,558.4386**

3.5 Building Construction - 2028

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.1414	33.2448	69.5104	0.2100	6.0434	0.8241	6.8675	1.7200	0.7582	2.4782		19,675.0393	19,675.0393	0.1307		19,677.7847
Worker	7.8264	9.4623	122.0148	0.5499	42.1174	0.3587	42.4761	11.1697	0.3328	11.5025		35,870.2037	35,870.2037	1.4610		35,900.8847
Total	**12.9677**	**42.7071**	**191.5252**	**0.7599**	**48.1608**	**1.1828**	**49.3436**	**12.8897**	**1.0910**	**13.9807**		**55,545.2429**	**55,545.2429**	**1.5917**		**55,578.6693**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3615	12.4097	16.0518	0.0269		0.5250	0.5250		0.4939	0.4939	0.0000	2,545.8905	2,545.8905	0.5975		2,558.4386
Total	**1.3615**	**12.4097**	**16.0518**	**0.0269**		**0.5250**	**0.5250**		**0.4939**	**0.4939**	**0.0000**	**2,545.8905**	**2,545.8905**	**0.5975**		**2,558.4386**

3.5 Building Construction - 2028

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.1414	33.2448	69.5104	0.2100	6.0434	0.8241	6.8675	1.7200	0.7582	2.4782		19,675.0393	19,675.0393	0.1307		19,677.7847
Worker	7.8264	9.4623	122.0148	0.5499	42.1174	0.3587	42.4761	11.1697	0.3328	11.5025		35,870.2037	35,870.2037	1.4610		35,900.8847
Total	**12.9677**	**42.7071**	**191.5252**	**0.7599**	**48.1608**	**1.1828**	**49.3436**	**12.8897**	**1.0910**	**13.9807**		**55,545.2429**	**55,545.2429**	**1.5917**		**55,578.6693**

3.5 Building Construction - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3615	12.4097	16.0518	0.0269		0.5250	0.5250		0.4939	0.4939		2,545.8905	2,545.8905	0.5975		2,558.4386
Total	**1.3615**	**12.4097**	**16.0518**	**0.0269**		**0.5250**	**0.5250**		**0.4939**	**0.4939**		**2,545.8905**	**2,545.8905**	**0.5975**		**2,558.4386**

3.5 Building Construction - 2029

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.0878	33.0833	68.7655	0.2100	6.0436	0.8253	6.8689	1.7201	0.7593	2.4794		19,675.7533	19,675.7533	0.1309		19,678.5021
Worker	7.4713	9.0469	117.2379	0.5499	42.1174	0.3589	42.4762	11.1697	0.3330	11.5027		35,591.0320	35,591.0320	1.4241		35,620.9384
Total	**12.5591**	**42.1302**	**186.0033**	**0.7599**	**48.1610**	**1.1842**	**49.3451**	**12.8898**	**1.0922**	**13.9820**		**55,266.7852**	**55,266.7852**	**1.5550**		**55,299.4404**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3615	12.4097	16.0518	0.0269		0.5250	0.5250		0.4939	0.4939	0.0000	2,545.8905	2,545.8905	0.5975		2,558.4386
Total	**1.3615**	**12.4097**	**16.0518**	**0.0269**		**0.5250**	**0.5250**		**0.4939**	**0.4939**	**0.0000**	**2,545.8905**	**2,545.8905**	**0.5975**		**2,558.4386**

3.5 Building Construction - 2029

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.0878	33.0833	68.7655	0.2100	6.0436	0.8253	6.8689	1.7201	0.7593	2.4794		19,675.7533	19,675.7533	0.1309		19,678.5021
Worker	7.4713	9.0469	117.2379	0.5499	42.1174	0.3589	42.4762	11.1697	0.3330	11.5027		35,591.0320	35,591.0320	1.4241		35,620.9384
Total	**12.5591**	**42.1302**	**186.0033**	**0.7599**	**48.1610**	**1.1842**	**49.3451**	**12.8898**	**1.0922**	**13.9820**		**55,266.7852**	**55,266.7852**	**1.5550**		**55,299.4404**

3.5 Building Construction - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3041	7.9179	16.1313	0.0308		0.1476	0.1476		0.1476	0.1476		2,884.8300	2,884.8300	0.1158		2,887.2617
Total	**1.3041**	**7.9179**	**16.1313**	**0.0308**		**0.1476**	**0.1476**		**0.1476**	**0.1476**		**2,884.8300**	**2,884.8300**	**0.1158**		**2,887.2617**

3.5 Building Construction - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.0358	32.9413	68.2438	0.2100	6.0437	0.8266	6.8703	1.7201	0.7605	2.4806		19,675.9699	19,675.9699	0.1311		19,678.7220
Worker	7.1303	8.6511	112.9762	0.5499	42.1174	0.3584	42.4758	11.1697	0.3325	11.5023		35,350.2454	35,350.2454	1.3893		35,379.4209
Total	**12.1661**	**41.5924**	**181.2200**	**0.7599**	**48.1611**	**1.1850**	**49.3461**	**12.8898**	**1.0930**	**13.9828**		**55,026.2152**	**55,026.2152**	**1.5204**		**55,058.1429**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3041	7.9179	16.1313	0.0308		0.1476	0.1476		0.1476	0.1476	0.0000	2,884.8300	2,884.8300	0.1158		2,887.2617
Total	**1.3041**	**7.9179**	**16.1313**	**0.0308**		**0.1476**	**0.1476**		**0.1476**	**0.1476**	**0.0000**	**2,884.8300**	**2,884.8300**	**0.1158**		**2,887.2617**

3.5 Building Construction - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.0358	32.9413	68.2438	0.2100	6.0437	0.8266	6.8703	1.7201	0.7605	2.4806		19,675.9699	19,675.9699	0.1311		19,678.7220
Worker	7.1303	8.6511	112.9762	0.5499	42.1174	0.3584	42.4758	11.1697	0.3325	11.5023		35,350.2454	35,350.2454	1.3893		35,379.4209
Total	**12.1661**	**41.5924**	**181.2200**	**0.7599**	**48.1611**	**1.1850**	**49.3461**	**12.8898**	**1.0930**	**13.9828**		**55,026.2152**	**55,026.2152**	**1.5204**		**55,058.1429**

3.5 Building Construction - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3041	7.9179	16.1313	0.0308		0.1476	0.1476		0.1476	0.1476		2,884.8300	2,884.8300	0.1158		2,887.2617
Total	**1.3041**	**7.9179**	**16.1313**	**0.0308**		**0.1476**	**0.1476**		**0.1476**	**0.1476**		**2,884.8300**	**2,884.8300**	**0.1158**		**2,887.2617**

3.5 Building Construction - 2031

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.0158	32.8423	67.8695	0.2101	6.0435	0.8229	6.8664	1.7200	0.7571	2.4771		19,686.3905	19,686.3905	0.1318		19,689.1591
Worker	6.8010	8.2745	109.1759	0.5510	42.1174	0.3587	42.4760	11.1697	0.3328	11.5025		35,211.5532	35,211.5532	1.3619		35,240.1529
Total	**11.8168**	**41.1168**	**177.0454**	**0.7611**	**48.1608**	**1.1816**	**49.3424**	**12.8897**	**1.0899**	**13.9796**		**54,897.9437**	**54,897.9437**	**1.4937**		**54,929.3119**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3041	7.9179	16.1313	0.0308		0.1476	0.1476		0.1476	0.1476	0.0000	2,884.8300	2,884.8300	0.1158		2,887.2617
Total	**1.3041**	**7.9179**	**16.1313**	**0.0308**		**0.1476**	**0.1476**		**0.1476**	**0.1476**	**0.0000**	**2,884.8300**	**2,884.8300**	**0.1158**		**2,887.2617**

3.5 Building Construction - 2031

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.0158	32.8423	67.8695	0.2101	6.0435	0.8229	6.8664	1.7200	0.7571	2.4771		19,686.3905	19,686.3905	0.1318		19,689.1591
Worker	6.8010	8.2745	109.1759	0.5510	42.1174	0.3587	42.4760	11.1697	0.3328	11.5025		35,211.5532	35,211.5532	1.3619		35,240.1529
Total	**11.8168**	**41.1168**	**177.0454**	**0.7611**	**48.1608**	**1.1816**	**49.3424**	**12.8897**	**1.0899**	**13.9796**		**54,897.9437**	**54,897.9437**	**1.4937**		**54,929.3119**

3.5 Building Construction - 2032

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3041	7.9179	16.1313	0.0308		0.1476	0.1476		0.1476	0.1476		2,884.8300	2,884.8300	0.1158		2,887.2617
Total	**1.3041**	**7.9179**	**16.1313**	**0.0308**		**0.1476**	**0.1476**		**0.1476**	**0.1476**		**2,884.8300**	**2,884.8300**	**0.1158**		**2,887.2617**

3.5 Building Construction - 2032

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	4.9897	32.7436	67.6264	0.2101	6.0434	0.8243	6.8677	1.7199	0.7584	2.4783		19,687.0971	19,687.0971	0.1320		19,689.8694
Worker	6.4503	7.9392	105.7071	0.5510	42.1174	0.3574	42.4748	11.1697	0.3316	11.5014		35,036.8211	35,036.8211	1.3326		35,064.8058
Total	**11.4399**	**40.6828**	**173.3335**	**0.7611**	**48.1607**	**1.1818**	**49.3425**	**12.8897**	**1.0900**	**13.9797**		**54,723.9182**	**54,723.9182**	**1.4646**		**54,754.6752**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3041	7.9179	16.1313	0.0308		0.1476	0.1476		0.1476	0.1476	0.0000	2,884.8300	2,884.8300	0.1158		2,887.2617
Total	**1.3041**	**7.9179**	**16.1313**	**0.0308**		**0.1476**	**0.1476**		**0.1476**	**0.1476**	**0.0000**	**2,884.8300**	**2,884.8300**	**0.1158**		**2,887.2617**

3.5 Building Construction - 2032

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	4.9897	32.7436	67.6264	0.2101	6.0434	0.8243	6.8677	1.7199	0.7584	2.4783		19,687.0971	19,687.0971	0.1320		19,689.8694
Worker	6.4503	7.9392	105.7071	0.5510	42.1174	0.3574	42.4748	11.1697	0.3316	11.5014		35,036.8211	35,036.8211	1.3326		35,064.8058
Total	**11.4399**	**40.6828**	**173.3335**	**0.7611**	**48.1607**	**1.1818**	**49.3425**	**12.8897**	**1.0900**	**13.9797**		**54,723.9182**	**54,723.9182**	**1.4646**		**54,754.6752**

3.6 Paving - 2032

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3549	6.9800	15.5192	0.0275		0.3234	0.3234		0.3234	0.3234		2,599.9866	2,599.9866	0.1219		2,602.5460
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.3549**	**6.9800**	**15.5192**	**0.0275**		**0.3234**	**0.3234**		**0.3234**	**0.3234**		**2,599.9866**	**2,599.9866**	**0.1219**		**2,602.5460**

3.6 Paving - 2032

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0257	0.0316	0.4208	2.1900e-003	0.1677	1.4200e-003	0.1691	0.0445	1.3200e-003	0.0458		139.4778	139.4778	5.3000e-003		139.5892
Total	**0.0257**	**0.0316**	**0.4208**	**2.1900e-003**	**0.1677**	**1.4200e-003**	**0.1691**	**0.0445**	**1.3200e-003**	**0.0458**		**139.4778**	**139.4778**	**5.3000e-003**		**139.5892**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3549	6.9800	15.5192	0.0275		0.3234	0.3234		0.3234	0.3234	0.0000	2,599.9866	2,599.9866	0.1219		2,602.5460
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.3549**	**6.9800**	**15.5192**	**0.0275**		**0.3234**	**0.3234**		**0.3234**	**0.3234**	**0.0000**	**2,599.9866**	**2,599.9866**	**0.1219**		**2,602.5460**

3.6 Paving - 2032

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0257	0.0316	0.4208	2.1900e-003	0.1677	1.4200e-003	0.1691	0.0445	1.3200e-003	0.0458		139.4778	139.4778	5.3000e-003		139.5892
Total	**0.0257**	**0.0316**	**0.4208**	**2.1900e-003**	**0.1677**	**1.4200e-003**	**0.1691**	**0.0445**	**1.3200e-003**	**0.0458**		**139.4778**	**139.4778**	**5.3000e-003**		**139.5892**

3.6 Paving - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3549	6.9800	15.5192	0.0275		0.3234	0.3234		0.3234	0.3234		2,599.9866	2,599.9866	0.1219		2,602.5460
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.3549**	**6.9800**	**15.5192**	**0.0275**		**0.3234**	**0.3234**		**0.3234**	**0.3234**		**2,599.9866**	**2,599.9866**	**0.1219**		**2,602.5460**

3.6 Paving - 2033

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0245	0.0305	0.4094	2.1900e-003	0.1677	1.4200e-003	0.1691	0.0445	1.3200e-003	0.0458		138.8963	138.8963	5.2000e-003		139.0056
Total	**0.0245**	**0.0305**	**0.4094**	**2.1900e-003**	**0.1677**	**1.4200e-003**	**0.1691**	**0.0445**	**1.3200e-003**	**0.0458**		**138.8963**	**138.8963**	**5.2000e-003**		**139.0056**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3549	6.9800	15.5192	0.0275		0.3234	0.3234		0.3234	0.3234	0.0000	2,599.9866	2,599.9866	0.1219		2,602.5460
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.3549**	**6.9800**	**15.5192**	**0.0275**		**0.3234**	**0.3234**		**0.3234**	**0.3234**	**0.0000**	**2,599.9866**	**2,599.9866**	**0.1219**		**2,602.5460**

3.6 Paving - 2033

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0245	0.0305	0.4094	2.1900e-003	0.1677	1.4200e-003	0.1691	0.0445	1.3200e-003	0.0458		138.8963	138.8963	5.2000e-003		139.0056
Total	**0.0245**	**0.0305**	**0.4094**	**2.1900e-003**	**0.1677**	**1.4200e-003**	**0.1691**	**0.0445**	**1.3200e-003**	**0.0458**		**138.8963**	**138.8963**	**5.2000e-003**		**139.0056**

3.7 Architectural Coating - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	241.0096					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1308	0.8563	1.7977	2.9700e-003		0.0203	0.0203		0.0203	0.0203		281.4481	281.4481	0.0114		281.6873
Total	**241.1404**	**0.8563**	**1.7977**	**2.9700e-003**		**0.0203**	**0.0203**		**0.0203**	**0.0203**		**281.4481**	**281.4481**	**0.0114**		**281.6873**

3.7 Architectural Coating - 2033

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	1.2311	1.5319	20.5792	0.1103	8.4279	0.0713	8.4992	2.2351	0.0661	2.3013		6,981.8538	6,981.8538	0.2616		6,987.3473
Total	**1.2311**	**1.5319**	**20.5792**	**0.1103**	**8.4279**	**0.0713**	**8.4992**	**2.2351**	**0.0661**	**2.3013**		**6,981.8538**	**6,981.8538**	**0.2616**		**6,987.3473**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	241.0096					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1308	0.8563	1.7977	2.9700e-003		0.0203	0.0203		0.0203	0.0203	0.0000	281.4481	281.4481	0.0114		281.6873
Total	**241.1404**	**0.8563**	**1.7977**	**2.9700e-003**		**0.0203**	**0.0203**		**0.0203**	**0.0203**	**0.0000**	**281.4481**	**281.4481**	**0.0114**		**281.6873**

3.7 Architectural Coating - 2033

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	1.2311	1.5319	20.5792	0.1103	8.4279	0.0713	8.4992	2.2351	0.0661	2.3013		6,981.8538	6,981.8538	0.2616		6,987.3473
Total	**1.2311**	**1.5319**	**20.5792**	**0.1103**	**8.4279**	**0.0713**	**8.4992**	**2.2351**	**0.0661**	**2.3013**		**6,981.8538**	**6,981.8538**	**0.2616**		**6,987.3473**

3.7 Architectural Coating - 2034

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	241.0096					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1308	0.8563	1.7977	2.9700e-003		0.0203	0.0203		0.0203	0.0203		281.4481	281.4481	0.0114		281.6873
Total	**241.1404**	**0.8563**	**1.7977**	**2.9700e-003**		**0.0203**	**0.0203**		**0.0203**	**0.0203**		**281.4481**	**281.4481**	**0.0114**		**281.6873**

3.7 Architectural Coating - 2034

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	1.1775	1.4848	20.0146	0.1103	8.4279	0.0709	8.4989	2.2351	0.0658	2.3010		6,956.8161	6,956.8161	0.2567		6,962.2069
Total	**1.1775**	**1.4848**	**20.0146**	**0.1103**	**8.4279**	**0.0709**	**8.4989**	**2.2351**	**0.0658**	**2.3010**		**6,956.8161**	**6,956.8161**	**0.2567**		**6,962.2069**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	241.0096					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1308	0.8563	1.7977	2.9700e-003		0.0203	0.0203		0.0203	0.0203	0.0000	281.4481	281.4481	0.0114		281.6873
Total	**241.1404**	**0.8563**	**1.7977**	**2.9700e-003**		**0.0203**	**0.0203**		**0.0203**	**0.0203**	**0.0000**	**281.4481**	**281.4481**	**0.0114**		**281.6873**

3.7 Architectural Coating - 2034

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	1.1775	1.4848	20.0146	0.1103	8.4279	0.0709	8.4989	2.2351	0.0658	2.3010		6,956.8161	6,956.8161	0.2567		6,962.2069
Total	**1.1775**	**1.4848**	**20.0146**	**0.1103**	**8.4279**	**0.0709**	**8.4989**	**2.2351**	**0.0658**	**2.3010**		**6,956.8161**	**6,956.8161**	**0.2567**		**6,962.2069**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

Increase Diversity

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	205.4694	410.3801	1,917.4839	7.5955	465.7250	10.8501	476.5751	124.6851	10.0141	134.6992		544,668.3733	544,668.3733	14.4487		544,971.7950
Unmitigated	226.4181	533.1004	2,410.8880	10.8433	674.4145	15.1143	689.5288	180.5560	13.9474	194.5034		777,344.5220	777,344.5220	20.2720		777,770.2335

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	18,241.12	19,818.88	16801.76	62,400,240	43,091,231
General Office Building	3,936.30	847.32	350.37	9,608,775	6,635,454
Office Park	4,213.98	605.16	280.44	10,597,138	7,317,980
Single Family Housing	29,226.78	30,784.32	26783.58	99,440,000	68,669,479
Strip Mall	61,339.32	58,183.78	28275.32	106,859,458	73,793,074
Total	116,957.50	110,239.46	72,491.47	288,905,610	199,507,218

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
General Office Building	16.60	8.40	6.90	33.00	48.00	19.00	77	19	4
Office Park	16.60	8.40	6.90	33.00	48.00	19.00	82	15	3
Single Family Housing	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Strip Mall	16.60	8.40	6.90	16.60	64.40	19.00	45	40	15

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.491908	0.059855	0.185077	0.131229	0.044940	0.007356	0.019164	0.046757	0.003019	0.003347	0.004084	0.000506	0.002760

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	4.1947	35.9367	15.9210	0.2288		2.8982	2.8982		2.8982	2.8982		45,760.3749	45,760.3749	0.8771	0.8389	46,038.8649
NaturalGas Unmitigated	4.1947	35.9367	15.9210	0.2288		2.8982	2.8982		2.8982	2.8982		45,760.3749	45,760.3749	0.8771	0.8389	46,038.8649

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Office Building	3575.21	0.0386	0.3505	0.2944	2.1000e-003		0.0266	0.0266		0.0266	0.0266		420.6129	420.6129	8.0600e-003	7.7100e-003	423.1727
Office Park	3103.64	0.0335	0.3043	0.2556	1.8300e-003		0.0231	0.0231		0.0231	0.0231		365.1346	365.1346	7.0000e-003	6.6900e-003	367.3567
Single Family Housing	282532	3.0469	26.0373	11.0797	0.1662		2.1051	2.1051		2.1051	2.1051		33,239.0568	33,239.0568	0.6371	0.6094	33,441.3442
Strip Mall	8797.01	0.0949	0.8625	0.7245	5.1700e-003		0.0656	0.0656		0.0656	0.0656		1,034.9421	1,034.9421	0.0198	0.0190	1,041.2406
Apartments Mid Rise	90955.3	0.9809	8.3822	3.5669	0.0535		0.6777	0.6777		0.6777	0.6777		10,700.6285	10,700.6285	0.2051	0.1962	10,765.7508
Total		**4.1947**	**35.9367**	**15.9211**	**0.2288**		**2.8982**	**2.8982**		**2.8982**	**2.8982**		**45,760.3749**	**45,760.3749**	**0.8771**	**0.8389**	**46,038.8649**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Office Park	3.10364	0.0335	0.3043	0.2556	1.8300e-003		0.0231	0.0231		0.0231	0.0231		365.1346	365.1346	7.0000e-003	6.6900e-003	367.3567
Single Family Housing	282.532	3.0469	26.0373	11.0797	0.1662		2.1051	2.1051		2.1051	2.1051		33,239.0568	33,239.0568	0.6371	0.6094	33,441.3442
Strip Mall	8.79701	0.0949	0.8625	0.7245	5.1700e-003		0.0656	0.0656		0.0656	0.0656		1,034.9421	1,034.9421	0.0198	0.0190	1,041.2406
Apartments Mid Rise	90.9553	0.9809	8.3822	3.5669	0.0535		0.6777	0.6777		0.6777	0.6777		10,700.6285	10,700.6285	0.2051	0.1962	10,765.7508
General Office Building	3.57521	0.0386	0.3505	0.2944	2.1000e-003		0.0266	0.0266		0.0266	0.0266		420.6129	420.6129	8.0600e-003	7.7100e-003	423.1727
Total		**4.1947**	**35.9367**	**15.9211**	**0.2288**		**2.8982**	**2.8982**		**2.8982**	**2.8982**		**45,760.3749**	**45,760.3749**	**0.8771**	**0.8389**	**46,038.8649**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	245.5218	5.5240	478.8483	0.0254		2.6644	2.6644		2.6644	2.6644	0.0000	865.3334	865.3334	0.8245	0.0000	882.6478
Unmitigated	1,775.1155	44.2309	3,405.2291	4.6811		447.3972	447.3972		447.3273	447.3273	54,534.1989	105,661.3334	160,195.5323	163.4560	3.7014	164,775.5409

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	29.7718					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	205.4395					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	1,525.5736	38.7070	2,926.3808	4.6557		444.7328	444.7328		444.6629	444.6629	54,534.1989	104,796.0000	159,330.1989	162.6315	3.7014	163,892.8931
Landscaping	14.3306	5.5240	478.8483	0.0254		2.6644	2.6644		2.6644	2.6644		865.3334	865.3334	0.8245		882.6478
Total	**1,775.1155**	**44.2309**	**3,405.2291**	**4.6811**		**447.3972**	**447.3972**		**447.3273**	**447.3273**	**54,534.1989**	**105,661.3334**	**160,195.5323**	**163.4560**	**3.7014**	**164,775.5410**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	25.7517					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	205.4395					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	14.3306	5.5240	478.8483	0.0254		2.6644	2.6644		2.6644	2.6644		865.3334	865.3334	0.8245		882.6478
Total	**245.5218**	**5.5240**	**478.8483**	**0.0254**		**2.6644**	**2.6644**		**2.6644**	**2.6644**	**0.0000**	**865.3334**	**865.3334**	**0.8245**	**0.0000**	**882.6478**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

```
CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
         JUNE 1989 VERSION
         PAGE   1

     JOB: Butterfield Ranch Rd & Soquel Cyn - AM
     RUN: Hour 1           (WORST CASE ANGLE)
POLLUTANT:
```

I. SITE VARIABLES

```
      U=   0.5 M/S            Z0= 100. CM            ALT=   365. (M)
    BRG= WORST CASE           VD=  0.0 CM/S
   CLAS=     7 (G)            VS=  0.0 CM/S
   MIXH= 1000. M             AMB=  1.6 PPM
  SIGTH=   10. DEGREES       TEMP= 20.0 DEGREE (C)
```

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Butterfield	198	194	34	324	AG	2607	2.8	0.0	40.0
B. Butterfield	247	155	436	0	AG	2240	2.8	0.0	40.0
C. Soquel north	242	194	324	324	AG	2508	0.0	0.0	40.0
D. Soquel south	109	0	208	155	AG	1908	0.0	0.0	40.0

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. 1	208	213	0.0
2. 2	266	179	0.0
3. 3	227	128	0.0
4. 4	184	174	0.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D
1. 1	296.	2.1	0.5	0.0	0.0	0.0
2. 2	145.	1.9	0.0	0.3	0.0	0.0
3. 3	113.	1.9	0.0	0.3	0.0	0.0
4. 4	322.	2.1	0.5	0.0	0.0	0.0

```
CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
         JUNE 1989 VERSION
         PAGE   1

     JOB: Soquel Cyn & Pomona Rincon - AM
     RUN: Hour 1           (WORST CASE ANGLE)
POLLUTANT:
```

I. SITE VARIABLES

```
      U=   0.5 M/S            Z0= 100. CM           ALT=   365. (M)
    BRG= WORST CASE           VD=  0.0 CM/S
   CLAS=     7 (G)            VS=  0.0 CM/S
   MIXH= 1000. M             AMB=  1.6 PPM
  SIGTH=   10. DEGREES       TEMP= 20.0 DEGREE (C)
```

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Soquel north	224	219	300	341	AG	4363	2.8	0.0	40.0
B. Soquel south	102	0	203	173	AG	3732	2.8	0.0	40.0
C. Pomona Rinco	242	186	509	173	AG	2129	0.0	0.0	40.0

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. 1	229	168	0.0
2. 2	237	203	0.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C
1. 1	225.	2.2	0.0	0.6	0.0
2. 2	19.	2.4	0.8	0.0	0.0

```
CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
         JUNE 1989 VERSION
         PAGE   1

     JOB: Chino Hills Pkwy & Pipeline Ave - AM
     RUN: Hour 1           (WORST CASE ANGLE)
POLLUTANT:
```

I. SITE VARIABLES

```
      U=   0.5 M/S            Z0= 100. CM            ALT=   365. (M)
    BRG= WORST CASE           VD=  0.0 CM/S
   CLAS=     7 (G)            VS=  0.0 CM/S
   MIXH= 1000. M             AMB=  1.6 PPM
  SIGTH=   10. DEGREES       TEMP= 20.0 DEGREE (C)
```

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Chino Hills	249	165	471	167	AG	3363	2.8	0.0	40.0
B. Chino Hills	0	165	217	165	AG	3301	2.8	0.0	40.0
C. Pipeline nor	231	181	228	315	AG	1703	2.8	0.0	40.0
D. Pipeline sou	233	144	231	0	AG	1547	2.8	0.0	40.0

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. 1	212	185	0.0
2. 2	252	191	0.0
3. 3	252	141	0.0
4. 4	212	141	0.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D
1. 1	259.	2.3	0.0	0.7	0.0	0.0
2. 2	259.	2.3	0.0	0.5	0.2	0.0
3. 3	76.	2.2	0.6	0.0	0.0	0.0
4. 4	284.	2.2	0.0	0.6	0.0	0.0

```
CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
         JUNE 1989 VERSION
         PAGE   1

     JOB: Chino Hills Pkwy & Pipeline Ave - PM
     RUN: Hour 1           (WORST CASE ANGLE)
POLLUTANT:
```

I. SITE VARIABLES

```
      U=   0.5 M/S            Z0= 100. CM           ALT=   365. (M)
    BRG= WORST CASE           VD=  0.0 CM/S
   CLAS=     7 (G)            VS=  0.0 CM/S
   MIXH= 1000. M             AMB=  1.6 PPM
  SIGTH=   10. DEGREES       TEMP= 20.0 DEGREE (C)
```

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Chino Hills	249	165	471	167	AG	4433	2.8	0.0	40.0
B. Chino Hills	0	165	217	165	AG	4192	2.8	0.0	40.0
C. Pipeline nor	231	181	228	315	AG	2891	2.8	0.0	40.0
D. Pipeline sou	233	144	231	0	AG	2246	2.8	0.0	40.0

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. 1	212	185	0.0
2. 2	252	191	0.0
3. 3	252	141	0.0
4. 4	212	141	0.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D
1. 1	259.	2.5	0.0	0.9	0.0	0.0
2. 2	259.	2.5	0.0	0.6	0.3	0.0
3. 3	76.	2.4	0.8	0.0	0.0	0.0
4. 4	284.	2.4	0.0	0.8	0.0	0.0

```
CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
         JUNE 1989 VERSION
         PAGE   1

     JOB: Chino Hills Pkwy & Peyton Ave - AM
     RUN: Hour 1           (WORST CASE ANGLE)
POLLUTANT:
```

I. SITE VARIABLES

```
      U=   0.5 M/S            Z0= 100. CM           ALT=   365. (M)
    BRG= WORST CASE           VD=  0.0 CM/S
   CLAS=     7 (G)            VS=  0.0 CM/S
   MIXH= 1000. M             AMB=  1.6 PPM
  SIGTH=   10. DEGREES       TEMP= 20.0 DEGREE (C)
```

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Chino Hills	270	183	833	183	AG	3295	2.8	0.0	40.0
B. Chino Hills	224	178	0	155	AG	3187	2.8	0.0	40.0
C. Peyton north	244	203	244	341	AG	1758	2.8	0.0	40.0
D. Peyton south	254	0	244	155	AG	2192	2.8	0.0	40.0

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. 1	216	203	0.0
2. 2	272	203	0.0
3. 3	267	158	0.0
4. 4	221	152	0.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D
1. 1	96.	2.2	0.6	0.0	0.0	0.0
2. 2	97.	2.5	0.9	0.0	0.0	0.0
3. 3	81.	2.3	0.7	0.0	0.0	0.0
4. 4	83.	2.2	0.5	0.0	0.0	0.1

Chino HIlls and PeytonPM.dat.out

```
CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
         JUNE 1989 VERSION
         PAGE   1

     JOB: Chino Hills Pkwy & Peyton Ave - PM
     RUN: Hour 1           (WORST CASE ANGLE)
POLLUTANT:
```

I. SITE VARIABLES

```
      U=   0.5 M/S            Z0= 100. CM           ALT=   365. (M)
    BRG= WORST CASE           VD=  0.0 CM/S
   CLAS=     7 (G)            VS=  0.0 CM/S
   MIXH= 1000. M             AMB=  1.6 PPM
  SIGTH=   10. DEGREES      TEMP= 20.0 DEGREE (C)
```

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Chino Hills	270	183	833	183	AG	4344	2.8	0.0	40.0
B. Chino Hills	224	178	0	155	AG	4760	2.8	0.0	40.0
C. Peyton north	244	203	244	341	AG	1902	2.8	0.0	40.0
D. Peyton south	254	0	244	155	AG	2919	2.8	0.0	40.0

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. 1	216	203	0.0
2. 2	272	203	0.0
3. 3	267	158	0.0
4. 4	221	152	0.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D
1. 1	249.	2.4	0.0	0.8	0.0	0.0
2. 2	97.	2.7	1.1	0.0	0.0	0.0
3. 3	80.	2.4	0.8	0.0	0.0	0.0
4. 4	279.	2.4	0.0	0.8	0.0	0.0

Chino HIlls and Carbon CanyonAM.dat.out

```
CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
         JUNE 1989 VERSION
         PAGE   1

     JOB: Chino Hills Pkwy & Carbon Canyon Rd - AM
     RUN: Hour 1           (WORST CASE ANGLE)
POLLUTANT:
```

I. SITE VARIABLES

```
      U=   0.5 M/S            Z0= 100. CM           ALT=   365. (M)
    BRG= WORST CASE           VD=  0.0 CM/S
   CLAS=     7 (G)            VS=  0.0 CM/S
   MIXH= 1000. M             AMB=  1.6 PPM
  SIGTH=   10. DEGREES       TEMP= 20.0 DEGREE (C)
```

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Chino Hills	243	162	509	91	AG	3241	2.8	0.0	40.0
B. Chino Hills	205	186	57	319	AG	2271	2.8	0.0	40.0
C. Carbon Canyo	233	195	310	319	AG	24	2.8	0.0	40.0
D. Carbon Canyo	105	0	210	157	AG	1475	2.8	0.0	40.0

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. 1	219	210	0.0
2. 2	248	186	0.0
3. 3	229	145	0.0
4. 4	186	169	0.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D
1. 1	120.	2.0	0.4	0.0	0.0	0.0
2. 2	117.	2.2	0.6	0.0	0.0	0.0
3. 3	97.	2.3	0.7	0.0	0.0	0.0
4. 4	103.	2.1	0.5	0.0	0.0	0.0

Chino HIlls and Carbon CanyonPM.dat.out

```
CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
         JUNE 1989 VERSION
         PAGE   1

     JOB: Chino Hills Pkwy & Carbon Canyon Rd - PM
     RUN: Hour 1           (WORST CASE ANGLE)
POLLUTANT:
```

I. SITE VARIABLES

```
      U=   0.5 M/S            Z0= 100. CM           ALT=   365. (M)
    BRG= WORST CASE           VD=  0.0 CM/S
   CLAS=     7 (G)            VS=  0.0 CM/S
   MIXH= 1000. M             AMB=  1.6 PPM
  SIGTH=   10. DEGREES       TEMP= 20.0 DEGREE (C)
```

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Chino Hills	243	162	509	91	AG	5099	2.8	0.0	40.0
B. Chino Hills	205	186	57	319	AG	3002	2.8	0.0	40.0
C. Carbon Canyo	233	195	310	319	AG	16	2.8	0.0	40.0
D. Carbon Canyo	105	0	210	157	AG	3464	2.8	0.0	40.0

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. 1	219	210	0.0
2. 2	248	186	0.0
3. 3	229	145	0.0
4. 4	186	169	0.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D
1. 1	120.	2.1	0.5	0.0	0.0	0.0
2. 2	117.	2.5	0.9	0.0	0.0	0.0
3. 3	97.	2.6	1.0	0.0	0.0	0.0
4. 4	103.	2.4	0.7	0.0	0.0	0.1

```
CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
         JUNE 1989 VERSION
         PAGE   1

     JOB: Peyton Drive & Grand Ave - AM
     RUN: Hour 1           (WORST CASE ANGLE)
POLLUTANT:
```

I. SITE VARIABLES

```
      U=   0.5 M/S            Z0= 100. CM            ALT=   365. (M)
    BRG= WORST CASE           VD=  0.0 CM/S
   CLAS=     7 (G)            VS=  0.0 CM/S
   MIXH= 1000. M             AMB=  1.6 PPM
  SIGTH=   10. DEGREES       TEMP= 20.0 DEGREE (C)
```

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Grand east	220	149	392	165	AG	2785	2.8	0.0	40.0
B. Grand west	169	137	0	86	AG	3627	2.8	0.0	40.0
C. Peyton north	186	161	128	263	AG	2514	2.8	0.0	40.0
D. Peyton south	234	0	204	122	AG	3046	2.8	0.0	40.0

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. 1	165	157	0.0
2. 2	212	169	0.0
3. 3	231	126	0.0
4. 4	173	114	0.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D
1. 1	241.	2.3	0.0	0.7	0.0	0.0
2. 2	97.	2.1	0.5	0.0	0.0	0.0
3. 3	263.	2.1	0.0	0.4	0.0	0.1
4. 4	268.	2.2	0.0	0.6	0.0	0.0

```
CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
         JUNE 1989 VERSION
         PAGE   1

     JOB: Peyton Drive & Grand Ave - PM
     RUN: Hour 1           (WORST CASE ANGLE)
POLLUTANT:
```

I. SITE VARIABLES

```
      U=   0.5 M/S            Z0= 100. CM            ALT=   365. (M)
    BRG= WORST CASE           VD=  0.0 CM/S
   CLAS=     7 (G)            VS=  0.0 CM/S
   MIXH= 1000. M             AMB=  1.6 PPM
  SIGTH=   10. DEGREES       TEMP= 20.0 DEGREE (C)
```

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Grand east	220	149	392	165	AG	3605	2.8	0.0	40.0
B. Grand west	169	137	0	86	AG	3465	2.8	0.0	40.0
C. Peyton north	186	161	128	263	AG	3037	2.8	0.0	40.0
D. Peyton south	234	0	204	122	AG	2985	2.8	0.0	40.0

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. 1	165	157	0.0
2. 2	212	169	0.0
3. 3	231	126	0.0
4. 4	173	114	0.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D
1. 1	241.	2.3	0.0	0.7	0.0	0.0
2. 2	97.	2.3	0.7	0.0	0.0	0.0
3. 3	68.	2.2	0.6	0.0	0.0	0.0
4. 4	268.	2.2	0.0	0.6	0.0	0.0

```
CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
         JUNE 1989 VERSION
         PAGE   1

     JOB: Peyton & Eucalyptus- AM
     RUN: Hour 1           (WORST CASE ANGLE)
POLLUTANT:
```

I. SITE VARIABLES

```
      U=   0.5 M/S            Z0= 100. CM           ALT=   365. (M)
    BRG= WORST CASE           VD=  0.0 CM/S
   CLAS=     7 (G)            VS=  0.0 CM/S
   MIXH= 1000. M             AMB=  1.6 PPM
  SIGTH=   10. DEGREES       TEMP= 20.0 DEGREE (C)
```

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Peyton north	194	271	188	162	AG	3182	2.8	0.0	20.0
B. Peyton south	170	0	182	129	AG	1882	2.8	0.0	20.0
C. Eucalyptus e	404	139	206	146	AG	1362	2.8	0.0	20.0
D. Eucalyptus w	0	146	180	148	AG	1038	2.8	0.0	20.0

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. 1	170	160	0.0
2. 2	210	164	0.0
3. 3	194	133	0.0
4. 4	168	133	0.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D
1. 1	23.	2.2	0.6	0.0	0.0	0.0
2. 2	338.	2.1	0.5	0.0	0.0	0.0
3. 3	358.	2.2	0.6	0.0	0.0	0.0
4. 4	19.	2.2	0.5	0.0	0.0	0.2

```
CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
         JUNE 1989 VERSION
         PAGE   1

     JOB: Peyton & Eucalyptus- PM
     RUN: Hour 1           (WORST CASE ANGLE)
POLLUTANT:
```

I. SITE VARIABLES

```
      U=   0.5 M/S            Z0= 100. CM           ALT=   365. (M)
    BRG= WORST CASE           VD=  0.0 CM/S
   CLAS=     7 (G)            VS=  0.0 CM/S
   MIXH= 1000. M             AMB=  1.6 PPM
  SIGTH=   10. DEGREES       TEMP= 20.0 DEGREE (C)
```

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Peyton north	194	271	188	162	AG	2862	2.8	0.0	20.0
B. Peyton south	170	0	182	129	AG	2414	2.8	0.0	20.0
C. Eucalyptus e	404	139	206	146	AG	1861	2.8	0.0	20.0
D. Eucalyptus w	0	146	180	148	AG	1985	2.8	0.0	20.0

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. 1	170	160	0.0
2. 2	210	164	0.0
3. 3	194	133	0.0
4. 4	168	133	0.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D
1. 1	175.	2.4	0.0	0.4	0.0	0.3
2. 2	262.	2.1	0.1	0.0	0.0	0.4
3. 3	198.	2.3	0.0	0.7	0.0	0.0
4. 4	19.	2.4	0.4	0.0	0.0	0.3

```
CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
         JUNE 1989 VERSION
         PAGE   1

     JOB: Pipeline Ave & Woodview Rd - AM
     RUN: Hour 1           (WORST CASE ANGLE)
POLLUTANT:


 I.  SITE VARIABLES

       U=   0.5 M/S            Z0= 100. CM           ALT=   365. (M)
     BRG= WORST CASE           VD=  0.0 CM/S
    CLAS=     7 (G)            VS=  0.0 CM/S
    MIXH= 1000. M             AMB=  1.6 PPM
   SIGTH=   10. DEGREES      TEMP= 20.0 DEGREE (C)


 II.  LINK VARIABLES

      LINK      *  LINK COORDINATES (M)   *              EF     H     W
  DESCRIPTION   *   X1    Y1    X2    Y2  * TYPE  VPH  (G/MI)  (M)   (M)
----------------*-------------------------*------------------------------
A. Pipeline     *   261   278   180     0 *  AG   2503   2.8    0.0  40.0
B. Woodview     *   222   158     0    10 *  AG    985   2.8    0.0  40.0


III.  RECEPTOR LOCATIONS

            *    COORDINATES (M)
  RECEPTOR  *    X      Y      Z
------------*---------------------
1. 1        *    224    172   0.0
2. 2        *    210    141   0.0


 IV.  MODEL RESULTS (WORST CASE WIND ANGLE )

            *       * PRED  * CONC/LINK
            *  BRG  * CONC  *   (PPM)
 RECEPTOR   * (DEG) * (PPM) *   A    B
-------------*-------*-------*----------
1. 1        *  195. *   2.2 *  0.6  0.1
2. 2        *   24. *   2.2 *  0.5  0.1
```

Appendix D – Results of Biological Overview, Prepared by Glenn Lukos Associates, Inc. dated October 21, 2010

GLENN LUKOS ASSOCIATES
Regulatory Services

October 21, 2010

Joann Lombardo
Comprehensive Planning Services
P.O. Box 15592
Newport Beach, California 92659

SUBJECT: Results of Biological Overview for the City of Chino Hills, San Bernardino County, California.

Dear Ms. Lombardo:

Per your request, the following letter identified special-status species and habitats that have potential to occur within the City of Chino Hills based on literature review and site reconnaissance.

Impacts to special-status species and habitats must be addressed during project review under the California Environmental Quality Act (CEQA). In addition, species Federally listed as threatened or endangered are regulated by the U.S. Fish and Wildlife Service (USFWS) pursuant to the Federal Endangered Species Act (ESA). Species listed as threatened or endangered by the State of California are regulated by the California Department of Fish and Game (CDFG) pursuant to the State ESA. Wildlife that are assigned other designations by CDFG (i.e., species of concern, fully-protected species, etc.), and plants given special status by the California Native Plant Society (CNPS) are not granted additional protection, except that impacts to these species may need to be evaluated pursuant to CEQA.

I. SITE DESCRIPTION

The City of Chino Hills is located within southwest San Bernardino County, California [Exhibit 1 – Regional Map]. The City is generally bounded by Interstate 60 to the north, Highway 71 to the east, the Santa Ana River to the south and Los Angeles County to the west. The City is located within the eastern Puente-Chino Hills, which are at the northern end of the Peninsular Ranges geomorphic province and are bounded on the northwest by the San Gabriel Valley, on the northeast by the San Bernardino Valley, and on the south by the Santa Ana River Canyon and the

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Los Angeles Basin [Exhibit 2 – Survey Area Map]. Elevations vary from approximately 500 feet to 1,600 feet above sea level.

The City is underlain by sandstone bedrock of the Puente Formation and the Topanga Formation and is traversed by the Chino Fault. In general, the underlying geologic formations of a given area will ultimately dictate the vegetation that may establish, and the wildlife that the vegetation will support. Soils develop from the erosion and weathering of parent materials, which depending on the type of parent materials will determine the resulting soil types. Individual plant species, including many sensitive plant species, often have particular soil requirements, including whether the soil is well drained or not, and the type of soil as defined by the particle size (i.e., clay, sand, loam, etc.). For example, species such as Munz's onion (*Allium munzii*) and many-stemmed dudleya (*Dudleya multicaulis*) occur in clay soils in scrub and grassland habitats, whereas chaparral sand verbena (*Abronia villosa* var. *aurita*) occurs in sandy soils associated with scrub habitats. Certain plant species are further restricted to areas with very specific parent material, which affects the chemistry of the soil. For example, Braunton's milk-vetch (*Astragalus brauntonii*) usually occurs in soils containing calcium carbonate. In addition to soil types, geologic faults and fractures in the underlying rock can allow for water to seep to the surface, which allows for the development of isolated seep wetlands amongst a broader area of upland vegetation. These isolated seeps provide habitat for plants and wildlife that may not typically occupy the adjacent upland habitats, in addition to representing a water source for wildlife.

The Study Area for the scope of this letter report excludes Chino Hills State Park, which is addressed separately by the Chino Hills State Park General Plan. The Study Area totals approximately 34 square miles.

II. METHODOLOGY

GLA biologists visited the study area on August 4, 2010. Site reconnaissance was conducted in such a manner as to allow inspection of approximately 20-percent of the Study Area [Exhibit 2 – Survey Area Map] by direct observation, including the use of binoculars[1]. Site reconnaissance was intended to familiarize biologists with the vegetation communities/land cover types occurring within the study area and each community's distinct characteristics that distinguish it on the aerial photography. Aerial photography was then used in the office to complete habitat mapping for those areas not examined in the field.

[1] GLA focused on the "undeveloped" portions of the Study Area, that is areas with natural vegetation (both native and non-native) as developed areas exhibit minimal potential for supporting special-status plants, animals or communities.

In addition to site reconnaissance, evaluation of the facilities included a review of the July 2010 California Natural Diversity Database (CNDDB) for the Black Star Canyon, Ontario, Orange, Prado Dam, San Dimas and Yorba Linda Quadrangles[2], the 2010 California Native Plant Society (CNPS) inventory[3], the U.S. Fish and Wildlife Service (FWS) Wetland Inventory[4], and FWS critical habitat maps for endangered and threatened species.

III. RESULTS

Suitable habitat for a variety of special-status plant and animal species occurs within the Study Area as described below.

A. Vegetation/Land Cover Mapping

As described above, generalized mapping of major vegetation communities and land cover types was carried out based upon aerial photography with spot checks in the field. Vegetation communities have been classified according to a combination of FWS wetland mapping categories and Holland vegetation classification[5]. Table 1 below summarizes the approximate acreage of each community type. Exhibit 3 depicts the distribution of habitat communities within the Study Area.

TABLE 1: Vegetation or Land Cover Types Observed Within the Chino Hills Study Area

Habitat Type	Approximate Area (acres)	Percentage of Total
Developed	8,816	41.0
Annual Grasslands	7,985	37.2
Diegan Coastal Sage Scrub	1,665	7.8
Coast Live Oak Woodland	778	3.6
Chaparral	741	3.4
Southern Willow Scrub	417	1.9

[2] California Department of Fish and Game. July 2010. Natural Diversity Database: RareFind 2.
[3] California Native Plant Society. 2010. Inventory of Rare and Endangered Plants of California (v7-10b). Rare Plant Advisory Committee, David Tibor Convening Editor, California Native Plant Society, Sacramento, California, accessed electronically via www.cnps.org
[4] U.S. Fish and Wildlife Service. 2010. National Wetlands Inventory. Accessed electronically via http://www.fws.gov/wetlands/Data/Mapper.html
[5] Holland, R. October 1986. Preliminary Description of the Terrestrial Natural Communities of California. Department of Fish and Game, California.

Walnut Woodland	288	1.3
Agriculture	207	1.0
Coast Live Oak Riparian Forest	180	0.8
Riverine	155	0.7
Coastal Sage Scrub/Chaparral Ecotone	104	0.5
Freshwater Emergent Wetland	70	0.3
Sycamore-Alder Riparian Woodland	40	0.2
Open Water	36	0.2
Total	**21,482**	**100%**

Developed

Approximately 41-percent of the Study Area consists of residential and commercial development including ornamental vegetation and landscaping.

Annual Grasslands

Annual grassland is dominated by annual grasses that are primarily of Mediterranean origin. Approximately 37-percent of the Study Area consists of annual grassland. Dominant species found in this community include wild oat (*Avena fatua*), ripgut grass (*Bromus diandrus*), foxtail chess (*Bromus madritensis* ssp. *rubens*), foxtail barley (*Hordeum murinum* ssp. *leporinum*)wild radish (*Raphanus sativus*), bull thistle (*Cirsium vulgare*), tocalote (*Centaurea melitensis*) and wild mustard (*Brassica nigra*).

Diegan Coastal Sage Scrub

Diegan Coastal Sage Scrub consists of drought-deciduous, low, soft-leaved shrubs with herbaceous understory on gentle to steep slopes under 3,000 feet. Approximately 8-percent of the Study Area supports Diegan sage scrub communities. Dominant species in this community include California sagebrush (*Artemesia californica*) and California buckwheat (*Eriogonum fasciculatum*). Other component species include laurel sumac (*Malosma laurina*), coast goldenbush (*Isocoma menziesii*), white sage *(Salvia apiana*), black sage (*Salvia mellifera*), deerweed (*Lotus scoparius*) and coyote brush (*Baccharis pilularis*). Diegan Coastal Sage Scrub is designated by DFG & CNDDB with a Sensitivity 3.1 “very threatened” (S3.1)- “Occurs in 21-100 viable locations statewide and/or between 10,000 and 50,000 acres of habitat remaining.” This habitat has potential to support federally threatened coastal California gnatcatcher (*Polioptila californica californica*) as well as several other special status species as detailed in Tables 2 and 3.

Coast Live Oak Woodland

Coast Live Oak Woodland is dominated by coast live oak (*Quercus agrifolia*) and exhibits a shrub layer that varies from sparse to moderately dense and may include toyon (*Heteromeles arbitufolia*), gooseberry (*Ribes* spp.), laurel sumac, and Mexican elderberry (*Sambucus nigra*). Approximately 4-percent of the Study Area supports coast live oak woodland communities. Coast Live Oak Woodland and southern California Coast Live Oak Riparian Forest are designated by DFG & CNDDB with a Sensitivity 4 (S4)- "Occurs in more than 100 viable locations statewide and/or more than 50,000 acres of habitat remaining."

Chaparral

Chaparral communities consist of evergreen, broad-leafed or needle-leafed, sclerophyllous (hard-leafed), medium height to tall shrubs that form a dense cover on steep slopes. The herbaceous understory is often sparse to nonexistent but there is often a substantial accumulation of leaf litter in mature chaparral stands. Approximately 3-percent of the Study Area supports chaparral communities. Dominant species within this community include black sage, laurel sumac, scrub oak (*Quercus berberidifolia*), lemonade berry (*Rhus integrifolia*), toyon and Mexican elderberry.

Southern Willow Scrub

Southern willow scrub is characterized by dense, broad leafed, winter-deciduous riparian thickets dominated by one or more willow species. The dominant species of this community is arroyo willow (*Salix lasiolepis*), black willow (*Salix gooddingii*), mule fat (*Baccharis salicifolia*) and stinging nettle (*Urtica dioica*). Approximately 2-percent of the Study Area supports southern willow scrub communities. Southern Willow Scrub communities are designated by the Department of Fish and Game (DFG) & CNDDB with a Sensitivity 2.1 "very threatened" (S2.1)- "Occurs in 6 to 20 known locations and/or 2,000 to 10,000 acres of habitat remaining." This habitat has some potential to support federally listed species including least Bell's vireo (*Vireo bellii pusillus*) and southwestern willow flycatcher (*Empidonax traillii extimus*).

California Walnut Woodland

California walnut woodland is an open to occasionally closed- canopy woodland dominated by California black walnut (*Juglans californica*). The understory is sparse with scattered patches of annual grasses. This subassociation occurs on moist, fine-textured soils of valley slopes and bottoms. Approximately 1-percent of the Study Area supports California walnut woodland communities. Walnut woodlands communities are designated by the Department of Fish and

Game (DFG) & CNDDB with a Sensitivity 2.1 “very threatened” (S2.1)- “Occurs in 6 to 20 known locations and/or 2,000 to 10,000 acres of habitat remaining.

Agriculture

Approximately 1-percent of the Study Area consists of agricultural lands.

Southern California Coast Live Oak Riparian Forest

Coast Live Oak Riparian Woodland is dominated by coast live oak and possesses a poorly developed shrub layer that may include poison oak (*Toxicodendron diversilobium*), toyon, laurel sumac and Mexican elderberry. Riparian oak woodland habitats were distinguished from upland oak woodland habitats based on their association with drainages as described above. Approximately 1-percent of the Study Area supports southern California coast live oak riparian forest communities. Southern California Coast Live Oak Riparian Forest is designated by DFG & CNDDB with a Sensitivity 4 (S4)- “Occurs in more than 100 viable locations statewide and/or more than 50,000 acres of habitat remaining.”

Riverine

Approximately 1-percent of the Study Area consists of unvegetated ephemeral, intermittent or perennial stream channels.

Coastal Sage Scrub/Chaparral Ecotone

Less than 1-percent of the Study Area consists of a mosaic of overlapping Chaparral and Coastal Sage Scrub communities.

Freshwater Emergent Wetland

Freshwater emergent wetland consists of freshwater marsh and freshwater seep communities. This habitat type is generally located within perennial or intermittent channel bottoms and is characterized by grass, forb and emergent species such as southern cattail (*Typha domingensis*), bulrush (*Scirpus* spp.), Mexican rush (*Juncus mexicanus*), spike rush (*Eleocharis* spp.), and rabbitsfoot grass (*Polypogon monspeliensis*). Less than 1-percent of the Study Area supports freshwater emergent wetland communities. Freshwater Marsh is designated by the Department of Fish and Game (DFG) & CNDDB with a Sensitivity 2.1 “very threatened” (S2.1) - “Occurs in 6 to 20 known locations and/or 2,000 to 10,000 acres of habitat remaining.”

Southern Sycamore-Alder Riparian Woodland

Southern Sycamore-Alder Riparian Woodland is dominated by western sycamore (*Platanus racemosa*) and may support white alder (*Alnus rhombifolia*), California blackberry (*Rubus ursinus*) and poison oak in the understory. Less than 1-percent of the Study Area supports southern sycamore-alder riparian woodland communities. Southern Sycamore-Alder Riparian Woodland is designated by DFG & CNDDB with a Sensitivity 4 (S4)- "Occurs in more than 100 viable locations statewide and/or more than 50,000 acres of habitat remaining."

Open Water

Less than 1-percent of the Study Area consists of Open Water.

B. <u>Special-Status Animals</u>

Table 2 provides a summary of special status animal species with potential to occur within the Study Area. Species were considered based on a number of factors, including: 1) species identified by the July 2010 CNDDB as occurring (either currently of historically) within or in the vicinity of the Study Area and 2) any other special-status species that are known to occur within the vicinity of the property, or for which potentially suitable habitat occurs on site. Exhibit 4 depicts CNDDB records for those species that are known to occur in the Study Area.

Table 2. Special-status animals with potential to occur within the Chino Hills Study Area

Species Name	Status	Habitat Requirements
FEDERALLY OR STATE-LISTED SPECIES		
FISH		
Santa Ana sucker *Catostomus santaanae*	Federal: FT State: None CDFG: CSC	Inhabits cool, clear water streams with sand-rubble-boulder bottoms.
BIRDS		
Coastal California gnatcatcher *Polioptila californica californica*	Federal: FT State: None CDFG: CSC	Inhabits low elevation coastal sage scrub and coastal bluff scrub.
Least Bell's vireo *Vireo bellii pusillus*	Federal: FE State: SE CDFG: None	Inhabits riparian scrub or forest in vicinity of water or in dry river bottoms. Usually builds nest near ground in thickets of willow, mule fat or blackberry.
Southwestern willow flycatcher *Empidonax traillii extimus*	Federal: FE State: SE CDFG: None	Inhabits riparian woodlands with a seasonal or perennial source of water.
Swainson's Hawk (nesting) *Buteo swainsoni*	Federal: None State: SE CDFG: None	Forages over open grassland, scrub or agricultural areas. Chino Hills falls outside of the nesting range for this species.
Western yellow-billed cuckoo *Coccyzus americanus occidentalis*	Federal: FC State: SE CDFG: None	Occurs in riparian forest nester, along the broad, lower flood-bottoms of larger river systems. Nests in riparian jungles of willow, often mixed with cottonwoods, with lower story of blackberry, nettles, or wild grape.
OTHER SPECIAL-STATUS SPECIES		
FISH		
Arroyo chub *Gila orcutti*	**Federal:** None **State:** None **CDFG:** CSC	Inhabits slow-moving or backwater sections of warm to cool (10-24ºC) streams with mud or sand substrates. Depths are typically greater than 40 cm.
AMPHIBIANS		
Coast Range Newt *Taricha torosa torosa*	Federal: None State: None CDFG: CSC	Inhabits perennial or intermittent streams with a canopy of oaks, sycamores and willow.
Western spadefoot *Scaphiopus hammondii*	Federal: FSC State: None CDFG: CSC	Inhabits seasonal pools in coastal sage scrub, chaparral, and grassland habitats.
REPTILES		
Coast horned lizard *Phrynosoma coronatum blainvillei*	Federal: None State: None CDFG: CSC	Inhabits coastal sage scrub and chaparral in arid and semi-arid climate conditions.
Coast patch-nosed snake *Salvadora hexalepis virgultea*	Federal: None State: None	Inhabits brushy or shrubby vegetation with small mammal burrows.

Species Name	Status	Habitat Requirements
	CDFG: CSC	
Northern red-diamond rattlesnake *Crotalus ruber rubber*	Federal: None State: None CDFG: CSC	Inhabits chaparral, woodland, grassland, and desert areas with rocky areas and dense vegetation.
Orange-throated whiptail *Aspidoscelis hyperythra*	Federal: None State: None CDFG: CSC	Inhabits low-elevation coastal scrub, chaparral, and valley-foothill hardwood habitats. Prefers sandy washes and other sandy areas with patches of brush and rocks.
Silverly legless lizard *Anniella pulchra pulchra*	Federal: None State: None CDFG: CSC	Inhabits areas with sandy or loose organic soil, or where there is plenty of leaf litter. Associated with coastal sage scrub, chaparral, coastal dunes, valley/foothill grasslands, oak woodlands, and pine forests.
Southwestern pond turtle *Emys marmorata pallida*	Federal: None State: None CDFG: CSC	Inhabits permanent or nearly permanent bodies of water in many habitat types. Require basking sites such as partially submerged logs, vegetation mats, or open mud banks.
Two-striped garter snake *Thamnophis hammondii*	Federal: None State: None CDFG: CSC	Inhabits pools, creeks, cattle tanks, and other water sources, often in rocky areas, in oak woodland, chaparral, brushland, and coniferous forest.
BIRDS		
Burrowing owl *Athene cunicularia*	Federal: None State: None CDFG: CSC	Inhabits open, dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation.
Coastal cactus wren *Campylorhynchus brunneicapillus sandiegensis*	Federal: None State: None CDFG: CSC	Inhabits coastal sage scrub with opuntia cactus for nesting and roosting.
Golden eagle (nesting and wintering) *Aquila chrysaetos*	Federal: None State: None CDFG: FP	Inhabits rolling foothills, mountain areas, sage-juniper flats, and deserts with cliff-walled canyons and large trees in open areas.
Grasshopper sparrow (nesting) *Ammodramus savannarum*	Federal: None State: None CDFG: CSC	Inhabits dense grasslands on rolling hills, lowland plains, in valleys, and on hillsides on lower mountain slopes. Favors native grasslands with a mix of grasses, forbs, and scattered shrubs. Loosely colonial when nesting.
Loggerhead shrike *Lanius ludovicianus*	Federal: None State: None CDFG: CSC	Inhabits pastures with fence rows, old orchards, mowed roadsides, cemeteries, golf courses, riparian areas, open woodland, agricultural fields, desert washes, desert scrub, grassland, broken chaparral and beach with scattered shrubs.
Long-eared owl (nesting) *Asio otus*	Federal: None State: None CDFG: CSC	Inhabits riparian bottomlands grown to tall willows and cottonwoods; also, belts of live oak paralleling stream courses.
Northern harrier (nesting) *Circus cyaneus*	Federal: None State: None CDFG: CSC	Inhabits open habitats such as fields, savannas, meadows, marshes, upland prairies, and desert steppe. Also occur in agricultural areas and riparian zones. Densest populations are

Species Name	Status	Habitat Requirements
		found in large expanses of undisturbed, open habitats with dense, low vegetation. Breeds on meadows and open marshland.
Tricolored blackbird (nesting colonies) *Agelaius tricolor*	Federal: None State: None CDFG: CSC	Requires open water, protected nesting substrate, and foraging area with insect prey within a few kilometers of the colony.
White-tailed kite (nesting) *Elanus leucurus*	Federal: None State: None CDFG: CFP	Inhabits low elevation open grasslands, savannah-like habitats, agricultural areas, wetlands, and oak woodlands. Dense canopies used for nesting and cover.
Yellow-breasted chat (nesting) *Icteria virens*	Federal: None State: None CDFG: CSC	Inhabits riparian thickets of willow and other brushy tangles often near watercourses. Nests in dense riparian areas consisting of willow, blackberry, and wild grape.
Yellow warbler (nesting) *Dendroica petechia*	Federal: None State: None CDFG: CSC	Inhabits lowland and foothill riparian woodlands dominated by cottonwoods, alders, or willows and other small trees and shrubs typical of low, open-canopy riparian woodland. During migration, forages in woodland, forest, and shrub habitats.
MAMMALS		
American badger *Taxidea taxis*	Federal: None State: None CDFG: CSC	Inhabits drier open stages of most shrub, forest, and herbaceous habitats, with friable soils.
Big free-tailed bat *Nyctinomops macrotis*	Federal: None State: None CDFG: CSC WBWG: MH	Roosts in high cliffs or rocky outcrops. Forages over low-lying arid areas.
Mexican long-tongued bat *Choeronycteris mexicana*	Federal: None State: None CDFG: CSC WBWG: H	Roosts in caves, mines and buildings.
Northwestern San Diego pocket mouse *Chaetodipus fallax fallax*	Federal: None State: None CDFG: CSC	Inhabits coastal sage scrub, sage scrub/grassland ecotones, and chaparral.
Pallid Bat *Antrozous pallidus*	Federal: None State: None CDFG: CSC WBWG: H	Roosts in a variety of structures including rock crevices, tree hollows, mines, caves and human structures.
Pocketed free-tailed bat *Nyctinomops femorosaccus*	Federal: None State: None CDFG: CSC WBWG: M	Inhabits a variety of arid areas in southern California including pine-juniper woodlands, desert scrub, palm oasis, desert wash and desert riparian. Roosts in rocky areas and high cliffs.
San Diego desert woodrat *Neotoma lepida intermedia*	Federal: None State: None	Inhabits a variety of shrub and desert habitats, primarily associated with rock outcrops, boulders, cacti, or areas of

Species Name	Status	Habitat Requirements
	CDFG: CSC	dense undergrowth.
Western mastiff bat *Eumops perotis californicus*	Federal: None State: None CDFG: CSC WBWG: H	Inhabits many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, and chaparral. Roosts in crevices in cliff faces, high buildings, trees, and tunnels.
Western red bat *Lasiurus blossevilliii*	Federal: None State: None CDFG: CSC WBWG: H	Roosts and forages predominantly in intact sycamore and cottonwood riparian habitat.
Western yellow bat *Lasiurus xanthinus*	Federal: None State: None CDFG: CSC WBWG: H	Inhabits valley foothill riparian, desert riparian, desert wash, and palm oasis habitats. Roosts in trees, particularly palms. Forages over water and among trees.
Yuma myotis *Myotis yumanensis*	Federal: None State: None CDFG: CSC WBWG: LM	Roosts in caves and old-buildings. Forages around areas of open water and in wooded canyons.

Federal
FE – Federally Endangered
FT – Federally Threatened
FPT – Federally Proposed Threatened
FSC – Federal Species of Concern
FC – Federal Candidate

CDFG
CSC – California Species of Concern
CFP – California Fully-Protected Species

State
SE – State Endangered
ST – State Threatened

WBWG
H – High Priority
MH – Medium-High Priority
M – Medium Priority
LM – Low-Medium Priority

1. State And Federally Listed Threatened Or Endangered Species with Potential to Occur within the Study Area

The following state and federally listed species have potential to occur within the Study Area within suitable habitat.

FISH

Santa Ana Sucker (*Catostomus santaanae*)

The Santa Ana sucker is federally listed as threatened and is a CDFG Species of Concern. This species requires requires clean, clear, and relatively cool streams of varying width and depth with appropriate substrates (e.g., a mix of sand, gravel, cobble, and boulder). The sucker scrapes algae and invertebrates from hard substrates such as gravel and cobbles and spawns over a gravel and cobble substrate.

Chino Creek may provide suitable habitat for this species.

BIRDS

California gnatcatcher (*Polioptila californica californica*)

The California gnatcatcher (CAGN) is federally listed as threatened and is a CDFG Species of Concern. This small songbird is a year-round, obligate resident of coastal sage scrub communities in southern California and northwestern Baja California, Mexico. The CAGN is insectivorous, and nests and forages in moderately dense stands of sage scrub occurring on arid hillsides, mesas, and in washes. The CAGN generally occur below 1,200 feet in elevation. Coastal sage scrub communities dominated by California sagebrush, California buckwheat, white sage, and black sage are preferred by this species. Loss and fragmentation of suitable habitat due to expanding development have been major factors in the decline of this bird in southern California.

Approximately 8.3-percent of the Study Area supports coastal sage scrub, which has potential to support California gnatcatcher. In addition, the southern most portion of the Study Area falls within federally-designated critical habitat for the CAGN.

Least Bell's Vireo (*Vireo belli pusillus*)

The Least bell's vireo (LBV) is a state- and federally listed as endangered. It is a small insectivorous migratory songbird, which is colored olive-gray above and whitish underneath. This vireo nests and forage almost exclusively in riparian woodland habitats. The LBV winters in southern Baja California, Mexico, and typically migrate between mid March and early April to southern California and northwestern Baja California, where they remain until late September.

Historically, the LBV was abundant in riparian habitats throughout the central valley, coastal southern California, and in scattered oases and canyons in California deserts. Populations declined dramatically owing to widespread destruction and degradation of riparian habitats and brood-parasitism by the brown-headed cowbird *(Molothrus ater*). The USFWS listed the LBV as an endangered species in 1986. The largest LBV populations in southern California are currently located at the Prado Basin in Riverside County, and along the Tijuana River, the San Luis Rey River, the San Diego River, the Santa Margarita River and other drainages in Camp Pendelton in San Diego County. During the last decade, the LBV has begun to exhibit a substantial recovery due in large measure to management, including trapping to remove brown-headed cowbirds from areas occupied by the vireo. Habitat restoration has also provided additional habitat areas for this species, contributing to its recovery.

Approximately 2-percent of the Study Area supports southern willow scrub, which has potential to support the LBV. In addition, the southeastern edge of the Study Area falls within federally designated critical habitat for the LBV.

Southwestern Willow Flycatcher (*Empidonax traillii extimus*)

The southwestern willow flycatcher (SWFL) is state and federally listed as endangered. It is a small, insectivorous songbird, which is drab olive-brown above with a white throat and a pale yellow belly. It is one of four subspecies of willow flycatchers recognized in North America, and is distinguished by subtle differences in color and morphology. Although the subspecies occupy distinct breeding ranges, northern subspecies (*E. t. brewsteri* and *E. t. adastus*) do pass through southern California during migration.

The SWFL breeds in riparian habitats along rivers, streams, or other wetlands characterized by dense willows and shrubs in woodlands with standing water. Willow flycatcher subspecies winter in Mexico and Central America, and typically arrive at breeding sites in the southwest in mid-May and remain until late August.

Historically, the SWFL were abundant in riparian habitats throughout southern California, Arizona, New Mexico, southwestern Colorado, southern Nevada and Utah, western Texas, and extreme northern Mexico. SWFL currently occupies a small fraction of its former range. The decline has been attributed to widespread destruction and degradation of riparian habitats and brood-parasitism by the brown-headed cowbird. As a result, the SWFL was listed by CDFG as an endangered species in1991and was federally listed as endangered in 1995. Currently, less than 100 breeding pairs are known in southern California. Most are located at the Kern Valley Nature Reserve, Kern County, the San Luis Rey River and Camp Pendelton Marine Corps Base in San Diego County, the San Ynez River, Santa Barbara County, and Prado Dam in Riverside County.

Approximately 2-percent of the Study Area supports southern willow scrub, which has some potential to support the SWFL.

Swainson's hawk (*Buteo swainsonii*)

The Swainson’s hawk is state-listed as threatened. The Swainson’s hawk is a rare visitor to this region and is not known to nest within the Study Area. This species may forage in open grassland, scrub habitats or agricultural areas.

Western yellow-billed cuckoo *(Coccyzus americanus occidentalis*)

The western yellow-billed cuckoo is federally designated as a species of concern and state listed as endangered. The species requires broad tracts of mixed old growth riparian forests including a canopy of willow and cottonwood and a dense understory of blackberry, nettles and wild grape.

2. Other Special-Status Species with the Potential to Occur Within the Study Area

The following special status species have potential to occur within the Study Area within suitable habitat.

FISH

Arroyo Chub (*Gila Orcutti*)

The arroyo chub is designated as a California Species of Concern. This species requires year-round flowing water with deep pools and muddy substrate. The arroyo chub is a small (typically < 4 inches), chunky minnow with gray-olive green backs and white bellies, fairly large eyes, and small mouths. Arroyo chubs eat algae and small insects and other invertebrates that they pick off plants or off the bottom. They breed from February through August, and during the breeding season, males develop bumps, called breeding tubercles, on their pectoral fins. The fish is native to the Los Angeles, San Gabriel, San Luis Rey, Santa Ana, and Santa Margarita rivers and to Malibu and San Juan creeks. Currently, they are absent or rare in much of their native range, and are only abundant in portions of the Santa Margarita River and Trabuco, San Juan, and Malibu Creeks. Arroyo chub is threatened by habitat modification due to urbanization, and by competition with introduced minnow species such as the red shiner. It was declared a Fish Species of Special Concern in California by the Department of Fish and Game in 1995, and the department recommends protection and management of any remaining natural stream habitat in their range.

Perennial streams within the Study Area, including Chino Creek, provide suitable habitat for this species.

AMPHIBIANS

Coast Range California Newt (*Taricha torosa torosa*)

The Coast Range California newt, a state species of concern, occurs in the Coast Ranges, Transverse Ranges, and Peninsular Ranges from central Mendocino County to San Diego

County. It is commonly found in or near seasonal or permanent streams under cover of trees. Adults are sedentary during the dry season and become active after the first fall rains. Breeding occurs in shallow pools and eggs are attached to vegetation or rocks. Breeding adults and aquatic larvae are active during the day and at night.

Western Spadefoot Toad (*Scaphiopus hammondii*)

The western spadefoot toad is a federal and state species of concern. This toad occurs primarily in grassland or scrub habitats associated with temporary pools, which are essential for breeding and egg laying. The duration of standing water in the temporary pools is critical, which must be present for at least three or more weeks in order for the larvae to metamorphose. These breeding pools must be free of fish, bullfrogs, and crayfish in order for the species to successfully reproduce and metamorphose. Spadefoot toads also use riparian habitats with suitable pool resources for breeding, which must also be free of exotic pests.

REPTILES

Coast Horned Lizard (*Phrynosoma coronatum blainvillei*)

The coast horned lizard is a state species of concern. This lizard inhabits coastal sage scrub and chaparral habitats characterized associated with sandy, rocky, or shallow soils that support native harvester ants (*Pogonomyrmex* spp.).

Coast Patch-Nose Snake (*Salvadora hexalepis virgultea*)

The coast patch-nose snake has been designated a state species of concern. This snake inhabits sandy flats and rocky open areas in coastal sage scrub and chaparral.

Orange-Throated Whiptail (*Cnemidophorus hyperythrus*)

The orange-throated whiptail is a state species of concern. This lizard is known from coastal sage scrub, chaparral, and valley-foothill hardwood habitats of San Bernardino, Riverside, Los Angeles, Orange and San Diego counties. It prefers washes and other sandy areas with patches of brush and rocks.

Northern Red-Diamond Rattlesnake (*Crotalus ruber ruber*)

The northern red-diamond rattlesnake has been designated a state species of concern. This snake inhabits chaparral, woodland, grassland, and desert areas from Morongo Valley west to the coast

and south along the peninsular ranges to Baja California. The northern red-diamond rattlesnake occurs in rocky areas or dense vegetation and requires rodent burrows or in cracks in rocks for cover.

Silvery Legless Lizard (*Anniella pulchra pulchra*)

The silvery legless lizard is a state species of concern. This small secretive species lives and forages in leaf litter and under small debris within sandy washes, scrub habitats and woodlands.

Southwestern Pond Turtle (*Emys marmorata pallida*)

The southwestern pond turtle is designated as a state species of concern and inhabits slow moving permanent or intermittent streams, small ponds, small lakes, reservoirs, abandoned gravel pits, permanent and ephemeral shallow wetlands, stock ponds, and sewage treatment lagoons. Pools are the preferred habitat within streams. Abundant logs, rocks, submerged vegetation, mud, undercut banks, and ledges are necessary habitat components for cover as well as a water depth greater than 2 meters. Additionally, emergent basking sites, emergent vegetation and the availability of suitable terrestrial shelter and nesting sites seem to characterize optimal habitat. Adjacent upland areas typically provide overwintering and estivation sites.

Two-Striped Garter Snake (*Thamnophis hammondii*)

The two-striped garter snake is a state species of concern. This species requires year-round or near year-round water with riparian or emergent vegetation for shelter.

BIRDS

Burrowing Owl (Athene cunicularia)

The western burrowing owl is a federal and state species of concern. A petition to list this species under the California ESA has been submitted to CDFG , but was denied by the Fish and Game Commission. Less than 10,000 pairs of this owl occur in the state, with only the Imperial County population considered stable. The remaining populations within the state are considered declining. Burrowing owl habitat can be found in annual and perennial grasslands, deserts, and scrub characterized by generally flat areas with low-growing vegetation. Burrows are essential for successful breeding. This owl will occupy abandoned rodent burrows and man-made structures such as culverts, pipes, and debris piles. The burrowing owl nesting season begins as early as February and continues through August.

The wintering habitat assessment survey was conducted according to the guidelines issued by the Burrowing Owl Consortium. Special attention was given to areas of ground squirrel activity and vacant burrows that could potentially be used by a wintering or migrating owls within the development areas. Evidence of burrowing owl occupation would include the presence of white wash around the burrow entrance, discarded pellets, feathers, grasses within the burrow entrance, and/or the presence of small mammal, reptile, or bird bones.

Coastal Cactus Wren (*Campylorhynchus brunneicapillus couesi*)

The coastal cactus wren is a state species of concern. It is an obligate, non-migratory resident of the coastal sage scrub and chaparral plant communities that include substantial cover of cacti (*Opuntia* sp.) In addition to cacti, characteristic shrubs in suitable habitat include California buckwheat, coastal sage brush, several sages and scattered shrubs including lemonadeberry and laurel sumac. Cactus wrens forage on the ground or in low vegetation for insects or other small invertebrates, cactus fruits and other fruits, seeds and nectars. The coastal southern California populations of cactus wren were historically found continuously along coastal slopes and lowlands of southern California. Threats to the cactus wren include habitat loss and fragmentation from urbanization and agricultural development. Numerous cactus wrens were observed on site. In 1990, the coastal southern California populations of cactus wren were proposed for classification as a distinct subspecies and a petition for federal listing as endangered was submitted later that year. However, the proposed classification of the Pacific coast population of cactus wren was rejected by the American Ornithological Union and subsequently the USFWS rejected the petition for federal listing. Not withstanding the past regulatory reviews, southern California coastal plain populations of cactus wren have continued to decline due to habitat loss and fragmentation (Mock 1993, Unitt 2004).

Golden Eagle (*Aquila chrysaetos*)

The golden eagle is a state fully protected species. This raptor is an uncommon year-round resident in southern California (Garrett and Dunn 1981). This species occurs in rolling foothills, mountain areas, sage-juniper flats, and deserts. Nesting is primarily restricted to rugged, mountainous country. This large raptor preys primarily on small to medium-sized mammals, but will take on occasion larger mammals including foxes and young deer (Kaufman 1996). According to a 2001 report detailing Nesting Birds of Prey Monitoring results for Chino Hills State Park, up to 4 pairs of golden eagles are known to nest in the vicinity of Chino Hills State Park.

Grasshopper Sparrow (*Ammodramus savannarum*)

The grasshopper sparrow is a state species of concern. During the breeding season in California, grasshopper sparrows occur on mesas and slopes in dense, dry or well-drained grasslands, especially native grassland with a mix of grasses and forbs for foraging and nesting (Grinnell and Miller 1944; Garrett and Dunn 1981). Apparently, thick cover of grasses and forbs is essential for concealment. They require fairly continuous grassland areas with occasional taller stems for breeding areas (Garrett and Dunn 1981). They especially occur in grasslands composed of a variety of grasses and tall forbs with scattered shrubs for singing perches (Zeiner et al. 1990). Although shrub and forb species are used for perching, they tend to avoid grassland areas with extensive shrub cover and the presence of native grasses is less important than the absence of trees (Smith 1963; Vickery 1996). Grasshopper sparrows typically forage on the ground and in low foliage for insects (especially Orthoptera), other invertebrates, and grass and forb seeds, with grass seeds constituting a large percentage of winter diet. Because the species is a visual predator, bare ground is important for foraging.

Loggerhead Shrike (*Lanius ludovicianus)*

This species is a state species of concern, which forages over open ground within areas of short vegetation, pastures with fence rows, old orchards, mowed roadsides, cemeteries, golf courses, riparian areas, open woodland, agricultural fields, desert washes, desert scrub, grassland, broken chaparral and beach with scattered shrubs.

Long-Eared Owl (*Asio otus*)

The long-eared owl is designated as a state species of concern when nesting. Riparian habitat is required by the species but it also uses live oak thickets and other dense stands of trees. It usually hunts in open areas, occasionally in woodland and forested habitats. Riparian or other thickets with small, densely canopied trees are required for roosting and nesting. It is also found in dense conifer stands at higher elevations, however this is for roosting and nesting only and the forested areas within which it occurs are usually adjacent to more open habitat including grasslands and shrublands.

Northern Harrier (*Circus cyaneus*)

The northern harrier is state species of concern, but is a common, often abundant from September through April, winter visitor throughout California. Characteristically, this hawk inhabits marshlands, both coastal salt and freshwater, but often forages over grasslands and fields. It glides and flies low over open habitats searching for prey.

Tri-colored Blackbird (*Agelaius tricolor*)

The tri-colored blackbird is currently a state species of concern. It has a relatively restricted breeding range that extends from southern Oregon and the Modoc Plateau of northeastern California, south through the lowlands of California west of the Sierra Nevada to northwestern Baja California, Mexico. It is estimated that 95 percent of the tri-colored blackbird population is in California. The species is not migratory, but is nomadic and highly colonial. It exhibits "itinerant breeding" where large flocks may appear suddenly in areas from which they have been absent for months or years, breed, and then quickly leave.

The decline of the tri-colored blackbird has been attributed to several factors. Loss of breeding and foraging habitat are a key factor, but pollutants and predation by mesopredators (e.g., opossum, feral cats) and native birds (e.g., black-crowned night heron) appear also to have contributed to the decline of this species. Poisoning, either deliberate (to control crop depredation) or indirect, and increased disturbance by humans from agriculture operations such as harvesting, have been cited as contributing to the continued population decreases. Contamination by trace elements (selenium) and pesticides are a potential cause of nesting failures. Contaminants can have direct effects on individuals, but perhaps more importantly, may indirectly affect the food supply. Tri-color blackbird was a Candidate Species for listing as state endangered, but subsequent state-wide surveys indicated that population numbers were sufficiently large to preclude listing.

White-Tailed Kite (*Elanus leucurus*)

The white-tailed kite is a state fully protected species. White-tailed kite foraging habitat includes grasslands, open shrub, agricultural areas, wetlands dominated by grasses, fence rows and irrigation ditches (with residual vegetation) adjacent to grazed lands, riparian, oak woodlands, coastal sage scrub, and saltmarsh. They forage in almost any habitat with a dense population of voles (*Microtus* spp.); its main prey in coastal southern California is the California vole (*M. californicus*). It also preys on other small, diurnal mammals, and occasionally on birds, insects, reptiles, and amphibians. White-tailed kite use trees with dense canopies for nesting including oaks and willows.

Yellow-Breasted Chat (*Icteria virens longicauda*)

The yellow-breasted chat is designated as a state species of concern while nesting. Yellow-breasted chats in southern California are primarily found in dense, relatively wide riparian woodlands and thickets of willows, vine tangles, and dense brush with well-developed understories. Nesting areas are associated with streams, swampy ground, and the borders of

small ponds. Grinnell and Miller (1944) suggested that the plant cover in breeding habitat must be dense to provide shade and concealment.

Yellow Warbler (*Dendroica petechia*)

The yellow warbler, which is a state species of concern while nesting, is a migratory songbird that breeds in riparian habitats in southern California. This species exhibits habitat requirements similar to the yellow-breasted chat and least Bell's vireo. Suitable habitat typically consists of multi-layered riparian scrub or willow woodland corridors along flowing streams.

MAMMALS

American Badger (Taxidea taxis)

The American badger is a state species of concern. Badgers are found at low densities throughout the state. They mainly prey upon ground squirrels and pocket gophers and primarily inhabit grassland, scrub and forest habitats with friable soils.

Big free-tailed bat (*Nyctinomops macrotis*)

The big free-tailed bat is insectivorous. They are classified as state species of concern. They usually roost in rock crevices in high places, although sometimes they use man-made structures.

Mexican Long-Tongued Bat (*Choeronycteris Mexicana*)

The Mexican long-tongued bat feeds on nectar, pollen, fruits and insects. They are classified as state species of concern. They are generalists in their roosting requirements – using of a variety of structures including mines, caves, and human structures.

Northwestern San Diego Pocket Mouse *(Chaetodipus fallax fallax)*

The northwestern San Diego pocket mouse is a state species of concern that inhabits coastal sage scrub, sage scrub/grassland ecotones, and chaparral communities. It also inhabits open, sandy areas of both the Upper and Lower Sonoran life-zones of southwestern California and northern Baja California. Records indicate that the highest populations recorded for the San Diego pocket mouse in coastal sage scrub supporting a mixture of coastal sagebrush (*Artemisia californica*) and California buckwheat (*Eriogonum fasciculatum*) occurred at the Naval Weapons Station, Fallbrook Annex in northwestern San Diego County, but it was also relatively abundant in chaparral. The San Diego pocket mouse generally exhibits a strong microhabitat affinity for

moderately gravelly and rocky substrates, and, to a lesser extent, shrubby areas. In western Riverside County, the San Diego pocket mouse also commonly is found in disturbed grassland and open sage scrub vegetation with sandy-loam to loam soils.

The San Diego pocket mouse occurs in sage scrub (coastal sage scrub, Riversidean sage scrub, alluvial scrub), chaparral, and non-native grassland. Other natural habitats with records include big sagebrush scrub, coast live oak woodland, and riparian.

Pallid bat *(Antrozous pallidus)*

The pallid bat is primarily insectivorous, feeding on a wide variety of large arthropod prey that they typically capture on or near the ground. They are classified as state species of concern. They are generalists in their roosting requirements – using of a variety of structures including rock crevices, tree hollows, mines, caves, and human structures.

Pocketed free-tailed bat (*Nyctinomops femorosaccus*)

The pocketed free-tailed bat is a colonial, crevice-dwelling species found in a variety of habitats, but usually associated with high cliffs and rugged rock outcrops where they roost during the day. They are classified as state species of concern.

San Diego Desert Woodrat *(Neotoma lepida intermedia)*

The San Diego desert woodrat is designated as a state species of concern. Desert woodrats are found in a variety of shrub and desert habitats, primarily associated with rock outcroppings, boulders, cacti, or areas of dense undergrowth. Desert woodrats are noted for their flexibility or plasticity in utilizing various materials, such as twigs and other debris (sticks, rocks, dung), to build elaborate dens or "middens," which typically include several chambers for nesting and food, as well as several entrances. Middens may be used by several generations of woodrats. Woodrats often are associated with cholla cactus which they use for water and dens or boulders and boulder piles. Thus, their distribution is a consequence of habitat structure and heterogeneity (i.e., patchiness).

The desert woodrat often is associated with large cactus patches, and within coastal sage scrub communities, it almost is invariably associated with prickly pear (*Opuntia occidentalis*). It also is found in rocky outcroppings and boulder-covered hillsides in chaparral or oak woodlands. In chaparral, rock dens usually are located near primary food sources to minimize travel time and exposure to predators.

Western mastiff bat (*Eumops perotis*)

E. perotis is a federal and state species of concern. It is a colonial, cliff-roosting species whose distribution is constrained to areas where there are significant rock features offering suitable roosting habitat and major threats to the species are urban expansion and activities that disturb or destroy cliff habitat. Roosts of this species are usually within crevices high above the ground, and maternity colonies may consist of 30 to several hundred bats (less than 100 is more typical).

Western red bat (*Lasiurus blossevillii*)

The western red bat is a solitary, migratory, foliage roosting species that relies heavily on intact sycamore and cottonwood riparian habitat for both roosting and foraging. They are classified as state species of concern. Although individuals of this species have been detected in urban Orange and San Diego counties, particularly in areas with ornamental trees, urbanization and the creation of water storage reservoirs can impact the species.

Its presence is directly influenced by the availability of suitable trees and shrubs for roosting. Broad-leafed trees and orchards of avocado, apricots, and citrus were used most often as day roosts, and other trees and shrubs with foliage that was sufficiently dense to provide suitable hiding places were also used in areas where the favored tree species were not available.

Western Yellow Bat (*Lasiurus xanthinus*)

The western yellow bat is primarily insectivorous and forages over water and among trees. This species is classified as state species of concern. It roosts in leafy riparian vegetation such as sycamores or palms.

Yuma Myotis (*Myotis yumanensis*)

Yuma myotis is insectivorous and roost in large colonies in caves, mines and under bridges. They are classified as state species of concern.

C. <u>Special-Status Plants</u>

Table 3 provides a summary of special-status plants with potential to occur within the study area. Species were considered based on a number of factors, including: 1) species identified by the July 2010 CNDDB as occurring (either currently of historically) on or in the vicinity of the property, 2) species identified by the 2010 CNPS Rare Plant Inventory as occurring (either currently of historically) on or in the vicinity of the property and 3) any other special-status plants

that are known to occur within the vicinity of the property, or for which potentially suitable habitat occurs on site. Exhibit 4 depicts CNDDB records for those species that are known to occur in the Study Area.

Table 3. Special-status plants with potential to occur within the Chino Hills Study Area.

Species	Status	Habitat
FEDERALLY OR STATE-LISTED SPECIES		
Braunton's milk-vetch *Astragalus brauntonii*	Federal: FE State: None CNPS: List 1B.1	Occurs in closed-cone coniferous forest, chaparral, coastal sage scrub, valley and foothill grassland. Usually carbonate soils and recent burn or disturbed areas.
Munz's onion *Allium munzii*	Federal: FE State: ST CNPS: List 1B.1	Occurs in clay soils in chaparral, coastal sage scrub, and valley and foothill grasslands.
Nevin's barberry *Berberis nevinii*	Federal: FE State: SE CNPS: List 1B.1	Occurs in chaparral, cismontane woodland, coastal scrub, riparian scrub. Occurs on steep, north-facing slopes or in low-grade sandy washes.
San Fernando Valley spineflower *Chorizanthe parryi* var. *fernandina*	Federal: None State: SE CNPS: 1B.1	Occurs in coastal sage scrub and valley and foothill grasslands in sandy soils.
Thread-leaved brodiaea *Brodiaea filifolia*	Federal: FT State: SE CNPS: List 1B.1	Occurs in on clay soils in chaparral (openings), cismontane woodland, coastal sage scrub, playas, valley and foothill grassland, vernal pools.
OTHER SPECIAL-STATUS SPECIES		
Allen's Pentachaeta *Pentachaeta aurea* ssp. *allenii*	Federal: None State: None CNPS: List 1B.1	Occurs in valley and foothill grassland and openings in coastal sage scrub.
Brand's phacelia *Phacelia stellaris*	Federal: None State: None CNPS: List 1B.1	Occurs on coastal dunes and in coastal sage scrub with sandy soils. Known to occur in open areas of sage scrub associated with the Santa Ana River floodplain.
California black walnut (*Juglans californica*)	Federal: None State: None CNPS: List 4.2	Occurs in chaparral, cismontane woodland and coastal sage scrub in alluvial soils.
California satintail *Imperata brevifolia*	Federal: None State: None CNPS: List 2.1	Occurs in chaparral, coastal scrub, Mojavean desert scrub, meadows and seeps (often alkali), and riparian scrub/mesic habitats in wet springs, meadows, streamsides, and flood plains.
California saw-grass *Cladium californicum*	Federal: None State: None CNPS: List 2.2	Occurs in freshwater or alkaline marshes, seeps, meadows and swamps.
Chaparral nolina	Federal: None	Occurs in chaparral and coastal scrub on sandstone and shale

Species	Status	Habitat
Nolina cismontane	State: None CNPS: List 1B.2	substrates.
Chaparral ragwort *Senecio aphanactis*	Federal: None State: None CNPS: List 2.2	Occurs in alkaline flats in chaparral, cismontane woodland and coastal scrub
Chaparral sand verbena *Abronia villosa* var. *aurita*	Federal: None State: None CNPS: List 1B.1	Occurs in sandy areas in chaparral and coastal scrub.
Coulter's saltbush *Atriplex coulteri*	Federal: None State: None CNPS: List 1B.2	Occurs in coastal bluff scrub, coastal dunes, coastal scrub, valley and foothill grassland. Ocean bluffs, ridgetops, as well as alkaline low places.
Davidson's saltscale *Atriplex serenana* var. *davidsonii*	Federal: None State: None CNPS: List 1B.2	Occurs in alkaline soil in coastal bluff scrub and coastal scrub.
Heart-leaved pitcher sage *Lepechinia cardiophylla*	Federal: None State: None CNPS: List 1B.2	Occurs in closed-cone coniferous forest, chaparral, and cismontane woodland. Occurring on gabbroic, metavolcanic, or serpentinite soils.
Intermediate mariposa lily *Calochortus weedii* var. *intermedius*	Federal: None State: None CNPS: List 1B.2	Occurs in coastal scrub, chaparral, and valley and foothill grassland. Dry, rocky open slopes and rock outcrops.
Long-spined spineflower *Chorizanthe polygonoides* var. *longispina*	Federal: None State: None CNPS: List 1B.2	Occurs in clay soils in chaparral, coastal sage scrub, meadows and seeps, and valley and foothill grasslands.
Malibu baccharis *Baccharis malibuensis*	Federal: None State: None CNPS: List 1B.1	Occurs in chaparral, cismontane woodland, coastal sage scrub, riparian woodland.
Many-stemmed dudleya *Dudleya multicaulis*	Federal: None State: None CNPS: List 1B.2	Occurs in chaparral, coastal scrub, and valley and foothill grassland, in heavy, often clayey soils.
Mesa horkelia *Horkelia cuneata* ssp. *puberula*	Federal: None State: None CNPS: List 1B.1	Occurs in sandy or gravelly sites in chaparral, cismontane woodland, and coastal scrub.
Parry's spineflower *Chorizanthe parryi* var. *parryi*	Federal: None State: None CNPS: List 1B.1	Occurs in sandy or rocky soils in open habitats of chaparral and coastal sage scrub.
Plummer's mariposa lily *Calochortus plummerae*	Federal: None State: None CNPS: List 1B.2	Occurs in rocky and sandy sites, usually of granitic or alluvial material in coastal scrub, chaparral, valley and foothill grassland, cismontane woodland, and lower montane coniferous forest.
Prostrate vernal pool navarretia	Federal: None State: None	Occurs in vernal pools, coastal sage scrub, alkaline valley and foothill grassland, meadows and seeps.

Species	Status	Habitat
Navarretia prostrata	CNPS: List 1B.1	
Robinson's pepper-grass *Lepidium virginicum var. robinsonii*	Federal: None State: None CNPS: 1B.2	Occurs in dry soils in chaparral and coastal scrub.
Round-leaved filaree *Erodium macrophyllum*	Federal: None State: None CNPS: List 1B.1	Occurs in clay soils in cismontane woodland, valley, and foothill grassland.
Salt spring checkerbloom *Sidalcea neomexicana*	Federal: None State: None CNPS: List 2.2	Occurs in alkali springs and marshes in alkali playas, brackish marshes, chaparral, coastal scrub, lower montane coniferous forest, and Mojavean desert scrub.
San Bernardino aster *Symphyotrichum defoliatum*	Federal: None State: None CNPS: 1B.2	Occurs in cismontane woodland, coastal scrub, lower montane coniferous forest, meadows and seeps, marshes and swamps, and valley and foothill grassland (vernally mesic)/near ditches, streams springs.
Smooth tarplant *Centromadia pungens* ssp. *laevis*	Federal: None State: None CNPS: List 1B.1	Occurs in alkaline soils in chenopod scrub, meadows and seeps, playas, riparian woodland, valley and foothill grasslands, disturbed habitats.
Southern tarplant *Centromadia parryi* ssp. *australis*	Federal: None State: None CNPS: List 1B.1	Occurs in marshes and swamps, valley and foothill grassland, and vernal pools. Often in disturbed sites near the coast, also in alkaline soils sometimes with salt grass.
Vernal barley *Hordeum intercedens*	Federal: None State: None CNPS: List 3.2	Occurs in coastal dunes, coastal sage scrub, valley and foothill grassland (saline flats and depressions), and vernal pools.
White rabbit-tobacco *Pseudognaphalium leucocephaleum*	Federal: None State: None CNPS: 2.2	Occurs on sandy or gravelly slopes or in stream bottoms, arroyos, and areas of oak-sycamore, oak-pine, to pine woodlands. Commonly found in riparian vegetation.

Federal
FE - Federally Endangered
FT - Federally Threatened

State
SE - State Endangered
ST – State Threatened

CNPS
List 1B - Plants rare, threatened, or endangered in California and elsewhere.
List 2 - Plants rare, threatened, or endangered in California, but more common elsewhere.
List 3 – Plants about which more information is needed.

Threat Code extension
.1 – Seriously endangered in California (over 80% occurrences threatened)
.2 – Fairly endangered in California (20-80% occurrences threatened)
.3 – Not very endangered in California (<20% of occurrences threatened or no current threats known)

1. Federally- or State Listed Plant Species with Potential to Occur within the Chino Hills Study Area

The following state and federally listed plant species have potential to occur within the Study Area within suitable habitat.

Braunton's Milk Vetch

Braunton's Milk Vetch (*Astragalus brauntonii*) is a member of the pea family (FABACEAE) that is designated as a federal endangered species as well as a CNPS List 1B.1 species. This perennial herb is known to occur in chaparral, coastal scrub and valley and foothill grasslands below 640 meters (2,100 feet) MSL. Where it occurs, this species is most commonly found in recently burned/disturbed areas. Braunton's Milk Vetch is known from Ventura, Los Angeles, Orange and Riverside Counties. This species is known to bloom from January through August.

Munz's Onion

Munz's onion (*Allium munzii*) is a member of the onion family (ALLIACEAE) and is designated as federal endangered and state threatened as well as a CNPS List 1B.1 species. This perennial bulbiferous herb is known to occur in chaparral, cismontane woodland, coastal scrub, pinyon and juniper woodland and mesic valley and foothill grassland associated with clay soils from 297 to 1,070 meters (975 to 3,510 feet) MSL. Munz's onion is known to from Riverside County and is known to bloom from March through May.

Nevin's Barberry

Nevin's barberry (*Berberis nevinii*) is a member of the barberry family (BERBERIDACEAE) and is designated as a federal and state listed endangered species as well as a CNPS List 1B.1 species. This perennial evergreen shrub is known to occur in chaparral, cismontane woodland, coastal scrub and riparian scrub with gravelly substrates from 275 to 825 meters (900 to 2,705 feet) MSL. Nevin's barberry is known to occur from Los Angeles, San Bernardino, Riverside and San Diego counties and is known to bloom from March through June.

San Fernando Valley Spineflower

San Fernando Valley Spineflower (*Chroizanthe parryi* var. *fernandina*) is a member of the buckwheat family (POLYGONACEAE) that is designated as a CNPS List 1B.1 species but is not a state or federal listed species. This annual herb is known to occur in sandy coastal scrub and valley and foothill grassland from 150 to 1,220 meters (490 to 4,000 feet) MSL. This species is

known to occur in Los Angeles, Orange and Ventura Counties and is known to bloom from April through July.

Thread-leaved Brodiaea

Thread-leaved brodiaea (*Brodiaea filifolia*) is a member of the brodiaea family (THEMIDACEAE) and is designated as a federally threatened and state endangered species as well as a CNPS List 1B.1 species. This perennial herb is known to occur in chaparral, cismontane woodland, coastal scrub, playas, valley and foothill grasslands and vernal pools with clay substrates from 25 to 1,219 meters (82 to 3,998 feet) MSL. Thread-leaved brodiaea is known to occur from San Luis Obispo, Los Angeles, Riverside, Orange and San Diego counties and is known to bloom from March through June.

2. Special-Status Plants with the Potential to Occur Within One or More Facilities

The following special status plant species have potential to occur within the Study Area within suitable habitat.

Allen's Pentachaeta

Allen's pentachaeta (*Pentachaeta aurea* var. *allenii*) is a member of the sunflower family (ASTERACEAE) that is designated as a CNPS List 1B.1 species but is not a state or federal listed species. This annual herb is known to occur in openings of coastal scrub and valley and foothill grasslands from 75 to 520 meters (246 to 1,705 feet) MSL. Allen's pentachaeta is known to occur from Orange County and is known to bloom from March through June.

Brand's Star Phacelia

Brand's star phacelia (*Phacelia stellaris*) is a member of the waterleaf family (HYDROPHYLLACEAE) and is designated as a CNPS List 1B.1 species but is not a federal or state listed species. This annual herb is known to occur in coastal dunes and coastal scrub below 400 meters (1,310 feet) MSL from Los Angeles County south to San Diego County, California. Brand's star phacelia is known to bloom from March through June.

California Black Walnut

California black walnut (*Juglans californica*) is a member of the walnut family (JUGLANDIACEAE) that is designated as a CNPS List 4.2 species but is not state or federally listed. This perennial deciduous tree is known to occur in chaparral, cismontane woodland and

coastal scrub from 50 to 900 meters (165 to 2,952 feet) MSL. California black walnut is known to occur from Santa Barbara, Ventura, Los Angeles, Riverside, San Bernardino, Orange and San Diego counties and is known to bloom from March through August.

California Satintail

California satintail (*Imperata brevifolia*) is a member of the grass family (POACEAE) that is designated as a CNPS List 2.1 species but is not a state or federal listed species. This perennial herb id known to occur in chaparral, coastal scrub, Mojavean desert scrub, alkali meadows and seeps and vernal pools below 500 meters (1,640 feet) MSL. California satintail is known to occur from several counties in southern California including Los Angeles, Orange, Riverside, San Bernardino and Imperial Counties and is known to bloom from September through May.

California Sawgrass

California sawgrass (*Cladium californicum*) is a member of the sedge family (CYPERACEAE) that is designated as a CNPS List 2.2 species but is not a state or federal listed species. This perennial herb is known to occur in meadows and seeps and within freshwater and alkaline marshes and swamps from 60 to 600 meters (200 to 1,968 feet) MSL. This species is known from a variety of western states, however, in southern California it occurs in San Luis Obispo, Santa Barbara, Los Angeles, Riverside and San Bernardino Counties. This species is known to bloom from June through September.

Chaparral Nolina

Chaparral nolina (*Nolina cismontana*) is a member of the butcher's broom family (RUSCACEAE) and is designated as a CNPS List 1B.2 species but is not a state or federal listed species. This perennial evergreen shrub is known to occur in chaparral and coastal scrub with sandstone or gabbro substrates from 140 to 1,275 meters (460 to 4,182 feet) MSL. Chaparral nolina is known to occur from Ventura, Orange, Riverside and San Diego counties and is known to bloom from May through July.

Chaparral Ragwort

Chaparral ragwort (*Senecio aphanactis*) is a member of the sunflower family (ASTERACEAE) that is designated as a CNPS List 2.2 species but is not a state or federal listed species. This annual herb is known to occur in chaparral, cismontane woodland and alkaline coastal scrub and flats from 15 to 800 meters (49 to 2,624 feet) MSL. Chaparral ragwort is known to occur numerous counties in southern California including San Luis Obispo, Santa Barbara, Ventura,

Los Angeles, Orange and San Diego as well as several of the Channel Islands and Baja California. This species is known to bloom from January through April.

Chaparral Sand Verbena

Chaparral sand verbena (*Abronia villosa* var. *aurita*) is a member of the four o'clock family (NYCTAGINACEAE) that is designated as a CNPS List 1B.1 species but is not a state or federal listed species. This annual herb is known to occur in chaparral, coastal scrub and desert dunes from 80 to 1,600 meters (262 to 5,248 feet) MSL. Chaparral sand verbena is known from Ventura, Los Angeles, Orange, San Diego, Riverside, San Bernardino and Imperial Counties as well as Baja California. This species is known to bloom from January through September.

Coulter's Saltbush

Coulter's saltbush (*Atriplex coulteri*) is a member of the goosefoot family (CHENOPODIACEAE) that is designated as a CNPS LIST 1B.2 species but is not a state or federal listed species. This perennial herb is known to occur in coastal bluff scrub, coastal dunes, coastal scrub and foothill and valley grasslands with alkaline or clay soils from 3 to 460 meters (10 to 1509 feet) MSL. Coulter's saltbush is known to occur in Santa Barbara, San Luis Obispo, Orange, Ventura, Los Angeles, Orange, San Bernardino, and San Diego counties as well as several of the Channel Islands. This species is known to bloom from March through October.

Davidson's Saltscale

Davidson's saltscale (*Atriplex serenana* var. *davidsonii*) is a member of the goosefoot family (CHENOPODIACEAE) that is designated as a CNPS LIST 1B.2 species but is not a state or federal listed species. This annual herb is known to occur in coastal bluff scrub and coastal scrub with alkaline soils from 10 to 200 meters (33 to 656 feet) MSL. Davidson's saltscale is known to occur from San Luis Obispo, Ventura, Los Angeles, Orange, San Diego and Riverside counties as well as several of the Channel Islands. This species is known to bloom from April through October.

Heart-Leaved Pitcher Sage

Heart-leaved pitcher sage (*Lepechinia cardiophylla*) is a member of the mint family (LAMIACEAE) that is designated as a CNPS List 1B.2 species but is not a state or federal listed species. This perennial shrub is known to occur in chaparral, closed cone coniferous forest and cismontane woodland from 520 to 1,370 meters (1,705 to 4,494 feet) MSL. Heart-leaved pitcher

sage is known to occur from Orange, Riverside and San Diego counties as well as Baja California and is known to bloom from April through July.

Intermediate Mariposa Lily

Intermediate mariposa lily (*Calochortus weedii* var. *intermedius*) is a member of the Lily family (LILIACEAE) and is designated as a CNPS LIST 1B.2 species but is not a state or federal listed species. This species is known to occur in chaparral, coastal scrub and valley and foothill grasslands. Intermediate mariposa lily is known to occur from Los Angeles, Orange and Riverside counties. This species is known to bloom from May through July.

Long-Spined Spine Flower

Long-spined spine flower (*Chorizanthe polygonoides* var. *longispina*) is a member of the buckwheat family (POLYGONACEAE) and is designated as a CNPS List 1B.2 species but is not a state or federal listed species. This annual herb is known to occur in chaparral, coastal scrub, meadows and seeps, valley and foothill grasslands and vernal pools from 30 to 1,530 meters (98 to 5,018 feet) MSL. Long-spined spine flower is known to occur from Santa Barbara, Orange, Riverside, and San Diego counties as well as Baja California and is known to bloom from April through July.

Malibu Baccharis

Malibu baccharis (*Bacchatis malibuensis*) is a member of the sunflower family (ASTERACEAE) that is designated as a CNPS List 1B.1 species but is not a state or federal listed species. This perennial shrub is known to occur in chaparral, cismontane woodland, coastal scrub and riparian woodland from 150 to 305 meters (492 to 1,000 feet) MSL. Malibu baccharis is known to occur from Los Angeles and Orange Counties and is known to bloom in August.

Many-Stemmed Dudleya

Many-stemmed Dudleya (*Dudleya multicaulis*) is a member of the stonecrop family (CRASSULACEAE) that is designated as a CNPS List 1B.2 species but is not a federal or state listed species. This perennial herb is known to occur in chaparral, coastal scrub and valley and foothill grasslands and is often associated with clay soils. Many stemmed dudleya is known to occur from Los Angeles, Orange, Riverside, San Bernardino and San Diego counties from 15 to 790 meters (50 to 2,590 feet) MSL. This species is known to bloom from April through July.

Mesa Horkelia

Mesa horkelia (*Horkelia cuneata* ssp. *puberula*) is a member of the rose family (ROSACEAE) that is designated as a CNPS List 1B.1 species but is not a federal or state listed species. This perennial herb is known to occur in maritime chaparral, cismontane woodland and coastal scrub and is often associated with sandy or gravelly. Mesa horkelia is known to occur from Los Angeles, Orange, Riverside, San Bernardino, Santa Barbara, San Luis Obispo, Ventura and San Diego counties from 70 to 810 meters (230 to 2,660 feet) MSL. This species is known to bloom from February through July.

Parry's Spine Flower

Parry's spine flower (*Chorizanthe parryi* var. *parryi*) is a member of the buckwheat family (POLYGONACEAE) and is designated as a CNPS List 1B.1 species but is designated as a state or federal listed species. This annual herb is known to occur in chaparral, cismontane woodland, coastal scrub and in rocky or sandy openings in foothill valley and grasslands from 275 to 1,220 meters (900 to 4,001 feet) MSL. Parry's spine flower is known to occur from Los Angeles, Riverside and San Bernardino counties and is known to bloom from April through June.

Plummer's Mariposa Lily

Plummer's Mariposa Lily (*Calochortus plummerae*) is a member of the lily family (LILIACEAE) that is designates as a CNPS List 1B.2 species but is not a federal or state listed species. This species is known to occur in chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest and valley and foothill grassland from 100 to 1,700 meters (328 to 5,575 feet) MSL. This species is known to occur from Los Angeles, Orange, San Bernardino, Riverside and Ventura counties and is known to bloom from May through July.

Prostrate Vernal Pool Navarretia

Protrate Vernal Pool Navarretia (*Navarretia prostrata*) is a member of the phlox family (POLEMONIACEAE) that is designates as a CNPS List 1B.1 species but is not a federal or state listed species. This species is known to occur in coastal scrub, meadows and seeps, valley and foothill grassland with alkaline soils and in vernal pools from 15 to 700 meters (50 to 2,300 feet) MSL. This species is known to occur from Los Angeles, Orange, San Bernardino, Riverside, Merced, Alameda, Monterey, San Benito, San Diego and San Luis Obispo counties and is known to bloom from April through July.

Robinson's Peppergrass

Robinson's peppergrass (*Lepidium virginicum* var. *robinsonii*) is a member of the mustard family (BRASSICACEAE) that is designated as a CNPS List 1B.2 species but is not a state or federal listed species. This annual herb is known to occur in chaparral and coastal scrub below 855 meters (2,805 feet) MSL. Robinson's peppergrass is known to occur from Santa Barbara, Los Angeles, Orange, Riverside, San Bernardino and San Diego Counties as well as Baja California. This species is known to bloom from January through July.

Round-Leaved Filaree

Round-leaved filaree (*California macrophylla*) is a member of the geranium family (GERANIACEAE) that is designated as a CNPS List 1B.1 species but is not a state or federal listed species. This annual herb is known to occur on cismontane woodland, and valley and foothill grasslands with clay soils from 15 to 1,200 meters (50 to 3,936 feet) MSL. Round-leaved filaree is known to occur from several counties in southern California including San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Riverside and Dan Diego. This species is known to bloom from March through May.

Salt Spring Checkbloom

Salt Spring Checkerbloom (*Sidalcea neomexicana*) is a member of the mallow family (MALVACEAE) that is designated as a CNPS List 2.2 species but is not a state or federal listed species. This perennial herb is known to occur in chaparral, coastal scrub, lower montane coniferous forest, Mojavean desert scrub and alkaline playas from 15 to 1,530 meters (50 to 5,020 feet) MSL. Salt Spring Checkerbloom is known to occur in Ventura, Los Angeles, Orange, Riverside, San Bernardino and San Diego Counties. This species is known to bloom from March through June.

San Bernardino aster

San Bernardino aster (*Symphyotrichum defoliatum*) is a member of the sunflower family (ASTERACEAE) that is designated as a CNPS List 1B.2 species but is not a state or federal listed species. This rhizomatous herb is known to occur in cismontane woodland, coastal scrub, lower montane coniferous forest, meadows and seeps, marshes and swamps and valley and foothill grassland near ditches, streams and springs from 2 to 2,040 meters (6 to 6,690 feet) MSL. This species is known to occur in Kern, Los Angeles, Orange, San Bernardino, San Diego, San Luis Obispo and Riverside Counties and is known to bloom from July through November.

Smooth Tarplant

Smooth tarplant (*Centromadia pungens* subsp. *laevis*) is a member of the sunflower family (ASTERACEAE) that is designated as a CNPS List 1B.1 species but is not a state or federal listed species. This annual herb is known to occur in chenopod scrub, meadows and seeps, playas, riparian woodland and saline valley and foothill grasslands below 640 meters (2,100 feet) MSL. Smooth tarplant is known to occur from Riverside, San Bernardino and San Diego Counties and is known to bloom from April through September.

Southern Tarplant

Southern tarplant (*Centromadia parryi* subsp. *australis*) is a member of the sunflower family (ASTERACEAE) and is designated as a CNPS List 1B.1 species but is not designated as a state or federal listed species. This annual herb is known to occur in marshes and swaps, valley and foothill grasslands and vernal pools below 427 meters (1,400 feet) MSL. Southern tarplant is known to occur from Santa Barbara, Ventura, Los Angeles, Orange, San Diego as well as several of the Channel Islands in southern California. This species is known to bloom from May through November.

Vernal Barley

Vernal barley (*Hordeum intercedens*) is a member of the grass family (POACEAE) that is designated as a CNPS List 3.2 species but is not a federal or state listed species. This annual herb is known to occur in coastal dunes, coastal scrub and saline flats and depressions within valley and foothill grasslands and vernal pools from 5 to 1,000 meters (16 to 3,280 feet) MSL from Fresno County south to Baja California. Vernal barley is known to bloom from March through June.

White Rabbit Tobacco

White Rabbit Tobacco (*Pseudognaphalium leucocephalum*) is a member of the sunflower family (ASTERACEAE) and is designated as a CNPS List 2.2 species but is not a federal or state listed species. This perennial herb is known to occur in chaparral, cismontane woodland, coastal scrub and riparian woodlands with sandy or gravelly soils below 2,000 meters (6,890 feet) MSL. This species is known to occur in San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Orange, San Diego and Riverside Counties. This species blooms from July through December.

D. Wildlife Movement

The Study Area falls within the Puente-Chino Hills Wildlife Corridor providing connectivity to coal Canyon to the south, Puente Hills to the north and the Prado Basin to the east. The Study Area is partially urbanized and partially open space. In urbanized areas, the opportunities for wildlife movement range from highly constrained settings where wildlife movement may be restricted to a man-made culvert, to more expansive areas that afford "live-in" habitat for some species while conveying movement between surrounding development for a broader suite of species.

Maintaining connectivity, where it has not already been severed is essential to maintain genetic diversity and provide colonization opportunities following local extinctions, thus maintaining the long-term integrity of meta-populations.

VI. CONCLUSION

Based upon the literature search and habitat mapping, the Study Area has potential to support a variety of special-status plants and animals in addition to providing connectivity for wildlife in a local and regional context. The majority of the Study Area (developed areas and annual grasslands/ruderal vegetation) either does not support special-status species, or has a very low potential for these species. As noted above in Table 1, and as depicted in Exhibit 3 [Vegetation Map] the Study Area contains a number of native vegetation types, all of which have the potential to support special-status species. Riparian/aquatic habitats include southern willow scrub, coast live oak riparian forest, freshwater emergent wetland, sycamore-alder riparian woodland, and open water. Upland habitats include coastal sage scrub, chaparral, sage scrub/chaparral ecotonal areas, coast live oak woodland, and walnut woodland.

Riparian/Aquatic Habitats

Riparian habitats within the Study Area in general have the potential to support a number of special-status birds, including but not limited to the least Bell's vireo, southwestern willow flycatcher, western yellow-billed cuckoo, yellow-breasted chat, yellow warbler, and white-tailed kite. Species such as the willow flycatcher and yellow-billed cuckoo may only occur within the Study Area as spring and fall migrants, whereas species such as the least Bell's vireo, yellow-breasted chat, and white-tailed kite have a higher potential of breeding within the Study Area. As noted by the CNDDB (depicted in Exhibit 4 of this report), least Bell's vireo and white-tailed kite have been detected within the Study Area. Species with the potential to occur in aquatic

habitats include the Santa Ana sucker, arroyo chub, coast range California newt, southwestern pond turtle and two-striped garter snake.

Upland Habitats

The upland scrub and chaparral habitats within the Study Area have the potential to support numerous special-status plant and animal species. Special-status birds include the coastal California gnatcatcher and coastal cactus wren. Reptiles include the coast horned lizard, coast patch-nosed snake, orange-throated whiptail, northern-red diamond rattlesnake, and silvery legless lizard. Woodland habitats have the potential to support a range of species, including a number of species also occurring in riparian and coastal sage scrub/chaparral habitats. These include white-tailed kite, long-eared owl, and silvery legless lizard; as well as roosting sites for a number of bat species.

Although annual grasslands are not themselves considered as a sensitive vegetation type, grasslands do support a number of special-status species, including grasshopper sparrow and loggerhead shrike, as well as providing foraging habitat for raptors such as Swainson's hawk, northern harrier, and golden eagle.

Wildlife Movement

The majority of the Study Area provides opportunity for local and regional wildlife movement, including to and from Chino Hills State Park, however specific information would need to be obtained through project-specific studies, when there is a reasonable potential for projects to affect wildlife movement that warrants further study. Medium and large mammals utilize prominent ridgelines, trails, and riparian drainages for movement, including developed areas. Developed areas provide attractions for wildlife that have become adapted to urban settings for food, water, and shelter, such as coyotes and raccoons. Individual development projects within the Study Area should consider wildlife movement, when there is reasonable potential for the project to affect movement.

If you have any questions regarding this letter report, please contact me (949) 837-0404 ext 35.

Sincerely,

GLENN LUKOS ASSOCIATES, INC.

Ingrid Chlup
Biologist

Jeff Ahrens
Biologist

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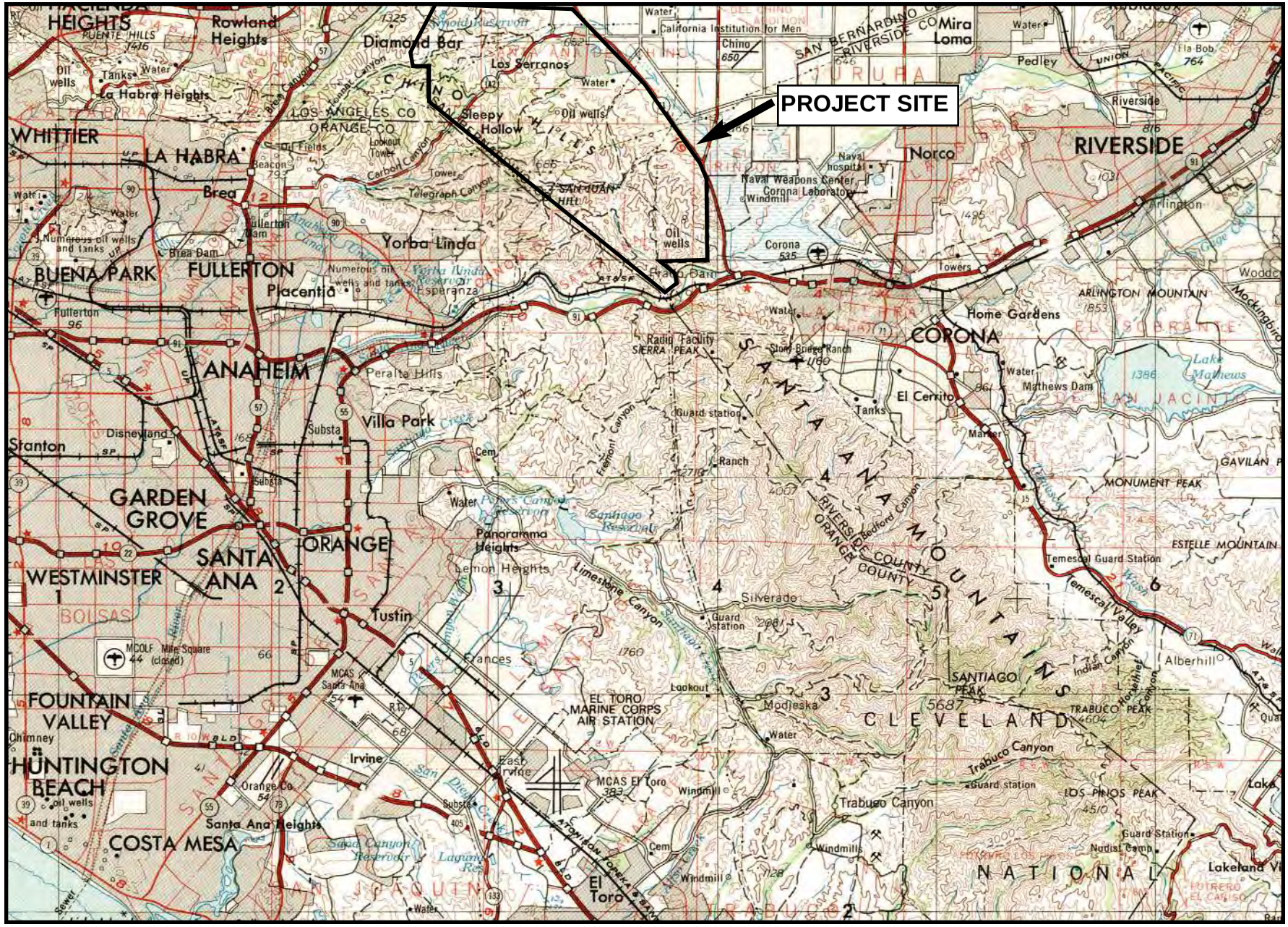
Adapted from USGS Santa Ana quadrangle

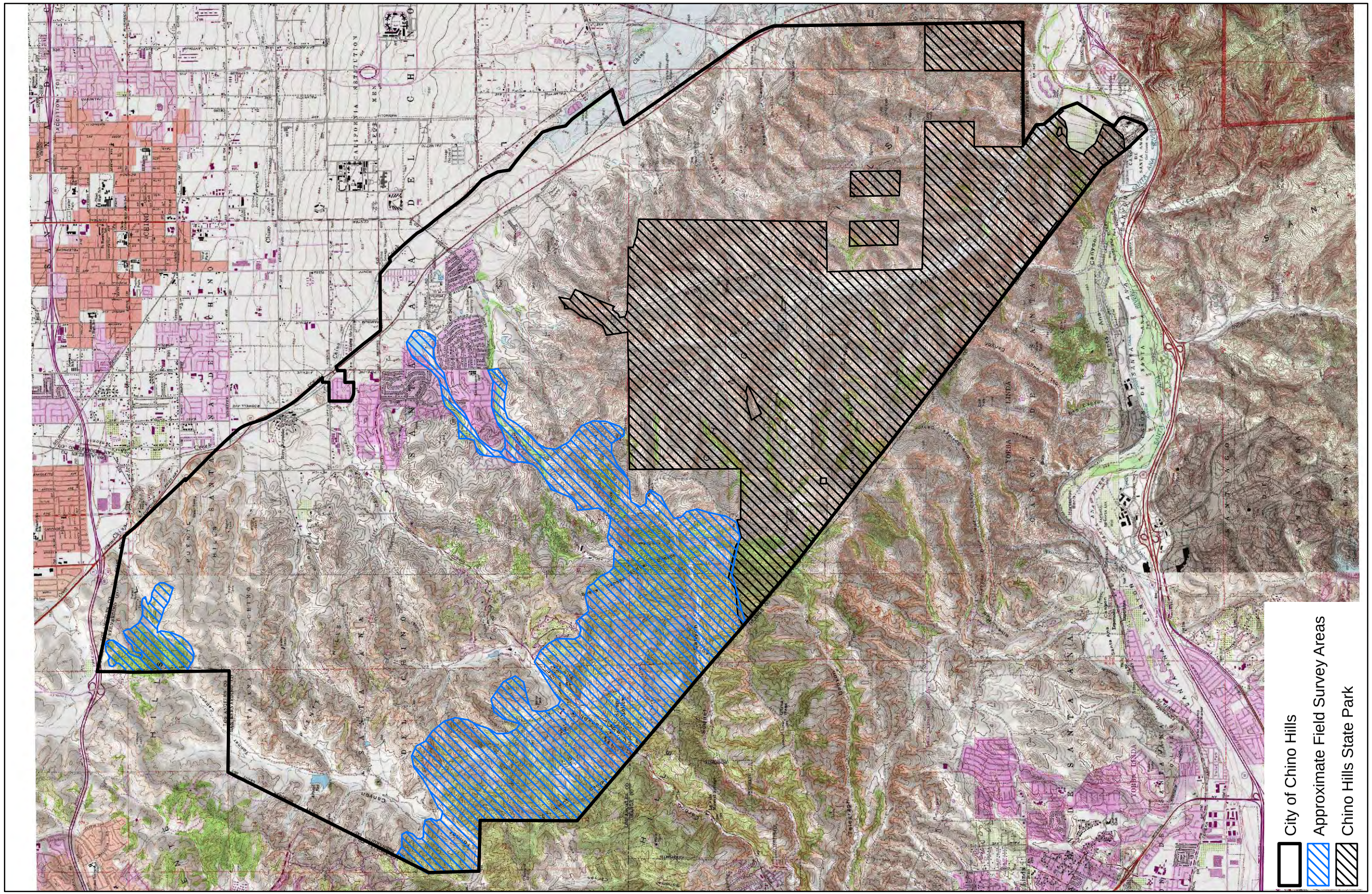


CHINO HILLS GENERAL PLAN

Regional Map

GLENN LUKOS ASSOCIATES

Exhibit 1



Adapted from USGS National Geographic Topo Software

NORTH

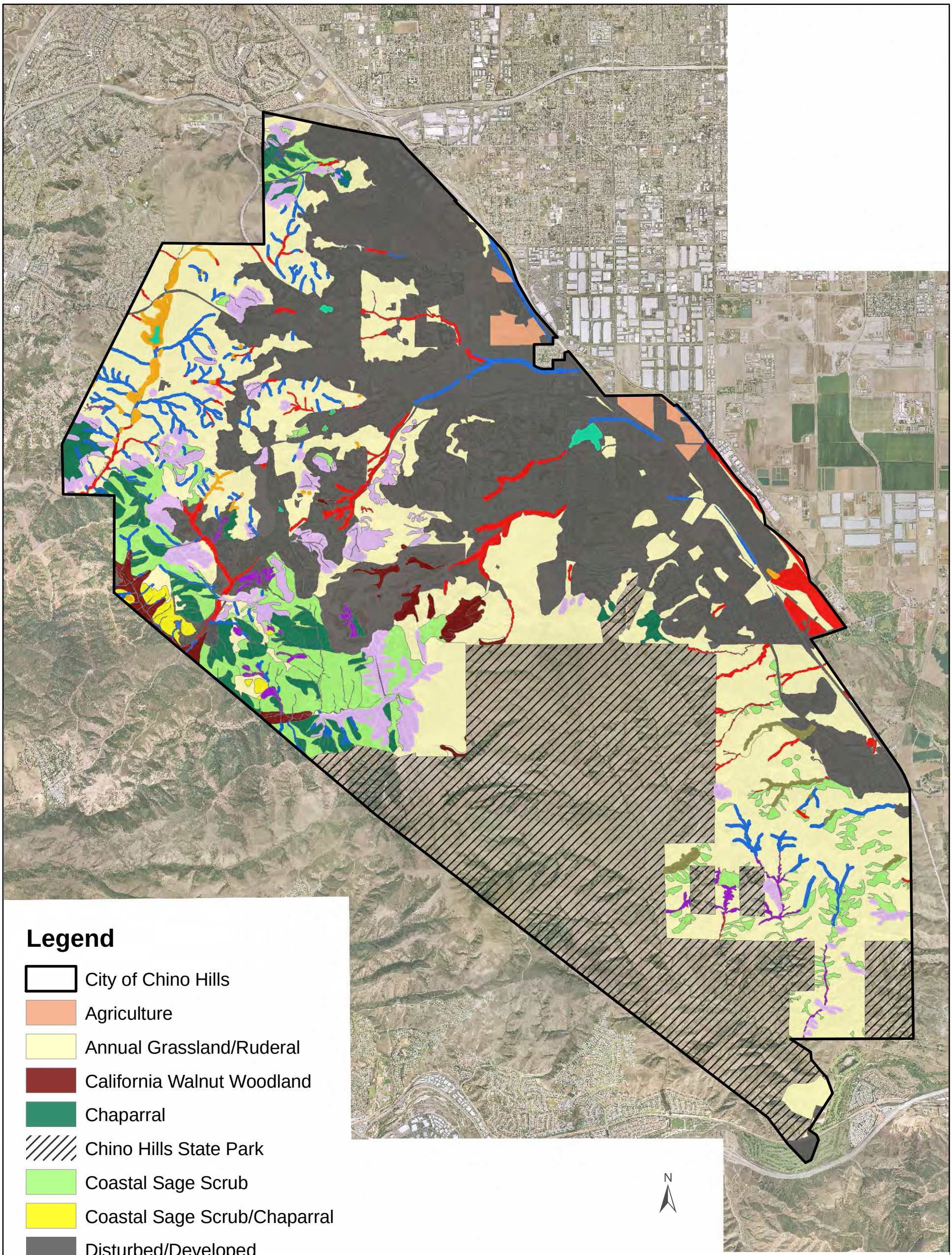
0 2,500 5,000 10,000
Feet

GLENN LUKOS ASSOCIATES

Exhibit 2

CHINO HILLS GENERAL PLAN

Survey Area Map



Legend

- City of Chino Hills
- Agriculture
- Annual Grassland/Ruderal
- California Walnut Woodland
- Chaparral
- Chino Hills State Park
- Coastal Sage Scrub
- Coastal Sage Scrub/Chaparral
- Disturbed/Developed
- Freshwater Emergent Wetland
- Oak Woodland
- Open Water
- Riparian Oak Woodland
- Riverine
- Southern Sycamore Alder Riparian Woodland
- Southern Willow Scrub

CHINO HILLS GENERAL PLAN

Vegetation Map

GLENN LUKOS ASSOCIATES

Exhibit 3

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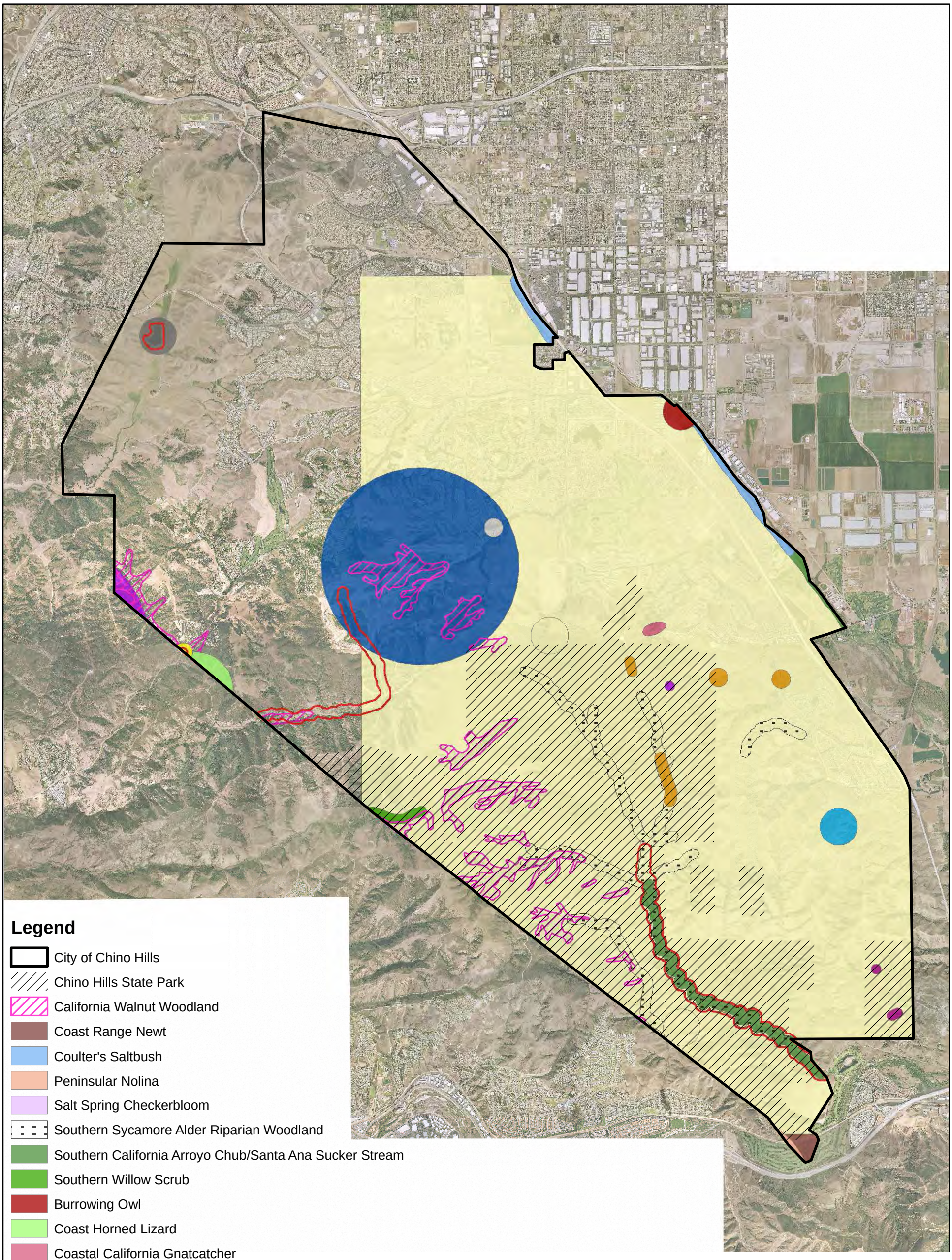
August 12, 2010



CHINO HILLS GENERAL PLAN

CNDDB Records Map

GLENN LUKOS ASSOCIATES

Exhibit 4

X:\0363-THE REST\0644-02CHGP\644-2.GIS\644-2CNDDB.mxd
August 12, 2010

Appendix E – Paleontological and Cultural Resources of Chino Hills for the General Plan Update, City of Chino Hills, California

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PALEONTOLOGY - ARCHAEOLOGY - HISTORY

PALEONTOLOGICAL AND CULTURAL RESOURCES OF CHINO HILLS FOR THE GENERAL PLAN UPDATE, CITY OF CHINO HILLS, CALIFORNIA

Confidential Version for Planning Use

Prepared for:
Joann Lombardo
Comprehensive Planning Services
Newport Beach, CA

Authors:
Sherri Gust with contributions by Molly Valasik

Principal Investigator:
Sherri Gust
Registered Professional Archaeologist and Qualified Principal Paleontologist

February 2011

Project Number: 1985
Type of Study: Paleontological and Cultural Resources Inventory
USGS 7.5' Quadrangles: San Dimas 1966, photorevised 1981, Ontario 1967, photorevised 1981, Yorba Linda 1964, photorevised 1981, Prado Dam 1967, 1981
Area: 28,723 acres
Key Words: Monterey Formation, Sycamore Canyon Formation, Puente Formation, Quaternary Older Alluvium, Miocene fossils, Pleistocene fossils, Rancho Santa Ana del Chino, Chino Ranch, Chino Hills

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MANAGEMENT SUMMARY

This study was conducted to provide available information on paleontological and cultural resources of the City of Chino Hills to support an update of the General Plan environmental documents. The City consists of 28,723 acres in San Bernardino County, California. The City is divided into eleven villages plus Chino Hills State Park.

Paleontological Resources. The eastern Puente Hills, also known as the Chino Hills, are comprised of middle to late Miocene Epoch (15-9 million years old) marine sedimentary rock units overlain in some areas by Pleistocene Epoch (1.8 million to 10 thousand years old) terrestrial sediments. Beginning about 23 million years ago, the ocean extended well past the modern shoreline and covered Chino Hills. The Miocene sediments were deposited as submarine fans at bathyal depths. Tectonic events about 5 million years ago including uplift of local mountains and subsidence of valleys resulted in withdrawal of the ocean and beginning of river and stream cutting of channels into the exposed sediments.

In most of the City, two formations are present. The older of the two is the Monterey Formation which is middle Miocene in age. The Sycamore Canyon Formation is late Miocene in age. Pleistocene Epoch Quaternary Older Alluvium is mapped at the surface in the vicinity of the ancestral Santa Ana River and its tributaries. However, results of paleontological monitoring of development projects have found these sediments more widely distributed in the city, particularly in canyons. Thus far, all results indicate a late Pleistocene age of about 50-12 thousand years for fossils from the Older Alluvium in the City.

Known paleontological resources in the city consist of Miocene and Pleistocene fossils. Miocene fossils represented the time period when Chino Hills was ocean floor include many kinds of marine life but also leaves from terrestrial plants that were washed into the ocean by streams and rivers. The Miocene marine fossils include marine mammals of 8 types, boney fishes of 41 types, cartilaginous fishes of 4 types, marine invertebrates of 18 types and marine plants of 10 types (Table 2). Miocene land plants of 32 types are represented along with freshwater snails. Pleistocene terrestrial mammals are represented by 8 types. The single most scientifically significant fossil is the Chino Hills Dolphin, *Atocetus anguloi,* recovered during construction excavations for Vellano in Soquel Canyon. This dolphin is a new and previously unknown species and has no living relatives.

Cultural Resources. The prehistoric cultural chronology for the area divides prehistory into three periods: Milling Stone at 8-3 thousand years before present, Intermediate at 3-1.4 thousand years before present and Late at 1.4 thousand-150 years before present. The entire City is within the traditional tribal territory of the Tongva/Gabrielino. The village of Pashiinonga was noted by early European explorers and settlers as having been located on a rise above Chino Creek. This village would have been a base with smaller satellite villages and seasonal camps in the vicinity.

A Sacred Lands File search was requested from the Native American Heritage Commission with positive results. Native American tribes and individuals contacted responded that the entire city is sensitive for prehistoric resources.

Beginning in 1771, Mission San Gabriel was given control over all the lands east and south of the mission. The inhabitants of Pashiinonga and other villages were forcibly relocated to the Mission. The lands were used for ranching activities, mostly cattle grazing, to support the Mission. In the 1820s the Mexican government gained control of California and by 1834 the mission lands were being redistributed as private land grants called “ranchos”. The 22,000 acre Rancho Santa Ana del Chino was granted in 1841 to Antonio Maria Lugo, a prominent Mexican citizen although he never lived on the property. One of his daughters had married an immigrant from the Eastern United States who had become a naturalized Mexican citizen, Isaac Williams. The Williams settled on the ranch and built an adobe home. Shortly thereafter 17, 280 acres adjoining Rancho Santa Ana del Chino were granted to Isaac Williams. Lugo deeded Rancho Santa Ana del Chino to Williams the same year. The Williams Adobe was the site of the first battle of the Mexican-American war, won by the Mexicans.

After the Americans won control of California, Williams applied for and received patent for all the acreage of Rancho Santa Ana del Chino and its addition. It became known as Chino Ranch. Williams died in 1856 and the ranch was inherited by his daughters. His oldest daughter married and purchased Rancho Cucamonga. His middle

daughter lived at Chino Ranch until her first husband died and then she moved to Los Angeles. His youngest daughter and her husband then managed the ranch and build a new adobe to the south of the original. After several disastrous years of drought, flood and new American tax burdens, the ranch passed out of family control in 1874. In 1881, the entire ranch was purchased by Richard Gird who moved in to the southern adobe and continued ranching. He subdivided the eastern portion and developed the town of Chino, while retaining the future Chino Hills as a ranch. Gird's investment in the town did not yield returns sufficient to maintain his properties and in 1894 he sold the 41,000 acres of the ranch he had left. Within a few years, the ranch was broken into small parcels and sold.

The small parcels of the former Chino Ranch within Chino Hills continued to be used for ranching. Some were explored for oil and wells installed following the late 1890s discovery of oil in the Brea-Olinda Field west of Chino Hills. In 1909, Boy's Republic purchased and occupied 240 acres including the former location of Isaac Williams' adobe and probably the village of Pashiinonga. Ranching, farming, milk production and many other agricultural activities were performed by the residents in times past. Currently the Boy's Republic is a treatment facility for teenagers in need of highly structured supervision.

In 1914 a trio of Los Angeles businessmen -Harry Chandler of the Los Angeles Times, wildcat oil driller turned elite attorney Tom Scott and William Rowland, former Los Angeles County Sheriff and descendant of wealthy La Puente rancher John Rowland- purchased property in western Chino Hills that they named Tres Hermanos Ranch. They threw an annual private-invitation-only spring round up with rodeo, branding and barbeque for fellow members of the Los Angeles elite which Chandler excluded from news coverage. In addition, family weekends were spent on the ranch and the men's sons were expected to participate in ranching activities.

In 1922 Sleepy Hollow Resort, south of Tres Hermanos, debuted with 80 acres subdivided for weekend getaway cabins. By 1925, a golf course was completed at Los Serranos Country Club on the eastern edge of Chino Hills. It featured recreation activities along with home sites. The Bridger/Gird Adobe was the original clubhouse but burned down in 1957. Development of both areas was minor until the 1970s.

In 1954 an 800 acre site south of Soquel Canyon was selected for an Aerojet facility that assembled and tested ordinance for the United States Department of Defense. Use continued until 1995. The Western Hills Golf and Country Club opened in 1963. In 1978 the City of Industry bought Tres Hermanos. Beginning in the late 1970s, residential development increased in Chino Hills with a major boom in the 1980s. These developments were mostly in the central area of Chino Hills in the villages of Carbon Canyon, The Oaks, Woodview and Los Serranos.

In 1991 the City of Chino Hills incorporated. Both additional residential areas and retail centers were planned. In the late 1990s residential developments were built in the villages of Butterfield Ranch, Rincon, Gordon Ranch, Laband and Rolling Ridge Estate. These were accompanied by construction of major shopping centers. In recent years the City constructed a new community park, civic center, fire station, library, post office and other community facilities.

Known archaeological and historic records resources were researched at the San Bernardino Archaeological Information Center. Sources consulted included the National Register of Historic Places, California Register of Historical Resources, California Inventory of Historical Resources, California Historical Landmarks, and California Points of Historical Interest. The records search determined there are 121 recorded cultural resources. Twenty-six are prehistoric-era sites, 55 are historic-era sites, 38 are prehistoric isolates and 2 are historic isolates within the city limits of Chino Hills. Two of the historic-era sites have additional listings. The Ranch Chino Adobe site is a California State Historical Landmark (#942)and the Battle of Chino marker is a California Point of Interest.

Discussion and Recommendations. The City is well aware of the paleontological and archaeological sensitivity of Chino Hills and has established standard mitigation measures to protect paleontological and cultural resources. The standard mitigation measures are recommended for all projects with earth-moving components. Archaeological investigations are recommended for all of Boy's Republic and a specific portion of Los Serranos. Historic resources evaluations are recommended for specific portions of Tres Hermanos and any remaining original cabins in Sleepy Hollow. Local acknowledgment of the unique neighborhood that evolved from the Sleepy Hollow vacation cabins and of the importance of the English Road Equestrian area in the history of the City are recommended.

INTRODUCTION

This study was conducted to provide available information on paleontological and cultural resources of the City of Chino Hills to support an update of the General Plan environmental documents. The City consists of 28,723 acres in San Bernardino County, California (Figure 1). The City is divided into eleven villages plus Chino Hills State Park (Figure 2).

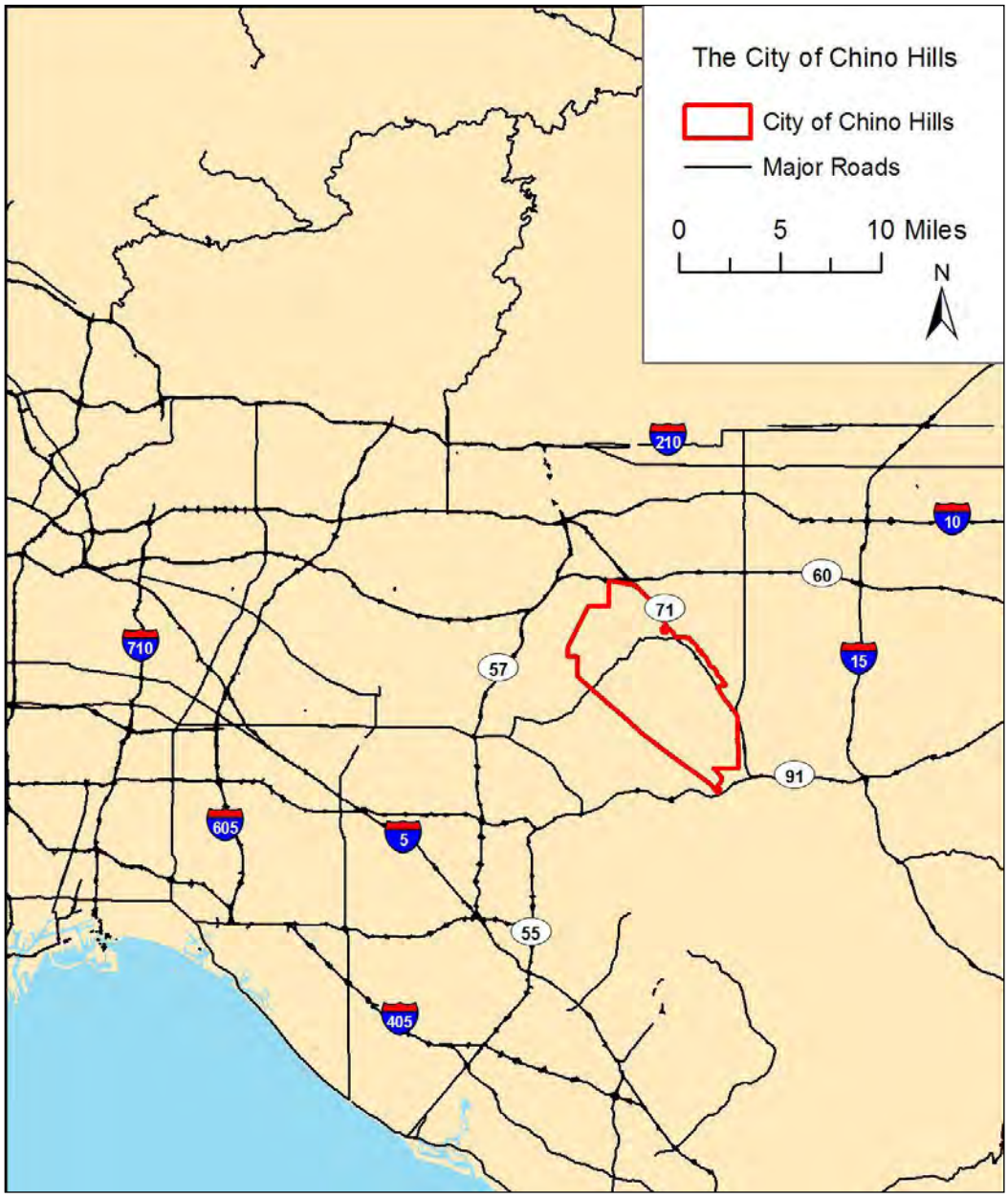


Figure 1. Project vicinity map

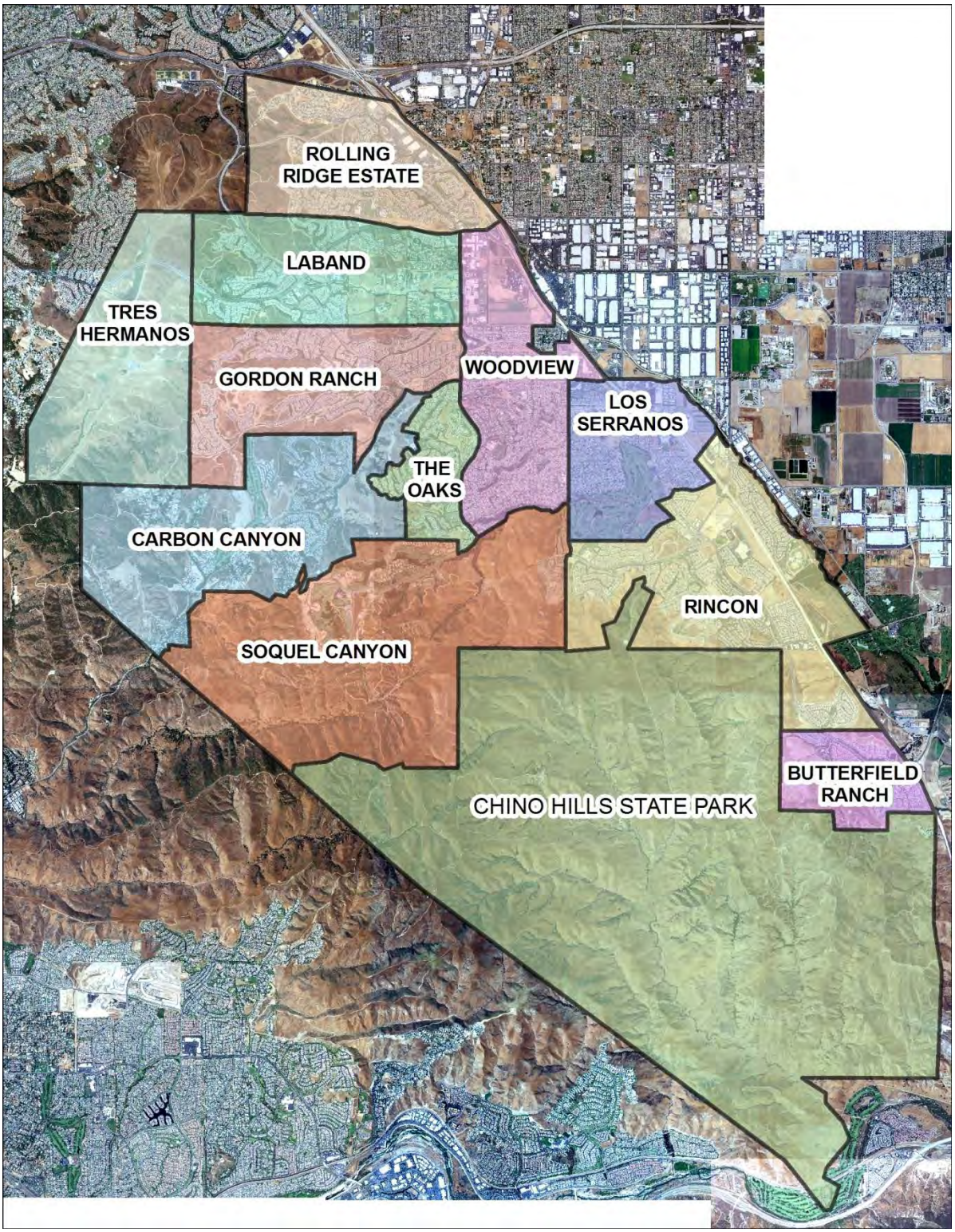


Figure 2. Aerial Overview Village Map

PROJECT PERSONNEL

Cogstone Resource Management Inc. performed the studies reported here. Sherri Gust served as Principal Paleontologist and Archaeologist for the project, supervised all work and wrote most of the sections. Gust is a Qualified Principal Paleontologist and Registered Professional Archaeologist with a M.S. in Anatomy (Evolutionary Morphology) from the University of Southern California, a B.S. in Anthropology from the University of California at Davis, and over 30 years of experience in California.

Molly Valasik prepared the GIS maps and the archaeological record search results. Valasik has a M.A. in Anthropology and experience in California archaeology. Further qualifications of Cogstone staff are provided (Appendix A).

REGULATORY ENVIRONMENT

NATIONAL HISTORIC PRESERVATION ACT OF 1966, AS AMENDED

The National Historic Preservation Act (NHPA) is the primary federal law governing the preservation of cultural and historic resources in the United States. The law establishes a national preservation program and a system of procedural protections which encourage the identification and protection of cultural and historic resources of national, state, tribal and local significance. Primary components of the act include:

a) Articulation of a national policy governing the protection of historic and cultural resources.
b) Establishment of a comprehensive program for identifying historic and cultural resources for listing in the National Register of Historic Places.
c) Creation of a federal-state/tribal-local partnership for implementing programs established by the act.
d) Requirement that federal agencies take into consideration actions that could adversely affect historic properties listed or eligible for listing on the National Register of Historic Places, known as the Section 106 Review Process.
e) Establishment of the Advisory Council on Historic Preservation, which oversees federal agency responsibilities governing the Section 106 Review Process.
f) Placement of specific stewardship responsibilities on federal agencies for historic properties owned or within their control (Section 110 of the NHPA).

Section 106, as noted above (item d), requires the head of any Federal agency having direct or indirect jurisdiction over a proposed Federal or federally assisted undertaking in any State and the head of any Federal department or independent agency having authority to license any

undertaking shall, prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license, as the case may be, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register. The head of any such Federal agency shall afford the Advisory Council on Historic Preservation a reasonable opportunity to comment with regard to such undertaking.

NATIONAL REGISTER OF HISTORIC PLACES

The National Register of Historic Places is the nation's official list of buildings, structures, objects, sites, and districts worthy of preservation because of their significance in American history, architecture, archeology, engineering, and culture. The National Register recognizes resources of local, state and national significance which have been documented and evaluated according to uniform standards and criteria.

Authorized under the National Historic Preservation Act of 1966, the National Register is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect historic and archeological resources. The National Register is administered by the National Park Service, which is part of the U. S. Department of the Interior.

To be eligible for listing in the National Register, a resource must meet at least one of the following criteria:

A. Is associated with events that have made a significant contribution to the broad patterns of our history
B. Is associated with the lives of persons significant in our past
C. Embodies the distinctive characteristics of a type, period or method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction
D. Has yielded, or may be likely to yield, information important in history or prehistory

Effects of National Register Designation include:

a) Tax incentives, in some cases, for rehabilitation of depreciable structures.
b) Tax deduction available for donation of preservation easement.
c) Local building inspector must grant code alternatives provided under State Historical Building Code.
d) Local assessor may enter into contract with property owner for property tax reduction (Mills Act).
e) Consideration in federally funded or licensed undertakings (Section 106, National Historic Preservation Act).
f) Limited Protection: Environmental review may be required under the California Environmental Quality Act (CEQA) if property is threatened by a project. Contact the local government planning agency for more information.

g) Automatic listing in California Register of Historical Resources. Owner may place his or her own plaque or marker at the resource site.
h) Listing in the National Register may result in restrictions, such as design review, imposed locally pursuant to the California Environmental Quality Act (CEQA) or through local zoning and land use planning regulations.

CALIFORNIA ENVIRONMENTAL QUALITY ACT OF 1970, AS AMENDED

CEQA declares that it is state policy to "take all action necessary to provide the people of this state with...historic environmental qualities." It further states that public or private projects financed or approved by the state are subject to environmental review by the state. All such projects, unless entitled to an exemption, may proceed only after this requirement has been satisfied. CEQA requires detailed studies that analyze the environmental effects of a proposed project. In the event that a project is determined to have a potential significant environmental effect, the act requires that alternative plans and mitigation measures be considered.

CEQA includes historic and archaeological resources as integral features of the environment. If paleontological resources are identified as being within the proposed project area, the sponsoring agency must take those resources into consideration when evaluating project effects. The level of consideration may vary with the importance of the resource.

CALIFORNIA REGISTER OF HISTORICAL RESOURCES

The State Historical Resources Commission has designed this program for use by state and local agencies, private groups and citizens to identify, evaluate, register and protect California's historical resources. The Register is the authoritative guide to the state's significant historical and archeological resources.

The California Register program encourages public recognition and protection of resources of architectural, historical, archeological and cultural significance, identifies historical resources for state and local planning purposes, determines eligibility for state historic preservation grant funding and affords certain protections under the California Environmental Quality Act.

To be eligible for listing in the California Register, a resource must meet at least one of the following criteria:

1) Associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States
2) Associated with the lives of persons important to local, California or national history
3) Embodies the distinctive characteristics of a type, period, region or method of construction or represents the work of a master or possesses high artistic values
4) Has yielded, or has the potential to yield, information important to the prehistory or

history of the local area, California or the nation

In addition to having significance, resources must have integrity for the period of significance. The period of significance is the date or span of time within which significant events transpired, or significant individuals made their important contributions. Integrity is the authenticity of a historical resource's physical identity as evidenced by the survival of characteristics or historic fabric that existed during the resource's period of significance. Alterations to a resource or changes in its use over time may have historical, cultural, or architectural significance. Simply, resources must retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. A resource that has lost its historic character or appearance may still have sufficient integrity for the California Register, if, under Criterion 4, it maintains the potential to yield significant scientific or historical information or specific data.

Effects of Designation include:

1) Limited protection: Environmental review may be required under CEQA if property is threatened by a project. Contact your local planning agency for more information.
2) Local building inspector must grant code alternatives provided under State Historical Building Code.

CALIFORNIA HISTORICAL LANDMARKS

California Historical Landmarks are buildings, structures, sites, or places that have been determined to have statewide historical significance by meeting at least one of the criteria listed below. The resource also must be approved for designation by the County Board of Supervisors or the City/Town Council in whose jurisdiction it is located; be recommended by the State Historical Resources Commission; and be officially designated by the Director of California State Parks.

To be eligible for designation as a Landmark, a resource must meet at least one of the following criteria:

1) Be the first, last, only, or most significant of its type in the state or within a large geographic region (Northern, Central, or Southern California).
2) Be associated with an individual or group having a profound influence on the history of California.
3) Be a prototype of, or an outstanding example of, a period, style, architectural movement or construction or is one of the more notable works or the best surviving work in a region of a pioneer architect, designer or master builder.

Effects of Designation include:

1) Registration will be recorded on the property deed.
2) Limited protection: Environmental review may be required under the California

Environmental Quality Act (CEQA) if property is threatened by a project. Contact your local planning agency for more information.
3) Local assessor may enter into contract with property owner for property tax reduction using the Mills Act.
4) Local building inspector must grant code alternative provided under State Historic Building Code.
5) Automatic listing in California Register of Historical Resources.
6) Bronze plaque at site (underwritten by local sponsor) may be ordered through OHP; highway directional sign available through local Department of Transportation (Caltrans) district office.

CALIFORNIA POINTS OF HISTORICAL INTEREST

California Points of Historical Interest are sites, buildings, features, or events that are of local (city or county) significance and have anthropological, cultural, military, political, architectural, economic, scientific or technical, religious, experimental, or other value.

Points of Historical Interest designated after December 1997 and recommended by the State Historical Resources Commission are also listed in the California Register. No historical resource may be designated as both a Landmark and a Point. If a Point is subsequently granted status as a Landmark, the Point designation will be retired.

To be eligible for designation as a Point of Historical Interest, a resource must meet at least one of the following criteria:
1) The first, last, only, or most significant of its type within the local geographic region (City or County).
2) Associated with an individual or group having a profound influence on the history of the local area.
3) A prototype of, or an outstanding example of, a period, style, architectural movement or construction or is one of the more notable works or the best surviving work in the local region of a pioneer architect, designer or master builder.

Effects of Designation include:
1) Limited protection: Environmental review may be required under CEQA if property is threatened by a project. Contact your local planning agency for more information.
2) Local assessor may enter into contract with property owner for property tax reduction (Mills Act).
3) Local building inspector must grant code alternative provided under State Historic Building Code.
4) Registration is recorded on property deed.
5) A small enamel directional sign (no text) available through local Caltrans district office. Owner may place his or her own marker at the site.

BACKGROUND

PALEONTOLOGICAL SETTING

The eastern Puente Hills, also known as the Chino Hills, are comprised of middle to late Miocene Epoch (15-9 million years old) marine sedimentary rock units overlain in some areas by Pleistocene Epoch (1.8 million to 10 thousand years old) terrestrial sediments. Beginning about 23 million years ago, the ocean extended well past the modern shoreline and covered Chino Hills (Figure 3). The Miocene sediments were deposited as submarine fans (Figure 4) at bathyal (1000-4000 meters or 3,300-13,000 feet) depths (Rumelhart and Ingersoll 1997). Tectonic events about 5 million years ago including uplift of local mountains and subsidence of valleys resulted in withdrawal of the ocean and beginning of river and stream cutting of channels into the exposed sediments.

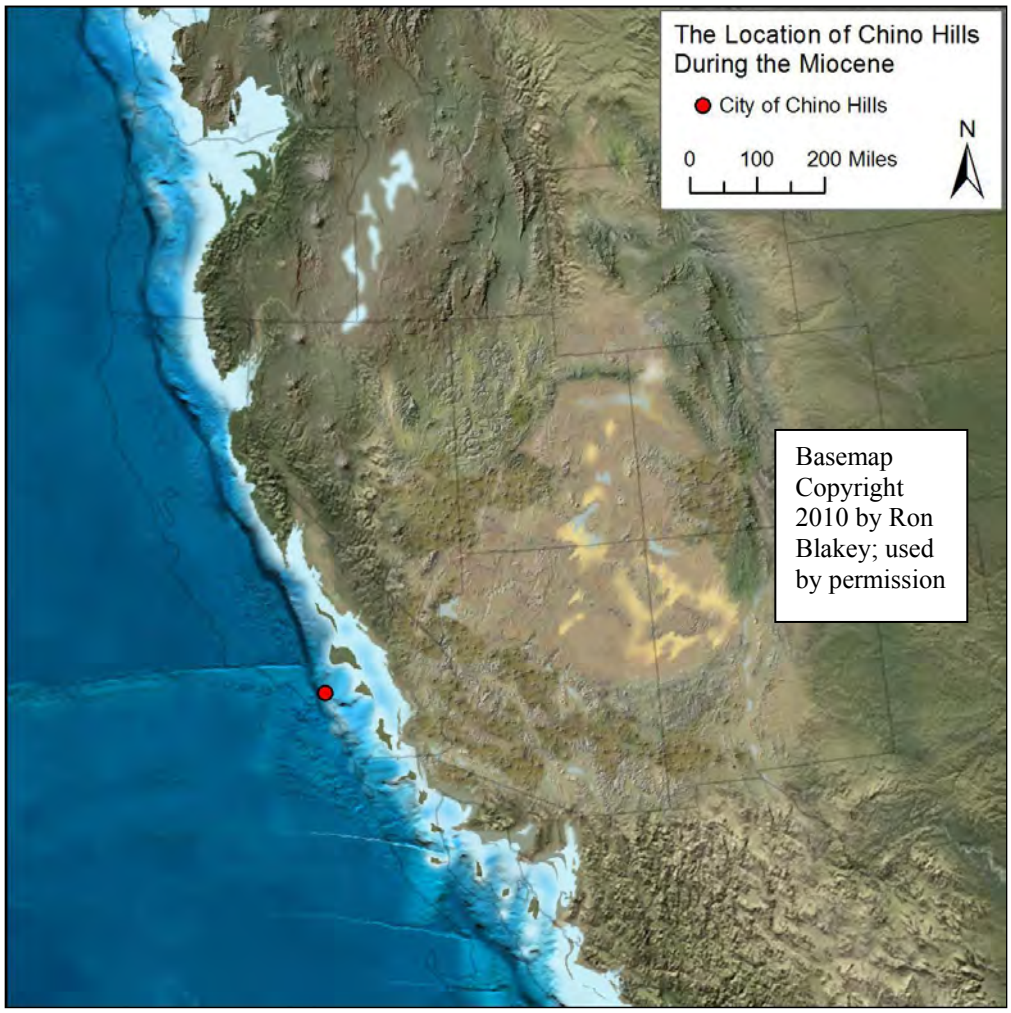


Figure 3. Miocene Paleoenvironment of Chino Hills

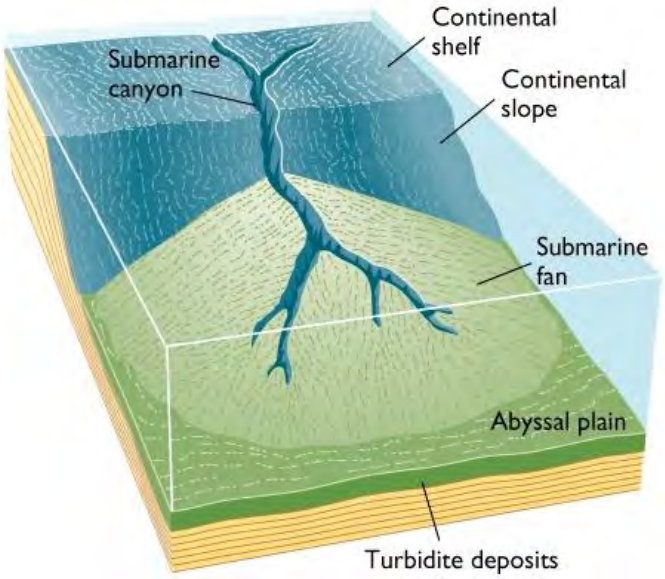


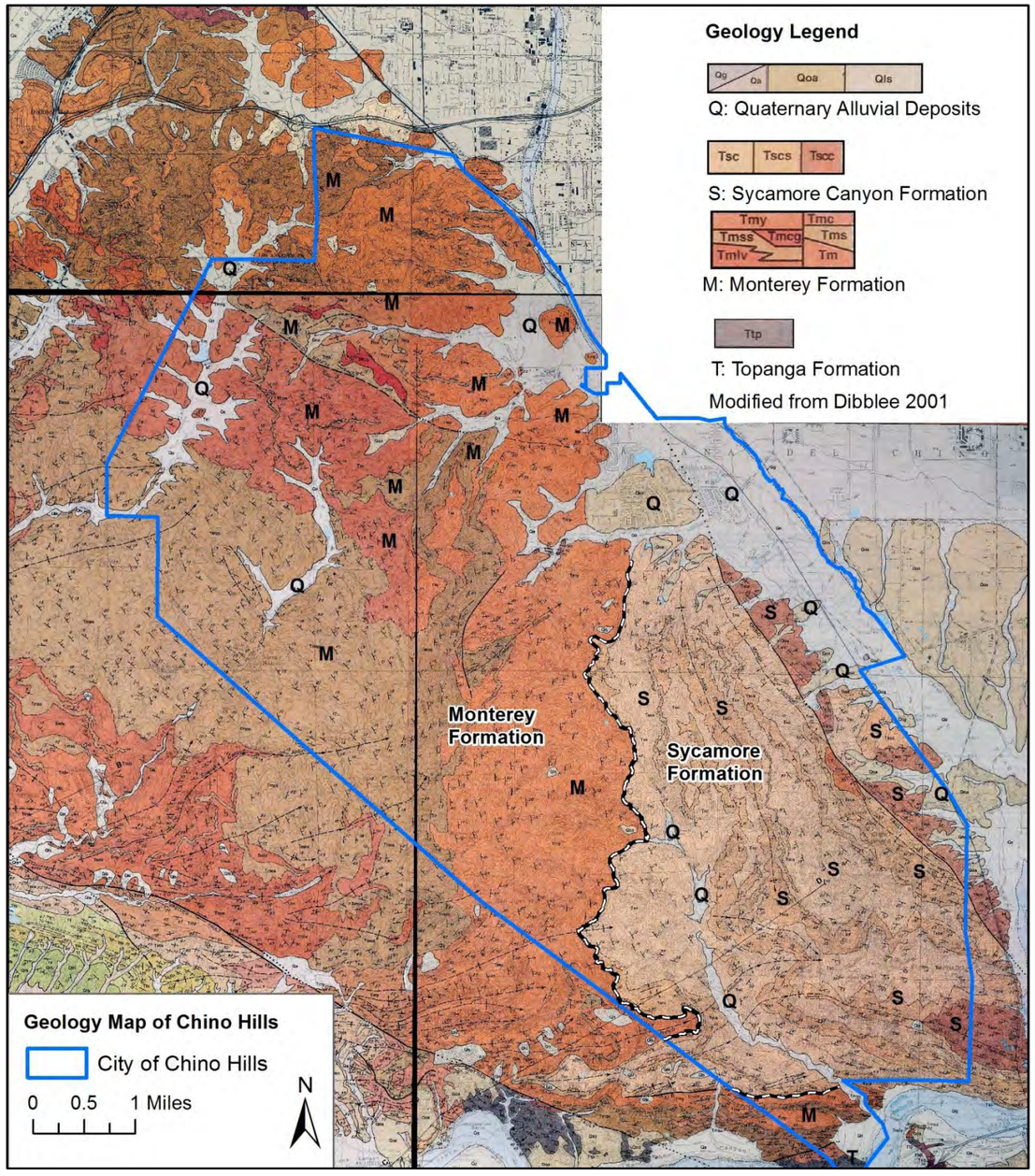
Figure 4. Submarine fan components

From http://earth.geol.ksu.edu/sgao/g100/plots/

The deepest marine rock unit is the Vaqueros Formation. There are no known surface occurrences. The next deepest is the Topanga Formation; however a small surface exposure is present in the extreme southern tip of the city near the Santa Ana River (Figure 5). The upper marine sedimentary rock units of the Chino Hills area were recently revised (Dibblee 2001; Figure 5). The previous major rock unit, the Puente Formation, was determined to be two separate formations. The older of the two is the Monterey Formation which is middle Miocene in age. The Monterey Formation in the area is subdivided into Yorba Shale, Soquel Sandstone and La Vida Shale Members. The Sycamore Canyon Formation is late Miocene in age. Recognized portions include silty clay shale, sandstone and conglomerate. These marine rock units are present at elevations of approximately 500 meters to minus 4000 meters (with modern sea level as zero; Figure 6).

Pleistocene Epoch Quaternary Older Alluvium is mapped at the surface in the vicinity of the ancestral Santa Ana River and its tributaries (Figure 5). However, results of paleontological monitoring of development projects have found these sediments more widely distributed in the city, particularly in canyons. Analysis indicates that the alluvial sediments consist of decomposed Monterey and Sycamore Canyon Formation rocks of the local area (Dibblee 2001). Thus far, all results indicate a late Pleistocene age of about 50-12 thousand years for fossils from the Older Alluvium in the city.

Since sediments only 50 thousand years old directly overlie sediments 9 million or more years old, it seems clear that there was a long period of erosion throughout the latest Miocene, Pliocene and most of the Pleistocene before conditions again favored deposition of sediments. The older Monterey Formation rocks are at the surface in the northwestern half of the city (Figure 5). The younger Sycamore Canyon Formation rocks are at the surface in the southeastern half.



Formation	Submember	Description
Quaternary Alluvial Deposits	Qg / Qa, Qoa, Qls	
	Qg	Gravel/sand of Santa Ana River
	Qa	Alluvial gravel, sand and silt of valleys and floodplains
	Qoa	Elevated, dissected remnants of alluvial gravel, sand and silt
	Qls	Land slide
Sycamore Canyon	Tsc, Tscs, Tscc	
	Tsc silty clay shale facies	Gray, micaceous, vaguely to moderately bedded, locally nodular, in places includes thin layers of fine-grained sandstone
	Tscs sandstone facies	Light gray to brown, nearly white near Prado Dam, coarse to fine-grained, arkosic, locally includes conglomerate like that of Tscc
	Tscc conglomerate or eastern fascies	Light gray, bedded, composed of cobbles and pebbles of mostly light-colored grantic rocks and others of gray quartz diorite, gneiss, andesitic porphyries and quartzite, in arkosic sandstone matrix; may be in part nonmarine
Monterey	Tmy, Tmc, Tmss, Tmcg, Tms, Tmlv, Tm	
	Tmy Yorba Shale Member	Thin-bedded, light gray, white-weathering, platy, siliceous to semi-siliceous to silty, locally includes thin layers of yellowish-gray, hard dolomite, and thin layers of fine-grained sandstone; late Mohnian Stage (Yerkes, 1972)
	Tmss Soquel Sandstone Member and facies	Mostly bedded sandstone, light gray, weathers tan, mostly medium-grained, arkosic, locally coarse and pebbly; with minor biotite; includes minor silty clay shale
	Tmcg	Conglomerate of granitic detritus
	Tms	Unassigned sandstone; similar to Tmss
	Tm	Unassigned shale; similar to Tmlv & Tmy
	Tmlv La Vida Shale Member	Similar to Tmy, thin-bedded, cream-white weathering, platy, siliceous to semi-siliceous shale; includes some layers of hard, yellow-gray dolomite; and some thin strata of sandstone
	Tmc clay shale facies	Gray, slightly siliceous, silty to finely sandy, micaceous
Topanga	Ttp	
	Ttp	Sandstone, light gray, weathers tan, bedded, fine to medium grained, locally pebbly, arkosic, includes thin partings of interbeds of micaceous siltstone

Figure 5. Geology Map of Chino Hills

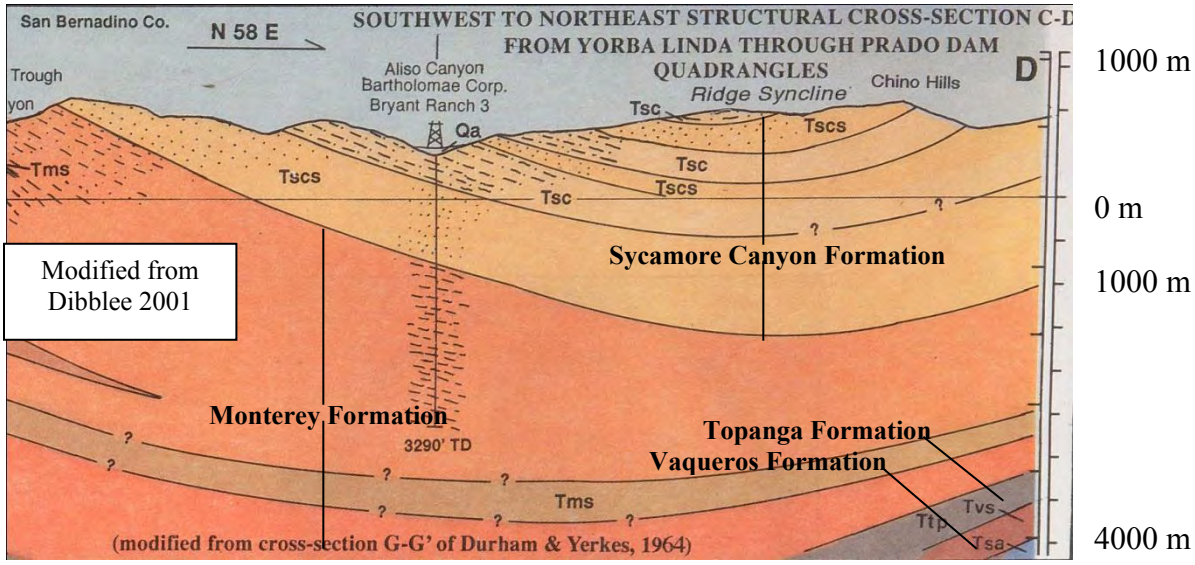


Figure 6. Depth of Rock Units

PREHISTORIC SETTING

The prehistoric cultural chronology for the area divides prehistory into three periods: Milling Stone at 8-3 thousand years before present, Intermediate at 3-1.4 thousand years before present and Late at 1.4 thousand-150 years before present (Mason, Koerper and Langenwalter 1997; Koerper, Mason and Peterson 2003).

The City of Chino Hills is within the traditional tribal territory of the Tongva/Gabrielino (McCawley 1996) beginning approximately 3000 years before present. The name "Gabrielino" is Spanish in origin and was used in reference to the Native Americans associated with the Mission San Gabriel. It is unknown what these people called themselves before the Spanish arrived, but today they call themselves "Tongva", meaning "people of the earth" (Gabrielino/Tongva Tribal Council of San Gabriel n.d.).

The Tongva/Gabrielino speak a language that is part of the Takic language family originating in the Great Basin (Bean and Smith 1978). Their prehistoric tool kit demonstrates strong links to other desert peoples (Altschul et al 2005, 2007). Their territory encompassed a vast area stretching from Topanga Canyon in the northwest, to the base of Mount Wilson in the north, to San Bernardino in the east, Aliso Creek in the southeast and the Southern Channel Islands, in all an area of more than 2,500 square miles (Figure 7; Grant 1978; McCawley 1996). At European contact, the tribe consisted of more than 5,000 people living in various settlements throughout the area. Some of the villages could be quite large, housing up to 150 people. They thrived by exploiting the abundant and rich animal and plant resources available in the area.

The most important factors contributing to habitation location included the presence of permanent water, a stable food supply and some protection from flooding. Common locations were rivers, steams, inland watercourses, coastal bays and the transitional area between grasslands and foothills (McCawley 1996). Groups left the main villages to harvest resources locally, along the coast and in the mountains and established temporary camps as a base of operations.

Pashiinonga

The village of Pashiinonga (Figure 8; McCawley 1996:47) was noted by early European explorers and settlers. The name of the village is thought to be derived from the Tongva word for chia (a highly nutritious plant resource). It was noted as having been located on a rise above Chino Creek. This village would have been a base with smaller satellite villages and seasonal camps in the vicinity.

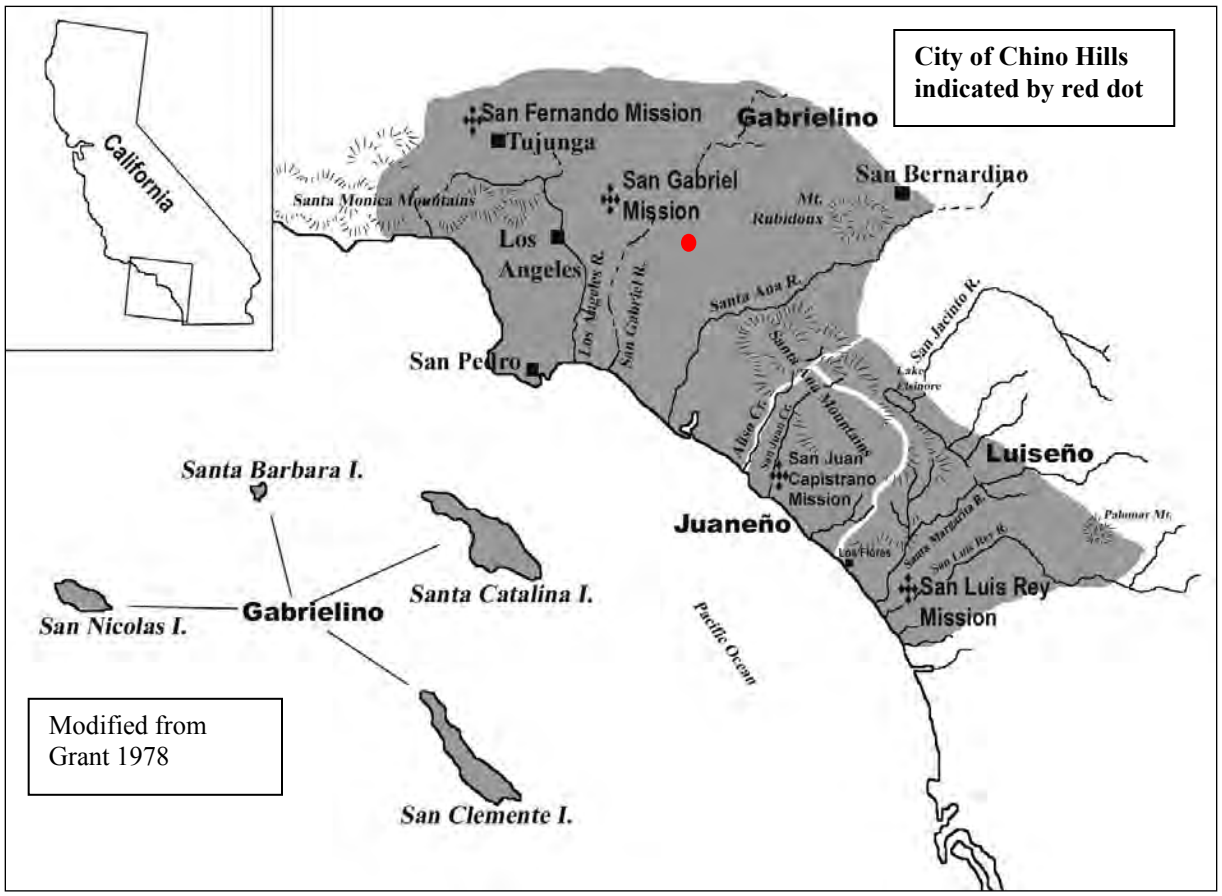


Figure 7. Tongva (Gabrielino) and Neighbors Traditional Tribal Territory Map

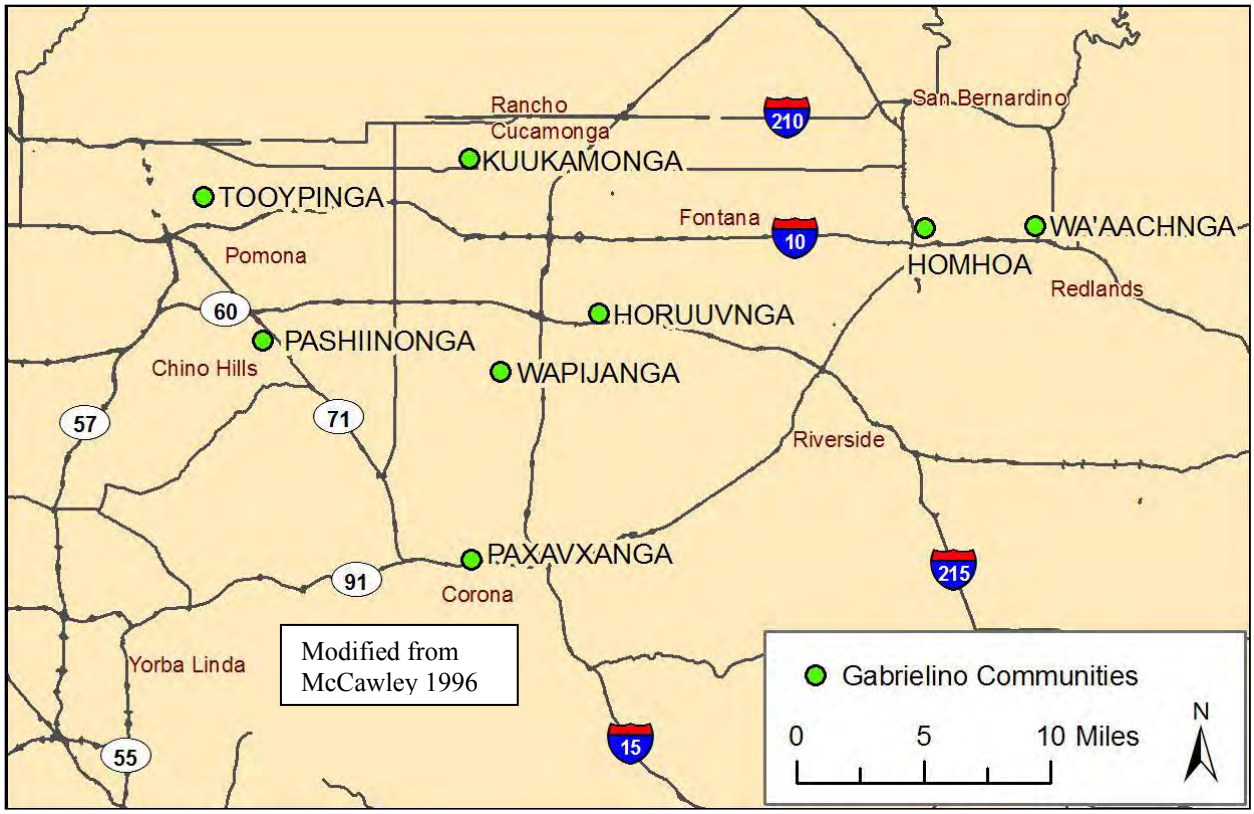


Figure 8. Major Tongva Villages in eastern Santa Ana River Valley

SPANISH & MEXICAN ERA SETTING

The earliest European explorer to visit California was Juan Rodríguez Cabrillo in 1542, when the Spanish explorer landed on Santa Catalina Island. In 1771, Father Serra established a Franciscan mission in San Gabriel. The Mission was given control over all the lands east and south of the mission. The inhabitants of Pashiinonga and other villages were forcibly relocated to Mission San Gabriel (McCawley 1996:49). The lands were used for ranching activities, mostly cattle grazing, to support the Mission.

In the 1820s the Mexican government gained control of California and by 1834 the mission lands were being redistributed as private land grants called "ranchos". The 22,000 acre Rancho Santa Ana del Chino (Figure 9) was granted by Governor Alvarado to Antonio Maria Lugo in March of 1841. Lugo received his first rancho (San Antonio centered in Bell) in 1810 after retiring from military service. He lived in an adobe house across from Plaza Church in downtown Los Angeles when he was not visiting his extended family. He served both as the mayor of Los Angeles and as the first judge. He spoke only Spanish and never adopted American customs. Lugo was known as the best horseman in California. His silver trimmed saddle is on display at the Autry Museum of Western Heritage. [Anon. 1890, Elliott 1883, Whitehead 1978]

Lugo's daughter Maria de Jesus was married in 1836 at the age of 13 to Isaac Williams. Lugo's wedding gift was four thousand head of cattle. Williams converted to Catholicism and became a naturalized Mexican citizen prior to his marriage. Williams had come from Pennsylvania in 1832 with a party of trappers. Later he operated a store in downtown Los Angeles. Lugo requested Rancho Santa Ana del Chino for the support of his extended family and received it when he was 79. In 1839 Maria de Jesus gave birth to Maria Merced Williams and in 1842 Maria de Jesus died at the age of 19 in childbirth. In 1843 Governor Micheltorena granted 17, 280 acres adjoining Rancho Santa Ana del Chino to Isaac Williams. Lugo deeded Rancho Santa Ana del Chino to Williams the same year. [Anon. 1890, Elliott 1883, Whitehead 1978]

Williams built a traditional adobe house with an internal courtyard on a rise above Chino Creek. The roof was of asphaltum and there were few doors and windows. The entire building was surrounded with an adobe wall and a ditch. Other structures included adobes for Native American and Mexican workers, barns, shearing shed and grist mill. In addition to grazing cattle and sheep, Williams planted orchards and vineyards. The rancho was heavily involved in the hide and tallow trade between California and the East Coast. [Anon. 1890, Elliott 1883, Whitehead 1978]

Williams is known to have imported Luiseño Native Americans from Temecula to work on his ranch using as his agent a Luiseño named Pablo Apis. While Williams never remarried, he had children with two granddaughters of Pablo Apis. Maria Jesus lived at Rancho Chino and was the mother of Francesca. Maria Antonia lived with her family in Temecula and was the mother of Victoria. Later she would bear Concepcion and Feliciano, both of whom died as youngsters. [Bibb 1991]

In 1846 the Battle of Chino, the first battle of the Mexican-American War, took place at the Williams house. A party of Americans on the way to Los Angeles to quell Californios who had taken the American garrison stopped at the house to rest. The Californios send a group to cut off these reinforcements. After the bullets were exhausted, the roof of the house was set on fire. Williams surrendered to save the lives of his children. The Americans were taken prisoner and marched to Los Angeles. The prisoners were all freed when other American forces reoccupied Los Angeles. It took nearly four more months and four more battles before a peace treaty was signed shifting control of California to the United States. Williams repaired his house and resumed his activities. [Elliott 1883, Rensch and Rensch 1932]

AMERICAN ERA SETTING (1848-1899)

When the United States took possession of California one of the major problems was sorting out land ownership claims. Mexican citizens Bernardo Yorba, Isaac Williams (naturalized) and Henry Dalton (naturalized) in the Chino Hills area were fortunate to retain their lands.

Figure 9. Rancho Santa Ana del Chino

The Williams title was confirmed and patented by the United States in 1869 (Figure 10, yellow blocks). Bernardo Yorba patented his parcels partially in 1866 and partially in 1879 (Figure 10, red blocks). Henry Dalton patented his in 1875 (Figure 10, blue blocks). [BLM GLO]

General Land Office Records indicates that at least 49 other individuals (plus the USA, State of California and the Southern Pacific Railroad) had obtained land patents for the Chino Hills area between 1865 and 1917 (Figure 11; Table 1; BLM GLO).

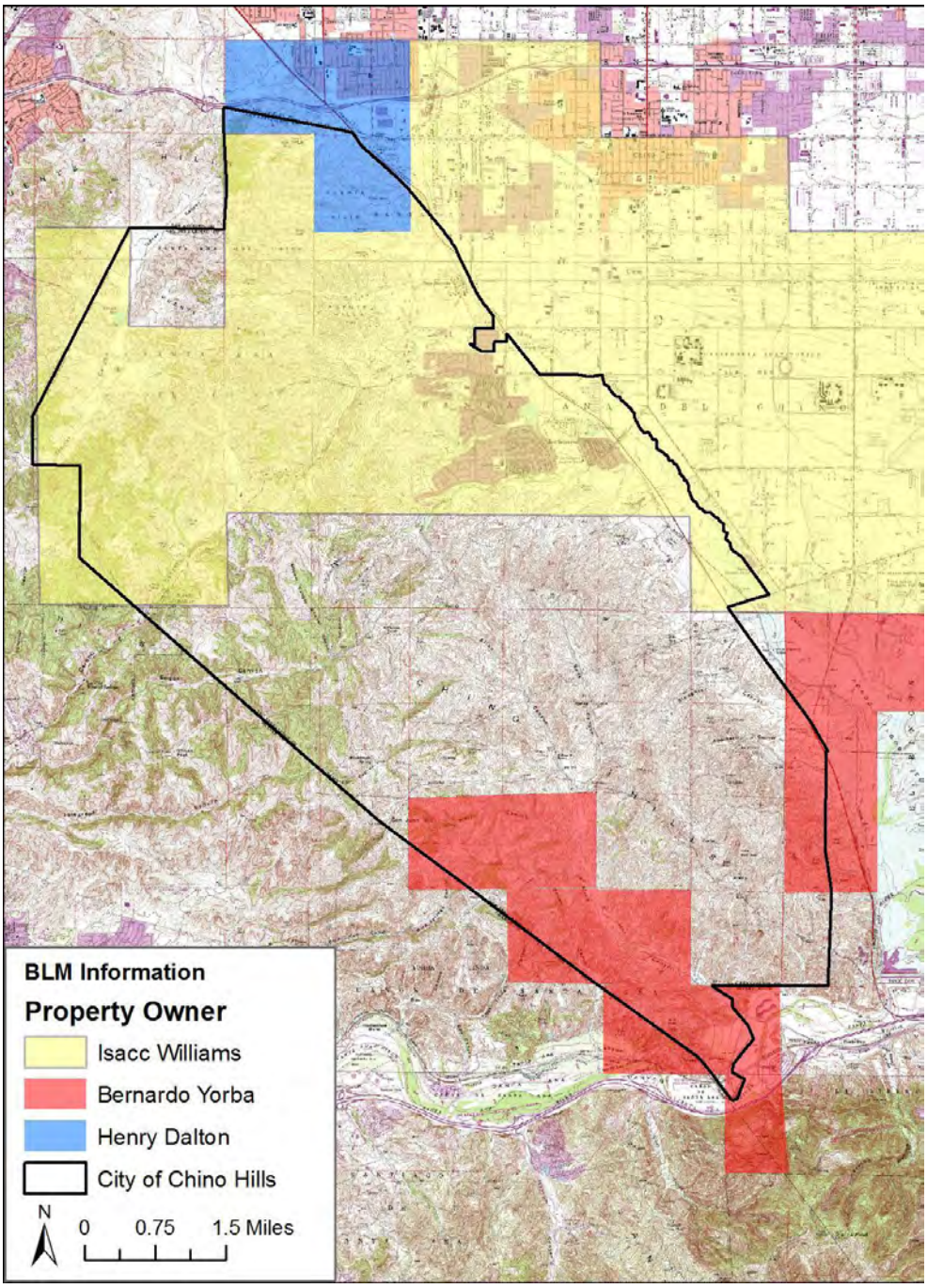


Figure 10. Ranchos become Ranches

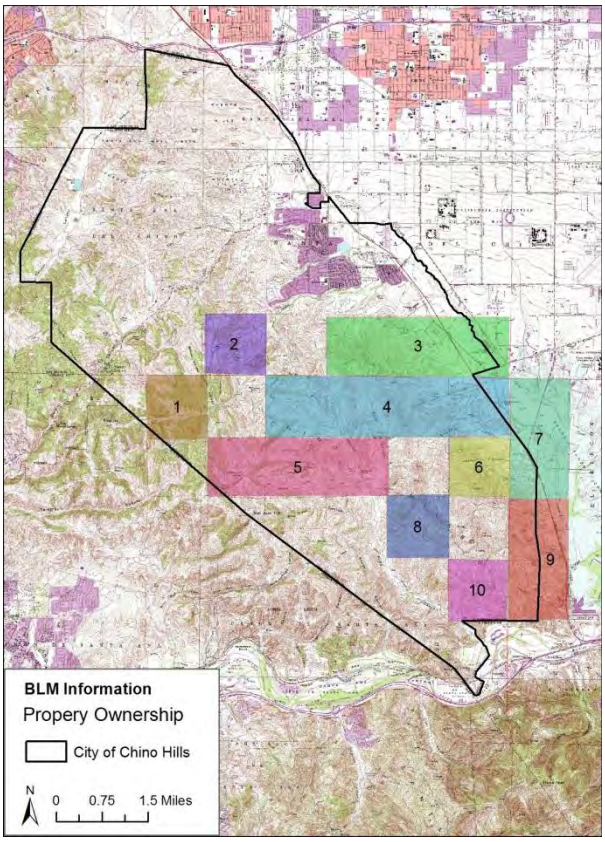


Figure 11. Small Property Owners

Table 1. Land Ownership for Small Property Owners

Block	Name	Date	Section	T	R
1	Noah Cary	1899	6	3S	8W
1	George Ashley	1900	6	3S	8W
1	Andrew J Friend	1900	6	3S	8W
1	George F Page	1901	6	3S	8W
1	William E Shafer	1902	6	3S	8W
1	Samuel J Carroll	1908	6	3S	8W
2	A. L. Toffelmier	1875	32	2S	8W
2	Lathan A Patton	1890	32	2S	8W
2	Edwin McCollough	1893	32	2S	8W
3	Harrison M Kurt	1874	35	2S	8W
3	William A Levick	1874	35	2S	8W
3	Samuel Pine	1874	36	2S	8W
3	James Bessant	1876	34	2S	8W
3	Isham Joplin	1878	34	2S	8W
3	J. J. Ward	1882	35	2S	8W
4	Joseph R Smith	1872	3, 4	3S	8W
4	John Peck	1872	1	3S	8W
4	Joseph W Riddle	1874	4	3S	8W
4	Oceola Sims	1874	1, 12	3S	8W
4	Pascal Castorene	1875	4	3S	8W
4	Fenton M Slaughter	1875	1	3S	8W
4	Henry Kearney	1890	3	3S	8W
4	Joseph Bray	1890	2	3S	8W
4	John H Rice	1891	4	3S	8W
4	Peter Griffin	1891	2	3S	8W
4	John M Banes	1892	2	3S	8W
5	Francis Defley	1872	10	3S	8W
5	Flora A Hazen	1891	10	3S	8W
5	Samuel D Smith	1872, 1878	9, 10	3S	8W
5	Franklin Cogswell	1882, 1889	8	3S	8W
6	Leolin Taylor	1889	12	3S	8W
6	Ela R Taylor	1895	12	3S	8W
6	John S Taylor	1907	12	3S	8W
7	Caleb Yount	1878	6	3S	7W
7	Elisha H Gates	1881	6	3S	7W
7	Harry G Brown	1891	7	3S	7W
8	Edward G. Tuthill	1901	14	3S	8W
8	Juan F Yorba	1901	14	3S	8W
8	J. E. Bacon	1904	14	3S	8W
8	Joseph W Chaney	1906	14	3S	8W
9	Antonio Aros	1882	18, 19	3S	7W
9	Domingo Mogart	1906	18	3S	7W
10	Isaac W Taylor	1895	24	3S	8W
10	John Richards	1902	24	3S	8W
10	Arthur B Tuthill	1902	24	3S	8W
10	Jonas V Brighton	1914	24	3S	8W

Three trails converged near Williams' home: the Spanish and Salt Lake trails over the Cajon Pass, and the Southern Emigrant Trail through southern Arizona. Williams provided rest and relief for many Gold Rush travelers and settlers. His help included overnight stays, food, animal feed, loans of mules and horses and even rescues of stragglers left behind in the desert. [Bynum 1935, Elliott 1883, Rensch and Rensch 1932]

Williams died in 1856. All of his surviving children were named in his will and possession of Rancho Santa Ana del Chino was confirmed to them in 1858. Shortly after their father's death, his older daughters married. Maria Merced Williams married John Rains, the rancho foreman. They purchased Rancho Cucamonga and moved there. Francesca Williams married Robert Carlisle and they remained on Rancho Santa Ana del Chino. Later, Victoria Regina Williams married Joseph Bridger. [Anon. 1890, Brown and Boyd 1922, Elliott 1883, Whitehead 1978]

In 1858 John Butterfield, founder of American Express, established the Butterfield Overland Mail Route which included a station at the Chino Ranch Williams/Carlisle adobe. With the start of the civil war in the south, the mail route was terminated in 1861. [Hafen 2004]

A period of hard times befell California. It began with a storm that began before Christmas of 1861 and lasted a month. The rain caused extensive flooding throughout the state. The Santa Ana River and many others cut new channels to the ocean. Not only were homes and crops destroyed, but many cattle and other animal drowned. This was followed by three years of drought and an epidemic of smallpox. In southern California an estimated 70% of the cattle died from lack of feed. In addition, taxes were implemented based on how much land was owned. Most former ranchos, including Chino Ranch, were economically devastated by this series of events. [Robinson 1941:117-137]

Robert Carlisle died in 1865. Francesca remarried and moved with her children and new husband to Los Angeles. Victoria's husband Joseph Bridger was the trustee of the Carlisle heirs and took over management of the rancho. The Bridger's built an adobe home in what is now Los Serranos. By 1874 the mortgages taken out in preceding years to run the ranch could not be repaid and the ranch passed into the hands of Los Angeles bankers. [Anon. 1890, Brown and Boyd 1922, Elliott 1883]

In 1881, Chino Ranch was purchased by Richard Gird. He moved into the Bridger adobe and began making improvements to the ranch that included purchasing additional acreage. Eventually his property included 47,000 acres. In 1887 he subdivided 23,000 acres into ten acre parcels and created a town site of one mile square – the original boundaries of the City of Chino. Gird developed Chino and eventually moved to town. His horse and cattle ranch continued to operate in Chino Hills. Gird's investment in the town did not yield returns sufficient to maintain his properties and in 1894 he sold the 41,000 acres of the ranch he had left. Within a few years, the ranch was broken into small parcels and sold. [Anon. 1890, Brown and Boyd 1922, Ingersoll 1904]

EARLY 20TH CENTURY ERA SETTING (1900-1949)

The small parcels of the former Chino Ranch within Chino Hills mostly continued to be used for ranching. However, some were explored for oil and wells installed following the late 1890s discovery of oil in the Brea-Olinda Field west of Chino Hills.

In 1909, an organization that provided vocational education for teens with life challenges moved to Chino Hills. Boy's Republic (previous names included George Junior Republic and California Junior Republic) occupied 240 acres including the former location of Isaac Williams adobe and probably the village of Pashiinonga. Ranching, farming, milk production and many other agricultural activities were performed by the residents in times past (CJR circa 1950). The facility is currently a treatment center for teenagers in need of highly structured supervision.

In 1914 a trio of Los Angeles business leaders formed a syndicate to purchase a ranch along the western border of Chino Hills. These men were Harry Chandler of the Los Angeles Times, wildcat oil driller turned elite attorney Tom Scott and William Rowland, former Los Angeles County Sheriff and descendant of wealthy La Puente rancher John Rowland. They renamed the ranch Tres Hermanos. They threw an annual private-invitation-only spring round up with rodeo, branding and barbeque for fellow members of the Los Angeles elite which Chandler excluded from news coverage. In addition, family weekends were spent on the ranch and the men's sons were expected to participate in ranching activities. [McDougal 2002, Valle 2009]

In 1922 Sleepy Hollow Resort, south of Tres Hermanos, debuted with 80 acres subdivided for weekend getaway cabins by Cleve and Elizabeth Purington (CCC n.d.). By 1925, a golf course designed by John Duncan Dunn was completed at Los Serranos Country Club on the eastern edge of Chino Hills. It also had rental cottages, home sites, a private landing strip, stables, polo grounds, boating, fishing, trap shooting and other recreational activities (LSCC n.d.). The Bridger/Gird Adobe was the original clubhouse but burned down in 1957. Development of these two areas continued over the years (Figure 12, 13). Other individual ranches likely were bought and developed as country homes in the following years.

LATE 20TH CENTURY ERA SETTING (1950-1999)

In 1954 an 800 acre site north of Soquel Canyon was selected for an Aerojet facility that assembled and tested ordinance for the United States Department of Defense (CA DTSC 2009). Use continued until 1995.

The Western Hills Golf and Country Club opened in 1963 with the golf course designed by Harry and David Rainville (CCC n.d.). It is a private club located northeast of Sleepy Hollow.

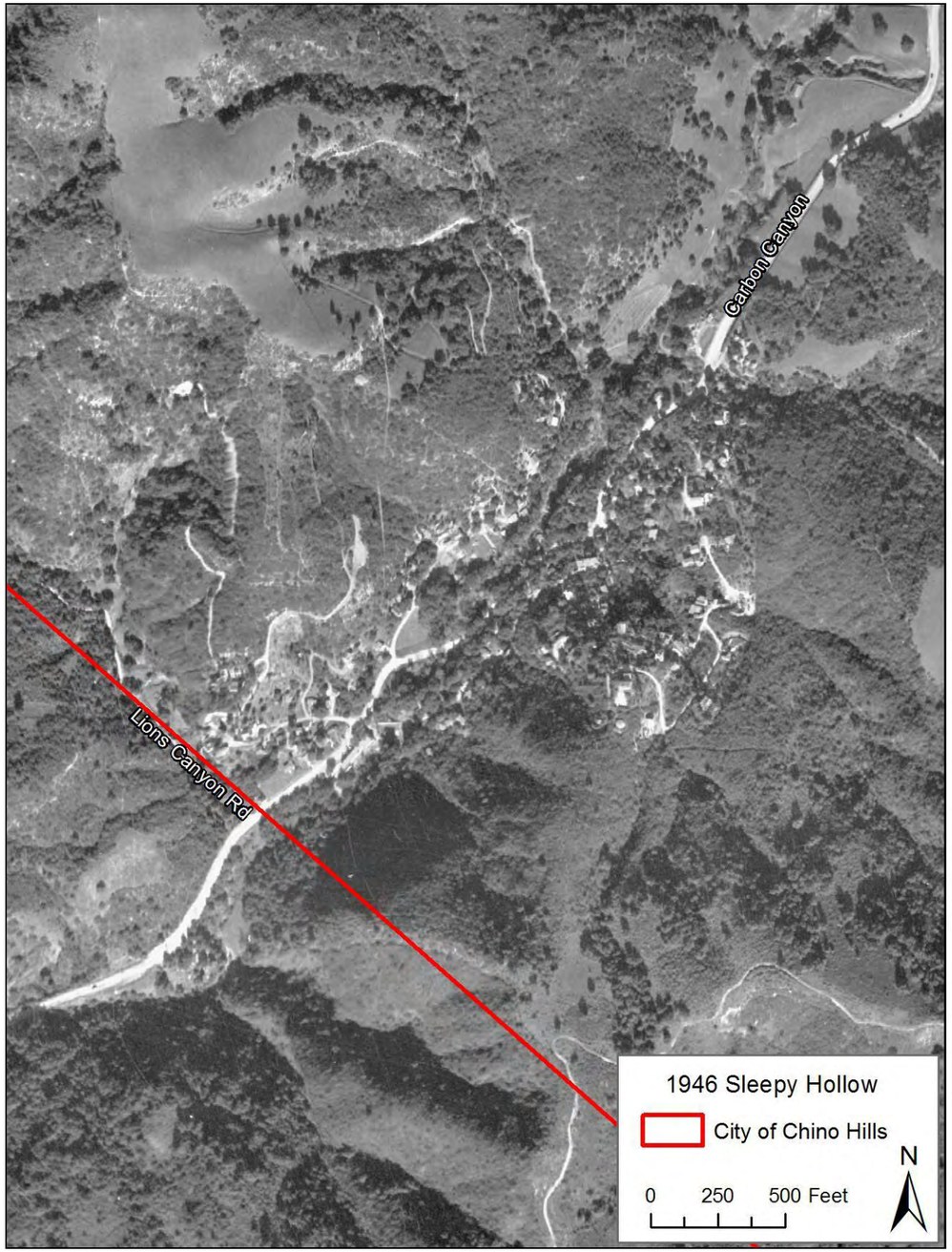


Figure 12. Sleepy Hollow Then and Now

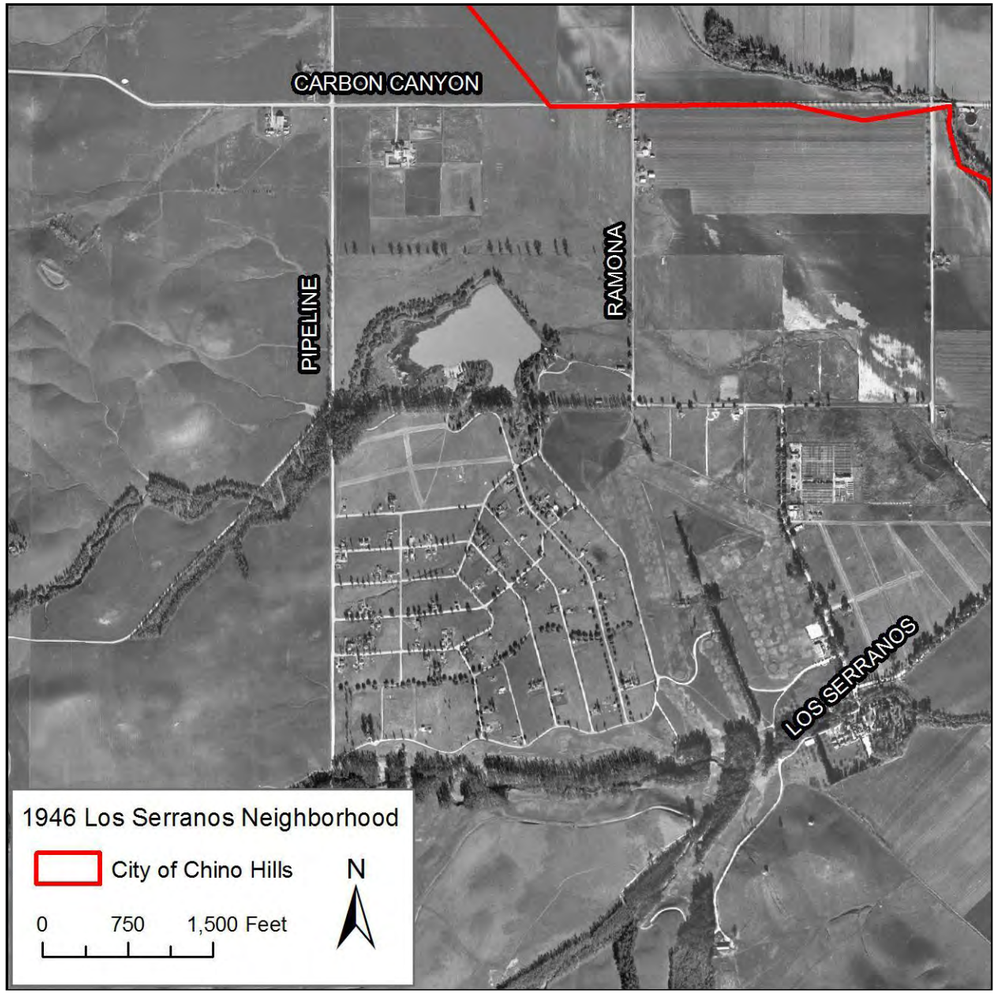


Figure 13. Los Serranos Then and Now

In 1978 the City of Industry bought Tres Hermanos (Valle 2009). It has continued as a working cattle ranch. A new road along Tonner Ridge has been proposed by the cities of Industry and Diamond Bar to funnel Inland Empire traffic into Orange County. In addition, the City of Industry has proposed three massive dams with water reservoirs in Tonner Canyon. There is local opposition as both projects would interrupt the known wildlife corridors (HFE n.d.).

Beginning in the late 1970s, residential development increased in Chino Hills with a major boom in the 1980s. These developments were mostly in the central area of Chino Hills in the villages of Carbon Canyon, The Oaks, Woodview and Los Serranos.

In 1991 the City of Chino Hills incorporated. Both additional residential areas and retail centers were planned (Inland Empire Business Journal 1993). In the late 1990s residential developments were built in the villages of Butterfield Ranch, Rincon, Gordon Ranch, Laband and Rolling Ridge Estate. These were accompanied by construction of major shopping centers.

EARLY 21ST CENTURY SETTING (2000-2010)

Infill development was occurring in Chino Hills until the economic slow-down that began in 2006. The City constructed a new community park, civic center, fire station, library, post office and other community facilities.

KNOWN RESOURCES

PALEONTOLOGICAL RESOURCES

Documentation on paleontological resources was obtained largely from mitigation compliance reports filed with the City (Appendix D) as there is no central repository for paleontological documents. The reports do not represent every project performed in the city. In addition, information on known fossil localities was obtained from the Natural History Museum of Los Angeles County and the San Bernardino County Museum. Both of these institutions curate fossils from Chino Hills along with Loma Linda University Department of Natural Sciences. Unidentified Chino Hills fossils are held by California State University San Bernardino Department of Geological Sciences, Saddleback College and possibly others. On this basis, the information presented here is incomplete.

City-held reports and/or museum information were available for 19 projects in six villages of Chino Hills (Figure 14). Miocene fossils represented the time period when Chino Hills was ocean floor include many kinds of marine life but also leaves from terrestrial plants that were washed into the ocean by streams and rivers. The Miocene marine fossils include marine mammals of 8 types including the extinct Chino Hills dolphin, boney fishes of 41 types, cartilaginous fishes of 4 types, marine invertebrates of 18 types and marine plants of 10 types

(Table 2). Miocene land plants of 32 types are represented along with freshwater snails. Pleistocene terrestrial mammals are represented by 8 types (Table 2).

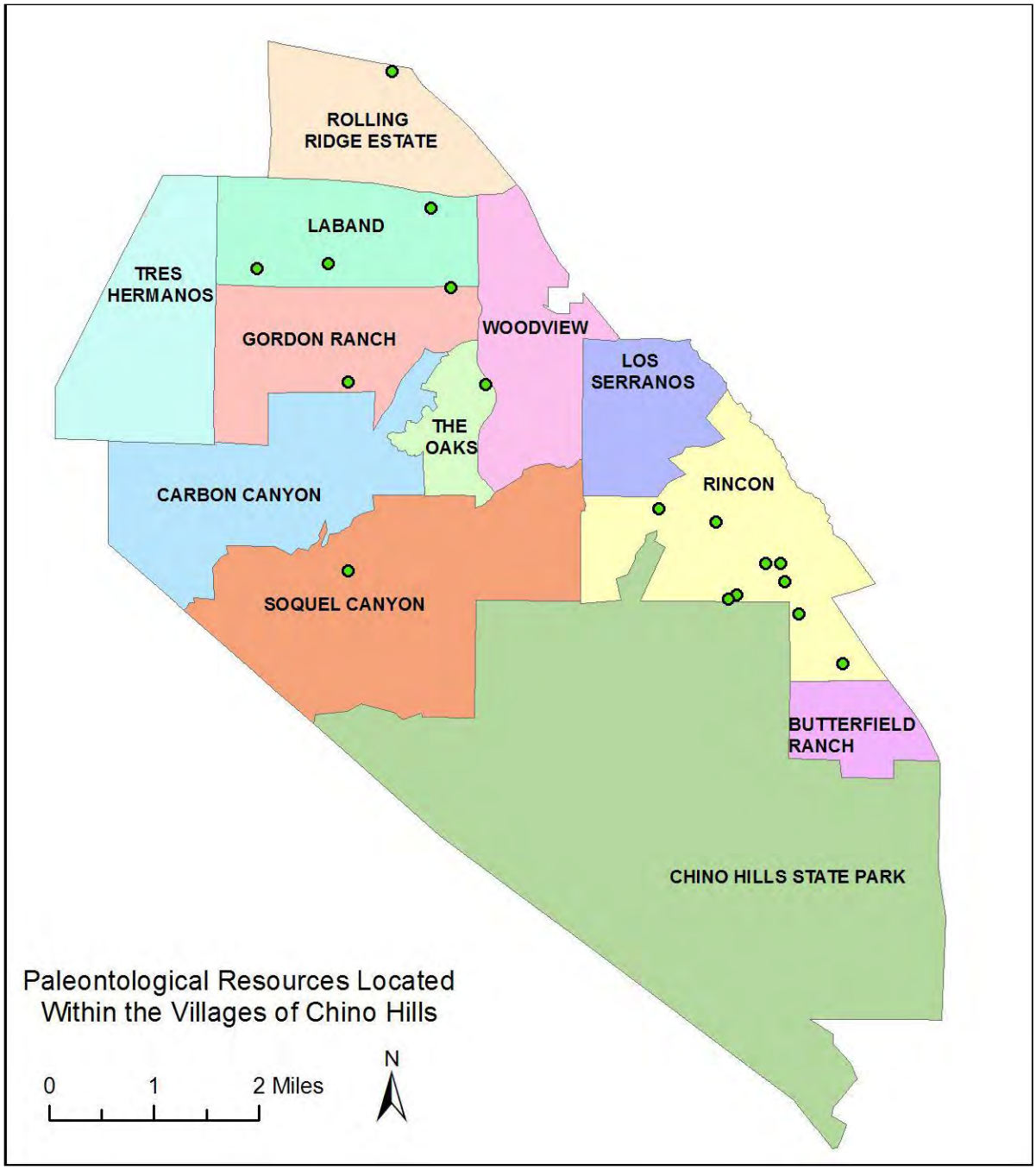


Figure 14. Fossil Localities (incomplete)

Table 2. Fossils from Chino Hills

Scientific Name	Gordon	Laband	Rincon	Rolling Ridge	Oaks	Soquel	Grand Total	Common Name
MIOCENE								
Marine Mammals								
Atocetus angulii						6	**6**	Chino Hills dolphin, extinct
Balaenopteridae			4				**4**	rorqual whale
Cetacea		1	5		2		**8**	whale
Delphinidae			1				**1**	dolphin
Mysticeti						1	**1**	baleen whale
Otariid		1					**1**	eared seal
Physeteridae			1				**1**	sperm whale
Pinnipedia		1	2				**3**	seals and sea lions
Pithanotaria starri			1				**1**	fur seal
marine mammals subtotal		**3**	**14**		**2**	**7**	**26**	
Birds								
Aves			9				**9**	birds
birds subtotal			**9**				**9**	
Boney Fishes								
Acanthopterygii	1	129	120	22	5		**277**	spiny-finned fish
Alepocephalidae						5	**5**	slickheads
Anarrhichthys						3	**3**	wolf-eel
Araeosteus (cf.)			1				**1**	bony fish
Araeosteus rothi			1			3	**4**	prow fish, extinct
Argentinoidei			5				**5**	smelt
Argyropelecus bullockii			2			2	**4**	hatchetfish, extinct
Atherinidae		4	1			2	**7**	silverside/grunion
Bathylagidae	2	14	18	1	4	108	**147**	deep sea smelt
Belonidae						3	**3**	needlefish
Carangidae		2	1				**3**	jack
Chauliodus eximius	1		1		4	31	**37**	viperfish, extinct
Clupeidae	1	24	9	4	1		**39**	herring/sardine
Cyclothone	1		2	1	1	4	**9**	bristlemouth
Decapterus		5			4	81	**90**	scad, extinct

Scientific Name	Gordon	Laband	Rincon	Rolling Ridge	Oaks	Soquel	Grand Total	Common Name
Eclipes		3	25		7	268	**303**	hake
Etringus	1	132	2	25		41	**201**	herring
Gadiformes			15				**15**	cod
Ganoessus		1					**1**	extinct sardine
Ganoessus clepsydra						29	**29**	sardine
Ganolytes	2	31	19	1		80	**133**	sardine
Hemirhamphid or Exocetid		1					**1**	gliding or flying fish
Hipposyngnathus impocitor						1	**1**	extinct pipefish
Lompoquia	1	46	18	1	7	60	**133**	croaker
Myctophidae	1	7	27		9	63	**107**	lantern fish
Oncorhynus rastrosus						5	**5**	saber-toothed salmon, extinct
Perciformes		5	1				**6**	perch-like fish
Pleuronectiformes					1	2	**3**	flat fishes, halibut
Pseudoseriola	1	2	1			3	**7**	bluefish
Sarda	1	10	3			4	**18**	bonito
Scomber		5	3			45	**53**	mackerel
Scomberesox		1	2				**3**	needle nose gar
Scombridae		5	7				**12**	mackeral
Scorpenidae		1	1				**2**	rockfish
Serranidae		1					**1**	sea bass
Sparidae						2	**2**	porgies
Sphyraena						1	**1**	barracuda
Stomias						3	**3**	scaly dragonfish
Syngnathus	1	4				2	**7**	pipefish
Thyrsocles		11	18		2	23	**54**	knife fish, extinct
Xyne grex	1	2	32		2	130	**167**	herring
Zaphlegidae			1				**1**	snake mackeral
boney fishes subtotal	**15**	**446**	**336**	**55**	**47**	**1004**	**1903**	
Cartilagenous Fishes								
Carcharocles						1	**1**	white shark, extinct
Cetorhinus			1				**1**	basking shark
Elasmobranchii			16				**16**	shark
Isurus			1			1	**2**	mako shark

Scientific Name	Gordon	Laband	Rincon	Rolling Ridge	Oaks	Soquel	Grand Total	Common Name
cartilagenous fishes subtotal			**18**			**2**	**20**	
Invertebrates								
Amusium			1				**1**	paper scallop
Argobuccinum			1				**1**	triton
Astrea cf. *undosa*			1				**1**	turban conch
Balanus		1					**1**	barnacle
Brachiopoda			1				**1**	brachiopod
Brachyura			5				**5**	crab
Cardium			1				**1**	heart cockle
Delectopecten		1	28			1	**30**	mud scallop
Pulmonata			10				**10**	fresh water snails
Lepas			2				**2**	goose-neck barnacle
Lucinidae			1				**1**	lucine clams
Mollusca			6				**6**	molluscs
Mytilus		1	2				**3**	mussel
Ostrea		2					**2**	oyster
Pectinidae		2				1	**3**	scallop
Pelecypoda		1	52				**53**	bivalve
Polinices		1					**1**	moon snail
Tellina			3				**3**	wedge clam
Turritella			2				**2**	turret snail
Venus			1				**1**	venus clam
invertebrates subtotal		**9**	**117**			**2**	**128**	
Marine Plants								
Chondrites ramulosa		8					**8**	red algae
Chondrites recurva		2					**2**	red algae
Codium		1					**1**	green algae
Cystoseirites		1					**1**	brown algae
Fucales		6					**6**	brown algae
Laminariales			3				**3**	kelp
Paleohalidrys occidentalis	1	1					**2**	brown algae
Phaeophyta		2					**2**	brown algae
Rhodophyta			2				**2**	red algae

Scientific Name	Gordon	Laband	Rincon	Rolling Ridge	Oaks	Soquel	Grand Total	Common Name
Thallophyia			33				**33**	seaweed
marine plants subtotal	**1**	**21**	**38**				**60**	
Terrestrial Plants								
Acer			16				**16**	maple
Acila			7				**7**	bivalve
Alnus	1		8				**9**	alder
Amelanchier			1				**1**	juneberry
Arbutus		2	11				**13**	madrone
Betula		2	2				**4**	birch
Ceanothus			1				**1**	shrub
Cercis		2	6				**8**	red bud
Cercocarpus		1					**1**	mountain mahogany
Commelinidae		19	8				**27**	reed
Dicot			32				**32**	flowering plant
Ficus		1					**1**	fig
Juglans			1				**1**	walnut
Juniperus		1					**1**	juniper
Lauracea		2					**2**	laurel
Leguminosea			3				**3**	legume
Magnolia			13				**13**	magnolia
Palmae			24				**24**	palm
Persea		4	3				**7**	avocado
Pinus			4				**4**	pine
Plantae	1	10	97		3		**111**	leaf
Platanus		6	104				**110**	sycamore
Poaceae			27				**27**	grasses
Populus			40				**40**	poplar
Quercus			136				**136**	oak
Rhus		1	12				**13**	sumac
Robinia			1				**1**	locust
Sabal		6	2				**8**	fan palm
Sabalites		14	3				**17**	palm
Salix		1	22				**23**	willow

Scientific Name	Gordon	Laband	Rincon	Rolling Ridge	Oaks	Soquel	Grand Total	Common Name
Sassafras			1				**1**	sassafras
Typha		2					**2**	cattail
Umbellularia		4	17				**21**	California laurel
terrestrial plants subtotal	**2**	**78**	**602**		**3**		**685**	
PLEISTOCENE								
Mammals								
Bison antiquus			7				**7**	bison
Equus occidentalis			7				**7**	horse, extinct
cf. *Equus giganteus*						3	**3**	giant horse, extinct
Mammuthus columbi			6				**6**	mammoth
Nothrotheriops shastense						2	**2**	Shasta ground sloth, extinct
Odocoileus			1				**1**	deer
Paramylodon harlani			1				**1**	Harlan's ground sloth, extinct
Rodentia			11				**11**	rodent
Pleistocene mammals subtotal			**33**			**5**	**38**	
Grand Total by Village	**18**	**557**	**1167**	**55**	**52**	**1020**	**2869**	

Note: Identified specimens only included; there are many additional undocumented fossils from Chino Hills

The Chino Hills Dolphin, *Atocetus anguloi,* was recovered during construction excavations for Vellano in Soquel Canyon. This dolphin is a new and previously unknown species and has no living relatives. It was recovered from the latest Miocene *(circa* 9 Ma) Sycamore Canyon Formation. The skeleton represents an adult individual, and includes the cranium, mandible, vertebrae, ribs, and some bones of the pectoral flipper. It has distinctive features of the skull and teeth that are unlike any other dophin. [Barnes 2010]

CULTURAL RESOURCES

A search for archaeological and historic records was completed at the San Bernardino Archaeological Information Center at the San Bernardino County Museum June 9-11, 2010 by Molly Valasik of Cogstone. The records search was performed within city limits. Sources consulted included the National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), California Inventory of Historical Resources, California Historical Landmarks, and California Points of Historical Interest.

The records search determined there are 121 recorded cultural resources (Figure 15, Table 3, Table 4). Twenty-six are prehistoric-era sites, 55 are historic-era sites, 38 are prehistoric isolates and 2 are historic isolates within the city limits of Chino Hills. Two of the historic-era sites have additional listings. The Ranch Chino Adobe site is a California State Historical Landmark and the Battle of Chino marker is a California Point of Interest.

The record search determined there have been 123 previous cultural resource studies within the city of Chino Hills (Appendix E). All are on file with the San Bernardino Archaeological Information Center.

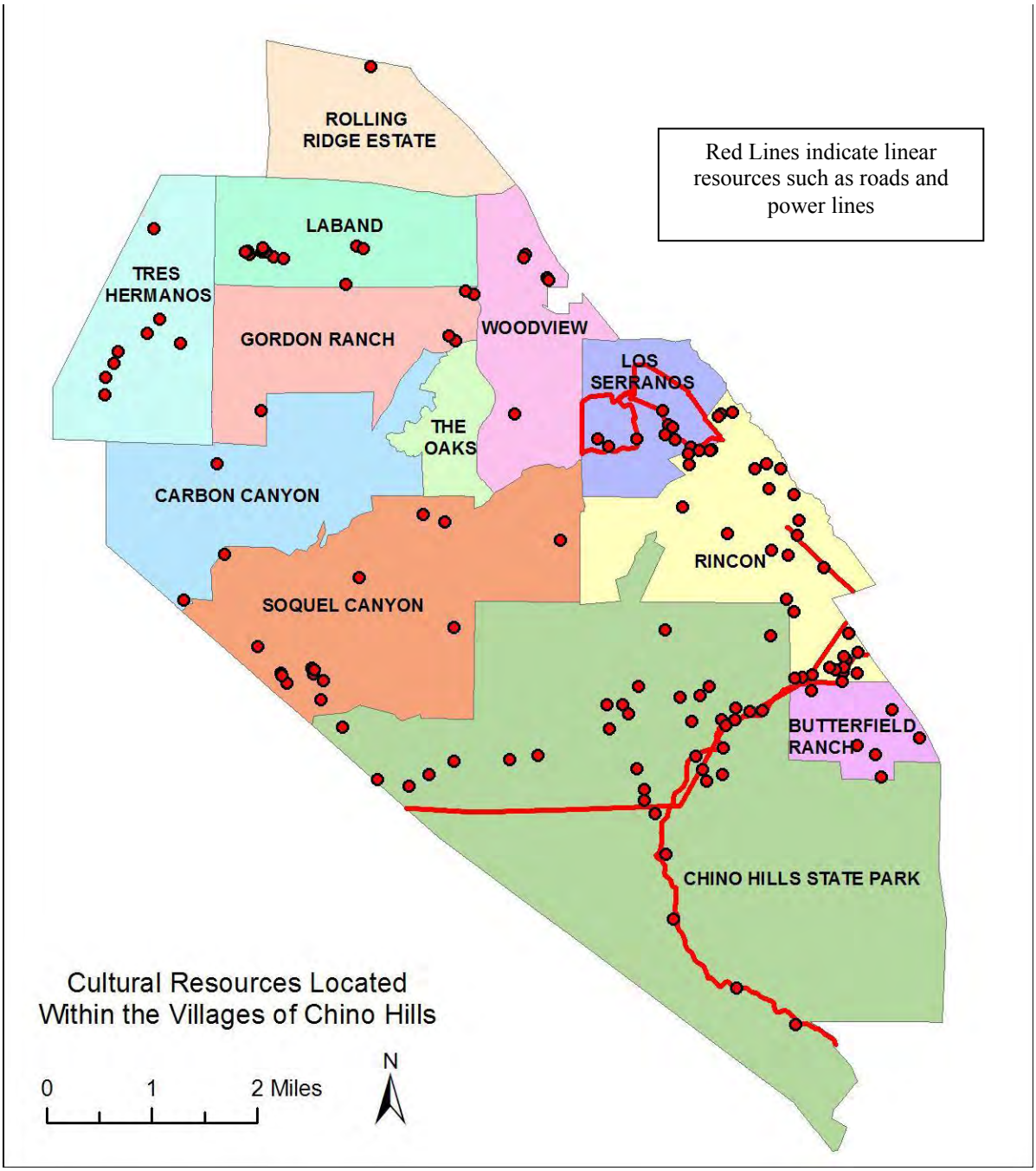


Figure 15. Location of Cultural Resources

Table 3. Sites by Time Period and Village

Village	Prehistoric	Spanish/Mexican	1848-1899	1900-1949	1950-1999	Total
Butterfield				1		**1**
Carbon Canyon	1			1	1	**3**
CHSP	32			3	4	**39**
Gordon	2			3		**5**
Laband	3			2		**5**
Los Serranos				7	1	**8**
Multiple			1	1		**2**
Rincon	14		1	16	2	**33**
Soquel Canyon	5		1	6	1	**13**
Tres Hermanos	5			3		**8**
Woodview	2	2				**4**
Grand Total	**64**	**2**	**3**	**43**	**9**	**121**

Table 4. Previously recorded cultural resources within the city of Chino Hills

Village	Brief Description	Time Period	Primary Number	Quad	Year Recorded
Butterfield	Oil well site	1900-1949	36-007008	Prado Dam	1991
Carbon Canyon	Bridge	1900-1949	36-015220	Yorba Linda	1979
Carbon Canyon	Corral Complex	1950-1999	36-006239	Yorba Linda	1989
Carbon Canyon	Milling site	Prehistoric	36-002374	Yorba Linda	1977
CHSP	Campsite	Prehistoric	36-003690	Prado Dam	1975
CHSP	Campsite	Prehistoric	36-012493	Prado Dam	2005
CHSP	Chipped Stone isolate	Prehistoric	36-060006	Prado Dam	1984
CHSP	Chipped Stone isolate	Prehistoric	36-060007	Prado Dam	1983
CHSP	Chipped Stone isolate	Prehistoric	36-060009	Prado Dam	1984

Village	Brief Description	Time Period	Primary Number	Quad	Year Recorded
CHSP	Chipped Stone isolate	Prehistoric	36-060013	Prado Dam	1983
CHSP	Chipped Stone isolate	Prehistoric	36-060015	Prado Dam	1983
CHSP	Chipped Stone isolate	Prehistoric	36-064360	Prado Dam	2000
CHSP	Chipped Stone scatter	Prehistoric	36-010714	Prado Dam	2002
CHSP	Groundstone isolate	Prehistoric	36-060003	Prado Dam	1984
CHSP	Groundstone isolate	Prehistoric	36-060004	Prado Dam	1984
CHSP	Groundstone isolate	Prehistoric	36-060008	Prado Dam	1983
CHSP	Groundstone isolate	Prehistoric	36-060010	Prado Dam	1983
CHSP	Groundstone isolate	Prehistoric	36-060011	Prado Dam	1983
CHSP	Groundstone isolate	Prehistoric	36-060012	Prado Dam	1983
CHSP	Groundstone isolate	Prehistoric	36-060014	Prado Dam	1984
CHSP	Groundstone isolate	Prehistoric	36-060016	Prado Dam	1983
CHSP	Groundstone isolate	Prehistoric	36-060017	Prado Dam	1983
CHSP	Groundstone isolate	Prehistoric	36-060018	Prado Dam	1983
CHSP	Groundstone isolate	Prehistoric	36-060019	Prado Dam	1983
CHSP	Groundstone isolate	Prehistoric	36-060020	Prado Dam	1983
CHSP	Groundstone isolate	Prehistoric	36-060021	Prado Dam	1983
CHSP	Groundstone isolate	Prehistoric	36-060022	Prado Dam	1984
CHSP	Groundstone isolate	Prehistoric	36-060023	Prado Dam	1983
CHSP	Groundstone scatter	Prehistoric	36-005280	Prado Dam	1984
CHSP	Groundstone scatter	Prehistoric	36-010715	Prado Dam	2002
CHSP	Milling site	Prehistoric	36-005097	Prado Dam	1982
CHSP	Milling site	Prehistoric	36-005283	Prado Dam	1983
CHSP	Milling site	Prehistoric	36-005284	Prado Dam	1983
CHSP	Milling site	Prehistoric	36-005286	Prado Dam	1984
CHSP	Milling site	Prehistoric	36-005287	Prado Dam	1982
CHSP	Rock Art	Prehistoric	36-005282	Prado Dam	1984
CHSP	Oil well site	1900-1949	36-019845	Prado Dam	2008
CHSP	Rolling M Ranch	1900-1949	36-003690	Prado Dam	1975
CHSP	Trash scatter	1900-1949	36-010714	Prado Dam	2002
CHSP	Irrigation system	1950-1999	36-019846	Prado Dam	2008
CHSP	Ranching isolate	1950-1999	36-019848	Yorba Linda	2008

Village	Brief Description	Time Period	Primary Number	Quad	Year Recorded
CHSP	Ranching isolate	1950-1999	36-060005	Prado Dam	1983
CHSP	Water system	1950-1999	36-019847	Prado Dam	2008
Gordon	Groundstone isolate	Prehistoric	36-020467	Prado Dam	2004
Gordon	Groundstone scatter	Prehistoric	36-010603	Prado Dam	2001
Gordon	Caballero Farm	1900-1949	36-020465	Prado Dam	2004
Gordon	Trash scatter	1900-1949	36-010604	Prado Dam	2001
Gordon	Water system	1900-1949	36-013390	Yorba Linda	2007
Laband	Chipped Stone isolate	Prehistoric	36-060039	Yorba Linda	1986
Laband	Chipped Stone scatter	Prehistoric	36-005694	Yorba Linda	1986
Laband	Groundstone isolate	Prehistoric	36-060038	Yorba Linda	1986
Laband	Trash scatter	1900-1949	36-060040	Yorba Linda	1986
Laband	Trash scatter	1900-1949	36-060041	Yorba Linda	1986
Los Serranos	Bungalow House	1900-1949	36-012521	Prado Dam	2004
Los Serranos	Los Serranos Neighborhood	1900-1949	36-012529	Prado Dam	2004
Los Serranos	Minimal traditional house	1900-1949	36-012527	Prado Dam	2004
Los Serranos	Minimal traditional house	1900-1949	36-012528	Prado Dam	2004
Los Serranos	Ranch style house	1900-1949	36-012523	Prado Dam	2004
Los Serranos	Ranch style house	1900-1949	36-012525	Prado Dam	2004
Los Serranos	Spanish style house	1900-1949	36-012526	Prado Dam	2004
Los Serranos	Ranch style house	1950-1999	36-012524	Prado Dam	2004
Multiple	Dirt road	1848-1899	36-007010	Prado Dam	1991
Multiple	Edison substation & "O" line	1900-1949	36-013627	Yorba Linda	2007
Rincon	Burial and Cooking Feature	Prehistoric	36-010821	Prado Dam	2002
Rincon	Chipped Stone isolate	Prehistoric	36-064533	Prado Dam	2002
Rincon	Chipped Stone scatter	Prehistoric	36-005245	Prado Dam	1983
Rincon	Chipped Stone scatter	Prehistoric	36-009371	Prado Dam	1998
Rincon	Cooking Feature	Prehistoric	36-008694	Prado Dam	1997
Rincon	Groundstone isolate	Prehistoric	36-012237	Prado Dam	2004
Rincon	Groundstone isolate	Prehistoric	36-012238	Prado Dam	2004
Rincon	Groundstone isolate	Prehistoric	36-060037	Prado Dam	1991
Rincon	Groundstone isolate	Prehistoric	36-060248	Prado Dam	1998
Rincon	Groundstone isolate	Prehistoric	36-064230	Prado Dam	1999

Village	Brief Description	Time Period	Primary Number	Quad	Year Recorded
Rincon	Groundstone scatter	Prehistoric	36-007972	Prado Dam	1993
Rincon	Groundstone scatter	Prehistoric	36-009398	Prado Dam	1998
Rincon	Milling site	Prehistoric	36-004212	Prado Dam	1980
Rincon	Milling site	Prehistoric	36-009399	Prado Dam	1998
Rincon	Pomona-Ricon Road	1848-1899	36-006817	Prado Dam	1991
Rincon	Foundation and debris	1900-1949	36-007006	Prado Dam	1991
Rincon	Gravel & sand quarry	1900-1949	36-007009	Prado Dam	1991
Rincon	Historic irrigation system	1900-1949	36-009895	Prado Dam	1999
Rincon	Homestead	1900-1949	36-007972	Prado Dam	1993
Rincon	Kramer Ranch	1900-1949	36-007046	Prado Dam	1991
Rincon	Oil production site	1900-1949	36-006578	Prado Dam	1989
Rincon	Oil well & production site	1900-1949	36-006575	Prado Dam	1989
Rincon	Oil well site	1900-1949	36-007003	Prado Dam	1991
Rincon	Spring well and debris	1900-1949	36-007007	Prado Dam	1991
Rincon	Trash scatter	1900-1949	36-006574	Prado Dam	1989
Rincon	Trash scatter	1900-1949	36-006576	Prado Dam	1989
Rincon	Trash scatter	1900-1949	36-006577	Prado Dam	1989
Rincon	Trash scatter	1900-1949	36-007002	Prado Dam	1991
Rincon	Trash scatter	1900-1949	36-009564	Prado Dam	1998
Rincon	Trash scatter	1900-1949	36-009939	Prado Dam	1999
Rincon	Trash scatter, foundation, & road	1900-1949	36-007973	Prado Dam	1993
Rincon	Oil well site and possible quarry	1950-1999	36-007005	Prado Dam	1991
Rincon	Trash scatter	1950-1999	36-007004	Prado Dam	1991
Soquel Canyon	Chipped Stone isolate	Prehistoric	36-060034	Prado Dam	1990
Soquel Canyon	Chipped Stone isolate	Prehistoric	36-060035	Prado Dam	1990
Soquel Canyon	Chipped Stone isolate	Prehistoric	36-060042	Yorba Linda	1989
Soquel Canyon	Groundstone isolate	Prehistoric	36-060031	Prado Dam	1984
Soquel Canyon	Groundstone isolate	Prehistoric	36-060036	Prado Dam	1990
Soquel Canyon	House complex	1848-1899	36-006246	Yorba Linda	1989
Soquel Canyon	Basque Homestead	1900-1949	36-006243	Yorba Linda	1989
Soquel Canyon	Construction debris	1900-1949	36-006245	Yorba Linda	1989
Soquel Canyon	Corral Complex	1900-1949	36-006242	Yorba Linda	1989

Village	Brief Description	Time Period	Primary Number	Quad	Year Recorded
Soquel Canyon	Farming equipment	1900-1949	36-006247	Yorba Linda	1989
Soquel Canyon	McDermont Cattle Ranch	1900-1949	36-004033	Prado Dam	1980
Soquel Canyon	Oil Well	1900-1949	36-006244	Yorba Linda	1989
Soquel Canyon	Construction debris	1950-1999	36-006241	Yorba Linda	1989
Tres Hermanos	Groundstone isolate	Prehistoric	36-060043	Yorba Linda	1995
Tres Hermanos	Stone artifact scatter	Prehistoric	36-005690	Yorba Linda	1980
Tres Hermanos	Stone artifact scatter	Prehistoric	36-005691	Yorba Linda	1980
Tres Hermanos	Stone artifact scatter	Prehistoric	36-005692	Yorba Linda	1980
Tres Hermanos	Stone artifact scatter	Prehistoric	36-005693	Yorba Linda	1980
Tres Hermanos	Adobe at Tres Hermanos Ranch	1900-1949	36-005689	Yorba Linda	1980
Tres Hermanos	Arnold Ranch complex	1900-1949	36-008124	Yorba Linda	1995
Tres Hermanos	Historic dam	1900-1949	36-008125	Yorba Linda	1995
Woodview	Chipped Stone isolate	Prehistoric	36-060033	Prado Dam	1984
Woodview	Groundstone isolate	Prehistoric	36-060024	Prado Dam	1980
Woodview	Battle of Chino marker	Spanish/Mexican	36-018755	Prado Dam	1940
Woodview	Rancho Chino marker	Spanish/Mexican	36-015215	Prado Dam	1974

NATIVE AMERICAN CONSULTATION

A Sacred Lands File search was requested from the Native American Heritage Commission on June 4, 2010. On June 7, the Commission replied that there were known Native American cultural resources within the project study area, and provided a list of seven Native American tribes or individuals to contact for further information (Appendix B).

Letters requesting information on any heritage sites and containing maps and project information were sent by post on June 8, 2010 to the seven Native American contacts. Anthony Morales of the San Gabriel Band of Mission Indians responded that the entire city is sensitive for prehistoric resources.

DISCUSSION

The City is well aware of the paleontological and archaeological sensitivity of Chino Hills and has established standard mitigation measures (available at the City of Chino Hills Community Development Department).

The City does not currently have policies regarding historic resources. These built-environment resources include all types of habitations, buildings, roads, bridges, dams and other structures. Archaeologists and architectural historians working on projects will generally establish formal site records for any resources more than 45 years old to comply with CEQA and their professional responsibilities. The 45 year rule is used due to the typical length of time a project is in process before construction begins and is meant to prevent last minutes problems with resources that have become 50 years old and are therefore historic under state and federal laws.

Local governments have major responsibility for preservation as most projects are permitted at the local level. The City has authority to determine what types of resources will be considered for preservation and to determine what the criteria for feasibility will be. The State of California provides guidance for the process (CA SHPO 2002, 2005). In addition, for practicality and economic considerations the City might adopt a list of properties exempt from evaluation (including culverts, moveable farm equipment, advertising signs and other items) similar to the one used by Caltrans (Caltrans 2006). To undertake the process of becoming a Certified Local Government, the city would be required to enter into an agreement with the State Office of Historic Preservation and then would be eligible for federal funding to embark on a city-wide historic survey and similar activities.

An issue for the City is the possible designation of historic districts. In addition to meeting one or more of the four criteria for the California Register of Historical Resources (CHRC), historic districts must demonstrate integrity. To determine whether or not a potential historic district has integrity, a formal evaluation completed in accordance with CHRC guidelines by a qualified architectural historian, is required. Alternatively, a conservation area can be designated when resources present do not meet criteria for a historic district. Both give the City the opportunity to create design guidelines for renovations or new structures.

A historic district is a geographically definable area, urban or rural, possessing a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united by past events or aesthetically by plan or physical development. A district may also comprise individual elements separated geographically but linked by association or history (NPS 2004).

A conservation area possesses form, character, and visual qualities derived from arrangements or combinations of topography, vegetation, space, scenic vistas, architecture, appurtenant features, or places of natural or cultural significance, that create an image of stability, comfort, local identity, and livable atmosphere. [Stipe 1998]
In theory, there are three kinds of areas or neighborhoods to which the designation might

appropriately be attached: (1) the designation would be appropriate for those areas surrounding or bordering on an existing local historic district. In this sense, conservation areas might be regarded in customary planning parlance as "buffers," or transitional areas designed to protect the edges of an existing district; (2) the conservation area approach would be highly appropriate as a tool to protect what might be called "pre-natal" historic districts that don't yet meet the usual 50-year rule or which have not yet acquired the patina of age or character associated with the traditional district, but which skilled observers feel certain will qualify in perhaps 5 or 10 years. Conservation area designation would thus provide incentives to the private sector to protect and maintain a maturing but not-yet-ripe historic district of the traditional kind; (3) the designation would be appropriate for areas or neighborhoods that while they might never qualify for "historic" status, areas important to preserve and maintain solely for their social and economic value, or for their utility as affordable housing. It is important to stress that regardless of motivation, the limits on the utility of the concept are local imagination and creativity. [Stipe 1998]

Within Chino Hills, there are five villages that have areas with potential to qualify as locally designated districts or conservation areas. These are described below:

Village of Woodview possibilities. The acreage occupied since 1909 by the Boy's Republic is a potential historic district. The period of significance might be defined as 1909-1959 when the facility used agricultural training as the primary method of helping troubled youth and during which they constructed most of the buildings on the property. This could be defined as a locally important event qualifying under Criterion 2 of CRHR. In addition, the property has potential to be an archaeological district with both prehistoric and Mexican periods of significance. The property is the most probable location of the prehistoric village of Pashiinonga and the former location of Isaac Williams' adobe and ranch, which was the site of the Battle of Chino. Williams' ranch had numerous functional outbuildings and worker residences in addition to his own adobe. Subsurface remnants of these previous occupations are highly likely to be present. Alternatively, a conservation area would preserve the cultural landscape represented by all of these resources.

Village of Tres Hermanos possibility. Tres Hermanos Ranch would have a 1910-1930 period of significance for its association with persons important in local history (CRHR criterion 2), namely Harry Chandler of the Los Angeles Times, wildcat oil driller turned attorney Tom Scott and William Rowland, former Los Angeles County Sheriff and descendant of wealthy La Puente rancher John Rowland.

They built the Tres Hermanos Adobe (P-36-005689) which is still present. The adobe was likely built in 1914 or 1915 and has unusual features. The central portion of the building has a living room of 1000 square feet with a central fireplace that opens on all four sides. An adjacent room appears to be for specialized food preparation with an adjustable rack barbeque pit, ceiling mounted meat hook and an open fireplace cooking pot setup. A full kitchen with all typical appliances and storage areas is also present. Two separate wings consisting of two bedrooms

each project from the central portion. A mural on one wall of the living room depicts a bull fight with dancing senoritas on each side and is dated 1918. This is consistent with historical information that the adobe was used for weekend gatherings.

A unique historic structure from this period within the Tres Hermanos property is a multiple arch dam with 26.5 ft. of height and 79.5 ft. of breadth. The dam was built in 1918 and has an associated pump. The dam for what is now known as Arnold Reservoir was built the same year. Both the adobe and dam represent unique architecture and would qualify under CRHR criterion 3. It is extremely likely that trash pits and privies from this period are present subsurface. This would qualify under CRHR criterion 4.

Village of Carbon Canyon possibilities. A Sleepy Hollow district with a period of significance of 1920-1940 would recognize the original weekend getaway cabins and their association with the Great American Hiking Period in the western United States. A driving survey of Sleepy Hollow revealed that few of the original cabins are extant. Most of the structures appear to date to after the mid-20th Century. No site records exist for any individual homes or the neighborhood. There is a low probability that Sleepy Hollow would meet integrity criteria for a historic district. Sleepy Hollow would, however, be appropriate for designation with a marker that would acknowledge the local importance of the distinctive neighborhood that evolved from the original resort cabins. It could also be a conservation area to maintain neighborhood design standards.

Village of Los Serranos possibility. The Los Serranos Country Club neighborhood has been formally evaluated for historic resources (Tang, Hogan and Tibbet 2004). Site records were filed for the original neighborhood boundaries (see Figure 14) and for select homes representing different time periods. The report documents that only 5% of the homes predate 1945 and that more than 50% postdate 1970. The report states that despite extensive historical research, Los Serranos is not a significant example of suburban residential development, is not associated with important persons, developers, designers or events and that intrusion of modern development has compromised the neighborhood's potential as a historic district. In addition, none of the individual homes recorded (representing the best preserved homes) were determined to be eligible for either the state or federal registers. An archaeological district limited to the vicinity of the original clubhouse of the 1925 Los Serranos County Club which was the historic American period Bridger/Gird Adobe (see history section; burned down in 1957) could be considered. Alternatively, a conservation area designation would be appropriate to preserve the entire cultural landscape.

Village of Laband possibility. The local importance of horse properties in the development of the city could be recognized with an English Road equestrian conservation area. This could permit the Planning Commission to review land use change applications for potential conflicts with equestrian use of the area.

RECOMMENDATIONS

Considering the factors presented in the previous sections, the following recommendations are made to ensure that potentially important paleontological and cultural resources in the City are protected. The entire City is sensitive for paleontological and prehistoric cultural resources. The City should condition all projects with earth-moving components to demonstrate that a qualified paleontological and archaeological resources consultant has been retained to provide monitoring and recovery in compliance with City's standard mitigation measures.

ARCHAEOLOGICAL RESOURCES

The entire Boy's Republic property is sensitive for subsurface archaeological resources (Figure 16). Prior to approval of any construction or other activities involving earth-moving, an archaeological assessment report with limited testing (extended Phase I study) should be required by the City. This report would include background research, a search of known archaeological site records, survey, shovel test pits in areas slated for excavation only, impact assessment and specific recommendations. This work should be conducted by a qualified archaeologist.

The vicinity of the original clubhouse of the 1925 Los Serranos County Club which was the historic American period Bridger/Gird Adobe (Figure 17) is sensitive for subsurface archaeological resources. Prior to approval of any construction or other activities involving earth-moving, an archaeological assessment report with limited testing (extended Phase I study) should be required by the City. This report would include background research, a search of known archaeological site records, survey, shovel test pits in areas slated for excavation only, impact assessment and specific recommendations. This work should be conducted by a qualified archaeologist.

HISTORIC RESOURCES

The early 20th century adobe and dam on Tres Hermanos (Figure 18, 19) should be evaluated as historic resources by a qualified architectural historian before any impacts are permitted by the City. The historic resources evaluation report would review documentation, include physical survey and photodocumentation, and determine whether either one meets criteria as significant historical resources under CEQA. It would also provide specific recommendations based on results.

Placement of a marker acknowledging the local importance of the distinctive neighborhood that evolved from the original Sleepy Hollow resort cabins is recommended. Any remaining original cabins should be evaluated as historic resources by a qualified architectural historian before any impacts are permitted by the City. The historic resources evaluation report would review documentation, include physical survey and photodocumentation, and determine whether either criteria as significant historical resources under CEQA are met. It would also provide specific recommendations based on results.

Figure 16. Sensitivity Map for Boy's Republic

Figure 17. Sensitivity Map for Bridger/Gird Adobe

Figure 18. Sensitivity Map for Tres Hermanos Adobe

Figure 19. Sensitivity Map for Tres Hermanos Dam

Throughout the City the Planning Department should determine appropriate conditions in regard to changing or demolishing buildings more than 45 years old keeping in mind the CEQA significance criteria. Most ordinary buildings will not meet these criteria but in case of doubt, a historic resources evaluation report as described above should be required.

Equestrian uses have been important in the history of the City. The local importance of horse properties, particularly English Road, should be considered in development of future City policies.

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APPENDIX A: QUALIFICATIONS

SHERRI GUST

Project Manager & Principal Investigator, Paleontology and Archaeology

EDUCATION

1994 M. S., Anatomy (Evolutionary Morphology), University of Southern California, Los Angeles
1979 B. S., Anthropology (Physical), University of California, Davis

SUMMARY QUALIFICATIONS

Gust has more than 30 years of experience in California, acknowledged credentials for meeting national standards, and is a certified/qualified principal archaeologist and paleontologist in all California cities and counties that maintain lists. Gust is an Associate of the Natural History Museum of Los Angeles County in the Vertebrate Paleontology and Rancho La Brea Sections. She is a Member of the Society of Vertebrate Paleontology, Society for Archaeological Sciences, Society for Historical Archaeology, the Society for California Archaeology and others. She has special expertise in the identification and analysis of human, animal and fossil bone. In addition, she is a Reader at the Huntington Library and is knowledgeable about archival research.

SELECTED PROJECTS

Tehachapi Renewable Transmission Project, Segments 1-3. Paleontological resources management plans, Phase I activities, archaeological and paleontological monitoring, artifact and fossil recovery, lab work, GIS mapping, multiple supplement survey and variance reports for construction of new electrical transmission facilities in Los Angeles and Kern Counties. Project Manager and Principal Archaeologist for Cogstone's work and Principal Paleontologist for entire project. 2007-9.

First Street Trunk Line Water Project. Archaeological and paleontological assessment and monitoring of installation of new water main in Los Angeles. Project Manager and Principal Paleontologist. 2006-9.

Opid's Camp. Archaeological Resource Damage Assessment for Locus 1 of Historic Archaeological Site (FS 05-01-51-82) within the Camp Hi-Hill Historic District, Angeles National Forest, Los Angeles County. Project Manager and Principal Archaeologist. 2009.

Pixar Animation Studios Construction Stage 1 Project. Archaeological and paleontological monitoring of studio expansion, artifact recovery and monitoring compliance report in Emeryville, California. Project Manager and Principal Paleontologist and Archaeologist. 2009.

Irvine Business Complex. Archaeological and Paleontological Evaluation of business complex with recent high density housing additions in Irvine, California. Project Manager and Principal Paleontologist and Archaeologist. 2009.

Scattergood Olympic Line. Archaeological and Paleontological Assessment and Mitigation Plan for new 11 mile underground electrical transmission line in Los Angeles. Project Manager and Principal Paleontologist and Archaeologist. 2008-9.

Spring Trails Project. Archaeological and Paleontological Resources Assessment of 350 acre residential development with evaluation of previous work and Mitigation Plan in San Bernardino. Project Manager and Principal Paleontologist and Archaeologist. 2008-9.

Los Angeles Gold Line Metro Project including Historic Los Angeles Cemetery. Archaeological and paleontological monitoring, testing, data recovery, identification and analysis, displays, curation and public presentations for new light rail/subway project in East Los Angeles. Project Manager and Principal Paleontologist and Archaeologist. 2004-present.

MOLLY VALASIK
Qualified Archaeologist/ Cross-Trained Paleontologist

EDUCATION

2009 M.A., Anthropology, Kent State University, Kent, Ohio

2006 B.A., Anthropology, Ohio State University, Columbus, Ohio

SUMMARY QUALIFICATIONS

Valasik is a qualified archaeologist with both professional and academic archaeological field and research experience. She is GIS proficient and currently supervises digitizing and mapping at Cogstone with the use of advanced Trimble software. She has completed more than eight hours of paleontological field training and logged one year's experience as a dual monitor for Cogstone.

SELECTED PROJECTS

Tehachapi Renewable Transmission Project. Archaeology/paleontology monitor, GIS specialist. Performed monitoring, survey and other duties as needed for installation of new electrical facilities in Los Angeles and Kern Counties. Participated in creating GIS layers for TRTP Segments 4-11 paleontological management plan. 939 hours on project. 2009

High Speed Rail Project. Paleontology field technician, GIS specialist. Performed pedestrian survey of roughly 59 miles, recorded survey area with Trimble GeoXH, produced weekly updates, and geo-referenced Dibley maps (geology formations). 135 hours on project. 2009

Wildrose Road, Death Valley National Monument. Archaeological field technician and GIS specialist. Assessment of construction activities on potential resources in Inyo County, requested by National Park Service. Performed 5-mile pedestrian survey identified previously recorded sites, recorded new site information with Trimble GeoXH. 58 hours on project. 2009

State Route 178 Widening Project. Archaeology field technician, GIS specialist. Caltrans District 8 highway project in San Bernardino County. Performed four-day archaeological pedestrian survey and relocated six archaeological sites. 37 hours on project. 2009

Blessed Teresa of Calcutta Church Project. Archaeology/paleontology field technician. Construction project in Riverside County. Phase II test excavation units of prehistoric milling area, extensive pedestrian survey, and recorded spatial information with Trimble GeoXH to document prehistoric features present. 24 hours on project. 2009

Telecom Survey. (extension of Tehachapi Renewable Transmission Project). Archaeological field technician. Documented archaeological sites, gathered GIS information, and produced maps for additional archaeological survey. Digitized and recorded sites and survey areas. 7 hours on project. 2009

Körös Regional Archaeological Project, Hungary. Field and Laboratory Assistant with Ohio State University and Kent State University. Worked with a team to excavate and process artifacts from an Early Copper Age settlement in Hungary. Participated in archaeological surveys of other possible Early Copper Age sites in the region. 2006

Sunwatch Indian Village, Dayton, Ohio. Field technician. Excavated a section of a Prehistoric Indian village for the Ohio State Boone-Shoft Museum of Discovery. Provided routine tours of the site to the public and museum board members. 2005

APPENDIX B: NATIVE AMERICAN HERITAGE COMMISSION

STATE OF CALIFORNIA Arnold Schwarzenegger, Governor

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e-mail: ds_nahc@pacbell.net

June 7, 2010

Ms. Sherri Gust, RPA
COGNSTONE CULTRAL RESOURCES MANAGEMENT ***for thte***
CITY OF CHINO HILLS
14000 City Center Drive
Chino Hills, CA 91709

Sent by FAX to: 714-974-8303
Number of pages: 2

Re: Tribal Consultation Per Government Code §§ 65352.3, 65352.4 and 65560 (SB 18/Sacred Lands File Search) for Project- **the Chino Hills General Plan**; located on 28,723-acres; City of Chino Hills;; San Bernardino County, California

Dear Ms. Gust:

Government Code §65352.3 and .5 requires local governments to consult with California Native American tribes identified by the Native American Heritage Commission (NAHC) for the purpose of protecting, and/or mitigating impacts to cultural places. Attached is a Native American Tribal Consultation list of tribes with traditional lands or cultural places located within the requested plan boundaries

As a part of consultation, the NAHC recommends that local governments conduct record searches through the NAHC and California Historic Resources Information System (CHRIS) to determine if any cultural places are located within the area(s) affected by the proposed action.

A NAHC Sacred Lands File search was conducted based on the project site n information included in your request and **Native American cultural resources** were found within the 'area of potential effect' (APE) you identified (e.g. Prado Dam, San Dimas quads). Also, local governments should be aware that records maintained by the NAHC are not exhaustive, and a negative response to these searches does not preclude the existence of a cultural place. A tribe may be the only source of information regarding the existence of a cultural place. I suggest you consult with all of those on the accompanying Native American Contacts list, which has been included separately. If they cannot supply information, they might recommend others with specific knowledge about cultural resources in your plan area. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call to ensure that the project information has been received.

If you have any questions, please contact me at (916) 653-6251.

Sincerely,

Dave Singleton
Program Analyst

Attachment: Native American Tribal Government Contacts

Native American Tribal Consultation List
San Bernardino County
June 7, 2010

San Manuel Band of Mission Indians
James Ramos, Chairperson
26569 Community Center Drive — Serrano
Highland , CA 92346
(909) 864-8933
(909) 864-3724 - FAX

Pechanga Band of Mission Indians
Mark Macarro, Chairperson
P.O. Box 1477 — Luiseno
Temecula , CA 92593
tbrown@pechanga-nsn.gov
(951) 676-2768

Soboba Band of Mission Indians
Scott Cozaet, Chairperson
P.O. Box 487 — Luiseno
San Jacinto , CA 92581
dhill@soboba-nsn.gov
(951) 654-2765

Serrano Nation of Indians
Goldie Walker
6588 Valaria Drive — Serrano
Highland , CA 92346
(909) 862-9883

Gabrieleno/Tongva San Gabriel Band of Mission
Anthony Morales, Chairperson
PO Box 693 — Gabrielino Tongva
San Gabriel , CA 91778
(626) 286-1262 -FAX
(626) 286-1632
(626) 286-1758 - Home
(626) 483--3564 cell

Gabrielino Tongva Nation
Sam Dunlap, Chairperson
P.O. Box 86908 — Gabrielino Tongva
Los Angeles , CA 90086
samdunlap@earthlink.net

(909) 262-9351 - cell

Morongo Band of Mission Indians
Robert Martin, Chairperson
12700 Pumarra Rroad — Cahuilla
Banning , CA 92220 — Serrano
Robert_Martin@morongo.org
(951) 849-8807
(951) 755-5200

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is applicable only for consultation with Native American tribes under Government Code Section 65352.3.

APPENDIX C: 1:24,000 MAPS

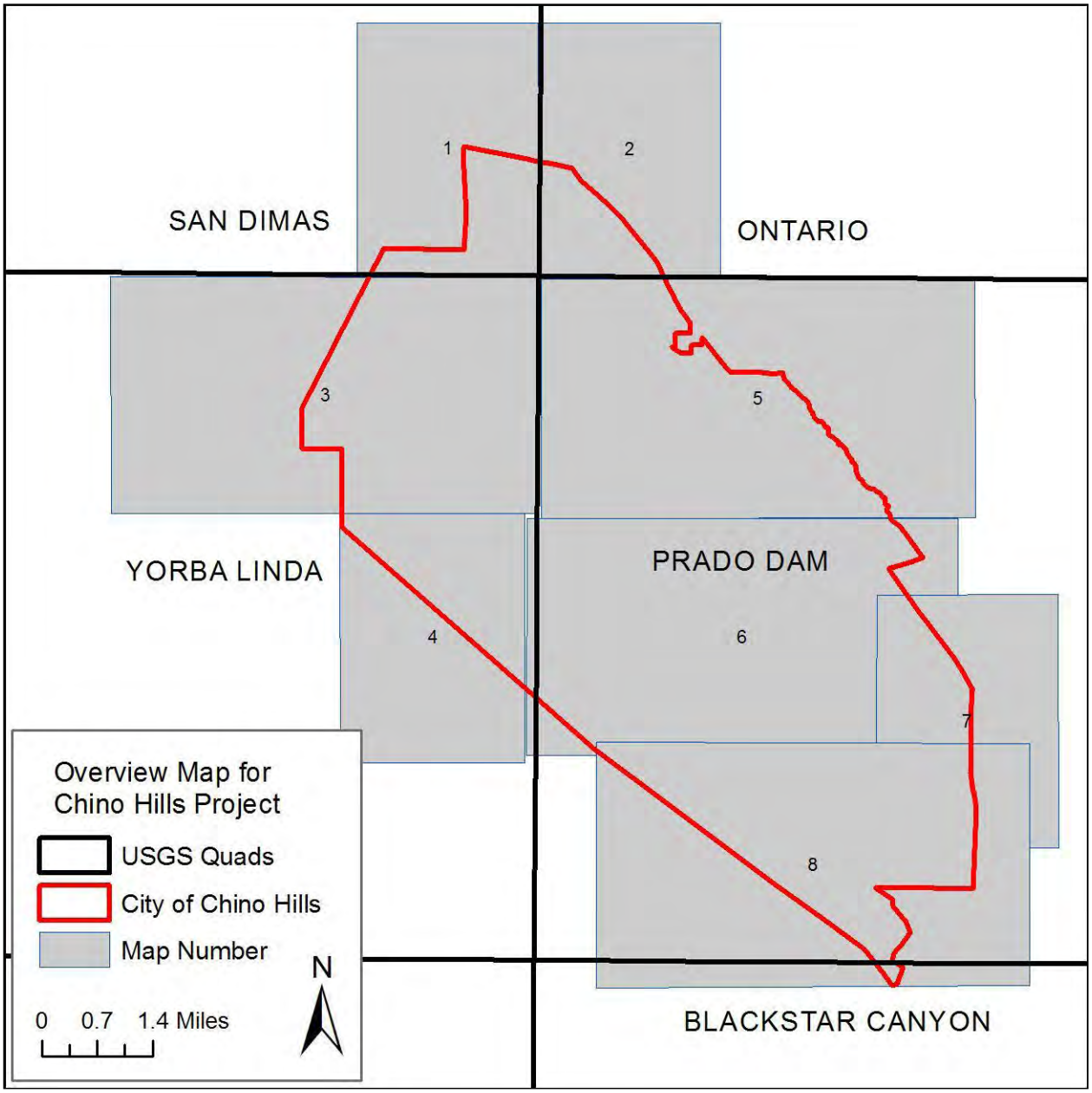

Figure Ca. Project Location Overview Map

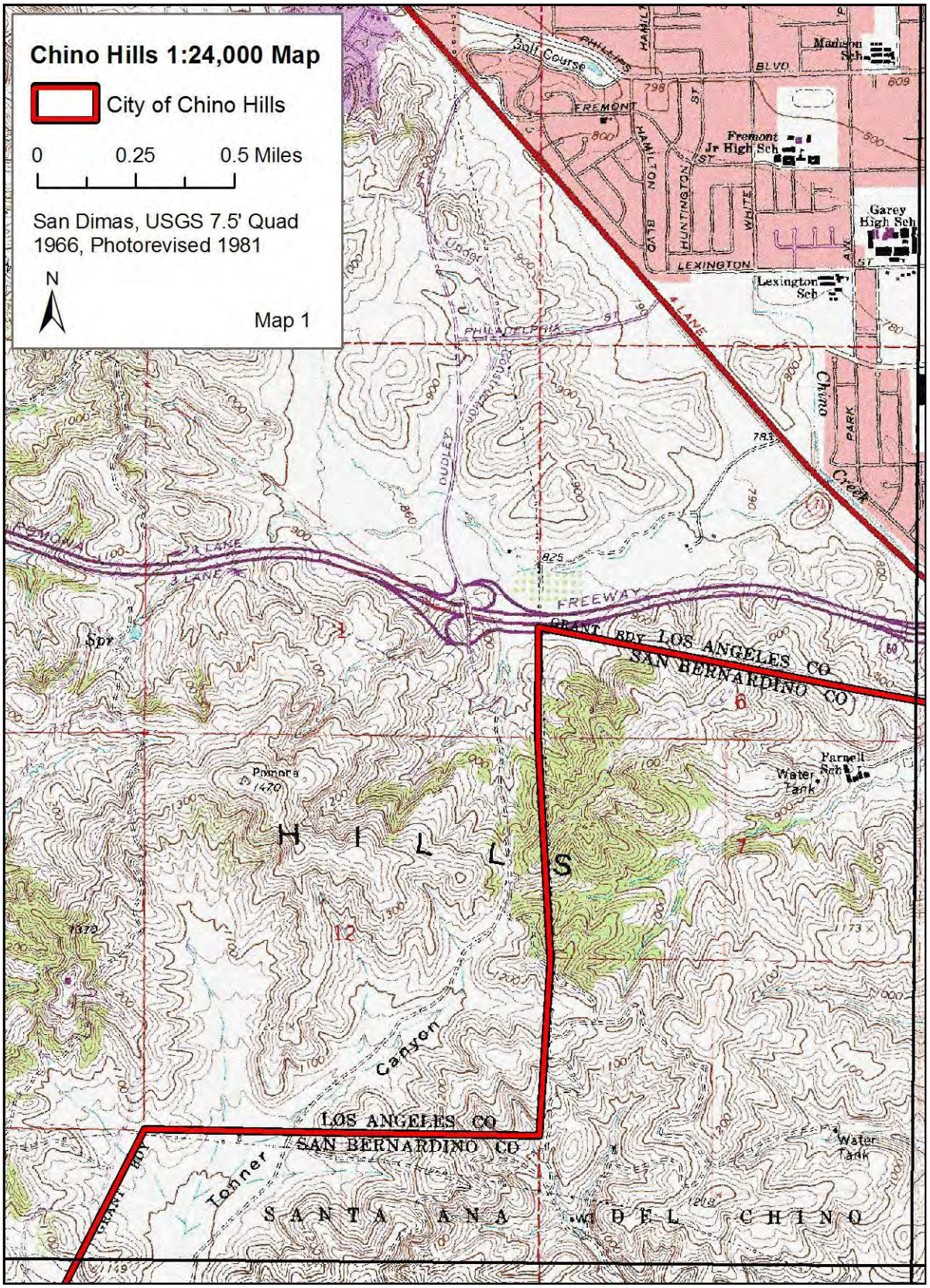

Figure Cb. Project location Map 1

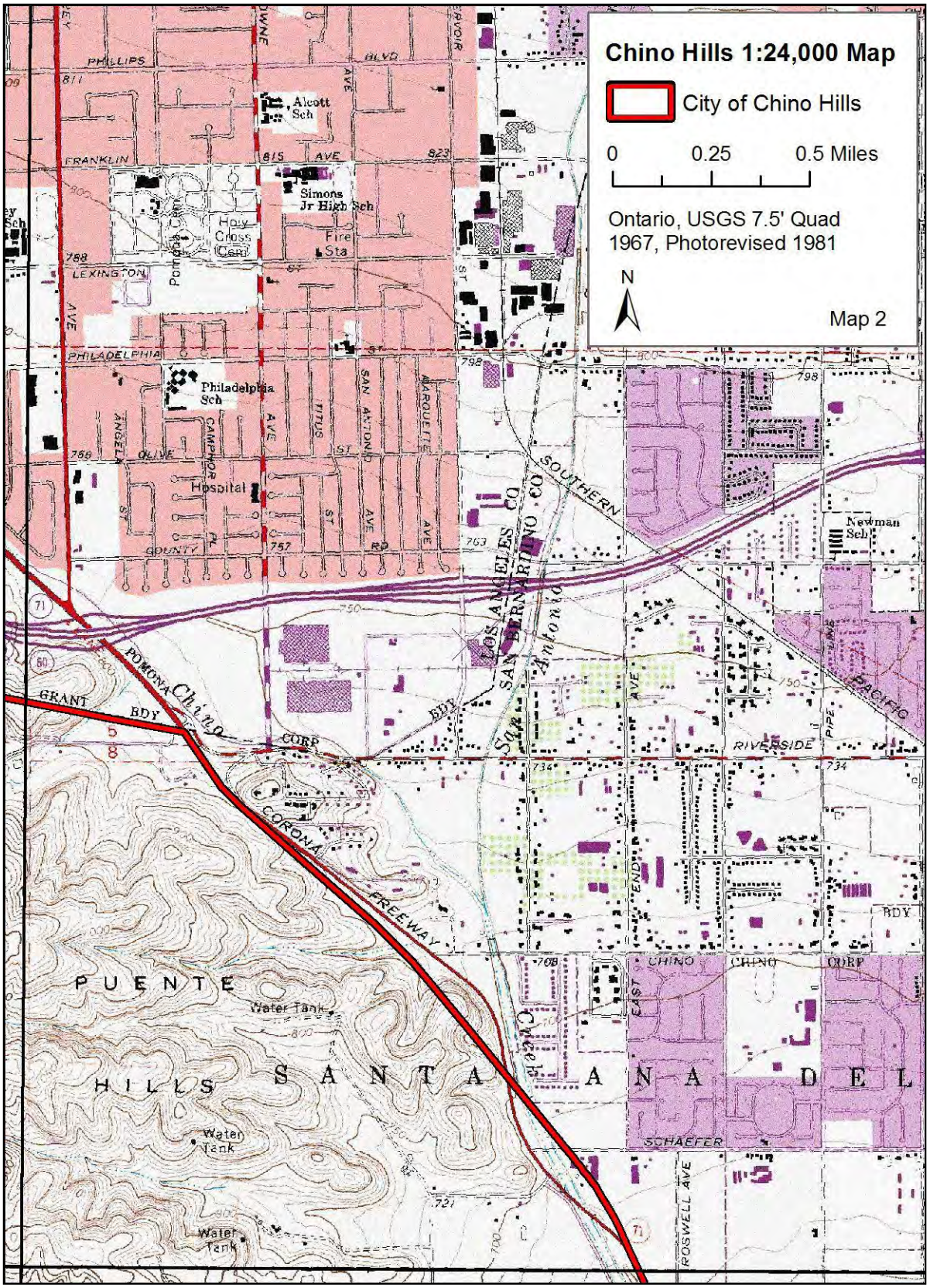

Figure Cc. Project Location Map 2

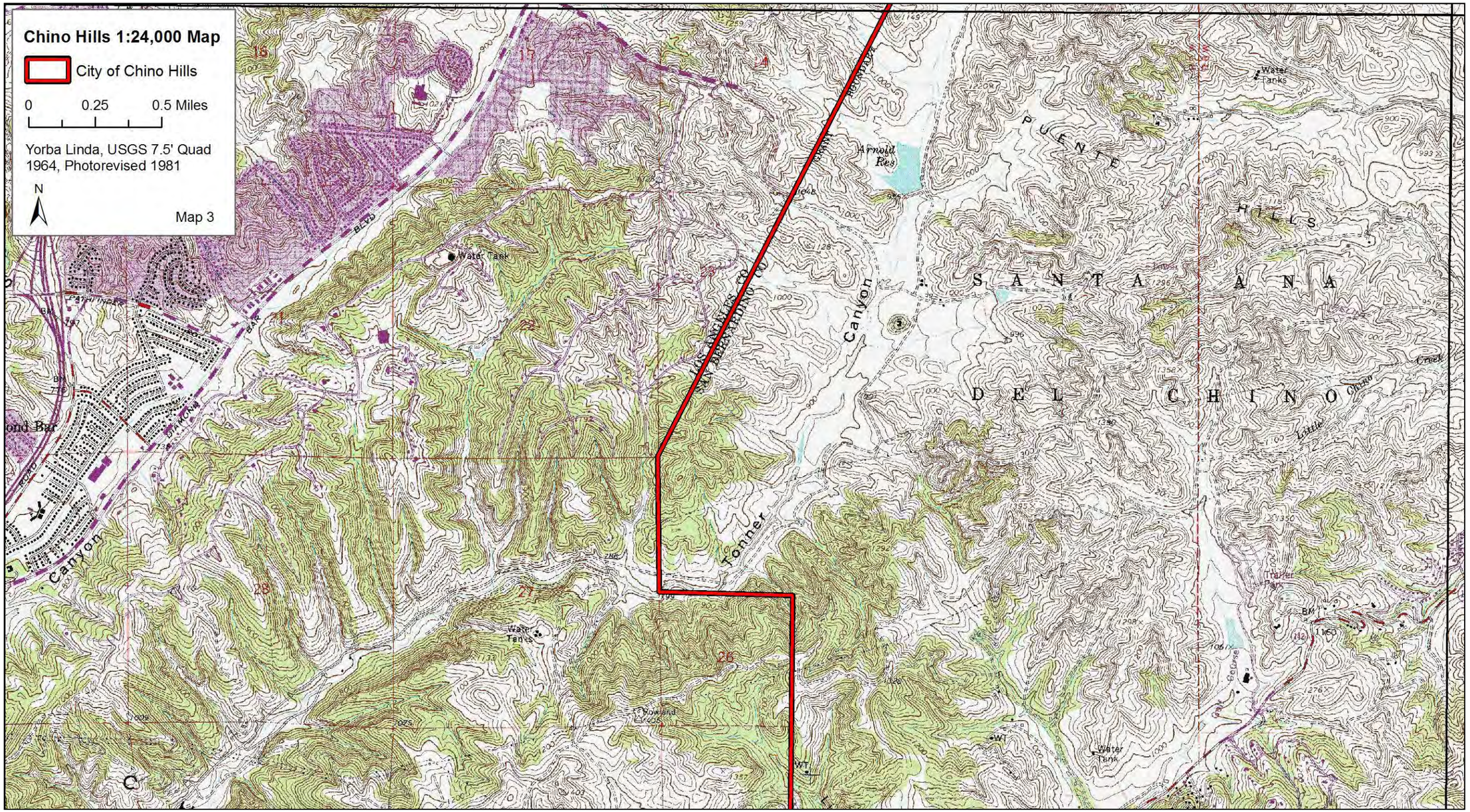

Figure Cd. Project Location Map 3

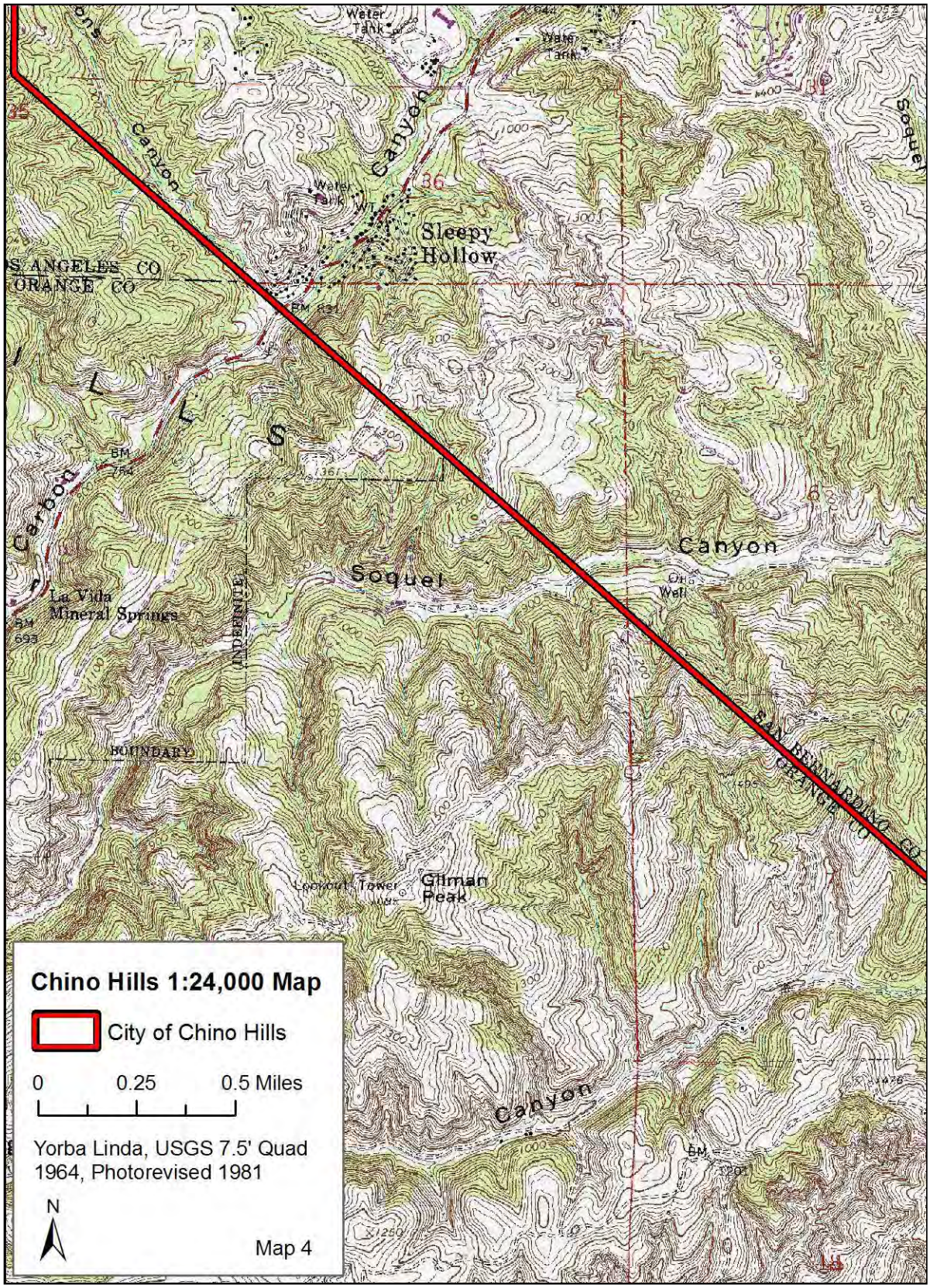

Figure Ce. Project Location Map 4

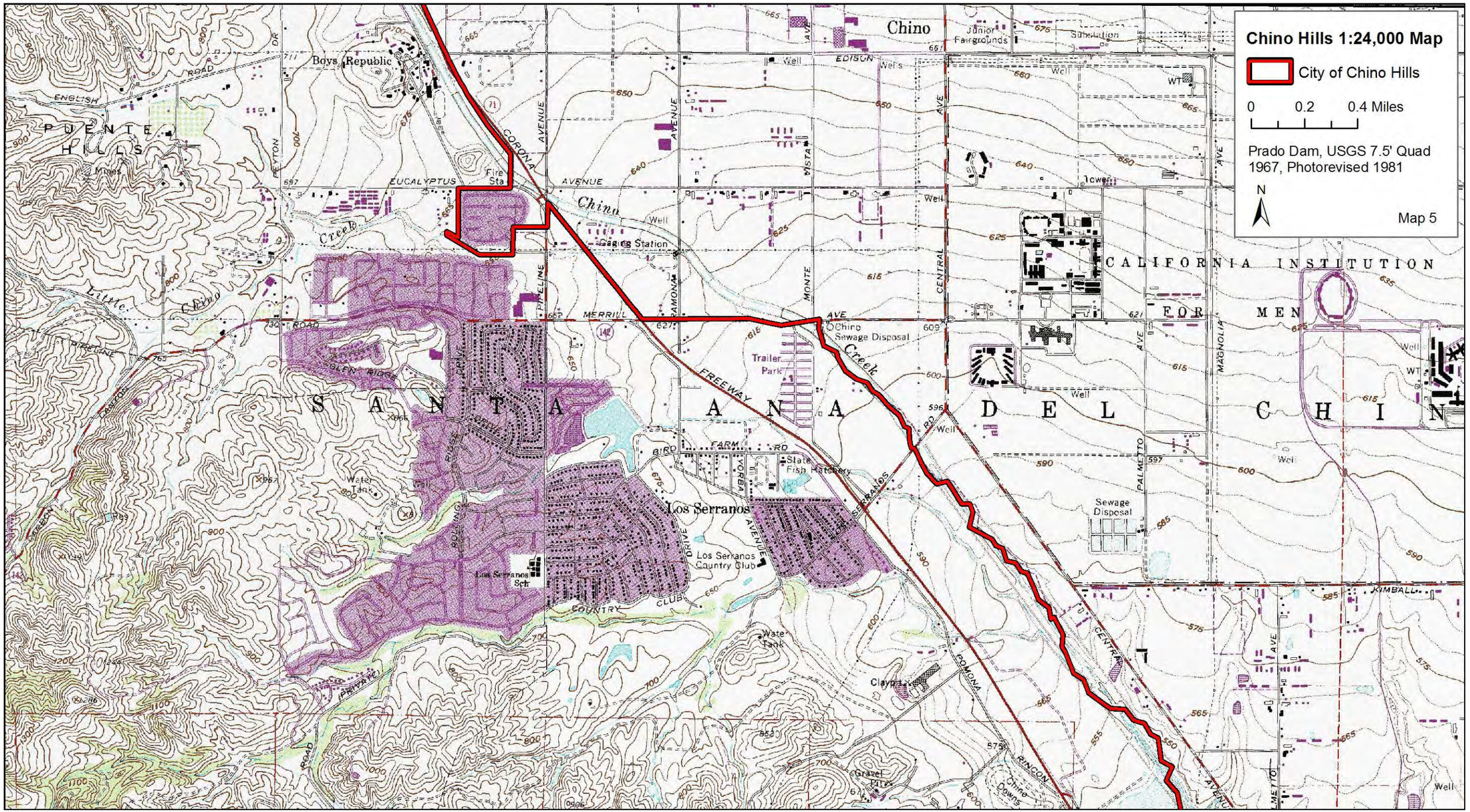

Figure Cf. Project Location Map 5

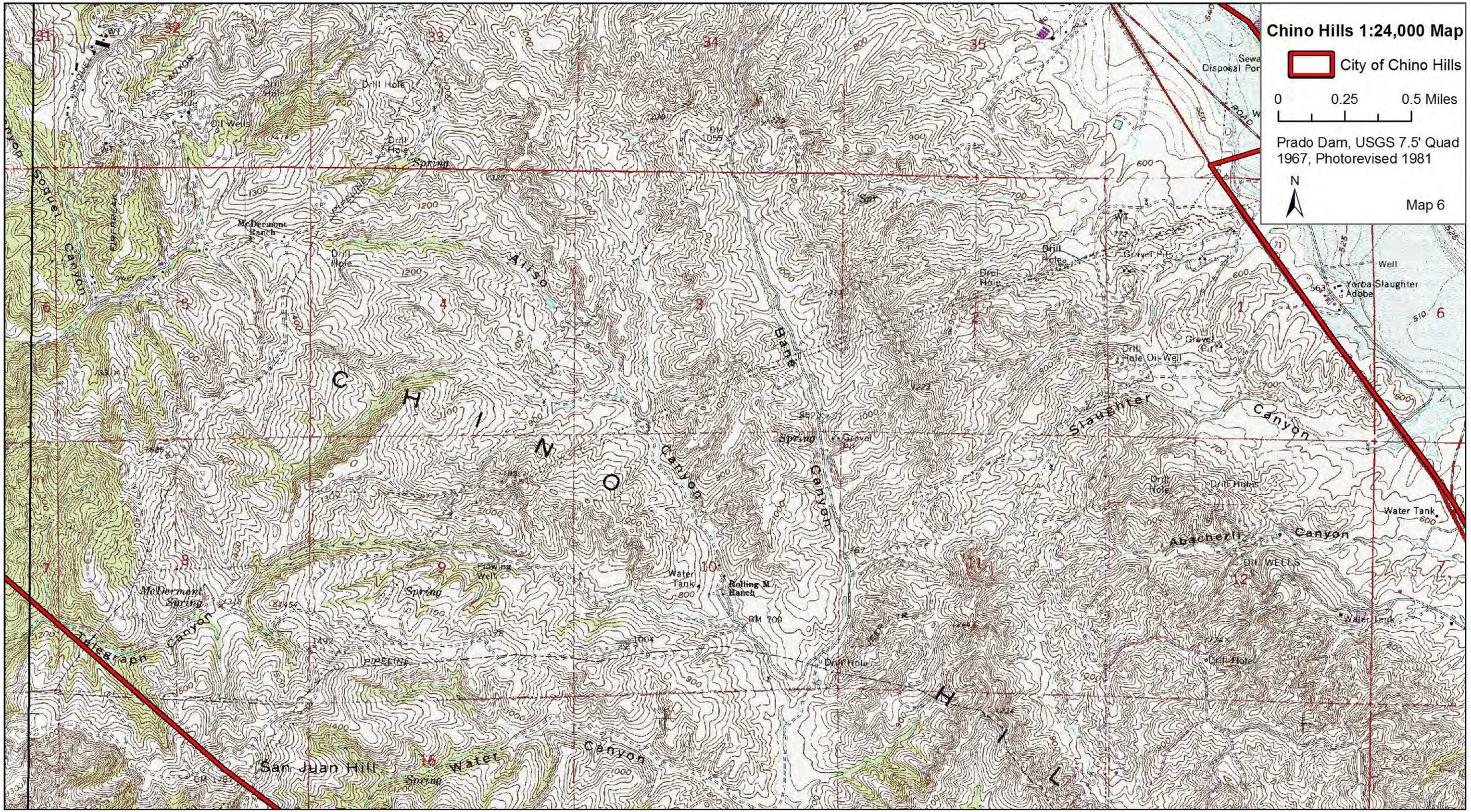

Figure Cg. Project Location Map 6

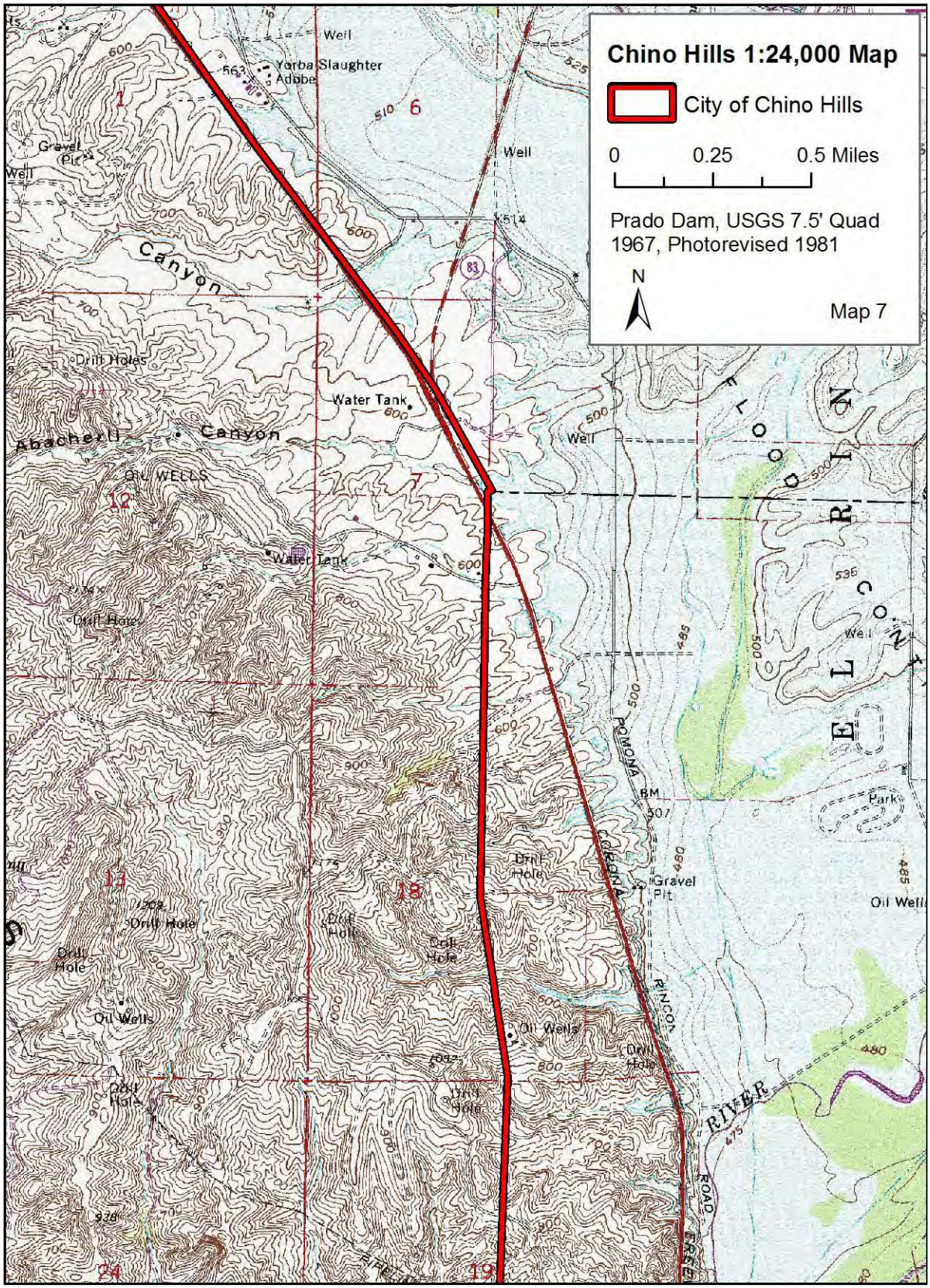

Figure Ch. Project Location Map 7

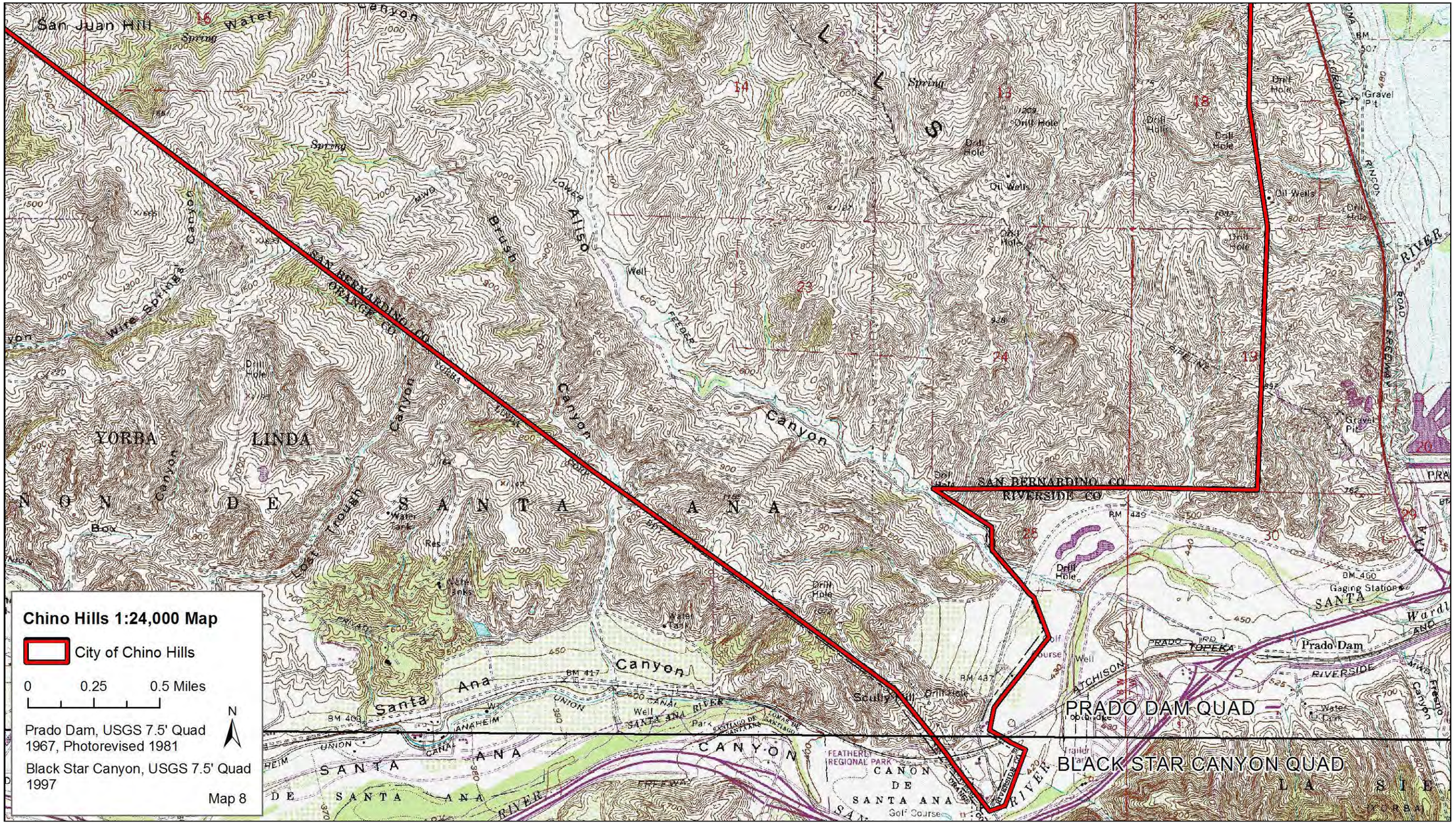

Figure Ci. Project Location Map 9

Project location (Quadrangle, Township, Range, Section)

USGS 7.5' Quadrangle	Township	Range	Sections
San Dimas	2S	8W	6, 7, 18
San Dimas	2S	9W	13, 14
Ontario	2S	8W	5, 8, 9, 16, 17
Yorba Linda	2S	8W	19, 30, 31
Yorba Linda	2S	9W	23, 24, 25, 26, 35, 36
Yorba Linda	3S	8W	6, 7
Yorba Linda	3S	9W	1
Prado Dam	2S	8W	20, 21, 22, 23, 26, 27, 28, 29, 32, 33, 34, 35, 36
Prado Dam	3S	7W	5, 6, 7, 18, 19
Prado Dam	3S	8W	1, 2, 3, 4, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 22, 23, 24, 25, 26
Black Star Canyon	3S	8W	36

APPENDIX D: PRIOR PALEONTOLOGY REPORTS

Village	Title	Authors	Date
Laband	Paleontological Monitoring/Salvage Report, Diamond Valley, Chino Hills, San Bernardino County, USGS Yorba Linda 7.5' Quadrangle	Govean, F.	1997
Laband	Paleontological Monitoring and Fossil Recovery Report, Payne Ranch, Chino Hills, San Bernardino County, CA	Stadum, C.	1997
Laband	Paleontological Resource Impact Mitigation Program: Laband Village, City of Chino Hills, San Bernardino County, California	LSA Assoc.	2002
Laband	Paleontological Resources Monitoring Report for the City of Chino Hills, New Community Park and Eucalyptus Avenue Road Extension Project, San Bernardino County, California	Scott, K.	2006
Rincon	Paleontological Resources Report, Vila Borba Project, Chino Hills, San Bernardino County, California	Synder, D.	
Rincon	Final Paleontological Grading Monitoring Report for Tracts 14079 & 14022, Chino Hills, San Bernardino County, CA	Morgan, M.	1991
Rincon	Paleontological Monitoring and Salvage Report for Tract 13601, Chino Hills, CA	Gallegher, S.	1995
Rincon	Paleontological Monitoring and Salvage Report: Tract 14652 and the Sundance Condominiums, Chino Hills, California	Stadum, C.	1997
Rincon	Paleontological Monitoring and Recovery Operations: Richland Fire Station, Chino Hills, California	Stadum, C.	1998
Rincon	Paleontological Monitoring Report: Richland Fire Station Borrow, Chino Hills, San Bernardino County	Morgan, M. and D. Stevens	1999
Rincon	Paleontological Monitoring and Mitigation Report for Richland Properties, Tract 14425, Chino Hills, California	Phillips, M. and D. Stevens	1999
Rincon	Paleontological Monitoring Report R19 Tank, Chino Hills, San Bernardino County, CA	Morgan, M.	1999
Rincon	Miocene Age Shoreline to Pleistocene Age Mammoths: Paleontological Resources Monitoring and Mitigation for the Ramona Avenue Project, Chino Hills, San Bernardino County, CA	Alexandrowicz, J., A. Kuhner, W. Jenson and D. Ingrahm	1999
Rincon	Results of Paleontological Resource Monitoring Program, Flintridge Development, Chino Hills, San Bernardino County, CA	LSA Assoc.	2000
Rincon	Final Paleontological Monitoring Report for Pinehurst Development Project, Tracts 14426 & 14427, Chino Hills, San Bernardino County, CA	Goldstein, D., G. Aron and C. Corsetti	2002
Rolling Ridge	Final Paleontological Monitoring Report for the Great Indoors Project, Chino Hills, San Bernardino County, California	Gust, S., C. Corsetti and M. Phillips	2001
Soquel	Final Report of Paleontological Mitigation Program, Vellano Project, City of Chino Hills, San Bernardino County, CA	Barnes, L., M. Barnes, G. Archer, S. Siren and J.D. Stewart	2005
The Oaks	Final Paleontological Monitoring Report for the Warmington Development, Chino Hills, San Bernardino County, California	Gust, S. and P. Alms	2001

APPENDIX E: PRIOR CULTURAL REPORTS

Author	Report No.	Title	Year	Quad
King, Thomas F.	1060124	Preliminary Report on Archaeological Impact Study-Southern California Edison Co. - Fry Mountain Project	1972	Prado Dam
San Bernardino County Museum Association	1060186	Archaeologic Values: Carbon Canyon Tracking Station	1973	Yorba Linda
San Bernardino County Museum Association	1060208	Environmental Impact Analysis: (Archaeological Values), WEstern Hills Mobile Home Estates	1974	Yorba Linda
San Bernardino County Museum Association	1060230	Archaeological Impact Report: Preliminary Report, Surface Survey, Sain Joseph's Hill of Hope	1974	Yorba Linda
San Bernardino County Museum Association	1060246	Archaeological Portion of Environmental Impact Report for Carbon Canon Specific Plan	1975	Yorba Linda, Prado Dam
Smothers, C.N.	1060252	Six Caltrans Projects, San Bernardino County	1975	Adelanto, Victorville, San Bernardino North, Cajon, Prado Dam, Yucaipa
Leonard III, N. Nelson	1060263	Archaeological Impact Evaluation: Carbon Canyon Road Development, Chino, San Bernardino County, California	1975	Prado Dam
Leonard III, N. Nelson	1060273	Santa Ana river Project, Description and Evaluation of Cultural Resources and Appendices: Field Data	1975	Black Star Canyon, Prado Dam, Corona North, San Bernardino South
Rosenthal, E. Jane	1060274	A Cultural Resource Survey of the Proposed Santa Ana River Hiking/Biking Trail in the Prado Flood Control Basin	1979	Prado Dam, Corona North
Tobey, Ronald C., Terry D. Suss, and Larry Burgess	1060275	Historical Resource Survey, Prado Flood Control Basin, San Bernardino and Riverside Counties, California	1977	Black Star Canyon, Prado Dam, Corona North
Harris, Ruth D.	1060301	Archaeological - Historical Resources Assessment, Tentative Tracts 9282-9284	1976	Ontario
Crowell, Jim	1060303	Archaeological - Historical Assessment - NE Corner of Peyton Drive and Eucalyptus Avenue, City of Chino.	1976	Prado Dam

Author	Report No.	Title	Year	Quad
Farrell, Nancy	1060319	Archaeological - Historical Resources Assessment: Zone 1, Carbon Canyon Channel, Chino Area	1976	Prado Dam
San Bernardino County Museum Association	1060355	Archaeological - Historical Resources Assessment for Proposed Grand Avenue Alignment	1976	Yorba Linda, Prado Dam, San Dimas, Ontario
Harris, Ruth D.	1060367	Archaeological - Historical Resources Assessment of Tract Number 9453, Chino Area	1976	Prado Dam
Hearn, Joseph E.	1060386	Archaeological - Historical Resources Assessment of 10-acre Assessor's Parcel No. 2082, Located in Sec. 20, T2S R8W	1976	Prado Dam
Hearn, Joseph E.	1060409	Archaeological - Historical Resources Assessment of Three Areas within Existing Parks in the Chino Area	1976	Prado Dam
Hearn, Joseph E.	106410	Archaeological - Historical Resources Assessment of Two Locations in Chino for a New Fire Station and For Training Firefighters	1976	Prado Dam, Ontario
Hearn, Joseph E.	1060416	Archaeological - Historical Resources Assessment of Existing Reservoir Site at the Northeast Endo of Hillside Road and the Existing Water Main at Oakway Lane in the Chino Area	1976	Yorba Linda
Hearn, Joseph E.	1060430	Archaeological - Historical Resources Assessment of Sec. 31, T2S R8W, chino Area	1976	Yorba Linda
Scott, M. B.	1060447	Development of Water Facilities in the Santa Ana river Basin, California, 1810-1968	1976	Prado Dam, Ontario,
Hearn, Joseph E.	1060475	Archaeological - Historical Resources Assessment of Tract 9744, Chino Area	1977	Prado Dam
San Bernardino County Museum Association	1060484	Environmental Impact Report: Paleontologic Resources, Tentative Tract 9620, Caron Canyon, Chino Hills, California	1977	Yorba Linda
San Bernardino County Museum Association	1060494	Environmental Assessment: Paleontologic and Archaeologic Resources, Tentative Tract 9852, Chino Hills, California	1977	Prado Dam

Author	Report No.	Title	Year	Quad
Hearn, Joseph E.	1060505	Archaeological - Historical Resources Assessment of Sec. 17, T2S R8W, Chino Hills	1977	Ontario, Prado Dam
Hearn, Joseph E.	1060566	Archaeological - Historical Resources Assessment of the Tentative Tracts 10203 and 12202, Chino Area	1977	Prado Dam
Hearn, Joseph E.	1060575	Archaeological - Historical Resources Assessment of Planned Street Improvements in the Los Serranos Areas of Chino, California	1977	Prado Dam
Hearn, Joseph E.	1060616	Archaeological - Historical Assessment of Tentative Tract 10313, Chino Area	1978	Prado Dam, Ontario
Hearn, Joseph E.	1060627	Archaeological - Historical Resources Assessment, Tentative Tract 10379, Chino.	1978	Yorba Linda
Tadlock, Jean and W. Lewis	1060943	Environmental Impact Report on the Proposed General Plan Amendments for the Rolling Ridge Estates, County of San Bernardino.	1978	San Dimas, Ontario
Mabry, Theo N. and Ronald D. Douglas	1060954	Paleontological, Archaeological, and Historical Resources, Chino Hills, County of San Bernardino, California	1980	Prado Dam, Yorba Linda, Ontario, San Dimas, Guasti, Corona North
Van Horn, David M.	1060992	Archaeological Surey Report: The 2,575-acre Tres Hermanos Ranch in the San Bernardino and Los Angeles Counties, California	1980	Yorba Linda, San Dimas
Foster, John M. and Roberta S. Greenwood	1061029	Cultural Resource Overview for the Serrano Substation to Mira Loma Substation Transmission Route Alternative Corridor Right-of-Way	1980	Prado Dam, Guasti, Corona North
Lerch, Michael K.	1061246	Cultural Resources Assessment of a Proposed Junior High School Site, Chino Unified School District, San Bernardino County, California	1982	Prado Dam
Weil, Edward B. and Michael E. Macko	1061372	SBR-3690, SBR4032, and ORA-614: The Encinitas Tradition in the chino Hills and Interpretations of A.B. 952	1983	Prado Dam

Author	Report No.	Title	Year	Quad
McGuire, Pamela J. and Nancy Evans	1061451	Inventory of Features, Cultural Resources, Chino Hills State Park	1984	Yorba Linda, Prado Dam, Black Star Canyon
Compton, Bruce A.	1061526	Negative Archaeological Survey Report: Route 71, P.M. 2.6.	1985	Prado Dam
Brock, James and Richard J. Wall	1061612	Cultural Resources Assessment of the Laband Ranch, Chino Hills, San Bernardino County, California	1986	Yorba Linda, Ontario, Prado Dam, San Dimas
Brock, James	1061760	Test Excavations at CA-SBR-5694, Laband Ranch, Chino Hills, San Bernardino County, California	1988	Yorba Linda
Goldberg, Susan K. and Jeanne E. Arnold	1061837	Prehistoric Sites in the Prado Basin, California: Regional Context and Significance Evaluation	1988	Redlands, San Bernardino South, Corona, Prado Dam
McKenna, Jeanette A. and Roger G. Hatheway	1061863	An Intensive Archaeological Survey of the Chino Hills Residential Project Area, Near Sleepy Hallow, San Bernardino County, California	1989	Yorba Linda
McKenna, Jeanette A.	1061888	A Cultural Resources Investigation of the Valley Springs EquestrianEstates Property, Carbon Canyon, San Bernardino County, California	1989	Yorba Linda
Macko, Michaeol E. and Edward B. Weil	1061890	ORA-614, SBR-3690, and SBR-4032: A Reassessment of the Encinitas Tradition in the Chino Hills	1989	Yorba Linds, Prado Dam
Brock, James and John F. Elliott	1061900	A Cultural Resources Assessment of the Trout Ranch, Chino Hills, San Bernardino County, California	1989	Yorba Linda
Brown, Robert S. and Carol R. Demcak	1061916	Archaeological Survey of the Villa Borba Project: A 360-Acre Property in San Bernardino County, California	1989	Prado Dam
Del Chario, Kathleen C. and Carol Demcak	1061917	Archaeological Resource Assessment of Tract 14531, Chino Hills, San Bernardino County, California	1989	Prado Dam
Brock, James	1061931	Interim Statement on Potential Significance of CA-SBR-5694, Laband Ranch, Chino Hills, San Bernardino County, California	1987	Yorba Linda

Author	Report No.	Title	Year	Quad
Hatheway, Roger G.	1061948	The Pomona-Rincon Road and its Place in the Regional Transportation Network	1989	Prado Dam
Infotec Research	1062059	Compendium of Results of Obsidian Studies for Study Area Sites: Appendix to Prehistoric Sites in the Prado Basin, California: Regional Context and Significance Evaluation	1990	Guasti, Yucaipa, Prado Dam, Cucamonga Peak
Solheid, Vicki L., and Paul Farnsworth	1062074	Cultural Resources Survey Report for the J.P. Rhoades Development Property, Tract 13880, San Bernardino County, California	1990	Prado Dam
Mason, Roger D., and Roger G. Hatheway	1062076	Cultural Resources Survey Report: The Harvest-Greening Property, San Bernardino County, California	1990	Prado Dam, Yorba Linda
Elliott, John f., and James Brock	1062111	Supplemental Archival Study for Tract 14161, Chino Hills, San Bernardino County, California	1990	Yorba Linda
Mason, Roger D.	1062246	Results of a Test Program Conducted at Archaeological Site SBR-5096, San Bernardino County, California	1990	Prado Dam
McKenna, Jeanette A.	1062247	Phase I Cultural Resources Investigations of the Higgins Property, Los Serranos, San Bernardino County, California	1991	Prado Dam
Sturm, Bradley L.	1062451	Historical and Archaeological Assessment of the Proposed Pinehurst Development Project in the Chino Hills of San Bernardino County, California	1991	Prado Dam
Alexandrowicz, J. Stephen, Susan R. Alexandrowicz, Arthur A. Kuhner, and Anne Duffield-Stoll	1062483	Historical Archaeological Investigations at the Hunters Hill Residential Development, Chino Hills, County of San Bernardino, California	1991	Prado Dam
Lerch, Michael K.	1062548	Archaeological Survey of the the Valentine Property Sand and Gravel Mine Near Prado Dam, San Bernardino County, California	1986	Prado Dam
Alexandrowicz, J. Stephen	1062622	Addendum to the Report, Historical Archaeology at the Hunters Hill Residential Development, Chino Hills, San Bernardino County, California	1992	Prado Dam

Author	Report No.	Title	Year	Quad
Jertberg, Patricia	1062711	Negative Archaeological Survey Report: Carbon Canyon Road (SR142)	1993	Yorba Linda
Brechbiel, Brant A.	1062750	Photographs, Measured Drawings, Descriptive Data and Architectural Data form Conforming to Levell III HABS/HAER Documentation of Locus B of CA-SBR-7046: Abandoned Livestock Barn Associated with Kraemer Ranch in the City of Chino Hills	1993	Prado Dam
Mason, Roger D., John d. Cooper, and Brant A. Brechbiel	1062788	Cultural Resources Survey and Paleontological Assessment Report for the Ramona Ave. Project	1992	Prado Dam
Drover, Christopher	1062892	Draft EIR for Carbon Creek Ranch and TT9781 County of San Bernardino	1977	Yorba Linda
McKenna, Jeanette A.	1063008	A Phase I Cultural Resources Investigation of Proposed Fill Sites for the State Route 71/Prado Basin Borrow Project, San Bernardino and Riverside Counties, CA	1995	Prado Dam
Owen, Shelley Marie	1063012	Cultural Resources Survey and Impact Assessment for the Cajon/EPTC Pipeline Project Located in Portions of Los Angeles, San Bernardino, and Orange Counties, CA	1995	Yorba Linda, Prado Dam
Govean, Fran and Beth Padon	1063034	Paleontological & Archaeological Resources Assessment: Del Sol Development, Chino Hills, San Bernardino County, CA	1995	Prado Dam
Alexandrowicz, J.S., S.R. Alexandrowicz, A.A. Kuhner, and A.Q. Duffield Stoll	1063218	Historic Archaeology at the Hunters Hill Residential Development, City of Chino Hills, San Bernardino County: The Data Recovery Program	1996	Prado Dam
McKenna, Jeanette A. and Shelley M. Owen	1063233	Cultural Resources Inventory Testing & Evaluation for the Proposed Edison Pipeline & Terminal Company (EPTC), Tonner Canyon Pipeline Modification Project, San Bernardino County, CA	1996	Yorba Linda

Author	Report No.	Title	Year	Quad
Lapin, Phillipe	1063563	Cultural Resource Assessment for PBMS Facility CM 421-02, County of San Bernardino, CA	2000	Ontario
Lapin, Phillipe	1063569	Cultural Resource Assessment for PBMS Facility LA 473-02, city of Chino Hills, County of San Bernardino, CA	2000	San Dimas
Strudwick, Ivan	1063680	Cultural Resource Survey of the 161 Acre Fairfield Ranch & Results of Archaeological Testing at CA-SBR-4212 and CA-SBR-5245, Chino Hills, San Bernardino County, Ca	1999	Prado Dam
Love, Bruce, Harry Quinn, and Miriam Dahdul	1063681	Archaeological Monitoring Report: Missions at Chino Hills Project	2002	Prado Dam
Carver, Larryn	1063682	Archaeological Test Excavation of Site CA-SBR-5097 For the Proposed Leach Field Expansion, Chino Hills State Park	2002	Prado Dam
Maxon, Patrick O.	1063683	Excavation of a Small Archaeological Deposit & Monitoring of Grading on the Higgans Ranch Property for Polygon Communities, Inc., Chino Hills, CA	1998	Prado Dam
Duke, Curt	1063684	Cultural Resource Assessment: Cingular Wireless Facility #SB107-01, San Bernardino County, CA	2001	Prado Dam
Hammond, Stephen R.	1063694	Historic Property Survey Report for Proposed Improvements to SR 71 Between I-10 & SR 91-07/08 LA, SBD, RIV-71-Various	1986	Ontario, Prado Dam
Peak, Melinda	1063730	Cultural Resources Assessment of the Proposed Relocation and/or Protection of the Santa Ana River Interceptor, Orange & San Bernardino Counties, CA	2001	Black Star Canyon
Drover, Christopher E.	1063960	A Cultural Resource Assessment for SB-040, Cox Cellular, 2050 Carbon Canyon, Chino Hills, CA	1998	Yorba Linda

Author	Report No.	Title	Year	Quad
Romani, Gwen	1063961	Archaeological Survey Report: Los Angeles-San Diego Fiber Optic Project: Mesa Substation to Chino Hills State Park Segment	2000	Yorba Linda, Prado Dam, Black Star Canyon, El Monte, La Habra, Whittier, Orange
Paige, Peter F.	1064385	Cultural Resources Survey of the Proposed Vila Borba Development Property, City of Chino Hills, San Bernardino County, CA	2004	Prado Dam
Tibbet, Casey	1064388	Historic Resources Evaluation of the Los Serranos Neighborhood, City of Chino Hills, San Bernardino County, CA	2004	Prado Dam
Lambert, Meranda	1064389	950-003-075/Soquel Substation North of Soquel Canyon Road & West of 71 Freeway, Chino Hills, San Bernardino County, CA	2004	Prado Dam
Kyle, Carolyn	1064390	Cultural Resource Assessment for Cingular Wireless Facility SB 189-02, City of Chino Hills, San Bernardino County, CA	2002	Prado Dam
Maxon, Patrick	1064391	Archaeological Monitoring for the Crestwood Corporation Project on Eucalyptus Ave between Maplewood and Chino Hills Parkway, San Bernardino, County, CA	2001	Prado Dam
Clifford, James and Brian F. Smith	1064392	A Cultural Resources Inventory & Preliminary Site Evaluation Report for the Chino Hills State Park East Entry Alighnment Alternative Study, Chino Hills State Park	2002	Prado Dam, Yorba Linda
Sikes, Nancy	1064393	Cultural Resource Assessment & Monitoring opf Grading for the Chino Hills (TT 14551-1) Proposed Development, Chino Hills, San Bernardino County, Ca	2003	Prado Dam
LSA Associates, Inc	1064395	Results of Archaeological Monitoring of the Fairfield Ranch Project Area, Chino Hills, San Bernardino County, CA	2002	Prado Dam

Author	Report No.	Title	Year	Quad
Bonner, Wayne	1064397	Record Search Results for Cingular Wireless Site SB-191-01 (Village Oaks Reservoir Site) Located at 15527 Live Oak Rd, Chino Hills, San Bernardino county, CA	2002	Prado Dam
Bonner, Wayne	1064398	Phase I Archaeological Field Survey for Cingular Wireless Site SB-193-01 (The Booster Station Site) Located at 3982 Eucalyptus Ave, Chino Hills, San Bernardino County, CA	2002	Prado Dam
Demcak, Carol	1064399	Report of Archaeological Records Search for Bechtel Cingular Site REF # 951003074A, SCE Gordon Ranch Tower, Chino Hills, CA	2003	Prado Dam
Cottrell, Marie G.	1064409	Field Survey & Records Check of Tentative Tracts 8998 & 8999	1975	Prado Dam
Gordon, Beth	1064514	Historic Resources Report: CA-8116/Canyon Hills JR HS, 2500 Madrugada Dr, Chino Hills, San Bernardino County, CA	2004	San Dimas
Harper, Caprice D.	1064515	Cultural Resource Assessment: Cingular Wireless Facility No. SB 288-04, Chin oHills, San Bernardino County, CA	2004	Yorba Linda
McKenna, Jeanette A.	1064516	CA-8518 (Western Hills)	2004	Yorba Linda
O'Connell, Keith	1064517	Cellular Communications Tower Site-Grand 1, 1301 Grand Ave, Chino Hills, CA	2004	Yorba Linda
Budinger, Fred E.	1064518	Verizon Site: Peyton	2002	San Dimas
Shepard, Richard	1064519	Preliminary Cultural Resources Assessment: Peyton Dr Public Improvements, City of Chino Hills, San Bernardino county, CA	2004	Ontario, Prado Dam
Goodwin, Riordan, Judith Marvin	1064659	Historic Property Survey Report for Proposed Improvements to Peyton Drive from Grand Avenue to Chino Hills Parkway, City of Chino Hills, San Bernardino County, CA	2005	Prado Dam
Bonner, Wayne	1064661	Cultural Resource Records Search and Site Visit Results for Cingular Telecommunications Facility Candidate ES-049-01 (Village Oaks Reservoir), 15532 Live Oaks Road, Chino Hills, San Bernardino County, CA	2005	Prado Dam

Author	Report No.	Title	Year	Quad
Carmack, Shannon, Brooks Smith, Deborah b. McLean	1064662	Archaeological Monitoring Report Chino Hills Corporate Park, City of Chino Hills, San Bernardino County, CA	2006	Prado Dam
Bonner, Wayne	1064709	Cultural Resource Records Search and Site Visit Results for Cingular Telecommunications Facility Candidate LSANCA8116A (Canyon Hill Jr. H.S.) 2500 Madrugada Drive, Chino Hills, San Bernardino County, CA	2005	Ontario
Bonner, Wayne	1064754	Cultural Resource Records Serach and Site Visit Results for Cingular Telecommunications Facility Candidate ES-0007-01 (Peyton Drive SCE Tower), South of Lost Trail Drive, Chino Hills, San Bernardino County, CA	2005	Prado Dam
Bonner, Wayne	1064755	Cultural Resource Records Search Results for Cingular Telecommunications Facility Candidate ES-0016-02 (Abacherli Silo), 17954 Euclid Avenue, Chino Hills, San Bernardino County, CA	2005	Prado Dam
Bonner, Wayne	1065189	Cultural Resource Records Search and Site Visit Results for Cingular Telecommunications Facility Candidate SV-0079-01 (Carbon Canyon Rd/Windmill) Chino Hills, San Bernardino County, CA	2005	Yorba Linda
Pollock, Katherine H., Virginia Austerman, Michael K. Lerch	1065416	Deteriorated Pole Replacement Project Archaeological Survey of One Pole Location on the Eucalyptus 12kV Transmission Line, City of Chino Hills, San Bernardino County, CA	2005	Yorba Linda
Jacobs, Saundra	1065703	Nextel Wireless Communications Site CA-5338B "Jurassic" located at 16150 Pomona Rincon Road, Chino Hills, CA	2005	Prado Dam
Ewers, Daniel	1065709	Cultural Resource Assessment The Shoppes at Chino Hills, San Bernardino County, CA	2004	Prado Dam, Ontario, San Dimas, Yorba Linda

Author	Report No.	Title	Year	Quad
Michael Brandman Associates	1065785	Phase I Cultural Resources Survey Report for the DeGroot Property, 44.23 Acres near Ramona and Merrill Avenues, City of Chino Hills, CA	2006	Prado Dam
Wlodarski, Robert	1066065	Bechtel Wireless Telecommunications Site SV0080 (Chino Hills Pkwy/Eucalyptus Avenue) Chino Hills, CA	2008	Prado Dam
Applied EarthWorks Inc.	1066095	Confidential Cultural Resources Specialist Report for the Tehachapi Renewal Transmission Project	2009	Corona North, Guasti, Ontario, Prado Dam, Yorba Linda
Bonner, Wayne	1066096	Cultural Resource Records Search and Site Visit Results for Royal Street Communications, California LLC Candidate LA2271A (SCE M10-T4, Chino Diamond Bar-Ganesha)	2008	Yorba Linda
URS	1066097	Cultural Resources Technical Report Fire Mitigation Chino Valley Independent Fire District	2007	Yorba Linda
Chandler, Evelyn N., Cary D. Cotterman, Jennifer M. Howard	1066098	Cultural Resources Inventory of Proposed Pole Replacements in the City of Chino Hills, San Bernardino County and the Cities of Corona and Norco, Riverside County, CA	2008	Corona North, Corona South, Yorba Linda
Tang, Bai "Tom, Michael Hogan	1066220	Identification and Evaluation of Historic Properties Recycled Water Reservoirs R-41, R-42, and R-42, City of Chino Hills, San Bernardino County, CA	2008	Prado Dam, Yorba Linda
Bonner, Wayne	1066264	Cultural Resource Records Search and Site Visit Results for Cingular Telecommunicaitons Facility Candidate SV-029-02 (SCE M3-T5 CHP & Grand), Phillips Ranch Road, Chino Hills, San Bernardino County, CA	2005	San Dimas
Bonner, Wayne	1066265	Direct APE Historic Structural Assessment for Cingular Telecommunications Facility Candidate SV-029-02 (SCE M3-T5 CHP & Grand) Philips Ranch Road, Chino Hills, San Bernardino County, CA	2005	San Dimas

Author	Report No.	Title	Year	Quad
Strudwick, Ivan	1066323	Review of Potential Alternative Mitigation to Cultural Resources from the Proposed Carbon Canyon Road (SR-142)/Fairway Drive Intersection Widening Project, City of Chino Hills, San Bernardino County, CA	2009	Yorba Linda
Bonner, Wayne	1066361	Direct APE Historic Structure Assessment for Cingular Telecommunications Facility Candidate ES-0007 (Peyton Drive SCE Tower) South of Lost Trail Drive, Chino Hills, San Bernardino County, CA	2005	Prado Dam
Baumann, Joseph E.	1066424	Cultural Resources Assessment for the Stonefield Chino Hills 37 Project, City of Chino Hills, San Bernardino County, CA	2007	Yorba Linda
Tang, Bai "Tom"	1066425	Addendum to Historical/Archaeological Survey Report Recycled Water Reservoirs R-41, R-42, and R-43, City of Chino Hills, San Bernardino County, CA	2009	Prado Dam, Yorba Linda
Schmidt, June	1066426	WO 6034-4800; 9-4868 Bufferfield 12 kv Deteriorated Pole Replacement Project, Prado Flood Control Basin	2009	Prado Dam
Schmidt, June	1066428	DWO 6034-4800, 9-4868; San Bernardino County Deteriorated Pole Replacement Project	2009	Prado Dam, Yorba Linda, Mount Baldy
Wlodarski, Robert	1066640	AT&T Wireless Telecommunications Site LA8055 (Chino Hills Skate Park)	2010	Prado Dam
Tang, Bai "Tom", Michael Hogan	1066665	Identification and Evaluation of Historic Properties: 930 Zone Recycled Water Project, Cities of Chino Hills, Chino, and Ontario, San Bernardino County, California	2009	Guasti, Ontario, Prado Dam

Appendix F – Geotechnical Conditions Update, Prepared by GMU Geotechnical, Inc., dated March 14, 2011

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Geotechnical Conditions Update
For
City of Chino Hills General Plan

Prepared For
COMPREHENSIVE PLANNING SERVICES

March 14, 2011

GMU Project No. 10-064-00

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TRANSMITTAL

COMPREHENSIVE PLANNING SERVICES
2916 Clay Street
Newport Beach, CA 92663

DATE: March 14, 2011

PROJECT: 10-064-00

ATTENTION: Ms. Joann Lombardo

SUBJECT: Geotechnical Conditions Update, City of Chino Hills General Plan

WE ARE SENDING THE FOLLOWING:

Digital copy of our "Geotechnical Conditions Update, City of Chino Hills General Plan," dated March 14, 2011.

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INTRODUCTION

PURPOSE

This geotechnical report is intended to provide a baseline geotechnical conditions update to be used in the preparation of the planned City of Chino Hills General Plan update.

LOCATION

The City of Chino Hills is located in the southwestern portion of San Bernardino County, California. The City is bordered by Riverside County to the southeast and Orange County on the west.

SCOPE

The scope of our geotechnical studies, as outlined in our proposal dated May 20, 2010, was as follows:

1. Reviewed and analyzed published regional seismic and geologic maps, reports, and documents for seismic and geologic hazard potential within the City of Chino Hills. The data and conclusions obtained during our research and analysis have been used to update pertinent sections of the General Plan including:

    a. Seismic Safety Overlay for the Land Use Element;
    b. Mineral Resources Discussion for the Conservation Element;
    c. Safety Element (including seismic hazards, geologic hazards, flooding, and oil and mineral production).

2. Prepared this geotechnical report as a summary of our research and analysis for inclusion into the planned City of Chino Hills General Plan update.

It should be noted that this report is limited to a generalized overview of the geotechnical conditions within the City of Chino Hills. No field exploration or laboratory testing was performed, nor research pertaining to the possible presence of toxic or hazardous materials within the limits of the City of Chino Hills.

EXISTING GENERAL PLAN

PREVIOUS GEOTECHNICAL STUDIES

The existing City of Chino Hills General Plan was prepared in 1994. The relevant sections reviewed and updated as part of this report include Chapter 1 - Land Use Element, Chapter 4 - Conservation Element; and Chapter 5 - Safety Element. Published seismic hazard conditions in the City of Chino Hills have been significantly updated by the California Geological Survey (CGS) and United States Geological Survey (USGS) since publication of the General Plan in 1994. Applicable portions of the General Plan that require updating are presented below.

GENERAL PLAN UPDATE

CHAPTER 1: LAND USE ELEMENT

Overlay Classifications

Seismic Safety Overlay

A Seismic Safety overlay has been identified adjacent to the trace of the Chino Hills fault, as described in detail within the Safety Element, Chapter 5.

CHAPTER 4: CONSERVATION ELEMENT

Mineral Resources

The Chino Hills area has produced oil since the late 1800s and minor oil production continues in the Chino-Soquel Oil Field and the Mahala Oil Field as discussed in the Safety Element.

A brick-making facility operates on Pomona Rincon Road near State Highway 71; however, clay for the brick is no longer mined onsite.

According to the California Geological Survey (CGS), no significant mineral deposits are known to exist in Chino Hills. Outside the corporate boundary in the southeastern portion of the city, CGS has classified the sand and gravel resources along the Santa Ana River Wash as Mineral Resource Zone 2 (MRZ-2), which is defined as an area where adequate information indicates that significant mineral deposits exist or are highly likely. The majority of this area lies within Chino Hills State Park.

CHAPTER 5: SAFETY ELEMENT

INTRODUCTION

The geological environment of Southern California and the Chino Hills area present a number of natural hazards that could potentially endanger the safety of the public. Numerous active and potentially active earthquake faults traverse Southern California, causing seismic hazards such as ground shaking to be potentially hazardous events. The city also contains a number of hillsides with slopes in excess of 25 percent. This steep topography, combined with area soil conditions, makes landslides and other slope instabilities potential geologic hazards. Additional natural hazards that could affect the city include flooding due to natural disasters or dam inundation.

BACKGROUND INFORMATION AND ISSUES IDENTIFICATION

This section describes in detail the hazards that might affect the City of Chino Hills as well as the resources that are available in the event of an emergency. This element examines seismic, geologic, flood and inundation, fire and hazardous material hazards. This background information provided the base data to create the goals and policies which direct decision makers on how to manage safety concerns.

The following sections discuss potential seismic hazards that might influence development of building or other civil works within the City of Chino Hills. The figures that are provided are intended as a guide to assist in determining if a particular geologic hazard may impact a site within the City. The figures are not intended to be a substitute for site-specific geologic and engineering investigations for planning, design, or construction of a particular project.

Seismic Hazards

Earthquakes occur when planes of weakness, called faults, in the Earth's crust move past one another. Southern California is located on a boundary of two tectonic plates, the North American Plate and the Pacific Plate, causing the area to be considered seismically active. Numerous faults considered active or potentially active have been mapped in Southern California, including in the vicinity of and within the City of Chino Hills. Earthquakes on faults can trigger several geologic phenomena that can cause severe property damage and loss of life. These hazards include ground shaking, fault rupture, liquefaction and associated hazards, subsidence, and seiches (waves in enclosed bodies of water). Earthquakes can also cause a variety of localized, but not less destructive hazards, such as urban fires, dam failures, and release of toxic chemicals. The City of Chino Hills could be impacted by any or all of these hazards.

Earthquakes are normally classified as to the severity of their magnitude or their seismic intensity. Magnitude is defined as a measure of the amount of energy released when a fault ruptures: it is generally measured using seismographs. Seismic intensity is defined as a qualitative estimate of the damage caused by an earthquake at a given location. Because the amount of destruction generally decreases with increasing distance away from the epicenter (a point at the ground surface directly above the origin of an earthquake), earthquakes are assigned several intensities. The most commonly used seismic intensity scale, called the Modified Mercalli Intensity (MMI) Scale, has 12 levels of damage. Higher numbers on the MMI Scale indicate greater damage at the area of interest (see attached Table S-1). The intensity of seismic ground shaking at any given site is a function of several factors, but primarily the magnitude of the earthquake, the distance from the epicenter to the area of concern, the type of geologic material between the epicenter and the site, and the topographic conditions of the site. The amount of damage is also controlled to a certain extent by the size, shape, age, and engineering characteristics of the affected structures. Most buildings in Chino Hills are of wood-frame construction, which while not immune to structural damage, is notably resilient to earthquake shaking, particularly when designed per current Building Codes.

Ground Shaking

The City of Chino Hills is located within close proximity of several active and potentially active faults that are capable of generating moderate to strong ground motions during earthquakes. These moderate to strong ground motions could result in damage to buildings and other civil works within the City. The location of active and potentially active earthquake faults capable of generating moderate to strong earthquake ground motions are illustrated in Figure S-1. The seismologic characteristics of these faults are summarized in Table S-2. The Uniform California Earthquake Rupture Forecast 2 (UCERF2) utilizes two different earthquake magnitudes to model various fault rupture scenarios and earthquake ground motions (WGCEP, 2008). These two magnitudes are presented in Table S-2. The location of historical earthquakes with magnitudes greater than 4.0 within the zone of influence of the City are illustrated on Figure S-2 and presented in Table S-2 where the causative fault is known.

The geologic and seismologic characteristics of major faults anticipated to influence performance of buildings and other civil works within the City are discussed below.

<u>Chino Fault</u>

The Chino fault is considered a northern splay of the Elsinore Fault Zone (Treiman, 2002). The Chino fault extends approximately 21 kilometers southeast through the City of Chino Hills toward the City of Corona where it joins the Elsinore Fault Zone near the southern terminus of Main Street in Corona. Available geologic mapping, paleoseismic studies and oil well data indicate the Chino fault trends northwest to southeast and dips approximately 50 to 70 degrees toward the southwest. The sense of fault displacement along the Chino fault is predominantly

right-lateral, strike-slip: however, some early geologic mapping and recent paleoseismic studies suggest a reverse sense of movement at some locations. Several recent geologic studies of the Chino fault have revealed Holocene fault displacement (i.e., during the last 11,000 years). The California Geological Survey re-evaluated the Chino fault in 2002 as a result of these recent findings and has zoned the Chino fault as active pursuant to the guidelines of the Alquist-Priolo Earthquake Fault Zone Act. Two historic earthquakes are attributed to the Chino fault: the February 16, 1989 magnitude 3.2 strike-slip earthquake that occurred at a depth of approximately 4.3 kilometers and the December 14, 2001 magnitude 3.9 strike-slip earthquake that occurred at a depth of approximately 13.8 kilometers (Hauksson and Jones, 1991; Treiman, 2002).

The Elsinore Fault Zone

The Elsinore fault extends for approximately 200 kilometers from near the border with Mexico to its northern terminus near Whittier Narrows (Figure S-1). The Uniform California Earthquake Rupture Forecast (UCERF2) and the Working Group on California Earthquake Probability (WGCEP 95) indentifies five fault segments within the Elsinore fault zone. These segments are the Whittier, Glen Ivy, Temecula, Julian, and Coyote Mountains segments, from north to south (WGCEP, 1995; WGCEP, 2008). The Whittier segment exhibits a reverse, right-lateral oblique sense of movement while the Glen Ivy, Temecula, Julian, and Coyote Mountains segments exhibit a right-lateral, strike-slip sense of movement (Cao et al., 2003).

Whittier Segment (W)

The Whittier segment of the Elsinore fault extends approximately 25 to 30 kilometers from the Whittier Narrows south to the Santa Ana River. Changes in fault geometry between the Whittier segment and the Glen Ivy segment to the southeast define the boundary between these two segments. The changes in fault geometry include a gradual 20 degree bend to the northwest from approximately N50W along the Glen Ivy segment to approximately N70W and a change in dip of the fault plane from approximately 80° southwest along the Glen Ivy segment to 70-75° northeast along the Whittier segment (Wills and others, 2007). Radiocarbon dating of charcoal collected during paleoseismic trenching studies of the Whittier segment of the Elsinore fault estimate the most recent earthquake event occurred between approximately 1400-2200 years ago (Patterson and Rockwell, 1993).

Glen Ivy Segment (GI)

The Glen Ivy segment of the Elsinore fault is located between the southern end of the Whittier segment near Corona and Lake Elsinore where a releasing stepover separates the Glen Ivy segment from the Temecula segment to the south. The Glen Ivy segment of the Elsinore fault is approximately 40 kilometers in length. The most recent earthquake event along the Glen Ivy segment occurred May 15, 1910 and produced approximately

25 cm of slip along the Glen Ivy segment based on offset of a cultural feature (Rockwell, 1989). Paleoseismic studies along the Glen Ivy segment suggest that some earthquake events prior to the May 15, 1910 earthquake have produced larger amounts of fault slip.

Temecula Segment (T)

The Temecula segment extends for a distance of approximately 50 kilometers between the stepover at the southern end of the Glen Ivy segment to a compressional uplift at Agua Tibia Mountain. This compressional uplift occurs at a bend in the Elsinore fault geometry. The bend at Agua Tibia Mountain forms the boundary between with the Julian segment to the south. The most recent earthquake event along the Temecula segment occurred between A.D. 1655 and A.D. 1810 (Dawson et al., 2008). Radiocarbon dating of samples collected from fault trenches and the historic record at the Pala Mission reveal four paleoseismic events occurred between 2,700 years ago and just before 4,500 years ago along the Temecula segment of the Elsinore fault at Agua Tibia (Vaughan et al., 1999).

Julian Segment (J)

The Julian segment extends for a distance of approximately 65-75 kilometers south from the compressional uplift at Agua Tibia Mountain to an extensional left step between the Julian and Coyote Mountains segments near the Tierra Blanca Mountains. The Julian segment is the longest segment of the Elsinore Fault Zone. Although the paleoseismic record along the Julian segment is limited to two earthquake events, the available data suggest the most recent earthquake event along the Julian segment occurred approximately 1,500 years ago to 2,000 years ago based on the results of trenching at Lake Henshaw and near Julian (Magistrale and Rockwell, 1996; Thorup, 1997). The available paleoseismic data suggest earthquake events occur less frequently along the Julian segment than other segments of the Elsinore fault (Dawson et al., 2008).

Coyote Mountains Segment (CM)

The Coyote Mountains segment extends approximately 30-35 kilometers south from the extensional left step between the Julian and Coyote Mountains segments near the Tierra Blanca Mountains. The southern end of the fault is defined by a releasing step with several northeast-trending cross faults that separate it from the Laguna Salada fault (Dawson et al., 2008). Paleoseismic studies of the Coyote Mountains segment suggest that three earthquake events have occurred within the last 2,000 years (Rockwell, 1990; Dawson et al., 2008).

San Jose Fault

The San Jose fault is located north of the City and extends approximately 20 kilometers from south side of the San Jose Hills northeast to near Claremont (Figure S-1). Available data suggests the fault dips steeply to the north with a reverse sense of fault displacement (i.e., north side up). The California Department of Water Resources indicates that the San Jose fault is well defined based on the presence of a groundwater barrier and suggests that the San Jose fault offsets "older alluvium" approximately 100 meters in the subsurface. However, Holocene deposits are not offset by the fault (CA DWR, 1970), indicating there has not been any Holocene activity.

Puente Hills Blind Thrust (PHT)

The Puente Hills Blind Thrust (PHT) is a north dipping thrust that extends approximately 40 kilometers east across the Los Angeles basin from downtown Los Angeles to Brea. A blind thrust fault is a buried fault, the surface of which does not break the surface. The fault is manifested at the surface by series of folds above the fault surface including the Montebello Hills and west and east Coyote Hills. The fault is subdivided into three segments: Los Angeles, Santa Fe Springs, and Coyote Hills (Shaw et al., 2002). Dolan et al. (2003) document at least four large earthquakes (i.e., magnitude 7.2 to 7.5) in the past 11,000 years. The 1987 M6.0 Whittier Narrows earthquake occurred on the Puente Hills Thrust (Shaw and Shearer, 1999).

Sierra Madre-Cucamonga Fault Zone

The Sierra Madre-Cucamonga Fault Zone is located along the boundary between the southern margin of the San Gabriel Mountains and the northern portions of the San Fernando and San Gabriel valleys (Figure S-1). The Sierra Madre-Cucamonga Fault Zone extends approximately 95 kilometers from near Interstate 405 in the San Fernando Valley to Lytle Creek. The Sierra Madre-Cucamonga Fault Zone is a major reverse fault in southern California. Historic fault rupture occurred along approximately 19 kilometers of the western portions of the Sierra Madre-Cucamonga Fault Zone between about Big Tujunga Canyon and Dunsmore Canyon during the February 9, 1971 M6.4 San Fernando Earthquake (Crook et al., 1987; Rubin et al., 1998). Holocene fault rupture has been documented along the eastern portion of the fault zone from approximately San Antonio Creek to Lytle Creek.

San Jacinto Fault Zone

The San Jacinto fault zone is located east of the City of Chino Hills and is one of the most seismically active faults in California. The fault zone extends approximately 250 kilometers from the area near Cajon Pass where the San Jacinto fault joins the San Andreas fault south to the Imperial Valley. This fault has a right-lateral, strike-slip sense of movement (Cao et al., 2003). The San Jacinto fault zone is divided into eight segments based on fault geometry, historical

seismicity, and slip rate data. The segments of the San Jacinto fault zone are: San Bernardino Valley, San Jacinto Valley, Anza/Clark, Coyote Creek, Borrego Mountain, and the sub-parallel Superstition Mountain and Superstition Hills segments (WGCEP, 1988; Dawson et al., 2008).

San Bernardino Valley Segment (SBV)

The San Bernardino Valley segment extends approximately 35 to 40 kilometers from the northern terminus of the San Jacinto fault zone at the San Andreas fault to the northern San Jacinto Valley. Paleoseismic studies of the San Bernardino Valley segment at the Walnut trench site suggest that six earthquake events have occurred within the approximately 1,000 year long interval between 3,000 and 4,000 years ago. Fault trenches excavated at a site near Colton, California suggest that two earthquakes have occurred within about the last 300 years (Fumal and Kendrick, 2008).

San Jacinto Valley Segment (SJV)

The San Jacinto Valley segment begins at a restraining bend at the northern end of the San Jacinto Valley and extends approximately 40 to 45 kilometers from along the east side of the Hemet releasing stepover. The Casa Loma fault located on the west side of the releasing stepover is part of the Anza segment. There are no paleoseismic data available to identify paleo-earthquake events or the age of the most recent surface rupture event on this segment of the San Jacinto fault. However, the fault has been a source of significant earthquakes during the historic period (Dawson et al., 2008). Two significant earthquakes occurred in 1899 (M6.9) and 1918 (M 7.1) that were located on or near the San Jacinto Valley segment (Bakun, 2006). The timing of the most recent event is uncertain for this segment of the fault because surface rupture was not documented for either of these earthquakes. However, surface rupture could have occurred along the Claremont section of the fault because this fault strand was not investigated following the 1918 earthquake (Rasmussen, 1982).

Anza/Clark Segment (A)

The Anza/Clark segment extends south from the Hemet releasing stepover for a distance of approximately 110 kilometers. The southern 50 kilometers of the Anza segment is also known as the Clark fault. This section of the fault parallels the Coyote Creek segment to the west. The area between the Clark section and the Coyote Creek segment includes numerous cross faults and other structures that accommodate slip between these two segments of the San Jacinto fault. Paleoseismic data obtained from the Hog Lake trench site reveals at least 16 paleo-earthquake events have occurred during the past 3,500 to 4,000 years ago. The most recent earthquake event along the Anza/Clark segment occurred between approximately 1750 and 1800 A.D. (Rockwell et al., 2006).

Coyote Creek Segment (CC)

The Coyote Creek segment is approximately 40 kilometers long and is located west of and parallel to the Clark section of the Anza/Clark segment discussed above. The southern end of the Coyote Creek segment is located at the northern terminus of the rupture zone associated with the 1968 M_w 6.5 Borrego Mountain earthquake. No paleoseismic data regarding paleo-earthquakes or recurrence interval are available for this segment (Dawson et al., 2008).

Borrego Mountain Segment (BM)

The Borrego Mountain segment is defined by the extent of faulting rupture observed after the 1968 M_w6.5 Borrego Mountain earthquake. The 1968 M_w6.5 Borrego Mountain earthquake ruptured approximately 31 kilometers of the San Jacinto fault. A maximum of 38 cm of right-lateral surface offset was recorded after this earthquake.

Superstition Mountain Segment (SM)

The Superstition Mountain segment of the San Jacinto fault zone extends south for a distance of approximately 24 kilometers from the southern end of the 1968 Borrego Mountain rupture to the end of the mapped trace (Gurrola and Rockwell, 1996; Cao et al., 2003). The Superstition Hills fault is located east of and sub-parallel to the Superstition Mountain fault and extends approximately 13 kilometers farther south than the Superstition Mountain segment. The Superstition Hills fault is the southern-most mapped trace of the San Jacinto fault zone (Dawson et al., 2008). No paleoseismic data regarding paleo-earthquakes or recurrence interval are available for this segment (Dawson et al., 2008).

<u>San Andreas Fault Zone</u>

The San Andreas fault extends southeast from where the fault joins the Kings Range Thrust and Mendocino Fault Zone approximately 1,300 kilometers to the Gulf of California. The San Andreas fault is one on the most active faults and has the highest measured slip rate in California. The San Andreas fault is the only known source of Magnitude 8 earthquakes in southern California. The predominant sense of movement along the San Andreas fault is right-lateral, strike-slip. The San Andreas fault has been subdivided into the northern and southern sections. In southern California, the fault zone has been divided into 10 segments: the Parkfield (PK), Cholame (CH), Carrizo (CC), Big Bend (BB), Mojave north (NM), Mojave south (SM), San Bernardino north (NSB), San Bernardino south (SSB), San Gorgonio-Garnet Hill (BG), and Coachella (CO) (Wills, et al., 2008). Only the southern nine fault segments from the Cholame segment south have a significant influence on seismic hazards in the city.

Ground Shaking Discussion

The city is located within a seismically active area of southern California and may be subject to future strong ground shaking on near- and/or far-field sources. Earthquake shaking is likely the seismic hazard with the greatest potential risk to loss of life and/or property within the city. The loss of life and/or property can be reduced by designing projects in accordance with the most recent versions of building codes and standards like the California Building Code (CBC) and the American Society of Civil Engineers Standard (ASCE) No. 7.

Although a great deal is known about where earthquakes are likely to occur, there is currently no reliable way to predict when an earthquake will occur in any specific location. Scientists study the past frequency of large earthquakes in order to determine the future likelihood of similar large earthquakes. Based on the number of historic earthquakes and known active faults in the vicinity of the city, ground shaking will affect the city again in the future. The eastern portion of the city is underlain by alluvial sediments that may be saturated. These sediments would likely be subject to ground amplification (ground shaking is typically less severe on rock than on alluvium) in the event of an earthquake occurring on one of the major active faults in the vicinity of the city including the Elsinore, Chino, Puente Hills, San Jacinto, San Andreas, or Cucamonga faults.

The historic record of moderate to strong earthquakes in southern California extends back to the Mission era. There have been approximately 10 historic earthquakes with magnitudes greater than approximately 5 that have resulted in moderate to strong damaging earthquake ground motions in the vicinity of the city. Historical earthquakes are described in the following paragraphs.

1812 Wrightwood Earthquake

An estimated magnitude 7.5 earthquake occurred on the morning of December 8, 1812, along the San Andreas fault in the Wrightwood area. The earthquake ruptured approximately 105 miles of the ground surface. Forty Native Americans were killed at Mission San Juan Capistrano while attending mass when the church collapsed.

1857 Fort Tejon Earthquake

One on the largest earthquakes ever recorded in the United States occurred on January 9, 1857 along the southern San Andreas fault. The 1857 Fort Tejon earthquake was estimated at a magnitude of 8.0. The earthquake ruptured approximately 220 miles of the San Andreas fault from Cholame on the north to the Cajon Pass area on the south. Offset along the fault rupture resulted in an average fault offset of approximately 15 feet and a maximum of approximately 30 feet near Wallace Creek on the Carrizo Plain. Strong

ground shaking caused by the earthquake was reported to have lasted for more than one minute.

1899 Cajon Pass Earthquake

An estimated magnitude 5.7 earthquake occurred on July 22, 1899 in the area of Cajon Pass. The earthquake occurred on an unknown fault somewhere near Lytle Creek and Cajon Pass. This earthquake triggered landslides that blocked Lytle Creek Canyon Road and the road through Cajon Pass. Damage to buildings was reported in San Bernardino and Highland.

1987 Whittier Narrows Earthquake

The magnitude 6.0 Whittier Narrows earthquake occurred at approximately 7:42 AM on October 1, 1987. The Whittier Narrows earthquake occurred along the Puente Hills Blind thrust (Shaw and Shearer, 1999). The earthquake caused three direct fatalities and over $358 million in damage (Hauksson et al., 2008). The ShakeMap data reveal Modified Mercalli Intensity (MMI) shaking up to approximately MMI VII or VIII in the epicentral region (Hauksson, 1994). ShakeMap data generated by the United States Geological Survey (USGS) indicate MMI shaking between approximately MMI V to MMI VI in the vicinity of the City of Chino Hills.

1988 and 1990 Upland Earthquakes

On June 26, 1988, a magnitude 4.6 earthquake occurred along the San Jose fault, about 2 miles (3 kilometers) northwest of the City of Upland. The earthquake caused minor damage in the epicentral area. On February 28, 1990, a magnitude 5.2 earthquake occurred along the San Jose fault in the same area. This earthquake caused landsliding in the Mount Baldy area, and it caused some damage to the San Antonio dam. Thirty-eight people sustained minor injuries and damage was considerable near the epicenter (Hauksson and Jones, 1991).

1991 Sierra Madre Earthquake

On June 28, 1991, a magnitude 5.8 earthquake occurred along a 4 kilometers segment of the Clamshell-Sawpit fault north of the City of Monrovia, approximately 26 miles (41 kilometers) northwest of the City of Chino Hills. The earthquake caused substantial damage in communities of the northern San Gabriel Valley. The ShakeMap data generated by the USGS reveal Modified Mercali Intensity (MMI) shaking up to approximately MMI VII in the epicentral region (Hauksson, 1994). ShakeMap data in the vicinity of the City of Chino Hills indicate MMI shaking between approximately MMI V to MMI VI.

1992 Landers and Big Bear Earthquakes

At 4:57 AM on June 28, 1992, the magnitude 7.3 Landers earthquake struck in the Desert Region near the communities of Yucca Valley, Joshua Tree, and Landers. The earthquake produced a 53 mile (85 kilometer) long surface rupture extending from about 9 miles (15 kilometers) south of Yucca Valley to about 25 miles (40 kilometers) north of Landers. Ground surface rupture occurred along several faults including the Johnson Valley fault, the Landers fault, the Homestead Valley fault, and the Camp Rock-Emerson faults. The average slip on the ground surface rupture was 10 to 13 feet (3 to 4 meters) with a maximum slip of about 20 feet (6 meters). The epicenter of the earthquake was located about 3.5 miles (6 kilometers) north of the community of Yucca Valley. ShakeMap data in the vicinity of the City of Chino Hills indicate MMI shaking between approximately MMI V to MMI VI.

Approximately 3 hours later, at 8:05 a.m., the magnitude 6.4 Big Bear earthquake struck in the mountains near Big Bear. The Big Bear earthquake occurred on a separate, previously unknown northeast trending left-lateral strike-slip fault that intersects the Camp Rock-Emerson faults. It appears that the Big Bear earthquake was triggered by movement on the Camp Rock-Emerson faults during the Landers Earthquake. The Big Bear earthquake did not produce a surface rupture and no trace of the fault with the proper orientation has been found. Collectively the quakes caused one death, over 400 injuries, and around $100 million in damage to property, roads, and water systems.

1994 Northridge Earthquake

The magnitude 6.7 Northridge earthquake occurred at approximately 4:30 AM on January 17, 1994. The Northridge earthquake occurred along the Northridge Blind Thrust located beneath the San Fernando Valley (Huftile and Yeats, 1996). The earthquake caused $35 billion in damage (Shaw and Shearer, 1999). ShakeMap data in the vicinity of the City of Chino Hills indicate MMI shaking up to approximately MMI VI.

1999 Hector Mine Earthquake

On October 16, 1999, a magnitude 7.1 earthquake ruptured portions of the Lavic Lake and the Bullion faults. The earthquake rupture was approximately 25 miles long and produced approximately 16 feet of right-lateral offset. The earthquake was centered approximately 34 miles northwest of Twentynine Palms, California. The ShakeMap data generated by the USGS reveal MMI shaking between approximately MMI IV to MMI V in the vicinity of the City of Chino Hills.

July 29, 2008 Unnamed Earthquake

A magnitude 5.4 earthquake occurred on July 29, 2008, with an epicenter located approximately 2.7 miles southwest of City Hall. Although damage was minimal, strong ground shaking was felt widely throughout southern California. The earthquake occurred at a depth of approximately 15 kilometers. Two aftershocks with M>3 occurred in the following two hours. The mainshock and aftershock sequence occurred at a depth between 13 to 16 kilometers between the Whittier and Chino faults. It is unclear from the available data which fault is the causative fault due to the limited aftershock distribution (Hauksson et al., 2008). The earthquake intensity data available at the ShakeMap website indicate the strongest shaking was recorded in the Diamond Bar area north of the City of Chino Hills. The ShakeMap data reveal MMI shaking varied between approximately MMI V to MMI VI in the City of Chino Hills.

Surface Fault Rupture

The potential for surface fault rupture exists in the city along the trace of an active or potentially active fault. The potential for surface fault rupture to impact life or property in the city is associated with the Chino fault (Figure S-3). Although the Chino fault has not ruptured within historic time, the paleoseismic studies reveal the fault has experienced surface fault rupture within the Holocene period (i.e., approximately the last 11,000 years). The California Geological Survey (CGS) established an Alquist-Priolo Earthquake Fault Zones around the Chino fault on May 1, 2003. A generalized map illustrating the Chino fault and Alquist-Priolo Earthquake Fault Zone is presented on Figure S-3. The Alquist-Priolo Earthquake Fault Zone map for the Chino fault is only intended to serve as a guide in determining the general locations of earthquake fault zones and is not suitable for local planning and site selection. It should be noted that the Alquist-Priolo Earthquake Fault Zone map may not be up-to-date since the CGS frequently updates maps as new data becomes available.

The Alquist-Priolo Earthquake Fault Zones map can be reviewed at:

- Department of Conservation/California Geological Survey, Southern California Regional Office, 655 S. Hope St. #700, Los Angeles, CA 90017-2321, Phone: 213-239-0878
- ADD info for City Community Development Dept.
- http://www.conservation.ca.gov/cgs/rghm/ap/gis_download/Pages/gis_download_wriverside.aspx

Alquist-Priolo Earthquake Fault Zones maps can be purchased at:

- BPS Reprographic Services, 945 Bryant Street, San Francisco, CA 94105, Phone: 415-512-6550

Electronic versions of Alquist-Priolo Earthquake Fault Zones maps in both PDF or GIS formats can be purchased at:

- Department of Conservation/California Geological Survey, Southern California Regional Office, 655 S. Hope St. #700, Los Angeles, CA 90017-2321, Phone: 213-239-0878

Liquefaction

Liquefaction is a soil strength and stiffness loss phenomenon that typically occurs in loose, saturated cohesionless soils as a result of strong ground shaking during earthquakes. The potential for liquefaction at a site is usually determined based on the results of a subsurface geotechnical investigation and the groundwater conditions beneath the site. Hazards to buildings associated with liquefaction include bearing capacity failure, lateral spreading, and differential settlement of soils below foundations, which can contribute to structural damage or collapse.

The California State Legislature passed the Seismic Hazards Mapping Act (SHMA) in 1990 (Public Resources Code Division 2, Chapter 7.8) as a result of earthquake damage caused by the 1987 Whittier Narrows and 1989 Loma Prieta earthquakes. The purpose of the SHMA is to protect public safety from the effects of strong ground shaking, liquefaction, landslides, or other ground failure, and other hazards caused by earthquakes (CGS SP117). The site is not mapped within a seismic hazard zone based on review of currently published maps available on the CGS website. However, review of the CGS website indicates that seismic hazard zone mapping of the City of Chino Hills is planned in the future.

Portions of the city may be underlain by loose, saturated alluvial materials subject to liquefaction. Areas considered most susceptible to liquefaction include the low-lying areas in the eastern portion of the city within the Chino Basin and canyon areas in Chino and eastern Puente Hills, as shown on Figures S-4 and S-5. Development of sites within these areas should include site-specific liquefaction studies as part of a geotechnical engineering investigation. At a minimum, the liquefaction studies should be performed in accordance with the most recent versions of CGS SP117 and the Southern California Earthquake Center Guidelines for Implementation of SP117.

Vulnerability of the City of Chino Hills to Seismic Hazards

Most injuries and property damage from a major earthquake impacting the city will be caused by strong ground motion, especially structural and non-structural damage to buildings. The City of

Chino Hills is developed mostly into low-density and medium-density residential zones. Less extensive areas are devoted to low-rise commercial development. Low-rise buildings (less than three stories) common in the city are more likely to be damaged by an earthquake on a nearby source, such as the Chino or Whittier fault segments.

Residential Development

The wood-frame construction used in the residential and some commercial development in the city generally performs well during earthquakes. These buildings may experience significant structural and non-structural damage, but rarely collapse. However, wood-frame structures with split-level or irregular floor plans can be subject to torsional racking of foundation and wall elements during earthquakes of intensities of MMI = VIII or greater. Split-level houses are also susceptible to damage caused by the weakness of pole platforms or structures used to support the structure. Vertical changes in strength are termed "soft-stories" and are also manifested in other types of construction.

Single-family residences built before the 1952 Building Code was implemented are more likely to slip off their foundations as a result of strong ground motion associated with near-field earthquakes. Mobile homes are also susceptible to slipping off their foundations and should be secured.

Commercial and/or Industrial Development

Buildings using tilt-up concrete walls are found in some commercial development in Chino Hills. Roof collapse has been observed in some pre-1971 commercial buildings using this type of construction. Concrete and steel-framed buildings are more earthquake-resistant forms of commercial construction and should be encouraged. Unusual architectural features such as long spans, minimal amount of interior shear walls, or irregular shapes may also be found in commercial development and should be viewed with caution as they may be more susceptible to damage during an earthquake.

Critical Facilities

Critical facilities must remain operational after an earthquake; facilities that pose unacceptable risks to public safety if severely damaged are also of critical concern. Essential facilities, such as hospitals, fire and police stations, emergency centers, and communication centers, are needed during an emergency. High-occupancy facilities, such as churches and multi-family residential complexes, as well as dependent care facilities, such as schools, and senior living facilities, are also considered critical facilities and should be designed and prepared as such.

It is important to ensure that critical facilities designed for human occupancy possess no structural weaknesses that can lead to collapse. It should be noted that the State of California has

jurisdictional responsibility to ensure that public schools are adequately constructed to seismic standards (Field Act, 1933; Garrison Act, 1969).
Any multi-story development or development of critical facilities planned to be constructed in the city should be built to the latest Building Code specifications and any additional criteria stipulated by pertinent governing agencies, and should include site-specific seismic hazard analyses per current State requirements, particularly for areas identified as having moderate to high susceptibility to liquefaction, as shown on Figure S-4.

Unreinforced Masonry Buildings

There are no known unreinforced masonry structures in the City of Chino Hills (Winston Ward, City of Chino Hills, 2010).

Nonstructural Hazards

Nonstructural damage is perhaps the largest expected source of injury in an earthquake. Buildings with exterior non-structural details such as cornices and parapets pose hazards to the public if not properly secured. Toppled furniture, interior equipment and decor items pose additional hazards. In structures where continued function is necessary (i.e. critical facilities such as fire stations and City Hall), special efforts should be made to ensure that communication equipment and emergency generators are not damaged during an earthquake.

Issues and Opportunities – Seismic Hazards

1. The primary seismic hazard in the City of Chino Hills is severe ground shaking as a result of an earthquake on any of several nearby seismically active faults. The simultaneous occurrence of earthquake-induced landslides, fire, isolated structural damage and impaired utility service caused by strong ground motion require adequate emergency response plans.

2. A magnitude 6.8 earthquake on the Chino fault could generate seismic intensities in the VIII to IX range on the MMI Scale within the city. This earthquake would cause the most damage in the eastern parts of the city, adjacent to the Chino fault, and in other low-lying areas susceptible to liquefaction. This fault also poses a potential surface rupture hazard.

3. A magnitude 7.3 earthquake on the Whittier segment of the Elsinore fault zone could generate seismic intensities in the VII to VIII range in the city. This earthquake would impact the western portions of the city.

4. The San Jacinto fault is considered to be one of the most seismically active faults in the region. Ground accelerations generated by this fault zone should be considered in

planning and design of future developments within the city. Additional faults listed in Table S-2 should also be considered in accordance with current Building Codes and industry standards for seismic hazard analyses.

5. The seismic design and constructions standards contained in the California Building Code (CBC) should be applied to any conventional development in the city. Site-specific geologic and seismic studies need to be conducted prior to the design and construction of a critical facility.

6. New construction within the city should adhere to safe design practices. Coordination between the property owner, architect, and structural engineer should be ongoing during the design process to eliminate design flaws. City building inspectors should review critical facilities and high-occupancy residential and commercial projects with consideration to the following:

    a. Symmetrical, concrete, and steel-framed commercial buildings have greater resistance to earthquake damage and should be encouraged.
    b. Irregularly shaped buildings are more difficult to design to withstand strong ground motions and are therefore more susceptible to damage during an earthquake and should be discouraged.
    c. Buildings with adverse discontinuities in strength between major structural elements, such as soft-story buildings, have increased susceptibility to earthquake damage and should be discouraged.
    d. Commercial pore-cast tilt-up construction must have adequate diaphragms (the horizontal bracing system that transmits horizontal forces to vertical-resisting components) and adequate tie-ins or connections between structural components to prevent roof collapse.
    e. Nonstructural elements must not block exit routes or constrain rescue operations if damaged or unseated during an earthquake.
    f. Stairways and elevators should be adequately strengthened and nonstructural components such as emergency generators, computers and furniture should be anchored or braced.

7. Earthquake damage to wood-frame, single-family residential structures from near-field sources is expected to be slight to moderate and limited to walls thrown out of plumb, fallen chimneys, and torsional racking of foundation and wall elements. Houses built prior to 1952 and mobile homes may not be adequately anchored and could experience shifting off their foundations during an earthquake. Information regarding the benefits and procedures for correcting structural and nonstructural hazards in private dwellings should be made available as part of a voluntary seismic upgrading program.

8. The city should consider conducting a structural inventory of pre-1973 commercial facilities in the city to identify possible design weaknesses such as soft-story structures or tilt-up concrete construction. It is understood that very few older commercial structures exist in the city (Winston Ward, personal communication, 2010).

9. The Chino fault along the eastern portion of the City of Chino Hills has been identified as an Alquist-Priolo Special Studies Zone (CGS, 2003). Any proposed development within the limits of the Special Studies Zone should comply with the requirements of the Alquist-Priolo Earthquake Fault Zoning Act. Other faults associated with the Chino fault, or the Whittier segment of the Elsinore fault zone, should also be considered active.

10. Fault zones should be clearly identified on parcel maps to increase public awareness of fault rupture hazards.

11. Several areas along Chino Creek and in the canyon bottoms that drain the city may have a moderate to high susceptibility to liquefaction. Site-specific studies to address the potential for liquefaction should be required for new construction projects in the city.

12. The Chino Independent Fire District operates three fire stations in the City of Chino Hills. These are located at 5551 Butterfield Ranch Road, 16231 Canon Lane, and 13707 Peyton Avenue. Simultaneous evacuation of high-occupancy structures and the occurrence of earthquake-induced fires in the city could tax the Fire District's manpower resources.

13. Water pipelines can be damaged by surface rupture, liquefaction, landslides, or high-frequency seismic waves if significant vertical or horizontal displacements of the ground occur (NCEER, 1989). Breaks in water distribution pipelines can result in significant reductions in water pressure that can negatively impact post-earthquake fire suppression efforts. Water reservoirs in the city are generally adequate to provide at least a three-day supply of water. Lake Los Serranos, Arnold Reservoir, other smaller ponds and swimming pools in the city can also be used as water sources for fire-suppression if necessary.

14. Electricity for the City of Chino Hills is provided by Southern California Edison. High frequency ground motions associated with a near-source earthquake can seriously disrupt the electricity supply network (Hayes, 1987; Toppozada et al., 1988). In the event of a major earthquake in the area, residents should be prepared to be without electricity for three days or more.

15. Damage to computer switchboards and disruption to electricity will impair emergency communications. Telephone systems may be overwhelmed after an earthquake. Emergency response facilities should be equipped with radio equipment capable of

monitoring several frequencies. These can serve as temporary communication links with similarly equipped facilities in the area.

16. Damaged natural gas pipelines and connections may result in service disruption and possibly fire. Information about how to shut off domestic gas supply should be made available to residents.

17. The potential for earthquake-induced hazardous materials accidents in the city and adjacent areas must be addressed in disaster planning scenarios for the City of Chino Hills. Hazardous materials issues are discussed further in the Hazardous Materials section of this Element.

Geologic Hazards

The City of Chino Hills is located in the eastern Puente Hills, in the northern portion of the Peninsular Ranges geomorphic province. The Peninsular Ranges province is characterized by a series of northwest to southeast-oriented valleys, hills, and mountains separated by faults associated with, and parallel to, the San Andreas fault system. Two of these faults, the Chino fault and the Whittier segment of the Elsinore fault system, are located within or close to the city of Chino Hills. These faults and the geologic units that underlie the city of Chino Hills generally control the potential geologic impacts discussed below.

The hilly portions of Chino Hills are underlain primarily by bedrock of the Puente Formation (Morton and Miller, 2006). This bedrock formation was deposited between 6 to 11 million years ago during a period when the area was submerged under the ocean. Approximately 2 to 3 million years ago, the continent began to rise and the ocean dropped, while a complex process of faulting and folding caused the uplift of the Puente Hills area and the city of Chino Hills. The bedrock materials of the Puente Formation have been folded and faulted within the Puente Hills such that bedding inclinations now range from gentle to steeply dipping (i.e., 10 to 70 degrees) with numerous folds of varying scales and axis orientations. In its entirety, it is estimated the Puente Formation is approximately 13,000 feet thick within the Chino Hills area.

The Puente Formation is divided into three members within the city of Chino Hills: the Sycamore Canyon member, Yorba member, and Soquel member (Morton and Miller, 2006). The Sycamore Canyon member of the Puente Formation, the youngest member, generally consists of thickly bedded sandstone and pebbly conglomerate with lesser amounts of siltstone and siliceous siltstone. The Yorba member generally consists of predominately thinly bedded siltstone, sandy siltstone, and siliceous siltstone, with scattered to rare claystone beds. The Soquel member, the oldest member of the formation, generally consists of well-bedded graded sandstone with interbedded siltstone.

The Topanga Formation is exposed within the southeastern portion of the city, adjacent to the Horseshoe Bend area of the Santa Ana River, within the Chino Hills State Park. The Topanga Formation was deposited about 15 million years ago, and generally consists of massively bedded sandstone and conglomerate with interbeds of siltstone and minor claystone. In addition to outcropping in the southeastern portions of the city, the Topanga Formation generally underlies the Puente Formation in the Chino Hills area.

Surficial sediments overlie bedrock in the lower portions of the city, particularly within canyons and at the eastern base of the Chino Hills. These sediments include very old alluvial soils to recent alluvial soils, slopewash and channel deposits, as well as landslide deposits. These sediments have been deposited over the past 2 million years as ancient stream channels have eroded the Chino Hills to their current topographic expression. Generally, the older surficial deposits are semi-consolidated, and consist of sands and silts with some clay. Younger surficial deposits may consist of coarser materials and are generally unconsolidated. Landslide deposits are generally comprised of the source materials that failed, such as bedrock or weak surficial soils on slopes.

Landslides and Slope Instability

A landslide is defined as a mass of rock or soil that has been displaced downslope by sliding, flowing, or falling. Slope failures can occur very rapidly on steep slopes or imperceptibly slowly on gentle slopes. Very slow movement of slopes is often called “slope creep” and is common on manufactured slopes and natural steep slopes. Factors that influence the stability of a slope include the characteristics of the rock and soil materials that make up the slope, moisture conditions, rainfall intensity, steepness of the terrain, geologic structure, and human influences (such as irrigation, grading, etc.).

The bedrock of the Puente Formation is often intensely fractured and folded and, therefore, relatively weak. Most large landslides in the Puente Hills area are thought to have occurred between 10 to 20 thousand years ago, when the regional climate was significantly wetter than today (Fife, et al, 1976; Tan, 1988). These landslides can be in delicate equilibrium with their environment and can be reactivated during periods of intense rainfall, if subjected to strong ground motions during an earthquake, or as a result of slope modifications by either man-made or natural conditions.

Increased water content in a slope can contribute to slope instability by increasing the weight of the soil materials on the slope, by softening planes of weakness such as bedding planes or faults, or by increasing the pressure exerted by water in the pores of the soil (pore pressure). Excessive rainfall or irrigation can saturate the soils on a slope, contributing to slope failure. Water introduced to a slope as a result of broken water or sewer lines or natural flooding can also cause slope instability problems. In general, water is the dominant trigger of slope failures and landslides.

Slope modification as a result of road construction and urban development can also render slopes unstable due to adverse geologic conditions. Many of the slopes in the Chino Hills area could be rendered unstable during or after grading due to exposure of adverse geologic conditions including folded or faulted bedrock. Failures are particularly likely on slopes underlain by the Yorba and Sycamore Canyon members of the Puente Formation (Yerkes, 1972; Tan, 1988). In order to mitigate this potential hazard, detailed geotechnical studies must be conducted prior to development in hilly portions of the city. These geotechnical studies should be completed per applicable Code and State standards as well as current geotechnical industry standards. The results of the geotechnical studies should be utilized to modify the grading plans to mitigate unstable slope conditions and stabilize any existing landslides or unstable slopes.

In order to identify and evaluate the potential for landsliding within the city, a relative landslide susceptibility map for Chino Hills is provided as Figure S-6, based on the work of Tan (1988). The slopes within the city are classified into four susceptibility areas, as described on the figure, ranging from least susceptible to most susceptible (Areas 1 through 4, Figure S-6), and are based on the following criteria:

1. The occurrence and distribution of landslides and features indicative of slope instability;
2. Geology of the area including bedrock type, engineering properties of the bedrock materials as they relate to slope instability, and data on bedding, folding, and faulting; and
3. The relative behavior of the slopes within the area based on a review of aerial photographs and field observations.

Given that these mapping classifications are based on regional data, site-specific investigations are still necessary to determine potential slope instability problems for proposed developments. Development projects must identify and address landslide susceptibility as a condition of project approval in landslide hazard areas or as required by the City Geologist, including site-specific stability analyses and reports for all slopes, staff review of slope instability areas shown on seismic or geologic maps or other in-house data, and/or staff field checks. Due to the potential relationship between seismic activity and landsliding effects, the City shall require that a seismic analysis be included as a part of landslide stability studies when required by the Engineering Department.

Earthquake-Induced Landsliding

Earthquake-generated strong ground motions can worsen existing unstable slope conditions. Typical earthquake-induced landslides in the terrain of the Chino Hills area could include rotational slumps, rock falls, shallow slumps, and slides commonly associated with moderate to steep road cuts and natural slopes. If the slope materials become saturated, strong ground motions could also trigger mudslides and mudflows. Properly designed and constructed engineered slopes will generally perform well during an earthquake.

Storm-Induced Landsliding and Erosion

Heavy rainfall often triggers surficial sliding (debris flows and mudflows) along the sides of canyons and on steep slopes. Hill slopes composed of Puente Formation blanketed with topsoil and colluvium are more susceptible to erosion if not properly planted.

The current California Building Code (CBC, 2007) provides guidelines that may reduce the potential for erosion of cut and fill slopes, including appropriate plantings, slope maintenance and construction of erosion control devices. Older hillside areas of the city developed prior to implementation of the current CBC may not have benefited from such protection, and consequently could experience a greater likelihood of storm damage.

Natural canyons and other hillside undeveloped areas may be susceptible to storm-induced landsliding and erosion. Downslope developments or those that may be impacted by these events should be designed with appropriate erosion control and/or debris catchment devices in order to minimize damage to developments.

Subsidence from Groundwater Withdrawal: Ground subsidence resulting from groundwater extraction has been documented at several locations in California, including the Chino-Riverside, Bunker Hill-Yucaipa, and Temecula areas (Lofgren, 1971; County of San Bernardino, 1991; Shlemon and Hakakian, 1992). Subsidence in these regions has typically occurred over broad areas where groundwater levels have declined as much as 150 feet over a period of decades. Ground subsidence generally occurs where deep alluvial valleys exist. Alluvium-filled canyons in the Chino Hills area generally contain less than 200 feet of alluvium overlying consolidated bedrock of the Puente Formation. Therefore future subsidence due to groundwater withdrawal is not anticipated to occur in the City of Chino Hills (Lofgren, 1971).

Collapsible and Expansive Soils: Soils can collapse or expand for a variety of reasons, including the type of soil or presence of water. Low-density soils such as recently deposited river sediments can settle if subjected to the heavy loads associated with building foundations. These soils may also settle if compacted during an earthquake when water is extruded from the soil as a result of strong ground-shaking, and the particles are compressed together.

Granular soils, such as sands and gravel held together by clay or another water-soluble binder, can compact or densify if the clay is washed away by infiltrating water. This process is called hydrocompaction. The change in volume that results when soils densify can cause extensive damage to building foundations, infrastructure (such as roads, bridges etc.) and utilities. Therefore, potentially compressible soils need to be identified during the preliminary geological investigations for a proposed project or development so that mitigation measures can be selected and applied. The sandy alluvial deposits located within the major drainages traversing the City of Chino Hills may be susceptible to consolidation and hydrocompaction. Bedrock of the Puente Formation generally has a low settlement potential.

Soil settlement can also occur in the eastern side of the city in the area where clay was previously mined. If the open pits left behind from the clay mining operation are backfilled with fill soils that are not compacted under the supervision of a geotechnical engineer, settlement could occur.

Expansive soils are soils with a significant amount of montmorillonitic clay, a mineral that has the ability to shrink and swell as the water content changes (Mathewson, 1981). When changes in the environment result in a change in the moisture content of these clays, the soils change volume. Changes in volume of these soils can be brought on by seasonal changes in rainfall or changes in irrigation. Vegetation, especially large trees planted near a foundation, can also cause significant changes in soil volume as the trees withdraw water from the surrounding soil. Poor drainage around a structure can also result in localized swelling. The change in soil volume brought about by these processes can cause extensive damage to structures built over these soils. Differential expansion or settlement along the edges of a building foundation can also cause extensive structural damage. In the United States, expansive soils cause more damage in dollars to highways, streets and buildings than other natural disasters such as earthquakes, floods, and tornadoes combined (Mathewson, 1981).

Most surface soils in the City of Chino Hills have a moderate to low shrink-swell potential (Woodruff and Brock, 1980). However, some soils formed in place from weathering of clay-rich units of the Puente Formation have a high shrink-swell potential. The distribution of these surface soils in the city is shown on Figure S-7. The Puente Formation locally contains layers of volcanic ash that weather to highly expansive clays. These ash layers could be exposed during grading. To mitigate the hazards posed by soils with a high shrink-swell potential, geotechnical studies should be conducted on a site-by-site basis to evaluate the expansion potential of the soils at or near the proposed grade of a project.

Reactive Soils: Reactive or corrosive soils have chemical properties that can disintegrate or corrode metal pipes and concrete. Corrosive soils include soils with either low (less than 3) or high (greater than 9) pH values and low resistivity, and soils rich in sulfates. Soils with high concentrations of sodium, magnesium, or calcium sulfate can react chemically with the hydrated lime in cement and disintegrate permeable concretes that have a high water-to-cement ratio. Geotechnical engineers routinely conduct sulfate analyses of soils as part of geotechnical investigations. The impact of sulfate-rich soils on concrete can be mitigated by using special cement mixes that include additives to reduce the permeability of the concrete and by paying careful attention to the mix design, quality control, and curing of the concrete. Soils in the Chino Hills area generally are potentially corrosive to ferrous metals and severely corrosive to concrete (GMU, 2008). The city currently (2010) requires a soils analysis for corrosion prior to installation of water lines, sewer mains, or storm drains. Special design and materials must be used where corrosive soils exist.

Issues and Opportunities – Geologic Hazards

This section summarizes principal issues and offers suggestions for future actions, as listed below:

1. Geologic hazards in the city of Chino Hills are controlled to a large extent by the types of rock that underlie the area. Bedrock of the Puente Formation comprises most of the hilly portions of the city. This formation has units within it that are characteristically weak and therefore prone to landsliding. Four landslide susceptibility zones have been identified within city limits.

2. In general, the landslides mapped within the city are, at present, in equilibrium with the surrounding environment. However, these landslides could be reactivated as a result of any natural or man-made processes, such as development of hillsides, earthquake-induced strong ground motion, and periods of intense rainfall.

3. Development projects that involve grading of hillsides should be planned so as to disturb the natural landforms as little as possible. It is City and County policy to control the overall shape, height, and grade of cut and fill slopes so that manufactured landforms are in concert with existing natural contours while preventing conditions that result in landsliding, runoff, or erosion.

4. Good grading design must balance safety and aesthetics to preserve the natural visual quality and community character. Mitigation of existing and/or potential slope problems at the site and tract level should be recommended by qualified and licensed geotechnical engineers and engineering geologists, and should be based on detailed site-specific information and current grading codes.

5. Hillside management guidelines must provide for implementation along entire slope segments. To benefit from contour grading, slope cover, irrigation, and drainage/debris protection regulations, these guidelines must be applied across several properties adjoining a single slope segment. Designation of Geologic Hazard Abatement Districts (GHAD) is one alternative for developing a comprehensive hillside plan along slope segments adjoining canyons and other hillsides in already developed areas.

6. Potentially active landslides, slopes with adverse geologic conditions, and engineered slopes can be destabilized by excessive water. Clay beds within the Puente Formation may be prone to slippage if excessive water is introduced into either an engineered slope or a natural landslide mass. To reduce the potential for activation or reactivation to occur, the introduction of water through landscaping or sewage septic systems must be minimized. This is especially true in areas underlain by either small landslides or deep-

seated large landslide complexes that were too large to have been mitigated during smaller grading projects.

7. Expansive soils occur within the city of Chino Hills. Homeowners can improve long-term performance and reduce the potential damage that expansive soils can cause to houses and other improvements by maintaining or improving drainage on their properties, installing gutters, and properly landscaping their properties. Homeowners should be encouraged to plant drought-resistant vegetation on slopes, and around homes and other improvements, including replacing water-thirsty plants such as trees with more drought-tolerant varieties. In addition, irrigation of landscaped areas should be kept to a minimum where possible and care should be taken to avoid cyclic drying and wetting of expansive soils. Consistency in irrigation of landscaped areas is critical in areas of expansive soils, as the consistent moisture content of the soils will reduce shrinking and swelling of the materials and resultant damage to structures and improvements.

8. Recently deposited alluvial soils in canyon bottoms in the city may be susceptible to adverse settlement. Artificial fill placed without the supervision of a geotechnical engineer and not compacted to an adequate density can also settle if subjected to heavy loads, or as a result of strong ground shaking during an earthquake. These soils should be identified during preliminary geological investigations for a proposed development. In most cases, settlement of these soils can be mitigated by removing and recompacting these settlement-prone materials.

9. Natural slopes are highly vulnerable to shallow soil slippage due to saturation from heavy rains. It is vital for property owners at the top of the slope to control surface drainage from their lot and not allow surface water to flow over the slope face. In addition, all drainage, such as area drain systems, should not be outletted onto any slope.

Flood and Inundation Hazards

California Government Code Section 65302(g) requires local governments to assess the potential impact that failure of a dam or other water retention structure may pose to the community. The Safety Element must also assess the impact of flooding from storm activity, such as 1% annual chance and 0.2% annual chance floods. The potential damage posed by more frequent, smaller-scale floods that occur when storm drain systems become overburdened during strong winter storms is also addressed. These floods can damage property and hinder emergency response activities, such as evacuation and fire department access to fire hydrants.

Storm Flooding

Most rainfall in the Chino Hills area occurs in the winter months between December and March. Runoff from the city generally drains east and south, toward Chino Creek and Prado Flood Control Basin, and on to the Santa Ana River Basin. Canyons on the west side of the city, including Tonner Canyon, Carbon Canyon, Soquel Canyon and Aliso Canyon drain westward toward Los Angeles and Orange Counties. With the exception of Tonner Canyon, which drains into the San Gabriel River watershed, the remaining canyons drain into the lower reaches of the Santa Ana River Basin. All the canyons in the city are prone to seasonal flooding.

Localized flooding has occurred historically in the Chino hills area, generally when drainage facilities are too small to convey the storm flows generated from increased urbanization and paved surfaces in the area. Severe erosion along many natural channels, and debris-clogged drainages, compound the problem. Localized flooding has been known to occur in some areas of the city, notably the lowlands bounded by Pipeline, Eucalyptus and Merrill Avenues and the Chino Creek Channel, also the section of Peyton Road between Eucalyptus Avenue and Carbon Canyon Road. Sheet flooding has also occurred in the Los Serranos area north of the golf course and along portions of English Road.

Portions of the City of Chino Hills have been mapped by the Federal Insurance Administration as part of the National Flood Insurance program. The Flood Insurance Rate Maps (FIRMs) show that most of the areas mapped were designated Zone X and D (National Flood Insurance Program, 2008). Zone X covers those areas of minimal flooding. Zone D is identified as an area where flood hazards are undetermined but possible. Areas on both sides of Carbon Canyon Creek and Little Chino Creek have been classified in to Zones A, AE and X (shaded). Zone A is an area with a 1% annual chance of flooding. Those portions of Zone A where the base flood elevations have been determined are classified as Zone AE. Zone X (shaded) is defined as an area with an annual chance of flooding of between 1% and 0.2%; areas subject to a 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from the 1% annual chance flood. The basic flood Zones A, D and X mapped in the City of Chino Hills area are shown on Figures S-8 and S-9. For more detail on the areas in the city zoned AE (where the base flood elevations have been determined), the Flood Insurance Rate Maps for Chino Hills should be consulted.

Private Drainage

Many of the soils in the Chino Hills area have a high erosion potential. Erosion is not only unsightly but can destabilize adjacent slopes. The importance of installing and maintaining adequate drainage devices on developed hillside lots cannot be overstated (refer to the section on Geologic Hazards). Channeling drainage away from slopes to maintained storm drains minimizes erosion potential on graded slopes.

Property owners should inspect drains and remove any debris on a regular basis. This prevents private drain systems from clogging or overflowing which could channel water and mud downslope with the potential for damage to adjacent properties and structures. Residential drainages often connect into the larger storm drain system which empty into natural drainages such as canyon areas. Paved concrete channels or flood velocity reduction structures are sometimes necessary in natural drainages to prevent erosion caused by channeled runoff.

Significant hillside erosion can also occur following a wildland fire. In November 2008, the Freeway Complex Fire burned over 30,000 acres, a significant portion of which was within the City of Chino Hills. Debris-laden floods emanating from recently burned slopes during rain storms can result in large amounts of sediment deposited in the channels draining the area. To mitigate this hazard, runoff from unimproved areas should be controlled and channeled to adequate drainage facilities. Erosion on slopes can be minimized by covering them with drought-resistant vegetation. Other erosion control measures that can be used to control slope erosion include riprap, gabions and concrete lining. Locating structures in the flow path of hillside gullies or swales should be prohibited unless adequate drainage and debris protection is designed into the project.

Seismically Induced Inundation

Seismically induced inundation refers to flooding as a result of water retention structures failing during an earthquake. There are two reservoirs within the city limits, Arnold Reservoir (Chino Ranch No. 1 Dam) and Los Serranos Lake, and two reservoirs adjacent to or upstream from the city that could fail during an earthquake and impact the city. In addition, culverts, levees, stock ponds, and other flood control structures may crack and suffer some structural damage during an earthquake especially in areas susceptible to ground failure. These facilities could pose an inundation hazard if they contain water at the time of the seismic event, or if they are not repaired soon after an earthquake and prior to the next rain season.

Dam Inundation

California Government Code requires reservoir owners to develop and maintain an emergency plan to be implemented in the event that the dam is catastrophically breached. Each dam-specific emergency plan includes a map that shows the potential limits of the flood that would result if the dam failed while the reservoir is at full capacity. These flooding maps are a worst-case scenario since most reservoirs and flood control structures in Southern California are rarely filled to capacity. Reservoir owners are also required to regularly inspect their dams for safety under supervision from the Department of Water Resources, Division of Safety of Dams. The possibility of inundation in the event of a catastrophic dam failure is therefore remote.

There are two small dams within the City of Chino Hills; Los Serranos Lake (also known as Rancho Cielito Reservoir) and Chino Ranch No. 1 Dam (also known as Arnold Reservoir) which could cause localized flooding if damaged. San Antonio Dam is located about 10 miles north of the city in San Antonio Canyon in the San Gabriel Mountains. If this dam failed while filled to capacity, the lowlands of the city could be impacted by flooding. A small portion of the city along the southeastern border would also be flooded if Prado Dam, located in the southeast of the city, failed catastrophically while full.

Each of these reservoirs is discussed in more detail below.

- Los Serranos Lake (or Rancho Cielito Reservoir) is an earthen dam located in the Los Serranos area. The dam was reportedly built between 1880 and 1901 (J. Greening, Jr., personal communication, 2010) although the Department of Water Resources (2010) lists it as having been completed in 1912. The 9-foot-high dam is owned by Rolling Ridge Ranch and was reportedly built to store well water for agricultural purposes. The reservoir has a capacity of 110 acre-feet (acre-foot is a measure of volume equal to 1 acre of land covered with water to a depth of 1 foot) and a dam crest elevation of 644.6 feet above Mean Sea Level (MSL) (Department of Water Resources, 2010). Water in the reservoir is generally kept to within 3 feet of the dam crest (J. Greening, Jr., personal communication, 2010). In the past, the stored water has been used to irrigate the golf course at the Los Serranos Country Club. The dam is inspected yearly by the Division of Safety of Dams (DSOD). At present, an inundation map has not been prepared for this reservoir. In the event of a breach of the dam, the area downgradient from the dam with an elevation below about 642 feet MSL could be inundated. Inundation waters would probably flow east to southeast toward the Chino Valley Freeway, where water would pond behind the freeway and flow southward to the closest storm drain. Ultimately floodwaters would flow into Chino Creek and the Prado Dam Flood Control Basin.

- Arnold Reservoir is located behind the Chino Ranch No. 1 dam. This dam is located in Tonner Canyon, in the northwest corner of the city. The 22-foot-high dam was completed in 1918 with a crest elevation of 959.5 feet MSL and a storage capacity of 137 acre-feet (Department of Water Resources, 2010). The dam is owned by the City of Industry Urban Development Agency and the stored water is used for livestock. In the event of dam failure, portions of Tonner Canyon that are presently undeveloped would be inundated.

Seiches

Seismically induced flooding can also occur as a result of seiches. Strong ground motion generated by an earthquake may trigger standing wave oscillation, or seiches, in enclosed or semi-enclosed bodies of water, such as lakes or reservoirs. If these seiches generate large enough amplitude, water may overflow the body of water, causing localized flooding of adjacent or downslope areas. Seiches could occur within the two reservoirs within the city, or in other

enclosed bodies of water, such as swimming pools. In addition, small private reservoirs or ponds used for livestock water, wildlife management, and natural habitat preservation may be located within Chino Hills in the State Park or other ranching areas. These enclosed bodies of water may be susceptible to seiches, with resultant localized flooding.

Tank Reservoirs

There are currently 18 water tanks in the city (City of Chino Hills Water, Recycled Water and Sewer Master Plan, dated October 2005) used to store water for domestic purposes. These tanks vary in storage capacity between 0.25 and 5.0 million gallons. Sixteen of these tanks are located within the Alquist-Priolo Special Studies Zone of the Chino fault. If a moderate to strong earthquake were to occur on the Chino fault or other nearby fault, these tanks could be damaged releasing the stored water and flooding adjacent developments downslope. Strong ground motions generated by earthquakes can cause water inside the tank to slosh back and forth with great force. Historically this has been known to lift water tanks off their foundations, causing the stored water to drain out of the tank in a matter of minutes and flood the downslope area.

Above ground storage tanks should be adequately attached to the foundation and baffled to reduce the incidence of earthquake-induced structural damage. Water tanks should remain operational after an earthquake as the stored water may be necessary to suppress earthquake-induced fires in the city. Residents may also have to depend on the water stored in these tanks if the city water supply system is damaged.

Issues and Opportunities – Flood and Inundation Hazards

1. A 1% and 0.2% annual chance flood zone has been designated in portions of Little Chino Creek. Flooding in this area can impact traffic on portions of Pipeline, Eucalyptus and Merrill Avenues, Carbon Canyon Road, Peyton Drive, and the Chino Valley Freeway (State Highway 71).

2. New development or expansion of existing development adjacent to canyons increases runoff and erosion. Environmental damage and/or slope instability may result. Increased erosion of hillsides, with consequent sedimentation along natural drainages generally occurs after wildland fires such as the Freeway Complex Fire of 2008. Erosion control measures such as planting of drought-resistant, fire-retardant vegetation can be used to reduce this hazard. Environmental impact reports must address the impact that development may pose on canyon drainages. Provisions should be made to finance the installation of adequate connectors to the existing storm drain system, and to improve the existing drainage system to accommodate the increased storm flows generated by increased urbanization.

3. Proper drainage is necessary to ensure adequate access for emergency response, fire fighting, or evacuation activities. The city should encourage correction of sheet flow or channel flow problems along existing single access routes or in areas where the existing drainage devices are inadequate.

4. Protection of structures from the threat of upslope generated debris flows should be mandated for all new developments and encouraged for all existing structures through community education and awareness.

5. Seismically induced flooding poses a potential hazard to portions of the City of Chino Hills. If the dam forming Los Serranos Lake failed during an earthquake, the water released would flood those areas to the east and southeast of the lake at elevations below 642 feet above mean sea level. Failure of the dam impounding Arnold Reservoir would result in flooding along the presently undeveloped Tonner Canyon. The lowlands in the eastern portion of the city could be flooded if San Antonio Dam failed during an earthquake. If Prado Dam failed during an earthquake, the southeastern corner of the city could also be flooded.

6. Localized, seismically induced flooding could also occur if an earthquake generates seiches in Los Serranos Lake or Arnold Reservoir. Sloshing water may also damage many of the water tanks in the city if they are not adequately anchored to their foundations and internally baffled. The majority of water tanks in the city satisfy these requirements. Development downslope from water tanks could be flooded if water is released during an earthquake.

Hazardous Materials

Oil and Gas Wells

Petroleum and natural gas have been produced from oil fields in the eastern Puente Hills since the late 1880s. The Chino-Soquel oil field is located in the rugged area around Soquel Canyon, to the east of Sleepy Hollow (see Figure S-10). The Mahala oil field is located south of the Butterfield Ranch development in the eastern portion of the city. District 1 Wildcat Maps W1-4 and W1-5 issued by the California Division of Oil, Gas and Geothermal Resources (June 16, 2010) indicate there are many plugged oil and gas wells in the city.

Most of these wells were likely not abandoned to current California Division of Oil, Gas and Geothermal Resources (CDOGGR) regulations. If development is planned for an area known to have plugged and/or abandoned oil wells, these wells should be inspected and if necessary re-abandoned to meet current regulations. If the property is planned for development, all wells must be slurry filled to minimize future problems. The City Planning Department is required to submit building permit applications to the Long Beach office of the CDOGGR if an oil well is

known to have occurred in the area planned for development. If according to the CDOGGR records, the wells in the area were not abandoned properly, it is the responsibility of the property owner to do so. Most wells plugged after the late 1970s were abandoned to current standards. However all applicable building permit applications still should be submitted to the CDOGGR for review.

Geological investigations that address environmental issues associated with oil field operations should be conducted prior to such areas being developed. Hazards that may require remediation and mitigation could include venting of gases, petroleum-saturated soils and soils contaminated with diesel, heavy metals or other hazardous substances.

Goals, Objectives and Policies

Seismic Hazards

Many of the active faults in Southern California have the potential to generate strong ground motions in the City of Chino Hills. The San Andreas and San Jacinto faults are generally thought to have the highest probabilities of generating a moderate to large earthquake in the near future. However, the Chino fault is delineated as an active fault pursuant to the guidelines of the Alquist-Priolo Earthquake Fault Zone Act, and must be considered as the probable worst-case scenario for the city of Chino Hills, posing the greatest seismic threat to public safety and economic welfare. It is estimated the Chino fault could generate near-field, high-frequency ground motions on the order of approximately 0.35 to 0.6g, with MMI Scale values ranging from VIII to IX. Such an earthquake would cause extensive damage to buildings and infrastructure as a result of strong ground motions, ground rupture, and possibly liquefaction and other secondary seismic hazards.

Potential impacts from seismic hazards are best mitigated through advance planning, special analyses, and code enforcement. In addition, residents should be encouraged to prepare for earthquakes by reinforcing inadequate structures, compiling earthquake kits, and developing emergency plans.

Geologic Hazards

Geologic hazards of greatest concern in the city of Chino Hills include slope instability, expansive soils, compressible soils, and erosion. A large portion of the city has been mapped as generally susceptible to landsliding (Figure S-6). Recently deposited stream sediments in canyon bottoms are susceptible to settling if subject to heavy loads, such as from building foundations. Some of the soils and bedrock units that underlie Chino Hills have a moderate to high expansion potential. Structures sited on untreated, highly expansive materials can experience substantial structural damage as a result of shrinking and/or swelling of these soils. Rationally designed stiffened foundations should be utilized in these areas.

Grading and construction operations are necessary to mitigate expansive and compressible soils, erosion, landsliding, and flooding in hillside areas. Efforts should be made to balance grading and construction to minimize geologic hazards with aesthetics and the preservation of natural, existing topography.

Flood and Inundation Hazards

Potential seismically induced inundation hazards in Chino Hills include flooding of the eastern portions of the city as a result of failure of San Antonio Dam while its reservoir is full, and localized flooding if the dams for Lake Los Serranos or Lake Arnold fail during an earthquake. Strong ground motions generated by an earthquake could also damage the water tanks in the city, especially if these are not baffled or braced. Localized storm flooding has occurred historically in Chino Hills, the result of inadequately sized drainage facilities that cannot convey the storm flows generated from increased urbanization of the area.

SUPPORTING DATA

The following Tables and Figures that complete this report are listed in the Table of Contents.

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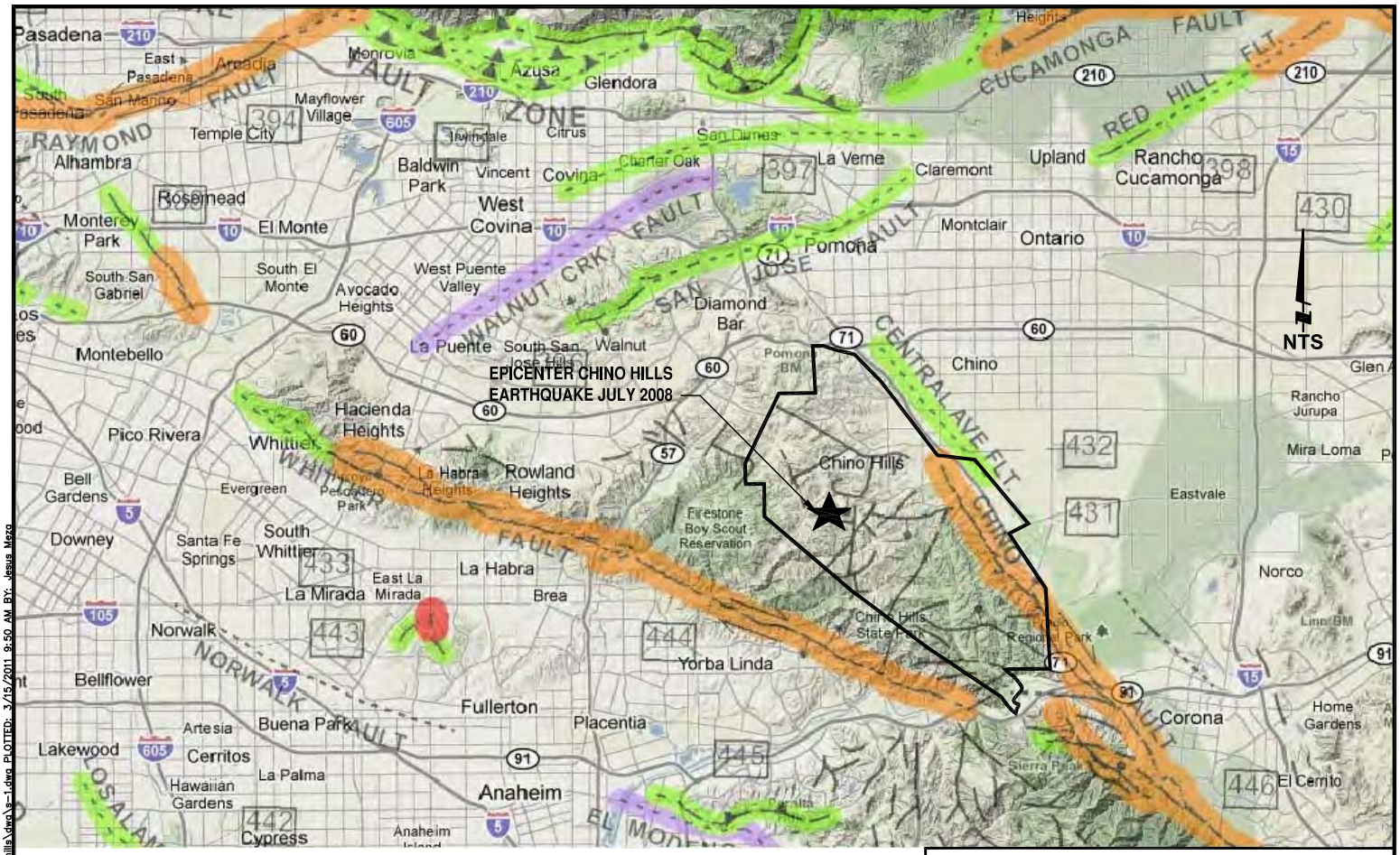
TABLE S-1
Modified Mercalli Intensity Scale

Intensity	Description	Average Peak Acceleration
I.	Not felt except by a very few under especially favorable circumstances.	-
II.	Felt by only a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing.	-
III.	Felt quite noticeably indoors, especially on upper floors of buildings but many people do not recognize it as an earthquake. Standing automobiles may rock slightly. Vibration like passing of truck. Duration estimated.	-
IV.	During the day felt indoors by many, outdoors by few. At night some awakened. Dishes, windows, doors disturbed; walls make creaking sound. Sensation like heavy truck striking building. Standing automobiles rocked noticeably.	0.015-0.02g
V.	Felt by nearly everyone, many awakened. Some dishes, windows and so on broken; cracked plaster in a few places; unstable objects overturned. Disturbances of trees, poles and other tall objects sometimes noticed. Pendulum clocks may stop.	0.03-0.04g
VI.	Felt by all, many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster and damaged chimneys. Damage slight.	0.06-0.07g
VII.	Everyone runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving in cars.	0.10-0.15g
VIII.	Damage slight in specially designed structures; considerable in ordinary substantial buildings with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stack, columns, monuments and walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving cars disturbed.	0.25-0.30g
IX.	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.	0.50-0.55g
X.	Some well built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from river banks and steep slopes. Shifted sand and mud. Water splashed, slopped over banks.	More than 0.60g
XI.	Few (if any) masonry structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.	More than 0.60g
XII.	Damage total. Waves seen on ground surface. Lines of sight and level distorted. Objects thrown in air.	More than 0.60g

Table S-2
Earthquake Faults and Magnitudes

Fault Name/Zone	Fault Segments	Displacement Style[4]	Approx. Fault Length (km)	Estimated Maximum Magnitude[1,3]	Estimated Maximum Magnitude[2,3]	Historical Earthquakes
Chino	n/a	rl-r-o	28.7	6.80	6.60	2/16/1989, M3.2 12/14/2001, M3.9
Elsinore	W+GI+T+J+CM	rl-ss	249.2	7.78	7.85	5/15/1910, M6
San Jose	n/a	ll-r-o	19.6	6.70	6.50	6/26/1988, M4.7
Puente Hills Blind Thrust	n/a	r	44.1	7.10	7.00	10/1/1987, M6.0
Sierra Madre	n/a	r	56.9	7.20	7.10	2/9/1971, M6.4
Cucamonga	n/a	r	28.0	6.70	6.50	
San Jacinto	SBV+SJV+A+C	rl-ss	205.7	7.73	7.78	4/21/1918, M6.8 4/9/1968, M6.5 12/25/1899, M6.7
San Andreas	PK+CH+CC+BB+NM+SM+NSB+SSB+BG+CO	rl-ss	546.1	8.04	8.18	12/8/1812, M7.5 1/9/1857, M7.9

[1]: Magnitude calculated method of Ellsworth
[2]: Magnitude calculated method of Hanks and Bakun (2002)
[3]: Estimated maximum magnitude for largest “likely” earthquake rupture presented in UCERF2
[4]: rl=right-lateral, ll=left-lateral, o=oblique, ss=strike-slip, r-reverse



EXPLANATION

Fault traces on land are indicated by solid lines where well located, by dashed lines where approximately located or inferred, and by dotted lines where concealed by younger rocks or by lakes or bays. Fault traces are queried where continuation or existence is uncertain.

FAULT CLASSIFICATION (Indicating recency of movement)

Fault along which historic (200 years) seismic slip has occurred.

Holocene fault displacement (during past 11 700 years) without historic record.

Late Quaternary fault displacement (during past

Quaternary fault (age undifferentiated)

Pre-Quaternary fault (older that 1.6 million years) or fault without recognized Quaternary displacement.

ADDITIONAL FAULT SYMBOLS

Bar and ball on downthrown side (relative or apparent).

Arrows along fault indicate relative or apparent direction of lateral movement.

Arrow on fault indicates direction of dip.

Low angle fault (barbs on upper plate).

SOURCE:
2010 FAULT ACTIVITY MAP OF CALIFORNIA,
State of California
Department of Conservation

ACTIVE & POTENTIALLY ACTIVE FAULTS

GMU GEOTECHNICAL, INC.

Date: March 14, 2011	Plate
Project No.: 10-064-00	S-1

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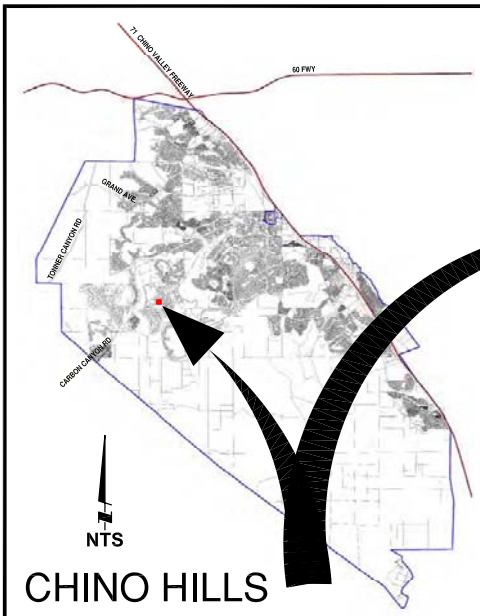
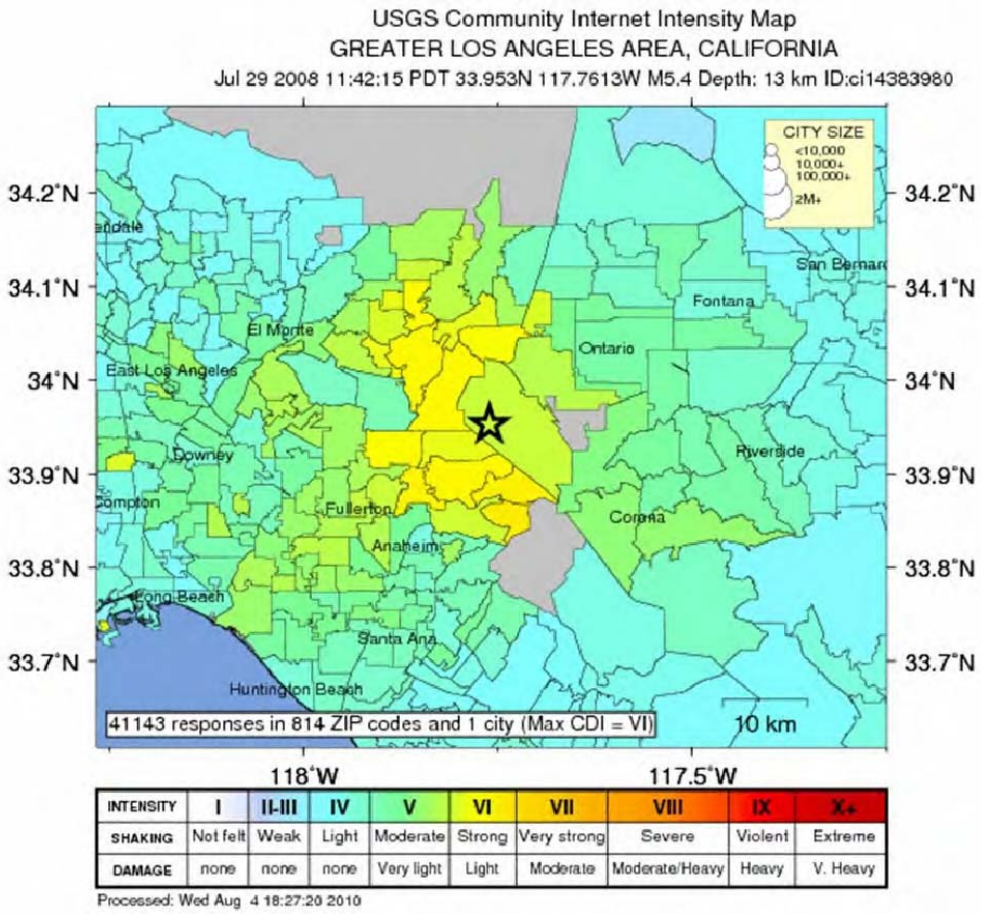


CHINO HILLS
JULY 2008 EARTHQUAKE
EPICENTER

USGS TOPOGRAPHIC MAP



INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+
SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	V. Heavy

Processed: Wed Aug 4 18:27:20 2010

MAGNITUDE: 5.5
DATE–TIME: TUESDAY, JULY 29, 2008 AT 18:42:15 UTC
TUESDAY JULY 29, 2008 AT 11:42:15 AM (PDT) AT EPICENTER
LOCATION: 33.953°N, 117.761°W
DEPTH: 14.7 km (9.1 miles)
REGION: GREATER LOS ANGELES AREA, CALIFORNIA
SOURCE: CALIFORNIA INTEGRATED SEISMIC NET
USGS, CALTECH, CGS, UCB, UCSD, UNR
EVENT ID: ci14383980

CHINO HILLS
JULY 2008 EARTHQUAKE
EPICENTER MAP

GMU GEOTECHNICAL INC.	Date: March 14, 2011	Plate
	Project No.: 10-064-00	S-2

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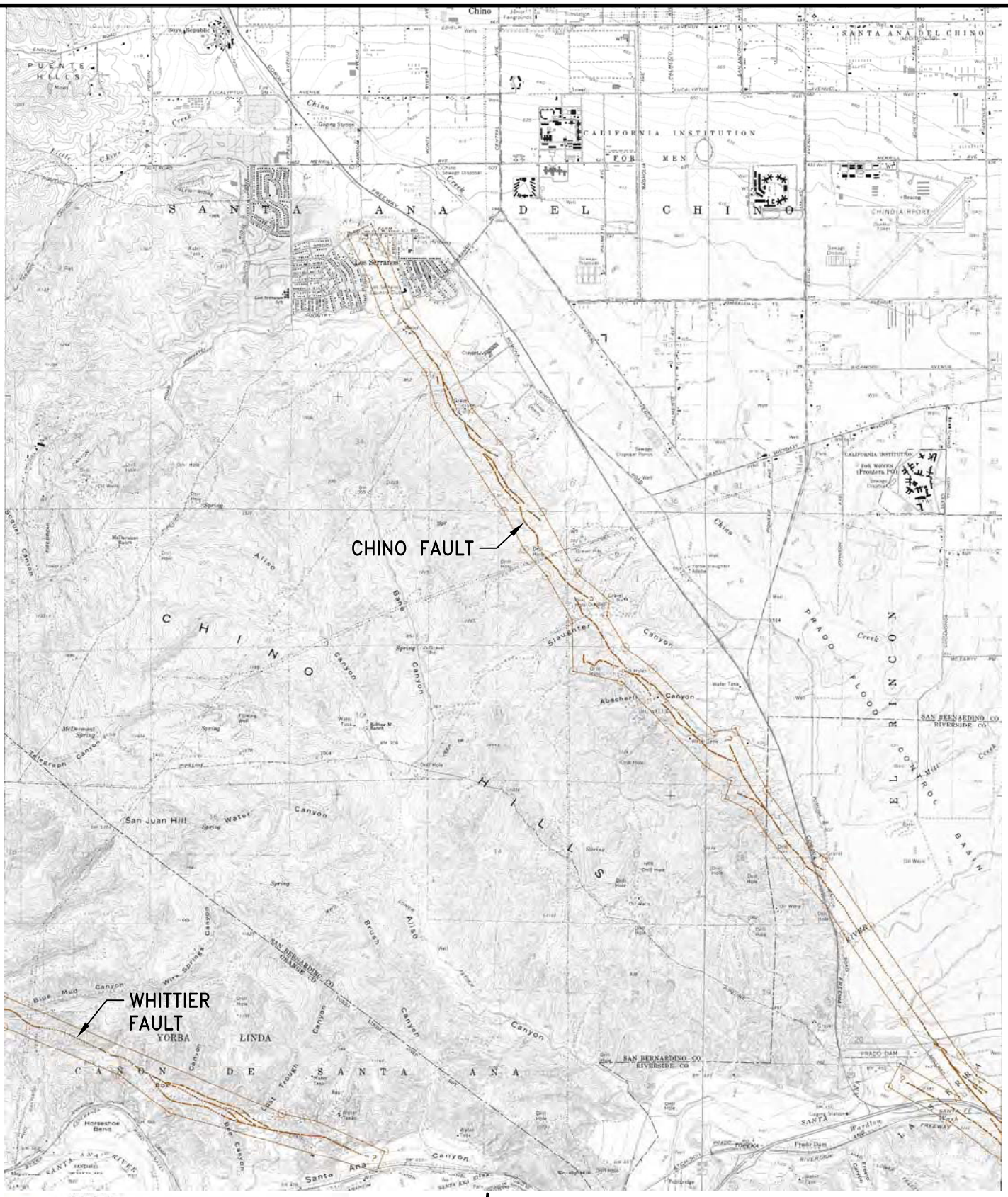

Active Faults

Faults considered to have been active during Holocene time and have potential for surface rupture; solid line where accurately located, long dash where approximately located, short dash where inferred, dotted where concealed; query (?) indicates additional uncertainty. Evidence of historic offset indicated by year of earthquake-associated event or C for displacement caused by fault creep.

Earthquake Fault Zone Boundaries

These are delineated as straight-line segments that connect encircled turning points so as to define Earthquake Fault Zone segments.

Seaward projection of zone boundary.

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NTS

MAP SOURCE:
STATE OF CALIFORNIA
EARTHQUAKE FAULT ZONES
PRADO DAM QUADRANGLE
REVISED OFFICIAL MAP
EFFECTIVE: MAY 1, 2003

SEISMIC HAZARDS FAULT RUPTURE

GMU GEOTECHNICAL, INC.

Date: March 14, 2011	Plate
Project No.: 10-064-00	S-3

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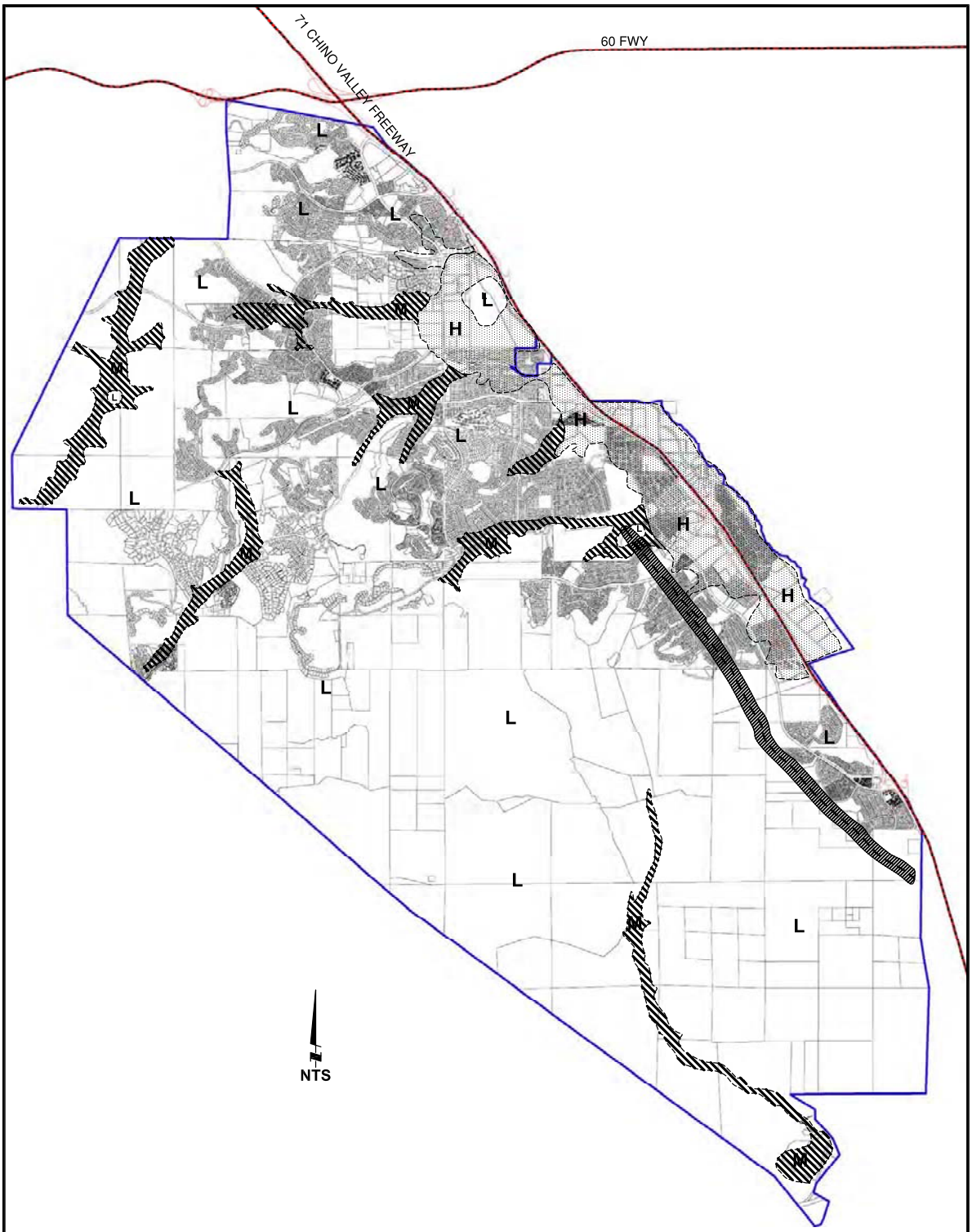

FAULT
LONG DASHED WHERE WELL-LOCATED; SHORT DASHED WHERE APPROXIMATE OR INDEFINITE; DOTTED WHERE CONCEALED OR BURIED; QUERIED WHERE UNCERTAIN.

FAULT HAZARD ZONE

AREAS OF HIGH LIQUEFACTION POTENTIAL
SHALLOW GROUNDWATER CONDITIONS WITHIN 30 FEET OF THE GROUND SURFACE ARE KNOWN OR SUSPECTED, INCLUDING MARSHY AREAS PRESENT IN THE LATE 1800'S. AREAS ARE UNDERLAIN BY UNCONSOLIDATED SANDY ALLUVIAL SOILS.

AREAS OF MODERATE LIQUEFACTION POTENTIAL
SHALLOW GROUNDWATER CONDITIONS BETWEEN 30 AND 50 FEET BELOW THE GROUND SURFACE ARE KNOWN OR SUSPECTED. INCLUDES ALLUVIUM-FILLED CANYONS THAT MAY HAVE SEASONAL, PERCHED GROUNDWATER.

AREAS OF LOW LIQUEFACTION POTENTIAL
GROUNDWATER IS 50 FEET BELOW GROUND SURFACE AND DEEPER. AREAS ARE UNDERLAIN BY CONSOLIDATED SEDIMENTS OR BEDROCK.

Source: Leighton & Associates, Inc., USGS

NOTE:
This is an interpretive map based on the distribution of susceptible alluvial sediments and known or suspected shallow or perched goundwater. The map presents a regional interpretation of liquefiable areas for general land planning purposes only. Site-specific liquefaction studies should be conducted for development purposes.

LIQUEFACTION SUSCEPTIBILITY SEISMICALLY-INDUCED LANDSLIDE HAZARD ZONES

GMU GEOTECHNICAL, INC.	Date: March 14, 2011	Plate
	Project No.: 10-064-00	S-4

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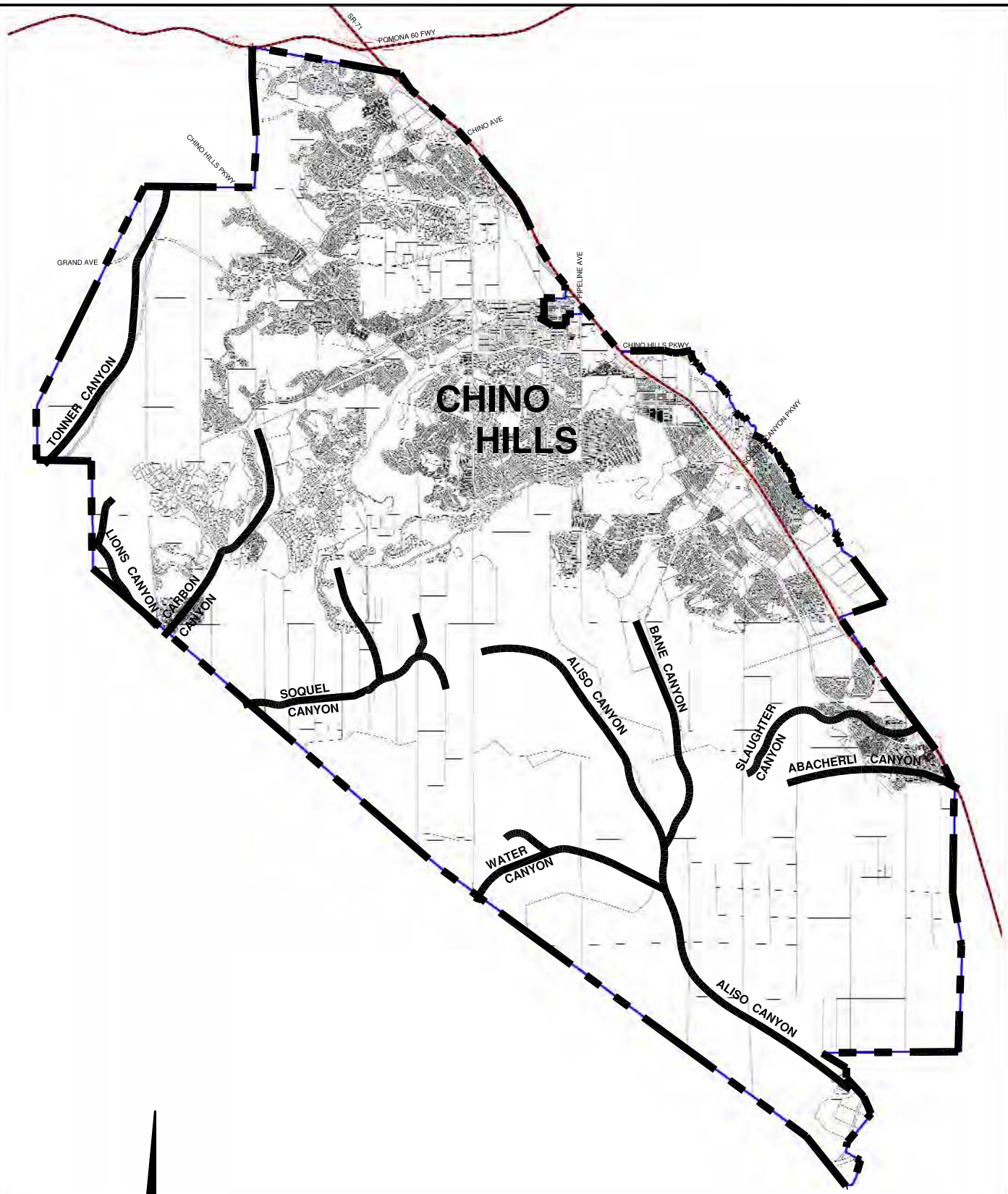

NTS

Canyons in the City of Chino Hills

GMU GEOTECHNICAL INC.

Date: March 14, 2011	Plate
Project No.: 10-064-00	S-5

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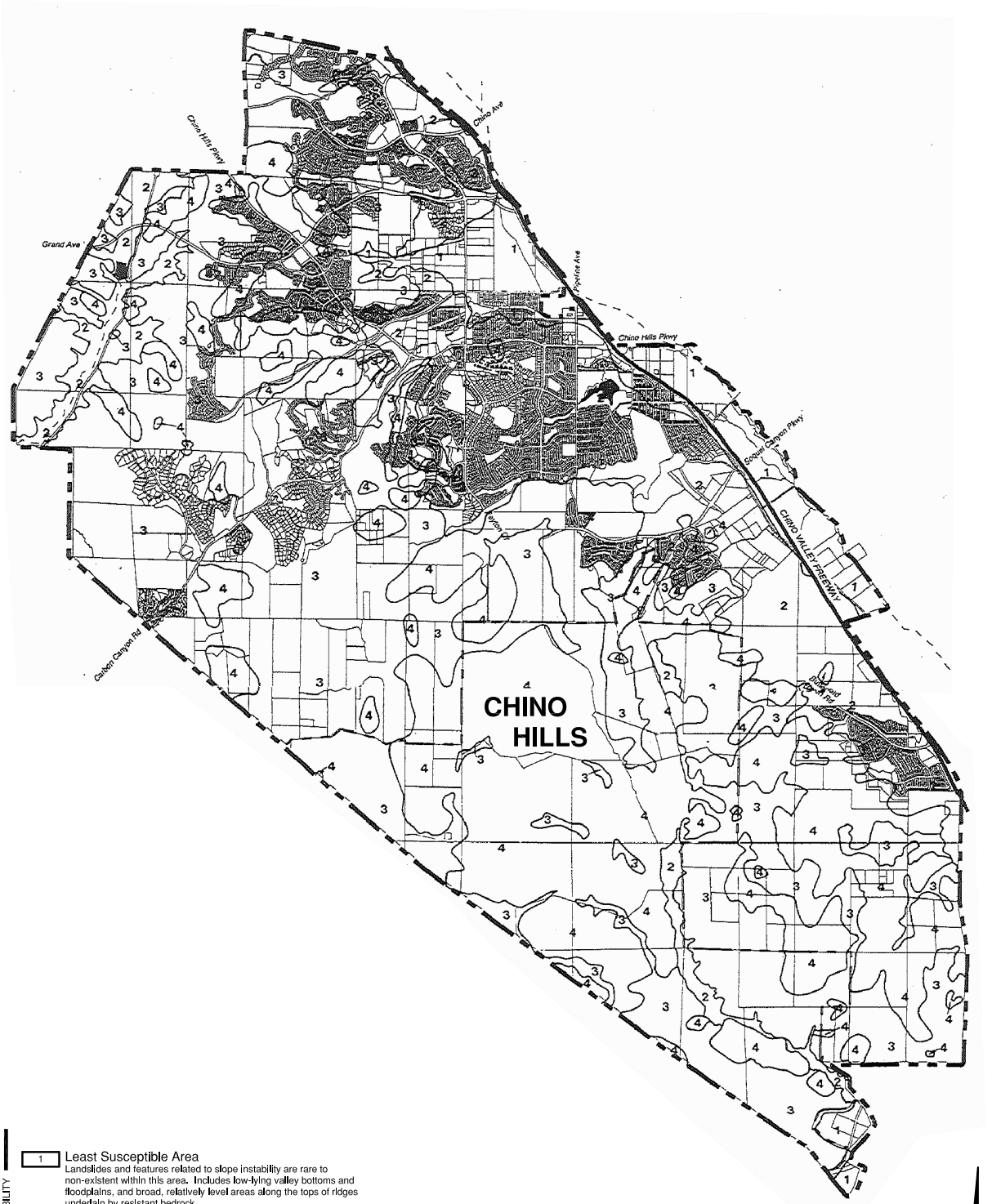

INCREASING LANDSLIDE SUSCEPTIBILITY

1 Least Susceptible Area
Landslides and features related to slope instability are rare to non-existent within this area. Includes low-lying valley bottoms and floodplains, and broad, relatively level areas along the tops of ridges underlain by resistant bedrock.

2 Marginally Susceptible Area
Includes gentle to moderate slopes, and ridgetops underlain by relatively competent material but flanked by steep, potentially unstable slopes. The stability of slopes in this area may change in response to future natural or man-induced alteration of the adjacent terrain.

3 Generally Susceptible Area
Slopes are at or near their stability limits due to a combination of weak materials and steep slopes. Most slopes in this area do not currently contain landslides deposits; however, the materials that underlie them can be expected to fail locally when modified by natural processess or activities of man.

4 Most Susceptible Area
Characterized by steep slopes; Includes most landslides in upslope areas, whether apparently active or not, and slopes with substantial evidence of downslope creep of surface materials. Land in this area should by considered unstable and subject to failure, even in the absence of the activities of man.

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Landslide Susceptibility

GMU GEOTECHNICAL, INC.

Date: March 14, 2011	Plate
Project No.: 10-064-00	S-6

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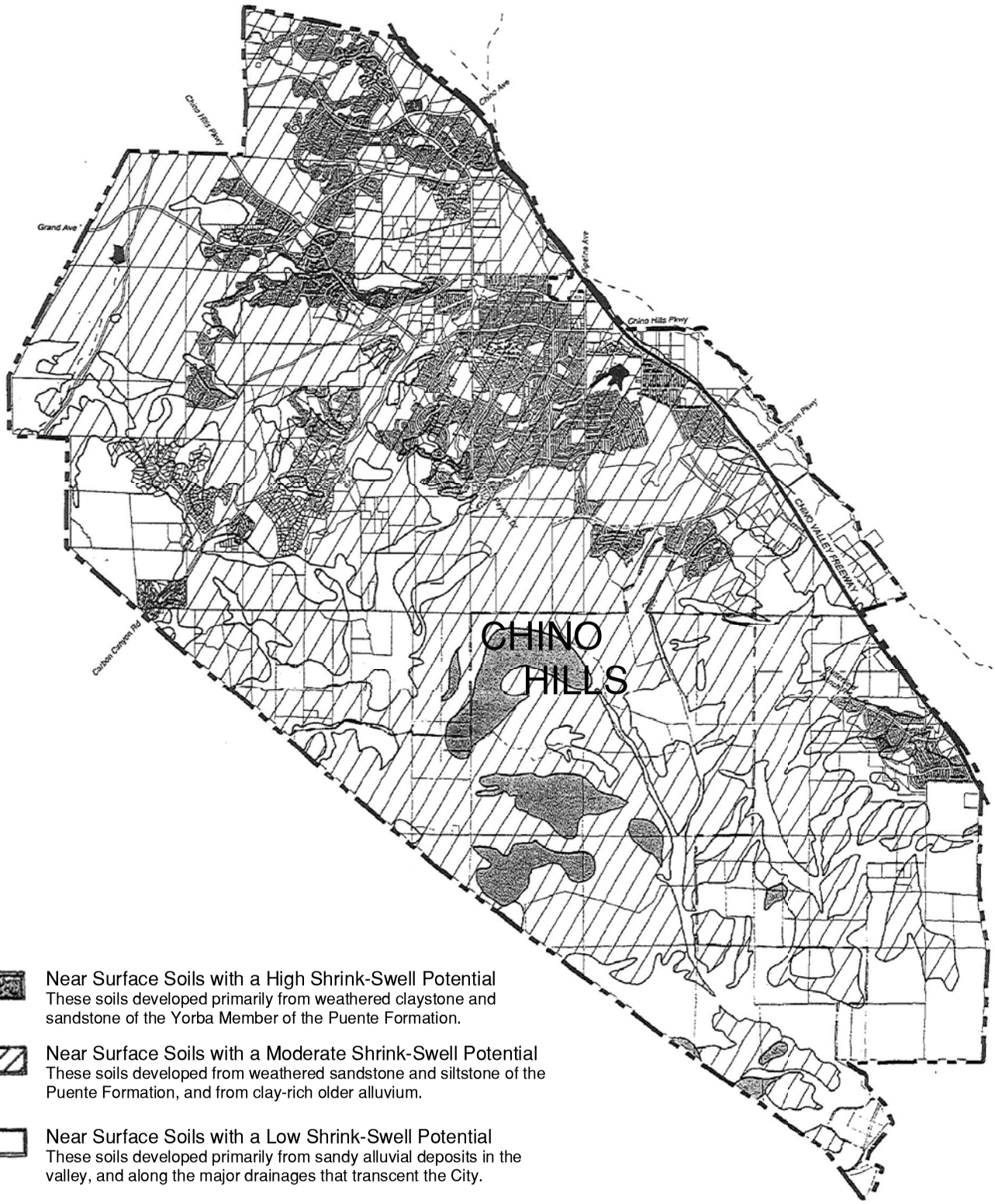

Near Surface Soils with a High Shrink-Swell Potential
These soils developed primarily from weathered claystone and sandstone of the Yorba Member of the Puente Formation.

Near Surface Soils with a Moderate Shrink-Swell Potential
These soils developed from weathered sandstone and siltstone of the Puente Formation, and from clay-rich older alluvium.

Near Surface Soils with a Low Shrink-Swell Potential
These soils developed primarily from sandy alluvial deposits in the valley, and along the major drainages that transcent the City.

NTS

NOTE: This figure shows the relative shrink-swell potential of the soils that occur at the surface in the City of Chino Hills. Volcanic Ash layers within the Puente Formation generally weather to clay with a high shrink-swell potential. These ash layers may uncovered during grading operations, affecting the proposed development at final grade. Site-specific soil studies need to be conducted to evaluate the expansion potential of the soil materials at grade prior to construction. Those ash layers could occur in other areas than those identified herein as having soils with a high expansion potential.

Expansive Soils

GMU GEOTECHNICAL, INC.	Date: March 14, 2011	Plate
	Project No.: 10-064-00	S-7

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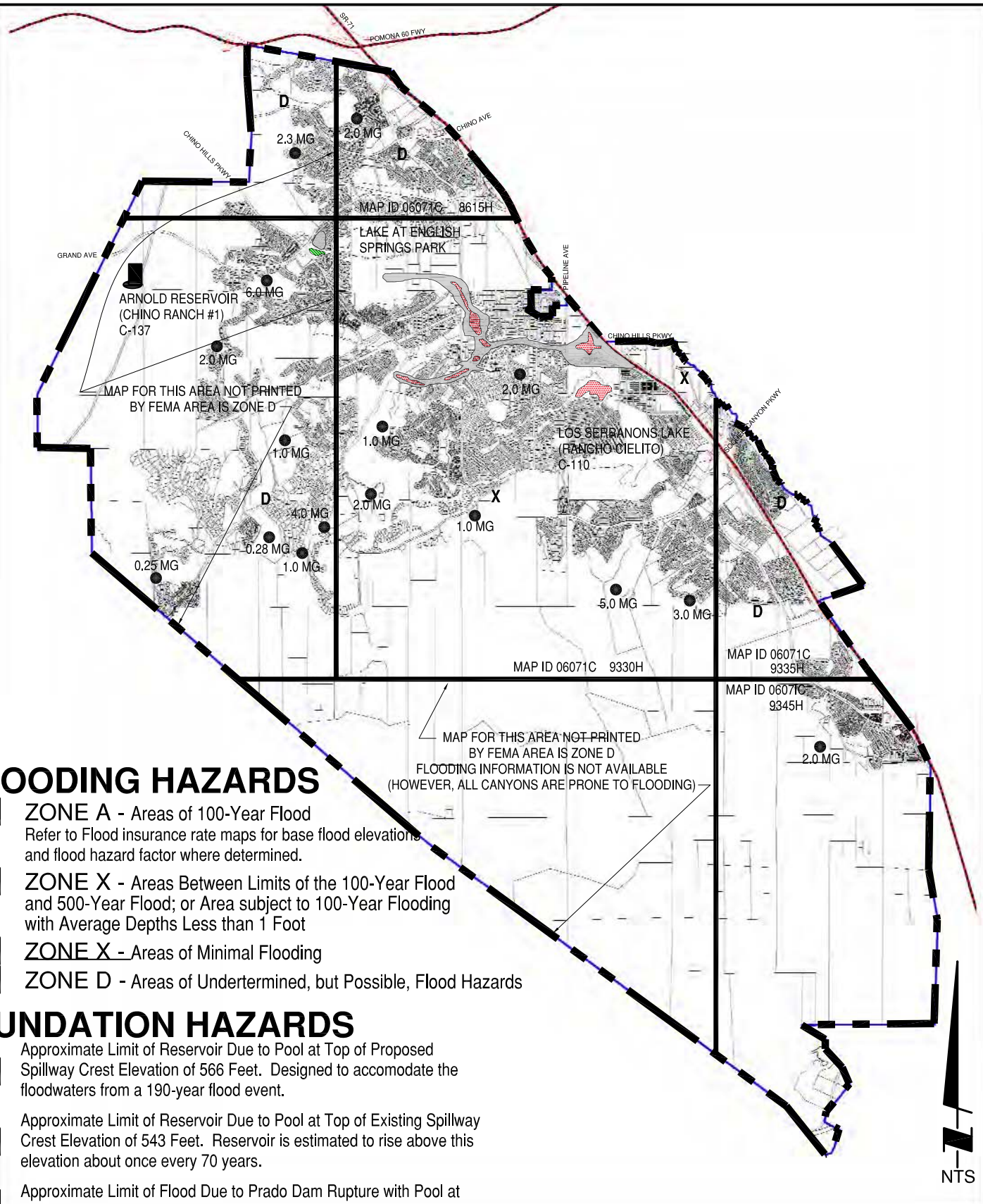

FLOODING HAZARDS

ZONE A - Areas of 100-Year Flood
Refer to Flood insurance rate maps for base flood elevations and flood hazard factor where determined.

ZONE X - Areas Between Limits of the 100-Year Flood and 500-Year Flood; or Area subject to 100-Year Flooding with Average Depths Less than 1 Foot

X ZONE X - Areas of Minimal Flooding

D ZONE D - Areas of Undertermined, but Possible, Flood Hazards

INUNDATION HAZARDS

Approximate Limit of Reservoir Due to Pool at Top of Proposed Spillway Crest Elevation of 566 Feet. Designed to accomodate the floodwaters from a 190-year flood event.

Approximate Limit of Reservoir Due to Pool at Top of Existing Spillway Crest Elevation of 543 Feet. Reservoir is estimated to rise above this elevation about once every 70 years.

Approximate Limit of Flood Due to Prado Dam Rupture with Pool at Spillway Crest Elevation of 543 Feet.

Approximate Limit of Flood Due to San Antonio Dam Rupture with Pool at Spillway Crest Elevation of 2,238 Feet.

Water Tank (MG = capacity in millions of gallons)

6.0 MG Man-Made Lake (C = capacity in acre-feet)
Under the Jurisdiction of the State of California, Division of Safety of Dams

C-137 Lake Not Under the Jurisdiction of the State of California, Division of Safety Dams

Flooding and Inundation Hazards

GMU GEOTECHNICAL, INC.

Date: March 14, 2011	Plate
Project No.: 10-064-00	S-8

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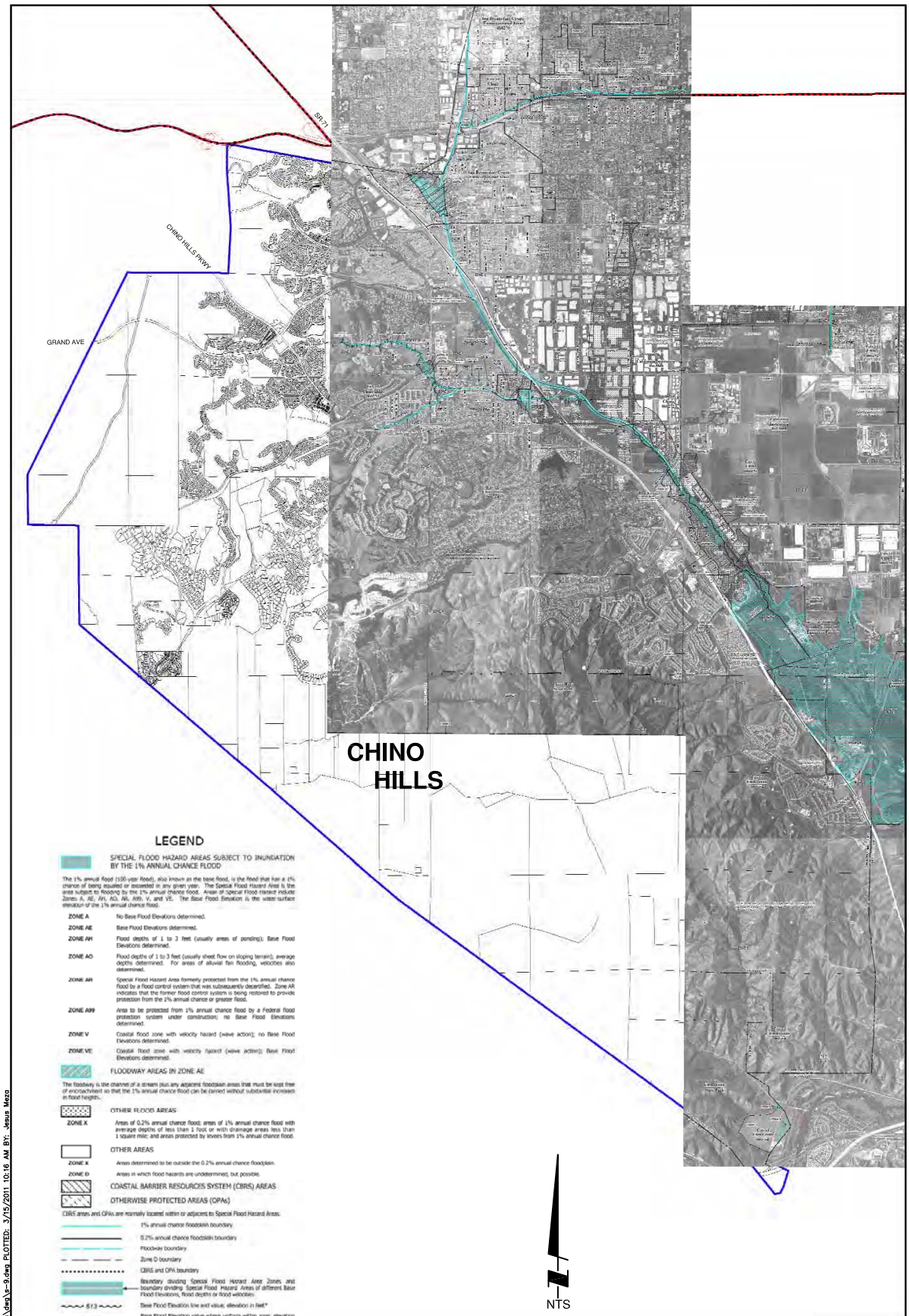

LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary

0.2% annual chance floodplain boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

(A)———(A)	Cross section line
(B)- - - - -(B)	Transect line
87°07'45", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
7°6'000"N	1000-meter Universal Transverse Mercator grid values, zone 11N
600000 FT	5000-foot grid ticks: California State Plane coordinate system, zone V (FIPSZONE 0405), Lambert Conformal Conic projection
DX5510 x	Bench mark (see explanation in Notes to Users section of this FIRM panel)
♦M1.5	River Mile

FEMA FLOOD MAP

GMU GEOTECHNICAL, INC.	Date: March 14, 2011	Plate
	Project No.: 10-064-00	S-9

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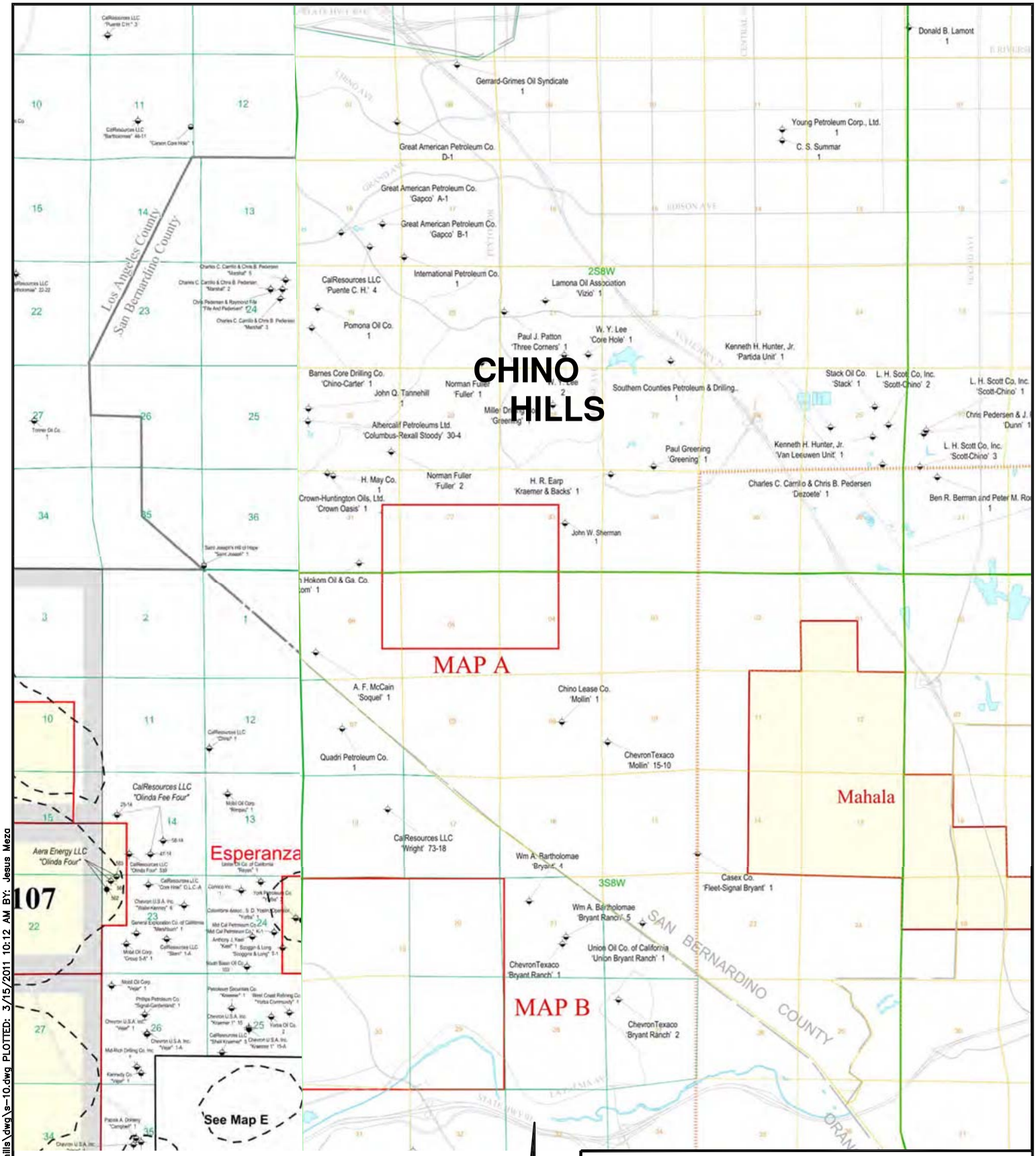

State of California - Department of Conservation
Division of Oil, Gas, and Geothermal Resources

LEGEND

- Drilling
- Drilling - idle
- Plugged and abandoned - dry hole
- Completed - oil
- Idle - oil
- Buried idle
- Plugged and abandoned - oil
- Completed - gas
- Idle - gas
- Plugged and abandoned - gas
- Plugged and abandoned - oil and gas
- Gas - open to oil zone
- Gas injection
- Gas storage
- Gas - converted to water disposal
- Abandoned oil - converted to water disposal
- Completed - waterflood
- Completed - water disposal
- Water source
- Observation
- Abandoned - conductor
- Township boundary
- Surveyed section
- Projected section
- Field boundary
- Productive Limit boundary

NTS

Oil Fields in the Chino Hills Area

GMU GEOTECHNICAL, INC.

Date: March 14, 2011	Plate
Project No.: 10-064-00	S-10

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Appendix G – Greenhouse Gas Study, Prepared by Rincon Consultants, Inc., dated January 2014

City of Chino Hills

Chino Hills General Plan Update

Greenhouse Gas Study

January 2014

rincon

Environmental Scientists Planners Engineers

Chino Hills General Plan Update

Greenhouse Gas Study

Prepared for:

City of Chino Hills
14000 City Center Drive
Chino Hills, CA 91709

Prepared by:

Rincon Consultants, Inc.
180 North Ashwood Avenue
Ventura, California 93003

January 2014

Chino Hills General Plan Update
Greenhouse Gas Study

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CalEEMod GHG Model Worksheets/N_2O from Mobile Emissions GHG Calculation Worksheet

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CHINO HILLS GENERAL PLAN UPDATE
CHINO HILLS, CALIFORNIA
GREENHOUSE GAS STUDY

This report is an analysis of the potential greenhouse gas (GHG) emissions impacts of the proposed General Plan Update for the City of Chino Hills in California. The report has been prepared by Rincon Consultants, Inc. under contract to the City of Chino Hills for use in support of the environmental documentation being prepared pursuant to the California Environmental Quality Act (CEQA). The purpose of this study is to analyze the proposed project's effects on GHG emissions and the associated impact to climate change. This study describes climate change, GHGs, and the current regulatory framework, and estimates GHG emissions associated with build-out of the General Plan Update. The analysis herein is based partially on the traffic impact study prepared by Minagar & Associates, Inc. (June 2013).

PROJECT DESCRIPTION

The City of Chino Hills is located in the Chino Valley within San Bernardino County. Chino Hills has a current population of 76,240 (as estimated by multiplying the California Department of Finance's [May 2013] vacancy rate and number of persons per household by the number of housing units in the City)) and its boundaries encompass approximately 28,744 acres.

Chino Hills is currently updating its General Plan. The General Plan is the long-range policy document that guides physical community development throughout the City. The General Plan establishes goals and objectives to guide decision-making by City officials and staff. The General Plan Update would update and supersede the City's current General Plan, which was adopted on September 13, 1994, and has a planning horizon from 1994 to 2013. The General Plan includes eight elements: Land Use; Circulation; Housing; Parks, Recreation, and Open Space; Conservation; Safety; Noise; and Economic Development. The proposed General Plan Update covers six of these elements, but the Housing Element and the Parks, Recreation, and Open Space Element are not included in the update. Greenhouse gas issues are primarily addressed in the Conservation Element, though other elements (i.e. Land Use and Circulation) also relate to greenhouse gases. The proposed General Plan Update would have a planning horizon from 2014 to 2035.

The General Plan Update includes changes to the Land Use Map and would facilitate residential and commercial development. Table 1 summarizes the increase in residential units and commercial and institutional space as a result of buildout of the General Plan Update.

Table 1
Existing and Future Development in Chino Hills

Land Use	Existing Chino Hills Development	Proposed General Plan Buildout	Change as a Result of Proposed General Plan
Residential			
Single Family Units	19,863 units	22,917 units	3,054 units
Multi-Family Units	3,930 units	6,698 units	2,768 units
		Total	**5,822 units**
Commercial/Institutional			
Mixed Use (non-residential)	None	33,087 sf	33,087 sf
Commercial	3,386,649 sf	4,737,574 sf	1,350,925 sf
Business Park	467,733 sf	836,733 sf	369,000 sf
Commercial Recreation	216,428 sf	216,428 sf	0
Institutional/Public Facility	1,775,042 sf	2,132,563 sf	357,521 sf
		Total	**2,110,533 sf**

sf= square feet
Source: City of Chino Hills

SETTING

Overview of Climate Change

Climate change is the observed increase in the average temperature of the Earth's atmosphere and oceans along with other substantial changes in climate (such as wind patterns, precipitation, and storms) over an extended period of time. The term "climate change" is often used interchangeably with the term "global warming," but "climate change" is preferred to "global warming" because it helps convey that there are other changes in addition to rising temperatures. The baseline against which these changes are measured originates in historical records identifying temperature changes that have occurred in the past, such as during previous ice ages. The global climate is continuously changing, as evidenced by repeated episodes of substantial warming and cooling documented in the geologic record. The rate of change has typically been incremental, with warming or cooling trends occurring over the course of thousands of years. The past 10,000 years have been marked by a period of incremental warming, as glaciers have steadily retreated across the globe. However, scientists have observed acceleration in the rate of warming during the past 150 years. Per the United Nations Intergovernmental Panel on Climate Change (IPCC, 2007), the understanding of anthropogenic warming and cooling influences on climate has led to a high confidence (90% or greater chance) that the global average net effect of human activities since 1750 has been one of warming. The prevailing scientific opinion on climate change is that most of the observed increase in global average temperatures, since the mid-20th century, is likely due to the observed increase in anthropogenic GHG concentrations (IPCC, 2007).

Greenhouse Gases (GHGs)

Gases that absorb and re-emit infrared radiation in the atmosphere are called greenhouse gases (GHGs). GHGs are present in the atmosphere naturally, are released by natural sources, or are formed from secondary reactions taking place in the atmosphere. The gases that are widely seen as the principal contributors to human-induced climate change include carbon dioxide (CO_2), methane (CH_4), nitrous oxides (N_2O), fluorinated gases such as hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs), and sulfur hexafluoride (SF6). Water vapor is excluded from the list of GHGs because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation.

GHGs are emitted by both natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas CH_4 results from off-gassing associated with agricultural practices and landfills. Man-made GHGs, many of which have greater heat-absorption potential than CO_2, include fluorinated gases and sulfur hexafluoride (SF_6) (California Environmental Protection Agency [CalEPA], 2006). Different types of GHGs have varying global warming potentials (GWPs). The GWP of a GHG is the potential of a gas or aerosol to trap heat in the atmosphere over a specified timescale (generally, 100 years). Because GHGs absorb different amounts of heat, a common reference gas (CO2) is used to relate the amount of heat absorbed to the amount of the gas emissions, referred to as "carbon dioxide equivalent" (CO_2e), and is the amount of a GHG emitted multiplied by its GWP. Carbon dioxide has a GWP of one. By contrast, methane (CH_4) has a GWP of 21, meaning its global warming effect is 21 times greater than carbon dioxide on a molecule per molecule basis (IPCC, 1997).

The accumulation of GHGs in the atmosphere regulates the earth's temperature. Without the natural heat trapping effect of GHG, Earth's surface would be about 34° C cooler (CalEPA, 2006). However, it is believed that emissions from human activities, particularly the consumption of fossil fuels for electricity production and transportation, have elevated the concentration of these gases in the atmosphere beyond the level of naturally occurring concentrations. The following discusses the primary GHGs of concern.

Carbon Dioxide. The global carbon cycle is made up of large carbon flows and reservoirs. Billions of tons of carbon in the form of CO_2 are absorbed by oceans and living biomass (i.e., sinks) and are emitted to the atmosphere annually through natural processes (i.e., sources). When in equilibrium, carbon fluxes among these various reservoirs are roughly balanced (United States Environmental Protection Agency [U.S. EPA], April 2012). CO_2 was the first GHG demonstrated to be increasing in atmospheric concentration, with the first conclusive measurements being made in the last half of the 20th Century. Concentrations of CO_2 in the atmosphere have risen approximately 40% since the industrial revolution. The global atmospheric concentration of CO_2 has increased from a pre-industrial value of about 280 parts per million (ppm) to 391 ppm in 2011 (IPCC, 2007; Oceanic and Atmospheric Association [NOAA], 2010; and, The World Bank, 2012). The average annual CO_2 concentration growth rate was larger between 1995 and 2005 (average: 1.9 ppm per year) than it has been since the beginning of continuous direct atmospheric measurements (1960–2005 average: 1.4 ppm per year), although there is year-to-year variability in growth rates (NOAA, 2010). Currently, CO_2 represents an estimated 82.8% of total GHG emissions

(Department of Energy [DOE] Energy Information Administration [EIA], August 2010). The largest source of CO_2, and of overall GHG emissions, is fossil fuel combustion.

Methane. Methane (CH_4) is an effective absorber of radiation, though its atmospheric concentration is less than that of CO_2 and its lifetime in the atmosphere is limited to 10 to 12 years. It has a global warming potential (GWP) approximately 21 times that of CO_2. Over the last 250 years, the concentration of CH_4 in the atmosphere has increased by 148 percent (IPCC, 2007), although emissions have declined from 1990 levels. Anthropogenic sources of CH_4 include enteric fermentation associated with domestic livestock, landfills, natural gas and petroleum systems, agricultural activities, coal mining, wastewater treatment, stationary and mobile combustion, and certain industrial processes (U.S. EPA, April 2012).

Nitrous Oxide. Concentrations of nitrous oxide (N_2O) began to rise at the beginning of the industrial revolution and continue to increase at a relatively uniform growth rate (NOAA, 2010). N_2O is produced by microbial processes in soil and water, including those reactions that occur in fertilizers that contain nitrogen, fossil fuel combustion, and other chemical processes. Use of these fertilizers has increased over the last century. Agricultural soil management and mobile source fossil fuel combustion are the major sources of N_2O emissions. The GWP of nitrous oxide is approximately 310 times that of CO_2.

Fluorinated Gases (HFCS, PFCS and SF6). Fluorinated gases, such as hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfurhexafluoride (SF_6), are powerful GHGs that are emitted from a variety of industrial processes. Fluorinated gases are used as substitutes for ozone-depleting substances such as chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), and halons, which have been regulated since the mid-1980s because of their ozone-destroying potential and are phased out under the Montreal Protocol (1987) and Clean Air Act Amendments of 1990. Electrical transmission and distribution systems account for most SF6 emissions, while PFC emissions result from semiconductor manufacturing and as a by-product of primary aluminum production. Fluorinated gases are typically emitted in smaller quantities than CO_2, CH_4, and N_2O, but these compounds have much higher GWPs. SF_6 is the most potent GHG the IPCC has evaluated with a GWP of 23,900.

Greenhouse Gas Inventory

Worldwide anthropogenic emissions of GHGs were approximately 40,000 million metric tons (MMT) CO_2e in 2004, including ongoing emissions from industrial and agricultural sources, but excluding emissions from land use changes (i.e., deforestation, biomass decay) (IPCC, 2007). CO_2 emissions from fossil fuel use accounts for 56.6 percent of the total emissions of 49,000 MMT CO_2e (includes land use changes) and CO_2 emissions from all sources account for 76.7 percent of the total. Methane emissions account for 14.3 percent of GHGs and N_2O emissions account for 7.9 percent (IPCC, 2007).

Total U.S. GHG emissions were 6,821.8 MMT CO_2e in 2009 (U.S. EPA, April 2012). Total U.S. emissions have increased by 10.5 percent since 1990; emissions rose by 3.2 percent from 2009 to 2010 (U.S. EPA, April 2012). This increase was primarily due to (1) an increase in economic output resulting in an increase in energy consumption across all sectors; and (2) much warmer summer conditions resulting in an increase in electricity demand for air conditioning. Since 1990, U.S.

emissions have increased at an average annual rate of 0.5 percent. In 2010, the transportation and industrial end-use sectors accounted for 32 percent and 26 percent of CO_2 emissions from fossil fuel combustion, respectively. Meanwhile, the residential and commercial end-use sectors accounted for 22 percent and 19 percent of CO_2 emissions from fossil fuel combustion, respectively (U.S. EPA, April 2012).

Based upon the California Air Resources Board (ARB) California Greenhouse Gas Inventory for 2000-2009 (ARB, October 2011), California produced 453 MMT CO_2e in 2009. The major source of GHG in California is transportation, contributing 38 percent of the state's total GHG emissions. Electricity generation is the second largest source, contributing 23 percent of the state's GHG emissions (ARB, October 2012). California emissions are due in part to its large size and large population compared to other states. However, a factor that reduces California's per capita fuel use and GHG emissions, as compared to other states, is its relatively mild climate. The ARB has projected statewide unregulated GHG emissions for the year 2020 will be 507 MMT CO_2e (ARB, April 2012). These projections represent the emissions that would be expected to occur in the absence of any GHG reduction actions.

Effects of Climate Change

Globally, climate change has the potential to affect numerous environmental resources through potential impacts related to future air temperatures and precipitation patterns. Scientific modeling predicts that continued GHG emissions at or above current rates would induce more extreme climate changes during the 21st century than were observed during the 20th century. Scientists have projected that the average global surface temperature could rise by1.0-4.5°F (0.6-2.5°C) in the next 50 years, and the increase may be as high as 2.2-10°F (1.4-5.8°C) in the next century. In addition to these projections, there are identifiable signs that global warming is currently taking place, including substantial ice loss in the Arctic (IPCC, 2007).

According to the CalEPA's 2010 Climate Action Team Biennial Report, potential impacts of climate change in California may include loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years (CalEPA, April 2010). Below is a summary of some of the potential effects that could be experienced in California as a result of climate change.

Sea Level Rise. According to *The Impacts of Sea-Level Rise on the California Coast*, prepared by the California Climate Change Center (CCCC) (May 2009), climate change has the potential to induce substantial sea level rise in the coming century. The rising sea level increases the likelihood and risk of flooding. The study identifies a sea level rise on the California coast over the past century of approximately eight inches. Based on the results of various global climate change models, sea level rise is expected to continue. The California Climate Adaptation Strategy (December 2009) estimates a sea level rise of up to 55 inches by the end of this century.

Air Quality. Higher temperatures, which are conducive to air pollution formation, could worsen air quality in California. Climate change may increase the concentration of ground-level ozone, but the magnitude of the effect, and therefore its indirect effects, are uncertain. If higher temperatures are accompanied by drier conditions, the potential for large wildfires could increase, which, in turn, would further worsen air quality. However, if higher temperatures are

accompanied by wetter, rather than drier conditions, the rains would tend to temporarily clear the air of particulate pollution and reduce the incidence of large wildfires, thereby ameliorating the pollution associated with wildfires. Additionally, severe heat accompanied by drier conditions and poor air quality could increase the number of heat-related deaths, illnesses, and asthma attacks throughout the state (CEC March, 2009).

Water Supply. Analysis of paleoclimatic data (such as tree-ring reconstructions of stream flow and precipitation) indicates a history of naturally and widely varying hydrologic conditions in California and the west, including a pattern of recurring and extended droughts. Uncertainty remains with respect to the overall impact of climate change on future water supplies in California. However, the average early spring snowpack in the Sierra Nevada decreased by about 10 percent during the last century, a loss of 1.5 million acre-feet of snowpack storage. During the same period, sea level rose eight inches along California's coast. California's temperature has risen 1°F, mostly at night and during the winter, with higher elevations experiencing the highest increase. Many Southern California cities have experienced their lowest recorded annual precipitation twice within the past decade. In a span of only two years, Los Angeles experienced both its driest and wettest years on record (California Department of Water Resources [DWR], 2008; CCCC, May 2009).

This uncertainty complicates the analysis of future water demand, especially where the relationship between climate change and its potential effect on water demand is not well understood. The Sierra snowpack provides the majority of California's water supply by accumulating snow during our wet winters and releasing it slowly when we need it during our dry springs and summers. Based upon historical data and modeling DWR projects that the Sierra snowpack will experience a 25 to 40 percent reduction from its historic average by 2050. Climate change is also anticipated to bring warmer storms that result in less snowfall at lower elevations, reducing the total snowpack (DWR, 2008).

Hydrology. As discussed above, climate change could potentially affect: the amount of snowfall, rainfall, and snow pack; the intensity and frequency of storms; flood hydrographs (flash floods, rain or snow events, coincidental high tide and high runoff events); sea level rise and coastal flooding; coastal erosion; and the potential for salt water intrusion. Sea level rise may be a product of climate change through two main processes: expansion of sea water as the oceans warm and melting of ice over land. A rise in sea levels could result in coastal flooding and erosion and could jeopardize California's water supply due to salt water intrusion. Increased storm intensity and frequency could affect the ability of flood-control facilities, including levees, to handle storm events.

Agriculture. California has a $30 billion agricultural industry that produces half of the country's fruits and vegetables. Higher CO_2 levels can stimulate plant production and increase plant water-use efficiency. However, if temperatures rise and drier conditions prevail, water demand could increase; crop-yield could be threatened by a less reliable water supply; and greater air pollution could render plants more susceptible to pest and disease outbreaks. In addition, temperature increases could change the time of year certain crops, such as wine grapes, bloom or ripen, and thereby affect their quality (CCCC, 2006).

Ecosystems and Wildlife. Climate change and the potential resulting changes in weather patterns could have ecological effects on a global and local scale. Increasing concentrations of GHGs are likely to accelerate the rate of climate change. Scientists project that the average global surface temperature could rise by 1.0-4.5°F (0.6-2.5°C) in the next 50 years, and 2.2-10°F (1.4-5.8°C) in the next century, with substantial regional variation. Soil moisture is likely to decline in many regions, and intense rainstorms are likely to become more frequent. Sea level could rise as much as two feet along most of the U.S. coast. Rising temperatures could have four major impacts on plants and animals: (1) timing of ecological events; (2) geographic range; (3) species' composition within communities; and (4) ecosystem processes, such as carbon cycling and storage (Parmesan, 2004; Parmesan, C. and H. Galbraith, 2004).

While the above-mentioned potential impacts identify the possible effects of climate change at a global and potentially statewide level, in general scientific modeling tools are currently unable to predict what impacts would occur locally with a similar degree of accuracy. In general, regional and local predictions are made based on downscaling statewide models (CEC, March 2009).

Regulatory Setting

The following regulations address both climate change and GHG emissions.

International Regulations. The United States is, and has been, a participant in the United Nations Framework Convention on Climate Change (UNFCCC) since it was produced by the United Nations in 1992. The UNFCCC is an international environmental treaty with the objective of, "stabilization of GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system." This is generally understood to be achieved by stabilizing global GHG concentrations between 350 and 400 ppm, in order to limit the global average temperature increases between 2 and 2.4°C above pre-industrial levels (IPCC 2007). The UNFCC itself does not set limits on GHG emissions for individual countries or enforcement mechanisms. Instead, the treaty provides for updates, called "protocols," that would identify mandatory emissions limits.

Five years later, the UNFCC brought nations together again to draft the Kyoto Protocol (1997). The Kyoto Protocol established commitments for industrialized nations to reduce their collective emissions of six GHGs (CO_2, CH_4, N_2O, SF_6, HFCs, and PFCs) to 5.2 percent below 1990 levels by 2012. The United States is a signatory of the Kyoto Protocol, but Congress has not ratified it and the United States has not bound itself to the Protocol's commitments (UNFCCC, 2007). The first commitment period of the Kyoto Protocol ended in 2012. Governments, including 38 industrialized countries, agreed to a second commitment period of the Kyoto Protocol, beginning January 1, 2013 and ending either on December 31, 2017 or December 31, 2020, to be decided by the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol at its seventeenth session (UNFCCC, November 2011).

In Durban (17th session of the Conference of the Parties in Durban, South Africa, December 2011), governments decided to adopt a universal legal agreement on climate change as soon as possible, but not later than 2015. Work will begin on this immediately under a new group called the Ad Hoc Working Group on the Durban Platform for Enhanced Action. Progress was also

made regarding the creation of a Green Climate Fund (GCF) for which a management framework was adopted (UNFCCC, December 2011;United Nations, September 2012).

Federal Regulations. The United States is currently using a voluntary and incentive-based approach toward emissions reductions in lieu of the Kyoto Protocol's mandatory framework. The Climate Change Technology Program (CCTP) is a multi-agency research and development coordination effort (led by the Secretaries of Energy and Commerce) that is charged with carrying out the President's National Climate Change Technology Initiative (U.S. EPA, December 2007). However, the voluntary approach to address climate change and greenhouse gas emissions may be changing. The United States Supreme Court in Massachusetts et al. v. Environmental Protection Agency et al. ([2007] 549 U.S. 05-1120) held that the U.S. EPA has the authority to regulate motor-vehicle GHG emissions under the federal Clean Air Act.

The U.S. EPA issued a Final Rule for mandatory reporting of GHG emissions in October 2009. This Final Rule applies to fossil fuel suppliers, industrial gas suppliers, direct GHG emitters, and manufacturers of heavy-duty and off-road vehicles and vehicle engines, and requires annual reporting of emissions. The first annual reports were due in March 2011.
On May 13, 2010, the U.S. EPA issued a Final Rule that took effect on January 2, 2011, setting a threshold of 75,000 million tons (MT) CO_2e per year for GHG emissions. New and existing industrial facilities that meet or exceed that threshold will require a permit after that date. On November 10, 2010, the U.S. EPA published the "PSD and Title V Permitting Guidance for Greenhouse Gases." The U.S. EPA's guidance document is directed at state agencies responsible for air pollution permits under the Federal Clean Air Act to help them understand how to implement GHG reduction requirements while mitigating costs for industry. It is expected that most states will use the U.S. EPA's new guidelines when processing new air pollution permits for power plants, oil refineries, cement manufacturing, and other big pollution point sources.

On January 2, 2011, the U.S. EPA implemented the first phase of the Tailoring Rule for industrial-source GHG emissions Title V Permitting. Under the first phase of the Tailoring Rule, all new sources of emissions are subject to GHG Title V permitting if they are otherwise subject to Title V for another air pollutant and they emit at least 75,000 MT CO_2e per year. Under Phase 1, no sources were required to obtain a Title V permit solely due to GHG emissions. Phase 2 of the Tailoring Rule went into effect July 1, 2011. At that time new sources were subject to GHG Title V permitting if the source emits 100,000 MT CO_2e per year, or they are otherwise subject to Title V permitting for another pollutant and emit at least 75,000 MT CO_2e per year.

California Regulations. Assembly Bill (AB) 1493 (2002), referred to as "Pavley," requires ARB to develop and adopt regulations to achieve "the maximum feasible and cost-effective reduction of GHG emissions from motor vehicles." On June 30, 2009, EPA granted the waiver of Clean Air Act preemption to California for its greenhouse gas emission standards for motor vehicles beginning with the 2009 model year. Pavley I took effect for model years starting in 2009 to 2016 and Pavley II, which is now referred to as "LEV (Low Emission Vehicle) III GHG" will cover 2017 to 2025. Fleet average emission standards would reach 22 per cent reduction by 2012 and 30 per cent by 2016.

In 2005, Governor Schwarzenegger issued Executive Order S-3-05, establishing statewide GHG emissions reduction targets. Executive Order (EO) S-3-05 provides that by 2010, emissions shall be

reduced to 2000 levels; by 2020, emissions shall be reduced to 1990 levels; and by 2050, emissions shall be reduced to 80% of 1990 levels (CalEPA, 2006). In response to EO S-3-05, CalEPA created the Climate Action Team (CAT), which in March 2006 published the Climate Action Team Report (the "2006 CAT Report") (CalEPA, 2006). The 2006 CAT Report identified a recommended list of strategies that the state could pursue to reduce GHG emissions. These are strategies that could be implemented by various state agencies to ensure that the emission reduction targets in EO S-3-05 are met and can be met with existing authority of the state agencies. The strategies include the reduction of passenger and light duty truck emissions, the reduction of idling times for diesel trucks, an overhaul of shipping technology/infrastructure, increased use of alternative fuels, increased recycling, and landfill methane capture.

California's major initiative for reducing GHG emissions is outlined in Assembly Bill 32 (AB 32), the "California Global Warming Solutions Act of 2006," signed into law in 2006. AB 32 codifies the Statewide goal of reducing GHG emissions to 1990 levels by 2020 (essentially a 15% reduction below 2005 emission levels; the same requirement as under S-3-05), and requires ARB to prepare a Scoping Plan that outlines the main State strategies for reducing GHGs to meet the 2020 deadline. In addition, AB 32 requires ARB to adopt regulations to require reporting and verification of statewide GHG emissions.

After completing a comprehensive review and update process, the ARB approved a 1990 statewide GHG level and 2020 limit of 427 MMT CO_2e. The Scoping Plan was approved by ARB on December 11, 2008, and includes measures to address GHG emission reduction strategies related to energy efficiency, water use, and recycling and solid waste, among other measures. The Scoping Plan includes a range of GHG reduction actions that may include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms.

Executive Order S-01-07 was enacted on January 18, 2007. The order mandates establishment of a Low Carbon Fuel Standard ("LCFS") for transportation fuels to reduce the carbon intensity of California's transportation fuels by at least 10% by 2020.

Senate Bill (SB) 97, signed in August 2007, acknowledges that climate change is an environmental issue that requires analysis in California Environmental Quality Act (CEQA) documents. In March 2010, the California Resources Agency (Resources Agency) adopted amendments to the State CEQA Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions. The adopted guidelines give lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHGs and climate change impacts.

Senate Bill (SB) 375, signed in August 2008, enhances the State's ability to reach AB 32 goals by directing ARB to develop regional greenhouse gas emission reduction targets to be achieved from vehicles for 2020 and 2035. SB 375 directs each of the state's 18 major Metropolitan Planning Organizations (MPO) to prepare a "sustainable communities strategy" (SCS) that contains a growth strategy to meet these emission targets for inclusion in the Regional Transportation Plan (RTP). On September 23, 2010 ARB adopted final regional targets for reducing GHG emissions from 2005 levels by 2020 and 2035. The Southern California Association of Governments (SCAG) was assigned targets of an 8% reduction in GHGs from transportation sources by 2020 and a 13% reduction in GHGs from transportation sources by 2035. In April

2012, SCAG adopted the *2012-2035 Regional Transportation Plan/Sustainable Communities Strategy* (RTP/SCS). SCAG's RTP/SCS includes a commitment to reduce emissions from transportation sources by promoting compact and infill development in order to comply with SB 375.

ARB Resolution 07-54 establishes 25,000 metric tons of GHG emissions as the threshold for identifying the largest stationary emission sources in California for purposes of requiring the annual reporting of emissions. This threshold is just over 0.005% of California's total inventory of GHG emissions for 2004.

In April 2011, Governor Brown signed SB 2X requiring California to generate 33% of its electricity from renewable energy by 2020.

For more information on the Senate and Assembly bills, Executive Orders, and reports discussed above, and to view reports and research referenced above, please refer to the following websites: www.climatechange.ca.gov and http://www.arb.ca.gov/cc/cc.htm.

Local Regulations and CEQA Requirements. The San Bernardino Associated Governments (SANBAG) is in the process of developing the *San Bernardino County Regional Greenhouse Gas Reduction Plan*. The public draft of the report was released in June, 2013. The plan includes a regional greenhouse gas inventory and summarizes actions that participating jurisdictions have selected in order to reduce GHG emissions. As part of the plan, the City of Chino Hills selected a goal to reduce its community GHG emissions to a level that is 20% below its projected emissions level in 2020. The City actually exceeds the goal with only state/county level actions (112% of goal), but has committed to additional local measures and to support applicable regional measures. Additional measures include implementing SB X7-7 to reduce water use in the City, encouraging the installation of solar energy collectors (e.g. photovoltaics) for existing housing (reducing energy use), and working with the City's wastewater treatment provider to upgrade to more energy efficient equipment at the wastewater treatment plant.

Pursuant to the requirements of SB 97, the Resources Agency has adopted amendments to the State CEQA Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions. The adopted CEQA Guidelines provide general regulatory guidance on the analysis and mitigation of GHG emissions in CEQA documents, but do not contain suggested thresholds of significance for GHG emissions. Instead, they give lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHGs and climate change impacts. The general approach to developing a Threshold of Significance for GHG emissions is to identify the emissions level for which a project would not be expected to substantially conflict with existing California legislation adopted to reduce statewide GHG emissions, as needed to move the state towards climate stabilization. If a project would generate GHG emissions above the threshold level, its contribution to cumulative impacts would be considered significant. To date, the Bay Area Air Quality Management District (BAAQMD), the South Coast Air Quality Management District (SCAQMD), and the San Joaquin Air Pollution Control District (SJVAPCD) have adopted quantitative significance thresholds for GHGs. The SCAQMD threshold, which was adopted in December 2008, considers emissions of over 10,000 metric tons CO_2e/year to be significant. However, the SCAQMD's threshold applies only to stationary sources and is expressly intended to apply only when the SCAQMD is the CEQA lead agency. Although not yet adopted, the SCAQMD has a recommended performance

threshold for planning documents of 6.6 MT/year CO_2e per service population (SCAQMD, "Proposed Tier 4 Performance Standards – Option 3", September 2010). Service population (SP) is defined as residents plus employees.

IMPACT ANALYSIS

Pursuant to the requirements of SB 97, the Resources Agency adopted amendments to the State CEQA Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions in March 2010. These guidelines are used in evaluating the cumulative significance of GHG emissions from the proposed project. According to the adopted CEQA Guidelines, impacts related to GHG emissions from the proposed project would be significant if the project would:

- *Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; and/or*
- *Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.*

The vast majority of individual projects do not generate sufficient GHG emissions to create a project-specific impact through a direct influence on climate change; therefore, the issue of climate change typically involves an analysis of whether a project's contribution towards an impact is cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects (CEQA Guidelines, Section 15355).

The significance of GHG emissions may be evaluated based on locally adopted quantitative thresholds, or consistency with a regional GHG reduction plan (such as a Climate Action Plan). Though General Plan Update Policy CN-3.2 calls for development and implementation of a Climate Action Plan, the City of Chino Hills has not yet adopted GHG thresholds or a GHG emissions reduction plan with established GHG emissions reduction strategies. Because the SCAQMD has not yet adopted GHG emissions thresholds that apply to projects where the SCAQMD is not the lead agency and no GHG emissions reduction plan or GHG emissions thresholds have been adopted in Chino Hills, the proposed project is evaluated based on the SCAQMD's plan level threshold of 6.6 MT/year CO_2e per SP.

Therefore, the proposed project's contribution to cumulative impacts related to GHG emissions and climate change would be cumulatively considerable if the project would generate more than 6.6 metric tons of CO_2e per SP per year. Additionally, in determining whether or not the proposed project's GHG emissions are "cumulatively considerable," an inconsistency with applicable GHG emissions reductions strategies would be a significant impact under the second significance threshold discussed above.

Methodology

Calculations of CO_2, CH_4, and N_2O emissions are provided to identify the magnitude of potential project effects. The analysis focuses on CO_2, CH_4, and N_2O because these make up 98.9 percent of all GHG emissions by volume (IPCC, 2007) and are the GHG emissions that the

project would emit in the largest quantities. Fluorinated gases, such as HFCs, PFCs, and SF_6, were also considered for the analysis. However, the quantity of fluorinated gases would not be significant since fluorinated gases are primarily associated with industrial processes. Emissions of all GHGs are converted into their equivalent weight in CO_2 (CO_2e). Minimal amounts of other main GHGs (such as chlorofluorocarbons [CFCs]) would be emitted; however, these other GHG emissions would not substantially add to the calculated CO_2e amounts. Calculations are based on the methodologies discussed in the California Air Pollution Control Officers Association (CAPCOA) *CEQA and Climate Change* white paper (January 2008) and included the use of the California Climate Action Registry (CCAR) General Reporting Protocol (January 2009).

This analysis focuses on the GHG emissions and the service population for the potential development that would be facilitated by the General Plan Update. This analysis does not quantify existing GHG emissions associated with current development in Chino Hills but rather focuses on the potential development facilitated by the proposed General Plan Update as the potential development could result in a change of GHG emissions compared to existing conditions.

On-Site Operational Emissions. Operational emissions from energy use (electricity and natural gas use) for the project were estimated using the California Emissions Estimator Model (CalEEMod) 2013 Version 2013.2.2 software program (see Appendix for calculations). The default values on which the CalEEMod software program are based include the California Energy Commission (CEC) sponsored California Commercial End Use Survey (CEUS) and Residential Appliance Saturation Survey (RASS) studies. CalEEMod provides operational emissions of CO_2, N_2O and CH_4. This methodology is considered reasonable and reliable for use, as it has been subjected to peer review by numerous public and private stakeholders, and in particular by the CEC; it is also recommended by CAPCOA (January 2008).

Emissions associated with area sources, including hearths (related interior residential fireplaces), consumer products, landscape maintenance, and architectural coating were calculated in CalEEMod and utilize standard emission rates from CARB, U.S. EPA, and district supplied emission factor values (CalEEMod User Guide, 2013).

Emissions from waste generation were also calculated in CalEEMod and are based on the IPCC's methods for quantifying GHG emissions from solid waste using the degradable organic content of waste (CalEEMod User Guide, 2013). Waste disposal rates by land use and overall composition of municipal solid waste in California was primarily based on data provided by the California Department of Resources Recycling and Recovery (CalRecycle).

Emissions from water and wastewater usage calculated in CalEEMod were based on the default electricity intensity from the CEC's 2006 Refining Estimates of Water-Related Energy Use in California using the average values for Northern and Southern California.

Direct Emissions from Mobile Combustion. Emissions of CO_2 and CH_4 from transportation sources for the proposed project were quantified using the CalEEMod software model. Because the CalEEMod software program does not calculate N_2O emissions from mobile sources, N_2O emissions were quantified using the California Climate Action Registry General

Reporting Protocol (January 2009) direct emissions factors for mobile combustion (see Appendix for calculations). As the traffic study for the General Plan Update (Minagar & Associates, Inc., June 2013) did not include an estimate of total daily trips associated with full General Plan buildout, the estimate of total daily trips associated with the General Plan Update was based on the standard Institute of Transportation Engineers (ITE) vehicle trip rates (used in CalEEMod and in the traffic study) and was calculated and extrapolated to derive total annual mileage in CalEEMod. Emission rates for N_2O emissions were based on the vehicle mix output generated by CalEEMod and the emission factors found in the California Climate Action Registry General Reporting Protocol.

A limitation of the quantitative analysis of emissions from mobile combustion is that emission models, such as CalEEMod, evaluate aggregate emissions, meaning that all vehicle trips and related emissions assigned to a project are assumed to be new trips and emissions generated by the project itself. Such models do not demonstrate, with respect to a regional air quality impact, what proportion of these emissions are actually "new" emissions, specifically attributable to the project in question. For most projects, the main contributor to regional air quality emissions is from motor vehicles; however, the quantity of vehicle trips appropriately characterized as "new" is usually uncertain as traffic associated with a project may be relocated trips from other locales. Therefore, because the proportion of "new" versus relocated trips is unknown, the VMT estimate generated by CalEEMod is used as a conservative, "worst-case" estimate.

Construction Emissions. Although construction activity is addressed in this analysis, CAPCOA does not discuss whether any of the suggested threshold approaches (as discussed below in *GHG Cumulative Significance*) adequately address impacts from temporary construction activity. As stated in the *CEQA and Climate Change* white paper, "more study is needed to make this assessment or to develop separate thresholds for construction activity" (CAPCOA, 2008). Nevertheless, air districts such as the SCAQMD (2011) have recommended amortizing construction-related emissions over a 30-year period in conjunction with the proposed project's operational emissions.

Construction of the proposed project would generate temporary GHG emissions primarily due to the operation of construction equipment and truck trips. Site preparation and grading typically generate the greatest amount of emissions due to the use of grading equipment and soil hauling. The CalEEMod software program was used to estimate emissions associated with the construction period, based on parameters such as the duration of construction activity, area of disturbance, and anticipated equipment used during construction.

Estimate of GHG Emissions

Construction Emissions. For the purpose of this analysis, construction activity is assumed to occur over a period of approximately twenty years from 2015 to 2035, or the General Plan Update buildout year. As stated in the Project Description, the proposed General Plan Update would facilitate development of 5,822 housing units and 2,110,533 square feet of commercial/ institutional space. Based on the CalEEMod model results, construction activity for the project would generate an estimated 109,589 metric tons of carbon dioxide equivalent (CO_2e) units (as shown in Table 2). Amortized over a 30-year period (the assumed life of the proposed development), construction of the residential units would generate an estimated 3,653

metric tons of CO_2e per year. (See Table 10 for comparison of total greenhouse gas emissions associated with the General Plan Update to thresholds).

Table 2
Estimated Construction Emissions of Greenhouse Gases

Emission Source	Annual Emissions	
	Emissions (metric tons)	**Carbon Dioxide Equivalent (CO_2e)**
Carbon Dioxide (CO_2)	109,489.1	109,489 metric tons
Methane (CH_4)	4.7	100 metric tons
Nitrous Oxide (N_2O)	0.0*	0.0 metric tons
Total		**109,589 metric tons**
Amortized over 30 years		**3,653 metric tons per year**

Source: See Table 2.1, "Unmitigated Construction" of annual CalEEMod modeling results in Appendix. Assumes development of 5,822 housing units and 2,110,533 square feet of commercial/ institutional space.
** N_2O emissions are not anticipated to occur as the type of construction equipment associated with development that would emit GHG emissions does not emit a significant amount of N_2O emissions. The modeling results (using CalEEMod) estimate that the N_2O would be 0 metric tons per year.*

Operational Indirect and Stationary Direct Emissions.

Area Source Emissions. The CalEEMod model was used to calculate direct sources of air emissions located throughout the potential new residential and commercial sites. This includes hearths, consumer product use, architectural coatings, and landscape maintenance equipment. As shown in Table 3, the area sources would generate approximately 1,959 metric tons CO_2e per year.

Table 3
Estimated Annual Area Source Greenhouse Gas Emissions

Emission Source	Annual Emissions
Architectural Coating	<0.001 metric tons CO_2e
Consumer Products	<0.001 metric tons CO_2e
Hearth	1,859 metric tons CO_2e
Landscaping	100 metric tons CO_2e
Total	**1,959 metric tons CO_2e**

Source: See Table 6.2, "Area by SubCategory- unmitigated," of annual CalEEMod modeling results in Appendix

Energy Use. Operation of the potential new residences and commercial uses would consume both electricity and natural gas. The generation of electricity through combustion of fossil fuels typically yields CO_2, and to a smaller extent, N_2O and CH_4. As discussed above, annual electricity and natural gas emissions can be calculated using default values from the CEC sponsored CEUS and RASS studies which are built into the CalEEMod model.

Table 4
Estimated Annual Energy-Related Greenhouse Gas Emissions

Emission Source	Annual Emissions
Electricity	18,310 metric tons CO_2e
Natural Gas	7,622 metric tons CO_2e
Total	**25,932 metric tons CO_2e**

Source: See Table 5.1, "Mitigation Measures Energy," of annual CallEEMod modeling results in Appendix.

As shown in Table 4, electricity consumption associated with the project would generate approximately 18,310 metric tons CO_2e per year. Natural gas use would generate approximately 7,622 metric tons CO_2e per year. Thus, overall energy use at the project site would generate approximately 25,932 metric tons of CO_2e per year.

*Solid Waste Emissions***.** It is anticipated that the potential new residences and commercial uses would generate approximately 3,492 tons of solid waste per year according to the CalEEMod output (assuming 50% diversion rate in accordance with AB 939). As shown in Table 5, based on this estimate, this aspect of the project would generate approximately 1,588 metric tons of CO_2e per year.

Table 5
Estimated Annual Solid Waste Greenhouse Gas Emissions

Emission Source	Annual Emissions
Solid Waste	**1,588 metric tons CO_2e**

Source: See Table 8.2, "Waste by Land Use – Mitigated" of annual CalEEMod modeling results in Appendix. Assumes 50% diversion rate in accordance with AB 939.

*Water Use Emissions***.** Based on the amount of electricity generated in order to supply water to development facilitated by the General Plan Update, as shown in Table 6, approximately 4,260 metric tons of CO_2e would be generated per year.

Table 6
Estimated Annual Greenhouse Gas Emissions from Water Use

Emission Source	Annual Emissions
Water Use	**4,260 metric tons CO_2e**

Source: See Table 7.2, "Water by Land Use – Unmitigated" of annual CalEEMod modeling results in Appendix.

Transportation Emissions. As the traffic study for the General Plan Update (Minagar & Associates, Inc., June 2013) did not include an average daily traffic (ADT) estimate for full General Plan buildout, mobile source GHG emissions were estimated using the average daily trips for residences and by the total vehicle miles traveled (VMT) estimated in CalEEMod. CalEEMod trip generation rates are based on the Institute of Transportation Engineers (ITE), which are also utilized in the traffic study. Based on the CalEEMod model estimate, potential development would generate approximately 199,507,218 annual VMT.

Table 7 shows the estimated mobile emissions of GHGs for the project based on the estimated annual VMT. As noted above, the CalEEMod model does not calculate N_2O emissions related to mobile sources. As such, N_2O emissions were calculated based on the project's VMT using calculation methods provided by the California Climate Action Registry General Reporting Protocol (January 2009). As shown in Table 7 below, the project would result in approximately 84,078 metric tons of CO_2e units associated with mobile emissions.

Table 7
Estimated Annual Mobile Emissions of Greenhouse Gases

Emission Source	Annual Emissions
Mobile Emissions (CO_2 & CH_4) [1]	79,722 metric tons CO_2e
Mobile Emissions (N_2O) [2]	4,356 metric tons CO_2e
Total	**84,078 metric tons CO_2e**

[1] See Table 4.1 of CalEEMod annual modeling results in Appendix. Assumes 199,507,218 annual vehicle miles traveled and that the General Plan Update would increase density to 5.5 dwelling units/acre and 3.6 jobs/job acre and improve the pedestrian network.
[2] See Appendix for calculations according to California Climate Action Registry General Reporting Protocol, Reporting Entity-Wide Greenhouse Gas Emissions, Version 3.1,January 2009, page 30-35.

Combined Construction, Stationary and Mobile Source Emissions. Table 8 combines the construction, operational, and mobile GHG emissions associated with General Plan Update buildout. Construction emissions associated with construction activity are amortized over 30 years (the anticipated life of the project).

Table 8
Combined Annual Emissions of Greenhouse Gases

Emission Source	Annual Emissions
Construction	3,653 metric tons CO_2e
Operational Area Energy Solid Waste Water	 1,959 metric tons CO_2e 25,932 metric tons CO_2e 1,588 metric tons CO_2e 4,260 metric tons CO_2e
Mobile	84,078 metric tons CO_2e
Total	**121,470 metric tons CO_2e**

Sources: See Tables 2-7 and annual CalEEMod emissions estimates in Appendix for calculations and for GHG emission factor assumptions.

For the proposed General Plan Update, the combined annual emissions would total approximately 121,470 metric tons per year in CO_2e units.

SCAQMD's plan-based threshold is 6.6 metric tons CO_2e per service population per year (SCAQMD, "Proposed Tier 4 Performance Standards," September 2010). Service population is defined as both residents and employees. Table 9 shows the total service population associated with buildout of the General Plan Update.

Table 9
General Plan Update Service Population

Land Use	Amount	Multiplication Factor	Total
Residences	5,822 units	3.3 persons/household*	19,213 residents***
Commercial/Mixed Use	1,384,012 sf	344 sf/employee**	4,024 employees
Business Park	369,000 sf	288 sf/employee**	1,282 employees
Commercial Recreation	0	n/a	0
Institutional/Public Facility	357,521 sf	261 sf/employee**	1,370 employees
		Total Service Population	**25,889**

** California Department of Finance, May 2013*
*** SCAG Employment Density Study, 2001, http://www.scag.ca.gov/forecast/downloads/employ_den.pdf*
****This number assumes that all residential units would be occupied, it does not take into account the vacancy rate.*

Based on the number of potential new residences and commercial space, the proposed General Plan update would add approximately 25,889 residents and employees. Therefore, the proposed General Plan Update would result in approximately 4.7 metric tons CO_2e per service population per year (121,470 MT CO_2e per year / 25,889 SP = 4.7 MT CO_2e/SP/year, see Table 10). This

would be below the plan-based threshold of 6.6 metric tons CO_2e per service population per year for use in the South Coast region. Impacts would be less than significant.

Table 10
Greenhouse Gases Emissions by Service Population

Total GHG Emissions	121,470 metric tons CO_2e
Total Service Population	25,889 residents and employees
Emissions per SP per year	**4.7 MT CO_2e/SP/Year**

Consistency with Applicable Mitigation Strategies

The proposed General Plan Update land use plan promotes sustainable development such as centralized land uses, mixed uses, and preservation of open spaces. The Land Use Element establishes a new Mixed-Use land use category intended to create a diverse, pedestrian-friendly, transit-accessible neighborhood. The proposed General Plan Update contains numerous goals, policies, and actions that would directly or indirectly reduce GHG emissions.

The Conservation Element includes specific goals and policies related to greenhouse gas emissions:

Goals

Goal CN-3 *Promote Sustainable Practices that Conserve Natural Resources and Reduce Greenhouse Gas Emissions*

Policies and Actions

Policy CN-3.1 *Endorse Green building design in new and existing construction*

Action CN-3.1.1 *Implement Green building policies that promote increased use of energy efficiency, alternative energy, recycled materials, renewable resources, local materials, water efficiency, and pollution reduction.*

Action CN-3.1.2 *Establish programs that encourage homeowners to reduce energy consumption.*

Action CN-3.1.3 *Seek available funding sources which can be applied toward green building programs.*

Action CN-3.1.4 *Coordinate with state and regional agencies to ensure that alternative energy facilities are compatible with Chino Hills' natural and built environment.*

Policy CN-3.2 *Develop and implement a Climate Action Plan facilitating the reduction of greenhouse gas emissions*

Action CN-3.2.1 *Reduce Greenhouse Gas emissions in City operations.*

Action CN-3.2.2 *Power City vehicles and equipment with reduced carbon dioxide emission fuels.*

Action CN-3.2.3 *Provide Climate Action Plan information and resources to the Chino Hills community.*

Senate Bill 375, signed in August 2008, requires the inclusion of sustainable communities' strategies (SCS) in regional transportation plans (RTPs) for the purpose of reducing GHG emissions. In April 2012, the Southern California Association of Government (SCAG) adopted the 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). The primary goal of the RTP/SCS is to provide a vision for future growth in Southern California that will reduce per capita GHG emissions by 8% by 2020 and 13% by 2035.

The consistency of the General Plan Update with applicable policies from SCAG's RTP/SCS is evaluated in Table 11. As shown, the General Plan Update would be consistent with all of the strategies identified below to reduce GHG emissions in the SCAG region, and these policies would help maintain or reduce per capita emissions in Chino Hills. Impacts would be less than significant.

Table 11
General Plan Update Consistency with SCAG 2012-2035 RTP/SCS

2012-2035 RTP/SCS	General Plan Update Policies
GOALS	
Better Placemaking Create better places to live and work through compact development, varied housing options, bike and pedestrian improvements, and efficient transportation infrastructure in order to reduce travel time and relieve road congestion.	**Policy LU-5.1:** Promote infill, mixed-use, and higher density development, and provide incentives to support the creation of affordable housing in mixed use zones. **Action LU-5.1.3:** Coordinate land use patterns with transportation plans to improve and protect air quality, and reduce vehicular trips. **Action LU-5.1.4:** Plan for high density residential and mixed use development near commercial areas, major roadways and transit facilities. **Action LU-5.1.5:** Encourage development to incorporate pedestrian and bicycle trails, fitness areas and/or other facilities that promote healthy living.
Lower Cost to Taxpayers and Families Reduce the cost of development for taxpayers and reduce the everyday costs of housing and transportation by creating more compact neighborhoods and placing everyday destinations closer to homes and closer to one another.	**Policy LU-5.1:** Promote infill, mixed-use, and higher density development, and provide incentives to support the creation of affordable housing in mixed use zones. **Action LU-5.1.1**: Identify sites suitable for mixed-use development within an existing urban service area and establish appropriate site specific standards to accommodate the mixed uses. **Action LU-5.1.3:** Coordinate land use patterns with transportation plans to improve and protect air quality, and reduce vehicular trips. **Action LU-5.1.4:** Plan for high density residential and mixed use development near commercial areas, major roadways and transit facilities.

Table 11
General Plan Update Consistency with SCAG 2012-2035 RTP/SCS

2012-2035 RTP/SCS	General Plan Update Policies
Benefits to Public Health and the Environment Better placemaking will encourage an active lifestyle and reduce impacts to natural environments.	**Policy LU-5.1:** Promote infill, mixed-use, and higher density development, and provide incentives to support the creation of affordable housing in mixed use zones. **Action LU-5.1.5:** Encourage development to incorporate pedestrian and bicycle trails, fitness areas and/or other facilities that promote healthy living. **Goal CN-3:** Promote Sustainable Practices that Conserve Natural Resources and Reduce Greenhouse Gas Emissions **Action LU-3.2.3:** Provide sidewalks along all streets in residential neighborhoods; and where possible, provide sidewalks in internal green belts.
Greater Responsiveness to Demographics and the Changing Housing Market Strategies focused on high-quality places, compact infill development, and more housing and transportation choices will be responsive to newly emerging market forces.	**Policy LU-5.1:** Promote infill, mixed-use, and higher density development, and provide incentives to support the creation of affordable housing in mixed use zones. **Goal CIRC-3:** Provide Safe And Adequate Pedestrian, Bicycle, and Public Transportation Systems to Provide Alternatives to Single Occupant Vehicular Travel and to Support Land Uses.
Improved Access and Mobility Placing destinations closer together and increasing alternative transportation options to decrease the time and cost of traveling between destinations.	**Policy LU-5.1:** Promote infill, mixed-use, and higher density development, and provide incentives to support the creation of affordable housing in mixed use zones.
STRATEGIES	
A Land Use growth pattern that accommodates the region's future employment and housing needs and protects sensitive habitat and natural resource areas.	**Policy LU-5.1:** Promote infill, mixed-use, and higher density development, and provide incentives to support the creation of affordable housing in mixed use zones. **Goal CN-3:** Promote Sustainable Practices that Conserve Natural Resources and Reduce Greenhouse Gas Emissions
A Transportation Network that consists of public transit, highways, local streets, bikeways, and walkways.	**Goal CIRC-3:** Provide Safe And Adequate Pedestrian, Bicycle, and Public Transportation Systems to Provide Alternatives to Single Occupant Vehicular Travel and to Support Land Uses. **Policy CIRC-3.1:** Encourage the use of public transportation for commute and local, and increase citywide transit ridership. **Policy CIRC-3.2:** Support other alternatives to single occupant vehicular travel. **Action CIRC-3.2.3:** Support the citywide Bicycle Master Plan and bikeway improvements.
Transportation System Management (TSM) measures that maximize the efficiency of the transportation network.	**Policy CIRC-2.1:** Support and participate in regional efforts to improve vehicular and non-vehicular transportation systems. **Action CIRC-2.1.2:** Coordinate with SANBAG regarding the integration of Intelligent Transportation Systems (ITS) that will maximize the efficiency of the transportation system through advanced technologies, such as adaptive signal controls. **Policy CIRC-3.1:** Encourage the use of public transportation for commute and local, and increase citywide transit ridership.

Source: Southern California Association of Governments, 2012-2035 RTP/SCS

As discussed in the *Regulatory Setting* section, in response to EO S-3-05, CalEPA created the Climate Action Team (CAT), which in March 2006, published the Climate Action Team Report (CAT Report) (CalEPA, 2006). The 2006 CAT Report identified a recommended list of strategies that the state could pursue to reduce GHG emissions.

In addition, in 2008 the California Attorney General published "The California Environmental Quality Act: Addressing Global Warming Impacts at the Local Agency Level" (Office of the California Attorney General, Global Warming Measures Updated May 21, 2008). This document provides information that may be helpful to local agencies in carrying out their duties under CEQA as they relate to global warming. Included in this document are various measures that may reduce the global warming related impacts of a project.

Tables 12 and 13 illustrate that the proposed General Plan Update would be consistent with the applicable GHG reduction strategies set forth by the 2006 CAT Report as well as the 2008 Attorney General's Greenhouse Gas Reduction Measures.

Table 12
Consistency with Applicable Climate Action Team Greenhouse Gas Emission Reduction Strategies

Strategy	***Project Consistency***
California Air Resources Board	
Vehicle Climate Change Standards AB 1493 (Pavley) required the state to develop and adopt regulations that achieve the maximum feasible and cost-effective reduction of climate change emissions emitted by passenger vehicles and light duty trucks. Regulations were adopted by the ARB in September 2004.	**Consistent** The vehicles that travel to and from the Chino Hills on public roadways would be in compliance with ARB vehicle standards that are in effect at the time of vehicle purchase.
Diesel Anti-Idling The ARB adopted a measure to limit diesel-fueled commercial motor vehicle idling in July 2004.	**Consistent** Current State law restricts diesel truck idling to five minutes or less. Diesel trucks operating from and making deliveries to the Chino Hills are subject to this state-wide law. In addition, vehicles hauling exported material from construction sites associated with development projects facilitated by the General Plan Update would not idle at the project site, those vehicles would pick-up the materials to be exported and leave the site.
Hydrofluorocarbon Reduction 1) Ban retail sale of HFC in small cans. 2) Require that only low GWP refrigerants be used in new vehicular systems. 3) Adopt specifications for new commercial refrigeration. 4) Add refrigerant leak-tightness to the pass criteria for vehicular inspection and maintenance programs. 5) Enforce federal ban on releasing HFCs.	**Consistent** This strategy applies to consumer products. All applicable products would be required to comply with the regulations that are in effect at the time of manufacture.
Alternative Fuels: Biodiesel Blends ARB would develop regulations to require the use of 1 to 4% biodiesel displacement of California diesel fuel.	**Consistent** Diesel vehicles such as delivery trucks that travel to and from the Chino Hills on public roadways could utilize this fuel once it is commercially available.

Table 12
Consistency with Applicable Climate Action Team Greenhouse Gas Emission Reduction Strategies

Strategy	*Project Consistency*
Alternative Fuels: Ethanol Increased use of E-85 fuel.	**Consistent** Residents and visitors in Chino Hills could choose to purchase flex-fuel vehicles and utilize this fuel once it is commercially available regionally and locally.
Heavy-Duty Vehicle Emission Reduction Measures Increased efficiency in the design of heavy duty vehicles and an education program for the heavy duty vehicle sector.	**Consistent** Heavy-duty vehicles for the exported material hauling activities that travel to and from Chino Hills on public roadways would be subject to all applicable ARB efficiency standards that are in effect at the time of vehicle manufacture.
Achieve 50% Statewide Recycling Goal Achieving the State's 50% waste diversion mandate as established by the Integrated Waste Management Act of 1989, (AB 939, Sher, Chapter 1095, Statutes of 1989), will reduce climate change emissions associated with energy intensive material extraction and production as well as methane emission from landfills. A diversion rate of 52% has been achieved on a statewide basis.	**Consistent** The City of Chino Hills is responsible for complying with AB 939. The City has consistently met its goals for solid waste diversion, and achieved a diversion rate of 64% in 2011 (ChinoHills.com, 2011). It is anticipated that development facilitated by the General Plan Update would participate in the City's waste diversion programs and would similarly divert at least 50% of solid waste. Individual projects would also be subject to all applicable State and County requirements for solid waste reduction as they change in the future. Further, the General Plan Update contains goals, policies, and actions intended to reduce solid waste: **Goal CN-5:** Provide for Adequate and Efficient Solid Waste **Policy CN-5**: Meet the City's solid waste disposal needs, while maximizing opportunities for waste reduction and recycling. **Action CN-5.1.1:** Implement the City's Source Reduction and Recycling Element as required by the California Integrated Waste Management Act. **Action CN-5.1.2:** Publicize and educate the public about waste reduction techniques and facilities.
Department of Water Resources	
Water Use Efficiency Approximately 19% of all electricity, 30% of all natural gas, and 88 million gallons of diesel are used to convey, treat, distribute and use water and wastewater. Increasing the efficiency of water transport and reducing water use would reduce greenhouse gas emissions.	**Consistent** The proposed General Plan Update includes policies and actions to reduce water use: **Policy CN-4.1:** Promote water conservation **Action CN-4.1.1:** Continue to implement water conservation programs to sustain potable water sources. **Action CN-4.1.2:** Promote use of drought tolerant plant materials and low water usage irrigation systems. **Action CN-4.1.3:** Promote low water use plantings and materials in City street medians and parkways.

Table 12
Consistency with Applicable Climate Action Team Greenhouse Gas Emission Reduction Strategies

Strategy	*Project Consistency*
	Action CN-4.1.4: Continue to use reclaimed water for non-potable water supplies wherever not precluded by public health considerations.
Energy Commission (CEC)	
Building Energy Efficiency Standards in Place and in Progress Public Resources Code 25402 authorizes the CEC to adopt and periodically update its building energy efficiency standards (that apply to newly constructed buildings and additions to and alterations to existing buildings).	**Consistent** The proposed project would involve physical development that would need to comply with the standards of Title 24 that are in effect at the time of development. The proposed General Plan Update also includes policies and actions to encourage energy efficiency: **Policy CN-3.1:** Endorse Green building design in new and existing construction **Action CN-3.1.1**: Implement Green building policies that promote increased use of energy efficiency, alternative energy, recycled materials, renewable resources, local materials, water efficiency, and pollution reduction. **Action CN-3.1.2**: Establish programs that encourage homeowners to reduce energy consumption. **Action CN-3.1.3:** Seek available funding sources which can be applied toward green building programs.
Appliance Energy Efficiency Standards in Place and in Progress Public Resources Code 25402 authorizes the Energy Commission to adopt and periodically update its appliance energy efficiency standards (that apply to devices and equipment using energy that are sold or offered for sale in California).	**Consistent** Under State law, appliances that are purchased would be consistent with energy efficiency standards that are in effect at the time of manufacture.
Fuel-Efficient Replacement Tires & Inflation Programs State legislation established a statewide program to encourage the production and use of more efficient tires.	**Consistent** Residents at and visitors to Chino Hills could purchase tires for their vehicles that comply with state programs for increased fuel efficiency.
Alternative Fuels: Non-Petroleum Fuels Increasing the use of non-petroleum fuels in California's transportation sector, as recommended as recommended in the CEC's 2003 and 2005 Integrated Energy Policy Reports.	**Consistent** Residents and visitors of Chino Hills could purchase alternative fuel vehicles and utilize these fuels once they are commercially available regionally and locally.
Green Buildings Initiative Green Building Executive Order, S-20-04 (CA 2004), sets a goal of reducing energy use in public and private buildings by 20% by the year 2015, as compared with 2003 levels. The Executive Order and related action plan spell out specific actions state agencies are to take with state-owned and -leased buildings. The order and plan also discuss various strategies and incentives to encourage private building owners and operators to achieve the 20% target.	**Consistent** The General Plan Update would facilitate physical development that would need to comply with the standards of Title 24 that are in effect at the time of development. See also discussion under "Building Energy Efficiency Standards in Place and in Progress" for General Plan Update policies and actions related to green building.

Table 12
Consistency with Applicable Climate Action Team Greenhouse Gas Emission Reduction Strategies

Strategy	***Project Consistency***
Business, Transportation and Housing	
Smart Land Use and Intelligent Transportation Systems (ITS) Smart land use strategies encourage jobs/housing proximity, promote transit-oriented development, and encourage high-density residential/commercial development along transit corridors.	**Consistent** The General Plan Update includes goals, strategies, and actions to encourage smart land use strategies: **Policy LU-5.1:** Promote infill, mixed-use, and higher density development, and provide incentives to support the creation of affordable housing in mixed use zones. **Action LU-5.1.1**: Identify sites suitable for mixed-use development within an existing urban service area and establish appropriate site specific standards to accommodate the mixed uses. **Action LU-5.1.3:** Coordinate land use patterns with transportation plans to improve and protect air quality, and reduce vehicular trips. **Action LU-5.1.4:** Plan for high density residential and mixed use development near commercial areas, major roadways and transit facilities.

Table 13
Project Consistency with Applicable Attorney General Greenhouse Gas Emission Reduction Measures

Strategy	***Project Consistency***
Transportation-Related Emissions	
Diesel Anti-Idling Set specific limits on idling time for commercial vehicles, including delivery vehicles.	**Consistent** Currently, the California Air Resources Board's (CARB) Airborne Toxic Control Measure (ATCM) to Limit Diesel-Fueled Commercial Motor Vehicle Idling restricts diesel truck idling to five minutes or less. Diesel trucks making deliveries to Chino Hills are subject to this state-wide law. In addition, vehicles hauling exported material off-site would not idle at the site; instead, those vehicles would pick-up the materials and leave the site.
Transportation Emissions Reduction Provide shuttle service to public transportation.	**Consistent** The General Plan Update includes goals, strategies, and actions to encourage alternative transportation: **Goal CIRC-3:** Provide Safe And Adequate Pedestrian, Bicycle, and Public Transportation Systems to Provide Alternatives to Single Occupant Vehicular Travel and to Support Land Uses. **Policy CIRC-3.1:** Encourage the use of public transportation for commute and local, and increase citywide transit ridership. **Policy CIRC-3.2:** Support other alternatives to single occupant vehicular travel.
Solid Waste and Energy Emissions	
Solid Waste Reduction Strategy Project construction shall require reuse and recycling of construction and demolition waste.	**Consistent** Individual projects facilitated by the General Plan Update would be required to comply with the 50% waste diversion mandate, as required by the Integrated Waste Management Act of 1989.
Water Use Efficiency Require measures that reduce the amount of water sent to the sewer system – see examples in CAT standard above. (Reduction in water volume sent to the sewer system means less water has to be treated and pumped to the end user, thereby saving energy.	**Consistent** The proposed General Plan Update includes policies and actions to reduce water use: **Policy CN-4.1:** Promote water conservation **Action CN-4.1.1:** Continue to implement water conservation programs to sustain potable water sources. **Action CN-4.1.2:** Promote use of drought tolerant plant materials and low water usage irrigation systems. **Action CN-4.1.3:** Promote low water use plantings and materials in City street medians and parkways. **Action CN-4.1.4:** Continue to use reclaimed water for non-potable water supplies wherever not precluded by public health considerations.
Land Use Measures, Smart Growth Strategies and Carbon Offsets	
Smart Land Use and Intelligent Transportation Systems Require pedestrian-only streets and plazas within the project site and destinations that may be reached conveniently by public transportation, walking or bicycling.	**Consistent** The General Plan Update includes policies and actions to encourage alternative transportation: **Policy LU-5.1:** Promote infill, mixed-use, and higher density development, and provide incentives to support the creation of affordable housing in mixed use zones. **Action LU-5.1.5:** Encourage development to incorporate pedestrian and bicycle trails, fitness areas and/or other

Table 13
Project Consistency with Applicable Attorney General Greenhouse Gas Emission Reduction Measures

Strategy	*Project Consistency*
	facilities that promote healthy living. **Action LU-3.2.3:** Provide sidewalks along all streets in residential neighborhoods; and where possible, provide sidewalks in internal green belts. **Policy CIRC-3.1:** Encourage the use of public transportation for commute and local, and increase citywide transit ridership. **Action CIRC-3.2.3:** Support the citywide Bicycle Master Plan and bikeway improvements..

As indicated in Tables 11, 12 and 13, the proposed project would be consistent with SCAG's RTP/SCS, CAT strategies and the 2008 Attorney General Greenhouse Gas Reduction Measures.

The General Plan Update would not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs and would be consistent with the objectives of AB 32, EO S-3-05, SB 375, and SB 97. Further, as indicated in Table 10, the increase of GHG emissions associated with the General Plan Update would be approximately 4.7 MT CO_2e/SP/year which would not exceed the SCAQMD's recommended 6.6 MT CO_2e/SP/year screening threshold. Therefore, GHG emissions from the proposed General Plan Update would be less than significant.

Cumulative Analysis

By its nature, a general plan considers cumulative impacts insofar as it considers cumulative development that could occur within a city's plan area. Therefore, the analysis of the General Plan Update's impacts also constitutes the cumulative analysis and this GHG analysis does not contain a separate analysis of cumulative impacts. In accordance with SCAQMD methodology, projects that do not exceed or can be mitigated to less than the threshold values, especially the estimated greenhouse gas emissions per service population, do not add significantly to a cumulative impact. Because GHG emissions from the proposed General Plan Update would be less than significant, cumulative impacts associated with GHG emissions also would be less than significant.

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Appendix

CalEEMod GHG Modeling Results

N_2O from Mobile Emissions GHG Calculation Worksheet

Chino Hills General Plan Update

Los Angeles-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	357.52	1000sqft	8.21	357,521.00	0
Office Park	369.00	1000sqft	8.47	369,000.00	0
Apartments Mid Rise	2,768.00	Dwelling Unit	72.84	2,768,000.00	7916
Single Family Housing	3,054.00	Dwelling Unit	991.56	5,497,200.00	8734
Strip Mall	1,384.01	1000sqft	31.77	1,384,012.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	10			**Operational Year**	2035
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	630.89	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - GP update involves 2,768 multi-family units, 3,054 single-family units, 33,087 sf of mixed use (strip mall), 1,350,925 sf of commercial (strip mall), 369,000 sf of business park (office park), 357,521 sf of institutional/public facility (general office).

Construction Phase - Estimated 20 year construction schedule

Architectural Coating - Per SCAQMD Rule 1113

Construction Off-road Equipment Mitigation -

Mobile Land Use Mitigation -

Waste Mitigation -

Area Coating - Per SCAQMD Rule 1113

Area Mitigation - Per SCAQMD Rule 1113

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	150.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	150.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	150
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	250	150
tblConstructionPhase	NumDays	11,000.00	390.00
tblConstructionPhase	NumDays	155,000.00	4,000.00
tblConstructionPhase	NumDays	10,000.00	200.00
tblConstructionPhase	NumDays	15,500.00	300.00
tblConstructionPhase	NumDays	11,000.00	200.00
tblConstructionPhase	NumDays	6,000.00	120.00
tblGrading	AcresOfGrading	750.00	38,750.00
tblLandUse	LandUseSquareFeet	357,520.00	357,521.00
tblLandUse	LandUseSquareFeet	1,384,010.00	1,384,012.00
tblProjectCharacteristics	OperationalYear	2014	2035

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	0.6212	6.5859	5.0583	5.4700e-003	1.1064	0.3395	1.4459	0.6018	0.3154	0.9173	0.0000	510.8473	510.8473	0.1368	0.0000	513.7203
2016	0.8153	9.1841	6.3452	7.7400e-003	22.5624	0.4490	23.0114	3.3184	0.4131	3.7315	0.0000	723.8416	723.8416	0.2117	0.0000	728.2864
2017	2.3907	13.8520	30.9744	0.0650	25.2868	0.4338	25.7206	3.7435	0.4019	4.1454	0.0000	5,161.9718	5,161.9718	0.3168	0.0000	5,168.6236
2018	3.0465	15.2884	42.6780	0.0996	6.1635	0.3889	6.5524	1.6523	0.3619	2.0142	0.0000	7,618.2132	7,618.2132	0.3499	0.0000	7,625.5607
2019	2.8109	14.0210	39.9336	0.0992	6.1637	0.3531	6.5168	1.6523	0.3286	1.9809	0.0000	7,373.5494	7,373.5494	0.3315	0.0000	7,380.5103
2020	2.6487	12.5314	37.9819	0.0996	6.1874	0.3194	6.5068	1.6587	0.2971	1.9558	0.0000	7,154.9430	7,154.9430	0.3188	0.0000	7,161.6387
2021	2.4978	10.9430	36.0539	0.0993	6.1638	0.2861	6.4499	1.6524	0.2661	1.9184	0.0000	7,055.3599	7,055.3599	0.3071	0.0000	7,061.8086
2022	2.3677	9.9269	34.2518	0.0989	6.1402	0.2641	6.4043	1.6460	0.2455	1.8916	0.0000	6,953.0919	6,953.0919	0.2965	0.0000	6,959.3181
2023	2.2185	8.4190	32.5738	0.0987	6.1402	0.2483	6.3886	1.6460	0.2307	1.8767	0.0000	6,874.7772	6,874.7772	0.2859	0.0000	6,880.7813
2024	2.1461	8.2333	31.5961	0.1000	6.1875	0.2395	6.4269	1.6587	0.2223	1.8810	0.0000	6,901.0475	6,901.0475	0.2826	0.0000	6,906.9828
2025	2.0552	7.9548	30.3975	0.0996	6.1639	0.2280	6.3919	1.6524	0.2115	1.8639	0.0000	6,819.8294	6,819.8294	0.2749	0.0000	6,825.6033
2026	1.9803	7.7362	29.4217	0.0996	6.1639	0.2234	6.3873	1.6524	0.2073	1.8597	0.0000	6,770.9831	6,770.9831	0.2689	0.0000	6,776.6298
2027	1.9246	7.6302	28.6191	0.0996	6.1639	0.2238	6.3877	1.6524	0.2077	1.8601	0.0000	6,728.7583	6,728.7583	0.2639	0.0000	6,734.3010
2028	1.8643	7.4954	27.8075	0.0992	6.1403	0.2224	6.3627	1.6461	0.2064	1.8524	0.0000	6,666.5493	6,666.5493	0.2585	0.0000	6,671.9768
2029	1.8190	7.4399	27.1941	0.0996	6.1640	0.2234	6.3874	1.6524	0.2073	1.8597	0.0000	6,660.3936	6,660.3936	0.2551	0.0000	6,665.7507

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2030	1.7617	6.7750	26.5915	0.1001	6.1640	0.1743	6.3383	1.6524	0.1622	1.8147	0.0000	6,673.0275	6,673.0275	0.1940	0.0000	6,677.1009
2031	1.7175	6.7050	26.0582	0.1003	6.1640	0.1738	6.3378	1.6524	0.1618	1.8142	0.0000	6,658.2613	6,658.2613	0.1908	0.0000	6,662.2684
2032	1.2364	4.9776	18.7506	0.0722	4.3754	0.1357	4.5111	1.1729	0.1272	1.3001	0.0000	4,800.8391	4,800.8391	0.1373	0.0000	4,803.7214
2033	16.6849	0.6091	2.4226	9.2600e-003	0.5761	0.0263	0.6023	0.1530	0.0259	0.1789	0.0000	585.6778	585.6778	0.0241	0.0000	586.1829
2034	30.6491	0.3213	2.5995	0.0137	1.0452	0.0115	1.0567	0.2776	0.0109	0.2885	0.0000	797.2156	797.2156	0.0308	0.0000	797.8617
Total	**83.2562**	**166.6293**	**517.3091**	**1.5667**	**141.2227**	**4.9642**	**146.1870**	**32.3941**	**4.6109**	**37.0051**	**0.0000**	**109,489.1778**	**109,489.1778**	**4.7357**	**0.0000**	**109,588.6276**

2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	0.6212	6.5859	5.0583	5.4700e-003	0.5102	0.3395	0.8497	0.2741	0.3154	0.5895	0.0000	510.8467	510.8467	0.1368	0.0000	513.7197
2016	0.8153	9.1841	6.3452	7.7400e-003	10.1685	0.4490	10.6174	1.4974	0.4131	1.9104	0.0000	723.8408	723.8408	0.2117	0.0000	728.2856
2017	2.3907	13.8520	30.9744	0.0650	13.4890	0.4338	13.9228	2.2502	0.4019	2.6521	0.0000	5,161.9712	5,161.9712	0.3168	0.0000	5,168.6230
2018	3.0465	15.2884	42.6780	0.0996	6.1635	0.3889	6.5524	1.6523	0.3619	2.0142	0.0000	7,618.2129	7,618.2129	0.3499	0.0000	7,625.5603
2019	2.8109	14.0210	39.9336	0.0992	6.1637	0.3531	6.5168	1.6523	0.3286	1.9809	0.0000	7,373.5491	7,373.5491	0.3315	0.0000	7,380.5100
2020	2.6487	12.5314	37.9819	0.0996	6.1874	0.3194	6.5068	1.6587	0.2971	1.9558	0.0000	7,154.9427	7,154.9427	0.3188	0.0000	7,161.6383
2021	2.4978	10.9430	36.0539	0.0993	6.1638	0.2861	6.4499	1.6524	0.2661	1.9184	0.0000	7,055.3595	7,055.3595	0.3071	0.0000	7,061.8082

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	2.3677	9.9269	34.2518	0.0989	6.1402	0.2641	6.4043	1.6460	0.2455	1.8916	0.0000	6,953.0915	6,953.0915	0.2965	0.0000	6,959.3177
2023	2.2185	8.4190	32.5738	0.0987	6.1402	0.2483	6.3886	1.6460	0.2307	1.8767	0.0000	6,874.7768	6,874.7768	0.2859	0.0000	6,880.7809
2024	2.1461	8.2333	31.5961	0.1000	6.1875	0.2395	6.4269	1.6587	0.2223	1.8810	0.0000	6,901.0472	6,901.0472	0.2826	0.0000	6,906.9824
2025	2.0552	7.9548	30.3975	0.0996	6.1639	0.2280	6.3919	1.6524	0.2115	1.8639	0.0000	6,819.8291	6,819.8291	0.2749	0.0000	6,825.6029
2026	1.9803	7.7362	29.4217	0.0996	6.1639	0.2234	6.3873	1.6524	0.2073	1.8597	0.0000	6,770.9827	6,770.9827	0.2689	0.0000	6,776.6295
2027	1.9246	7.6302	28.6191	0.0996	6.1639	0.2238	6.3877	1.6524	0.2077	1.8601	0.0000	6,728.7579	6,728.7579	0.2639	0.0000	6,734.3006
2028	1.8643	7.4954	27.8075	0.0992	6.1403	0.2224	6.3627	1.6461	0.2064	1.8524	0.0000	6,666.5489	6,666.5489	0.2585	0.0000	6,671.9765
2029	1.8190	7.4399	27.1941	0.0996	6.1640	0.2234	6.3874	1.6524	0.2073	1.8597	0.0000	6,660.3932	6,660.3932	0.2551	0.0000	6,665.7503
2030	1.7617	6.7750	26.5915	0.1001	6.1640	0.1743	6.3383	1.6524	0.1622	1.8147	0.0000	6,673.0271	6,673.0271	0.1940	0.0000	6,677.1004
2031	1.7175	6.7050	26.0582	0.1003	6.1640	0.1738	6.3378	1.6524	0.1618	1.8142	0.0000	6,658.2609	6,658.2609	0.1908	0.0000	6,662.2680
2032	1.2364	4.9776	18.7506	0.0722	4.3754	0.1357	4.5111	1.1729	0.1272	1.3001	0.0000	4,800.8387	4,800.8387	0.1373	0.0000	4,803.7210
2033	16.6849	0.6091	2.4226	9.2600e-003	0.5761	0.0263	0.6023	0.1530	0.0259	0.1789	0.0000	585.6776	585.6776	0.0241	0.0000	586.1828
2034	30.6491	0.3213	2.5995	0.0137	1.0452	0.0115	1.0567	0.2776	0.0109	0.2885	0.0000	797.2156	797.2156	0.0308	0.0000	797.8617
Total	**83.2562**	**166.6293**	**517.3091**	**1.5667**	**116.4348**	**4.9642**	**121.3990**	**28.7520**	**4.6109**	**33.3630**	**0.0000**	**109,489.1701**	**109,489.1701**	**4.7357**	**0.0000**	**109,588.6198**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**17.55**	**0.00**	**16.96**	**11.24**	**0.00**	**9.84**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	63.7871	1.1743	96.4358	0.0614		5.8922	5.8922		5.8913	5.8913	618.4074	1,286.4938	1,904.9012	1.9377	0.0420	1,958.6047
Energy	0.7655	6.5584	2.9056	0.0418		0.5289	0.5289		0.5289	0.5289	0.0000	25,814.6166	25,814.6166	0.9836	0.3124	25,932.1004
Mobile	37.4620	94.1154	415.6377	1.7432	109.8691	2.5118	112.3809	29.4625	2.3179	31.7804	0.0000	113,703.9847	113,703.9847	3.0549	0.0000	113,768.1376
Waste						0.0000	0.0000		0.0000	0.0000	1,417.5042	0.0000	1,417.5042	83.7721	0.0000	3,176.7182
Water						0.0000	0.0000		0.0000	0.0000	193.8329	3,488.2756	3,682.1085	20.0688	0.5033	4,259.5640
Total	**102.0146**	**101.8482**	**514.9791**	**1.8464**	**109.8691**	**8.9330**	**118.8020**	**29.4625**	**8.7382**	**38.2007**	**2,229.7445**	**144,293.3707**	**146,523.1151**	**109.8171**	**0.8576**	**149,095.1249**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	43.9837	0.6905	59.8560	3.1700e-003		0.3331	0.3331		0.3331	0.3331	0.0000	98.1272	98.1272	0.0935	0.0000	100.0906
Energy	0.7655	6.5584	2.9056	0.0418		0.5289	0.5289		0.5289	0.5289	0.0000	25,814.6166	25,814.6166	0.9836	0.3124	25,932.1004
Mobile	34.0335	72.0909	339.2678	1.2215	75.8714	1.8044	77.6758	20.3457	1.6653	22.0110	0.0000	79,676.1425	79,676.1425	2.1784	0.0000	79,721.8891
Waste						0.0000	0.0000		0.0000	0.0000	708.7521	0.0000	708.7521	41.8861	0.0000	1,588.3591
Water						0.0000	0.0000		0.0000	0.0000	193.8329	3,488.2756	3,682.1085	20.0652	0.5025	4,259.2548
Total	**78.7828**	**79.3399**	**402.0294**	**1.2664**	**75.8714**	**2.6663**	**78.5377**	**20.3457**	**2.5273**	**22.8730**	**902.5850**	**109,077.1618**	**109,979.7468**	**65.2067**	**0.8149**	**111,601.6939**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**22.77**	**22.10**	**21.93**	**31.41**	**30.94**	**70.15**	**33.89**	**30.94**	**71.08**	**40.12**	**59.52**	**24.41**	**24.94**	**40.62**	**4.98**	**25.15**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2015	10/7/2015	5	200	
2	Site Preparation	Site Preparation	10/8/2015	3/23/2016	5	120	
3	Grading	Grading	3/24/2016	5/17/2017	5	300	
4	Building Construction	Building Construction	5/18/2017	9/15/2032	5	4000	
5	Paving	Paving	9/16/2032	6/22/2033	5	200	
6	Architectural Coating	Architectural Coating	6/23/2033	12/20/2034	5	390	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 38750

Acres of Paving: 0

Residential Indoor: 16,737,030; Residential Outdoor: 5,579,010; Non-Residential Indoor: 3,165,800; Non-Residential Outdoor: 1,055,267 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Demolition	Excavators	3	8.00	162	0.38
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Excavators	2	8.00	162	0.38
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	125	0.42
Paving	Rollers	2	8.00	80	0.38
Demolition	Rubber Tired Dozers	2	8.00	255	0.40
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Graders	1	8.00	174	0.41
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Paving Equipment	2	8.00	130	0.36
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	3,768.00	968.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	754.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Demolition - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4508	4.8363	3.6074	3.9900e-003		0.2451	0.2451		0.2286	0.2286	0.0000	374.4127	374.4127	0.1015	0.0000	376.5441
Total	**0.4508**	**4.8363**	**3.6074**	**3.9900e-003**		**0.2451**	**0.2451**		**0.2286**	**0.2286**	**0.0000**	**374.4127**	**374.4127**	**0.1015**	**0.0000**	**376.5441**

3.2 Demolition - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.2700e-003	0.0106	0.1103	2.1000e-004	0.0164	1.7000e-004	0.0166	4.3700e-003	1.5000e-004	4.5200e-003	0.0000	16.5931	16.5931	9.9000e-004	0.0000	16.6138
Total	**7.2700e-003**	**0.0106**	**0.1103**	**2.1000e-004**	**0.0164**	**1.7000e-004**	**0.0166**	**4.3700e-003**	**1.5000e-004**	**4.5200e-003**	**0.0000**	**16.5931**	**16.5931**	**9.9000e-004**	**0.0000**	**16.6138**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4508	4.8363	3.6074	3.9900e-003		0.2451	0.2451		0.2286	0.2286	0.0000	374.4122	374.4122	0.1015	0.0000	376.5437
Total	**0.4508**	**4.8363**	**3.6074**	**3.9900e-003**		**0.2451**	**0.2451**		**0.2286**	**0.2286**	**0.0000**	**374.4122**	**374.4122**	**0.1015**	**0.0000**	**376.5437**

3.2 Demolition - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.2700e-003	0.0106	0.1103	2.1000e-004	0.0164	1.7000e-004	0.0166	4.3700e-003	1.5000e-004	4.5200e-003	0.0000	16.5931	16.5931	9.9000e-004	0.0000	16.6138
Total	**7.2700e-003**	**0.0106**	**0.1103**	**2.1000e-004**	**0.0164**	**1.7000e-004**	**0.0166**	**4.3700e-003**	**1.5000e-004**	**4.5200e-003**	**0.0000**	**16.5931**	**16.5931**	**9.9000e-004**	**0.0000**	**16.6138**

3.3 Site Preparation - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0840	0.0000	1.0840	0.5958	0.0000	0.5958	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1605	1.7351	1.3003	1.1900e-003		0.0942	0.0942		0.0867	0.0867	0.0000	113.7684	113.7684	0.0340	0.0000	114.4817
Total	**0.1605**	**1.7351**	**1.3003**	**1.1900e-003**	**1.0840**	**0.0942**	**1.1782**	**0.5958**	**0.0867**	**0.6825**	**0.0000**	**113.7684**	**113.7684**	**0.0340**	**0.0000**	**114.4817**

3.3 Site Preparation - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.6600e-003	3.8700e-003	0.0404	8.0000e-005	6.0200e-003	6.0000e-005	6.0800e-003	1.6000e-003	6.0000e-005	1.6500e-003	0.0000	6.0731	6.0731	3.6000e-004	0.0000	6.0807
Total	**2.6600e-003**	**3.8700e-003**	**0.0404**	**8.0000e-005**	**6.0200e-003**	**6.0000e-005**	**6.0800e-003**	**1.6000e-003**	**6.0000e-005**	**1.6500e-003**	**0.0000**	**6.0731**	**6.0731**	**3.6000e-004**	**0.0000**	**6.0807**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4878	0.0000	0.4878	0.2681	0.0000	0.2681	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1605	1.7351	1.3003	1.1900e-003		0.0942	0.0942		0.0867	0.0867	0.0000	113.7683	113.7683	0.0340	0.0000	114.4815
Total	**0.1605**	**1.7351**	**1.3003**	**1.1900e-003**	**0.4878**	**0.0942**	**0.5820**	**0.2681**	**0.0867**	**0.3548**	**0.0000**	**113.7683**	**113.7683**	**0.0340**	**0.0000**	**114.4815**

3.3 Site Preparation - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.6600e-003	3.8700e-003	0.0404	8.0000e-005	6.0200e-003	6.0000e-005	6.0800e-003	1.6000e-003	6.0000e-005	1.6500e-003	0.0000	6.0731	6.0731	3.6000e-004	0.0000	6.0807
Total	**2.6600e-003**	**3.8700e-003**	**0.0404**	**8.0000e-005**	**6.0200e-003**	**6.0000e-005**	**6.0800e-003**	**1.6000e-003**	**6.0000e-005**	**1.6500e-003**	**0.0000**	**6.0731**	**6.0731**	**3.6000e-004**	**0.0000**	**6.0807**

3.3 Site Preparation - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0840	0.0000	1.0840	0.5958	0.0000	0.5958	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1498	1.6117	1.2126	1.1500e-003		0.0867	0.0867		0.0798	0.0798	0.0000	108.7875	108.7875	0.0328	0.0000	109.4766
Total	**0.1498**	**1.6117**	**1.2126**	**1.1500e-003**	**1.0840**	**0.0867**	**1.1707**	**0.5958**	**0.0798**	**0.6756**	**0.0000**	**108.7875**	**108.7875**	**0.0328**	**0.0000**	**109.4766**

3.3 Site Preparation - 2016

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3200e-003	3.3900e-003	0.0353	7.0000e-005	5.8200e-003	6.0000e-005	5.8700e-003	1.5500e-003	5.0000e-005	1.6000e-003	0.0000	5.6779	5.6779	3.2000e-004	0.0000	5.6846
Total	**2.3200e-003**	**3.3900e-003**	**0.0353**	**7.0000e-005**	**5.8200e-003**	**6.0000e-005**	**5.8700e-003**	**1.5500e-003**	**5.0000e-005**	**1.6000e-003**	**0.0000**	**5.6779**	**5.6779**	**3.2000e-004**	**0.0000**	**5.6846**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4878	0.0000	0.4878	0.2681	0.0000	0.2681	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1498	1.6117	1.2126	1.1500e-003		0.0867	0.0867		0.0798	0.0798	0.0000	108.7873	108.7873	0.0328	0.0000	109.4764
Total	**0.1498**	**1.6117**	**1.2126**	**1.1500e-003**	**0.4878**	**0.0867**	**0.5745**	**0.2681**	**0.0798**	**0.3479**	**0.0000**	**108.7873**	**108.7873**	**0.0328**	**0.0000**	**109.4764**

3.3 Site Preparation - 2016

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3200e-003	3.3900e-003	0.0353	7.0000e-005	5.8200e-003	6.0000e-005	5.8700e-003	1.5500e-003	5.0000e-005	1.6000e-003	0.0000	5.6779	5.6779	3.2000e-004	0.0000	5.6846
Total	**2.3200e-003**	**3.3900e-003**	**0.0353**	**7.0000e-005**	**5.8200e-003**	**6.0000e-005**	**5.8700e-003**	**1.5500e-003**	**5.0000e-005**	**1.6000e-003**	**0.0000**	**5.6779**	**5.6779**	**3.2000e-004**	**0.0000**	**5.6846**

3.4 Grading - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					21.4505	0.0000	21.4505	2.7152	0.0000	2.7152	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.6544	7.5562	4.9629	6.2300e-003		0.3620	0.3620		0.3331	0.3331	0.0000	587.7768	587.7768	0.1773	0.0000	591.5000
Total	**0.6544**	**7.5562**	**4.9629**	**6.2300e-003**	**21.4505**	**0.3620**	**21.8125**	**2.7152**	**0.3331**	**3.0482**	**0.0000**	**587.7768**	**587.7768**	**0.1773**	**0.0000**	**591.5000**

3.4 Grading - 2016

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.8200e-003	0.0129	0.1344	2.8000e-004	0.0221	2.1000e-004	0.0224	5.8800e-003	2.0000e-004	6.0800e-003	0.0000	21.5994	21.5994	1.2300e-003	0.0000	21.6252
Total	**8.8200e-003**	**0.0129**	**0.1344**	**2.8000e-004**	**0.0221**	**2.1000e-004**	**0.0224**	**5.8800e-003**	**2.0000e-004**	**6.0800e-003**	**0.0000**	**21.5994**	**21.5994**	**1.2300e-003**	**0.0000**	**21.6252**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					9.6527	0.0000	9.6527	1.2218	0.0000	1.2218	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.6544	7.5562	4.9629	6.2300e-003		0.3620	0.3620		0.3331	0.3331	0.0000	587.7761	587.7761	0.1773	0.0000	591.4993
Total	**0.6544**	**7.5562**	**4.9629**	**6.2300e-003**	**9.6527**	**0.3620**	**10.0147**	**1.2218**	**0.3331**	**1.5549**	**0.0000**	**587.7761**	**587.7761**	**0.1773**	**0.0000**	**591.4993**

3.4 Grading - 2016

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.8200e-003	0.0129	0.1344	2.8000e-004	0.0221	2.1000e-004	0.0224	5.8800e-003	2.0000e-004	6.0800e-003	0.0000	21.5994	21.5994	1.2300e-003	0.0000	21.6252
Total	**8.8200e-003**	**0.0129**	**0.1344**	**2.8000e-004**	**0.0221**	**2.1000e-004**	**0.0224**	**5.8800e-003**	**2.0000e-004**	**6.0800e-003**	**0.0000**	**21.5994**	**21.5994**	**1.2300e-003**	**0.0000**	**21.6252**

3.4 Grading - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					21.4505	0.0000	21.4505	2.7152	0.0000	2.7152	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2989	3.4100	2.2935	3.0200e-003		0.1625	0.1625		0.1495	0.1495	0.0000	280.6422	280.6422	0.0860	0.0000	282.4480
Total	**0.2989**	**3.4100**	**2.2935**	**3.0200e-003**	**21.4505**	**0.1625**	**21.6131**	**2.7152**	**0.1495**	**2.8647**	**0.0000**	**280.6422**	**280.6422**	**0.0860**	**0.0000**	**282.4480**

3.4 Grading - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.8300e-003	5.6600e-003	0.0589	1.4000e-004	0.0107	1.0000e-004	0.0108	2.8500e-003	9.0000e-005	2.9400e-003	0.0000	10.0862	10.0862	5.5000e-004	0.0000	10.0978
Total	**3.8300e-003**	**5.6600e-003**	**0.0589**	**1.4000e-004**	**0.0107**	**1.0000e-004**	**0.0108**	**2.8500e-003**	**9.0000e-005**	**2.9400e-003**	**0.0000**	**10.0862**	**10.0862**	**5.5000e-004**	**0.0000**	**10.0978**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					9.6527	0.0000	9.6527	1.2218	0.0000	1.2218	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2989	3.4100	2.2934	3.0200e-003		0.1625	0.1625		0.1495	0.1495	0.0000	280.6419	280.6419	0.0860	0.0000	282.4476
Total	**0.2989**	**3.4100**	**2.2934**	**3.0200e-003**	**9.6527**	**0.1625**	**9.8153**	**1.2218**	**0.1495**	**1.3714**	**0.0000**	**280.6419**	**280.6419**	**0.0860**	**0.0000**	**282.4476**

3.4 Grading - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.8300e-003	5.6600e-003	0.0589	1.4000e-004	0.0107	1.0000e-004	0.0108	2.8500e-003	9.0000e-005	2.9400e-003	0.0000	10.0862	10.0862	5.5000e-004	0.0000	10.0978
Total	**3.8300e-003**	**5.6600e-003**	**0.0589**	**1.4000e-004**	**0.0107**	**1.0000e-004**	**0.0108**	**2.8500e-003**	**9.0000e-005**	**2.9400e-003**	**0.0000**	**10.0862**	**10.0862**	**5.5000e-004**	**0.0000**	**10.0978**

3.5 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2513	2.1389	1.4685	2.1700e-003		0.1443	0.1443		0.1355	0.1355	0.0000	193.9781	193.9781	0.0477	0.0000	194.9807
Total	**0.2513**	**2.1389**	**1.4685**	**2.1700e-003**		**0.1443**	**0.1443**		**0.1355**	**0.1355**	**0.0000**	**193.9781**	**193.9781**	**0.0477**	**0.0000**	**194.9807**

3.5 Building Construction - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.6427	6.5360	8.8174	0.0172	0.4811	0.0960	0.5771	0.1372	0.0883	0.2255	0.0000	1,536.0395	1,536.0395	0.0113	0.0000	1,536.2761
Worker	1.1940	1.7615	18.3362	0.0425	3.3445	0.0309	3.3754	0.8883	0.0285	0.9168	0.0000	3,141.2258	3,141.2258	0.1712	0.0000	3,144.8211
Total	**1.8367**	**8.2975**	**27.1536**	**0.0597**	**3.8256**	**0.1269**	**3.9524**	**1.0255**	**0.1168**	**1.1423**	**0.0000**	**4,677.2652**	**4,677.2652**	**0.1825**	**0.0000**	**4,681.0972**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2513	2.1389	1.4685	2.1700e-003		0.1443	0.1443		0.1355	0.1355	0.0000	193.9779	193.9779	0.0477	0.0000	194.9804
Total	**0.2513**	**2.1389**	**1.4685**	**2.1700e-003**		**0.1443**	**0.1443**		**0.1355**	**0.1355**	**0.0000**	**193.9779**	**193.9779**	**0.0477**	**0.0000**	**194.9804**

3.5 Building Construction - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.6427	6.5360	8.8174	0.0172	0.4811	0.0960	0.5771	0.1372	0.0883	0.2255	0.0000	1,536.0395	1,536.0395	0.0113	0.0000	1,536.2761
Worker	1.1940	1.7615	18.3362	0.0425	3.3445	0.0309	3.3754	0.8883	0.0285	0.9168	0.0000	3,141.2258	3,141.2258	0.1712	0.0000	3,144.8211
Total	**1.8367**	**8.2975**	**27.1536**	**0.0597**	**3.8256**	**0.1269**	**3.9524**	**1.0255**	**0.1168**	**1.1423**	**0.0000**	**4,677.2652**	**4,677.2652**	**0.1825**	**0.0000**	**4,681.0972**

3.5 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3483	3.0355	2.2880	3.5000e-003		0.1950	0.1950		0.1833	0.1833	0.0000	308.9844	308.9844	0.0756	0.0000	310.5723
Total	**0.3483**	**3.0355**	**2.2880**	**3.5000e-003**		**0.1950**	**0.1950**		**0.1833**	**0.1833**	**0.0000**	**308.9844**	**308.9844**	**0.0756**	**0.0000**	**310.5723**

3.5 Building Construction - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.9727	9.6767	13.6356	0.0276	0.7752	0.1456	0.9209	0.2211	0.1340	0.3551	0.0000	2,433.8399	2,433.8399	0.0181	0.0000	2,434.2191
Worker	1.7255	2.5761	26.7544	0.0685	5.3883	0.0482	5.4365	1.4311	0.0446	1.4758	0.0000	4,875.3889	4,875.3889	0.2562	0.0000	4,880.7692
Total	**2.6982**	**12.2528**	**40.3900**	**0.0961**	**6.1635**	**0.1939**	**6.3574**	**1.6523**	**0.1786**	**1.8308**	**0.0000**	**7,309.2288**	**7,309.2288**	**0.2743**	**0.0000**	**7,314.9884**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3483	3.0355	2.2880	3.5000e-003		0.1950	0.1950		0.1833	0.1833	0.0000	308.9841	308.9841	0.0756	0.0000	310.5720
Total	**0.3483**	**3.0355**	**2.2880**	**3.5000e-003**		**0.1950**	**0.1950**		**0.1833**	**0.1833**	**0.0000**	**308.9841**	**308.9841**	**0.0756**	**0.0000**	**310.5720**

3.5 Building Construction - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.9727	9.6767	13.6356	0.0276	0.7752	0.1456	0.9209	0.2211	0.1340	0.3551	0.0000	2,433.8399	2,433.8399	0.0181	0.0000	2,434.2191
Worker	1.7255	2.5761	26.7544	0.0685	5.3883	0.0482	5.4365	1.4311	0.0446	1.4758	0.0000	4,875.3889	4,875.3889	0.2562	0.0000	4,880.7692
Total	**2.6982**	**12.2528**	**40.3900**	**0.0961**	**6.1635**	**0.1939**	**6.3574**	**1.6523**	**0.1786**	**1.8308**	**0.0000**	**7,309.2288**	**7,309.2288**	**0.2743**	**0.0000**	**7,314.9884**

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3069	2.7359	2.2342	3.5000e-003		0.1677	0.1677		0.1577	0.1577	0.0000	305.5302	305.5302	0.0743	0.0000	307.0913
Total	**0.3069**	**2.7359**	**2.2342**	**3.5000e-003**		**0.1677**	**0.1677**		**0.1577**	**0.1577**	**0.0000**	**305.5302**	**305.5302**	**0.0743**	**0.0000**	**307.0913**

3.5 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.9218	8.9230	13.1860	0.0275	0.7754	0.1384	0.9138	0.2212	0.1273	0.3485	0.0000	2,383.8784	2,383.8784	0.0177	0.0000	2,384.2494
Worker	1.5822	2.3621	24.5134	0.0682	5.3883	0.0470	5.4353	1.4311	0.0436	1.4747	0.0000	4,684.1409	4,684.1409	0.2395	0.0000	4,689.1696
Total	**2.5040**	**11.2851**	**37.6994**	**0.0957**	**6.1637**	**0.1854**	**6.3491**	**1.6523**	**0.1709**	**1.8232**	**0.0000**	**7,068.0192**	**7,068.0192**	**0.2571**	**0.0000**	**7,073.4191**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3069	2.7359	2.2342	3.5000e-003		0.1677	0.1677		0.1577	0.1577	0.0000	305.5299	305.5299	0.0743	0.0000	307.0909
Total	**0.3069**	**2.7359**	**2.2342**	**3.5000e-003**		**0.1677**	**0.1677**		**0.1577**	**0.1577**	**0.0000**	**305.5299**	**305.5299**	**0.0743**	**0.0000**	**307.0909**

3.5 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.9218	8.9230	13.1860	0.0275	0.7754	0.1384	0.9138	0.2212	0.1273	0.3485	0.0000	2,383.8784	2,383.8784	0.0177	0.0000	2,384.2494
Worker	1.5822	2.3621	24.5134	0.0682	5.3883	0.0470	5.4353	1.4311	0.0436	1.4747	0.0000	4,684.1409	4,684.1409	0.2395	0.0000	4,689.1696
Total	**2.5040**	**11.2851**	**37.6994**	**0.0957**	**6.1637**	**0.1854**	**6.3491**	**1.6523**	**0.1709**	**1.8232**	**0.0000**	**7,068.0192**	**7,068.0192**	**0.2571**	**0.0000**	**7,073.4191**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2766	2.5000	2.2019	3.5100e-003		0.1458	0.1458		0.1371	0.1371	0.0000	302.1514	302.1514	0.0736	0.0000	303.6973
Total	**0.2766**	**2.5000**	**2.2019**	**3.5100e-003**		**0.1458**	**0.1458**		**0.1371**	**0.1371**	**0.0000**	**302.1514**	**302.1514**	**0.0736**	**0.0000**	**303.6973**

3.5 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.8841	7.8335	12.8763	0.0276	0.7785	0.1269	0.9054	0.2221	0.1167	0.3388	0.0000	2,339.6979	2,339.6979	0.0174	0.0000	2,340.0629
Worker	1.4880	2.1979	22.9037	0.0685	5.4090	0.0467	5.4557	1.4366	0.0433	1.4799	0.0000	4,513.0938	4,513.0938	0.2278	0.0000	4,517.8785
Total	**2.3721**	**10.0314**	**35.7800**	**0.0961**	**6.1874**	**0.1736**	**6.3610**	**1.6587**	**0.1601**	**1.8187**	**0.0000**	**6,852.7917**	**6,852.7917**	**0.2452**	**0.0000**	**6,857.9414**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2766	2.5000	2.2019	3.5100e-003		0.1458	0.1458		0.1371	0.1371	0.0000	302.1510	302.1510	0.0736	0.0000	303.6969
Total	**0.2766**	**2.5000**	**2.2019**	**3.5100e-003**		**0.1458**	**0.1458**		**0.1371**	**0.1371**	**0.0000**	**302.1510**	**302.1510**	**0.0736**	**0.0000**	**303.6969**

3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.8841	7.8335	12.8763	0.0276	0.7785	0.1269	0.9054	0.2221	0.1167	0.3388	0.0000	2,339.6979	2,339.6979	0.0174	0.0000	2,340.0629
Worker	1.4880	2.1979	22.9037	0.0685	5.4090	0.0467	5.4557	1.4366	0.0433	1.4799	0.0000	4,513.0938	4,513.0938	0.2278	0.0000	4,517.8785
Total	**2.3721**	**10.0314**	**35.7800**	**0.0961**	**6.1874**	**0.1736**	**6.3610**	**1.6587**	**0.1601**	**1.8187**	**0.0000**	**6,852.7917**	**6,852.7917**	**0.2452**	**0.0000**	**6,857.9414**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2471	2.2629	2.1582	3.5000e-003		0.1246	0.1246		0.1172	0.1172	0.0000	301.0339	301.0339	0.0725	0.0000	302.5568
Total	**0.2471**	**2.2629**	**2.1582**	**3.5000e-003**		**0.1246**	**0.1246**		**0.1172**	**0.1172**	**0.0000**	**301.0339**	**301.0339**	**0.0725**	**0.0000**	**302.5568**

3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.8494	6.6360	12.4894	0.0275	0.7755	0.1151	0.8906	0.2212	0.1059	0.3271	0.0000	2,328.9773	2,328.9773	0.0174	0.0000	2,329.3435
Worker	1.4013	2.0441	21.4064	0.0683	5.3883	0.0464	5.4347	1.4311	0.0430	1.4742	0.0000	4,425.3488	4,425.3488	0.2171	0.0000	4,429.9083
Total	**2.2507**	**8.6801**	**33.8957**	**0.0958**	**6.1638**	**0.1615**	**6.3253**	**1.6524**	**0.1489**	**1.8013**	**0.0000**	**6,754.3260**	**6,754.3260**	**0.2346**	**0.0000**	**6,759.2517**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2471	2.2629	2.1582	3.5000e-003		0.1246	0.1246		0.1172	0.1172	0.0000	301.0335	301.0335	0.0725	0.0000	302.5565
Total	**0.2471**	**2.2629**	**2.1582**	**3.5000e-003**		**0.1246**	**0.1246**		**0.1172**	**0.1172**	**0.0000**	**301.0335**	**301.0335**	**0.0725**	**0.0000**	**302.5565**

3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.8494	6.6360	12.4894	0.0275	0.7755	0.1151	0.8906	0.2212	0.1059	0.3271	0.0000	2,328.9773	2,328.9773	0.0174	0.0000	2,329.3435
Worker	1.4013	2.0441	21.4064	0.0683	5.3883	0.0464	5.4347	1.4311	0.0430	1.4742	0.0000	4,425.3488	4,425.3488	0.2171	0.0000	4,429.9083
Total	**2.2507**	**8.6801**	**33.8957**	**0.0958**	**6.1638**	**0.1615**	**6.3253**	**1.6524**	**0.1489**	**1.8013**	**0.0000**	**6,754.3260**	**6,754.3260**	**0.2346**	**0.0000**	**6,759.2517**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2209	2.0197	2.1226	3.4900e-003		0.1047	0.1047		0.0986	0.0986	0.0000	299.9946	299.9946	0.0718	0.0000	301.5017
Total	**0.2209**	**2.0197**	**2.1226**	**3.4900e-003**		**0.1047**	**0.1047**		**0.0986**	**0.0986**	**0.0000**	**299.9946**	**299.9946**	**0.0718**	**0.0000**	**301.5017**

3.5 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.8269	6.0012	12.1194	0.0273	0.7726	0.1134	0.8859	0.2204	0.1043	0.3247	0.0000	2,318.1444	2,318.1444	0.0178	0.0000	2,318.5172
Worker	1.3199	1.9059	20.0098	0.0681	5.3677	0.0460	5.4137	1.4257	0.0427	1.4683	0.0000	4,334.9529	4,334.9529	0.2070	0.0000	4,339.2992
Total	**2.1468**	**7.9071**	**32.1292**	**0.0954**	**6.1402**	**0.1594**	**6.2996**	**1.6460**	**0.1470**	**1.7930**	**0.0000**	**6,653.0973**	**6,653.0973**	**0.2247**	**0.0000**	**6,657.8164**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2209	2.0197	2.1226	3.4900e-003		0.1047	0.1047		0.0986	0.0986	0.0000	299.9943	299.9943	0.0718	0.0000	301.5013
Total	**0.2209**	**2.0197**	**2.1226**	**3.4900e-003**		**0.1047**	**0.1047**		**0.0986**	**0.0986**	**0.0000**	**299.9943**	**299.9943**	**0.0718**	**0.0000**	**301.5013**

3.5 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.8269	6.0012	12.1194	0.0273	0.7726	0.1134	0.8859	0.2204	0.1043	0.3247	0.0000	2,318.1444	2,318.1444	0.0178	0.0000	2,318.5172
Worker	1.3199	1.9059	20.0098	0.0681	5.3677	0.0460	5.4137	1.4257	0.0427	1.4683	0.0000	4,334.9529	4,334.9529	0.2070	0.0000	4,339.2992
Total	**2.1468**	**7.9071**	**32.1292**	**0.0954**	**6.1402**	**0.1594**	**6.2996**	**1.6460**	**0.1470**	**1.7930**	**0.0000**	**6,653.0973**	**6,653.0973**	**0.2247**	**0.0000**	**6,657.8164**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2036	1.8606	2.1072	3.4900e-003		0.0906	0.0906		0.0852	0.0852	0.0000	300.0980	300.0980	0.0713	0.0000	301.5949
Total	**0.2036**	**1.8606**	**2.1072**	**3.4900e-003**		**0.0906**	**0.0906**		**0.0852**	**0.0852**	**0.0000**	**300.0980**	**300.0980**	**0.0713**	**0.0000**	**301.5949**

3.5 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.7674	4.7693	11.6701	0.0272	0.7726	0.1119	0.8845	0.2204	0.1030	0.3234	0.0000	2,307.1981	2,307.1981	0.0160	0.0000	2,307.5334
Worker	1.2476	1.7891	18.7965	0.0681	5.3677	0.0458	5.4135	1.4257	0.0425	1.4681	0.0000	4,267.4811	4,267.4811	0.1987	0.0000	4,271.6530
Total	**2.0150**	**6.5584**	**30.4666**	**0.0952**	**6.1403**	**0.1577**	**6.2980**	**1.6461**	**0.1455**	**1.7915**	**0.0000**	**6,574.6792**	**6,574.6792**	**0.2146**	**0.0000**	**6,579.1864**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2036	1.8606	2.1072	3.4900e-003		0.0906	0.0906		0.0852	0.0852	0.0000	300.0976	300.0976	0.0713	0.0000	301.5946
Total	**0.2036**	**1.8606**	**2.1072**	**3.4900e-003**		**0.0906**	**0.0906**		**0.0852**	**0.0852**	**0.0000**	**300.0976**	**300.0976**	**0.0713**	**0.0000**	**301.5946**

3.5 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.7674	4.7693	11.6701	0.0272	0.7726	0.1119	0.8845	0.2204	0.1030	0.3234	0.0000	2,307.1981	2,307.1981	0.0160	0.0000	2,307.5334
Worker	1.2476	1.7891	18.7965	0.0681	5.3677	0.0458	5.4135	1.4257	0.0425	1.4681	0.0000	4,267.4811	4,267.4811	0.1987	0.0000	4,271.6530
Total	**2.0150**	**6.5584**	**30.4666**	**0.0952**	**6.1403**	**0.1577**	**6.2980**	**1.6461**	**0.1455**	**1.7915**	**0.0000**	**6,574.6792**	**6,574.6792**	**0.2146**	**0.0000**	**6,579.1864**

3.5 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1920	1.7524	2.1135	3.5200e-003		0.0800	0.0800		0.0752	0.0752	0.0000	302.4646	302.4646	0.0714	0.0000	303.9643
Total	**0.1920**	**1.7524**	**2.1135**	**3.5200e-003**		**0.0800**	**0.0800**		**0.0752**	**0.0752**	**0.0000**	**302.4646**	**302.4646**	**0.0714**	**0.0000**	**303.9643**

3.5 Building Construction - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.7591	4.7768	11.5017	0.0275	0.7785	0.1129	0.8915	0.2221	0.1039	0.3260	0.0000	2,330.0727	2,330.0727	0.0163	0.0000	2,330.4146
Worker	1.1951	1.7041	17.9810	0.0691	5.4090	0.0466	5.4555	1.4366	0.0432	1.4798	0.0000	4,268.5103	4,268.5103	0.1949	0.0000	4,272.6038
Total	**1.9542**	**6.4808**	**29.4827**	**0.0965**	**6.1875**	**0.1595**	**6.3470**	**1.6587**	**0.1471**	**1.8058**	**0.0000**	**6,598.5829**	**6,598.5829**	**0.2112**	**0.0000**	**6,603.0185**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1920	1.7524	2.1135	3.5200e-003		0.0800	0.0800		0.0752	0.0752	0.0000	302.4642	302.4642	0.0714	0.0000	303.9639
Total	**0.1920**	**1.7524**	**2.1135**	**3.5200e-003**		**0.0800**	**0.0800**		**0.0752**	**0.0752**	**0.0000**	**302.4642**	**302.4642**	**0.0714**	**0.0000**	**303.9639**

3.5 Building Construction - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.7591	4.7768	11.5017	0.0275	0.7785	0.1129	0.8915	0.2221	0.1039	0.3260	0.0000	2,330.0727	2,330.0727	0.0163	0.0000	2,330.4146
Worker	1.1951	1.7041	17.9810	0.0691	5.4090	0.0466	5.4555	1.4366	0.0432	1.4798	0.0000	4,268.5103	4,268.5103	0.1949	0.0000	4,272.6038
Total	**1.9542**	**6.4808**	**29.4827**	**0.0965**	**6.1875**	**0.1595**	**6.3470**	**1.6587**	**0.1471**	**1.8058**	**0.0000**	**6,598.5829**	**6,598.5829**	**0.2112**	**0.0000**	**6,603.0185**

3.5 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1777	1.6195	2.0948	3.5000e-003		0.0685	0.0685		0.0645	0.0645	0.0000	301.4019	301.4019	0.0707	0.0000	302.8874
Total	**0.1777**	**1.6195**	**2.0948**	**3.5000e-003**		**0.0685**	**0.0685**		**0.0645**	**0.0645**	**0.0000**	**301.4019**	**301.4019**	**0.0707**	**0.0000**	**302.8874**

3.5 Building Construction - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.7435	4.7254	11.2665	0.0273	0.7756	0.1131	0.8886	0.2212	0.1040	0.3253	0.0000	2,321.2959	2,321.2959	0.0163	0.0000	2,321.6379
Worker	1.1340	1.6099	17.0363	0.0688	5.3883	0.0464	5.4347	1.4311	0.0430	1.4742	0.0000	4,197.1316	4,197.1316	0.1879	0.0000	4,201.0779
Total	**1.8775**	**6.3353**	**28.3027**	**0.0961**	**6.1639**	**0.1595**	**6.3233**	**1.6524**	**0.1471**	**1.7994**	**0.0000**	**6,518.4275**	**6,518.4275**	**0.2042**	**0.0000**	**6,522.7158**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1777	1.6195	2.0948	3.5000e-003		0.0685	0.0685		0.0645	0.0645	0.0000	301.4015	301.4015	0.0707	0.0000	302.8871
Total	**0.1777**	**1.6195**	**2.0948**	**3.5000e-003**		**0.0685**	**0.0685**		**0.0645**	**0.0645**	**0.0000**	**301.4015**	**301.4015**	**0.0707**	**0.0000**	**302.8871**

3.5 Building Construction - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.7435	4.7254	11.2665	0.0273	0.7756	0.1131	0.8886	0.2212	0.1040	0.3253	0.0000	2,321.2959	2,321.2959	0.0163	0.0000	2,321.6379
Worker	1.1340	1.6099	17.0363	0.0688	5.3883	0.0464	5.4347	1.4311	0.0430	1.4742	0.0000	4,197.1316	4,197.1316	0.1879	0.0000	4,201.0779
Total	**1.8775**	**6.3353**	**28.3027**	**0.0961**	**6.1639**	**0.1595**	**6.3233**	**1.6524**	**0.1471**	**1.7994**	**0.0000**	**6,518.4275**	**6,518.4275**	**0.2042**	**0.0000**	**6,522.7158**

3.5 Building Construction - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1777	1.6195	2.0948	3.5000e-003		0.0685	0.0685		0.0645	0.0645	0.0000	301.4019	301.4019	0.0707	0.0000	302.8874
Total	**0.1777**	**1.6195**	**2.0948**	**3.5000e-003**		**0.0685**	**0.0685**		**0.0645**	**0.0645**	**0.0000**	**301.4019**	**301.4019**	**0.0707**	**0.0000**	**302.8874**

3.5 Building Construction - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.7203	4.5832	11.0575	0.0273	0.7756	0.1083	0.8839	0.2212	0.0997	0.3209	0.0000	2,320.8183	2,320.8183	0.0158	0.0000	2,321.1497
Worker	1.0824	1.5336	16.2694	0.0688	5.3883	0.0466	5.4349	1.4311	0.0432	1.4744	0.0000	4,148.7629	4,148.7629	0.1824	0.0000	4,152.5927
Total	**1.8026**	**6.1168**	**27.3269**	**0.0961**	**6.1639**	**0.1549**	**6.3188**	**1.6524**	**0.1429**	**1.7953**	**0.0000**	**6,469.5812**	**6,469.5812**	**0.1982**	**0.0000**	**6,473.7424**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1777	1.6195	2.0948	3.5000e-003		0.0685	0.0685		0.0645	0.0645	0.0000	301.4015	301.4015	0.0707	0.0000	302.8871
Total	**0.1777**	**1.6195**	**2.0948**	**3.5000e-003**		**0.0685**	**0.0685**		**0.0645**	**0.0645**	**0.0000**	**301.4015**	**301.4015**	**0.0707**	**0.0000**	**302.8871**

3.5 Building Construction - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.7203	4.5832	11.0575	0.0273	0.7756	0.1083	0.8839	0.2212	0.0997	0.3209	0.0000	2,320.8183	2,320.8183	0.0158	0.0000	2,321.1497
Worker	1.0824	1.5336	16.2694	0.0688	5.3883	0.0466	5.4349	1.4311	0.0432	1.4744	0.0000	4,148.7629	4,148.7629	0.1824	0.0000	4,152.5927
Total	**1.8026**	**6.1168**	**27.3269**	**0.0961**	**6.1639**	**0.1549**	**6.3188**	**1.6524**	**0.1429**	**1.7953**	**0.0000**	**6,469.5812**	**6,469.5812**	**0.1982**	**0.0000**	**6,473.7424**

3.5 Building Construction - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1777	1.6195	2.0948	3.5000e-003		0.0685	0.0685		0.0645	0.0645	0.0000	301.4019	301.4019	0.0707	0.0000	302.8874
Total	**0.1777**	**1.6195**	**2.0948**	**3.5000e-003**		**0.0685**	**0.0685**		**0.0645**	**0.0645**	**0.0000**	**301.4019**	**301.4019**	**0.0707**	**0.0000**	**302.8874**

3.5 Building Construction - 2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.7129	4.5460	10.9419	0.0273	0.7756	0.1086	0.8842	0.2213	0.0999	0.3212	0.0000	2,320.9919	2,320.9919	0.0158	0.0000	2,321.3241
Worker	1.0340	1.4647	15.5825	0.0688	5.3883	0.0467	5.4350	1.4311	0.0433	1.4745	0.0000	4,106.3645	4,106.3645	0.1774	0.0000	4,110.0895
Total	**1.7469**	**6.0107**	**26.5243**	**0.0961**	**6.1639**	**0.1553**	**6.3192**	**1.6524**	**0.1433**	**1.7956**	**0.0000**	**6,427.3564**	**6,427.3564**	**0.1932**	**0.0000**	**6,431.4136**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1777	1.6195	2.0948	3.5000e-003		0.0685	0.0685		0.0645	0.0645	0.0000	301.4015	301.4015	0.0707	0.0000	302.8871
Total	**0.1777**	**1.6195**	**2.0948**	**3.5000e-003**		**0.0685**	**0.0685**		**0.0645**	**0.0645**	**0.0000**	**301.4015**	**301.4015**	**0.0707**	**0.0000**	**302.8871**

3.5 Building Construction - 2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.7129	4.5460	10.9419	0.0273	0.7756	0.1086	0.8842	0.2213	0.0999	0.3212	0.0000	2,320.9919	2,320.9919	0.0158	0.0000	2,321.3241
Worker	1.0340	1.4647	15.5825	0.0688	5.3883	0.0467	5.4350	1.4311	0.0433	1.4745	0.0000	4,106.3645	4,106.3645	0.1774	0.0000	4,110.0895
Total	**1.7469**	**6.0107**	**26.5243**	**0.0961**	**6.1639**	**0.1553**	**6.3192**	**1.6524**	**0.1433**	**1.7956**	**0.0000**	**6,427.3564**	**6,427.3564**	**0.1932**	**0.0000**	**6,431.4136**

3.5 Building Construction - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1770	1.6133	2.0867	3.4900e-003		0.0683	0.0683		0.0642	0.0642	0.0000	300.2471	300.2471	0.0705	0.0000	301.7269
Total	**0.1770**	**1.6133**	**2.0867**	**3.4900e-003**		**0.0683**	**0.0683**		**0.0642**	**0.0642**	**0.0000**	**300.2471**	**300.2471**	**0.0705**	**0.0000**	**301.7269**

3.5 Building Construction - 2028

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.7010	4.4848	10.7937	0.0272	0.7727	0.1075	0.8802	0.2204	0.0989	0.3193	0.0000	2,312.1304	2,312.1304	0.0157	0.0000	2,312.4597
Worker	0.9863	1.3973	14.9271	0.0685	5.3677	0.0466	5.4143	1.4257	0.0433	1.4689	0.0000	4,054.1719	4,054.1719	0.1723	0.0000	4,057.7902
Total	**1.6873**	**5.8821**	**25.7207**	**0.0957**	**6.1403**	**0.1541**	**6.2945**	**1.6461**	**0.1422**	**1.7882**	**0.0000**	**6,366.3022**	**6,366.3022**	**0.1880**	**0.0000**	**6,370.2499**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1770	1.6133	2.0867	3.4900e-003		0.0683	0.0683		0.0642	0.0642	0.0000	300.2467	300.2467	0.0705	0.0000	301.7266
Total	**0.1770**	**1.6133**	**2.0867**	**3.4900e-003**		**0.0683**	**0.0683**		**0.0642**	**0.0642**	**0.0000**	**300.2467**	**300.2467**	**0.0705**	**0.0000**	**301.7266**

3.5 Building Construction - 2028

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.7010	4.4848	10.7937	0.0272	0.7727	0.1075	0.8802	0.2204	0.0989	0.3193	0.0000	2,312.1304	2,312.1304	0.0157	0.0000	2,312.4597
Worker	0.9863	1.3973	14.9271	0.0685	5.3677	0.0466	5.4143	1.4257	0.0433	1.4689	0.0000	4,054.1719	4,054.1719	0.1723	0.0000	4,057.7902
Total	**1.6873**	**5.8821**	**25.7207**	**0.0957**	**6.1403**	**0.1541**	**6.2945**	**1.6461**	**0.1422**	**1.7882**	**0.0000**	**6,366.3022**	**6,366.3022**	**0.1880**	**0.0000**	**6,370.2499**

3.5 Building Construction - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1777	1.6195	2.0948	3.5000e-003		0.0685	0.0685		0.0645	0.0645	0.0000	301.4019	301.4019	0.0707	0.0000	302.8874
Total	**0.1777**	**1.6195**	**2.0948**	**3.5000e-003**		**0.0685**	**0.0685**		**0.0645**	**0.0645**	**0.0000**	**301.4019**	**301.4019**	**0.0707**	**0.0000**	**302.8874**

3.5 Building Construction - 2029

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.6956	4.4797	10.7135	0.0273	0.7757	0.1081	0.8837	0.2213	0.0994	0.3207	0.0000	2,321.1073	2,321.1073	0.0158	0.0000	2,321.4383
Worker	0.9457	1.3407	14.3859	0.0688	5.3883	0.0468	5.4351	1.4311	0.0435	1.4746	0.0000	4,037.8845	4,037.8845	0.1686	0.0000	4,041.4250
Total	**1.6413**	**5.8204**	**25.0993**	**0.0961**	**6.1640**	**0.1549**	**6.3189**	**1.6524**	**0.1429**	**1.7953**	**0.0000**	**6,358.9917**	**6,358.9917**	**0.1844**	**0.0000**	**6,362.8633**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1777	1.6195	2.0948	3.5000e-003		0.0685	0.0685		0.0645	0.0645	0.0000	301.4015	301.4015	0.0707	0.0000	302.8871
Total	**0.1777**	**1.6195**	**2.0948**	**3.5000e-003**		**0.0685**	**0.0685**		**0.0645**	**0.0645**	**0.0000**	**301.4015**	**301.4015**	**0.0707**	**0.0000**	**302.8871**

3.5 Building Construction - 2029

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.6956	4.4797	10.7135	0.0273	0.7757	0.1081	0.8837	0.2213	0.0994	0.3207	0.0000	2,321.1073	2,321.1073	0.0158	0.0000	2,321.4383
Worker	0.9457	1.3407	14.3859	0.0688	5.3883	0.0468	5.4351	1.4311	0.0435	1.4746	0.0000	4,037.8845	4,037.8845	0.1686	0.0000	4,041.4250
Total	**1.6413**	**5.8204**	**25.0993**	**0.0961**	**6.1640**	**0.1549**	**6.3189**	**1.6524**	**0.1429**	**1.7953**	**0.0000**	**6,358.9917**	**6,358.9917**	**0.1844**	**0.0000**	**6,362.8633**

3.5 Building Construction - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1702	1.0333	2.1051	4.0200e-003		0.0193	0.0193		0.0193	0.0193	0.0000	341.5281	341.5281	0.0137	0.0000	341.8160
Total	**0.1702**	**1.0333**	**2.1051**	**4.0200e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**341.5281**	**341.5281**	**0.0137**	**0.0000**	**341.8160**

3.5 Building Construction - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.6882	4.4601	10.6344	0.0273	0.7757	0.1082	0.8839	0.2213	0.0996	0.3209	0.0000	2,321.1325	2,321.1325	0.0158	0.0000	2,321.4639
Worker	0.9032	1.2816	13.8519	0.0688	5.3883	0.0468	5.4351	1.4311	0.0434	1.4745	0.0000	4,010.3669	4,010.3669	0.1645	0.0000	4,013.8209
Total	**1.5915**	**5.7417**	**24.4864**	**0.0961**	**6.1640**	**0.1550**	**6.3190**	**1.6524**	**0.1430**	**1.7954**	**0.0000**	**6,331.4994**	**6,331.4994**	**0.1803**	**0.0000**	**6,335.2848**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1702	1.0333	2.1051	4.0200e-003		0.0193	0.0193		0.0193	0.0193	0.0000	341.5277	341.5277	0.0137	0.0000	341.8156
Total	**0.1702**	**1.0333**	**2.1051**	**4.0200e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**341.5277**	**341.5277**	**0.0137**	**0.0000**	**341.8156**

3.5 Building Construction - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.6882	4.4601	10.6344	0.0273	0.7757	0.1082	0.8839	0.2213	0.0996	0.3209	0.0000	2,321.1325	2,321.1325	0.0158	0.0000	2,321.4639
Worker	0.9032	1.2816	13.8519	0.0688	5.3883	0.0468	5.4351	1.4311	0.0434	1.4745	0.0000	4,010.3669	4,010.3669	0.1645	0.0000	4,013.8209
Total	**1.5915**	**5.7417**	**24.4864**	**0.0961**	**6.1640**	**0.1550**	**6.3190**	**1.6524**	**0.1430**	**1.7954**	**0.0000**	**6,331.4994**	**6,331.4994**	**0.1803**	**0.0000**	**6,335.2848**

3.5 Building Construction - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1702	1.0333	2.1051	4.0200e-003		0.0193	0.0193		0.0193	0.0193	0.0000	341.5281	341.5281	0.0137	0.0000	341.8160
Total	**0.1702**	**1.0333**	**2.1051**	**4.0200e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**341.5281**	**341.5281**	**0.0137**	**0.0000**	**341.8160**

3.5 Building Construction - 2031

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.6852	4.4464	10.5795	0.0273	0.7757	0.1078	0.8834	0.2213	0.0991	0.3204	0.0000	2,322.3659	2,322.3659	0.0159	0.0000	2,322.6992
Worker	0.8620	1.2254	13.3737	0.0689	5.3883	0.0468	5.4351	1.4311	0.0434	1.4746	0.0000	3,994.3673	3,994.3673	0.1612	0.0000	3,997.7532
Total	**1.5473**	**5.6718**	**23.9531**	**0.0962**	**6.1640**	**0.1546**	**6.3185**	**1.6524**	**0.1426**	**1.7950**	**0.0000**	**6,316.7332**	**6,316.7332**	**0.1771**	**0.0000**	**6,320.4524**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1702	1.0333	2.1051	4.0200e-003		0.0193	0.0193		0.0193	0.0193	0.0000	341.5277	341.5277	0.0137	0.0000	341.8156
Total	**0.1702**	**1.0333**	**2.1051**	**4.0200e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**341.5277**	**341.5277**	**0.0137**	**0.0000**	**341.8156**

3.5 Building Construction - 2031

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.6852	4.4464	10.5795	0.0273	0.7757	0.1078	0.8834	0.2213	0.0991	0.3204	0.0000	2,322.3659	2,322.3659	0.0159	0.0000	2,322.6992
Worker	0.8620	1.2254	13.3737	0.0689	5.3883	0.0468	5.4351	1.4311	0.0434	1.4746	0.0000	3,994.3673	3,994.3673	0.1612	0.0000	3,997.7532
Total	**1.5473**	**5.6718**	**23.9531**	**0.0962**	**6.1640**	**0.1546**	**6.3185**	**1.6524**	**0.1426**	**1.7950**	**0.0000**	**6,316.7332**	**6,316.7332**	**0.1771**	**0.0000**	**6,320.4524**

3.5 Building Construction - 2032

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1206	0.7324	1.4922	2.8500e-003		0.0137	0.0137		0.0137	0.0137	0.0000	242.0793	242.0793	9.7200e-003	0.0000	242.2834
Total	**0.1206**	**0.7324**	**1.4922**	**2.8500e-003**		**0.0137**	**0.0137**		**0.0137**	**0.0137**	**0.0000**	**242.0793**	**242.0793**	**9.7200e-003**	**0.0000**	**242.2834**

3.5 Building Construction - 2032

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.4831	3.1420	7.4742	0.0194	0.5498	0.0765	0.6263	0.1568	0.0704	0.2272	0.0000	1,646.1805	1,646.1805	0.0113	0.0000	1,646.4171
Worker	0.5796	0.8331	9.1716	0.0488	3.8193	0.0331	3.8524	1.0144	0.0307	1.0451	0.0000	2,817.1028	2,817.1028	0.1118	0.0000	2,819.4512
Total	**1.0627**	**3.9751**	**16.6458**	**0.0682**	**4.3691**	**0.1096**	**4.4787**	**1.1712**	**0.1011**	**1.2723**	**0.0000**	**4,463.2834**	**4,463.2834**	**0.1231**	**0.0000**	**4,465.8683**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1206	0.7324	1.4922	2.8500e-003		0.0137	0.0137		0.0137	0.0137	0.0000	242.0790	242.0790	9.7200e-003	0.0000	242.2831
Total	**0.1206**	**0.7324**	**1.4922**	**2.8500e-003**		**0.0137**	**0.0137**		**0.0137**	**0.0137**	**0.0000**	**242.0790**	**242.0790**	**9.7200e-003**	**0.0000**	**242.2831**

3.5 Building Construction - 2032

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.4831	3.1420	7.4742	0.0194	0.5498	0.0765	0.6263	0.1568	0.0704	0.2272	0.0000	1,646.1805	1,646.1805	0.0113	0.0000	1,646.4171
Worker	0.5796	0.8331	9.1716	0.0488	3.8193	0.0331	3.8524	1.0144	0.0307	1.0451	0.0000	2,817.1028	2,817.1028	0.1118	0.0000	2,819.4512
Total	**1.0627**	**3.9751**	**16.6458**	**0.0682**	**4.3691**	**0.1096**	**4.4787**	**1.1712**	**0.1011**	**1.2723**	**0.0000**	**4,463.2834**	**4,463.2834**	**0.1231**	**0.0000**	**4,465.8683**

3.6 Paving - 2032

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0522	0.2687	0.5975	1.0600e-003		0.0125	0.0125		0.0125	0.0125	0.0000	90.8087	90.8087	4.2600e-003	0.0000	90.8981
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0522**	**0.2687**	**0.5975**	**1.0600e-003**		**0.0125**	**0.0125**		**0.0125**	**0.0125**	**0.0000**	**90.8087**	**90.8087**	**4.2600e-003**	**0.0000**	**90.8981**

3.6 Paving - 2032

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.6000e-004	1.3800e-003	0.0152	8.0000e-005	6.3300e-003	5.0000e-005	6.3800e-003	1.6800e-003	5.0000e-005	1.7300e-003	0.0000	4.6677	4.6677	1.9000e-004	0.0000	4.6716
Total	**9.6000e-004**	**1.3800e-003**	**0.0152**	**8.0000e-005**	**6.3300e-003**	**5.0000e-005**	**6.3800e-003**	**1.6800e-003**	**5.0000e-005**	**1.7300e-003**	**0.0000**	**4.6677**	**4.6677**	**1.9000e-004**	**0.0000**	**4.6716**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0522	0.2687	0.5975	1.0600e-003		0.0125	0.0125		0.0125	0.0125	0.0000	90.8086	90.8086	4.2600e-003	0.0000	90.8980
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0522**	**0.2687**	**0.5975**	**1.0600e-003**		**0.0125**	**0.0125**		**0.0125**	**0.0125**	**0.0000**	**90.8086**	**90.8086**	**4.2600e-003**	**0.0000**	**90.8980**

3.6 Paving - 2032

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.6000e-004	1.3800e-003	0.0152	8.0000e-005	6.3300e-003	5.0000e-005	6.3800e-003	1.6800e-003	5.0000e-005	1.7300e-003	0.0000	4.6677	4.6677	1.9000e-004	0.0000	4.6716
Total	**9.6000e-004**	**1.3800e-003**	**0.0152**	**8.0000e-005**	**6.3300e-003**	**5.0000e-005**	**6.3800e-003**	**1.6800e-003**	**5.0000e-005**	**1.7300e-003**	**0.0000**	**4.6677**	**4.6677**	**1.9000e-004**	**0.0000**	**4.6716**

3.6 Paving - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0833	0.4293	0.9544	1.6900e-003		0.0199	0.0199		0.0199	0.0199	0.0000	145.0581	145.0581	6.8000e-003	0.0000	145.2009
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0833**	**0.4293**	**0.9544**	**1.6900e-003**		**0.0199**	**0.0199**		**0.0199**	**0.0199**	**0.0000**	**145.0581**	**145.0581**	**6.8000e-003**	**0.0000**	**145.2009**

3.6 Paving - 2033

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4600e-003	2.1300e-003	0.0236	1.3000e-004	0.0101	9.0000e-005	0.0102	2.6800e-003	8.0000e-005	2.7700e-003	0.0000	7.4249	7.4249	2.9000e-004	0.0000	7.4310
Total	**1.4600e-003**	**2.1300e-003**	**0.0236**	**1.3000e-004**	**0.0101**	**9.0000e-005**	**0.0102**	**2.6800e-003**	**8.0000e-005**	**2.7700e-003**	**0.0000**	**7.4249**	**7.4249**	**2.9000e-004**	**0.0000**	**7.4310**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0833	0.4293	0.9544	1.6900e-003		0.0199	0.0199		0.0199	0.0199	0.0000	145.0579	145.0579	6.8000e-003	0.0000	145.2007
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0833**	**0.4293**	**0.9544**	**1.6900e-003**		**0.0199**	**0.0199**		**0.0199**	**0.0199**	**0.0000**	**145.0579**	**145.0579**	**6.8000e-003**	**0.0000**	**145.2007**

3.6 Paving - 2033

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4600e-003	2.1300e-003	0.0236	1.3000e-004	0.0101	9.0000e-005	0.0102	2.6800e-003	8.0000e-005	2.7700e-003	0.0000	7.4249	7.4249	2.9000e-004	0.0000	7.4310
Total	**1.4600e-003**	**2.1300e-003**	**0.0236**	**1.3000e-004**	**0.0101**	**9.0000e-005**	**0.0102**	**2.6800e-003**	**8.0000e-005**	**2.7700e-003**	**0.0000**	**7.4249**	**7.4249**	**2.9000e-004**	**0.0000**	**7.4310**

3.7 Architectural Coating - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	16.5092					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.9600e-003	0.0587	0.1232	2.0000e-004		1.3900e-003	1.3900e-003		1.3900e-003	1.3900e-003	0.0000	17.4898	17.4898	7.1000e-004	0.0000	17.5047
Total	**16.5181**	**0.0587**	**0.1232**	**2.0000e-004**		**1.3900e-003**	**1.3900e-003**		**1.3900e-003**	**1.3900e-003**	**0.0000**	**17.4898**	**17.4898**	**7.1000e-004**	**0.0000**	**17.5047**

3.7 Architectural Coating - 2033

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0820	0.1190	1.3215	7.2400e-003	0.5660	4.8800e-003	0.5709	0.1503	4.5300e-003	0.1549	0.0000	415.7051	415.7051	0.0163	0.0000	416.0464
Total	**0.0820**	**0.1190**	**1.3215**	**7.2400e-003**	**0.5660**	**4.8800e-003**	**0.5709**	**0.1503**	**4.5300e-003**	**0.1549**	**0.0000**	**415.7051**	**415.7051**	**0.0163**	**0.0000**	**416.0464**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	16.5092					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.9600e-003	0.0587	0.1232	2.0000e-004		1.3900e-003	1.3900e-003		1.3900e-003	1.3900e-003	0.0000	17.4898	17.4898	7.1000e-004	0.0000	17.5046
Total	**16.5181**	**0.0587**	**0.1232**	**2.0000e-004**		**1.3900e-003**	**1.3900e-003**		**1.3900e-003**	**1.3900e-003**	**0.0000**	**17.4898**	**17.4898**	**7.1000e-004**	**0.0000**	**17.5046**

3.7 Architectural Coating - 2033

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0820	0.1190	1.3215	7.2400e-003	0.5660	4.8800e-003	0.5709	0.1503	4.5300e-003	0.1549	0.0000	415.7051	415.7051	0.0163	0.0000	416.0464
Total	**0.0820**	**0.1190**	**1.3215**	**7.2400e-003**	**0.5660**	**4.8800e-003**	**0.5709**	**0.1503**	**4.5300e-003**	**0.1549**	**0.0000**	**415.7051**	**415.7051**	**0.0163**	**0.0000**	**416.0464**

3.7 Architectural Coating - 2034

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	30.4877					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0165	0.1083	0.2274	3.8000e-004		2.5700e-003	2.5700e-003		2.5700e-003	2.5700e-003	0.0000	32.2987	32.2987	1.3100e-003	0.0000	32.3261
Total	**30.5043**	**0.1083**	**0.2274**	**3.8000e-004**		**2.5700e-003**	**2.5700e-003**		**2.5700e-003**	**2.5700e-003**	**0.0000**	**32.2987**	**32.2987**	**1.3100e-003**	**0.0000**	**32.3261**

3.7 Architectural Coating - 2034

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1449	0.2130	2.3721	0.0134	1.0452	8.9700e-003	1.0542	0.2776	8.3300e-003	0.2859	0.0000	764.9170	764.9170	0.0295	0.0000	765.5356
Total	**0.1449**	**0.2130**	**2.3721**	**0.0134**	**1.0452**	**8.9700e-003**	**1.0542**	**0.2776**	**8.3300e-003**	**0.2859**	**0.0000**	**764.9170**	**764.9170**	**0.0295**	**0.0000**	**765.5356**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	30.4877					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0165	0.1083	0.2274	3.8000e-004		2.5700e-003	2.5700e-003		2.5700e-003	2.5700e-003	0.0000	32.2986	32.2986	1.3100e-003	0.0000	32.3261
Total	**30.5043**	**0.1083**	**0.2274**	**3.8000e-004**		**2.5700e-003**	**2.5700e-003**		**2.5700e-003**	**2.5700e-003**	**0.0000**	**32.2986**	**32.2986**	**1.3100e-003**	**0.0000**	**32.3261**

3.7 Architectural Coating - 2034

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1449	0.2130	2.3721	0.0134	1.0452	8.9700e-003	1.0542	0.2776	8.3300e-003	0.2859	0.0000	764.9170	764.9170	0.0295	0.0000	765.5356
Total	**0.1449**	**0.2130**	**2.3721**	**0.0134**	**1.0452**	**8.9700e-003**	**1.0542**	**0.2776**	**8.3300e-003**	**0.2859**	**0.0000**	**764.9170**	**764.9170**	**0.0295**	**0.0000**	**765.5356**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

Increase Diversity

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	34.0335	72.0909	339.2678	1.2215	75.8714	1.8044	77.6758	20.3457	1.6653	22.0110	0.0000	79,676.1425	79,676.1425	2.1784	0.0000	79,721.8891
Unmitigated	37.4620	94.1154	415.6377	1.7432	109.8691	2.5118	112.3809	29.4625	2.3179	31.7804	0.0000	113,703.9847	113,703.9847	3.0549	0.0000	113,768.1376

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	18,241.12	19,818.88	16801.76	62,400,240	43,091,231
General Office Building	3,936.30	847.32	350.37	9,608,775	6,635,454
Office Park	4,213.98	605.16	280.44	10,597,138	7,317,980
Single Family Housing	29,226.78	30,784.32	26783.58	99,440,000	68,669,479
Strip Mall	61,339.32	58,183.78	28275.32	106,859,458	73,793,074
Total	116,957.50	110,239.46	72,491.47	288,905,610	199,507,218

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
General Office Building	16.60	8.40	6.90	33.00	48.00	19.00	77	19	4
Office Park	16.60	8.40	6.90	33.00	48.00	19.00	82	15	3
Single Family Housing	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Strip Mall	16.60	8.40	6.90	16.60	64.40	19.00	45	40	15

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.491908	0.059855	0.185077	0.131229	0.044940	0.007356	0.019164	0.046757	0.003019	0.003347	0.004084	0.000506	0.002760

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	18,238.4733	18,238.4733	0.8384	0.1735	18,309.8499
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	18,238.4733	18,238.4733	0.8384	0.1735	18,309.8499
NaturalGas Mitigated	0.7655	6.5584	2.9056	0.0418		0.5289	0.5289		0.5289	0.5289	0.0000	7,576.1433	7,576.1433	0.1452	0.1389	7,622.2504
NaturalGas Unmitigated	0.7655	6.5584	2.9056	0.0418		0.5289	0.5289		0.5289	0.5289	0.0000	7,576.1433	7,576.1433	0.1452	0.1389	7,622.2504

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Office Building	1.30495e+006	7.0400e-003	0.0640	0.0537	3.8000e-004		4.8600e-003	4.8600e-003		4.8600e-003	4.8600e-003	0.0000	69.6372	69.6372	1.3300e-003	1.2800e-003	70.0610
Office Park	1.13283e+006	6.1100e-003	0.0555	0.0467	3.3000e-004		4.2200e-003	4.2200e-003		4.2200e-003	4.2200e-003	0.0000	60.4521	60.4521	1.1600e-003	1.1100e-003	60.8200
Single Family Housing	1.03124e+008	0.5561	4.7518	2.0220	0.0303		0.3842	0.3842		0.3842	0.3842	0.0000	5,503.0986	5,503.0986	0.1055	0.1009	5,536.5896
Strip Mall	3.21091e+006	0.0173	0.1574	0.1322	9.4000e-004		0.0120	0.0120		0.0120	0.0120	0.0000	171.3463	171.3463	3.2800e-003	3.1400e-003	172.3891
Apartments Mid Rise	3.31987e+007	0.1790	1.5297	0.6510	9.7600e-003		0.1237	0.1237		0.1237	0.1237	0.0000	1,771.6091	1,771.6091	0.0340	0.0325	1,782.3908
Total		**0.7655**	**6.5584**	**2.9056**	**0.0417**		**0.5289**	**0.5289**		**0.5289**	**0.5289**	**0.0000**	**7,576.1433**	**7,576.1433**	**0.1452**	**0.1389**	**7,622.2504**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Office Park	1.13283e+006	6.1100e-003	0.0555	0.0467	3.3000e-004		4.2200e-003	4.2200e-003		4.2200e-003	4.2200e-003	0.0000	60.4521	60.4521	1.1600e-003	1.1100e-003	60.8200
Single Family Housing	1.03124e+008	0.5561	4.7518	2.0220	0.0303		0.3842	0.3842		0.3842	0.3842	0.0000	5,503.0986	5,503.0986	0.1055	0.1009	5,536.5896
Strip Mall	3.21091e+006	0.0173	0.1574	0.1322	9.4000e-004		0.0120	0.0120		0.0120	0.0120	0.0000	171.3463	171.3463	3.2800e-003	3.1400e-003	172.3891
Apartments Mid Rise	3.31987e+007	0.1790	1.5297	0.6510	9.7600e-003		0.1237	0.1237		0.1237	0.1237	0.0000	1,771.6091	1,771.6091	0.0340	0.0325	1,782.3908
General Office Building	1.30495e+006	7.0400e-003	0.0640	0.0537	3.8000e-004		4.8600e-003	4.8600e-003		4.8600e-003	4.8600e-003	0.0000	69.6372	69.6372	1.3300e-003	1.2800e-003	70.0610
Total		**0.7655**	**6.5584**	**2.9056**	**0.0417**		**0.5289**	**0.5289**		**0.5289**	**0.5289**	**0.0000**	**7,576.1433**	**7,576.1433**	**0.1452**	**0.1389**	**7,622.2504**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	1.06702e+007	3,053.4571	0.1404	0.0290	3,065.4069
General Office Building	3.8219e+006	1,093.7011	0.0503	0.0104	1,097.9813
Office Park	4.11435e+006	1,177.3908	0.0541	0.0112	1,181.9985
Single Family Housing	2.34536e+007	6,711.6497	0.3085	0.0638	6,737.9158
Strip Mall	2.16736e+007	6,202.2747	0.2851	0.0590	6,226.5474
Total		**18,238.4733**	**0.8384**	**0.1735**	**18,309.8499**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	1.06702e+007	3,053.4571	0.1404	0.0290	3,065.4069
General Office Building	3.8219e+006	1,093.7011	0.0503	0.0104	1,097.9813
Office Park	4.11435e+006	1,177.3908	0.0541	0.0112	1,181.9985
Single Family Housing	2.34536e+007	6,711.6497	0.3085	0.0638	6,737.9158
Strip Mall	2.16736e+007	6,202.2747	0.2851	0.0590	6,226.5474
Total		**18,238.4733**	**0.8384**	**0.1735**	**18,309.8499**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	43.9837	0.6905	59.8560	3.1700e-003		0.3331	0.3331		0.3331	0.3331	0.0000	98.1272	98.1272	0.0935	0.0000	100.0906
Unmitigated	63.7871	1.1743	96.4358	0.0614		5.8922	5.8922		5.8913	5.8913	618.4074	1,286.4938	1,904.9012	1.9377	0.0420	1,958.6047

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	5.4334					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	37.4927					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	19.0697	0.4838	36.5798	0.0582		5.5592	5.5592		5.5583	5.5583	618.4074	1,188.3667	1,806.7741	1.8442	0.0420	1,858.5142
Landscaping	1.7913	0.6905	59.8560	3.1700e-003		0.3331	0.3331		0.3331	0.3331	0.0000	98.1272	98.1272	0.0935	0.0000	100.0906
Total	**63.7871**	**1.1743**	**96.4358**	**0.0614**		**5.8922**	**5.8922**		**5.8913**	**5.8913**	**618.4074**	**1,286.4938**	**1,904.9012**	**1.9377**	**0.0420**	**1,958.6047**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	4.6997					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	37.4927					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.7913	0.6905	59.8560	3.1700e-003		0.3331	0.3331		0.3331	0.3331	0.0000	98.1272	98.1272	0.0935	0.0000	100.0906
Total	**43.9837**	**0.6905**	**59.8560**	**3.1700e-003**		**0.3331**	**0.3331**		**0.3331**	**0.3331**	**0.0000**	**98.1272**	**98.1272**	**0.0935**	**0.0000**	**100.0906**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	3,682.1085	20.0652	0.5025	4,259.2548
Unmitigated	3,682.1085	20.0688	0.5033	4,259.5640

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	180.346 / 113.697	1,090.6956	5.9241	0.1486	1,261.1638
General Office Building	63.5434 / 38.9459	380.7547	2.0871	0.0523	440.8038
Office Park	65.5838 / 40.1965	392.9808	2.1542	0.0540	454.9580
Single Family Housing	198.98 / 125.444	1,203.3903	6.5362	0.1639	1,391.4719
Strip Mall	102.517 / 62.8331	614.2871	3.3673	0.0844	711.1667
Total		**3,682.1085**	**20.0688**	**0.5033**	**4,259.5640**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	180.346 / 113.697	1,090.6956	5.9230	0.1484	1,261.0725
General Office Building	63.5434 / 38.9459	380.7547	2.0868	0.0522	440.7716
Office Park	65.5838 / 40.1965	392.9808	2.1538	0.0539	454.9248
Single Family Housing	198.98 / 125.444	1,203.3903	6.5350	0.1637	1,391.3712
Strip Mall	102.517 / 62.8331	614.2871	3.3667	0.0843	711.1148
Total		**3,682.1085**	**20.0652**	**0.5025**	**4,259.2548**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	708.7521	41.8861	0.0000	1,588.3591
Unmitigated	1,417.5042	83.7721	0.0000	3,176.7182

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	1273.28	258.4643	15.2748	0.0000	579.2352
General Office Building	332.49	67.4925	3.9887	0.0000	151.2550
Office Park	343.17	69.6604	4.1168	0.0000	156.1135
Single Family Housing	3580.94	726.8985	42.9585	0.0000	1,629.0263
Strip Mall	1453.21	294.9885	17.4333	0.0000	661.0882
Total		**1,417.5042**	**83.7721**	**0.0000**	**3,176.7182**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	636.64	129.2322	7.6374	0.0000	289.6176
General Office Building	166.245	33.7462	1.9944	0.0000	75.6275
Office Park	171.585	34.8302	2.0584	0.0000	78.0567
Single Family Housing	1790.47	363.4492	21.4792	0.0000	814.5132
Strip Mall	726.605	147.4943	8.7167	0.0000	330.5441
Total		**708.7521**	**41.8861**	**0.0000**	**1,588.3591**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

Greenhouse Gas Emission Worksheet
N20 Mobile Emissions Chino Hills General Plan Update

From URBEMIS 2007 Vehicle Fleet Mix Output:

Annual VMT: 199,507,218

Vehicle Type	Percent Type	CH4 Emission Factor (g/mile)*	CH4 Emission (g/mile)**	N2O Emission Factor (g/mile)*	N2O Emission (g/mile)**
Light Auto	46.0%	0.04	0.0184	0.04	0.0184
Light Truck < 3750 lbs	10.3%	0.05	0.00515	0.06	0.00618
Light Truck 3751-5750 lbs	23.2%	0.05	0.0116	0.06	0.01392
Med Truck 5751-8500 lbs	12.2%	0.12	0.01464	0.2	0.0244
Lite-Heavy Truck 8501-10,000 lbs	2.1%	0.12	0.00252	0.2	0.0042
Lite-Heavy Truck 10,001-14,000 lbs	0.5%	0.09	0.00045	0.125	0.000625
Med-Heavy Truck 14,001-33,000 lbs	1.0%	0.06	0.0006	0.05	0.0005
Heavy-Heavy Truck 33,001-60,000 lbs	2.9%	0.06	0.00174	0.05	0.00145
Other Bus	0.1%	0.06	0.00006	0.05	0.00005
Urban Bus	0.1%	0.06	0.00006	0.05	0.00005
Motorcycle	1.1%	0.09	0.00099	0.01	0.00011
School Bus	0.1%	0.06	0.00006	0.05	0.00005
Motor Home	0.4%	0.09	0.00036	0.125	0.0005
Total	**100.0%**		**0.05663**		**0.070435**

Total Emissions (metric tons) =
Emission Factor by Vehicle Mix (g/mi) x Annual VMT(mi) x 0.000001 metric tons/g

Conversion to Carbon Dioxide Equivalency (CO2e) Units based on Global Warming Potential (GWP)

CH4	21	GWP
N2O	310	GWP
1 ton (short, US) =	0.90718474	metric ton

Annual Mobile Emissions:

	Total Emissions		Total CO2e units	
N20 Emissions:	14.0523	metric tons N2O	**4,356.21**	metric tons CO2e
		Project Total:	***4,356.21***	***metric tons CO2e***

References

* from Table C.4: Methane and Nitrous Oxide Emission Factors for Mobile Sources by Vehicle and Fuel Type (g/mile).
in California Climate Action Registry General Reporting Protocol, Reporting Entity-Wide Greenhouse Gas Emissions, Version 3.1, January 2009.
Assume Model year 2000-present, gasoline fueled.
** Source: California Climate Action Registry General Reporting Protocol, Reporting Entity-Wide Greenhouse Gas Emissions, Version 3.1, January 2009.
*** From URBEMIS 2007 results for mobile sources

Appendix H – Noise Element: Technical Noise Memorandum, Prepared by Wieland Acoustics, dated November 13, 2013

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Noise Element
Technical Memorandum
for the
City of Chino Hills General Plan

Project File 12.042.00
November 13, 2013

Prepared for:

City of Chino Hills
14000 City Center Drive
Chino Hills, CA 91709

Prepared by:

David L. Wieland, Principal Consultant
Jonathan L. Higginson, Senior Consultant

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1 Introduction

The Noise Element of a General Plan is a comprehensive approach for including noise control in the planning process. It is a tool for achieving and maintaining environmental noise levels compatible with land use. The Noise Element identifies noise-sensitive land uses and noise sources, defines areas of noise impact, and establishes goals, policies, and programs so that residents in the City of Chino Hills will be protected from excessive noise.

This technical memorandum provides definitions of common acoustical terms, a description of the effects of noise on people, a discussion of existing noise regulations, discussions of both the existing and future noise environments throughout the City, and a discussion of programmatic noise mitigation measures.

2 Common Definitions

2.1 Decibels

Sound pressures can be measured in units called microPascals (µPa). However, expressing sound levels in terms of µPa would be very cumbersome since it would require a wide range of very large numbers. For this reason, sound pressure levels are described in logarithmic units of ratios of actual sound pressures to a reference pressure squared. These units are called bels. In order to provide a finer resolution, a bel is subdivided into ten decibels, abbreviated dB.

Since decibels are logarithmic units, sound pressure levels cannot be added or subtracted by ordinary arithmetic means. For example, if one automobile produces a sound pressure level of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB. In fact, they would combine to produce 73 dB. This same principle can be applied to other traffic quantities as well. In other words, doubling the traffic volume on a street or the speed of the traffic will increase the traffic noise level by 3 dB. Conversely, halving the traffic volume or speed will reduce the traffic noise level by 3 dB.

2.2 A-Weighting

Sound pressure level alone is not a reliable indicator of loudness. The frequency or pitch of a sound also has a substantial effect on how humans will respond. While the intensity of the sound is a purely physical quantity, the loudness or human response depends on the characteristics of the human ear.

Human hearing is limited not only to the range of audible frequencies, but also in the way it perceives the sound pressure level in that range. In general, the healthy human ear is most sensitive to frequencies between 1,000 Hz and 5,000 Hz, and perceives both higher and lower frequency sounds of the same magnitude with less intensity. [Frequency is measured in cycles per second, or Hertz (Hz). One Hertz equals one cycle per second.] In order to approximate the frequency response of the human ear, a series of sound pressure level adjustments is usually applied to the sound

measured by a sound level meter. The adjustments, or weighting network, are frequency dependent.

Of all the various scales available for measuring noise, the A-weighted sound pressure level [identified as dBA] is the scale of measurement that is most useful in community noise measurement. The A-scale approximates the frequency response of the average young ear when listening to most ordinary everyday sounds. When people make relative judgments of the loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. A range of noise levels associated with common in- and outdoor activities is shown in Figure 2-1.

The A-weighted sound level of traffic and other long-term noise-producing activities within and around a community varies considerably with time. Measurements of this varying noise level are accomplished by recording values of the A-weighted level during representative periods within a specified portion of the day.

2.3 Community Noise Equivalent Level (CNEL)

It is recognized that a given level of noise may be more or less tolerable depending on the duration of exposure experienced by an individual. There are numerous measures of noise exposure that consider not only the A-level variation of noise but also the duration of the disturbance. The community noise equivalent level (denoted CNEL) measure weights the average noise levels for the evening hours (7:00 p.m. to 10:00 p.m.) by increasing them 5 dB, and weights the average noise levels for the nighttime hours (10:00 p.m. to 7:00 a.m.) by increasing them 10 dB. The daytime noise levels are combined with these weighted levels and are averaged to obtain a CNEL value. Figure 2-2 indicates the outdoor CNEL at typical locations throughout the Southern California area.

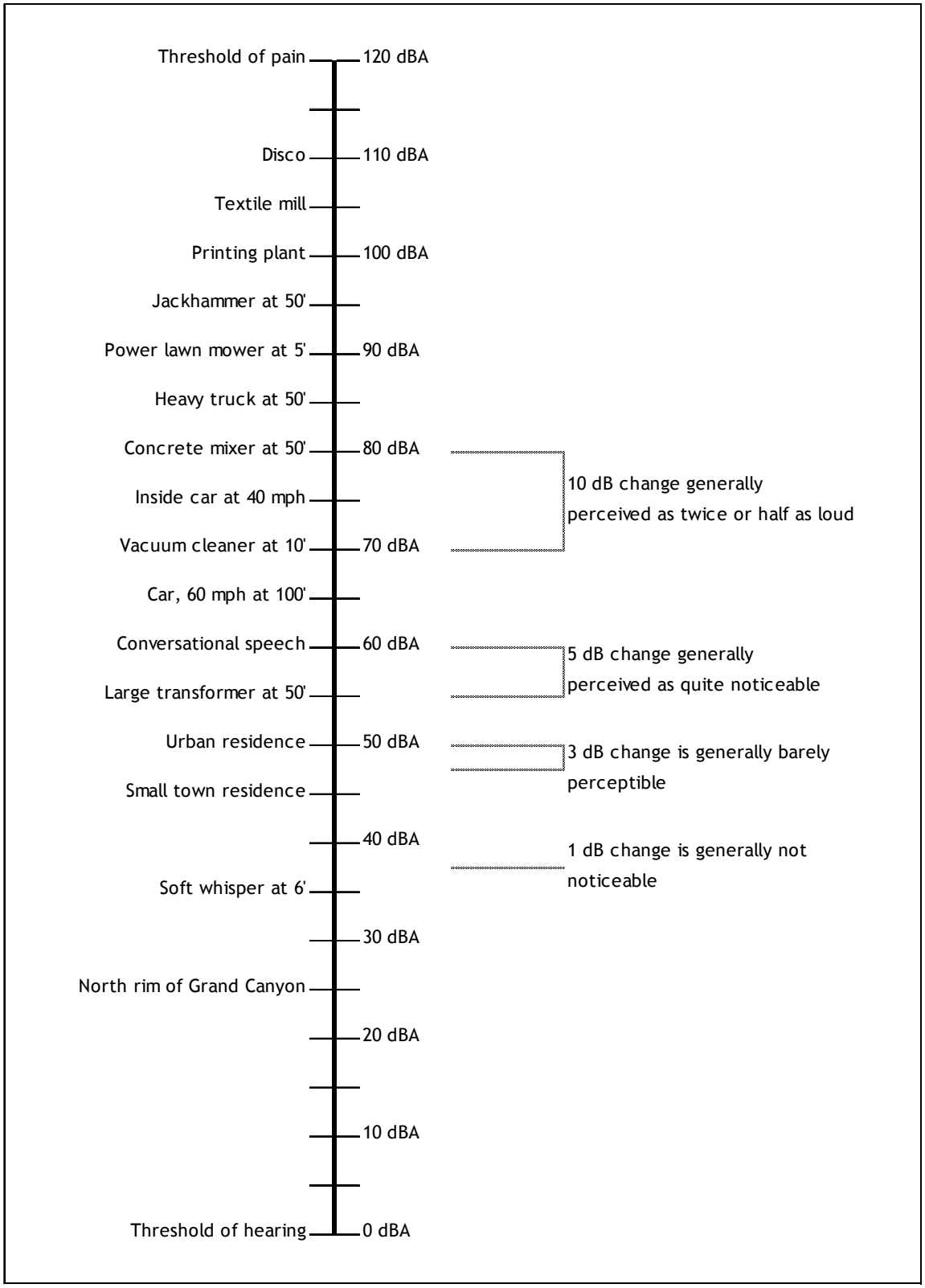


Figure 2-1. Common Noise Sources and A-Weighted Noise Levels

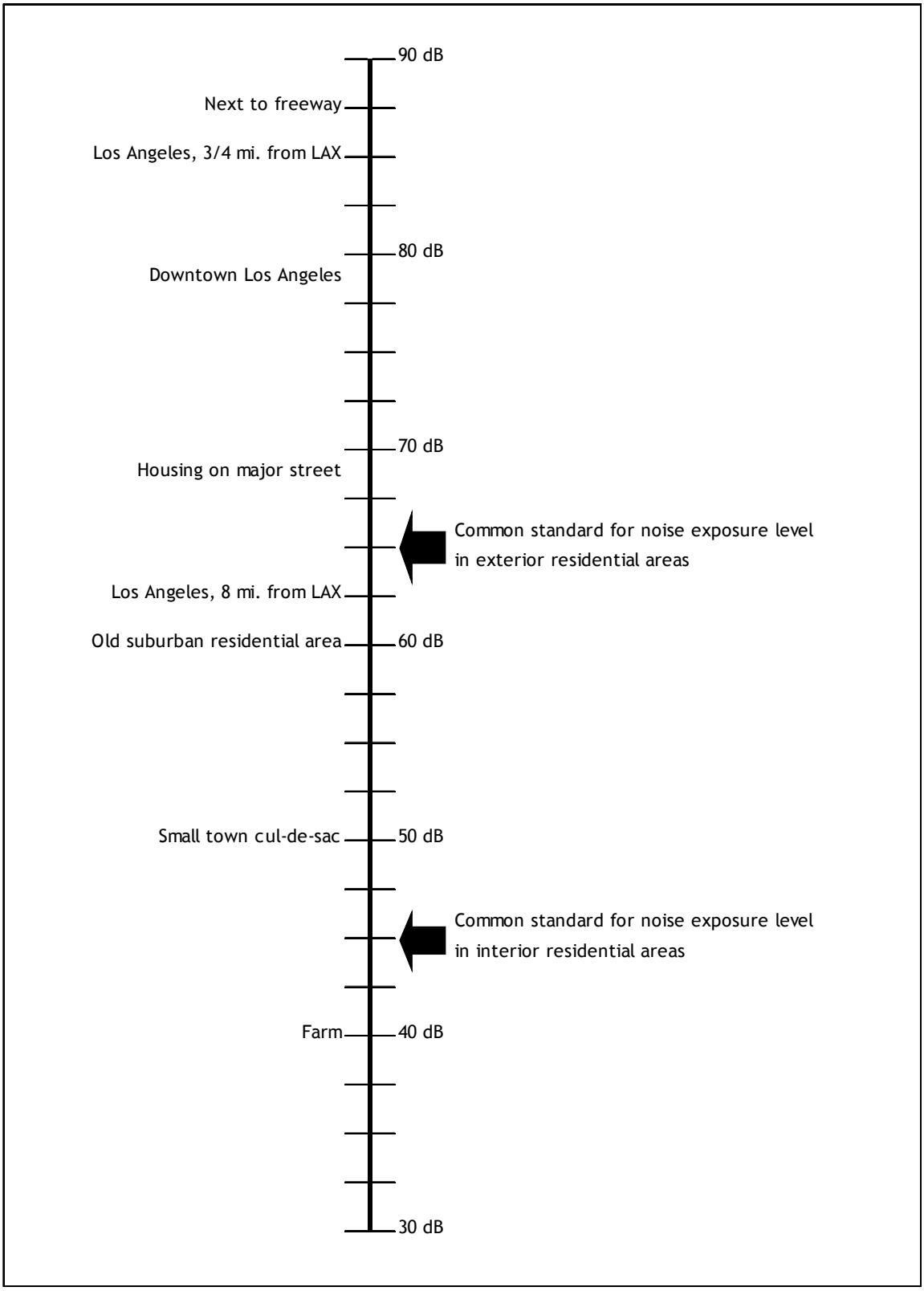


Figure 2-2. Common CNEL Noise Exposure Levels at Various Locations

3 Effects of Noise on People

In general, noise may affect the average individual in the following ways:

3.1 General Hearing Loss or Damage

Sound levels which exceed 85 dBA, when experienced for long durations during each working day, may result in severe temporary or even permanent hearing loss. State and federal safety and health regulations currently protect workers at levels of exposure that exceed 90 dBA for each 8-hour workday.

3.2 Interference with Oral Communication

Speech intelligibility is impaired when sound levels exceed 60 dBA. The amount of interference increases with sound level, and with distance between speaker and listener.

3.3 Sleep Interference

Sound levels that exceed 40 to 45 dBA are generally considered excessive for sleeping areas within a residence.

4 Regulatory Environment

4.1 California Administrative Code Section 65302(f)

California Government Code Section 65302(f) requires that all General Plans include a Noise Element to address noise problems in the community. State law also requires that current and future noise level contours be developed for the following sources:

- Highways and freeways.
- Primary arterials and major local streets.
- Passenger and freight on-line railroad operations and ground rapid transit systems.
- Commercial, general aviation, heliport, and military airport operations, aircraft flyovers, jet engine tests stands and all other ground facilities and maintenance functions related to airport operation.
- Local industrial plants, including, but not limited to, railroad classification yards.
- Other stationary ground noise sources identified by local agencies as contributing to the community noise environment.

4.2 California Environmental Quality Act (CEQA) Guidelines

The California Environmental Quality Act (CEQA) was adopted by the state legislature in response to a public mandate for thorough environmental analysis of projects that might affect the environment. Excessive noise is considered an environmental impact under CEQA. The provisions of the law and environmental review procedures are described in the CEQA Statutes and the CEQA Guidelines. Implementation of CEQA ensures that during the decision making stage of development, City officials and the general public will be able to assess the noise impacts associated with public and private development projects.

4.3 California State Building Code

Title 24, Part 2, of the California Code of Regulations requires all multifamily residential dwellings, hotels, and motels exposed to a CNEL of 60 dB or greater to have an acoustical study performed that shows how an interior CNEL of 45 dB or less will be achieved in habitable rooms. Title 24 is commonly referred to as the State's Noise Insulation Standards.

4.4 California Green Building Standards Code

Section 5.507 of the Code places mandatory requirements on the design of new non-residential buildings that are located within the 65 dB CNEL noise contour of an airport, freeway, expressway, railroad, industrial source, or fixed-guideway source as determined by the Noise Element of the General Plan. The purpose of the design requirements is to achieve a 1-hour average noise level of 50 dBA or less within occupied interior spaces. Buildings with few or no occupants or where occupants are not likely to be affected by exterior noise, as determined by the enforcement authority, such as factories, stadiums, storage, enclosed parking structures, and utility buildings, are not required to comply with the mandatory design requirements.

Division 5.7 of the Code places the same mandatory requirements on the design of additions or alterations to existing non-residential buildings. However, the requirements only apply to the portions of the building being added or altered, and only for additions or alterations on or after the dates shown in the following table:

Effective Date of Compliance	Square Footage of Addition	Permit Valuation or Estimated Construction Cost of Alteration
July 1, 2012	2,000	$500,000
Effective date of the 2013 *California Building Standards Code*	1,000	$200,000

4.5 Existing Noise Element of the Chino Hills General Plan (September 1994)

The stated purpose of the existing Noise Element is to identify noise levels, and to establish policies and programs designed to minimize the effects of noise on people living and working in Chino Hills. Towards this end, the Noise Element focuses on:

- Reducing the exposure of existing residences, schools, parks, libraries, and community centers to transportation noise;
- Minimizing the number of new residences constructed within areas of high noise levels or incorporating measures to reduce noise exposure;
- Establishing guidelines for new construction along roadways where noise may be a problem; and
- Identifying, mitigating, and reducing intermittent or short-term noise.

To achieve its stated purpose, the Noise Element identifies the following thirteen policies:

Policy 1-1: To the extent feasible, improve noise conditions in Chino Hills through the active, ongoing efforts of the City in coordination with other government agencies.

Policy 1-2: Increase public input on environmental noise issues, and establish a program for the monitoring and abatement of local noise sources.

Policy 1-3: Prohibit through truck traffic in noise-sensitive areas, such as school sites located in Chino Hills.

Policy 1-4: Minimize through vehicular traffic in the City's residential areas.

Policy 1-5: Utilize Transportation Demand Management measures (TDM) to decrease congestion along major roadways, and at major intersections.

Policy 1-6: Enforce State motor vehicle noise standards for cars, trucks, and motorcycles.

Policy 1-7: Incorporate sound attenuation measures in residential developments where outdoor ambient noise levels exceed 65 dB CNEL.

Policy 1-8: Incorporate ambient noise level considerations into land use decisions involving schools, hospitals, and similar noise sensitive uses.

Policy 1-9: Ensure all new developments provide adequate sound insulation or other protection from existing and projected noise sources.

Policy 1-10: Utilize the development approval process to ensure that buildings are sited and traffic circulation systems designed to minimize the impact of noise-generating activities on noise sensitive land uses.

Policy 1-11: Enforce standards that specify acceptable noise limits for various land uses throughout the City. Table N-1 (reproduced below) shows criteria used to assess the compatibility of proposed land uses with the noise environment. These criteria are the bases of specific Noise Standards.

Policy 1-12: Enforce the provisions of the State of California Uniform Building Code, which specifies that the indoor noise levels for multi-family residential living spaces not exceed 45 dB CNEL due to the combined effect of all noise sources. The State requires implementation of this standard when the outdoor noise levels exceed 60 dB CNEL. The Noise Referral Zones (the 60 dB CNEL contour) can be used to determine when this standard needs to be addressed. The Code requires that this standard be applied to all new hotels, motels, apartment houses and dwellings other than detached

single-family dwellings. The City will also, as a matter of policy, apply this standard to single-family dwellings.

Policy 1-13: Ensure that equipment, machinery, fan, and air conditioning noise does not exceed specified levels, established in the City's noise ordinance.

Table N-1. Noise/Land Use Compatibility Matrix

Land Use Categories		CNEL, dB						
Categories	Compatible Uses	<55	60	65	70	75	80>	
Residential	Single-Family, Duplex, Multiple Family	A	B	C	C	C	D	D
Residential	Mobile Homes	A	B	C	C	C	D	D
Commercial – Regional, District	Hotel, Motel, Transient Lodging	A	A	B	B	C	C	D
Commercial – Regional, Village District, Special	Commercial Retail, Bank, Restaurant, Movie Theater	A	A	A	B	B	B	C
Commercial, Industrial, Institutional	Office Building, Research and Development, Professional Offices, City Office Building	A	A	A	B	B	C	D
Commercial – Recreation Institutional – Civic Center	Amphitheater, Concert Hall Auditorium, Meeting Hall	B	B	C	C	D	D	D
Commercial – Recreation	Children's Amusement Park, Miniature Golf Course, Go-Cart Track, Equestrian Center, Sports Club	A	A	A	B	B	D	D
Commercial – General, Special Industrial, Institutional	Automobile, Service Station, Auto Dealership, Manufacturing, Warehousing, Wholesale, Utilities	A	A	A	A	A	B	B
Institutional – General	Hospital, Church, Library, Schools, Classroom	A	B	B	C	C	D	D
Open Space	Parks	A	A	A	B	C	D	D
Open Space	Golf Course, Cemeteries, Nature Centers, Wildlife Habitat	A	A	A	A	B	C	C
Agriculture	Agriculture	A	A	A	A	A	A	A

Zone A, Clearly Compatible: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.
Zone B, Normally Compatible: New construction or development should be undertaken only after detailed analysis of the noise reduction requirements are made and needed noise insulation features in the design are determined. Conventional construction, with closed windows and fresh air supply systems or air conditioning, will normally suffice.
Zone C, Requires Analysis and Mitigation: Potential noise impacts exist. If new construction or development is proposed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included in the design.
Zone D, Clearly Incompatible: New construction or development should generally not be undertaken.

4.6 City of Chino Hills Municipal Code

The City's Municipal Code provides, among other things, a basis for controlling excessive and annoying noise. Some of the more pertinent chapters of the Municipal Code are discussed in the following sections.

4.6.1 Chapter 6.04.040, Noisy or At-Large Animals – Public Nuisance

This chapter defines the circumstances under which an animal may be deemed a nuisance.

4.6.2 Chapter 6.04.060, Barking Dogs – Declaration of Complaint

This chapter defines the circumstances under which a barking dog may be deemed a nuisance.

4.6.3 Chapter 8.08.020, Regulation of Construction Noise

This chapter regulates the hours during which construction activities are permitted on weekdays and Saturdays. No construction is permitted on Sundays or holidays.

4.6.4 Chapter 13.20.170, Trucks – Noise

This chapter states that the noise level for collection vehicles during the stationary compaction process shall not exceed 75 dBA at a distance of 25 feet from the vehicle.

4.6.5 Chapter 16.09.100, Commercial Outdoor Patio Guidelines

This chapter requires that the noise levels at an outdoor patio comply with the City's noise standards. If the patio is located adjacent to a residential use, an acoustical analysis is required to demonstrate that the patio will comply with the city's noise standards (CHMC 16.48.020).

4.6.6 Chapter 16.11.060, Application Procedures – Requirements

When an existing multiple-family rental unit is converted to condominium use, this chapter of the Municipal Code requires that an acoustical report be prepared showing the existing sound transmission between units and providing recommendations for reduction of excessive noise between the units.

4.6.7 Chapter 16.48.020 Noise

This chapter states that no person may create a noise level that exceeds the "Zone C" noise standards contained in Table N-1 in the Noise Element of the General Plan (see Section 4.5, above) for more than 30 minutes in any hour when measured on another property. The standard is further modified to allow higher noise levels for shorter periods of time, and to correct for the type of noise (i.e., a simple tone or impact noise). It is worth noting that there is an inherent inconsistency in the Chapter 16.48.020 noise standards in that a 24-hour CNEL guideline for the control of transportation noise impacts is being used to establish a 30-minute noise standard for the control of non-transportation noise sources.

4.7 Vibration Criteria

There are two types of potential vibration impact: (1) annoyance or interference with vibration-sensitive activities, and (2) vibration-induced building damage. The City of Chino Hills does not have standards that address permissible levels of vibration. However, criteria and guidelines developed by the Federal Transit Administration (FTA) and Caltrans are often used to evaluate vibration levels. These criteria are discussed in the following sections.

4.7.1 Annoyance or Interference with Vibration-Sensitive Activities

Criteria developed by the Federal Transit Administration **[1]** indicate that when ground-borne vibration exceeds 72 VdB, it is usually perceived as annoying to occupants of residential buildings. For schools, churches, other institutions, and quiet offices, a ground-borne vibration level of more than 75 VdB is usually perceived as annoying. The criteria do not provide any standards for vibration annoyance or interference at commercial properties.

4.7.2 Vibration-Induced Building Damage

General vibration damage criteria developed by Caltrans **[2]** are summarized in Table 4-1.

Table 4-1. Guideline Vibration Damage Potential Threshold Criteria

Building Category	Peak Particle Velocity, PPV (in/s)	
	Continuous/Frequent Intermittent Sources	Transient Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.08	0.12
Fragile buildings	0.10	0.20
Historic and some old buildings	0.25	0.50
Older residential structures	0.30	0.50
New residential structures	0.50	1.00
Modern industrial/commercial buildings	0.50	2.00
Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seal equipment, vibratory pile drivers, and vibratory compaction equipment.		

5 Existing Noise Environment

The most significant noise source within the City of Chino Hills is traffic on the local streets, the Pomona Freeway (State Route 60), and the Chino Valley Freeway (State Route 71). Activities at commercial properties and construction sites also add to the noise environment in Chino Hills. The following sections provide a discussion of the noise measurements obtained throughout the City to identify the existing noise environment, and an inventory of noise sources. From these measurements and complementing analytical procedures, noise exposure contours have been derived for the existing environment.

5.1 Noise Survey Results

Various locations within the City of Chino Hills were surveyed in April and June 2013 to define the existing noise environment. A total of six (6) long-term noise measurements, and fifteen (15) short-term noise measurements were obtained throughout the city. Figure 5-1 provides the location of the noise measurement positions. Measurement results are provided in Appendix I and are summarized in Table 5-1.

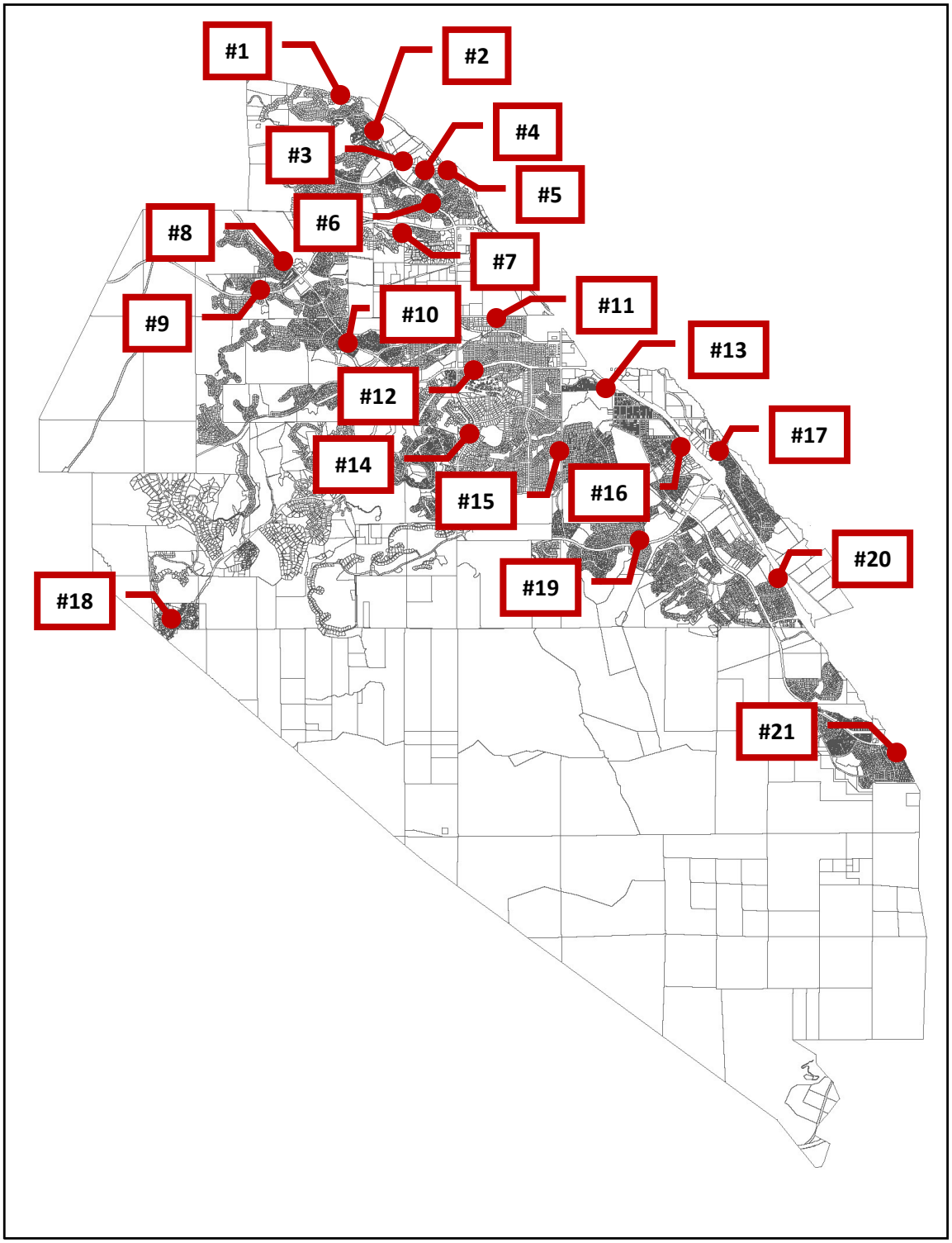


Figure 5-1. Noise Measurement Locations

Table 5-1. Summary of Noise Measurement Results

No.	Position	Date	Time Period	Measured Noise Levels, dBA*						
				L2	L8	L25	L50	Leq	Lmax	CNEL
1	In front of 2427 Scenic Ridge Dr.	4/4/2013	4:47 pm - 5:09 pm	60.4	57.9	57.0	56.3	56.8	66.0	N/M
2	In front of 13104 Glen Ct.	6/17/2013	1:48 pm - 2:10 pm	74.1	67.0	62.5	58.5	65.1	89.5	N/M
3	On Rolling Ridge Dr. at Chino Ave.	4/3/2013	4:33 pm - 4:53 pm	73.3	70.7	67.1	63.0	66.0	75.5	N/M
4	Rear yard, 3059 Galaxy Pl.	4/5-8/2013	67 hours	53.2-62.6	49.4-60.4	45.4-58.6	43.1-56.8	45.9-59.8	57.7-85.8	59.0-60.1
5	Rear yard, 3238 Skyview Ridge	4/3-4/2013	24 hours	67.7-73.0	65.8-72.2	63.4-71.3	61.0-70.4	62.2-70.6	71.1-81.4	73.7
6	In front of Ridgefield Dr.	6/17/2013	2:40 pm - 3:04 pm	70.0	63.6	60.4	56.3	63.2	88.3	N/M
7	In front of 2936 Sunny Brook Ln.	6/17/2013	3:21 pm - 3:42 pm	71.5	69.4	66.5	62.5	65.0	78.3	N/M
8	In front of 14100 Heathervale Dr.	6/17/2013	3:54 pm - 4:16 pm	71.8	68.6	64.5	58.4	63.8	78.0	N/M
9	Willow Wood Ln. at Grand Ave.	4/5/2013	2:17 pm - 2:38 pm	68.3	65.6	62.1	57.8	61.0	72.8	N/M
10	Moon Rise Ln. at Chino Hills Pkwy.	4/5/2013	2:54 pm - 3:14 pm	69.3	66.7	63.9	60.1	62.6	75.0	N/M
11	In front of 14514 Foxglove Dr.	6/17/2013	12:48 pm - 1:10 pm	71.6	68.4	64.9	60.8	64.0	80.8	N/M
12	Rear yard, 3456 Whirlaway Ln.	4/4-5/2013	25 hours	67.1-74.3	65.5-70.9	62.9-68.7	60.4-67.7	61.9-68.8	71.0-95.6	73.1
13	In front of 4488 Village Dr.	6/17/2013	11:52 am - 12:23 pm	60.3	57.5	55.3	54.0	55.2	79.0	N/M
14	Front yard, 3384 Gabriel Dr.	4/4/2013	1:30 pm - 1:50 pm	67.9	65.9	63.4	60.7	62.4	77.0	N/M
15	Rear yard, 15567 Sandlewood Ln.	4/3-4/2013	24 hours	47.5-63.1	39.2-61.1	32.5-58.1	30.4-52.5	38.3-56.4	58.8-82.1	54.5
16	In front of 5022 Pomona Rincon Rd	6/17/2013	10:49 am - 11:14 am	60.3	58.9	57.3	55.9	56.6	73.1	N/M
17	In front of 15461 Timberidge Ln.	6/17/2013	9:47 am - 10:07 am	62.3	60.3	57.6	55.0	56.6	68.6	N/M
18	In front of 16860 Oak Way Ln.	6/17/2013	4:42 pm - 5:04 pm	68.1	66.3	64.8	63.4	63.8	79.5	N/M
19	Rear yard, 4597 St. Andrews Dr.	4/3-4/2013	26 hours	43.4-70.3	34.0-66.3	28.4-58.9	26.5-50.2	33.2-59.2	52.3-77.5	57.6
20	End of Rosebud Ct. cul-de-sac	4/4/2013	2:42 pm - 3:03 pm	62.3	60.8	59.5	58.3	58.7	63.4	N/M
21	Rear yard, 17957 Lariat Dr.	4/3-4/2013	27 hours	61.6-79.2	58.7-66.9	55.3-64.5	51.0-63.2	55.2-67.0	65.3-88.5	68.0

* Ln is the noise level exceeded n% of the time during the measurement period (e.g., L50 is the noise level exceeded for more than 50% of the measurement period; for a 1-hour measurement, this is the noise level exceeded for more than 30 minutes in the hour).
Leq is the equivalent (i.e., average) noise level during the measurement period.
Lmax is the maximum noise level during the measurement period.
CNEL is the community noise equivalent level.
N/M: not measured.

5.2 Community Noise Equivalent Level (CNEL) Contours

In compliance with California Government Code Section 65302(f), Figure 5-2 provides the CNEL contours for the existing traffic noise environment within the City of Chino Hills. The map provides the CNEL contours ranging from 60 dB to 80 dB in 5 dB increments. Appendix II provides the tabular data on which the contour map of Figure 5-2 is based. For every reach of arterial, highway, and freeway considered in this study, the table in Appendix II provides the CNEL at the approximate location of the right-of-way line, as well as the distances from the roadway centerlines to the various noise contour locations.

The CNEL contours for the major arterials, highways, and freeways within the City of Chino Hills were developed utilizing SoundPLAN version 7.2 software and the Traffic Noise Model (TNM) lookup tables **[3, 4]** developed by the Federal Highway Administration (FHWA). Traffic data for the models was obtained from Caltrans and Minagar & Associates, Inc. **[5, 6]**

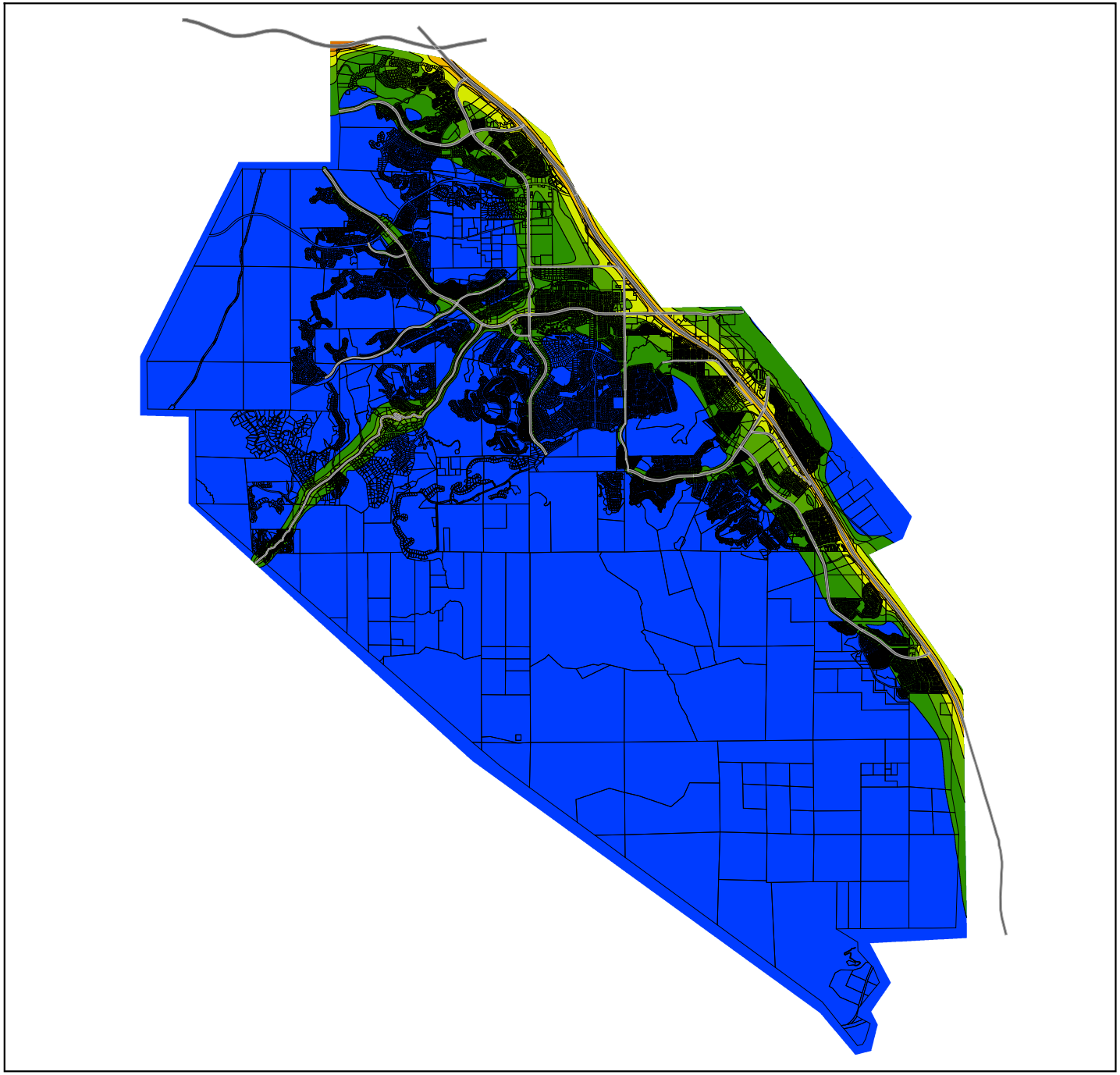


Figure 5-2. Community Noise Equivalent Level (CNEL) Contours for the Existing Environment

CNEL, dB

>	85
80 -	85
75 -	80
70 -	75
65 -	70
60 -	65
<=	60

Signs and symbols

Road Surface

N

0 4000 8000 12000 feet

Date: April 17, 2013

WIELAND ACOUSTICS
noise & vibration consultants

5.3 Arterial Traffic

Arterial traffic is the predominant noise source throughout the City of Chino Hills. Referring to the analyses of Appendix II and the noise contour map of Figure 5-2, existing traffic on the arterials generates CNELs that range from below 60 dB to over 70 dB at the adjacent properties.

Based on the analyses provided in Appendix II, the traffic volumes are sufficient to result in an unmitigated exterior CNEL that is above 65 dB at existing residential properties, or above the upper value of the "Normally Compatible" category for various existing land uses, adjacent to the road segments shown in Table 5-2.

Table 5-2. Locations Where Existing Roadway Traffic Noise Exceeds City Guidelines

Arterial	Segment	Properties At Which the City's Standard or Land Use/Noise Compatibility Guideline is Exceeded				
		Amphitheater, Concert Hall, Auditorium, Meeting Hall	Residential, Hospital, Church, Library, School	Hotel, Motel, Transient Lodging, Parks	Office, Commercial Recreation, Non-Park Open Space	Commercial
Bird Farm Rd.	V. Vista to Pomona Rincon	Yes	No	No	No	No
Butterfield Ranch Rd.	Soquel Cyn to Picasso	Yes	Yes	No	No	No
	Picasso to Pine	Yes	Yes	No	No	No
	Pine to Mystic Canyon	Yes	No	No	No	No
	Mystic Canyon to SR-71	Yes	No	No	No	No
Central Ave.	SR-71 to City Limits (East)	Yes	Yes	Yes	No	No
Chino Ave.	City Limits to Rock Springs	Yes	Yes	No	No	No
	Rock Springs to Eagle Cyn	Yes	No	No	No	No
	Eagle Canyon to Peyton	Yes	Yes	No	No	No
	Peyton to Emerald	Yes	Yes	No	No	No
	Emerald to SR-71	Yes	Yes	No	No	No
Chino Hills Pkwy.	W. City Limits to Grand	Yes	Yes	No	No	No
	Grand to Eucalyptus	Yes	Yes	Yes	No	No
	Eucalyptus to Carbon Cyn	Yes	Yes	No	No	No
	Carbon Canyon to Peyton	Yes	Yes	Yes	No	No
	Peyton to Pipeline	Yes	Yes	Yes	No	No
	Pipeline to SR-71	Yes	Yes	Yes	No	No
	SR-71 to City Limits (East)	Yes	Yes	No	No	No
Eucalyptus Ave.	Rcho Hills to C. Barcelona	Yes	Yes	No	No	No
	C. Barcelona to Ridgeview	Yes	Yes	No	No	No
	Ridgeview to Chino Hills	Yes	Yes	No	No	No
	Ch. Hills to Galloping Hills	Yes	Yes	No	No	No
	Peyton to Pipeline	Yes	Yes	No	No	No
Founders Dr.	Grand to Chino Hills	Yes	No	No	No	No
Frost Ave.	Chino Hills to Peyton	Yes	No	No	No	No
Peyton Dr.	Garey to SR-71	Yes	Yes	No	No	No
	SR-71 to Chino	Yes	Yes	No	No	No
	Chino to Bedford	Yes	Yes	No	No	No
	Bedford to Grand	Yes	Yes	No	No	No
	Grand to Eucalyptus	Yes	Yes	No	No	No
	Eucalyptus to Chino Hills	Yes	Yes	No	No	No
	Chino Hills to Bayberry	Yes	Yes	No	No	No
	Bayberry to Woodview	Yes	No	No	No	No
Pipeline Ave.	Eucalyptus to Glen Ridge	Yes	Yes	No	No	No
	Glen Ridge to Valle Vista	Yes	No	No	No	No
	Woodview to Winged Foot	Yes	Yes	No	No	No
	Winged Ft to Soquel Cyn	Yes	Yes	No	No	No
Pomona Rincon Rd.	South of Bird Farm	Yes	No	No	No	No
	Soquel Canyon to Picasso	Yes	No	No	No	No
	South of Picasso	Yes	No	No	No	No
Soquel Canyon Pkwy.	Pipeline to Pinehurst	Yes	Yes	Yes	No	No
	Pinehurst to Elinvar	Yes	Yes	Yes	No	No
	Elinvar - Butterfield Rnch	Yes	Yes	Yes	No	No
	Butterfield Ranch to SR-71	Yes	Yes	Yes	No	No

5.4 Freeway and Highway Traffic

Portions of the City of Chino Hills are bounded or traversed by the Pomona Freeway (State Route 60), the Chino Valley Freeway (State Route 71), and State Route 142 (Carbon Canyon Road and a portion of Chino Hills Parkway). Soundwalls have been constructed adjacent to some sections of SR-71. Based on 24-hour noise measurements (refer to Figure 5-1, locations #5 and #21), the existing CNEL is 68.0 dB to 73.7 dB at typical residences near SR-71.

Referring to the analyses provided in Appendix II, and the noise contour map of Figure 5-2, existing traffic on the freeways and highways in Chino Hills generates CNELs of up to 85 dB at properties adjacent to SR-60, up to 82 dB at properties adjacent to SR-71, and up to 74 dB at properties adjacent to SR-142.

Based on the analyses provided in Appendix II, the traffic volumes are sufficient to result in an unmitigated exterior CNEL that is above 65 dB at existing residential properties, or above the upper value of the "Normally Compatible" category for various existing land uses, adjacent to the freeway and highway segments shown in Table 5-3.

Table 5-3. Locations Where Existing Highway Traffic Noise Exceeds City Guidelines

Arterial	Segment	Properties At Which the City's Standard or Land Use/Noise Compatibility Guideline is Exceeded				
		Amphitheater, Concert Hall, Auditorium, Meeting Hall	Residential, Hospital, Church, Library, School	Hotel, Motel, Transient Lodging, Parks	Office, Commercial Recreation, Non-Park Open Space	Commercial
SR-60 (Pomona Freeway)	West of SR-71 interchange	Yes	Yes	Yes	Yes	Yes
SR-71 (Chino Valley Freeway)	South of SR-60 interchange	Yes	Yes	Yes	Yes	Yes
	Peyton to Chino	Yes	Yes	Yes	Yes	Yes
	Chino to Grand	Yes	Yes	Yes	Yes	Yes
	Grand to Chino Hills	Yes	Yes	Yes	Yes	Yes
	Chino Hills to Central	Yes	Yes	Yes	Yes	Yes
	Central to Pine	Yes	Yes	Yes	Yes	Yes
	North of Euclid Ave	Yes	Yes	Yes	Yes	Yes
SR-142 (Carbon Canyon Road)	W City Limits to Rosemary	Yes	Yes	Yes	No	No
	Rosemary to Canyon Hills	Yes	Yes	Yes	No	No
	Canyon Hills to Chino Hills	Yes	Yes	Yes	No	No

5.5 Commercial Activities

The primary noise sources associated with commercial properties are activities and music in outdoor dining areas, loading dock operations, delivery trucks entering and leaving the area, and mechanical equipment located both inside and outside the buildings. To quantify the noise levels that are experienced at a typical residential/commercial interface, a measurement was obtained at a residence overlooking a restaurant's outdoor dining area on Chino Avenue. (Refer to location #4 on Figure 5-1.) This measurement was obtained for a continuous 67-hour period over a weekend. The

results of the measurement, summarized in Table 5-1, are compared with the City's municipal code standards in the following table:

Noise Level That May Not Be Exceeded For More Than …	Descriptor	Residential Noise Standard	Measured Noise Level
30 minutes in any hour	L_{50}	60 dBA	43.1-56.8 dBA
15 minutes in any hour	L_{25}	65 dBA	45.4-58.6 dBA
5 minutes in any hour	L_8	70 dBA	49.4-60.4 dBA
1 minute in any hour	L_2	75 dBA	53.2-62.6 dBA
Any time	L_{max}	80 dBA	57.7-85.8 dBA

In general, the measured noise levels are well below the City's standards. The only possible exception to this is the L_{max} standard of 80 dBA. In reviewing the measurement data, there were two hours during which the measured L_{max} noise level exceeded 80 dBA. Both occurred on Sunday, April 7, 2013, with one occurring between 11:00 a.m. and 12:00 p.m., and the other occurring between 2:00 p.m. and 3:00 p.m. Because the noise monitor was unmanned, it is not possible to identify with certainty whether the noise level was caused by activities at the restaurant or by activities at the residence. However, it is most likely that the measured L_{max} noise levels that exceeded 80 dBA were due to residential activities.

5.6 Construction

Construction activities generate considerable amounts of noise, especially during the demolition phase and the construction of project infrastructure when heavy equipment is used. Noise levels resulting from construction depend on the number and types of construction equipment being used, the timing and duration of noise-generating activities, and the distance between construction noise sources and noise-sensitive receptors.

The highest maximum noise levels generated by project construction would typically range from about 90 to 105 dBA at a distance of 50 feet from the noise source. Typical hourly average construction-generated noise levels are about 81 dBA to 89 dBA measured at a distance of 50 feet from the center of the site during busy construction periods, such as when earth moving equipment and impact tools are being used. Construction-generated noise levels drop off at a rate of about 6 dBA per doubling of distance between the source and receptor. Shielding by buildings or terrain often result in much lower construction noise levels at distant receptors.

Typically, small residential, commercial, or office construction projects do not generate significant noise impacts when standard construction noise control measures are enforced at the project site and when the duration of the noise-generating construction period is relatively short (typically one year or less). Construction noises associated with projects of this type are disturbances that are necessary for the construction or repair of buildings and structures in urban areas. Reasonable regulation of the hours of construction, as well as regulation of the arrival and operation of heavy equipment and the delivery of construction materials, are necessary to protect the health and safety of persons, promote the general welfare of the community, and maintain the quality of life.

Larger construction projects are typically built out over more than one year, and some construction methods, such as pile driving, generate higher noise levels and noise that would be considered impulsive. Construction noise impacts primarily result when construction activities occur during noise-sensitive times of the day (early morning, evening, or nighttime hours), the construction occurs in areas immediately adjoining noise-sensitive land uses, or when construction durations last over extended periods of time. Limiting the hours when construction can occur to daytime hours is often a simple method to reduce the potential for noise impacts. In areas immediately adjacent to construction, controls such as erecting temporary noise barriers and utilizing "quiet" construction equipment can also reduce the potential for noise impacts.

6 Existing Vibration Environment

The only significant vibration source within the City of Chino Hills is construction equipment. Construction of new projects on sites adjacent to existing developments could result in the generation of excessive ground-borne vibration on a temporary basis. Construction activities may include demolition of existing structures, site preparation work, excavation of below grade levels, foundation work, pile driving, and framing. Demolition activity at an individual site may last several weeks and at times may produce substantial vibration. Excavation for underground levels could also occur on some project sites and vibratory pile driving could be used to stabilize the walls of the excavated area. Piles or drilled caissons may also be used to support building foundations.

Pile driving has the potential to generate the highest ground vibration levels and is the greatest risk factor in causing structural damage, particularly when it occurs within 100 feet of structures. Vibration levels generated by pile driving activities would vary depending on project conditions including type, construction methods, and equipment used. Other construction activities, such as caisson drilling, the use of jackhammers, rock drills and other high-power or vibratory tools, and rolling stock equipment (tracked vehicles, compactors, etc.) may also generate substantial vibration in the immediate vicinity of the site.

Depending on the proximity of existing structures to each construction site, the structural soundness of the existing buildings, and the methods of construction used, vibration levels caused by pile driving or other impact work may be high enough to damage existing structures.

7 Proposed General Plan Policies

The following goals, policies, and action statements from the proposed General Plan Update are relevant to noise within the City of Chino Hills.

Goal NOI-1: Manage Existing Noise Sources.

Policy NOI-1.1: Protect public health and welfare by eliminating or minimizing the effects of existing noise problems.

Action NOI-1.1.1: Control noise conditions in Chino Hills through the active, ongoing efforts of the City in coordination with other government agencies.

Action NOI-1.1.2: Increase public input on environmental noise issues, and establish a program for the monitoring and abatement of local noise sources.

Action NOI-1.1.3: Prohibit through truck traffic in noise-sensitive areas, such as school sites located in Chino Hills.

Action NOI-1.1.4: Restrict truck traffic to roadways that are located away from sensitive land uses.

Action NOI-1.1.5: Minimize through vehicular traffic in the City's residential areas.

Action NOI-1.1.6: Enforce state motor vehicle noise standards for cars, trucks and motorcycles.

Action NOI-1.1.7: Incorporate sound attenuation measures in residential development where outdoor ambient noise levels exceed 65 dB CNEL.

Action NOI-1.1.8: Ensure that equipment, machinery, fan and air conditioning noise does not exceed specified levels established in the City's Noise Ordinance.

Goal NOI-2: Limit New Noise Conflicts.

Policy NOI-2.1: Minimize increases in noise levels due to new land use and transportation facility decisions.

Action NOI-2.1.1: Enforce standards that specify acceptable noise limits for various land uses throughout the City, including implementation of Table N-1 "Land Use-Noise Compatibility Matrix".

Action NOI-2.1.2: Continue to assess projects through the subdivision, site plan, conditional use permit, and other development review processes and incorporate conditions of approval and mitigation measures which ensure noise compatibility where appropriate.

Action NOI-2.1.3: Require a noise study to be performed and appropriate noise attenuation to be incorporated prior to approving any multifamily or mixed-use residential development in an area with a CNEL of 65 dB or greater.

Action NOI-2.1.4: Incorporate ambient noise level considerations into land use decisions involving schools, hospitals, and similar noise-sensitive uses.

Action NOI-2.1.5: Ensure all new developments provide adequate sound insulation or other protection from existing and projected noise sources.

Action NOI-2.1.6: Design new transportation facilities to minimize noise impacts on nearby sensitive receivers.

Action NOI-2.1.7: Ensure that all new hotels, motels, multi-family and single-family dwellings to be developed within an area where the outdoor CNEL exceeds 60 dB are designed to achieve an indoor CNEL of 45 dB or less.

8 Thresholds of Significance

According to the State's CEQA guidelines, a significant impact would result if implementation of the Chino Hills General Plan update (i.e., the project) resulted in any of the following:

- Exposure of persons to, or generation of, noise levels in excess of standards established in the General Plan or Municipal Code of the City of Chino Hills, or applicable standards of other agencies. The impact would be considered significant if the proposed General Plan update would:
  - Result in exterior noise levels that are above 65 dB at residential properties, or above the upper value of the "Normally Compatible" category for various land uses, as shown in Table N-1 (page 8), due to the project's noise level increases.
  - Result in residential interior noise levels that are above 45 dB caused by noise level increases due to the project.
  - Result in the development of commercial/industrial properties that generate noise levels in excess of the City's Municipal Code standards at adjacent residential properties.
- Exposure of persons to, or generation of, excessive ground-borne vibration or ground-borne noise levels. The impact would be considered significant if the proposed General Plan update would permit existing and/or planned residential and commercial areas to be exposed to vibration peak particle velocities (PPVs) greater than 0.3 inches per second due to project construction.
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project. CEQA does not define what noise level increase would be considered substantial. Typically, if the project would increase the CNEL by more than 3 dB at noise-sensitive receptors, the impact would be considered significant.
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. The impact would be considered significant if the proposed General Plan update would result in construction noise levels that exceed the standards in the City of Chino Hills Municipal Code.
- The project would expose people residing or working in the project area to excessive noise levels as a result of activities at an airport or private airstrip.

9 Discussion of Impacts

This section discusses the potential noise impacts associated with implementing the Chino Hills General Plan update (i.e., the project). It is organized by, and responds to, each of the Thresholds of Significance identified above in Section 8.

9.1 Exposure of persons to, or generation of, noise levels in excess of standards established in the General Plan or Municipal Code of the City of Chino Hills, or applicable standards of other agencies

In compliance with California Government Code Section 65302(f), Figure 9-1 provides the CNEL contours for the future traffic noise environment within the City of Chino Hills. The map provides the CNEL contours ranging from 60 dB to 85 dB in 5 dB increments. Appendix II provides the tabular data on which the contour map of Figure 9-1 is based. For every reach of arterial considered in this study, the table in Appendix II provides the CNEL at the approximate location of the right-of-way line, as well as the distances from the roadway centerlines to the various noise contour locations.

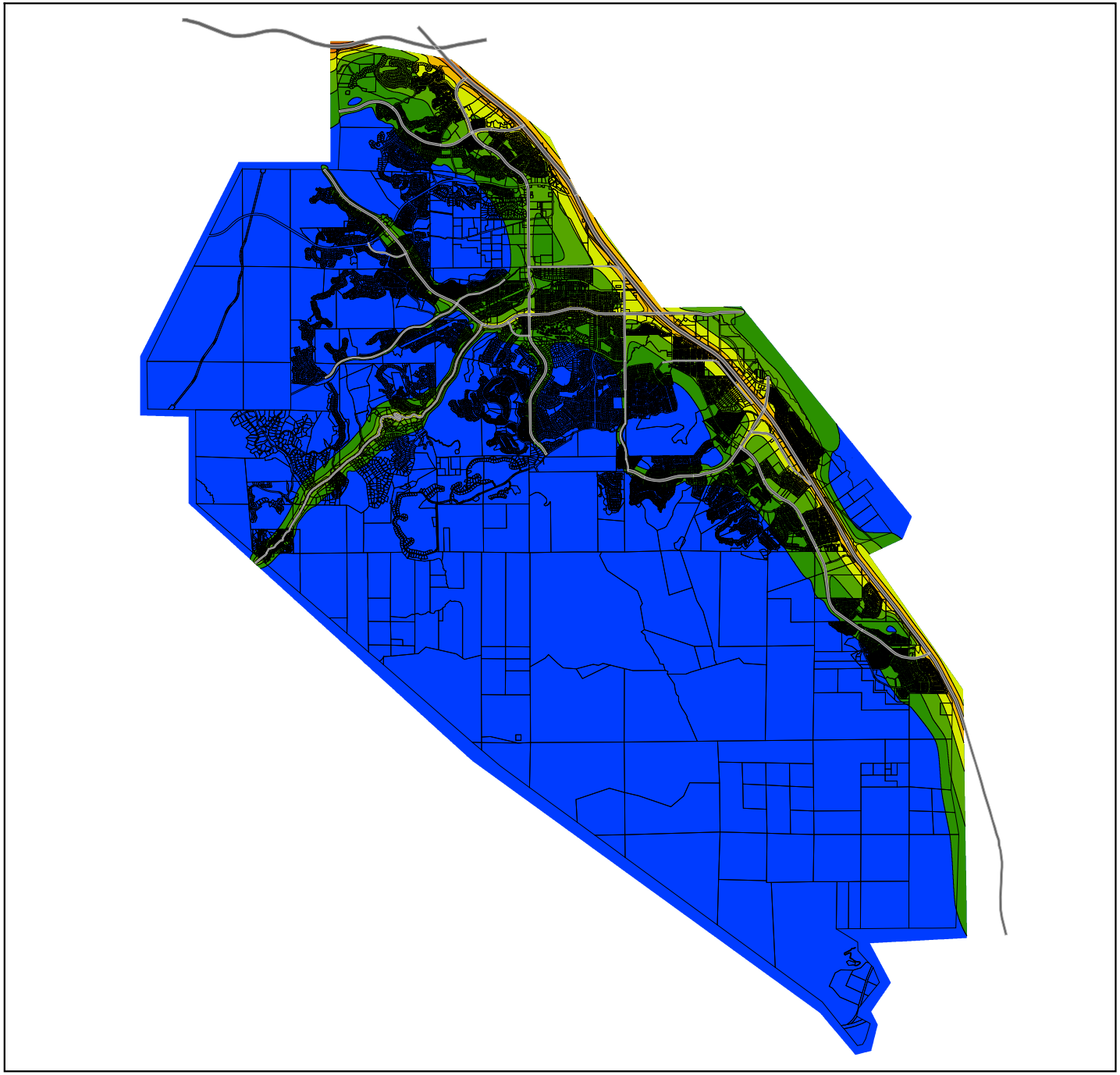


Figure 9-1. Community Noise Equivalent Level (CNEL) Contours for the Future Environment

CNEL, dB

>	85
80 -	85
75 -	80
70 -	75
65 -	70
60 -	65
<=	60

Signs and symbols

Road Surface

N

0 4000 8000 12000 feet

Date: July 10, 2013

WIELAND ACOUSTICS
noise & vibration consultants

9.1.1 Impact #1 – Exterior Traffic Noise Levels at Existing Properties

Based on noise measurements and on existing and future noise modeling, noise levels in excess of City guidelines currently occur and will continue to occur in many existing residential and other noise-sensitive areas throughout the City. Therefore, no significant impact is assessed for the project at these locations since the project will not change the existing circumstances. However, referring to Tables 9-1 and 9-2, as well as the City's land use plan, the project may result in exterior noise levels that are above 65 dB at existing residential properties, or above the upper value of the "Normally Compatible" category for various existing land uses adjacent to the following road segments. At these locations the impact of the project is potentially significant.

- Existing residential properties adjacent to: (1) Butterfield Ranch Road between Pine Avenue and SR-71; (2) Chino Avenue between Rock Springs Drive and Eagle Canyon Drive; (3) Eucalyptus Avenue between Rancho Hills Drive and Calle Barcelona; and (4) Pomona Rincon Road from south of Bird Farm Road to south of Picasso Drive.
- Existing hotel, motel, and transient lodging properties adjacent to: (1) Chino Avenue between Emerald Way and SR-71; (2) Chino Hills Parkway between the west city limits and Grand Avenue, and between Eucalyptus Avenue and Carbon Canyon Road; (3) Peyton Drive between Garey Avenue and Grand Avenue; and (4) Soquel Canyon Parkway between Elinvar Drive and Butterfield Ranch Road.
- Existing office properties adjacent to Chino Hills Parkway between Carbon Canyon Road and Peyton Drive.
- Existing general institutional properties adjacent to Pomona Rincon Road from south of Bird Farm Road to south of Picasso Drive.
- Existing parks adjacent to: (1) Chino Hills Parkway between Eucalyptus Avenue and Carbon Canyon Road; and (2) Soquel Canyon Parkway between Elinvar Drive and Butterfield Ranch Road.
- Existing open space (non-park) properties adjacent to Chino Hills Parkway between Carbon Canyon Road and Peyton Drive.

Table 9-1. Estimated Existing and Future Traffic Noise Levels Adjacent to Roadways

Arterial	Segment	Estimated CNEL at Right-of-Way Line, dB	
		Existing	Future (2037)[1]
Butterfield Ranch Rd.	Soquel Cyn Pkwy to Picasso Dr	68.7	70.3
	Picasso Dr to Pine Ave	66.9	68.5
	Pine Ave to Mystic Canyon Rd	64.5	65.9
	Mystic Canyon Rd to SR-71	63.8	65.1
Central Ave.	SR-71 to City Limits (East)	70.2	73.0
Chino Ave.	City Limits to Rock Springs Dr	66.8	67.9
	Rock Springs Dr to Eagle Cyn Dr	64.4	65.5
	Eagle Canyon Dr to Peyton Dr	66.7	67.8
	Peyton Dr to Emerald Wy	68.6	69.7
	Emerald Wy to SR-71	69.0	70.1
Chino Hills Pkwy.	City Limits (West) to Grand Ave	69.7	71.2
	Grand Ave to Eucalyptus Ave	70.4	72.0
	Eucalyptus Ave to Carbon Canyon Rd	69.8	71.3
	Carbon Canyon to Peyton (SR-142)	73.6	75.1
	Peyton Dr to Pipeline Ave (SR-142)	73.4	75.0
	Pipeline Ave to SR-71 (SR-142)	72.6	74.0
	SR-71 to City Limits (East)	67.0	69.6
Eucalyptus Ave.	Rancho Hills Dr to Calle Barcelona	64.1	65.2
	Calle Barcelona to Ridgeview Dr	67.1	68.2
	Ridgeview Dr to Chino Hills Pkwy	66.4	67.4
	Chino Hills Pkwy to Galloping Hills Rd	66.7	67.8
	Peyton Dr to Pipeline Ave	69.1	70.2
Peyton Dr.	Garey Ave to SR-71	69.9	72.1
	SR-71 to Chino Ave	69.8	70.9
	Chino Ave to Bedford Ln	69.4	70.5
	Bedford Ln to Grand Ave	69.4	70.5
	Grand Ave to Eucalyptus Ave	67.9	69.0
	Eucalyptus Ave to Chino Hills Pkwy	68.5	69.6
	Chino Hills Pkwy to Bayberry Dr	66.6	67.7
	Bayberry Dr to Woodview Rd	63.3	64.4
Pipeline Ave.	Eucalyptus Ave to Glen Ridge Dr	66.5	67.3
	Glen Ridge Dr to Valle Vista Dr	64.1	64.9
	Woodview Rd to Winged Foot Wy	63.4	64.8
	Winged Foot to Soquel Canyon Pkwy	66.5	67.8
Pomona Rincon Rd.	South of Bird Farm Rd	63.3	66.6
	Soquel Canyon Pkwy to Picasso Dr	62.7	66.1
	South of Picasso Dr	64.5	67.8
Soquel Canyon Pkwy.	Pipeline Ave to Pinehurst Dr	67.1	68.4
	Pinehurst Dr to Elinvar Dr	68.2	69.5
	Elinvar Dr to Butterfield Ranch Rd	69.1	70.3
	Butterfield Ranch Rd to SR-71	70.4	73.3

Notes:
1. Future case with or without the project.

Table 9-2. Estimated Existing and Future Traffic Noise Levels Adjacent to Freeways & Highways

Arterial	Segment	Estimated CNEL at Right-of-Way Line, dB	
		Existing	Future (2037)[1]
SR-60 (Pomona Freeway)	West of SR-71 interchange	85.0	86.8
SR-71 (Chino Valley Freeway)	South of SR-60 interchange	81.7	83.5
	Peyton to Chino	81.2	83.3
	Chino to Grand	80.7	83.0
	Grand to Chino Hills	81.1	83.6
	Chino Hills to Central	80.6	83.3
	Central to Pine	81.1	84.0
	North of Euclid Ave	80.4	82.2
SR-142 (Carbon Canyon Road)	W City Limits to Rosemary Ln	73.2	74.4
	Rosemary Ln to Canyon Hills Rd	70.2	71.6
	Canyon Hills Rd to Chino Hills Pkwy	73.9	74.5

Notes:
1. Future case with or without the project.

9.1.2 Mitigation Measure #1 – Exterior Traffic Noise Levels at Existing Properties

Policy NOI-1.1 of the General Plan Update addresses existing noise problems and includes six action statements that would mitigate these potential impacts to a less-than-significant level. Action Statements NOI-1.1.1 and NOI-1.1.2 establish a City program to improve noise conditions in Chino Hills by monitoring and abating local noise sources, by coordinating its actions with other governmental agencies, and by increasing public input. Action Statements NOI-1.1.3 through NOI-1.1.6 reduce ambient noise levels in residential and other sensitive areas by prohibiting truck traffic and minimizing through traffic of all kinds in these areas, and by enforcing the state's motor vehicle noise standards. Policy NOI-2.1, with Action Statement NOI-2.1.6, will ensure that noise impacts on nearby existing sensitive receptors will be minimized as part of the design of new transportation facilities.

With full implementation of these policies, the amount of noise reduction that will be achieved at any specific property will be the difference between the level to which the property is currently exposed and 65 dB (for residential properties) or the upper value of the "Normally Compatible" category in Table N-1 for other properties.

9.1.3 Impact #2 – Interior Traffic Noise Levels at Existing Properties

Assuming that standard residential building construction provides 20 dB of noise reduction with windows and doors closed, it may be assumed that the project may result in interior noise levels that are above 45 dB at existing residential properties adjacent to: (1) Butterfield Ranch Road between Pine Avenue and SR-71; (2) Chino Avenue between Rock Springs Drive and Eagle Canyon Drive; (3) Eucalyptus Avenue between Rancho Hills Drive and Calle Barcelona; and (4) Pomona Rincon Road from south of Bird Farm Road to south of Picasso Drive. At these locations the impact of the project is potentially significant.

9.1.4 Mitigation Measure #2 – Interior Traffic Noise Levels at Existing Properties

Policy NOI-1.1 of the General Plan Update addresses existing noise problems and includes six action statements that would mitigate these potential impacts to a less-than-significant level. Action Statements NOI-1.1.1 and NOI-1.1.2 establish a City program to improve noise conditions in Chino Hills by monitoring and abating local noise sources, by coordinating its actions with other governmental agencies, and by increasing public input. Action Statements NOI-1.1.3 through NOI-1.1.6 reduce ambient noise levels in residential and other sensitive areas by prohibiting truck traffic and minimizing through traffic of all kinds in these areas, and by enforcing the state's motor vehicle noise standards. Policy NOI-2.1, with Action Statement NOI-2.1.6, will ensure that noise impacts on nearby existing sensitive receptors will be minimized as part of the design of new transportation facilities.

With full implementation of these policies, the amount of noise reduction that will be achieved at any specific property will be the difference between the interior level to which the property is currently exposed and 45 dB.

9.1.5 Impact #3 – Exterior and Interior Traffic Noise Levels at Future Developments

The project will result in new developments located adjacent to the arterials throughout the City. Depending on how close these developments are situated to the arterials, they may be exposed to excessive future noise levels. Tables 9-3 and 9-4 identify, for each arterial segment studied within the City, the distances from the arterial centerline within which various types of new development could be exposed to noise levels that exceed 65 dB for residential developments, or the upper value of the "Normally Compatible" category for various existing land uses. If a new development were to occur within the distances shown in Tables 9-3 and 9-4, the impact of the project would be potentially significant.

Table 9-3. Future Noise Impact Zones Adjacent to Roadways

Arterial	Segment	Distance from Roadway Centerline Within Which New Development May Be Exposed to a Significant Impact, feet				
		Amphitheater, Concert Hall, Auditorium, Meeting Hall	Residential, Hospital, Church, Library, School	Hotel, Motel, Transient Lodging, Parks	Office, Commercial Recreation, Non-Park Open Space	Commercial
Butterfield Ranch Rd.	Soquel Cyn to Picasso	507	197	63	--	--
	Picasso to Pine	369	131	44	--	--
	Pine to Mystic Canyon	193	62	--	--	--
	Mystic Canyon to SR-71	160	53	--	--	--
Central Ave.	SR-71 to City Limits (East)	811	339	119	38	--
Chino Ave.	City Limits to Rock Springs	285	98	--	--	--
	Rock Springs to Eagle Cyn	177	58	--	--	--
	Eagle Canyon to Peyton	285	96	--	--	--
	Peyton to Emerald	464	174	57	--	--
	Emerald to SR-71	495	189	61	--	--
Chino Hills Pkwy.	W. City Limits to Grand	525	203	65	--	--
	Grand to Eucalyptus	603	238	80	--	--
	Eucalyptus to Carbon Cyn	536	207	66	--	--
	Carbon Canyon to Peyton	>985	443	163	53	--
	Peyton to Pipeline	>985	434	158	51	--
	Pipeline to SR-71	>985	419	152	49	--
	SR-71 to City Limits (East)	399	145	47	--	--
Eucalyptus Ave.	Rcho Hills to C. Barcelona	112	35	--	--	--
	C. Barcelona to Ridgeview	214	69	--	--	--
	Ridgeview to Chino Hills	187	60	--	--	--
	Ch. Hills to Galloping Hills	202	64	--	--	--
	Peyton to Pipeline	322	112	35	--	--
Peyton Dr.	Garey to SR-71	617	245	82	--	--
	SR-71 to Chino	570	222	73	--	--
	Chino to Bedford	536	207	66	--	--
	Bedford to Grand	533	206	66	--	--
	Grand to Eucalyptus	410	149	49	--	--
	Eucalyptus to Chino Hills	393	142	47	--	--
	Chino Hills to Bayberry	278	94	--	--	--
	Bayberry to Woodview	137	46	--	--	--
Pipeline Ave.	Eucalyptus to Glen Ridge	223	72	--	--	--
	Glen Ridge to Valle Vista	157	51	--	--	--
	Woodview to Winged Foot	103	--	--	--	--
	Winged Ft to Soquel Cyn	202	64	--	--	--
Pomona Rincon Rd.	South of Bird Farm	157	51	--	--	--
	Soquel Canyon to Picasso	203	64	--	--	--
	South of Picasso	203	64	--	--	--
Soquel Canyon Pkwy.	Pipeline to Pinehurst	363	129	43	--	--
	Pinehurst to Elinvar	440	163	54	--	--
	Elinvar to Butterfield Ranch	510	197	63	--	--
	Butterfield Ranch to SR-71	837	354	125	42	--

Notes:
"—" indicates that there is no distance within which a proposed development will experience a significant impact.

Table 9-4. Future Noise Impact Zones Adjacent to Freeways & Highways

Arterial	Segment	Distance from Roadway Centerline Within Which New Development May Be Exposed to a Significant Impact, feet				
		Amphitheater, Concert Hall, Auditorium, Meeting Hall	Residential, Hospital, Church, Library, School	Hotel, Motel, Transient Lodging, Parks	Office, Commercial Recreation, Non-Park Open Space	Commercial
SR-60 (Pomona Freeway)	West of SR-71 interchange	>985	>985	>985	935	395
SR-71 (Chino Valley Freeway)	South of SR-60 interchange	>985	>985	>985	490	182
	Peyton to Chino	>985	>985	>985	478	176
	Chino to Grand	>985	>985	>985	464	169
	Grand to Chino Hills	>985	>985	>985	447	162
	Chino Hills to Central	>985	>985	>985	428	155
	Central to Pine	>985	>985	968	410	147
	North of Euclid Ave	>985	>985	729	301	104
SR-142 (Carbon Canyon Road)	W City Limits to Rosemary	701	281	94	--	--
	Rosemary to Canyon Hills	443	161	51	--	--
	Canyon Hills to Chino Hills	710	286	96	--	--

Notes:
"—" indicates that there is no distance within which a proposed development will experience a significant impact.

9.1.6 Mitigation Measure #3 – Exterior and Interior Traffic Noise Levels at Future Developments

Policies NOI-1.1 and NOI-2.1 of the General Plan Update address land use/noise compatibility issues and include several action statements that would mitigate these potential impacts to a less-than-significant level. Action Statement NOI-1.1.7 ensures that new residential developments located in areas where the exterior CNEL exceeds 65 dB will incorporate sound attenuation measures. Action Statement NOI-2.1.3 provides the same consideration for new multifamily or mixed-use residential developments. And Action Statements NOI-2.1.1, NOI-2.1.2, NOI-2.1.4, and NOI-2.1.5 ensure that the City will continue to address and enforce its land use/noise compatibility guidelines when addressing new developments, and will continue to require that appropriate noise mitigation measures be included in their design. Action Statement NOI-2.1.7 will ensure that all new hotels, motels, multi-family and single-family dwellings to be developed within an area where the outdoor CNEL exceeds 60 dB are designed to achieve an indoor CNEL of 45 dB or less.

9.1.7 Impact #4 – Commercial/Industrial Noise Impacts on Residential Properties

The project may result in new commercial/industrial developments located adjacent to noise-sensitive properties such as residential areas. Depending on how close these developments are situated to the residential areas, the types of mechanical equipment used at the developments, and the activities that will occur at the developments, they may produce noise levels that exceed the City's Municipal Code standards. Therefore, the impact of the project is potentially significant.

9.1.8 Mitigation Measure #4 – Commercial/Industrial Noise Impacts on Residential Properties

Policies NOI-1.1 and NOI-2.1 of the General Plan Update address these specific land use/noise compatibility issues and include several action statements that would mitigate these potential impacts to a less-than-significant level. Policy NOI-1.1, with Action Statement NOI-1.1.8, will ensure that mechanical equipment at commercial/industrial developments do not generate excessive noise levels. Action Statements NOI-2.1.1 and NOI-2.1.2 ensure that the City will continue to address and enforce its land use/noise compatibility guidelines when addressing new commercial/industrial developments, and will continue to require that appropriate noise mitigation measures be included in their design.

9.2 Exposure of persons to, or generation of, excessive ground-borne vibration or ground-borne noise levels

9.2.1 Impact #5 – Vibration Impacts During Construction

Construction of new developments occurring under the General Plan could generate significant ground-borne vibration that could expose building occupants to vibration levels in excess of established guidelines. This would be a significant impact for which the General Plan update does not identify any mitigating policies or regulations.

9.2.2 Mitigation Measure #5 – Vibration Impacts During Construction

The City should amend its Municipal Code to identify and enforce specific limits on the ground-borne vibration level that is permitted at offsite buildings during construction of a project. The City should establish conditions of approval that minimize the potential for construction vibration impacts on nearby properties when approving development. All future projects should be reviewed for the potential to generate construction vibration prior to the issuance of building permits, and require appropriate measures to reduce such vibration to acceptable levels, such as types of equipment and procedures uses, continuous monitoring at sensitive locations, and notification of neighbors. With implementation of these mitigation measures, the impact will be reduced to a less-than-significant level.

9.3 A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

9.3.1 Impact #6 – Substantial Permanent Increase in Ambient Noise Level

As development proceeds in Chino Hills and the surrounding areas, vehicular traffic on the roadways, freeways, and highways will increase. The anticipated increase in vehicular traffic would result in increased traffic noise. Traffic noise levels throughout Chino Hills were modeled to determine how changes in vehicular traffic volumes would affect traffic noise levels. Traffic noise levels were projected for General Plan build-out for the year 2037.

Noise impacts resulting from build-out of the 2013 General Plan are assessed by comparing projected noise levels to the existing condition. Tables 9-5 and 9-6 compare the build-out of the 2013 General Plan to the existing condition, and provides the estimated increases in traffic noise levels that will occur throughout the City of Chino Hills. Referring to the tables, the project is expected to increase the CNEL by more than 3 dB at properties adjacent to Pomona Rincon Road. This is a substantial permanent increase in ambient noise levels; therefore, at these locations the impact of the project is potentially significant.

Table 9-5. Estimated Increases in Traffic Noise Levels Adjacent to Roadways

Arterial	Segment	Estimated CNEL at Right-of-Way Line, dB		Estimated Increase in CNEL, dB
		Existing	Future (2037)[1]	
Butterfield Ranch Rd.	Soquel Cyn Pkwy to Picasso Dr	68.7	70.3	1.6
	Picasso Dr to Pine Ave	66.9	68.5	1.6
	Pine Ave to Mystic Canyon Rd	64.5	65.9	1.5
	Mystic Canyon Rd to SR-71	63.8	65.1	1.3
Central Ave.	SR-71 to City Limits (East)	70.2	73.0	2.8
Chino Ave.	City Limits to Rock Springs Dr	66.8	67.9	1.1
	Rock Springs Dr to Eagle Cyn Dr	64.4	65.5	1.1
	Eagle Canyon Dr to Peyton Dr	66.7	67.8	1.1
	Peyton Dr to Emerald Wy	68.6	69.7	1.1
	Emerald Wy to SR-71	69.0	70.1	1.1
Chino Hills Pkwy.	City Limits (West) to Grand Ave	69.7	71.2	1.5
	Grand Ave to Eucalyptus Ave	70.4	72.0	1.6
	Eucalyptus Ave to Carbon Canyon Rd	69.8	71.3	1.5
	Carbon Canyon to Peyton (SR-142)	73.6	75.1	1.6
	Peyton Dr to Pipeline Ave (SR-142)	73.4	75.0	1.6
	Pipeline Ave to SR-71 (SR-142)	72.6	74.0	1.4
	SR-71 to City Limits (East)	67.0	69.6	2.6
Eucalyptus Ave.	Rancho Hills Dr to Calle Barcelona	64.1	65.2	1.1
	Calle Barcelona to Ridgeview Dr	67.1	68.2	1.1
	Ridgeview Dr to Chino Hills Pkwy	66.4	67.4	1.1
	Chino Hills Pkwy to Galloping Hills Rd	66.7	67.8	1.1
	Peyton Dr to Pipeline Ave	69.1	70.2	1.1
Peyton Dr.	Garey Ave to SR-71	69.9	72.1	2.2
	SR-71 to Chino Ave	69.8	70.9	1.1
	Chino Ave to Bedford Ln	69.4	70.5	1.1
	Bedford Ln to Grand Ave	69.4	70.5	1.1
	Grand Ave to Eucalyptus Ave	67.9	69.0	1.1
	Eucalyptus Ave to Chino Hills Pkwy	68.5	69.6	1.1
	Chino Hills Pkwy to Bayberry Dr	66.6	67.7	1.1
	Bayberry Dr to Woodview Rd	63.3	64.4	1.1
Pipeline Ave.	Eucalyptus Ave to Glen Ridge Dr	66.5	67.3	0.8
	Glen Ridge Dr to Valle Vista Dr	64.1	64.9	0.8
	Woodview Rd to Winged Foot Wy	63.4	64.8	1.4
	Winged Foot to Soquel Canyon Pkwy	66.5	67.8	1.3
Pomona Rincon Rd.	South of Bird Farm Rd	63.3	66.6	3.4
	Soquel Canyon Pkwy to Picasso Dr	62.7	66.1	3.4
	South of Picasso Dr	64.5	67.8	3.4
Soquel Canyon Pkwy.	Pipeline Ave to Pinehurst Dr	67.1	68.4	1.3
	Pinehurst Dr to Elinvar Dr	68.2	69.5	1.3
	Elinvar Dr to Butterfield Ranch Rd	69.1	70.3	1.2
	Butterfield Ranch Rd to SR-71	70.4	73.3	2.9

Notes:
1. Future case with or without the project.

Table 9-6. Estimated Increases in Traffic Noise Levels Adjacent to Freeways & Highways

Arterial	Segment	Estimated CNEL at Right-of-Way Line, dB		Estimated Increase in CNEL, dB
		Existing	Future (2037)[1]	
SR-60 (Pomona Freeway)	West of SR-71 interchange	85.0	86.8	1.8
SR-71 (Chino Valley Freeway)	South of SR-60 interchange	81.7	83.5	1.8
	Peyton to Chino	81.2	83.3	2.1
	Chino to Grand	80.7	83.0	2.3
	Grand to Chino Hills	81.1	83.6	2.5
	Chino Hills to Central	80.6	83.3	2.7
	Central to Pine	81.1	84.0	2.9
	North of Euclid Ave	80.4	82.2	1.8
SR-142 (Carbon Canyon Road)	W City Limits to Rosemary Ln	73.2	74.4	1.2
	Rosemary Ln to Canyon Hills Rd	70.2	71.6	1.4
	Canyon Hills Rd to Chino Hills Pkwy	73.9	74.5	0.6

Notes:
1. Future case with or without the project.

9.3.2 Mitigation Measure #6 – Substantial Permanent Increase in Ambient Noise Level

Policy NOI-1.1 of the General Plan Update addresses noise problems and includes six action statements that would mitigate these potential impacts to a less-than-significant level. Action Statements NOI-1.1.1 and NOI-1.1.2 establish a City program to improve noise conditions in Chino Hills by monitoring and abating local noise sources, by coordinating its actions with other governmental agencies, and by increasing public input. Action Statements NOI-1.1.3 through NOI-1.1.6 reduce ambient noise levels in residential and other sensitive areas by prohibiting truck traffic and minimizing through traffic of all kinds in these areas, and by enforcing the state's motor vehicle noise standards. Policy NOI-2.1, with Action Statement NOI-2.1.6, will ensure that noise impacts on nearby existing sensitive receptors will be minimized as part of the design of new transportation facilities.

With full implementation of these policies, the amount of noise reduction that will be achieved at any specific property will be the difference between the level to which the property is currently exposed and 65 dB (for residential properties) or the upper value of the "Normally Compatible" category in Table N-1 for other properties.

9.4 A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project

9.4.1 Impact #7 – Substantial Temporary or Periodic Increase in Ambient Noise Levels

Development allowed under the General Plan may result in new construction activity, which could temporarily elevate noise levels at adjacent noise-sensitive uses. The Chino Hills Municipal Code regulates construction noise to some extent; however, in the absence of more exacting policies limiting the impact of construction noise, development occurring under the General Plan could

result in construction noise levels at adjacent land uses that temporarily elevate the ambient noise level by 15 to 20 dB. This would be a significant impact.

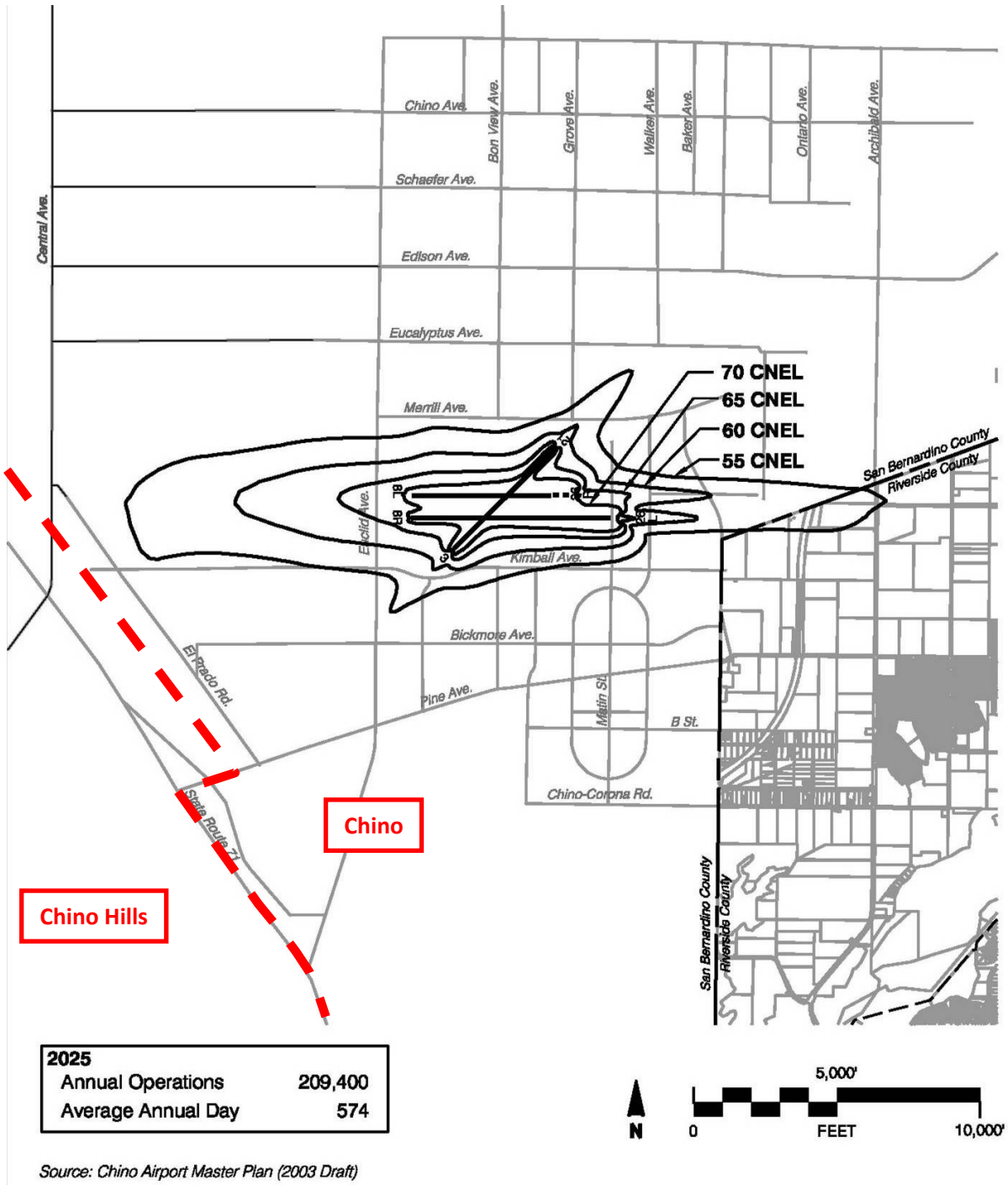
9.4.2 Mitigation Measure #7 – Substantial Temporary or Periodic Increase in Ambient Noise Levels

Construction noise is a short-term impact that is typically regulated through permit conditions and adherence to the City's municipal code. However, the City's municipal code only regulates the hours during which construction can occur (CHMC Chapter 8.08.020). Therefore, the City should establish conditions of approval (including construction hours) that minimize the potential for noise impacts on nearby properties when approving development or issuing conditional use permits. All future projects should be reviewed for their potential to generate construction noise prior to the issuance of building permits, and require appropriate mitigation measures to reduce such noise to acceptable levels. Such mitigation measures should include one or more of the following: (1) limits on the hours of construction per CHMC Chapter 8.08.020, (2) traffic routing, (3) notification of neighbors, (4) types of equipment used, and (5) use of sound mufflers on engine exhaust pipes.

Adoption of this Mitigation Measure would reduce potential impacts related to construction noise to a less-than-significant level.

9.5 The project would expose people residing or working in the project area to excessive noise levels as a result of activities at an airport or private airstrip.

The nearest airport is Chino Municipal Airport, which is located approximately 2 miles east of the City of Chino Hills. Referring to Figure 9-2, activities at the airport will generate a future CNEL that is less than 55 dB at all locations within the City of Chino Hills. This is well below the City's noise compatibility guidelines for all land uses; therefore, the impact is not significant.



Source: Chino Airport Master Plan (2003 Draft)

Figure 9-2. Future (2025) Noise Contours for Chino Municipal Airport

10 Project Alternatives

Only one alternative to the proposed project has been considered in this study: the "No Project" alternative. For this alternative, noise impacts resulting from build-out of the 2013 General Plan are assessed by comparing projected noise levels to the build-out of the 1994 General Plan. However, based on information provided by the City's traffic consultant, Minagar & Associates, there is expected to be little difference in traffic volumes between the build-out of the 1994 General Plan and the build-out of the 2013 General Plan **[7]**. Future noise levels along area roadways would be essentially equivalent under the 1994 and the 2013 General Plans. Therefore, the increase in future noise levels that would occur under the 2013 General Plan would not represent a substantial increase above and beyond future noise levels that would occur under build-out of the 1994 General Plan. As a result, no significant impacts would occur at noise-sensitive locations in Chino Hills.

11 Suggested Changes to the Noise Element Update

11.1 Land Use Compatibility Standards

The City's Noise Element of the General Plan (1994) provides the community noise and land use compatibility guidelines identified in Table N-1 (see page 8 of this report). However, there do not appear to be any policies, programs, or regulations within the City's proposed General Plan update or within the City's Municipal Code that specifically adopt these guidelines as official City standards for new developments. (The exceptions to this are Action Statements NOI-1.1.7 and NOI-2.1.3, which require sound attenuation at residential developments where the exterior CNEL exceeds 65 dB, and Action Statement NOI 2.1.7, which establishes an interior CNEL standard of 45 dB for residential developments.)

To alleviate this situation, it is recommended that the City's updated Noise Element include the exterior and interior noise standards identified in Table 11-1, and that Action Statement NOI-2.1.1 be revised to read "Enforce the standards of Table [11-1], which specify acceptable exterior and interior noise limits for various land uses throughout the City, and are based on the Land Use/Noise Compatibility Matrix of Table N-1."

Table 11-1. Interior and Exterior Noise Standards

Land Use Categories		CNEL	
Categories	**Compatible Uses**	**Interior[1]**	**Exterior[2]**
Residential	Single-Family, Duplex, Multiple Family	45[3]	65[5]
	Mobile Homes	--	65[4]
Commercial/Industrial	Hotel, Motel, Transient Lodging	45[3]	65
	Commercial, Retail, Bank, Restaurant, Health Clubs	55	--
	Office Building, Research and Development, Professional Offices	50	--
	Amphitheater, Concert Hall Auditorium, Meeting Hall, Movie Theater	45	--
	Gymnasium (Multipurpose)	50	--
	Manufacturing, Warehousing, Wholesale, Utilities	65	--
Institutional	Hospital, Schools, Classrooms	45[3]	65
	Church, Library	45[3]	--
Open Space	Parks	--	65

Interpretation:
1. Interior environment excludes bathrooms, toilets, closets, and corridors.
2. Outdoor environment limited to private yard of single-family or multi-family residential private patio which is accessed by a means of exit from inside the unit; mobile home park; hospital patio; park picnic area; school playground; and hotel and motel recreation area.
3. Noise level requirement with closed windows. Mechanical ventilating system or other means of natural ventilation shall be provided pursuant to UBC requirements.
4. Exterior noise level shall be such that interior noise level will not exceed 45 dB CNEL.
5. Multi-family developments with balconies that do not meet the 65 dB CNEL standard are required to provide occupancy disclosure notices to all future tenants regarding potential noise impacts.

11.2 Noise Ordinance Standards

To eliminate the inherent inconsistency that exists regarding implementation of transportation and non-transportation noise standards in Chapter 16.48.020 of the City's Municipal Code (as discussed in Section 4.6.7, above), and to provide a more comprehensive noise ordinance, it is recommended that the City's updated Noise Element include a new policy requiring that the City update its Municipal Code to include a new noise ordinance that provides reasonable and enforceable limits on noise intrusion from one property to another.

12 References

1. *Transit Noise and Vibration Impact Assessment*. U.S. Department of Transportation/Federal Transit Administration (FTA-VA-90-1003-06). May 2006.
2. *Transportation- and Construction-Induced Vibration Guidance Manual.* Jones & Stokes (J&S 02-039). Contract No. 43A0049 for California Department of Transportation, Noise, Vibration, and Hazardous Waste Management Office, Sacramento, CA. June 2004.

3. *FHWA Traffic Noise Model, Version 2.5 Look-Up Table, User's Guide*. U.S. Department of Transportation, Federal Highway Administration. Final Report, December 2004.
4. *Traffic Noise Model (FHWA TNM) LookUp Program, Software Version 2.1 (Data Generated by TNM Version 2.5)*. U.S. Department of Transportation, Federal Highway Administration. February 22, 2007.
5. *Traffic Impact Study for the Transportation & Circulation Element for The City of Chino Hills General Plan Update*. Minagar & Associates, Inc. June 28, 2013.
6. *Inventory of Citywide Traffic Volume Counts for the City of Chino Hills' General Plan Update and Traffic Study*. Minagar & Associates, Inc. January 24, 2013.
7. *Traffic Impact Study for the Transportation & Circulation Element for the City of Chino Hills General Plan Update – Analysis of Existing General Plan Alternatives of Transportation Modes*. Minagar & Associates, Inc.
8. *City of Chino Hills General Plan Land Use Map*. January 14, 2013.
9. *City of Chino Hills General Plan Land Use, Proposed Land Use Changes for Proposed General Plan Buildout*. January 14, 2013.
10. City of Chino Hills General Plan, Chapter 7 – Noise Element. CBA. September 13, 1994.
11. City of Chino Hills Municipal Code.

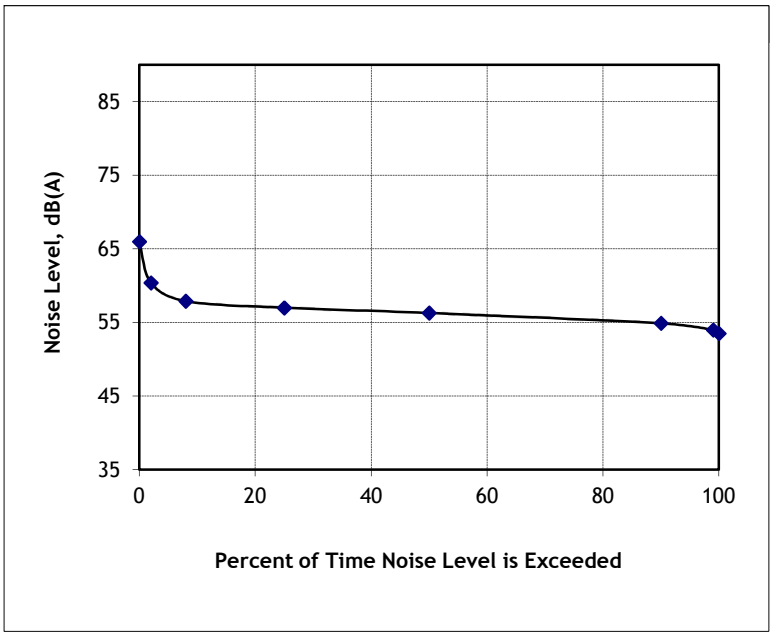
APPENDIX I

Noise Measurements

Table I-1. Noise Survey

Project:	Chino Hills Noise Element Update
Position:	#1, on sidewalk in front of front yard at 2427 Scenic Ridge Dr.
Date:	April 4, 2013
Time:	Noted
Noise Source:	Ambient traffic
Distance:	N/A
SLM Height:	5'
LD 824 S/N:	3536
LD CAL200 Calibrator S/N:	2916
Operator:	Jonathan Higginson

	Measurement Period		
	4:47 PM to 5:09 PM	to	to
n*	Ln	Ln	Ln
2	60.4		
8	57.9		
25	57.0		
50	56.3		
90	54.9		
99	54.0		
Leq	56.8		
Lmax	66.0		
Lmin	53.5		



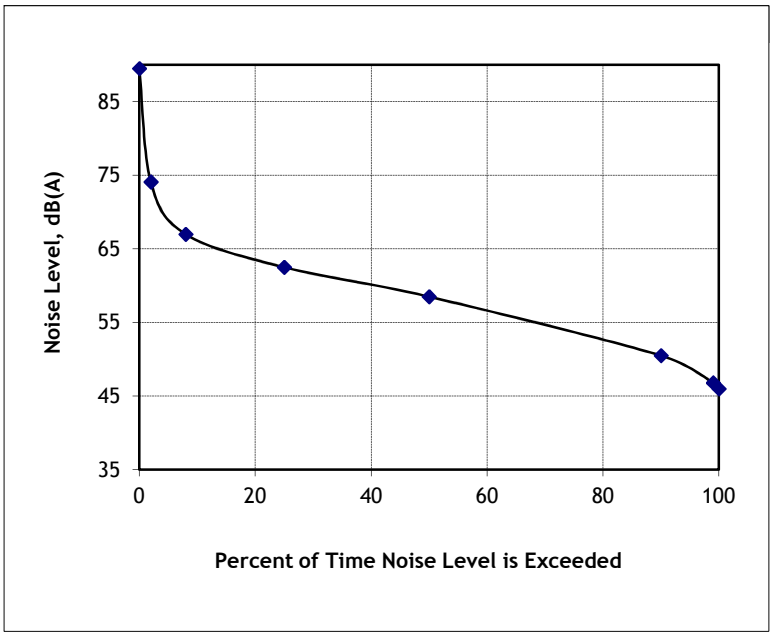
* Leq is the average sound level during the measurement period.
Ln is the sound level exceeded n% of the time during the measurement period.
Lmax and Lmin are the maximum and minimum sound levels during the measurement period.

WIELAND ACOUSTICS, INC.

Table I-2. Noise Survey

Project:	Chino Hills Noise Element Update
Position:	#2, in front of 13104 Glen Ct.
Date:	June 17, 2013
Time:	Noted
Noise Source:	Ambient traffic
Distance:	31'8" from Peyton Dr.
SLM Height:	5'
LD 712 S/N:	0555
LD CAL150 Calibrator S/N:	2206
Operator:	Cynthia Bordash

	Measurement Period		
	1:48 PM to 2:10 PM	to	to
n*	Ln	Ln	Ln
2	74.1		
8	67.0		
25	62.5		
50	58.5		
90	50.5		
99	46.8		
Leq	65.1		
Lmax	89.5		
Lmin	46.0		



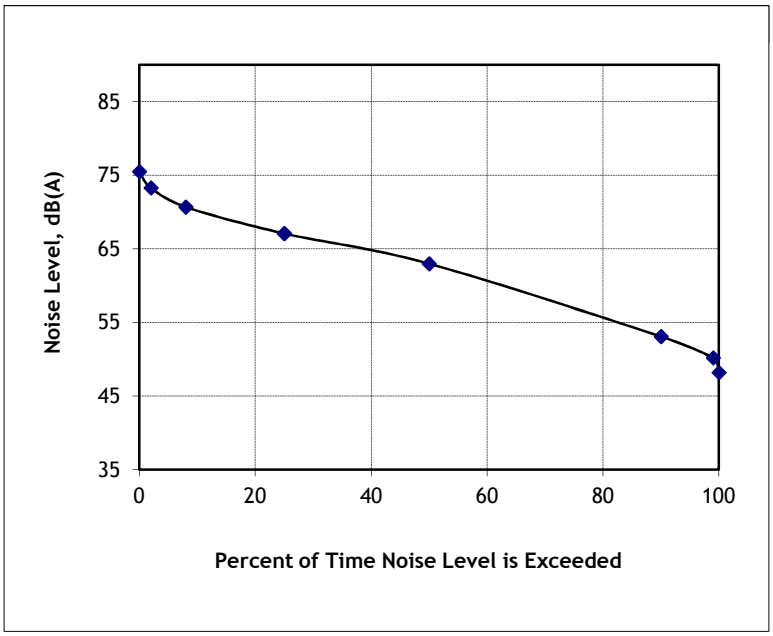
* Leq is the average sound level during the measurement period.
Ln is the sound level exceeded n% of the time during the measurement period.
Lmax and Lmin are the maximum and minimum sound levels during the measurement period.

WIELAND ACOUSTICS, INC.

Table I-3. Noise Survey

Project:	Chino Hills Noise Element Update
Position:	#3, on Rolling Ridge Dr. at Chino Ave.
Date:	April 3, 2013
Time:	Noted
Noise Source:	Ambient traffic
Distance:	21' from Chino Ave.
SLM Height:	5'
LD 824 S/N:	3536
LD CAL200 Calibrator S/N:	2916
Operator:	Jonathan Higginson

	Measurement Period		
	4:33 PM to 4:53 PM	to	to
n*	Ln	Ln	Ln
2	73.3		
8	70.7		
25	67.1		
50	63.0		
90	53.1		
99	50.2		
Leq	66.0		
Lmax	75.5		
Lmin	48.2		



* Leq is the average sound level during the measurement period.
Ln is the sound level exceeded n% of the time during the measurement period.
Lmax and Lmin are the maximum and minimum sound levels during the measurement period.

WIELAND ACOUSTICS, INC.

Table I-4. Summary of Measured Noise Levels and CNEL

Project: Chino Hills Noise Element Update

Position: #4, rear yard of 3059 Galaxy

Date	Time	Leq	Lmax	Lmin	L(2)	L(8)	L(25)	L(50)	L(90)	L(99)	CNEL
05Apr 13	14:00	56.4	67.1	47.8	61.6	59.6	57.6	55.5	51.5	49.0	
05Apr 13	15:00	57.8	79.6	48.1	62.1	59.8	57.7	55.4	51.4	49.1	
05Apr 13	16:00	56.6	68.3	48.6	61.7	59.8	57.7	55.4	51.3	49.4	
05Apr 13	17:00	56.9	75.6	48.2	61.4	59.7	57.8	55.8	51.9	49.3	
05Apr 13	18:00	56.6	65.2	48.9	61.5	59.9	57.8	55.7	52.1	50.1	
05Apr 13	19:00	56.4	70.4	48.8	61.0	59.6	57.5	55.5	51.9	50.1	
05Apr 13	20:00	55.2	68.0	47.8	59.9	58.4	56.5	54.4	50.6	48.9	
05Apr 13	21:00	55.3	72.1	47.7	60.4	58.2	56.1	54.2	51.0	49.2	
05Apr 13	22:00	54.6	68.0	48.4	59.6	57.6	55.4	53.6	50.6	49.2	
05Apr 13	23:00	53.0	67.4	44.4	58.6	56.0	53.7	51.7	48.1	45.8	
06Apr 13	0:00	50.0	62.3	40.0	55.9	53.9	50.9	48.0	44.2	42.3	
06Apr 13	1:00	48.6	65.4	38.4	56.3	52.5	48.5	45.6	42.4	40.3	
06Apr 13	2:00	46.5	69.1	35.8	53.9	50.1	45.9	43.6	40.3	37.7	
06Apr 13	3:00	45.9	61.9	35.4	53.9	49.4	45.4	43.1	39.6	37.3	
06Apr 13	4:00	49.7	69.3	36.3	58.2	52.3	47.8	45.3	41.1	38.3	
06Apr 13	5:00	49.9	68.0	37.4	56.8	53.6	48.7	46.1	43.1	40.3	
06Apr 13	6:00	52.8	67.3	42.0	58.9	56.5	53.7	50.8	46.7	44.4	
06Apr 13	7:00	56.8	79.1	47.2	62.6	58.9	56.2	53.9	50.7	48.4	
06Apr 13	8:00	56.1	67.1	47.3	60.9	59.2	57.2	55.2	51.3	49.0	
06Apr 13	9:00	56.4	69.7	46.9	61.4	59.3	57.4	55.3	51.3	49.1	
06Apr 13	10:00	57.2	64.6	48.1	61.9	60.3	58.2	56.3	52.2	49.9	
06Apr 13	11:00	57.2	75.3	47.6	61.7	59.9	58.2	56.4	52.4	49.4	
06Apr 13	12:00	56.9	64.3	49.5	61.6	59.9	58.0	55.9	52.8	50.8	
06Apr 13	13:00	57.2	69.6	48.2	62.0	60.2	58.2	56.3	52.3	49.6	59.3
06Apr 13	14:00	57.1	66.0	47.2	61.9	60.3	58.2	56.2	51.6	48.8	59.3
06Apr 13	15:00	56.4	72.4	47.4	60.9	59.2	57.4	55.4	51.5	49.1	59.3
06Apr 13	16:00	56.5	72.6	48.6	60.9	59.2	57.2	55.3	51.5	49.4	59.3
06Apr 13	17:00	56.2	68.0	47.2	61.5	59.3	57.2	55.2	51.2	49.0	59.3
06Apr 13	18:00	56.2	65.5	47.7	61.0	59.4	57.4	55.3	51.6	49.4	59.3
06Apr 13	19:00	54.9	64.0	46.2	60.3	58.1	55.9	53.8	50.0	47.9	59.2
06Apr 13	20:00	54.6	71.0	47.2	59.5	57.7	55.5	53.4	50.1	48.0	59.2
06Apr 13	21:00	54.0	64.0	46.3	58.9	57.2	55.2	53.2	50.1	48.2	59.1
06Apr 13	22:00	56.2	71.0	49.8	61.0	58.7	56.8	55.3	52.6	50.5	59.4
06Apr 13	23:00	53.6	63.2	46.5	58.3	56.5	54.5	52.7	49.7	48.0	59.4
07Apr 13	0:00	53.3	64.4	45.8	57.8	56.2	54.3	52.5	49.5	47.4	59.7
07Apr 13	1:00	52.4	67.5	41.5	58.2	55.5	52.9	50.9	47.4	44.8	59.9
07Apr 13	2:00	50.4	63.5	40.0	56.5	54.1	51.3	48.7	44.4	41.3	60.0
07Apr 13	3:00	49.7	64.4	38.9	56.0	53.1	50.3	47.8	43.5	40.4	60.1

Table I-4, cont. Summary of Measured Noise Levels and CNEL

Project: Chino Hills Noise Element Update

Position: #4, rear yard of 3059 Galaxy

Date	Time	Leq	Lmax	Lmin	L(2)	L(8)	L(25)	L(50)	L(90)	L(99)	CNEL
07Apr 13	4:00	47.7	60.0	35.4	54.9	51.9	48.1	45.3	40.5	37.0	60.0
07Apr 13	5:00	50.5	62.7	37.5	56.1	53.7	51.2	49.3	45.7	41.3	60.1
07Apr 13	6:00	53.5	63.6	40.4	58.9	56.9	54.5	52.3	47.9	45.1	60.1
07Apr 13	7:00	53.4	65.6	42.2	59.1	56.9	54.3	52.0	47.7	45.3	60.1
07Apr 13	8:00	54.6	74.1	43.9	59.8	57.5	55.2	52.8	48.4	46.0	60.0
07Apr 13	9:00	57.7	70.0	46.9	62.3	60.4	58.6	56.8	53.4	50.2	60.1
07Apr 13	10:00	56.6	68.4	47.0	61.6	59.7	57.7	55.6	51.6	48.9	60.1
07Apr 13	11:00	59.8	85.8	48.0	62.0	59.9	57.9	55.9	52.0	49.5	60.1
07Apr 13	12:00	56.3	69.8	46.8	61.4	59.4	57.4	55.4	51.4	48.5	60.1
07Apr 13	13:00	56.5	67.1	46.8	61.5	59.8	57.7	55.5	51.3	48.7	60.1
07Apr 13	14:00	57.8	82.8	47.2	62.0	59.7	57.6	55.5	51.6	49.2	60.1
07Apr 13	15:00	56.5	74.0	47.2	61.2	59.5	57.4	55.1	50.9	48.1	60.1
07Apr 13	16:00	56.1	72.7	45.7	61.7	59.1	56.7	54.6	50.2	47.7	60.1
07Apr 13	17:00	55.8	63.3	46.9	60.6	59.0	57.0	54.9	51.0	48.4	60.1
07Apr 13	18:00	56.1	70.4	47.5	61.7	59.1	56.9	54.7	51.0	48.7	60.1
07Apr 13	19:00	54.9	66.6	46.2	59.7	58.1	56.1	53.9	50.3	48.1	60.1
07Apr 13	20:00	54.3	68.6	46.3	59.4	57.4	55.2	53.2	49.5	47.6	60.1
07Apr 13	21:00	54.5	66.3	47.5	59.8	57.6	55.4	53.5	50.4	48.7	60.1
07Apr 13	22:00	52.9	61.8	46.1	57.8	56.1	53.9	51.8	48.6	47.0	59.7
07Apr 13	23:00	52.2	63.6	43.1	56.9	55.2	53.1	51.2	48.0	45.3	59.6
08Apr 13	0:00	47.7	61.2	38.5	54.7	51.5	48.1	45.4	42.3	40.3	59.3
08Apr 13	1:00	50.2	67.4	38.7	56.7	54.1	50.9	48.2	43.0	39.8	59.1
08Apr 13	2:00	49.7	57.7	39.3	54.9	53.2	50.8	48.5	44.2	40.8	59.1
08Apr 13	3:00	46.6	57.7	37.2	53.2	50.0	47.0	44.7	41.2	39.0	59.0
08Apr 13	4:00	49.7	62.7	40.4	56.3	53.6	49.9	47.6	44.2	42.0	59.0
08Apr 13	5:00	52.7	68.9	44.4	58.5	55.8	53.2	50.9	47.6	46.0	59.2
08Apr 13	6:00	54.9	69.3	47.3	59.9	57.8	55.6	53.7	50.8	48.9	59.4
08Apr 13	7:00	56.5	65.4	49.0	61.6	59.7	57.5	55.4	52.0	50.2	59.4
08Apr 13	8:00	56.7	69.7	50.0	61.6	59.8	57.6	55.6	52.2	50.5	59.5

Table I-5. Summary of Measured Noise Levels and CNEL

Project: Chino Hills Noise Element Update

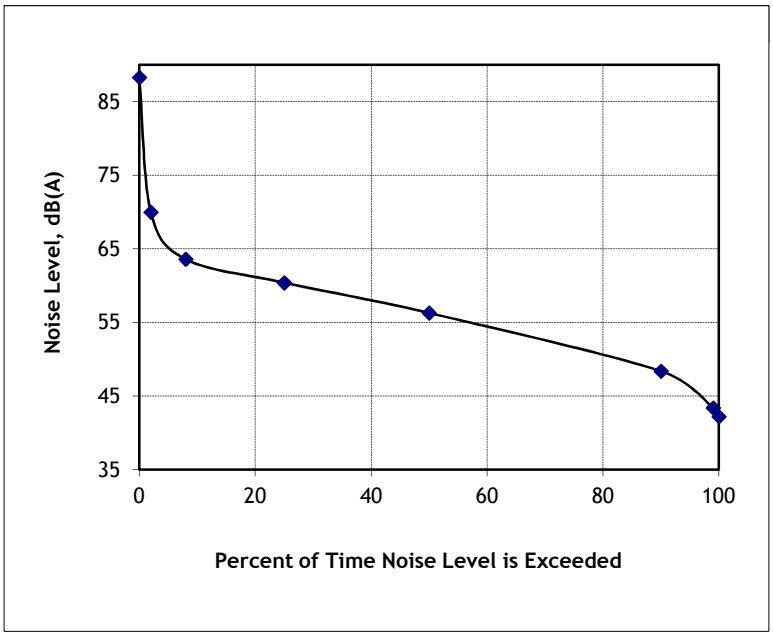
Position: #5, rear yard of 3238 Skyview Ridge

Date	Time	Leq	Lmax	Lmin	L(2)	L(8)	L(25)	L(50)	L(90)	L(99)	CNEL
03Apr 13	17:00	70.1	75.5	65.8	72.5	71.6	70.8	70.0	68.4	67.1	
03Apr 13	18:00	69.7	79.0	64.1	71.9	71.2	70.4	69.5	67.6	65.7	
03Apr 13	19:00	69.1	81.4	61.2	72.1	70.9	69.7	68.7	66.7	64.6	
03Apr 13	20:00	68.3	73.3	61.5	70.9	69.9	69.1	68.2	66.3	64.2	
03Apr 13	21:00	67.9	76.0	60.3	71.1	69.8	68.7	67.5	65.2	63.1	
03Apr 13	22:00	66.7	75.7	58.1	69.9	68.8	67.6	66.5	64.0	61.5	
03Apr 13	23:00	65.4	75.5	55.6	69.0	67.9	66.4	64.9	61.5	57.9	
04Apr 13	0:00	63.1	72.5	47.8	67.8	66.2	64.1	62.3	57.4	51.7	
04Apr 13	1:00	62.2	71.1	43.6	67.7	65.8	63.4	61.1	54.3	47.1	
04Apr 13	2:00	62.2	71.7	42.8	67.7	66.0	63.6	61.0	53.5	46.4	
04Apr 13	3:00	63.1	73.1	41.5	68.1	66.6	64.5	62.1	55.3	45.1	
04Apr 13	4:00	66.8	76.7	55.6	70.9	69.5	68.0	66.3	62.4	58.8	
04Apr 13	5:00	68.9	75.6	60.3	71.9	70.8	69.7	68.6	66.1	63.3	
04Apr 13	6:00	69.6	74.1	61.3	72.5	71.5	70.4	69.4	67.1	65.1	
04Apr 13	7:00	70.4	75.5	62.2	72.8	71.9	71.1	70.3	68.5	66.6	
04Apr 13	8:00	70.6	75.6	65.8	72.9	72.2	71.3	70.4	68.7	67.2	
04Apr 13	9:00	70.2	74.9	64.6	73.0	71.9	71.0	70.0	68.0	66.4	
04Apr 13	10:00	70.0	75.6	64.4	72.7	71.8	70.8	69.9	68.0	66.1	
04Apr 13	11:00	69.5	74.2	63.1	72.4	71.3	70.2	69.3	67.3	65.5	
04Apr 13	12:00	69.3	76.5	62.8	72.2	71.2	70.1	69.0	66.9	64.6	
04Apr 13	13:00	68.9	73.5	61.9	71.7	70.8	69.8	68.7	66.4	64.4	
04Apr 13	14:00	68.9	74.9	61.9	71.7	70.7	69.7	68.8	66.6	64.4	
04Apr 13	15:00	68.9	75.8	62.2	71.9	70.7	69.7	68.6	66.8	65.0	73.7

Table I-6. Noise Survey

Project:	Chino Hills Noise Element Update
Position:	#6, in front of 3098 Ridgefield Dr.
Date:	June 17, 2013
Time:	Noted
Noise Source:	Ambient traffic
Distance:	77' from Peyton Dr.
SLM Height:	5'
LD 712 S/N:	0555
LD CAL150 Calibrator S/N:	2206
Operator:	Cynthia Bordash

	Measurement Period		
	2:40 PM to 3:04 PM	to	to
n*	Ln	Ln	Ln
2	70.0		
8	63.6		
25	60.4		
50	56.3		
90	48.4		
99	43.4		
Leq	63.2		
Lmax	88.3		
Lmin	42.2		



* Leq is the average sound level during the measurement period.
Ln is the sound level exceeded n% of the time during the measurement period.
Lmax and Lmin are the maximum and minimum sound levels during the measurement period.

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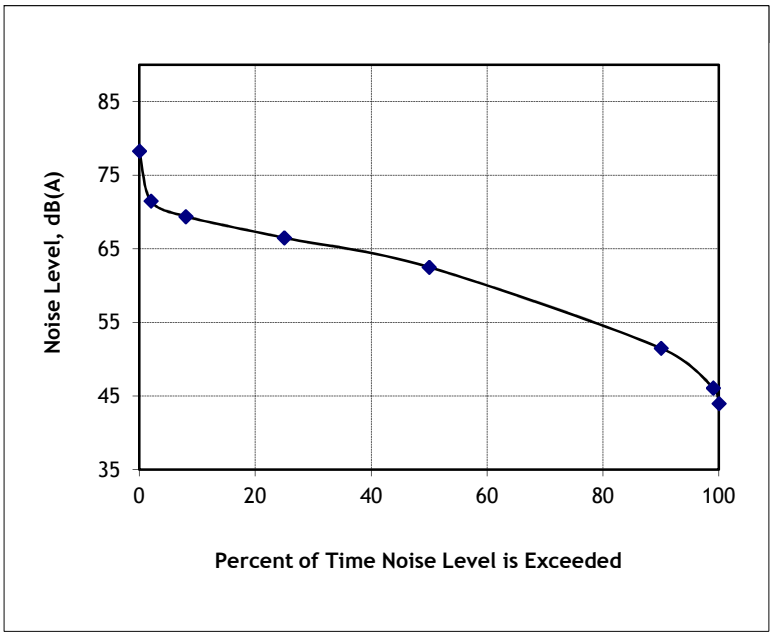
Table I-7. Noise Survey

Project:	Chino Hills Noise Element Update
Position:	#7, in front of 2936 Sunny Brook Ln.
Date:	June 17, 2013
Time:	Noted
Noise Source:	Ambient traffic
Distance:	66'6" from Grand Ave.
SLM Height:	5'
LD 712 S/N:	0555
LD CAL150 Calibrator S/N:	2206
Operator:	Cynthia Bordash

	Measurement Period		
	3:21 PM to 3:42 PM	to	to
n*	Ln	Ln	Ln
2	71.5		
8	69.4		
25	66.5		
50	62.5		
90	51.5		
99	46.1		
Leq	65.0		
Lmax	78.3		
Lmin	44.0		



* Leq is the average sound level during the measurement period.
Ln is the sound level exceeded n% of the time during the measurement period.
Lmax and Lmin are the maximum and minimum sound levels during the measurement period.

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Table I-8. Noise Survey

Project: Chino Hills Noise Element Update

Position: #8, in front of 14100 Heathervale Dr.

Date: June 17, 2013

Time: Noted

Noise Source: Ambient traffic

Distance: 27'6" from Chino Hills Pkwy.

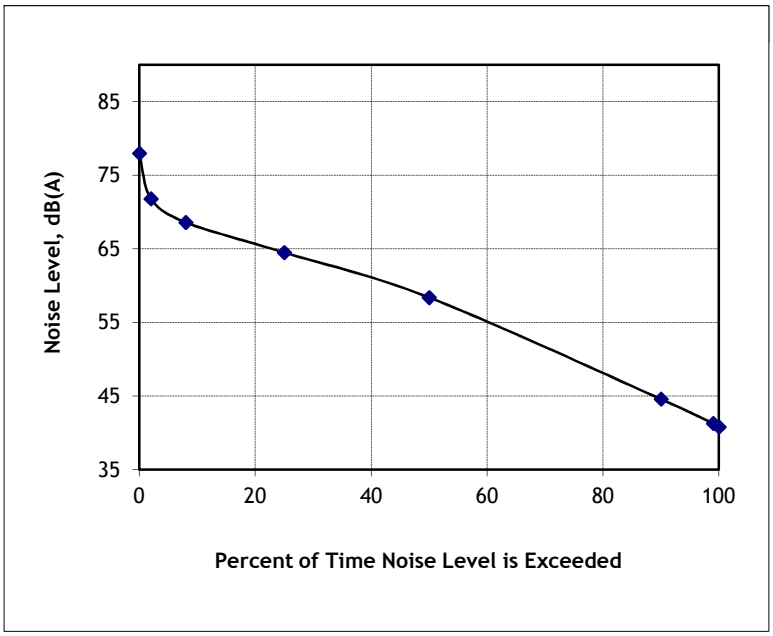
SLM Height: 5'

LD 712 S/N: 0555

LD CAL150
Calibrator S/N: 2206

Operator: Cynthia Bordash

	Measurement Period		
	3:54 PM to 4:16 PM	to	to
n*	Ln	Ln	Ln
2	71.8		
8	68.6		
25	64.5		
50	58.4		
90	44.6		
99	41.3		
Leq	63.8		
Lmax	78.0		
Lmin	40.8		



* Leq is the average sound level during the measurement period.
Ln is the sound level exceeded n% of the time during the measurement period.
Lmax and Lmin are the maximum and minimum sound levels during the measurement period.

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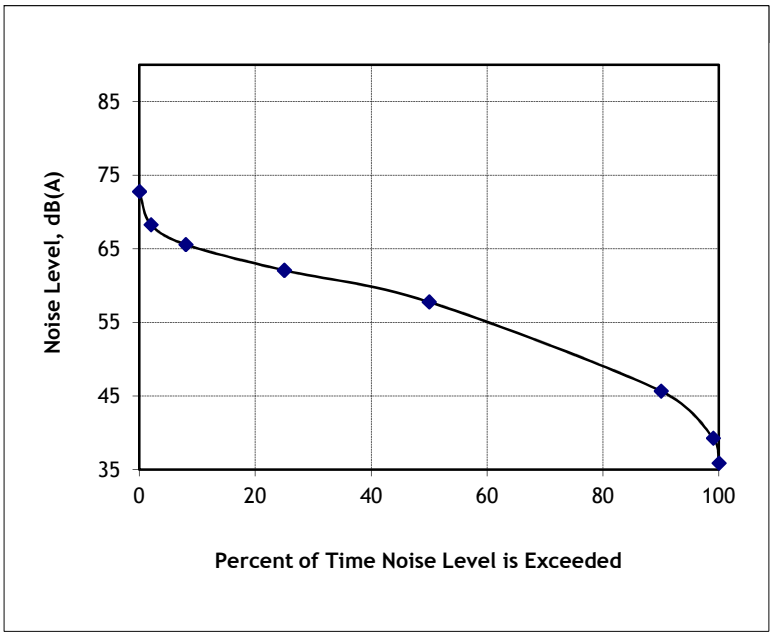
Table I-9. Noise Survey

Project:	Chino Hills Noise Element Update
Position:	#9, at Willow Wood and Grand, at setback of house. Adjacent to 1793 Walnut Creek Rd.
Date:	April 5, 2013
Time:	Noted
Noise Source:	Ambient traffic
Distance:	66' from Grand Ave.
SLM Height:	5'
LD 824 S/N:	3536
LD CAL200 Calibrator S/N:	2916
Operator:	Jonathan Higginson

	Measurement Period		
	2:17 PM to 2:38 PM	to	to
n*	Ln	Ln	Ln
2	68.3		
8	65.6		
25	62.1		
50	57.8		
90	45.7		
99	39.3		
Leq	61.0		
Lmax	72.8		
Lmin	35.9		



* Leq is the average sound level during the measurement period.
Ln is the sound level exceeded n% of the time during the measurement period.
Lmax and Lmin are the maximum and minimum sound levels during the measurement period.

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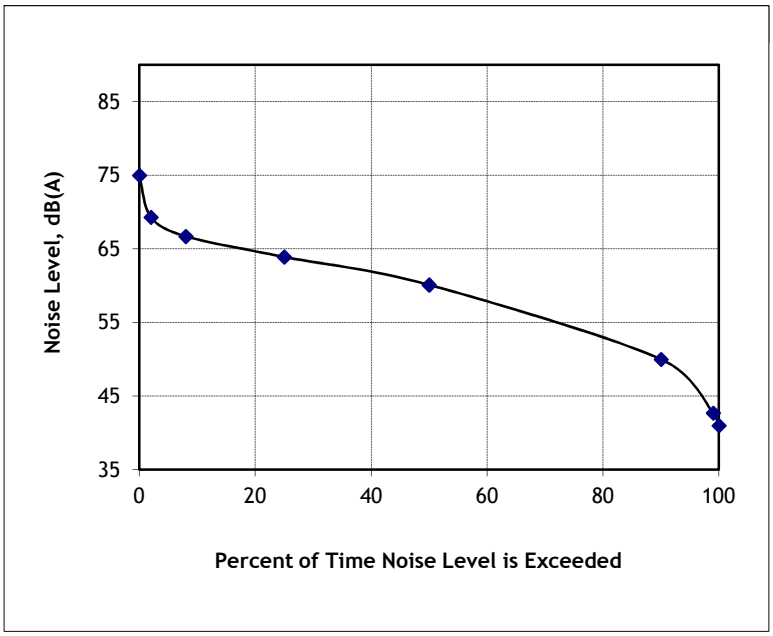
Table I-10. Noise Survey

Project:	Chino Hills Noise Element Update
Position:	#10, at the Sunset Apts/Condos on the east side of Moon Rise Ln.
Date:	April 5, 2013
Time:	Noted
Noise Source:	Ambient traffic
Distance:	33' from Chino Hills Pkwy.
SLM Height:	5'
LD 824 S/N:	3536
LD CAL200 Calibrator S/N:	2916
Operator:	Jonathan Higginson

	Measurement Period		
	2:54 PM to 3:14 PM	to	to
n*	Ln	Ln	Ln
2	69.3		
8	66.7		
25	63.9		
50	60.1		
90	50.0		
99	42.7		
Leq	62.6		
Lmax	75.0		
Lmin	41.0		



* Leq is the average sound level during the measurement period.
Ln is the sound level exceeded n% of the time during the measurement period.
Lmax and Lmin are the maximum and minimum sound levels during the measurement period.

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Table I-11. Noise Survey

Project: Chino Hills Noise Element Update

Position: #11, in front of 14514 Foxglove Dr.

Date: June 17, 2013

Time: Noted

Noise Source: Ambient traffic

Distance: 31'6" from Eucalyptus Dr.

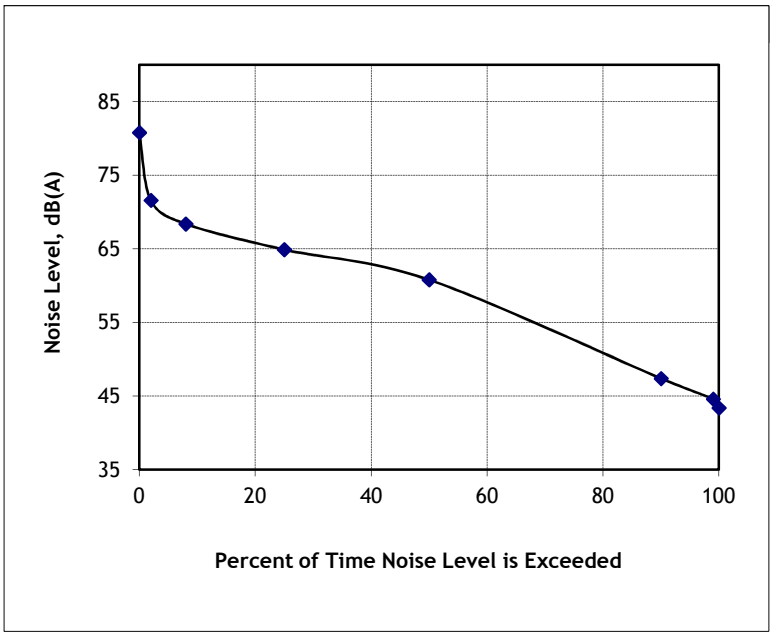
SLM Height: 5'

LD 712 S/N: 0555

LD CAL150
Calibrator S/N: 2206

Operator: Cynthia Bordash

	Measurement Period		
	12:48 PM to 1:10 PM	to	to
n*	Ln	Ln	Ln
2	71.6		
8	68.4		
25	64.9		
50	60.8		
90	47.4		
99	44.6		
Leq	64.0		
Lmax	80.8		
Lmin	43.4		



* Leq is the average sound level during the measurement period.
Ln is the sound level exceeded n% of the time during the measurement period.
Lmax and Lmin are the maximum and minimum sound levels during the measurement period.

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Table I-12. Summary of Measured Noise Levels and CNEL

Project: Chino Hills Noise Element Update

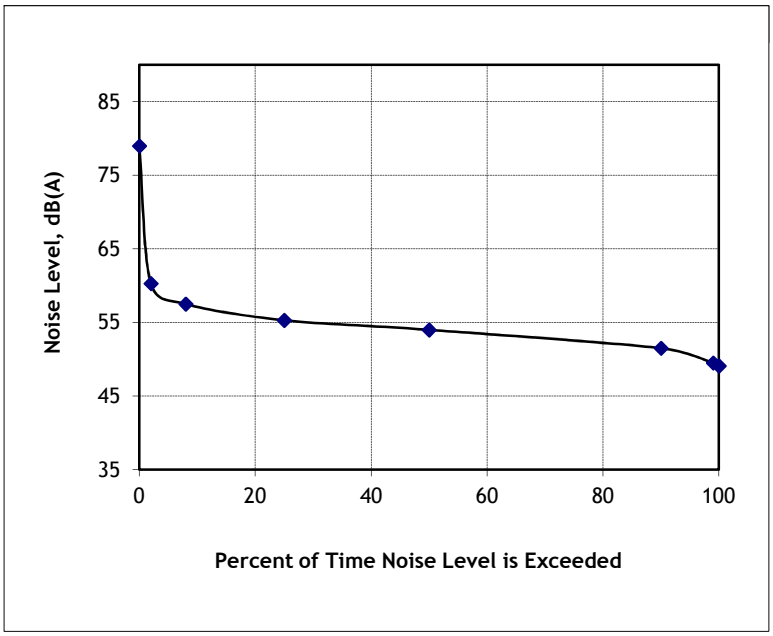
Position: #12, rear yard of 3456 Whirlaway

Date	Time	Leq	Lmax	Lmin	L(2)	L(8)	L(25)	L(50)	L(90)	CNEL
04Apr 13	14:00	66.4	90.8	49.0	72.2	69.4	66.6	63.6	66.4	
04Apr 13	15:00	66.7	83.4	48.1	73.2	70.5	67.8	64.3	66.7	
04Apr 13	16:00	68.8	95.0	49.1	74.3	70.9	68.7	65.6	68.8	
04Apr 13	17:00	67.7	90.6	49.9	72.8	70.4	68.5	65.8	67.7	
04Apr 13	18:00	67.9	90.5	52.1	72.9	70.3	68.2	65.0	67.9	
04Apr 13	19:00	66.5	87.5	49.4	72.2	69.0	66.2	63.3	71.5	
04Apr 13	20:00	65.3	89.1	50.9	71.2	67.7	64.8	61.8	70.3	
04Apr 13	21:00	63.0	85.5	49.8	68.7	66.3	63.6	60.4	68.0	
04Apr 13	22:00	61.9	71.2	50.9	67.5	65.5	62.9	60.6	71.9	
04Apr 13	23:00	65.6	74.6	59.1	69.6	68.7	66.9	64.5	75.6	
05Apr 13	0:00	66.8	73.4	59.8	69.0	68.6	67.9	67.2	76.8	
05Apr 13	1:00	66.4	71.0	65.4	68.0	67.5	66.8	66.3	76.4	
05Apr 13	2:00	65.4	80.5	64.1	67.1	66.0	65.7	65.2	75.4	
05Apr 13	3:00	65.5	73.3	64.4	67.7	66.6	65.8	65.3	75.5	
05Apr 13	4:00	67.3	72.1	65.8	69.2	68.4	67.7	67.2	77.3	
05Apr 13	5:00	68.2	79.8	66.4	71.3	69.6	68.4	67.7	78.2	
05Apr 13	6:00	67.9	79.2	65.2	71.4	69.9	68.6	67.5	77.9	
05Apr 13	7:00	68.0	79.4	64.7	71.8	70.2	68.7	67.5	68.0	
05Apr 13	8:00	67.3	83.0	53.5	71.6	69.9	68.1	66.5	67.3	
05Apr 13	9:00	67.5	95.6	50.9	70.7	68.3	65.8	62.7	67.5	
05Apr 13	10:00	65.9	88.1	52.1	72.0	68.7	65.7	62.8	65.9	
05Apr 13	11:00	66.5	92.6	53.5	71.4	68.9	66.3	63.5	66.5	
05Apr 13	12:00	65.1	79.7	53.2	71.2	68.8	66.3	63.5	65.1	
05Apr 13	13:00	67.3	87.9	53.4	73.7	69.6	66.7	63.9	67.3	73.1
05Apr 13	14:00	66.1	81.1	49.7	72.1	70.0	67.2	64.0	66.1	73.1

Table I-13. Noise Survey

Project:	Chino Hills Noise Element Update
Position:	#13, in front of 4488 Village Dr.
Date:	June 17, 2013
Time:	Noted
Noise Source:	Ambient traffic
Distance:	N/A
SLM Height:	5'
LD 712 S/N:	0555
LD CAL150 Calibrator S/N:	2206
Operator:	Cynthia Bordash

	Measurement Period		
	11:52 AM to 12:23 PM	to	to
n*	Ln	Ln	Ln
2	60.3		
8	57.5		
25	55.3		
50	54.0		
90	51.5		
99	49.5		
Leq	55.2		
Lmax	79.0		
Lmin	49.1		



* Leq is the average sound level during the measurement period.
Ln is the sound level exceeded n% of the time during the measurement period.
Lmax and Lmin are the maximum and minimum sound levels during the measurement period.

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Table I-14. Noise Survey

Project: Chino Hills Noise Element Update

Position: #14, front yard of 3384 Gabriel Dr.

Date: April 4, 2013

Time: Noted

Noise Source: Ambient traffic

Distance: 12' from Gabriel

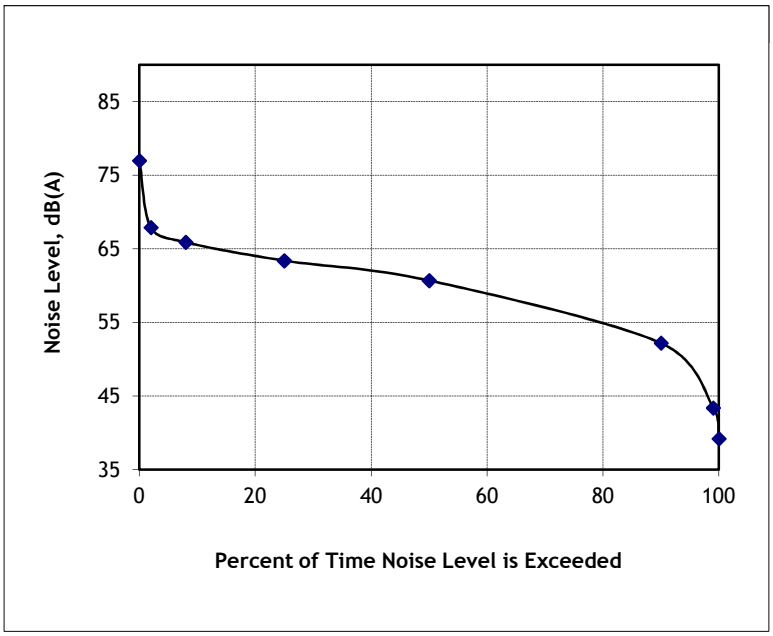
SLM Height: 5'

LD 824 S/N: 3536

LD CAL200
Calibrator S/N: 2916

Operator: Jonathan Higginson

	Measurement Period		
	1:30 PM to 1:50 PM	to	to
n*	Ln	Ln	Ln
2	67.9		
8	65.9		
25	63.4		
50	60.7		
90	52.2		
99	43.4		
Leq	62.4		
Lmax	77.0		
Lmin	39.2		



* Leq is the average sound level during the measurement period.
Ln is the sound level exceeded n% of the time during the measurement period.
Lmax and Lmin are the maximum and minimum sound levels during the measurement period.

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Table I-15. Summary of Measured Noise Levels and CNEL

Project: Chino Hills Noise Element Update

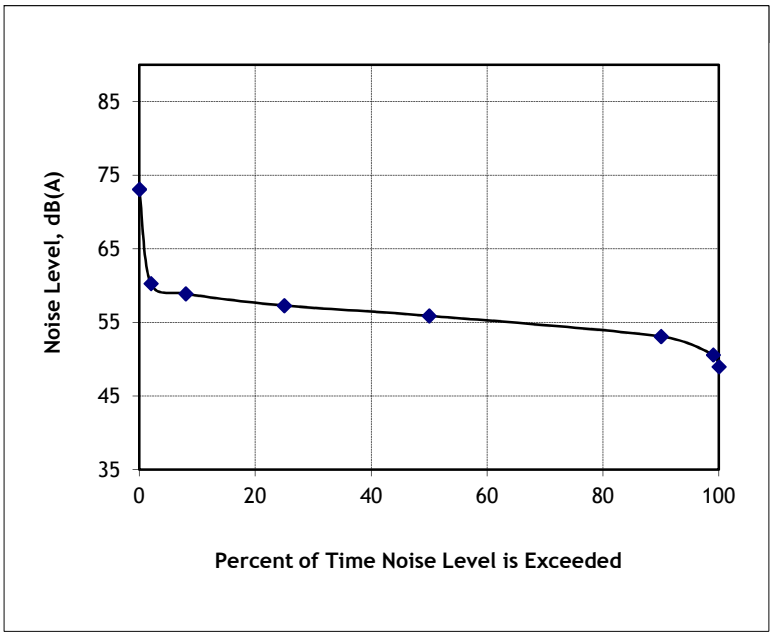
Position: #15, rear yard of 15567 Sandlewood

Date	Time	Leq	Lmax	Lmin	L(2)	L(8)	L(25)	L(50)	L(90)	L(99)	CNEL
03Apr 13	15:00	50.9	67.8	37.7	58.4	53.8	51.1	48.8	42.9	39.3	
03Apr 13	16:00	53.1	77.1	38.4	60.6	55.6	51.7	49.0	43.0	40.0	
03Apr 13	17:00	52.9	70.3	37.6	61.3	55.7	52.6	50.1	43.8	39.1	
03Apr 13	18:00	52.9	70.5	37.6	60.4	55.2	52.4	50.1	45.1	40.2	
03Apr 13	19:00	53.0	80.5	42.3	58.2	54.5	52.2	49.9	45.6	43.6	
03Apr 13	20:00	52.5	73.1	37.8	61.0	54.9	51.0	48.1	43.1	40.3	
03Apr 13	21:00	48.5	67.8	37.8	55.0	51.9	49.0	45.6	40.8	38.7	
03Apr 13	22:00	47.3	63.5	35.1	55.1	51.4	47.4	43.2	38.9	36.0	
03Apr 13	23:00	42.7	58.8	29.4	51.7	48.0	41.0	37.3	33.3	30.3	
04Apr 13	0:00	39.7	60.0	28.0	49.1	44.3	36.0	31.6	29.2	28.2	
04Apr 13	1:00	40.1	66.7	27.6	48.5	39.9	32.5	30.4	29.0	28.1	
04Apr 13	2:00	38.3	62.9	28.2	47.5	39.2	34.5	31.9	29.7	28.5	
04Apr 13	3:00	41.8	62.3	26.6	51.8	43.6	35.2	31.0	28.2	27.1	
04Apr 13	4:00	42.4	63.1	27.5	52.3	46.8	38.5	33.9	30.1	28.5	
04Apr 13	5:00	48.1	64.1	32.6	56.5	53.0	49.0	40.4	33.9	32.8	
04Apr 13	6:00	50.5	66.5	34.5	58.0	54.7	51.1	46.8	38.9	35.3	
04Apr 13	7:00	56.4	69.8	42.9	63.1	61.1	58.1	52.5	46.8	44.7	
04Apr 13	8:00	52.4	70.9	42.6	58.9	55.6	52.5	49.6	44.7	43.3	
04Apr 13	9:00	51.4	67.9	42.1	58.5	54.7	51.9	48.8	44.2	42.7	
04Apr 13	10:00	51.4	72.5	42.2	58.2	54.4	51.3	48.4	44.0	42.6	
04Apr 13	11:00	50.4	66.7	42.0	57.1	54.0	51.2	48.4	43.8	42.6	
04Apr 13	12:00	51.4	68.2	41.7	58.5	54.9	51.8	49.2	43.9	42.2	
04Apr 13	13:00	53.7	82.1	36.4	58.7	54.1	50.6	47.6	41.2	38.4	
04Apr 13	14:00	51.1	72.7	37.4	58.8	53.8	50.4	47.6	41.4	39.2	54.5

Table I-16. Noise Survey

Project:	Chino Hills Noise Element Update
Position:	#16, in front of 5022 Pomona Rincon
Date:	June 17, 2013
Time:	Noted
Noise Source:	Ambient traffic
Distance:	58' from Pomona Rincon
SLM Height:	5'
LD 712 S/N:	0555
LD CAL150 Calibrator S/N:	2206
Operator:	Cynthia Bordash

	Measurement Period		
	10:49 AM to 11:14 AM	to	to
n*	Ln	Ln	Ln
2	60.3		
8	58.9		
25	57.3		
50	55.9		
90	53.1		
99	50.6		
Leq	56.6		
Lmax	73.1		
Lmin	49.0		



* Leq is the average sound level during the measurement period.
Ln is the sound level exceeded n% of the time during the measurement period.
Lmax and Lmin are the maximum and minimum sound levels during the measurement period.

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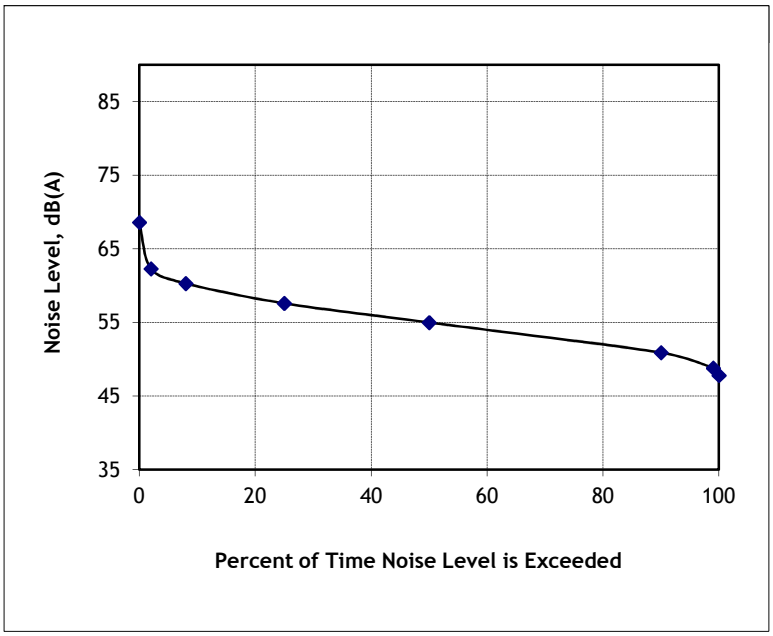
Table I-17. Noise Survey

Project:	Chino Hills Noise Element Update
Position:	#17, in front of 15461 Timberidge
Date:	June 17, 2013
Time:	Noted
Noise Source:	Ambient traffic
Distance:	N/A
SLM Height:	5'
LD 712 S/N:	0555
LD CAL150 Calibrator S/N:	2206
Operator:	Cynthia Bordash

	Measurement Period		
	9:47 AM to 10:07 AM	to	to
n*	Ln	Ln	Ln
2	62.3		
8	60.3		
25	57.6		
50	55.0		
90	50.9		
99	48.8		
Leq	56.6		
Lmax	68.6		
Lmin	47.8		



* Leq is the average sound level during the measurement period.
Ln is the sound level exceeded n% of the time during the measurement period.
Lmax and Lmin are the maximum and minimum sound levels during the measurement period.

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Table I-18. Noise Survey

Project: Chino Hills Noise Element Update

Position: #18, in front of 16860 Oak Way Ln.

Date: June 17, 2013

Time: Noted

Noise Source: Ambient traffic

Distance: 58' from Carbon Canyon Rd.

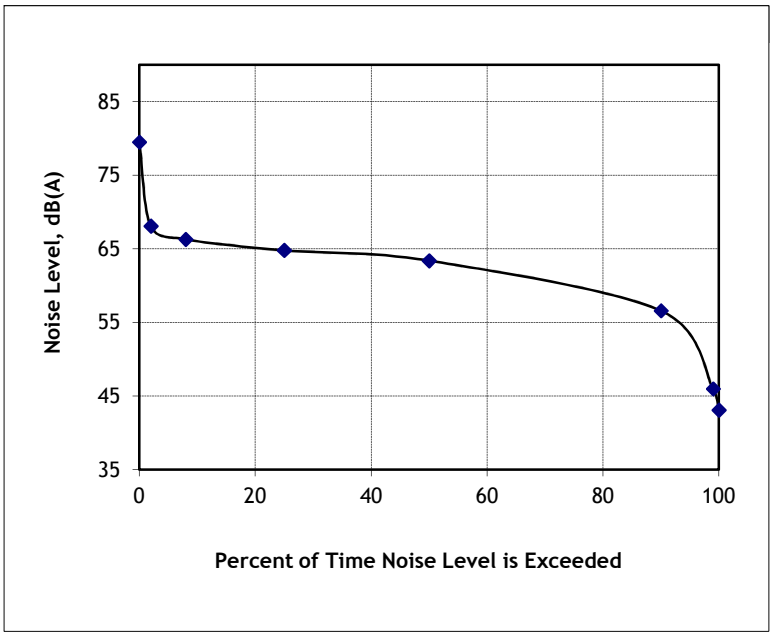
SLM Height: 5'

LD 712 S/N: 0555

LD CAL150
Calibrator S/N: 2206

Operator: Cynthia Bordash

	Measurement Period		
	4:42 PM to 5:04 PM	to	to
n*	Ln	Ln	Ln
2	68.1		
8	66.3		
25	64.8		
50	63.4		
90	56.6		
99	46.0		
Leq	63.8		
Lmax	79.5		
Lmin	43.1		



* Leq is the average sound level during the measurement period.
Ln is the sound level exceeded n% of the time during the measurement period.
Lmax and Lmin are the maximum and minimum sound levels during the measurement period.

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Table I-19. Summary of Measured Noise Levels and CNEL

Project: Chino Hills Noise Element Update

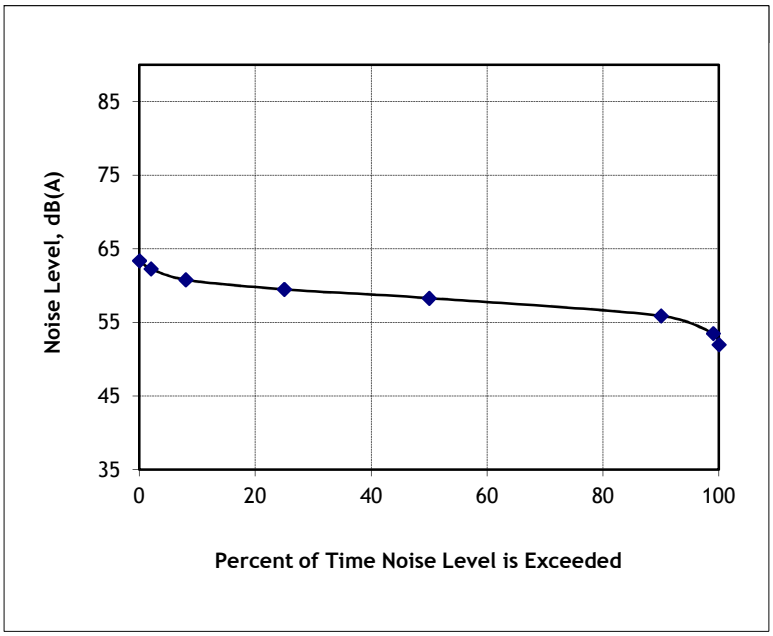
Position: #19, rear yard of 4597 St. Andrews

Date	Time	Leq	Lmax	Lmin	L(2)	L(8)	L(25)	L(50)	L(90)	L(99)	CNEL
03Apr 13	13:00	50.8	72.5	28.3	61.4	52.6	48.4	44.7	37.4	32.2	
03Apr 13	14:00	50.1	67.1	35.8	57.5	53.9	50.5	47.1	42.4	39.1	
03Apr 13	15:00	49.5	63.7	36.8	55.4	52.8	50.2	47.8	43.0	39.3	
03Apr 13	16:00	53.4	76.1	36.3	61.0	57.5	53.0	49.3	43.5	40.3	
03Apr 13	17:00	51.3	68.7	33.9	58.7	55.0	51.5	48.0	42.6	38.7	
03Apr 13	18:00	50.7	71.9	36.8	56.3	53.7	51.3	48.4	43.2	38.6	
03Apr 13	19:00	49.5	65.1	38.5	56.2	53.5	50.2	47.1	42.5	40.1	
03Apr 13	20:00	58.6	77.5	31.9	70.3	55.8	49.4	45.6	38.7	34.9	
03Apr 13	21:00	49.9	66.2	32.4	55.1	52.6	50.5	49.2	41.7	37.0	
03Apr 13	22:00	48.1	75.5	30.2	54.5	49.9	45.9	42.4	35.9	32.0	
03Apr 13	23:00	41.5	55.8	24.0	50.4	46.8	41.3	35.5	28.1	25.1	
04Apr 13	0:00	38.8	58.4	22.4	48.4	43.5	34.6	26.5	23.4	22.4	
04Apr 13	1:00	37.2	57.2	22.7	47.6	41.5	31.1	26.6	24.3	23.2	
04Apr 13	2:00	33.2	52.3	22.3	43.4	34.0	28.4	26.5	24.4	23.0	
04Apr 13	3:00	34.9	55.1	22.1	45.0	37.7	31.3	27.8	23.7	22.4	
04Apr 13	4:00	38.2	63.1	23.1	45.5	41.1	34.3	28.8	25.6	24.1	
04Apr 13	5:00	41.9	62.5	24.3	50.4	44.8	40.1	32.9	26.9	25.0	
04Apr 13	6:00	59.2	71.2	25.5	67.7	66.3	58.9	50.2	34.9	27.3	
04Apr 13	7:00	54.4	73.3	29.0	64.7	60.0	49.6	45.5	37.5	31.1	
04Apr 13	8:00	50.0	71.2	36.8	58.0	53.4	49.5	46.6	42.3	38.5	
04Apr 13	9:00	49.7	66.5	33.5	58.0	53.8	49.6	46.4	41.3	36.6	
04Apr 13	10:00	49.6	63.1	32.0	56.0	53.8	50.7	47.5	40.5	35.5	
04Apr 13	11:00	51.4	73.5	34.1	57.4	52.7	49.5	46.4	40.7	37.6	
04Apr 13	12:00	47.7	61.7	29.3	55.4	51.9	48.1	44.4	36.2	32.1	57.6
04Apr 13	13:00	49.3	67.3	35.0	55.3	52.2	49.2	46.1	40.6	37.3	57.6
04Apr 13	14:00	49.1	63.9	37.2	55.8	52.8	49.5	46.8	41.6	38.7	57.6

Table I-20. Noise Survey

Project:	Chino Hills Noise Element Update
Position:	#20, at end of Rosebud Ct. cul-de-sac between #5779 and #5776
Date:	April 4, 2013
Time:	Noted
Noise Source:	Ambient traffic
Distance:	N/A
SLM Height:	5'
LD 824 S/N:	3536
LD CAL200 Calibrator S/N:	2916
Operator:	Jonathan Higginson

	Measurement Period		
	2:42 PM to 3:03 PM	to	to
n*	Ln	Ln	Ln
2	62.3		
8	60.8		
25	59.5		
50	58.3		
90	55.9		
99	53.5		
Leq	58.7		
Lmax	63.4		
Lmin	52.0		



* Leq is the average sound level during the measurement period.
Ln is the sound level exceeded n% of the time during the measurement period.
Lmax and Lmin are the maximum and minimum sound levels during the measurement period.

WIELAND ACOUSTICS, INC.

Table I-21. Summary of Measured Noise Levels and CNEL

Project: Chino Hills Noise Element Update

Position: #21, rear yard of 17957 Lariat Dr.

Date	Time	Leq	Lmax	Lmin	L(2)	L(8)	L(25)	L(50)	CNEL
03Apr 13	11:00	63.5	85.4	52.1	66.9	65.4	63.7	62.2	
03Apr 13	12:00	62.6	84.8	52.4	66.1	64.8	63.5	62.2	
03Apr 13	13:00	61.6	68.5	48.1	65.7	64.1	62.8	61.3	
03Apr 13	14:00	60.8	73.9	51.4	65.3	63.2	61.7	60.2	
03Apr 13	15:00	63.1	85.7	50.7	69.2	63.9	62.3	60.8	
03Apr 13	16:00	61.6	70.2	50.7	65.5	63.9	62.6	61.3	
03Apr 13	17:00	62.1	72.5	52.8	65.8	64.1	62.9	61.7	
03Apr 13	18:00	61.6	83.0	53.1	65.6	63.4	61.9	60.7	
03Apr 13	19:00	59.8	68.0	52.7	63.4	62.0	60.8	59.4	
03Apr 13	20:00	61.5	81.6	51.5	66.9	62.8	61.1	59.5	
03Apr 13	21:00	62.6	82.7	49.6	69.4	63.8	62.0	60.4	
03Apr 13	22:00	67.0	84.5	44.5	79.2	66.9	59.9	57.2	
03Apr 13	23:00	57.2	65.3	41.9	62.6	60.7	58.5	56.3	
04Apr 13	0:00	58.2	88.5	38.5	62.2	59.4	56.4	53.1	
04Apr 13	1:00	56.0	83.0	38.5	61.6	58.7	55.4	51.3	
04Apr 13	2:00	57.2	81.4	37.5	63.9	59.7	55.3	51.0	
04Apr 13	3:00	55.2	67.3	37.9	63.0	59.9	56.0	52.4	
04Apr 13	4:00	59.9	70.1	42.9	65.0	63.6	61.3	58.9	
04Apr 13	5:00	63.1	69.4	49.9	66.6	65.4	64.2	62.9	
04Apr 13	6:00	60.4	69.1	49.4	65.7	64.5	62.4	58.0	
04Apr 13	7:00	61.3	78.1	49.4	65.3	64.2	62.8	60.6	
04Apr 13	8:00	63.1	73.2	53.3	66.6	65.1	64.0	62.8	
04Apr 13	9:00	63.5	73.0	57.0	66.7	65.7	64.5	63.2	
04Apr 13	10:00	62.9	73.4	51.5	66.6	65.4	63.9	62.6	68.0
04Apr 13	11:00	62.9	83.4	52.1	66.2	64.9	63.8	62.5	67.9
04Apr 13	12:00	61.8	79.6	46.2	66.1	64.5	62.7	61.1	67.9
04Apr 13	13:00	61.0	70.0	52.4	65.1	63.6	62.0	60.5	67.9

APPENDIX II

Analysis of Traffic Noise Contour Locations

Table II-1. Distance to Existing CNEL Contour Lines, City of Chino Hills

Arterial / Reach	Speed Limit, mph	% Trucks Med.	% Trucks Hvy.	Traffic Dist.*	Avg. Daily Traffic Existing	Hard (H) or Soft (S) Site?	Barrier Details** (leave blank if none) Height (2-10m)	Barrier Details** (leave blank if none) Distance (10/30m)	Dist., R/W to C/L	CNEL at R/W, dB	Distance to CNEL Contours From Roadway Centerline, feet*** 60dB	65dB	70dB	75dB	80dB
AVENIDA DE LAS FLORES															
Chino Hills Pkwy to Paseo del Palacio	25	1.84%	0.74%	5	1,186	H			33'	53.7	--	--	--	--	--
BAYBERRY DRIVE															
Tall Oak Dr to Oak Creek Rd	35	1.84%	0.74%	6	2,044	H			33'	58.9	--	--	--	--	--
Oak Creek Rd to Peyton Dr	35	1.84%	0.74%	7	2,281	H			33'	59.6	--	--	--	--	--
Peyton Dr to Tern St	25	1.84%	0.74%	8	625	H			33'	50.3	--	--	--	--	--
Tern St to Zenobia Ln	25	1.84%	0.74%	9	795	H			33'	51.7	--	--	--	--	--
Zenobia Ln to Pipeline Ave	25	1.84%	0.74%	10	1,896	H			33'	55.9	--	--	--	--	--
BEVERLY GLEN ROAD															
Peyton Dr to Peyton Dr	25	1.84%	0.74%	11	776	H			33'	52.2	--	--	--	--	--
BIRD FARM ROAD															
Valle Vista Dr to Pomona Rincon Rd	30	1.84%	0.74%	12	5,760	H			33'	61.9	54	--	--	--	--
BUTTERFIELD RANCH ROAD															
Soquel Canyon Pkwy to Picasso Dr	55	1.84%	0.74%	13	9,592	H			60'	68.7	382	137	46	--	--
Picasso Dr to Pine Ave	55	1.84%	0.74%	14	6,214	H			60'	66.9	270	93	--	--	--
Pine Ave to Mystic Canyon Rd	45	1.84%	0.74%	15	5,147	H			52'	64.5	139	46	--	--	--
Mystic Canyon Rd to SR-71	45	1.84%	0.74%	16	4,080	H			52'	63.8	119	39	--	--	--
CALLE MADRID															
Eucalyptus Ave to Paseo del Palacio	25	1.84%	0.74%	17	1,548	H			33'	54.7	--	--	--	--	--
CALLE SAN MARCOS															
Olympic View Dr to Grand Ave	25	1.84%	0.74%	18	2,751	H			33'	55.8	--	--	--	--	--
CANON LANE															
Highland Pass Rd to Carbon Canyon Rd	35	1.84%	0.74%	19	801	H			33'	55.1	--	--	--	--	--
CARRIAGE HILLS LANE															
Carbon Canyon to Old Carbon Canyon	25	1.84%	0.74%	20	69	H			33'	41.9	--	--	--	--	--
CENTRAL AVENUE															
SR-71 to City Limits (East)	45	1.84%	0.74%	21	20,093	H			60'	70.2	503	192	62	--	--

Table II-1, cont. Distance to Existing CNEL Contour Lines, City of Chino Hills

Arterial / Reach	Speed Limit, mph	% Trucks Med.	% Trucks Hvy.	Traffic Dist.*	Avg. Daily Traffic Existing	Hard (H) or Soft (S) Site?	Barrier Details** (leave blank if none) Height (2-10m)	Barrier Details** (leave blank if none) Distance (10/30m)	Dist., R/W to C/L	CNEL at R/W, dB	Distance to CNEL Contours From Roadway Centerline, feet*** 60dB	65dB	70dB	75dB	80dB
CHINO AVENUE															
City Limits (West) to Rock Springs Dr	50	1.84%	0.74%	22	5,666	H			52'	66.8	229	76	--	--	--
Rock Springs Dr to Eagle Canyon Dr	45	1.84%	0.74%	23	4,933	H			52'	64.4	138	46	--	--	--
Eagle Canyon Dr to Peyton Dr	45	1.84%	0.74%	24	9,563	H			52'	66.7	227	75	--	--	--
Peyton Dr to Emerald Wy	45	1.84%	0.74%	25	17,440	H			60'	68.6	378	135	45	--	--
Emerald Wy to SR-71	45	1.84%	0.74%	26	18,319	H			60'	69.0	406	148	49	--	--
CHINO HILLS PARKWAY															
City Limits (West) to Grand Ave	50	1.84%	0.74%	27	10,635	H			52'	69.7	398	145	49	--	--
Grand Ave to Eucalyptus Ave	45	1.84%	0.74%	28	18,849	H			52'	70.4	459	171	56	--	--
Eucalyptus Ave to Carbon Canyon Rd	45	1.84%	0.74%	29	16,231	H			52'	69.8	408	149	49	--	--
Carbon Canyonto Peyton (SR-142)	50	7.47%	1.53%	30	22,086	H			52'	73.6	805	333	115	37	--
Peyton Dr to Pipeline Ave (SR-142)	45	7.47%	1.53%	31	27,941	H			52'	73.4	789	323	111	34	--
Pipeline Ave to SR-71 (SR-142)	40	7.47%	1.53%	32	38,362	H			60'	72.6	790	322	110	33	--
SR-71 to City Limits (East)	40	1.84%	0.74%	33	11,815	H			52'	67.0	242	80	--	--	--
COUNTRY CLUB DRIVE															
Pipeline Ave to Los Serranos Blvd	25	1.84%	0.74%	34	491	H			33'	49.2	--	--	--	--	--
Los Serranos Blvd to Valle Vista Dr	25	1.84%	0.74%	35	1,045	H			33'	53.4	--	--	--	--	--
EAGLE CANYON DRIVE															
Wandering Ridge Dr to Chino Ave	25	1.84%	0.74%	36	653	H			33'	50.7	--	--	--	--	--
ELINVAR DRIVE															
Soquel Canyon Pkwy to Sapphire Rd	35	1.84%	0.74%	37	979	H			33'	55.7	--	--	--	--	--
ENGLISH ROAD															
End (West) to Peyton Dr	25	1.84%	0.74%	38	930	H			33'	52.0	--	--	--	--	--
EUCALYPTUS AVENUE															
Rancho Hills Dr to Calle Barcelona	45	1.84%	0.74%	39	2,905	H			33'	64.1	88	--	--	--	--
Calle Barcelona to Ridgeview Dr	45	1.84%	0.74%	40	6,072	H			33'	67.1	170	56	--	--	--
Ridgeview Dr to Chino Hills Pkwy	40	1.84%	0.74%	41	7,118	H			33'	66.4	147	48	--	--	--
Chino Hills Pkwy to Galloping Hills Rd	40	1.84%	0.74%	42	8,162	H			33'	66.7	158	52	--	--	--
Peyton Dr to Pipeline Ave	45	1.84%	0.74%	43	11,228	H			33'	69.1	261	88	--	--	--

Table II-1, cont. Distance to Existing CNEL Contour Lines, City of Chino Hills

Arterial / Reach	Speed Limit, mph	% Trucks Med.	% Trucks Hvy.	Traffic Dist.*	Avg. Daily Traffic Existing	Hard (H) or Soft (S) Site?	Barrier Details** (leave blank if none) Height (2-10m)	Barrier Details** (leave blank if none) Distance (10/30m)	Dist., R/W to C/L	CNEL at R/W, dB	Distance to CNEL Contours From Roadway Centerline, feet*** 60dB	65dB	70dB	75dB	80dB
FOUNDERS DRIVE															
Grand Ave to Chino Hills Pkwy	35	1.84%	0.74%	44	4,620	H			33'	63.3	72	--	--	--	--
FROST AVENUE															
Chino Hills Pkwy to Peyton Dr	40	1.84%	0.74%	45	2,488	H			33'	61.8	53	--	--	--	--
PEYTON DRIVE															
Garey Ave to SR-71	45	1.84%	0.74%	46	18,963	H			52'	69.9	417	152	51	--	--
SR-71 to Chino Ave	45	1.84%	0.74%	47	24,581	H			60'	69.8	470	177	58	--	--
Chino Ave to Bedford Ln	45	1.84%	0.74%	48	21,250	H			60'	69.4	439	161	54	--	--
Bedford Ln to Grand Ave	45	1.84%	0.74%	49	21,024	H			60'	69.4	437	161	53	--	--
Grand Ave to Eucalyptus Ave	40	1.84%	0.74%	50	20,797	H			60'	67.9	332	116	37	--	--
Eucalyptus Ave to Chino Hills Pkwy	45	1.84%	0.74%	51	13,498	H			52'	68.5	320	112	35	--	--
Chino Hills Pkwy to Bayberry Dr	45	1.84%	0.74%	52	8,933	H			52'	66.6	221	73	--	--	--
Bayberry Dr to Woodview Rd	45	1.84%	0.74%	53	4,368	H			52'	63.3	109	34	--	--	--
PIPELINE AVENUE															
Eucalyptus Ave to Glen Ridge Dr	40	1.84%	0.74%	54	10,168	H			44'	66.5	190	61	--	--	--
Glen Ridge Dr to Valle Vista Dr	35	1.84%	0.74%	55	9,107	H			52'	64.1	131	42	--	--	--
Valle Vista Dr to Woodview Rd	35	1.84%	0.74%	56	5,769	H			33'	63.4	75	--	--	--	--
Woodview Rd to Winged Foot Wy	40	1.84%	0.74%	57	8,320	H			33'	66.5	152	50	--	--	--
Winged Foot to Soquel Canyon Pkwy	40	1.84%	0.74%	58	8,080	H			33'	66.4	149	49	--	--	--
POMONA RINCON ROAD															
South of Bird Farm Rd	35	1.84%	0.74%	59	5,765	H			33'	63.3	71	--	--	--	--
Soquel Canyon Pkwy to Picasso Dr	40	1.84%	0.74%	60	5,770	H			52'	62.7	95	--	--	--	--
South of Picasso Dr	40	1.84%	0.74%	61	5,770	H			33'	64.5	95	--	--	--	--
RIDGEVIEW DRIVE															
Windmill Creek Dr to Eucalyptus Ave	30	1.84%	0.74%	62	1,927	H			33'	56.7	--	--	--	--	--
SOQUEL CANYON PARKWAY															
Pipeline Ave to Pinehurst Dr	50	1.84%	0.74%	63	8,605	H			60'	67.1	282	97	--	--	--
Pinehurst Dr to Elinvar Dr	50	1.84%	0.74%	64	10,819	H			60'	68.2	351	124	41	--	--
Elinvar Dr to Butterfield Ranch Rd	50	1.84%	0.74%	65	13,032	H			60'	69.1	413	151	50	--	--
Butterfield Ranch Rd to SR-71	50	1.84%	0.74%	66	16,563	H			60'	70.4	523	202	65	--	--

Table II-1, cont. Distance to Existing CNEL Contour Lines, City of Chino Hills

Arterial / Reach	Speed Limit, mph	% Trucks Med.	% Trucks Hvy.	Traffic Dist.*	Avg. Daily Traffic Existing	Hard (H) or Soft (S) Site?	Barrier Details** (leave blank if none) Height (2-10m)	Barrier Details** (leave blank if none) Distance (10/30m)	Dist., R/W to C/L	CNEL at R/W, dB	Distance to CNEL Contours From Roadway Centerline, feet*** 60dB	65dB	70dB	75dB	80dB
SR-142 (CARBON CANYON ROAD)															
W City Limits to Rosemary Ln	45	7.47%	1.53%	67	15,800	H			33'	73.2	571	220	71	--	--
Rosemary Ln to Canyon Hills Rd	35	7.47%	1.53%	68	15,012	H			33'	70.2	340	117	36	--	--
Canyon Hills Rd to Chino Hills Pkwy	45	7.47%	1.53%	69	18,500	H			33'	73.9	643	254	84	--	--
SR-60 (POMONA FREEWAY)															
West of SR-71 interchange	65	2.21%	7.82%	70	219,000	H			95'	85.0	>985	>985	>985	696	278
SR-71 (CHINO VALLEY FREEWAY)															
South of SR-60 interchange	65	3.65%	6.59%	71	92,000	H			85'	81.7	>985	>985	843	349	124
Peyton to Chino	65	3.69%	5.96%	71	86,667	H			87'	81.2	>985	>985	789	326	114
Chino to Grand	65	3.74%	5.33%	71	81,333	H			89'	80.7	>985	>985	740	302	104
Grand to Chino Hills	65	3.78%	4.70%	71	76,000	H			74'	81.1	>985	>985	688	278	95
Chino Hills to Central	65	3.83%	4.07%	71	70,667	H			75'	80.6	>985	>985	640	254	87
Central to Pine	65	3.87%	3.44%	71	65,333	H			61'	81.1	>985	>985	591	232	78
North of Euclid Ave	65	3.92%	2.81%	72	60,000	H			63'	80.4	>985	>985	541	210	69

Table II-1, cont. Distance to Existing CNEL Contour Lines, City of Chino Hills

* The following summarizes the traffic distributions used in the analysis:

Traffic Distribution No.	Day			Evening			Night		
	A	MT	HT	A	MT	HT	A	MT	HT
1	75.51%	1.56%	0.64%	12.57%	0.09%	0.02%	9.34%	0.19%	0.08%
2	65.83%	2.92%	2.10%	17.98%	0.20%	0.23%	9.49%	0.50%	0.75%
3	73.60%	0.90%	0.35%	13.60%	0.04%	0.04%	10.22%	0.90%	0.35%
4	69.50%	1.44%	2.40%	12.90%	0.06%	0.10%	9.60%	1.50%	2.50%
5	73.11%	1.38%	0.56%	13.80%	0.26%	0.10%	10.51%	0.20%	0.08%
6	78.59%	1.48%	0.60%	9.82%	0.19%	0.07%	9.01%	0.17%	0.07%
7	76.24%	1.44%	0.58%	10.89%	0.21%	0.08%	10.29%	0.19%	0.08%
8	76.69%	1.45%	0.58%	12.78%	0.24%	0.10%	7.95%	0.15%	0.06%
9	73.52%	1.39%	0.56%	15.07%	0.28%	0.11%	8.82%	0.17%	0.07%
10	73.48%	1.39%	0.56%	11.46%	0.22%	0.09%	12.49%	0.24%	0.09%
11	69.17%	1.31%	0.53%	15.82%	0.30%	0.12%	12.43%	0.23%	0.09%
12	76.04%	1.44%	0.58%	11.52%	0.22%	0.09%	9.86%	0.19%	0.07%
13	78.15%	1.48%	0.59%	11.28%	0.21%	0.09%	7.98%	0.15%	0.06%
14	77.74%	1.47%	0.59%	11.15%	0.21%	0.08%	8.53%	0.16%	0.06%
15	76.82%	1.45%	0.58%	10.83%	0.20%	0.08%	9.77%	0.18%	0.07%
16	75.40%	1.42%	0.57%	10.36%	0.20%	0.08%	11.65%	0.22%	0.09%
17	76.09%	1.44%	0.58%	10.82%	0.20%	0.08%	10.51%	0.20%	0.08%
18	85.17%	1.61%	0.65%	7.61%	0.14%	0.06%	4.64%	0.09%	0.04%
19	77.23%	1.46%	0.59%	9.36%	0.18%	0.07%	10.82%	0.20%	0.08%
20	74.83%	1.41%	0.57%	7.06%	0.13%	0.05%	15.53%	0.29%	0.12%
21	75.48%	1.43%	0.57%	8.48%	0.16%	0.06%	13.46%	0.25%	0.10%
22	72.52%	1.37%	0.55%	12.21%	0.23%	0.09%	12.69%	0.24%	0.10%
23	75.40%	1.42%	0.57%	11.63%	0.22%	0.09%	10.39%	0.20%	0.08%
24	79.18%	1.50%	0.60%	10.41%	0.20%	0.08%	7.82%	0.15%	0.06%
25	78.30%	1.48%	0.59%	11.61%	0.22%	0.09%	7.51%	0.14%	0.06%
26	77.52%	1.46%	0.59%	11.57%	0.22%	0.09%	8.33%	0.16%	0.06%
27	71.23%	1.35%	0.54%	13.04%	0.25%	0.10%	13.15%	0.25%	0.10%
28	74.12%	1.40%	0.56%	12.19%	0.23%	0.09%	11.11%	0.21%	0.08%
29	74.82%	1.41%	0.57%	11.21%	0.21%	0.09%	11.39%	0.22%	0.09%
30	68.61%	5.69%	1.93%	10.31%	0.86%	0.29%	11.09%	0.92%	0.31%

Table II-1, cont. Distance to Existing CNEL Contour Lines, City of Chino Hills

Traffic Distribution No.	Day			Evening			Night		
	A	MT	HT	A	MT	HT	A	MT	HT
31	68.30%	5.67%	1.92%	10.27%	0.85%	0.29%	11.43%	0.95%	0.32%
32	68.36%	5.67%	1.92%	10.94%	0.91%	0.31%	10.70%	0.89%	0.30%
33	75.72%	1.43%	0.58%	9.17%	0.17%	0.07%	12.53%	0.24%	0.10%
34	79.36%	1.50%	0.60%	10.12%	0.19%	0.08%	7.94%	0.15%	0.06%
35	70.85%	1.34%	0.54%	14.36%	0.27%	0.11%	12.21%	0.23%	0.09%
36	77.58%	1.47%	0.59%	10.14%	0.19%	0.08%	9.70%	0.18%	0.07%
37	77.22%	1.46%	0.59%	11.34%	0.21%	0.09%	8.86%	0.17%	0.07%
38	79.19%	1.50%	0.60%	9.95%	0.19%	0.08%	8.28%	0.16%	0.06%
39	75.12%	1.42%	0.57%	9.93%	0.19%	0.08%	12.37%	0.23%	0.09%
40	74.03%	1.40%	0.56%	13.04%	0.25%	0.10%	10.35%	0.20%	0.08%
41	73.65%	1.39%	0.56%	12.97%	0.25%	0.10%	10.80%	0.20%	0.08%
42	75.63%	1.43%	0.57%	12.19%	0.23%	0.09%	9.61%	0.18%	0.07%
43	77.42%	1.46%	0.59%	12.96%	0.24%	0.10%	7.04%	0.13%	0.05%
44	71.97%	1.36%	0.55%	12.06%	0.23%	0.09%	13.39%	0.25%	0.10%
45	73.30%	1.38%	0.56%	13.16%	0.25%	0.10%	10.96%	0.21%	0.08%
46	77.69%	1.47%	0.59%	11.39%	0.22%	0.09%	8.34%	0.16%	0.06%
47	80.24%	1.52%	0.61%	10.97%	0.21%	0.08%	6.21%	0.12%	0.05%
48	78.56%	1.48%	0.60%	11.67%	0.22%	0.09%	7.18%	0.14%	0.05%
49	78.75%	1.49%	0.60%	11.29%	0.21%	0.09%	7.39%	0.14%	0.06%
50	78.93%	1.49%	0.60%	10.90%	0.21%	0.08%	7.59%	0.14%	0.06%
51	77.23%	1.46%	0.59%	11.58%	0.22%	0.09%	8.61%	0.16%	0.07%
52	77.94%	1.47%	0.59%	10.99%	0.21%	0.08%	8.50%	0.16%	0.06%
53	80.09%	1.51%	0.61%	9.19%	0.17%	0.07%	8.14%	0.15%	0.06%
54	75.84%	1.43%	0.58%	12.86%	0.24%	0.10%	8.72%	0.16%	0.07%
55	73.89%	1.40%	0.56%	12.74%	0.24%	0.10%	10.79%	0.20%	0.08%
56	77.32%	1.46%	0.59%	11.20%	0.21%	0.09%	8.90%	0.17%	0.07%
57	78.44%	1.48%	0.60%	10.29%	0.19%	0.08%	8.69%	0.16%	0.07%
58	78.30%	1.48%	0.59%	10.24%	0.19%	0.08%	8.89%	0.17%	0.07%
59	80.66%	1.52%	0.61%	7.88%	0.15%	0.06%	8.88%	0.17%	0.07%
60	85.28%	1.61%	0.65%	4.24%	0.08%	0.03%	7.90%	0.15%	0.06%
61	85.28%	1.61%	0.65%	4.24%	0.08%	0.03%	7.90%	0.15%	0.06%
62	78.16%	1.48%	0.59%	12.18%	0.23%	0.09%	7.08%	0.13%	0.05%

Table II-1, cont. Distance to Existing CNEL Contour Lines, City of Chino Hills

Traffic Distribution No.	Day			Evening			Night		
	A	MT	HT	A	MT	HT	A	MT	HT
63	78.41%	1.48%	0.60%	10.06%	0.19%	0.08%	8.94%	0.17%	0.07%
64	77.52%	1.46%	0.59%	10.55%	0.20%	0.08%	9.35%	0.18%	0.07%
65	76.92%	1.45%	0.58%	10.87%	0.21%	0.08%	9.63%	0.18%	0.07%
66	76.20%	1.44%	0.58%	9.67%	0.18%	0.07%	11.54%	0.22%	0.09%
67	67.21%	5.58%	1.89%	7.19%	0.60%	0.20%	15.60%	1.29%	0.44%
68	67.21%	5.58%	1.89%	7.19%	0.60%	0.20%	15.60%	1.29%	0.44%
69	67.21%	5.58%	1.89%	7.19%	0.60%	0.20%	15.60%	1.29%	0.44%
70	65.98%	1.62%	5.74%	11.75%	0.29%	1.02%	12.24%	0.30%	1.06%
71	65.83%	2.68%	4.83%	11.72%	0.48%	0.86%	12.21%	0.50%	0.90%
72	68.41%	2.87%	2.06%	12.18%	0.51%	0.37%	12.69%	0.53%	0.38%

A = automobiles; MT = medium (2-axle) trucks; HT = heavy (3+ axle) trucks

The above values are adjusted as needed so that the overall medium truck and heavy truck percentages for a traffic distribution number agree with the values entered into the "% Trucks" columns on the summary table.

** For street segments with barriers, noise levels and contour distances are only reported for locations 10m (approx. 30') or more beyond the noise barrier.

*** There are no streets within the City of Chino Hills that have sufficient traffic volumes to generate a CNEL contour of 80 dB or greater.

Table II-2. Distance to Future (2037) CNEL Contour Lines, City of Chino Hills

Arterial / Reach	Speed Limit, mph	% Trucks Med.	% Trucks Hvy.	Traffic Dist.*	Avg. Daily Traffic Future	Hard (H) or Soft (S) Site?	Barrier Details** (leave blank if none) Height (2-10m)	Barrier Details** (leave blank if none) Distance (10/30m)	Dist., R/W to C/L	CNEL at R/W, dB	Distance to CNEL Contours From Roadway Centerline, feet*** 60dB	65dB	70dB	75dB	80dB
BUTTERFIELD RANCH ROAD															
Soquel Canyon Pkwy to Picasso Dr	55	1.84%	0.74%	13	13,920	H			60'	70.3	507	197	63	--	--
Picasso Dr to Pine Ave	55	1.84%	0.74%	14	8,950	H			60'	68.5	369	131	44	--	--
Pine Ave to Mystic Canyon Rd	45	1.84%	0.74%	15	7,240	H			52'	65.9	193	62	--	--	--
Mystic Canyon Rd to SR-71	45	1.84%	0.74%	16	5,530	H			52'	65.1	160	53	--	--	--
CENTRAL AVENUE															
SR-71 to City Limits (East)	45	1.84%	0.74%	21	38,579	H			60'	73.0	811	339	119	38	--
CHINO AVENUE															
City Limits (West) to Rock Springs Dr	50	1.84%	0.74%	22	7,310	H			52'	67.9	285	98	--	--	--
Rock Springs Dr to Eagle Canyon Dr	45	1.84%	0.74%	23	6,380	H			52'	65.5	177	58	--	--	--
Eagle Canyon Dr to Peyton Dr	45	1.84%	0.74%	24	12,300	H			52'	67.8	285	96	--	--	--
Peyton Dr to Emerald Wy	45	1.84%	0.74%	25	22,510	H			60'	69.7	464	174	57	--	--
Emerald Wy to SR-71	45	1.84%	0.74%	26	23,620	H			60'	70.1	495	189	61	--	--
CHINO HILLS PARKWAY															
City Limits (West) to Grand Ave	50	1.84%	0.74%	27	15,150	H			52'	71.2	525	203	65	--	--
Grand Ave to Eucalyptus Ave	45	1.84%	0.74%	28	27,100	H			52'	72.0	603	238	80	--	--
Eucalyptus Ave to Carbon Canyon Rd	45	1.84%	0.74%	29	23,048	H			52'	71.3	536	207	66	--	--
Carbon Canyonto Peyton (SR-142)	50	7.47%	1.53%	30	31,574	H			52'	75.1	>985	443	163	53	--
Peyton Dr to Pipeline Ave (SR-142)	45	7.47%	1.53%	31	40,100	H			52'	75.0	>985	434	158	51	--
Pipeline Ave to SR-71 (SR-142)	40	7.47%	1.53%	32	52,900	H			60'	74.0	>985	419	152	49	--
SR-71 to City Limits (East)	40	1.84%	0.74%	33	21,450	H			52'	69.6	399	145	47	--	--
EUCALYPTUS AVENUE															
Rancho Hills Dr to Calle Barcelona	45	1.84%	0.74%	39	3,718	H			33'	65.2	112	35	--	--	--
Calle Barcelona to Ridgeview Dr	45	1.84%	0.74%	40	7,772	H			33'	68.2	214	69	--	--	--
Ridgeview Dr to Chino Hills Pkwy	40	1.84%	0.74%	41	9,111	H			33'	67.4	187	60	--	--	--
Chino Hills Pkwy to Peyton Dr	40	1.84%	0.74%	42	10,500	H			33'	67.8	202	64	--	--	--
Peyton Dr to Pipeline Ave	45	1.84%	0.74%	43	14,370	H			33'	70.2	322	112	35	--	--

Table II-2, cont. Distance to Future (2037) CNEL Contour Lines, City of Chino Hills

Arterial / Reach	Speed Limit, mph	% Trucks Med.	% Trucks Hvy.	Traffic Dist.*	Avg. Daily Traffic Future	Hard (H) or Soft (S) Site?	Barrier Details** (leave blank if none) Height (2-10m)	Barrier Details** (leave blank if none) Distance (10/30m)	Dist., R/W to C/L	CNEL at R/W, dB	Distance to CNEL Contours From Roadway Centerline, feet*** 60dB	65dB	70dB	75dB	80dB
PEYTON DRIVE															
Garey Ave to SR-71	45	1.84%	0.74%	46	31,668	H			52'	72.1	617	245	82	--	--
SR-71 to Chino Ave	45	1.84%	0.74%	47	31,610	H			60'	70.9	570	222	73	--	--
Chino Ave to Bedford Ln	45	1.84%	0.74%	48	27,550	H			60'	70.5	536	207	66	--	--
Bedford Ln to Grand Ave	45	1.84%	0.74%	49	27,250	H			60'	70.5	533	206	66	--	--
Grand Ave to Eucalyptus Ave	40	1.84%	0.74%	50	26,950	H			60'	69.0	410	149	49	--	--
Eucalyptus Ave to Chino Hills Pkwy	45	1.84%	0.74%	51	17,440	H			52'	69.6	393	142	47	--	--
Chino Hills Pkwy to Bayberry Dr	45	1.84%	0.74%	52	11,515	H			52'	67.7	278	94	--	--	--
Bayberry Dr to Woodview Rd	45	1.84%	0.74%	53	5,590	H			52'	64.4	137	46	--	--	--
PIPELINE AVENUE															
Eucalyptus Ave to Glen Ridge Dr	40	1.84%	0.74%	54	12,200	H			44'	67.3	223	72	--	--	--
Glen Ridge Dr to Valle Vista Dr	35	1.84%	0.74%	55	10,928	H			52'	64.9	157	51	--	--	--
Valle Vista Dr to Woodview Rd	35	1.84%	0.74%	56	7,930	H			33'	64.8	103	--	--	--	--
Woodview Rd to Winged Foot Wy	40	1.84%	0.74%	57	11,200	H			33'	67.8	202	64	--	--	--
Winged Foot to Soquel Canyon Pkwy	40	1.84%	0.74%	58	10,890	H			33'	67.7	199	63	--	--	--
POMONA RINCON ROAD															
South of Bird Farm Rd	35	1.84%	0.74%	59	12,490	H			33'	66.6	157	51	--	--	--
Soquel Canyon Pkwy to Picasso Dr	40	1.84%	0.74%	60	12,490	H			52'	66.1	203	64	--	--	--
South of Picasso Dr	40	1.84%	0.74%	61	12,490	H			33'	67.8	203	64	--	--	--
SOQUEL CANYON PARKWAY															
Pipeline Ave to Pinehurst Dr	50	1.84%	0.74%	63	11,560	H			60'	67.9	330	116	38	--	--
Pinehurst Dr to Elinvar Dr	50	1.84%	0.74%	64	14,395	H			60'	68.9	393	143	48	--	--
Elinvar Dr to Butterfield Ranch Rd	50	1.84%	0.74%	65	17,230	H			60'	69.6	452	170	56	--	--
Butterfield Ranch Rd to SR-71	50	1.84%	0.74%	66	31,750	H			60'	72.3	717	291	100	--	--
SR-142 (CARBON CANYON ROAD)															
W City Limits to Rosemary Ln	45	7.47%	1.53%	67	20,723	H			33'	72.6	516	195	62	--	--
Rosemary Ln to Canyon Hills Rd	35	7.47%	1.53%	68	20,723	H			33'	69.9	317	107	--	--	--
Canyon Hills Rd to Chino Hills Pkwy	45	7.47%	1.53%	69	21,110	H			33'	72.7	523	199	63	--	--

Table II-2, cont. Distance to Future (2037) CNEL Contour Lines, City of Chino Hills

Arterial / Reach	Speed Limit, mph	% Trucks		Traffic Dist.*	Avg. Daily Traffic Future	Hard (H) or Soft (S) Site?	Barrier Details** (leave blank if none)		Dist., R/W to C/L	CNEL at R/W, dB	Distance to CNEL Contours From Roadway Centerline, feet***				
		Med.	Hvy.				Height (2-10m)	Distance (10/30m)			60dB	65dB	70dB	75dB	80dB
SR-60 (POMONA FREEWAY)															
West of SR-71 interchange	65	2.21%	7.82%	70	331,368	H			95'	87.2	>985	>985	>985	>985	424
SR-71 (CHINO VALLEY FREEWAY)															
South of SR-60 interchange	65	3.65%	6.59%	71	139,205	H			85'	83.9	>985	>985	>985	524	197
Peyton to Chino	65	4.35%	6.81%	71	131,135	H			87'	83.6	>985	>985	>985	510	191
Chino to Grand	65	5.05%	7.03%	71	123,065	H			89'	83.3	>985	>985	>985	495	184
Grand to Chino Hills	65	5.75%	7.25%	71	114,995	H			74'	84.0	>985	>985	>985	479	176
Chino Hills to Central	65	6.45%	7.48%	71	106,926	H			75'	83.7	>985	>985	>985	462	168
Central to Pine	65	7.15%	7.70%	71	98,855	H			61'	84.4	>985	>985	>985	441	159
North of Euclid Ave	65	3.92%	2.81%	72	90,786	H			63'	82.6	>985	>985	778	324	114

Table II-2, cont. Distance to Future (2037) CNEL Contour Lines, City of Chino Hills

* The following summarizes the traffic distributions used in the analysis:

Traffic Distribution No.	Day			Evening			Night		
	A	MT	HT	A	MT	HT	A	MT	HT
13	78.15%	1.48%	0.59%	11.28%	0.21%	0.09%	7.98%	0.15%	0.06%
14	77.74%	1.47%	0.59%	11.15%	0.21%	0.08%	8.53%	0.16%	0.06%
15	76.82%	1.45%	0.58%	10.83%	0.20%	0.08%	9.77%	0.18%	0.07%
16	75.40%	1.42%	0.57%	10.36%	0.20%	0.08%	11.65%	0.22%	0.09%
21	75.48%	1.43%	0.57%	8.48%	0.16%	0.06%	13.46%	0.25%	0.10%
22	72.52%	1.37%	0.55%	12.21%	0.23%	0.09%	12.69%	0.24%	0.10%
23	75.40%	1.42%	0.57%	11.63%	0.22%	0.09%	10.39%	0.20%	0.08%
24	79.18%	1.50%	0.60%	10.41%	0.20%	0.08%	7.82%	0.15%	0.06%
25	78.30%	1.48%	0.59%	11.61%	0.22%	0.09%	7.51%	0.14%	0.06%
26	77.52%	1.46%	0.59%	11.57%	0.22%	0.09%	8.33%	0.16%	0.06%
27	71.23%	1.35%	0.54%	13.04%	0.25%	0.10%	13.15%	0.25%	0.10%
28	74.12%	1.40%	0.56%	12.19%	0.23%	0.09%	11.11%	0.21%	0.08%
29	74.82%	1.41%	0.57%	11.21%	0.21%	0.09%	11.39%	0.22%	0.09%
30	68.61%	5.69%	1.93%	10.31%	0.86%	0.29%	11.09%	0.92%	0.31%
31	68.30%	5.67%	1.92%	10.27%	0.85%	0.29%	11.43%	0.95%	0.32%
32	68.36%	5.67%	1.92%	10.94%	0.91%	0.31%	10.70%	0.89%	0.30%
33	75.72%	1.43%	0.58%	9.17%	0.17%	0.07%	12.53%	0.24%	0.10%
39	75.12%	1.42%	0.57%	9.93%	0.19%	0.08%	12.37%	0.23%	0.09%
40	74.03%	1.40%	0.56%	13.04%	0.25%	0.10%	10.35%	0.20%	0.08%
41	73.65%	1.39%	0.56%	12.97%	0.25%	0.10%	10.80%	0.20%	0.08%
42	75.63%	1.43%	0.57%	12.19%	0.23%	0.09%	9.61%	0.18%	0.07%
43	77.42%	1.46%	0.59%	12.96%	0.24%	0.10%	7.04%	0.13%	0.05%
46	77.69%	1.47%	0.59%	11.39%	0.22%	0.09%	8.34%	0.16%	0.06%
47	80.24%	1.52%	0.61%	10.97%	0.21%	0.08%	6.21%	0.12%	0.05%
48	78.56%	1.48%	0.60%	11.67%	0.22%	0.09%	7.18%	0.14%	0.05%
49	78.75%	1.49%	0.60%	11.29%	0.21%	0.09%	7.39%	0.14%	0.06%
50	78.93%	1.49%	0.60%	10.90%	0.21%	0.08%	7.59%	0.14%	0.06%
51	77.23%	1.46%	0.59%	11.58%	0.22%	0.09%	8.61%	0.16%	0.07%
52	77.94%	1.47%	0.59%	10.99%	0.21%	0.08%	8.50%	0.16%	0.06%
53	80.09%	1.51%	0.61%	9.19%	0.17%	0.07%	8.14%	0.15%	0.06%

Table II-2, cont. Distance to Future (2037) CNEL Contour Lines, City of Chino Hills

Traffic Distribution No.	Day			Evening			Night		
	A	MT	HT	A	MT	HT	A	MT	HT
54	75.84%	1.43%	0.58%	12.86%	0.24%	0.10%	8.72%	0.16%	0.07%
55	73.89%	1.40%	0.56%	12.74%	0.24%	0.10%	10.79%	0.20%	0.08%
56	77.32%	1.46%	0.59%	11.20%	0.21%	0.09%	8.90%	0.17%	0.07%
57	78.44%	1.48%	0.60%	10.29%	0.19%	0.08%	8.69%	0.16%	0.07%
58	78.30%	1.48%	0.59%	10.24%	0.19%	0.08%	8.89%	0.17%	0.07%
59	80.66%	1.52%	0.61%	7.88%	0.15%	0.06%	8.88%	0.17%	0.07%
60	85.28%	1.61%	0.65%	4.24%	0.08%	0.03%	7.90%	0.15%	0.06%
61	85.28%	1.61%	0.65%	4.24%	0.08%	0.03%	7.90%	0.15%	0.06%
62	78.16%	1.48%	0.59%	12.18%	0.23%	0.09%	7.08%	0.13%	0.05%
63	78.41%	1.48%	0.60%	10.06%	0.19%	0.08%	8.94%	0.17%	0.07%
64	77.52%	1.46%	0.59%	10.55%	0.20%	0.08%	9.35%	0.18%	0.07%
65	76.92%	1.45%	0.58%	10.87%	0.21%	0.08%	9.63%	0.18%	0.07%
66	76.20%	1.44%	0.58%	9.67%	0.18%	0.07%	11.54%	0.22%	0.09%
67	67.21%	5.58%	1.89%	7.19%	0.60%	0.20%	15.60%	1.29%	0.44%
68	67.21%	5.58%	1.89%	7.19%	0.60%	0.20%	15.60%	1.29%	0.44%
69	67.21%	5.58%	1.89%	7.19%	0.60%	0.20%	15.60%	1.29%	0.44%
70	65.98%	1.62%	5.74%	11.75%	0.29%	1.02%	12.24%	0.30%	1.06%
71	65.83%	2.68%	4.83%	11.72%	0.48%	0.86%	12.21%	0.50%	0.90%
72	68.41%	2.87%	2.06%	12.18%	0.51%	0.37%	12.69%	0.53%	0.38%

A = automobiles; MT = medium (2-axle) trucks; HT = heavy (3+ axle) trucks

The above values are adjusted as needed so that the overall medium truck and heavy truck percentages for a traffic distribution number agree with the values entered into the "% Trucks" columns on the summary table.

** For street segments with barriers, noise levels and contour distances are only reported for locations 10m (approx. 30') or more beyond the noise barrier.

*** There are no streets within the City of Chino Hills that have sufficient traffic volumes to generate a CNEL contour of 80 dB or greater.

Appendix I – Traffic Impact Study for the Transportation & Circulation Element, Prepared by Minagar & Associates, Inc., dated June 28, 2013

Traffic Impact Study

for the

Transportation & Circulation Element

for

The City of Chino Hills General Plan Update

PREPARED FOR:

CITY OF CHINO HILLS
Engineering Department – Traffic Section
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20 Years of Excellence

June 28, 2013

Traffic Impact Study
for the
Transportation & Circulation Element
for
The City of Chino Hills General Plan Update

Presented to:

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INTRODUCTION

The Chino Hills General Plan is the long-range policy document which guides physical community development throughout the City. The General Plan establishes goals and objectives to guide decision-making by city officials and staff. The City of Chino Hills is currently updating its General Plan to maintain consistency with other report bodies, such as the Municipal Code, Development Code and Parking Code, as required by State law. State law additionally requires that text and maps within the General Plan accurately reflect existing roadways and intersections. This includes, specifically, staying current with the Circulation Element of the General Plan to provide important transportation planning guidance and information such as:

- Existing traffic conditions;
- Roadway classifications and design criteria;
- Analysis and forecast of projected traffic conditions;
- Mitigation measures to alleviate potential future traffic impacts, and
- Discussion of alternative transportation modes.

To provide an update to the General Plan, the City of Chino Hills retained Minagar & Associates, Inc. to conduct a traffic impact study which analyzes the existing transportation and circulation system of the City and identifies potential traffic impacts likely to occur on city streets within a 15-year period (Year 2027 projection), and within the foreseeable future to the General Plan 25-year Build-out term (Year 2037). The study also provides various recommended short- and long-term improvement measures to allay these potential traffic impacts to levels of insignificance.

Purpose and Study Objectives

The purpose of this traffic analysis is to forecast future travel demands in the City of Chino Hills so that the Circulation Element Update may be designed to accommodate not only existing conditions, but also address future travel demands. It is important that the Circulation Element consider long-term traffic growth foreseeable within the next fifteen (15) and twenty-five (25) years. Future traffic projections prepared as part of the Circulation Element Update are based upon traffic volumes and travel patterns derived from data collected in late 2012, and estimated growth changes within the City projected forward to the years 2027 and 2037.

Future travel demand increases will result from development occurring within the City of Chino Hills, as well as growth in regional traffic passing through the City. Development within Chino Hills will generate potential traffic impacts on citywide streets, while through traffic

growth will primarily impact main travel-through routes linked to neighboring cities and subregions, such as Carbon Canyon Road (SR-142), Grand Avenue, and Chino Hills Parkway.

For this analysis, all citywide background traffic is assumed to increase on an annual basis, based on regional socioeconomic growth trends projected for over the next 15-25 years. The traffic analysis was conducted in accordance with consultation from the City of Chino Hills to evaluate existing and future projected traffic conditions for the following target years and scenarios:

- Existing Year 2012

- 15-Year Future Conditions (2027)
  Existing + 15-Year Ambient Growth + Programmed Improvements + Cumulative Developments

- 25-Year Build-out Conditions (2037)
  Existing + 25-Year Ambient Growth + Programmed Improvements + Cumulative Developments

- Mitigated Existing Conditions
  Existing 2012 + proposed short-term improvements

- Mitigated Future Conditions
  Future Year 2027 + proposed short- and future-term improvements

- Mitigated Future Conditions
  Future Year 2027 + proposed short-term, future-term and build-out year improvements

To be consistent with the City of Chino Hills' General Plan update horizon year, and for the purposes of this general plan level analysis, City build-out is expected to occur in the year 2035. The build-out alternative used in the traffic model assumes a 25-year ambient traffic growth to the year 2037. This two-year variance in the projected build-out scenario baseline conditions has been determined to be insignificant since, on average, intersections having anticipated Year 2037 impacts will be operating under 29% oversaturation peak hour traffic conditions, and a two percent (2%) annually-compounded reduction to reflect Year 2035 baseline conditions would not change the applied thresholds of significance or reduce the degree of cumulative development project impacts. The results of this traffic impact analysis are therefore conservative, and in conformance with the analysis of alternatives for the City's General Plan Update.

A map depicting the ten (10) intersections analyzed within the traffic study area is shown below in Figure 1.

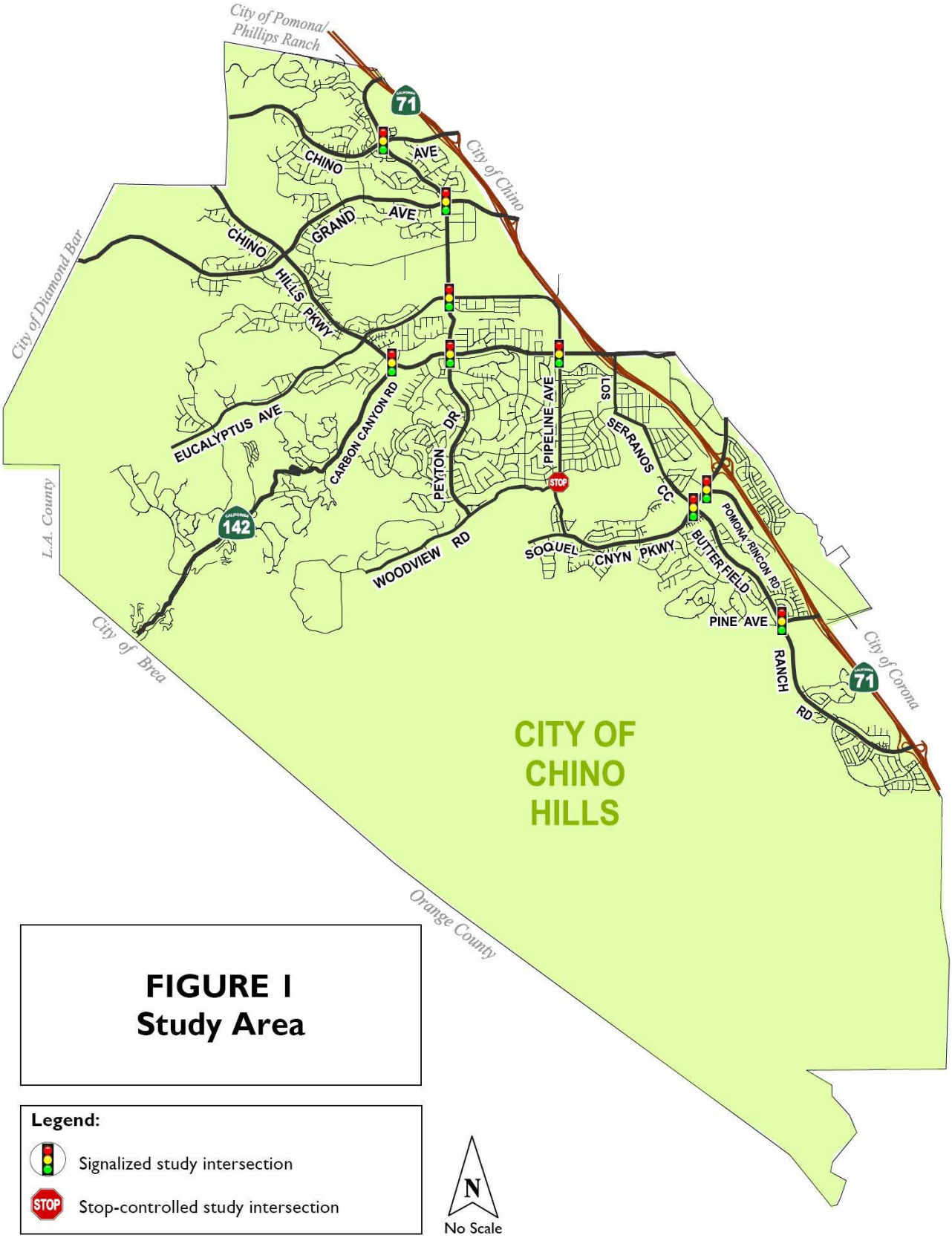


FIGURE 1
Study Area

Legend:

Signalized study intersection

Stop-controlled study intersection

EXISTING TRANSPORTATION SYSTEM & TRAFFIC CONDITIONS

The City of Chino Hills owns and operates various traffic signals on street intersections throughout the city. Given the competing traffic flows on intersecting roadways, traffic signals (as well as stop sign controls) serve to assign right-of-way to motorists traveling in conflicting directions. This requires that traffic movements be delayed on an alternate basis, while the traffic on the intersecting street is allowed to flow. Therefore, signal- and stop-controlled intersections are generally the most critical elements affecting a roadway system's capacity. The most critical time periods occur when traffic flow reaches peak volume. This generally happens during the morning and evening commute periods of 7:00-9:00 AM and 4:00-6:00 PM. This traffic impact study was therefore based on an analysis of major street intersections during critical traffic hours occurring within these weekday peak periods.

Functional Classification of Citywide Roadways

Functional classification is the process by which streets and highways are grouped into classes, or systems, according to the character of traffic service that they are intended to provide. There are three highway functional classifications: arterial, collector, and local roads. All streets and highways are grouped into one of these classes, depending on the character of the traffic (i.e., local or long distance) and the degree of land access that they allow. There are further stratifications within these three basic functional systems to insure greater adaptability.

The *California Road System (CRS)* is a database of maps are the maps designated by the United States Department of Transportation, working in partnership with the California Department of Transportation, as having the official functional classification of roads in the State of California. The sub-categorizations currently adopted by the State of California (Caltrans), and currently defined in the CRS for the City of Chino Hills, are described in brief below and include Principal Arterial, Minor Arterial, Collector (Minor and Major) and Local Street.

<u>Principal arterial system</u>

This system of streets and highways is the urban principal arterial system and should serve the major centers of activity of a metropolitan area, the highest traffic volume corridors, and the longest trip desires; and should carry a high proportion of the total urban area travel on a minimum of mileage. The system should be integrated, both internally and between major rural connections. The principal arterial system should carry the major portion of trips entering and leaving the urban area, as well as the majority of through movements desiring to bypass the central city.

In addition, significant intra-area travel, such as between central business districts and outlying residential areas between major inner city communities, or between major suburban centers, should be served by this system. Frequently the principal arterial system will carry important intra-urban as well as intercity bus routes. Finally, this system in small urban and urbanized areas should provide continuity for all rural arterials which intercept the urban boundary.

Minor arterial street system

The minor arterial street system should interconnect with and augment the urban principal arterial system and provide service to trips of moderate length at a somewhat lower level of travel mobility than principal arterials. This system also distributes travel to geographic areas smaller than those identified with the higher system. The minor arterial street system includes all arterials not classified as a principal and contains facilities that place more emphasis on land access than the higher system, and offer a lower level of traffic mobility. Such facilities may carry local bus routes and provide intra-community continuity, but ideally should not penetrate identifiable neighborhoods.

This system should include urban connections to rural collector roads where such connections have not been classified as urban principal arterials. The spacing of minor arterial streets may vary from 1/8 - 1/2 mile in the central business district to 2 - 3 miles in the suburban fringes, but should normally be not more than 1 mile in fully developed areas.

Collector (Major/Minor) street system

The collector street system provides both land access service and traffic circulation within residential neighborhoods, commercial and industrial areas. It differs from the arterial system in that facilities on the collector system may penetrate residential neighborhoods, distributing trips from the arterials through the area to the ultimate destination. Conversely, the collector street also collects traffic from local streets in residential neighborhoods and channels it into the arterial system. In the central business district, and in other areas of like development and traffic density, the collector system may include the street grid which forms a logical entity for traffic circulation.

Local street system

The local street system comprises all facilities not on one of the higher systems. It serves primarily to provide direct access to abutting land and access to the higher order systems. It offers the lowest level of mobility and usually contains no bus routes. Service to through, traffic movement usually is deliberately discouraged.

Description of Existing Major Roadways in Chino Hills

Peyton Drive is a north-south divided highway, with six lanes (three per direction) from State Route 71 (SR-71) to Eucalyptus Avenue, two lanes (one per direction) from Eucalyptus Avenue to just south of Morningfield Drive, and three lanes (two southbound, one northbound) from Morningfield Drive to Chino Hills Parkway. Peyton Drive is classified as Principal Arterial with a raised median north of Eucalyptus Avenue and a painted centerline south of Eucalyptus Avenue Peyton Drive. On-street parking is prohibited along Peyton Drive.

The City recently completed Phase II of a roadway widening project which expanded Peyton Drive from four to six lanes from Eucalyptus Avenue to Boys Republic/English Road. The southbound approach to the intersection of Peyton Drive and Eucalyptus is temporarily striped to channelize the existing 3 through-lanes of traffic into a single lane to accommodate the narrowing roadway south of Eucalyptus Avenue. Class II bike lanes are provided along each side of Peyton Drive between Rock Springs Drive and Eucalyptus Avenue, and between Chino Hills Parkway and Woodview Road. On-street parking on Peyton Drive is prohibited.

Grand Avenue is a divided Principal Arterial with a raised median, oriented east-west through the City of Chino Hills from State Route 71 to the west city limit. Grand Avenue has four lanes (two per direction) west of Peyton Drive and six lanes (three per direction) east of Peyton Drive to SR-71. Class II bike lanes are provided along each side of Grand Avenue between the west city limit and Peyton Drive. On-street parking is prohibited on Grand Avenue.

Eucalyptus Avenue is an undivided Major Collector oriented east-west in the City of Chino Hills from Pipeline Avenue to just west of Rancho Hills Drive. Eucalyptus Avenue has two lanes (one per direction) west of Peyton Drive to its westerly terminus, three lanes (one eastbound, two westbound) east of Peyton Drive adjacent to Litel Elementary School, and two lanes (one per direction) east of that point to Pipeline Avenue. Class II bike lanes are provided along each side of Eucalyptus Avenue from west of Peyton Drive to Chino Hills Parkway. On-street parking is allowed on the north side of Eucalyptus Avenue east of Peyton Drive in front of the school. Parking is also allowed on the south side of Eucalyptus Avenue from Peyton Drive to the east city limit.

Chino Hills Parkway is a four- to six-lane divided highway oriented generally east-west through the City of Chino Hills from north city limit to the south city limit. Chino Hills Parkway is classified as a Principal Arterial. Four travel lanes are provided to the west of Pipeline Avenue, and six travel lanes are provided to the east of Pipeline Avenue. Chino Hills Parkway has raised medians along the majority of its length, with several painted medians provided between Grand Avenue and Eucalyptus Drive, as well as several two-way left-turn lanes between Peyton Drive

and Pipeline Avenue. On-street parking is prohibited on Chino Hills Parkway. Class II bike lanes are provided along each side of the City-owned portion of Chino Hills Parkway from the north city limit to Carbon Canyon Road. Class II bike lanes are also provided on the north side of Chino Hills Parkway from Peyton Drive to Cherry Drive, and on the south side of Chino Hills Parkway from Peyton Drive to Rolling Ridge Drive.

Pipeline Avenue is two- to four-lane Minor Arterial oriented north-south in the City of Chino Hills from Eucalyptus Avenue to its southerly terminus at Soquel Canyon Parkway. At its north end in the City of Chino Hills, the roadway of Pipeline Avenue aligns west and becomes Eucalyptus Avenue. The majority of Pipeline Avenue provides two undivided travel lanes, one in each direction, with short four-lane segments provided at Glen Ridge Drive 600' northerly, and at Chino Hills Parkway 1,000' southerly. On-street parking on Pipeline Avenue is prohibited.

Soquel Canyon Parkway is a two- to six-lane divided highway, oriented east-west in the City of Chino Hills from State Route 71 to approximately 1/3 mile west of Pipeline Avenue. From its westerly termination point to Pipeline Avenue, Soquel Canyon Parkway is a two-lane local street with raised medians and left-turn lanes. From Pipeline Avenue to SR-71, Soquel Canyon Parkway is designated as a Principal Arterial with six travel lanes (three per direction), raised medians and left-turn lanes. Class II bike lanes are provided along each side of Soquel Canyon Parkway from west of Pipeline Avenue to Butterfield Ranch Road. On-street parking on Soquel Canyon Parkway is prohibited.

Butterfield Ranch Road is four- to six-lane Principal Arterial following a north-south alignment from Soquel Canyon Parkway to State Route 71 in the City of Chino Hills. At its north end, Butterfield Ranch Road becomes Los Serranos Country Club Drive north of Soquel Canyon Parkway. Six travel lanes divided by a raised median are provided on Butterfield Ranch Road north of Pine Avenue. South of Pine Avenue, four travel lanes are provided on Butterfield Ranch Road, divided on various segments by raised center medians, painted center medians, and striped centerlines. Class II bike lanes are provided along each side of Butterfield Ranch Road, and on-street parking is prohibited.

Chino Avenue is a four- to six-lane Minor Arterial, oriented east-west in the city of Chino Hills between the east and west city limits. To the west of Peyton Drive, Chino Avenue provides four lanes of travel divided by two-way left-turn lanes, painted center medians, and a striped centerline west of San Rafael Drive. To the east of Peyton Drive, Chino Avenue provides six lanes of travel (three per direction) divided by a raised median, with Class II bike lanes along each side from Peyton Drive to SR-71. On-street parking on Chino Avenue is prohibited, except for a short segment east of SR-71 on the north side of the street, where Chino Avenue transitions into a four-lane roadway near the east city limit.

Carbon Canyon Road is a designated State Highway, State Route 142 (SR-142). In the City of Chino Hills, Carbon Canyon Road is composed of a two-lane highway classified as a Principal Arterial, with Class II bike lanes provided in both direction between Old Carbon Canyon Road and Chino Hills Parkway. Carbon Canyon Road is primarily undivided, with a double yellow centerline along its length, and short painted medians located along switchback turns and in advance of side street intersections.

Woodview Road is two-lane undivided roadway in the City of Chino Hills, oriented east-west from its westerly terminus at the Vellano Country Club to its easterly terminus at Pipeline Avenue. Woodview Road is classified as a local street west of Peyton Drive and as a Minor Arterial east of Peyton Drive, with a double yellow centerline along the majority of its length. A painted median is provided between Versante Terrace and Venezia Terrace, for a distance of approximately 1/3 mile. On-street parking on Woodview Road is prohibited.

Study Intersection Selection Process for Traffic Analysis

A total of ten (10) study intersections were pre-selected for analysis during the scoping phase of the traffic study. These ten locations represent the most critical arterial and highway junctions within the city's transportation system which will be impacted by future traffic growth. The intersections also signify major "valve" points established in the traffic model, located between trip zones within the City of Chino Hills and adjacent sub-regional zones exterior to the City which are expected to contain a high percentage of trip ends that will be attracted to future citywide development.

The ten study intersections are located at key positions within the influence area of major residential and non-residential projects planned to be built out within the next 15 to 25 years, based on an examination of the city's current General Plan and proposed land use and zoning plan changes. Figure 2 depicts the locations of the ten study intersections, existing travel lane configurations and the functional classification of major roadways in the City of Chino Hills as currently recorded in the CRS by the State of California.

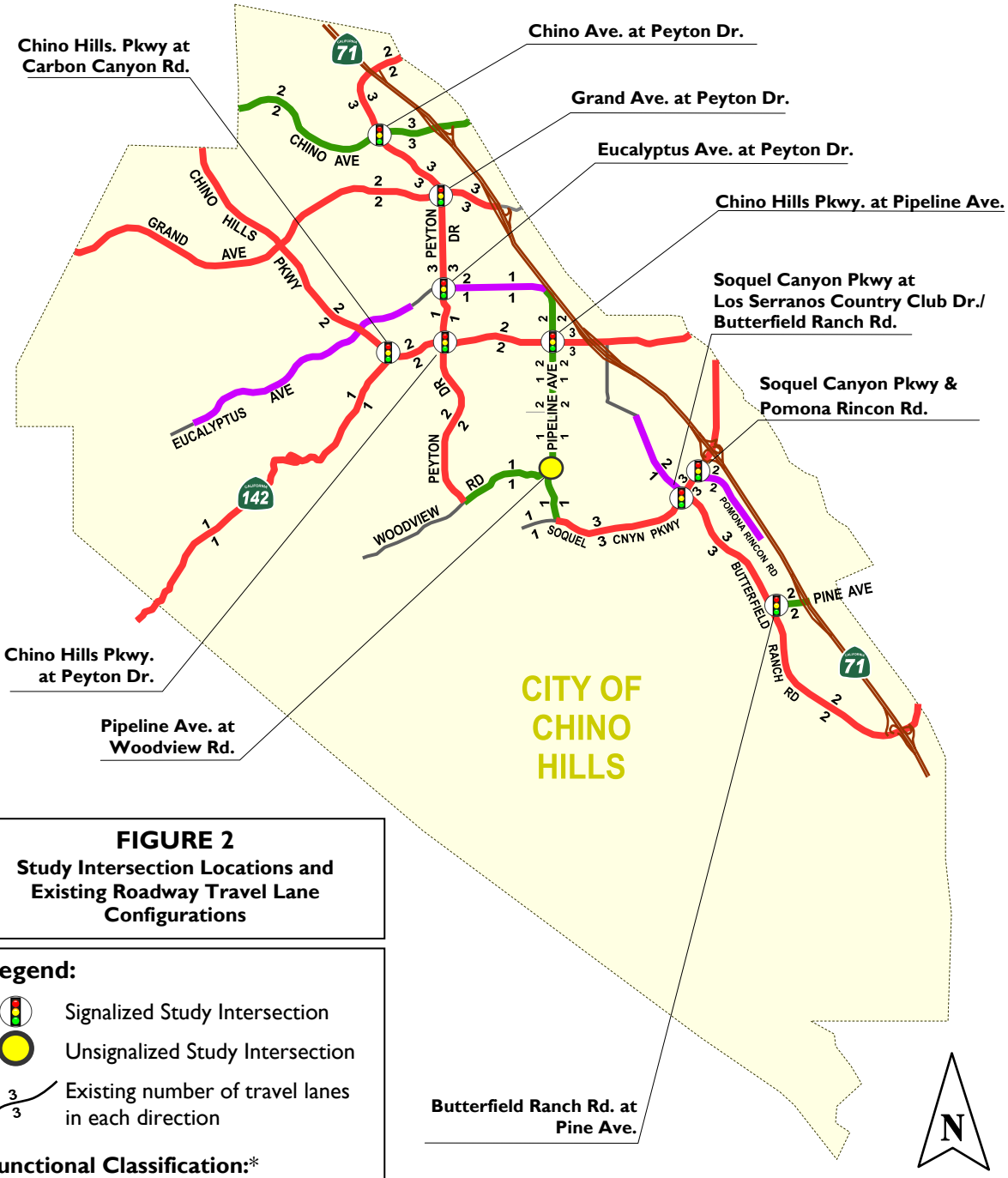


FIGURE 2
Study Intersection Locations and Existing Roadway Travel Lane Configurations

Legend:

- Signalized Study Intersection
- Unsignalized Study Intersection
- Existing number of travel lanes in each direction

Functional Classification:*

- Freeway
- Principal Arterial
- Minor Arterial
- Major Collector
- Minor Collector
- Local

* Source: Caltrans' 2011 California Road System (CRS) Map Database
URL: http://www.dot.ca.gov/hq/tsip/hseb/crs_maps/

The following section describes the existing lane geometries and traffic controls at each of the ten study intersections.

Signalized Intersections

Intersection #1: Soquel Canyon Parkway/Butterfield Ranch Road at Los Serranos Country Club Drive.

The intersection of Soquel Canyon Parkway and Los Serranos Country Club Drive is traffic signal-controlled, with marked crosswalks and pedestrian signal phases in all four directions. On the northbound approach (Butterfield Ranch Road), there are 270' protected dual left-turn lanes, a single through-only lane, 335' dual right-turn lanes with an overlap green phase coinciding with westbound left-turn movements, and one downstream receiving lane. On the southbound approach (Los Serranos Country Club Drive), there are 180' protected dual left-turn lanes with U-turns prohibited, a single through-only lane, a shared through/right curb lane, and three downstream receiving lanes.

On the eastbound approach (Soquel Canyon Parkway), there is a 245' protected left-turn lane, two through-only lanes, a shared through/right curb lane, and three downstream receiving lanes. On the westbound approach (Soquel Canyon Parkway), there are 285' left-turn lanes with U-turns prohibited, two through-only lanes, a shared through-right curb lane, and three downstream receiving lanes.

Intersection #2: Soquel Canyon Parkway at Pomona Rincon Road.

The traffic signal at Pomona Rincon Road and Soquel Canyon Parkway is a "T" intersection, with Pomona Rincon Road terminating at Soquel Canyon Parkway from the south. A marked crosswalk and pedestrian signal phase is provided on the south intersection leg across Pomona Rincon Road. There are two northbound travel lanes on Pomona Rincon Road which transition to three, 310' long approach lanes at the intersection at Soquel Canyon Parkway Road, including a dedicated left-turn lane with U-turns prohibited, a shared left-right lane, and a dedicated right-turn curb lane with an overlap green phase coinciding with westbound left-turn movements.

On the eastbound approach (Soquel Canyon Parkway), there are two through-only lanes with U-turns prohibited from the inside travel lanes, a shared through-right lane, a 160' dedicated right-turn curb lane, and three downstream receiving lanes. On the westbound approach (Soquel Canyon Parkway), there are 380' protected dual left-turn lanes with U-turn prohibited, two through-only lanes, and three downstream receiving lanes.

Intersection #3: Butterfield Ranch Road at Pine Avenue.

The intersection of Butterfield Ranch Road and Pine Avenue is traffic signal-controlled, with marked crosswalks and pedestrian signal phases in all four directions. On the northbound approach (Butterfield Ranch Road), there is a 155' protected left-turn lane, two through-only lanes, a 125' dedicated right-turn curb lane controlled with an overlap green phase coinciding with westbound left-turn movements, and three downstream receiving lanes. On the southbound approach (Butterfield Ranch Road), there are 250' protected dual left-turn lanes, two through-only lanes, a 95' dedicated right-turn curb lane, and two downstream receiving lanes. On the eastbound approach (Pine Avenue), there is a 60' protected left-turn lane with U-turns prohibited, a shared through-right curb lane, and three downstream receiving lanes which transition into two lanes further east on Pine Avenue. On the westbound approach (Pine Avenue), there is a staggered dual left-turn pocket (protected phase, U-turns prohibited) with a median cut to turn into the adjacent retail center, a shared through-right lane, and a dedicated right-turn curb lane, and one downstream receiving lane.

Intersection #4: Chino Hills Parkway (SR-142) at Pipeline Avenue.

The intersection of Chino Hills Parkway and Pipeline Avenue is traffic signal-controlled, with marked crosswalks and pedestrian signal phases in all four directions. On the northbound approach (Pipeline Avenue), there is a 180' protected left-turn lane with U-turns prohibited, a single through-only lane, a shared through-right curb lane, and two downstream receiving lanes. The southbound approach (Pipeline Avenue) has a similar geometric configuration as in the northbound direction, with a 130' protected left-turn lane (U-turns prohibited), a single through-only lane, a shared through-right curb lane, and two downstream receiving lanes which merge into a single lane approximately 1,000' south of Chino Hills Parkway. On the eastbound approach (Chino Hills Parkway), there is a 100' protected left-turn lane with U-turns prohibited, three through lanes, and three downstream receiving lanes. The rightmost/curb lane on the eastbound approach provides approximately 170' of storage, and was observed to effectively function as two separate lanes, simultaneously serving both through and right-turn (de facto) vehicle movements during the peak traffic hours. On the westbound approach (Chino Hills Parkway), there is a 170' protected left-turn lane, two through-only lanes, a 170' dedicated right-turn lane formed from the upstream curb lane transition, and two downstream receiving lanes.

Intersection #5: Chino Hills Parkway (SR-142) at Peyton Drive.

The intersection of Chino Hills Parkway and Peyton Drive is traffic signal-controlled, with marked crosswalks and pedestrian signal phases in all four directions. On the northbound

approach (Peyton Drive), there are 120' protected dual left-turn lanes with U-turns prohibited, a single through-only lane, and a shared through-right curb lane. On the southbound approach (Peyton Drive), there is a 190' protected left-turn lane, two through-only lanes, and a 200' dedicated right-turn curb lane controlled by an overlap green phase which coincides with eastbound left movements. On the eastbound approach (Chino Hills Parkway), there are 345' protected dual left-turn lanes with U-turn prohibited, two through lanes, and two downstream receiving lanes. The rightmost/curb lane on the eastbound approach was observed to effectively function as two separate lanes, simultaneously serving both through and right-turn (de facto) vehicle movements during the peak traffic hours. On the westbound approach, there are 150' protected dual left-turn lanes with U-turns prohibited, two through-only lanes, a 140' dedicated right-turn curb lane, and two downstream receiving lanes.

Intersection #6: Carbon Canyon Road (SR-142)/Rustic Drive at Chino Hills Parkway.

The intersection of Carbon Canyon Road and Chino Hills Parkway is traffic signal controlled, with marked crosswalks and pedestrian signal phases on the north, south and west intersection legs. Northbound and southbound traffic movements on Carbon Canyon Road and Rustic Drive, respectively, run on concurrent permissive green signal phases. On the northbound approach (Carbon Canyon Road), there is a 195' dedicated left-turn lane, a shared through-right lane, a dedicated right-turn curb lane, and one downstream receiving lane. On the southbound approach (Rustic Drive), there is a dedicated left-turn lane, a shared through-right curb lane, and two downstream receiving lanes which merge into a single lane further south on Carbon Canyon Road. On the eastbound approach (Chino Hills Parkway), there is a 200' protected left-turn lane, two through-only lanes, a 245' dedicated right-turn curb lane, and two downstream receiving lanes. On the westbound approach (Chino Hills Parkway), there are 510' protected dual left-turn lanes with U-turns prohibited, a single through-only lane, a shared through-right curb lane with right-turns onto Rustic Drive prohibited between the hours of 6:00-9:00AM Monday through Friday, and two downstream receiving lanes.

Intersection #7: Grand Avenue at Peyton Drive.

The signalized intersection of Grand Avenue and Peyton Drive is traffic signal-controlled, with marked crosswalks and pedestrian signal phases on all four intersection legs. Similar traffic signal heads, poles and mast arm configurations are provided on all four intersection quadrants for each approach. On the northbound approach (Peyton Drive), there are 165' protected dual left-turn lanes, three through-only lanes, a 135' dedicated right-turn curb lane, and three downstream receiving lanes. On the southbound approach (Peyton Drive), there are 110' protected dual left-turn lanes, two through-only lanes, a shared through-right curb lane, and three downstream receiving lanes. On the eastbound approach (Grand Avenue), there are 160' protected dual left-turn lanes, two through-only lanes, a 170' right-turn curb lane, and three

downstream lanes. On the westbound approach (Grand Avenue), there are 190' protected dual left-turn lanes, two through-only lanes, a 200' dedicated right-turn lane formed from the upstream curb lane transition, and two downstream receiving lanes.

Intersection #8: Peyton Drive at Eucalyptus Avenue.

The intersection of Peyton Drive and Eucalyptus Avenue is traffic signal-controlled, has marked crosswalks and pedestrian phases in all four directions, and runs traffic movements for each approach using protected-permissive phasing and timing settings. On the northbound approach (Peyton Drive), there is a 60' dedicated left turn lane a shared through-right curb lane, and three downstream receiving lanes. On the southbound approach (Peyton Drive), there is a dedicated left-turn lane, a single through-only curb lane, a dedicated right-turn lane, and one downstream receiving lane. On the eastbound approach (Eucalyptus Avenue), there is a 180' dedicated left-turn lane, a shared through-right curb lane, and one downstream receiving lanes. On the westbound approach (Eucalyptus Avenue), there is a 150' dedicated left-turn lane, a shared through-right lane, a 140' dedicated right-turn lane, and one downstream receiving lane.

Intersection #10: Chino Avenue at Peyton Drive.

The signalized intersection of Chino Avenue and Peyton Drive is traffic signal-controlled, with marked crosswalks and pedestrian signal phases on all four intersection legs. Similar traffic signal heads, poles and mast arm configurations are provided on all four intersection quadrants for each approach. On the northbound approach (Peyton Drive), there are 135' protected dual left-turn lanes, two through-only lanes, a shared through-right curb lane, and three downstream receiving lanes. The southbound approach on Peyton Drive also provides for 135' protected dual left-turn lanes, two through-only lanes, a shared through-right curb lane, and three downstream receiving lanes. On the eastbound approach (Chino Avenue), there is a 175' protected left-turn lane, three through lanes, and three downstream receiving lanes. The rightmost/curb lane on the eastbound approach provides approximately 175' of storage, and was observed to effectively function as two separate lanes, simultaneously serving both through and right-turn (de facto) vehicle movements during the peak traffic hours.

Unsignalized Intersection

Intersection #9: Pipeline Avenue at Woodview Road. The intersection of Pipeline Avenue and Woodview Road is an unsignalized "T" intersection formed by Woodview Road terminating at Pipeline Avenue from the west. Eastbound traffic on Woodview Road is stop-controlled, and approaches the intersection from a single shared left-right lane. North/south traffic on Pipeline Avenue is uncontrolled and turns onto Woodview Road from the through travel lane.

Existing Intersection Traffic Conditions

Intersection turning movement traffic volume counts were collected manually in the field by Minagar & Associates, Inc. staff at each of the ten study locations. Traffic counts were performed during typical morning (AM) and afternoon (PM) peak traffic periods during the week. Morning peak hour counts were taken between 7:00 and 9:00 AM on a typical weekday during October 2012 and afternoon/evening peak hour counts were taken between 4:00 and 6:00 PM during the same month. The measured volumes were then programmed into the traffic baseline model along with each intersection's estimated roadway capacity, field-verified lane geometrics (depicted in Figure 3) and signal timing parameters to establish existing (Year 2012) traffic conditions. The traffic analysis software was then used to calculate the amount of existing vehicular delay experienced at each intersection during the peak AM and PM commute hours.

Based on prevailing signalized and unsignalized vehicular delays calculated for each location (reported in seconds per vehicle), the intersections are described by a subsequent Level of Service (LOS). The level of service concept describes the qualitative measure of an intersection's capacity and function to move traffic, as summarized in Figure 4. As per the City of Chino Hills' latest Traffic Impact Study (TIS) Guidelines, LOS "D" is the minimum acceptable grade for intersections in Chino Hills, and is typically the lowest acceptable in similar suburban areas. Table 1 summarizes the results of the LOS analysis for the 10 study intersections under Existing Year 2012 conditions. Figure 5 illustrates existing AM/PM intersection volumes and level of service.

During the AM weekday peak period, the following six signalized intersections operate at level of service E or F and experience poor operating conditions and significant delay: Pipeline Avenue/Woodview Road (two-way stop controlled intersection); Peyton Drive/Grand Avenue; Peyton Drive/Eucalyptus Avenue; Peyton Drive/Chino Hills Parkway; Chino Hills Parkway/Carbon Canyon Road (SR-142); and Chino Hills Parkway/Pipeline Avenue. The remaining four signalized intersections are all operating at acceptable levels of service during the morning peak period.

During the PM peak period, a total of six intersections (all are located along Chino Hills Parkway and/or Peyton Drive) are operating at LOS E or F and level of service D or better: Peyton Drive/Chino Avenue; Peyton Drive/Grand Avenue; Peyton Drive/Eucalyptus Avenue; Peyton Drive/Chino Hills Parkway; Chino Hills Parkway/Carbon Canyon Road (SR-142); and Chino Hills Parkway/Pipeline Avenue.

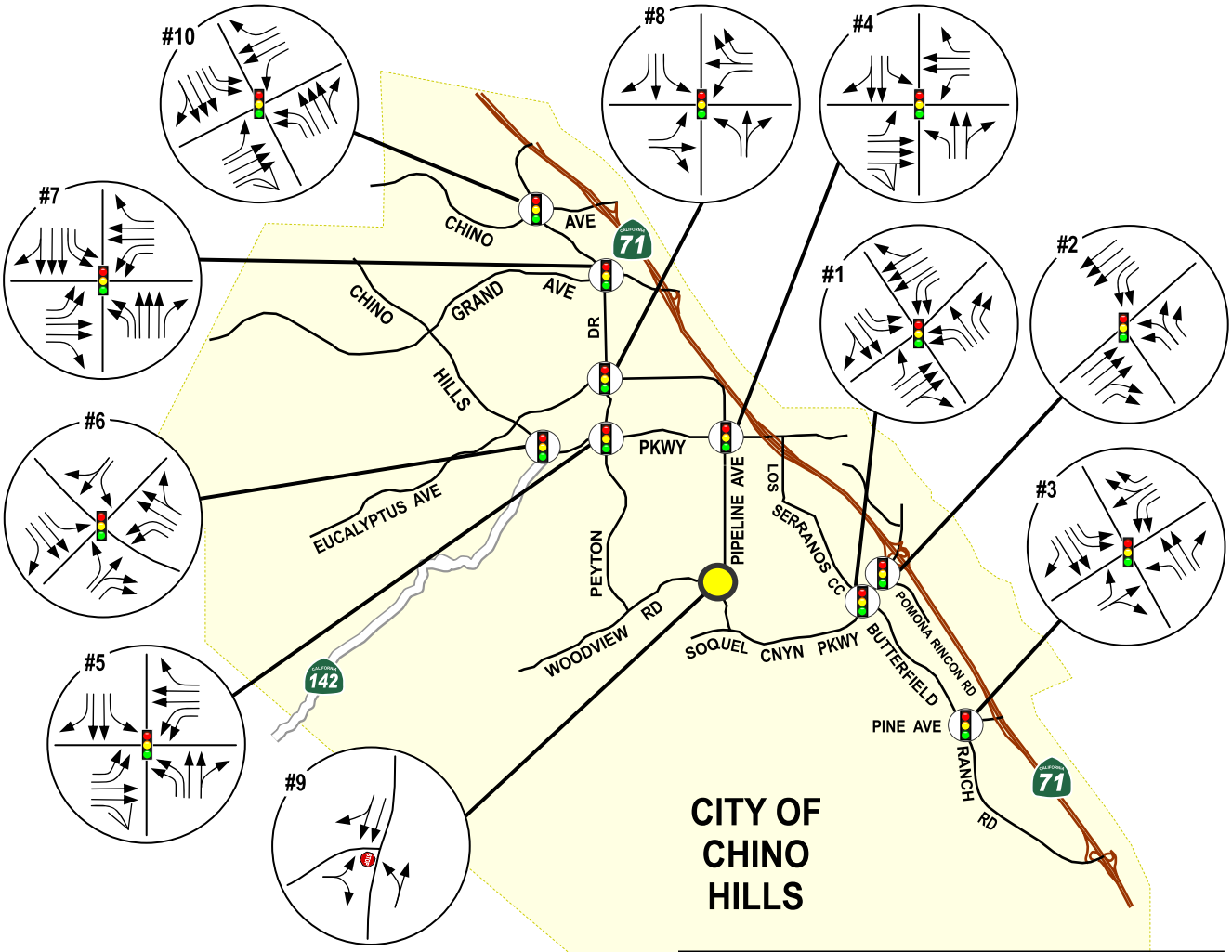


FIGURE 3
Intersection Lane Geometrics

Legend:

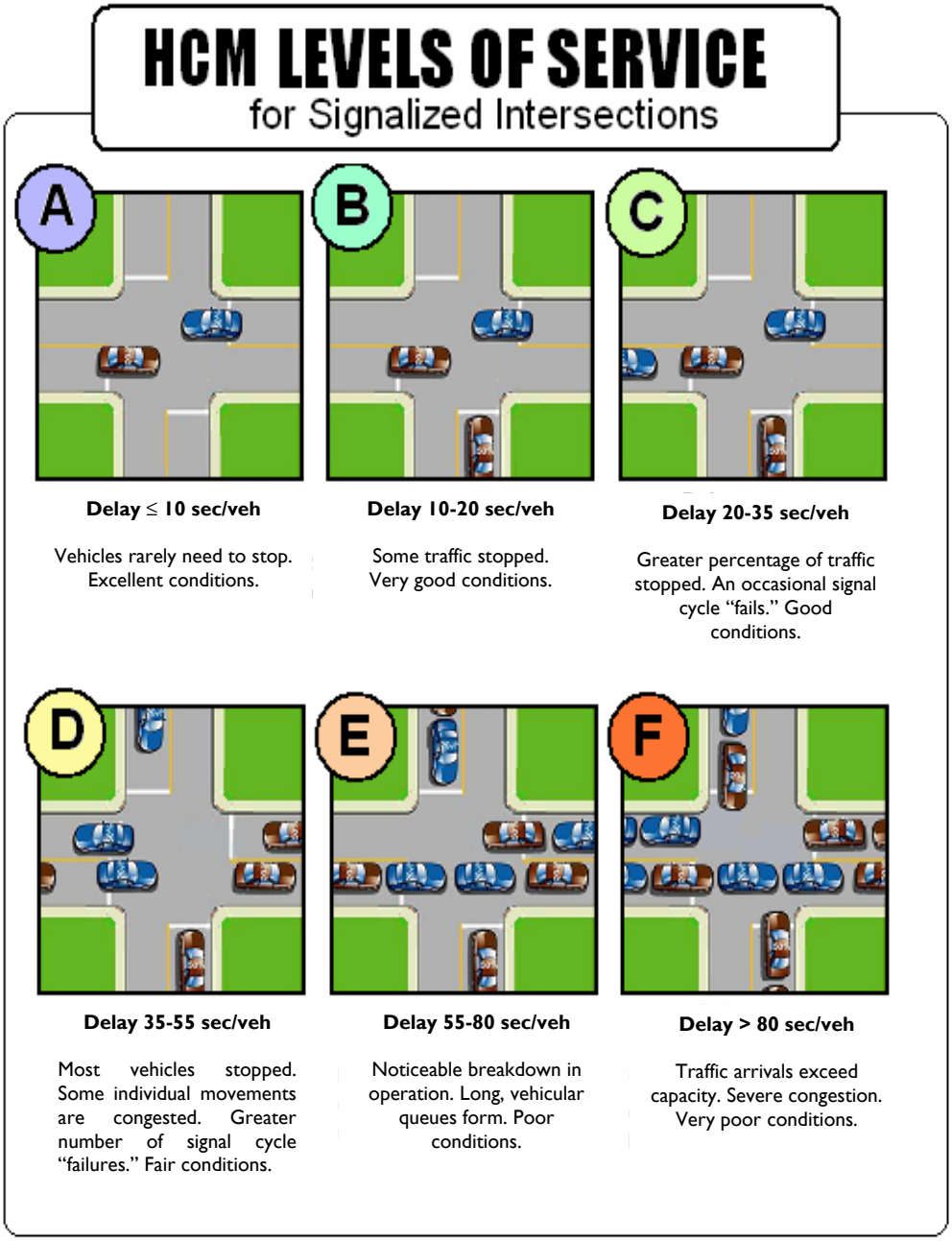
- Signalized study intersection
- Unsignalized study intersection
- Lane movement
- De-facto lane
- Stop-controlled approach

N

List of Intersections:

#1: Soquel Cnyn. Pkwy. / Butterfield Ranch Rd.
#2: Soquel Cnyn. Pkwy. / Pomona Rincon Rd.
#3: Butterfield Ranch Rd. / Pine Ave.
#4: Chino Hills Pkwy. / Pipeline Ave.
#5: Chino Hills Pkwy. / Peyton Dr.
#6: Carbon Canyon Rd. / Chino Hills Pkwy.
#7: Grand Ave. / Peyton Dr.
#8: Peyton Dr. / Eucalyptus Ave.
#9: Pipeline Ave. / Woodview Rd.
#10: Chino Ave. / Peyton Dr.

FIGURE 4
Intersection Level of Service (LOS) Criteria for Signalized Intersections



Source: Highway Capacity Manual (HCM2010), *Transportation Research Board*

TABLE 1
Level of Service Summary:
Existing 2012 Weekday AM & PM Peak Hour Conditions

Location		Level of Service Analysis*			
No.	Intersection	Peak Hour	Existing Year 2012		
			V/C	Delay	LOS
1	Soquel Canyon Parkway / Butterfield Ranch Road	AM	0.898	51.6	D
		PM	0.826	41.3	D
2	Soquel Canyon Parkway / Pomona Rincon Drive	AM	0.893	41.4	D
		PM	0.467	7.5	A
3	Butterfield Ranch Road / Pine Avenue	AM	0.381	14.5	B
		PM	0.350	19.9	B
4	Chino Hills Parkway / Pipeline Avenue	AM	1.025	83.6	F
		PM	1.210	146.1	F
5	Chino Hills Parkway / Peyton Drive	AM	0.998	83.0	F
		PM	1.188	129.5	F
6	Chino Hills Parkway / Carbon Canyon Road	AM	0.889	42.3	D
		PM	1.438	191.3	F
7	Grand Avenue / Peyton Drive	AM	0.882	58.1	E
		PM	0.909	78.8	E
8	Eucalyptus Avenue / Peyton Drive	AM	1.451	202.6	F
		PM	1.428	177.6	F
9	Pipeline Road / Woodview Road	AM	1.059	68.2	F
		PM	0.609	4.8	A
10	Chino Avenue / Peyton Drive	AM	0.743	43.5	D
		PM	0.768	83.9	F

* Notes:
- V/C: Intersection volume-to-capacity ratio
- Average intersection control delay reported in seconds per vehicle (sec/veh)

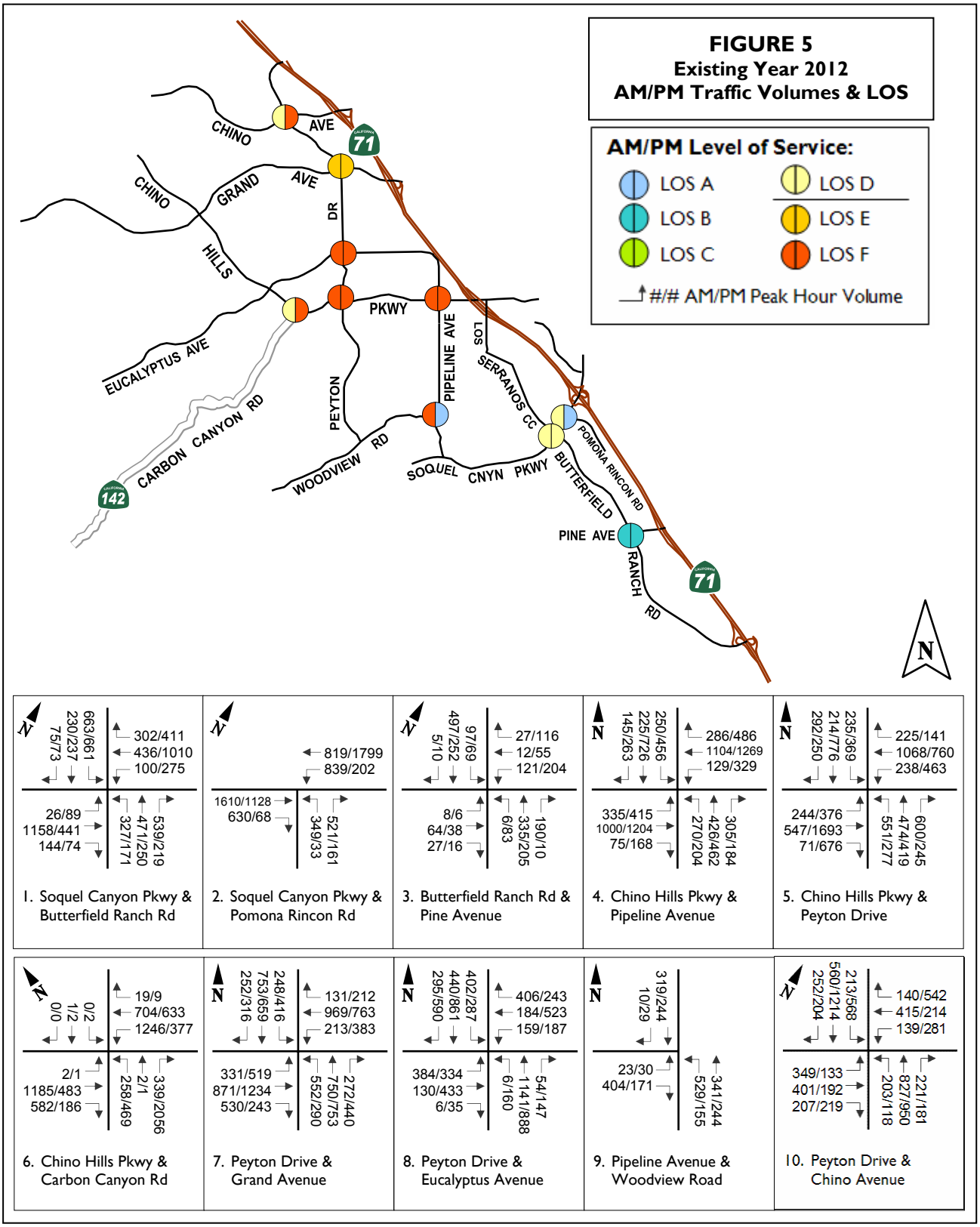


FIGURE 5
Existing Year 2012
AM/PM Traffic Volumes & LOS
AM/PM Level of Service:
LOS A
LOS B
LOS C
LOS D
LOS E
LOS F
#/# AM/PM Peak Hour Volume
CHINO AVE
CHINO GRAND AVE
HILLS DR
PKWY
EUCALYPTUS AVE
PEYTON
PIPELINE AVE
LOS SERRANOS CC
CARBON CANYON RD
WOODVIEW RD
SOQUEL CNYN PKWY
BUTTERFIELD
POMONA RINCON RD
PINE AVE
RANCH RD
71
142
N
1. Soquel Canyon Pkwy & Butterfield Ranch Rd
302/411
436/1010
100/275
663/661
230/237
75/73
26/89
1158/441
144/74
327/171
471/250
539/219
2. Soquel Canyon Pkwy & Pomona Rincon Rd
819/1799
839/202
1610/1128
630/68
349/33
521/161
3. Butterfield Ranch Rd & Pine Avenue
27/116
12/55
121/204
97/69
497/252
5/10
8/6
64/38
27/16
6/83
335/205
190/10
4. Chino Hills Pkwy & Pipeline Avenue
286/486
1104/1269
129/329
250/456
225/726
145/263
335/415
1000/1204
75/168
270/204
426/462
305/184
5. Chino Hills Pkwy & Peyton Drive
225/141
1068/760
238/463
235/369
214/776
292/250
244/376
547/1693
71/676
551/277
474/419
600/245
6. Chino Hills Pkwy & Carbon Canyon Rd
19/9
704/633
1246/377
0/2
1/2
0/0
2/1
1185/483
582/186
258/469
2/1
339/2056
7. Peyton Drive & Grand Avenue
131/212
969/763
213/383
248/416
753/659
252/316
331/519
871/1234
530/243
552/290
750/753
272/440
8. Peyton Drive & Eucalyptus Avenue
406/243
184/523
159/187
402/287
440/861
295/590
384/334
130/433
6/35
6/160
1141/888
54/147
9. Pipeline Avenue & Woodview Road
319/244
10/29
23/30
404/171
529/155
341/244
10. Peyton Drive & Chino Avenue
140/542
415/214
139/281
213/568
560/1214
252/204
349/133
401/192
207/219
203/118
827/950
221/181

FUTURE TRANSPORTATION SYSTEM & TRAFFIC CONDITIONS

Applied Growth Factor

Future traffic conditions analyzed in this study have taken into account sub-regional forecasts for future-term housing, population and employment growth projected to the years 2027 and 2037. These projections are based on historical socioeconomic growth trends in the City of Chino Hills and San Bernardino County, and represent the maximum, worst-case ambient traffic growth which would occur throughout the City.

Both of the 15-year (2027) and 25-year (2037) "without project" traffic scenarios were developed by applying an annual growth rate to the existing baseline traffic volumes to estimate subregional growth in the area due to projects and activity external to the City of Chino Hills. This growth rate was derived from San Bernardino Association of Governments (SANBAG)/Southern California Association of Governments (SCAG) traffic model forecasts and historic data on socioeconomic trends in the region, and approved by the City of Chino Hills for use in the traffic model developed for this analysis. The existing traffic volumes were projected forward to the 15-year (2027) and 25-year (2037) build-out conditions by a factor of one percent (1%), compounded annually.

Anticipated/Programmed Transportation Improvements

The City of Chino Hills provided Minagar & Associates, Inc. with a list of Transportation Projects included in the City's latest FY 2012-13 Capital Improvement Program (CIP). Some projects have been completed, while others are in various other planning, design, engineering, right-of-way or construction stages and have not yet been built. Of those programmed and/or planned improvement projects, only the Peyton Drive Widening Project (Phase 3) is expected to directly impact traffic operations at the subject study intersections. This project will include widening the street from two lanes to four lanes (2 per direction) with bike lanes on both sides, between south of Eucalyptus and north of Chino Hills Parkway. As part of the widening effort, several intersection approaches at Peyton/Eucalyptus and Peyton/Chino Hills Parkway will also be reconfigured, and will include modification of each intersection's timing plans and traffic signal phasing to match the improved roadway and traffic conditions.

Other projects for sidewalk construction, curb/gutter and street lighting improvements, tree replacements, street resurfacing and other routine maintenance projects will generally not affect vehicular circulation as it pertains to the traffic analysis model for the future 15-year (2027) and build-out year (2037) conditions considered in this study. The City currently uses Measure I, traffic improvement fee (TIF) and Gas Tax 7360 funding for local traffic signal

controller upgrades, correction of general traffic issues, and developer-imposed transportation mitigation measures; however, no specific improvement projects within the study area have currently been identified for use of this funding. Other potential sources of federal and/or state funding may be pursued by the City and used for future traffic improvement programs, such as STIP, HBRRP, HSIP, SRTS/SR2S, etc.

Summary of Local Development within Chino Hills

Future growth in traffic along City of Chino Hills streets will also be influenced by residential and non-residential development within the City. To analyze the potential traffic-related impacts of future development, a microcomputer-based traffic model was developed for the city's major arterials and highways. The model includes nine (9) major signalized intersections and one (1) major stop-controlled intersection in Chino Hills. The traffic model divided the City into several traffic analysis zones to facilitate the modeling of traffic impacts between major points of origin and destination throughout the City, including the 10 study locations.

A list of thirteen (13) potential development projects was furnished to Minagar & Associates, Inc. by the City of Chino Hills staff for use in the traffic analysis model. This list includes some projects which are currently being developed, are approved for construction, or have permit applications on file. These "cumulative projects" represent the City's current long range plans for both major residential and non-residential developments within the study area and throughout the City. The cumulative projects are under various development phases; however, they are all expected to be completed and operational prior to the City's future 15-year and 25-year build-out conditions. The General Plan build-out scenario will occur in 2037 (Existing Year 2012 + 25 years), with a few additional residentials expected to develop during this interim period. At this time, however, these potential isolated developments are considered negligible in the traffic analysis due to there being no specific scope, size or location for such development.

Table 2 lists the cumulative future developments in the City of Chino Hills which were considered in the model. Figure 6 shows the locations of the 13 specific developments identified within the City, along with the generalized trip distribution percentages used to distribute the added traffic to the roadway network. The maximum anticipated build-out conditions, as reflected in Table 8, includes 553 single-family detached housing units, 230 residential condominium/townhome units, 566 multi-family residential (apartment) units, approximately 779,000 square feet of non-residential developments (e.g., retail, church, office, and restaurant uses). The cumulative developments are anticipated to generate approximately 1,500 new AM peak hour vehicle trips and 2,800 new PM peak hour trips, which would be added to city streets by the future year 2027 and build-out year 2037.

Standard trip generation rates from the Institute of Transportation Engineers (ITE, 9th Edition) were used to estimate future trip-making resulting from the developments listed in Table 2. Trip rates for each land use were multiplied by the amount of anticipated development to derive future trip-making. Cumulative trip generation rates and estimates are further summarized in Table 2 by location and type of land assumed in the analysis.

The geographic distribution of future trip generation was performed using manual gravity model methods, and is based on applicable contributing factors such as type and location of proposed developments, surrounding land uses and population, physical conditions of the surrounding street system, existing weekday AM and PM peak hour traffic and travel patterns observed in the field, and nearby competing developments. The percent of total future traffic volumes assigned to each roadway indicates that key arterial streets such as Chino Hills Parkway and Soquel Canyon Parkway are assumed to carry a significant proportion of new trips.

Figure 7 illustrates the estimated future traffic to be generated and added to the transportation network from planned developments within the City of Chino Hills, anticipated on both the future year (2027) and build-out year (2037) conditions. Full standard output data sheets containing traffic volume, geometry and timing/phasing assumptions, as HCM results from the traffic analysis model are included in Appendix B.

TABLE 2

AM/PM Weekday and Daily Trip Generation: Cumulative Developments

Cumulative Development Projects			Size		Weekday AM/PM Peak Hour Trip Generation																	
					AM Rate			AM Trips			PM Rate			PM Trips			Daily Rate			Daily Trips		
No.	Project Description/Location	Land Use	Qty	Units	In %	Out %	AM Rate	In	Out	AM Total	In %	Out %	PM Rate	In	Out	PM Total	In %	Out %	Daily Rate	In	Out	PM Total
1	B.A.P.S. Temple and Cultural Center	Church > Temple, Recep. Hall, Classrms, Gym,																				
	S/o Chino Hill Pkwy., E/o Monte Vista Ave., W/o Central Ave.	Dining/Kitchen Halls, Living Qtrs, Snack Shop	114.445	KSF	62%	38%	0.56	40	24	64.09	48%	52%	0.55	30	33	62.94	50%	50%	9.11	111	111	221.86
		Church > Cultural Center	33.781	KSF	62%	38%	0.56	12	7	18.92	48%	52%	0.55	9	10	18.58	50%	50%	9.11	33	33	65.49
		Church > Exhibition hall	16.236	KSF	62%	38%	0.56	6	3	9.09	48%	52%	0.55	4	5	8.93	50%	50%	9.11	16	16	31.48
							Sub-total	**57**	**35**	**92.10**			*Sub-total*	**43**	**47**	**90.45**			*Sub-total*	**159**	**159**	**318.83**
2	Crossroads Entertainment Center	Quality Restaurant (2 pads)	14.500	KSF	82%	18%	0.81	**10**	**2**	**11.75**	67%	33%	7.49	**73**	**36**	**108.61**	50%	50%	89.95	**95**	**95**	**190.16**
	N/o Chino Ave., W/o and adjacent to SR-71																					
3	Heritage Professional Center	Hospital	55.000	KSF	63%	37%	0.95	33	19	52.25	38%	62%	0.93	19	32	51.15	50%	50%	13.22	128	128	255.58
	E/o Pomona Rincon Rd. and CH High School, S/o Soquel Cnyn. Pkwy.	Medical-Dental Office Building	86.912	KSF	79%	21%	0.53	36	10	46.06	34%	66%	1.06	31	61	92.13	50%	50%	36.13	175	175	349.50
		Shopping Center > Retail, Restaurant, Hotel	235.000	KSF	59%	41%	1.12	155	108	263.20	42%	58%	3.14	310	428	737.90	50%	50%	42.70	2,304	2,304	4,607.84
							Sub-total	**225**	**137**	**361.51**			*Sub-total*	**361**	**520**	**881.18**			*Sub-total*	**2,606**	**2,606**	**5,212.91**
4	The Commons	Shopping Center (40% leasable building area)	208.000	KSF	59%	41%	1.12	**137**	**96**	**232.96**	42%	58%	3.14	**274**	**379**	**653.12**	50%	50%	42.70	**2,039**	**2,039**	**4,078.43**
	E/o Ramona Ave. between Chino Hills Pkwy.. and SR-71																					
5	Country Club Villas	Residential Condominium/Townhouse	70	DU	17%	83%	0.44	**5**	**26**	**30.80**	67%	33%	0.52	**24**	**12**	**36.40**	50%	50%	5.81	**74**	**74**	**148.53**
	E/o Pomona Rincon Rd. between Wallace Ave and Los Serranos Rd.																					
6	Foremost Communities (Canyon Hills)	Single-Family Detached Housing	76	DU	25%	75%	0.75	**14**	**43**	**57.00**	63%	37%	1.01	**48**	**28**	**76.76**	50%	50%	9.52	**203**	**203**	**406.98**
	NW/o Carbon Canyon Rd., W/o Canyon Hills Rd.																					
7	Lago Los Serranos	Residential Condominium/Townhouse	95	DU	17%	83%	0.44	**7**	**35**	**41.80**	67%	33%	0.52	**33**	**16**	**49.40**	50%	50%	5.81	**101**	**101**	**201.57**
	S/o Bird Farm Rd. between Country Club Dr. and Ramona Ave.																					
8	Pine Valley Estates	Single-Family Detached Housing	98	DU	25%	75%	0.75	**18**	**55**	**73.50**	63%	37%	1.01	**62**	**37**	**98.98**	50%	50%	9.52	**262**	**262**	**524.79**
	W/o Rancho Hills Dr. between Eucalyptus Ave. and Highland Pass Rd.																					
9	Stonefield Development	Single-Family Detached Housing	28	DU	25%	75%	0.75	**5**	**16**	**21.00**	63%	37%	1.01	**18**	**10**	**28.28**	50%	50%	9.52	**75**	**75**	**149.94**
	NW/o Carbon Canyon Rd., E/o Fairway Dr.																					
10	Vila Borba	Single-Family Detached Housing	351	DU	25%	75%	0.75	66	197	263.25	63%	37%	1.01	223	131	354.51	50%	50%	9.52	940	940	1,879.61
	W/o & E/o Butterfield Ranch Rd., S/o Pine Ave. and N/o Park Crest Ct.	Apartment	280	DU	20%	80%	0.51	29	114	142.80	65%	35%	0.62	113	61	173.60	50%	50%	6.65	380	380	759.70
							Sub-total	**94**	**312**	**406.05**			*Sub-total*	**336**	**192**	**528.11**			*Sub-total*	**1,320**	**1,320**	**2,639.30**
11	Villagio Apartment Complex	Apartment	286	DU	20%	80%	0.51	**29**	**117**	**145.86**	65%	35%	0.62	**115**	**62**	**177.32**	50%	50%	6.65	**388**	**388**	**775.98**
	E/o Butterfield Ranch Rd. between Picasso Dr. and Slate Dr.																					
12	Vista Bella Townhomes	High-Rise Residential Condominium/Townhouse	65	DU	19%	81%	0.54	**7**	**28**	**35.10**	62%	38%	0.38	**15**	**9**	**24.70**	50%	50%	4.20	**60**	**60**	**119.41**
	W/o Butterfield Ranch Rd., Bane Canyon Rd. and St. Gaudens Dr.																					
13	Gateway Village Phase IV Development	Shopping Center	14.950	KSF	59%	41%	1.12	**10**	**7**	**16.74**	42%	58%	3.14	**20**	**27**	**46.94**	50%	50%	42.70	**147**	**147**	**293.14**
	N/o Grand Ave. between SR-71 and Boys Republic Dr.																					

Total AM Peak Hour Trips	In	Out	Total
	619	907	**1,526**

Total PM Peak Hour Trips	In	Out	Total
	1,424	1,377	**2,800**

Total Daily Trips (ADT)	In	Out	Total
	7,530	7,530	**15,060**

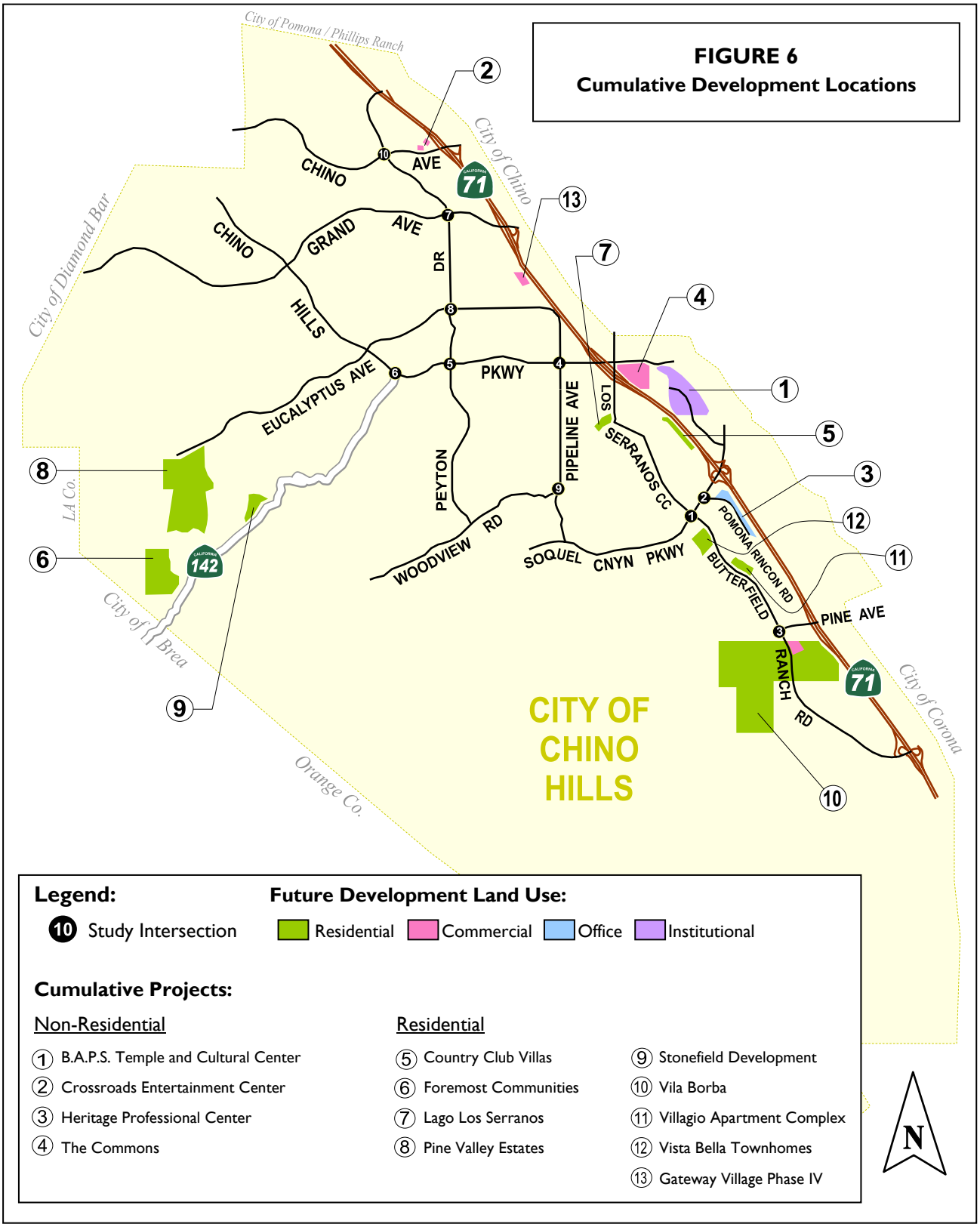


FIGURE 6
Cumulative Development Locations

Legend:

(10) Study Intersection

Future Development Land Use:

Residential, Commercial, Office, Institutional

Cumulative Projects:

Non-Residential

1. B.A.P.S. Temple and Cultural Center
2. Crossroads Entertainment Center
3. Heritage Professional Center
4. The Commons

Residential

5. Country Club Villas
6. Foremost Communities
7. Lago Los Serranos
8. Pine Valley Estates
9. Stonefield Development
10. Vila Borba
11. Villagio Apartment Complex
12. Vista Bella Townhomes
13. Gateway Village Phase IV

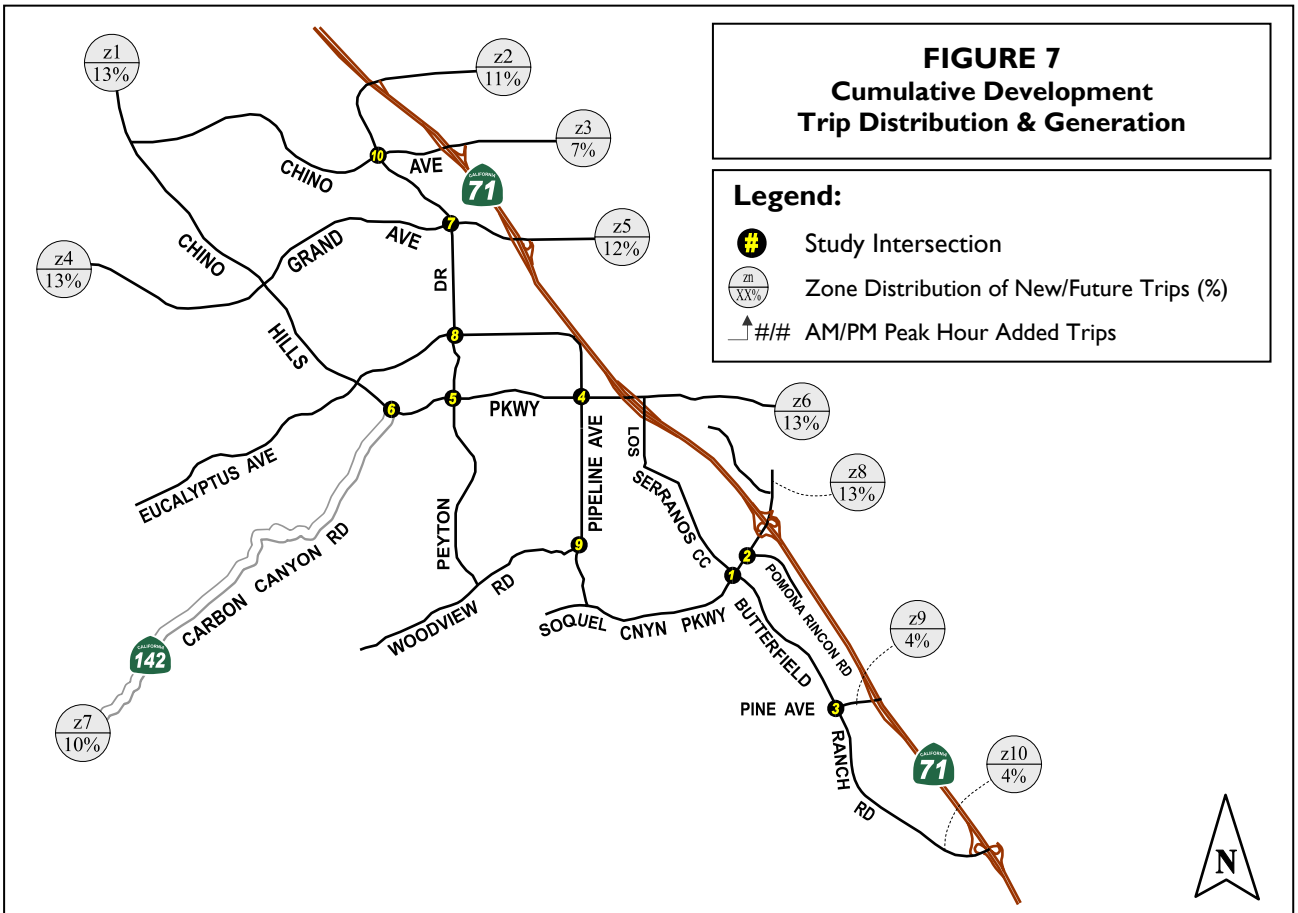
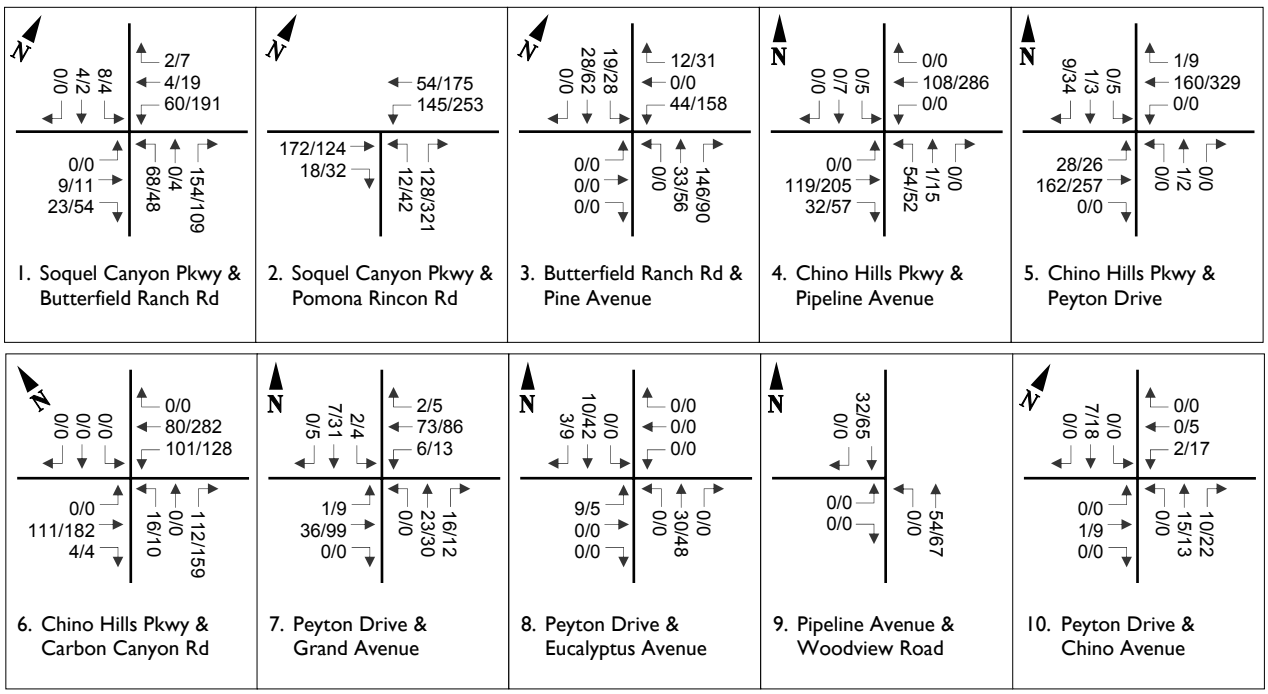


FIGURE 7
Cumulative Development
Trip Distribution & Generation

Legend:

- # Study Intersection
- zn XX% Zone Distribution of New/Future Trips (%)
- #/# AM/PM Peak Hour Added Trips



Future Intersection Operating Conditions

Table 3 summarizes the results of the LOS analysis for the 10 study intersections under future 15-Year (2027) conditions, illustrating the comparison of intersection delay and LOS between future baseline conditions without the anticipated cumulative developments, and with the full construction of these development projects. These results reveal that with a 1% annual background traffic growth, plus the implementation of all currently planned and/or programmed transportation improvements, the following nine (9) study intersections will operate at deficient levels during one or both peak weekday hours, under future year base 2027 conditions:

- Soquel Canyon Parkway at Los Serranos Drive/Butterfield Ranch Road
- Soquel Canyon Parkway at Pomona Rincon Road (AM peak hour only)
- Chino Hills Parkway at Pipeline Avenue
- Chino Hills Parkway at Peyton Drive
- Chino Hills Parkway at Carbon Canyon Road
- Peyton Drive at Grand Avenue
- Peyton Drive at Eucalyptus Avenue
- Pipeline Avenue at Woodview Road (AM peak hour only)
- Peyton Drive at Chino Avenue

The signalized intersection at Butterfield Ranch Road and Pine Avenue (Location #3) will operate at acceptable levels of service during the Future Year 2027 base conditions. With the addition of AM and PM peak hour project trips from future planned/programmed citywide cumulative developments, all levels of service will remain as during "pre-project" conditions, with the exception the following two intersections:

- Soquel Canyon Parkway at Pomona Rincon Road
  - PM peak hour level of service to degrade from LOS A to LOS C with the addition of cumulative developments
- Butterfield Ranch Road and Pine Avenue
  - PM peak hour level of service to degrade from LOS B to LOS C with the addition of cumulative developments

The projected Future Year 2027 Plus Cumulative Development traffic volume conditions at each of the ten study intersections are depicted in Figure 8.

TABLE 3
Level of Service Summary:
Future Year 2027 Weekday AM & PM Peak Hour Conditions
With and Without Future Development

Location		Level of Service Analysis [1]						
No.	Intersection	Peak Hour	15-Year (2027) Conditions					
			Future Year 2027 Base [2]			Future Year 2027 Plus Cumulative Projects [3]		
			V/C	Delay	LOS	V/C	Delay	LOS
1	Soquel Canyon Pkwy. / Butterfield Ranch Rd.	AM	1.017	82.0	F	1.044	90.0	F
		PM	0.937	62.0	E	0.946	72.2	E
2	Soquel Canyon Pkwy. / Pomona Rincon Dr.	AM	1.020	81.1	F	1.118	115.2	F
		PM	0.526	8.5	A	0.628	29.2	C
3	Butterfield Ranch Rd. / Pine Ave.	AM	0.410	15.3	B	0.440	16.2	B
		PM	0.380	19.3	B	0.445	32.0	C
4	Chino Hills Pkwy. / Pipeline Ave.	AM	1.168	126.9	F	1.200	140.0	F
		PM	1.382	212.5	F	1.473	259.0	F
5	Chino Hills Pkwy. / Peyton Dr.	AM	1.059	101.4	F	1.114	118.0	F
		PM	1.235	166.4	F	1.312	191.2	F
6	Chino Hills Pkwy. / Carbon Canyon Rd. (SR-142)	AM	1.010	81.4	F	1.043	94.4	F
		PM	1.646	273.8	F	1.770	331.0	F
7	Grand Ave. / Peyton Dr.	AM	1.002	93.2	F	1.025	100.0	F
		PM	1.033	116.4	F	1.073	130.6	F
8	Eucalyptus Ave. / Peyton Dr.	AM	1.272	133.7	F	1.286	161.0	F
		PM	1.254	128.2	F	1.272	150.9	F
9	Pipeline Rd. / Woodview Rd.	AM	1.213	279.5	F	1.262	417.2	F
		PM	0.691	5.7	A	0.764	6.0	A
10	Chino Ave. / Peyton Dr.	AM	0.841	63.5	E	0.846	66.0	E
		PM	0.875	128.2	F	0.883	132.8	F

V/C: Intersection volume-to-capacity ratio

[1] Average intersection control delay reported in seconds per vehicle (sec/veh)

[2] Includes estimated ambient annual growth of 1% per City direction, plus anticipated/approved transportation system improvements

[3] Includes citywide development projects to be completed by the 15-Year Future Year of 2027.

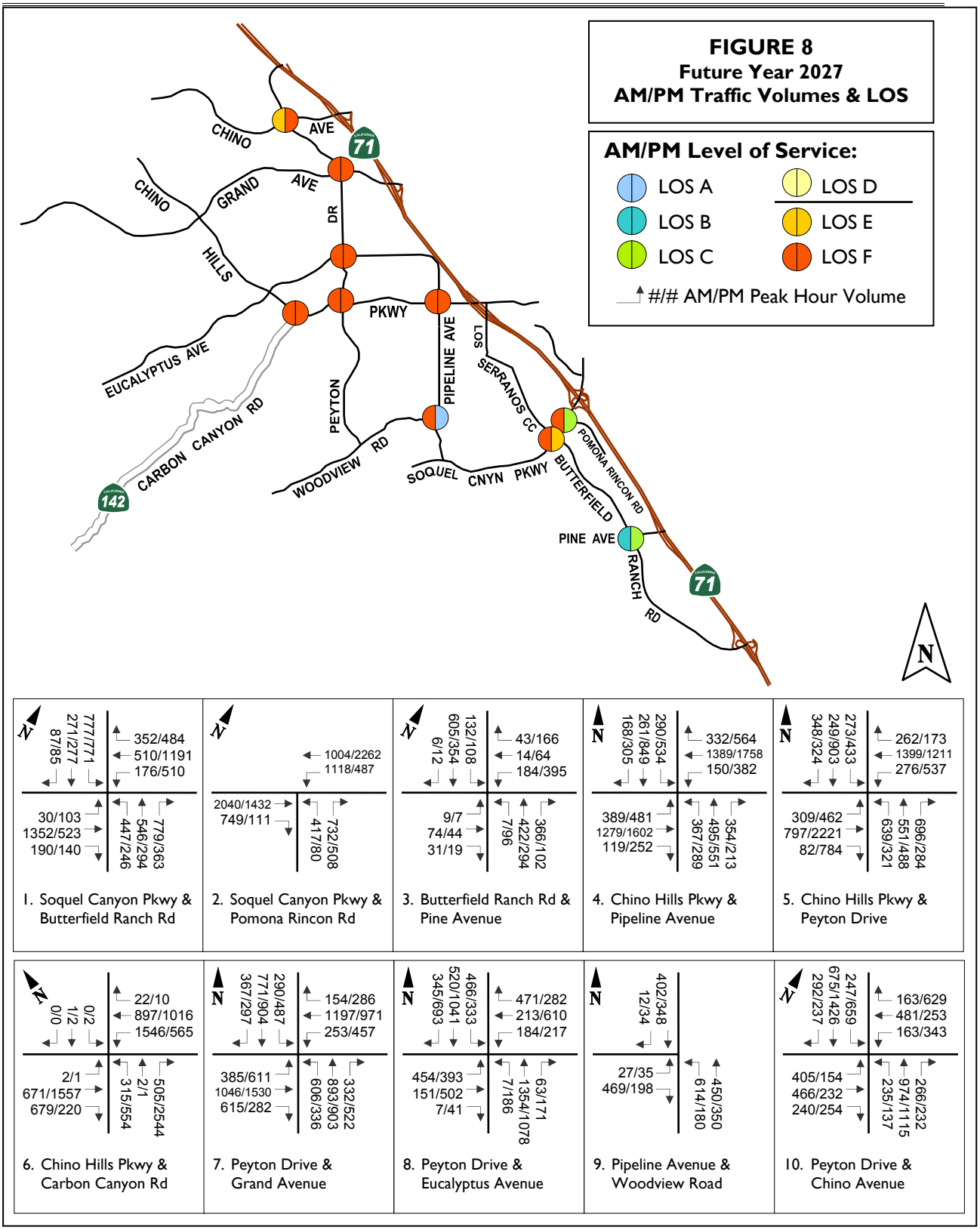


FIGURE 8
Future Year 2027
AM/PM Traffic Volumes & LOS
AM/PM Level of Service:
LOS A
LOS B
LOS C
LOS D
LOS E
LOS F
#/# AM/PM Peak Hour Volume
CHINO AVE
CHINO GRAND AVE
HILLS DR
PKWY
EUCALYPTUS AVE
PEYTON
PIPELINE AVE
LOS SERRANOS CC
CARBON CANYON RD
WOODVIEW RD
SOQUEL CNYN PKWY
BUTTERFIELD
POMONA RINCON RD
PINE AVE
RANCH RD
71
142
N
1. Soquel Canyon Pkwy & Butterfield Ranch Rd
352/484
510/1191
176/510
87/85
271/277
777/771
30/103
1352/523
190/140
447/246
546/294
779/363
2. Soquel Canyon Pkwy & Pomona Rincon Rd
1004/2262
1118/487
2040/1432
749/111
417/80
732/508
3. Butterfield Ranch Rd & Pine Avenue
43/166
14/64
184/395
6/12
605/354
132/108
9/7
74/44
31/19
7/96
422/294
366/102
4. Chino Hills Pkwy & Pipeline Avenue
332/564
1389/1758
150/382
168/305
261/849
290/534
389/481
1279/1602
119/252
367/289
495/551
354/213
5. Chino Hills Pkwy & Peyton Drive
262/173
1399/1211
276/537
348/324
249/903
273/433
309/462
797/2221
82/784
639/321
551/488
696/284
6. Chino Hills Pkwy & Carbon Canyon Rd
22/10
897/1016
1546/565
0/0
1/2
0/2
2/1
671/1557
679/220
315/554
2/1
505/2544
7. Peyton Drive & Grand Avenue
154/286
1197/971
253/457
367/297
771/904
290/487
385/611
1046/1530
615/282
606/336
893/903
332/522
8. Peyton Drive & Eucalyptus Avenue
471/282
213/610
184/217
345/693
520/1041
466/333
454/393
151/502
7/41
7/186
1354/1078
63/171
9. Pipeline Avenue & Woodview Road
402/348
12/34
27/35
469/198
614/180
450/350
10. Peyton Drive & Chino Avenue
163/629
481/253
163/343
292/237
675/1426
247/659
405/154
466/232
240/254
235/137
974/1115
266/232

Build-out Year (2037) Intersection Operating Conditions

Table 4 summarizes the results of the LOS analysis for the 10 study intersections under 25-year build-out (Year 2037) conditions, illustrating the comparison of intersection delay and LOS between build-out conditions without and with the anticipated cumulative development projects. These results reveal that with a 1% annual background traffic growth (projected forward to a 25-year forecast period), plus the implementation of all currently planned and/or programmed transportation improvements, nine out of ten study intersections will operate at deficient levels of service during one or both peak weekday hours:

- Soquel Canyon Parkway at Los Serranos Drive/Butterfield Ranch Road
- Soquel Canyon Parkway at Pomona Rincon Road (AM peak hour only)
- Chino Hills Parkway at Pipeline Avenue
- Chino Hills Parkway at Peyton Drive
- Chino Hills Parkway at Carbon Canyon Road
- Peyton Drive at Grand Avenue
- Peyton Drive at Eucalyptus Avenue
- Pipeline Avenue at Woodview Road
- Peyton Drive at Chino Avenue

The signalized intersection at Butterfield Ranch Road and Pine Avenue (Location #3) will operate at acceptable levels of service (LOS B in the AM peak hour, and LOS C in the PM peak hour) during the Build-out Year 2037 base conditions. With the addition of AM and PM peak hour project trips from future planned/programmed citywide cumulative developments, all levels of service will remain as during "pre-project" conditions, with the exception the following two intersections:

- Soquel Canyon Parkway at Pomona Rincon Road
  - PM peak hour level of service to degrade from LOS A to LOS C with the addition of cumulative developments
- Butterfield Ranch Road and Pine Avenue
  - PM peak hour level of service to degrade from LOS C to LOS D with the addition of cumulative developments

The projected Future Year 2037 Plus Cumulative Development traffic volume conditions at each of the ten study intersections are depicted in Figure 9. Figure 10 shows the projected year 2037 build-out traffic volume conditions on major citywide roadway segments within the project study area.

TABLE 4
Level of Service Summary:
Build-out Year 2037 Weekday AM & PM Peak Hour Conditions
With and Without Future Development

Location			Level of Service Analysis [1]						
No.	Intersection		Peak Hour	25-Year (2037) Conditions					
				Build-out Year 2037 Base [2]			Build-out Year 2037 Plus Cumulative Projects [3]		
				V/C	Delay	LOS	V/C	Delay	LOS
1	Soquel Canyon Pkwy. / Butterfield Ranch Rd.		AM	1.108	110.6	F	1.136	120.1	F
			PM	1.020	86.4	F	1.029	98.1	F
2	Soquel Canyon Pkwy. / Pomona Rincon Dr.		AM	1.115	117.3	F	1.213	153.0	F
			PM	0.572	9.5	A	0.667	34.9	C
3	Butterfield Ranch Rd. / Pine Ave.		AM	0.432	16.4	B	0.465	18.2	B
			PM	0.402	20.6	C	0.467	36.8	D
4	Chino Hills Pkwy. / Pipeline Ave.		AM	1.275	162.9	F	1.306	176.2	F
			PM	1.511	268.4	F	1.602	316.1	F
5	Chino Hills Pkwy. / Peyton Dr.		AM	1.155	133.1	F	1.210	152.4	F
			PM	1.349	213.5	F	1.426	242.1	F
6	Chino Hills Pkwy. / Carbon Canyon Rd. (SR-142)		AM	1.101	117.7	F	1.134	131.0	F
			PM	1.803	337.4	F	1.927	394.2	F
7	Grand Ave. / Peyton Dr.		AM	1.092	127.9	F	1.115	136.3	F
			PM	1.126	155.5	F	1.167	174.6	F
8	Eucalyptus Ave. / Peyton Dr.		AM	1.390	169.9	F	1.439	186.9	F
			PM	1.370	173.9	F	1.408	203.1	F
9	Pipeline Rd. / Woodview Rd.		AM	1.328	1302.9	F	1.375	3734.4	F
			PM	0.752	6.8	A	0.824	83.0	F
10	Chino Ave. / Peyton Dr.		AM	0.914	85.2	F	0.920	88.3	E
			PM	0.956	170.6	F	0.963	175.9	F

V/C: Intersection volume-to-capacity ratio

[1] Average intersection control delay reported in seconds per vehicle (sec/veh)

[2] Includes estimated ambient annual growth of 1% per City direction, plus anticipated/approved transportation system improvements

[3] Includes citywide development projects to be completed by the 25-Year Build-out Year of 2037.

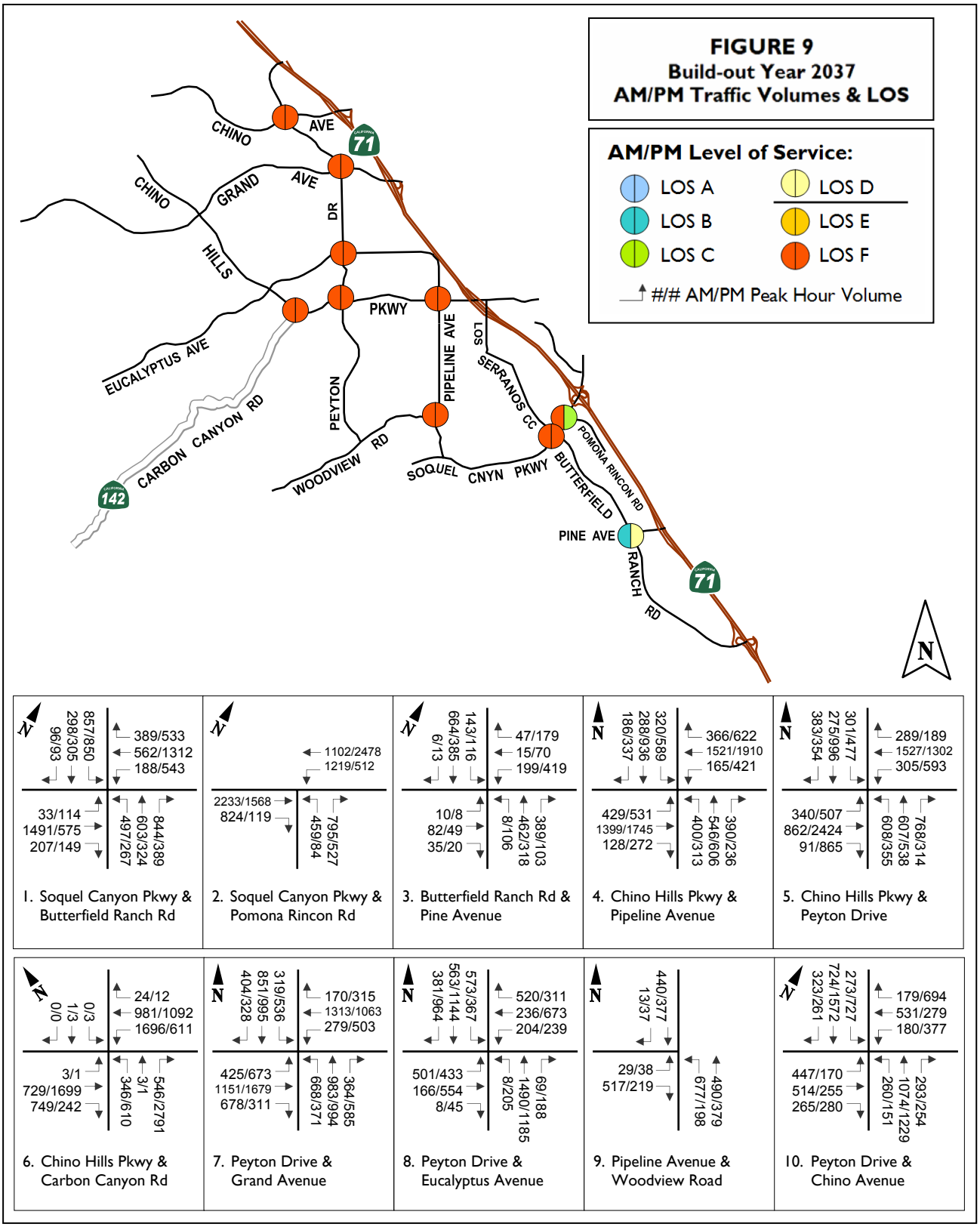


FIGURE 9
Build-out Year 2037
AM/PM Traffic Volumes & LOS
AM/PM Level of Service:
LOS A
LOS B
LOS C
LOS D
LOS E
LOS F
#/# AM/PM Peak Hour Volume
CHINO AVE
CHINO GRAND AVE
HILLS
DR
PKWY
EUCALYPTUS AVE
PEYTON
PIPELINE AVE
LOS SERRANOS CC
CARBON CANYON RD
WOODVIEW RD
SOQUEL CNYN PKWY
BUTTERFIELD
POMONA RINCON RD
PINE AVE
RANCH RD
71
142
N
1. Soquel Canyon Pkwy & Butterfield Ranch Rd
857/850 298/305 96/93
389/533 562/1312 188/543
33/114 1491/575 207/149
497/267 603/324 844/389
2. Soquel Canyon Pkwy & Pomona Rincon Rd
1102/2478 1219/512
2233/1568 824/119
459/84 795/527
3. Butterfield Ranch Rd & Pine Avenue
143/116 664/385 6/13
47/179 15/70 199/419
10/8 82/49 35/20
8/106 462/318 389/103
4. Chino Hills Pkwy & Pipeline Avenue
320/589 288/936 186/337
366/622 1521/1910 165/421
429/531 1399/1745 128/272
400/313 546/606 390/236
5. Chino Hills Pkwy & Peyton Drive
301/477 275/996 383/354
289/189 1527/1302 305/593
340/507 862/2424 91/865
608/355 607/538 768/314
6. Chino Hills Pkwy & Carbon Canyon Rd
0/3 1/3 0/0
24/12 981/1092 1696/611
3/1 729/1699 749/242
346/610 3/1 546/2791
7. Peyton Drive & Grand Avenue
319/536 851/995 404/328
170/315 1313/1063 279/503
425/673 1151/1679 678/311
668/371 983/994 364/585
8. Peyton Drive & Eucalyptus Avenue
573/367 563/1144 381/964
520/311 236/673 204/239
501/433 166/554 8/45
8/205 1490/1185 69/188
9. Pipeline Avenue & Woodview Road
440/377 13/37
29/38 517/219
677/198 490/379
10. Peyton Drive & Chino Avenue
273/727 724/1572 323/261
179/694 531/279 180/377
447/170 514/255 265/280
260/151 1074/1229 293/254

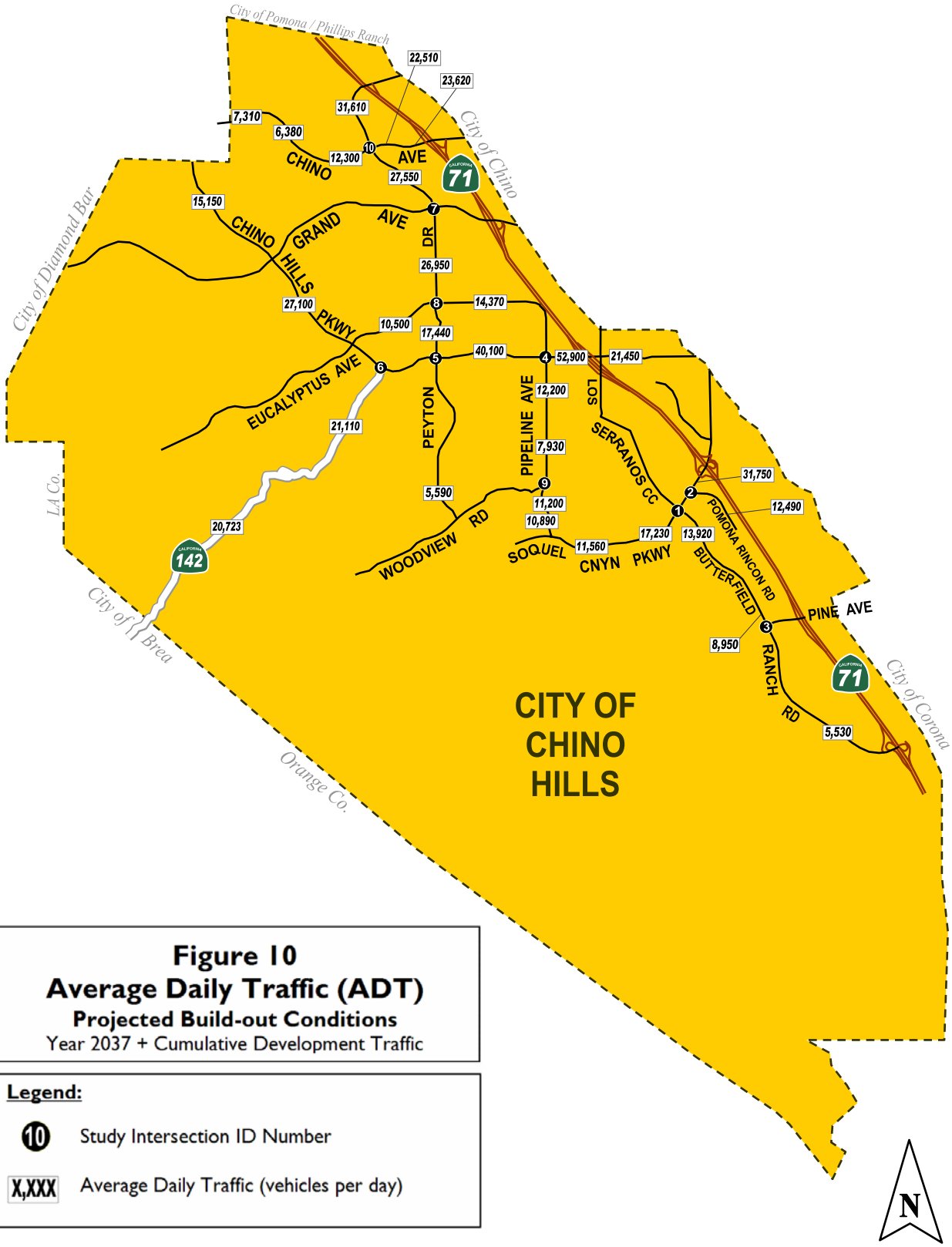


Figure 10
Average Daily Traffic (ADT)
Projected Build-out Conditions
Year 2037 + Cumulative Development Traffic

Legend:

10 Study Intersection ID Number

X,XXX Average Daily Traffic (vehicles per day)

TRAFFIC IMPACT ASSESSMENT

Traffic Model/Forecast Methodology

The traffic model developed for the Circulation Element update is a microcomputer based model utilizing Trafficware's *Synchro 8.0* system. Existing AM and PM intersection turning volumes were input to the model at each key intersection location. Based upon the Highway Capacity Manual (HCM2010) method of signalized and unsignalized intersection analysis, average control delay, volume/capacity ratios and level of service were determined. The HCM delay-based method, as published by the Transportation Research Board (TRB) of the National Academy of Science, is consistent with Caltrans' Guide for the Preparation of Traffic Impact Studies and is the current state-of-the-practice in the transportation planning industry.

The HCM methodology calculates the average vehicular delay (expressed in seconds per vehicle) experienced by motorists at both signalized and unsignalized intersections, and assigns an LOS letter grade to the intersection based upon the resulting delay calculation. Longer delays result in lower levels of service (i.e. LOS F); shorter delays result in higher levels of service (i.e., LOS A). Other methods of measuring LOS used by some agencies include the *Intersection Capacity Utilization*, or ICU method, which identifies how much of the traffic carrying capacity at an intersection is being used by existing or future forecasted traffic volumes. In comparison with the HCM2010 analysis method, however, the ICU does not factor in the effects of signal timing, pedestrians, bicycles, parking, or other real-world conditions that affect the flow of traffic through an intersection. As such, this methodology often results in assigning a better intersection LOS letter grade than what drivers actually experience.

Conversely, the HCM method, which is the currently adopted standard used in the City of Chino Hills, typically provides a more conservative LOS rating, or letter grade, than using the ICU method under the same circumstances at the same intersection. An intersection operating at LOS C (up to 79% of intersection capacity) using the ICU method is roughly equivalent to LOS mid-D (an average of 45 seconds of delay per vehicle) using the delay-based HCM operational methodology. Since HCM-derived levels of service are expressed in average delay, results better reflect the motorist's actual experience.

The *California Complete Street Act* requires all city general plan transportation elements to plan for the development of multimodal transportation networks. This means that city streets must be designed and constructed to meet the needs of vehicles, mass transit, pedestrians and bicyclists. The City of Chino Hills' continued application of the HCM method for traffic analysis studies and impact significance determination allows the City to comply with the California Complete Streets Act by providing a representative analysis of how its intersection are

operating, based on traffic delays and the current standard of the industry. At the time of the preparation of this traffic study report, the latest HCM2010 analysis methods do not support the analysis of signalized intersections having special overlap, split or otherwise Non-NEMA phasing or shared lane configurations. In these cases, use of HCM2000 intersection LOS analysis methods were used and considered acceptable.

As per the City of Chino Hills' latest Traffic Impact Study (TIS) Guidelines, LOS "D" is the minimum acceptable grade for intersections in Chino Hills, and is typically the lowest acceptable in similar suburban areas. Following the analysis of existing traffic conditions, a "future baseline" scenario was developed to represent ambient growth conditions. This included a compounded annual traffic growth factor approved by the City of Chino Hills and congruent with subregional travel demand forecasts developed by the Southern California Association of Governments (SCAG) and San Bernardino County Association of Governments (SANBAG) for the surrounding area within the County.

A series of analysis zones were then established throughout the City, and the anticipated developments were input into the model along with standard trip generation rates. For the City of Chino Hills, a total of 10 zones were established at key origin-destination and entry points to the City. Trips estimated to be generated by the cumulative developments were assigned to the roadway network within each zone based upon trip distribution values calculated outside of the model. For this model, the trip distribution assumptions are based upon project size, location, surrounding and competing land uses and developments, and current AM/PM peak hour traffic and travel patterns observed in the field.

Lastly, the *Synchro* model was used to produce a series of reports which document model input information, existing conditions and future estimated intersection delays, V/C ratios and LOS determinations used in this traffic analysis.

Signalized and Unsignalized Intersection Impacts

City of Chino Hills Impact Significance Criteria - To determine whether the addition of project-generated trips results in a significant impact at a study intersection, and thus requires mitigation, the City of Chino Hills utilizes the following thresholds of significance:

- A significant project impact occurs at an intersection when a proposed project causes a level of service change from LOS D to LOS E or F (using HCM signalized/unsignalized delay-based methods); or

- If an intersection is already operating at LOS E or F, a significant impact occurs if the proposed project results in an increase of over one percent of the volume-to-capacity ratio ($\Delta V/C \geq 0.01$)

The level of service forecast in the traffic model included 9 signalized intersections and one (1) stop-controlled intersection. The traffic model described in the previous section was used to assign future trips to the roadway network in the City and to calculate the resulting year 2027 and 2037 intersection delays and volume-to-capacity (V/C) ratios. Based on this average delay (in seconds per vehicle), the future level of service for each intersection was determined for the AM and PM peak hour periods.

15-Year (Future 2027) Cumulative Development Impacts

During the AM peak hour, intersection operating conditions at eight locations would be significantly impacted by future anticipated development. A significant impact is defined as either (1) the LOS degradation of an intersection from LOS "D" or better to LOS "E" or "F" as a result of project traffic, or (2) a change in V/C ratio 0.01 or greater at an intersection already operating at LOS "E" or "F". The eight intersections that would be significantly impacted by future local development traffic are as follows:

- Soquel Canyon Parkway at Butterfield Ranch Road
- Soquel Canyon Parkway at Pomona Rincon Road
- Chino Hills Parkway at Pipeline Avenue
- Chino Hills Parkway at Peyton Drive
- Chino Hills Parkway at Carbon Canyon Road
- Peyton Drive at Grand Avenue
- Peyton Drive at Eucalyptus Avenue
- Pipeline Avenue at Woodview Road

During the PM peak hour, only five of the 10 intersections are expected to be significantly impacted by future traffic volume increases due to cumulative development:

- Chino Hills Parkway at Pipeline Avenue
- Chino Hills Parkway at Peyton Drive
- Chino Hills Parkway at Carbon Canyon Road
- Peyton Drive at Grand Avenue
- Peyton Drive at Eucalyptus Avenue

25-Year (Future 2037) Cumulative Development Impacts

Under the build-out (Year 2037) conditions, the following eight study intersections would be significantly impacted by future anticipated development during the AM peak hour:

- Soquel Canyon Parkway at Butterfield Ranch Road
- Soquel Canyon Parkway at Pomona Rincon Road
- Chino Hills Parkway at Pipeline Avenue
- Chino Hills Parkway at Peyton Drive
- Chino Hills Parkway at Carbon Canyon Road
- Peyton Drive at Grand Avenue
- Peyton Drive at Eucalyptus Avenue
- Pipeline Avenue at Woodview Road

During the PM peak hour, the following six study intersections would be significantly impacted by future traffic volume increases due to cumulative development under build-out (Year 2037) conditions.

- Chino Hills Parkway at Pipeline Avenue
- Chino Hills Parkway at Peyton Drive
- Chino Hills Parkway at Carbon Canyon Road
- Peyton Drive at Grand Avenue
- Peyton Drive at Eucalyptus Avenue

TABLE 5 – Future Year 2027 Level of Service (LOS) and Cumulative Development Impact Summary

Location			Level of Service Analysis [1]									Project Impacts (2027)		
No.	Intersection	Peak Hour	Existing Year 2012			15-Year (2027) Conditions						V/C Change	Delay Change (sec/veh)	Significant Impact?
						Future Year 2027 Baseline [2]			Future Year 2027 Plus Projects [3]					
			V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS			
1	Soquel Cnyn Pkwy. at Butterfield Ranch Rd.	AM	0.898	51.6	D	1.017	82.0	F	1.044	90.0	F	+0.027	+8.0	Yes
		PM	0.826	41.3	D	0.937	62.0	E	0.946	72.2	E	+0.009	+10.2	No
2	Soquel Canyon Pkwy. at Pomona Rincon Dr.	AM	0.893	41.4	D	1.020	81.1	F	1.118	115.2	F	+0.098	+34.1	Yes
		PM	0.467	7.5	A	0.526	8.5	A	0.628	29.2	C	+0.102	+20.7	No
3	Butterfield Ranch Rd. at Pine Ave.	AM	0.381	14.5	B	0.410	15.3	B	0.440	16.2	B	+0.030	+4.0	No
		PM	0.350	19.9	B	0.380	19.3	B	0.445	32.0	C	+0.065	+12.7	No
4	Chino Hills Pkwy. at Pipeline Ave.	AM	1.025	83.6	F	1.168	126.9	F	1.200	140.0	F	+0.032	+13.1	Yes
		PM	1.210	146.1	F	1.382	212.5	F	1.473	259.0	F	+0.091	+46.5	Yes
5	Chino Hills Pkwy. at Peyton Dr.	AM	0.998	83.0	F	1.059	101.4	F	1.114	118.0	F	+0.055	+16.6	Yes
		PM	1.188	129.5	F	1.235	166.4	F	1.312	191.2	F	+0.077	+24.8	Yes
6	Chino Hills Pkwy. at Carbon Canyon Rd.	AM	0.889	42.3	D	1.010	81.4	F	1.043	94.4	F	+0.033	+13.0	Yes
		PM	1.438	191.3	F	1.646	273.8	F	1.770	331.0	F	+0.124	+57.2	Yes
7	Grand Ave. at Peyton Dr.	AM	0.882	58.1	E	1.002	93.2	F	1.025	100.0	F	+0.023	+6.8	Yes
		PM	0.909	78.8	E	1.033	116.4	F	1.073	130.6	F	+0.040	+14.2	Yes
8	Eucalyptus Ave. at Peyton Dr.	AM	1.451	202.6	F	1.272	133.7	F	1.286	161.0	F	+0.014	+27.3	Yes
		PM	1.428	177.6	F	1.254	128.2	F	1.272	150.9	F	+0.018	+22.7	Yes
9	Pipeline Rd. at Woodview Rd.	AM	1.059	68.2	F	1.213	279.5	F	1.262	417.2	F	+0.049	+137.7	Yes
		PM	0.609	4.8	A	0.691	5.7	A	0.764	6.0	A	+0.073	+0.3	No
10	Chino Ave. at Peyton Dr.	AM	0.743	43.5	D	0.841	63.5	E	0.846	66.0	E	+0.005	+2.5	No
		PM	0.768	83.9	F	0.875	128.2	F	0.883	132.8	F	+0.008	+4.6	No

V/C: Intersection volume-to-capacity ratio

[1] Average intersection control delay reported in seconds per vehicle (sec/veh)

[2] Includes estimated ambient annual growth of 1% per City direction, plus anticipated/approved transportation system improvements

[3] Includes citywide development projects to be completed by the 15-year future period to 2027.

Highlighted cells indicate a projected significant traffic impact due to cumulative development conditions

TABLE 6 – Build-out Year 2037 Level of Service (LOS) and Cumulative Development Impact Summary

Location		Level of Service Analysis [1]										Project Impacts (2037)		
No.	Intersection	Peak Hour	Existing Year 2012			25-Year (2037) Conditions						V/C Change	Delay Change (sec/veh)	Significant Impact?
						Build-out Year 2037 Baseline [2]			Build-out Year 2037 Plus Projects [2]					
			V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS			
1	Soquel Cnyn Pkwy. at Butterfield Ranch Rd.	AM	0.898	51.6	D	1.108	110.6	F	1.136	120.1	F	+0.028	+6.7	Yes
		PM	0.826	41.3	D	1.020	86.4	F	1.029	98.1	F	+0.009	+7.8	No
2	Soquel Canyon Pkwy. at Pomona Rincon Dr.	AM	0.893	41.4	D	1.115	117.3	F	1.213	153.0	F	+0.098	+28.2	Yes
		PM	0.467	7.5	A	0.572	9.5	A	0.667	34.9	C	+0.095	+17.3	No
3	Butterfield Ranch Rd. at Pine Ave.	AM	0.381	14.5	B	0.432	16.4	B	0.465	18.2	B	+0.033	+1.0	No
		PM	0.350	19.9	B	0.402	20.6	C	0.467	36.8	D	+0.065	+6.8	No
4	Chino Hills Pkwy. at Pipeline Ave.	AM	1.025	83.6	F	1.275	162.9	F	1.306	176.2	F	+0.031	+11.8	Yes
		PM	1.210	146.1	F	1.511	268.4	F	1.602	316.1	F	+0.091	+41.5	Yes
5	Chino Hills Pkwy. at Peyton Dr.	AM	0.998	83.0	F	1.155	133.1	F	1.210	152.4	F	+0.055	+11.6	Yes
		PM	1.188	129.5	F	1.349	213.5	F	1.426	242.1	F	+0.077	+40.2	Yes
6	Chino Hills Pkwy. at Carbon Canyon Rd.	AM	0.889	42.3	D	1.101	117.7	F	1.134	131.0	F	+0.033	+4.0	Yes
		PM	1.438	191.3	F	1.803	337.4	F	1.927	394.2	F	+0.124	+55.6	Yes
7	Grand Ave. at Peyton Dr.	AM	0.882	58.1	E	1.092	127.9	F	1.115	136.3	F	+0.023	+4.0	Yes
		PM	0.909	78.8	E	1.126	155.5	F	1.167	174.6	F	+0.041	+9.2	Yes
8	Eucalyptus Ave. at Peyton Dr.	AM	1.451	202.6	F	1.390	169.9	F	1.439	186.9	F	+0.049	+16.2	Yes
		PM	1.428	177.6	F	1.370	173.9	F	1.408	203.1	F	+0.038	+104.7	Yes
9	Pipeline Rd. at Woodview Rd.	AM	1.059	68.2	F	1.328	1302.9	F	1.375	3734.4	F	+0.047	+24.9	Yes
		PM	0.609	4.8	A	0.752	6.8	A	0.824	83.0	F	+0.072	+0.0	No
10	Chino Ave. at Peyton Dr.	AM	0.743	43.5	D	0.914	85.2	F	0.920	88.3	E	+0.006	+1.4	No
		PM	0.768	83.9	F	0.956	170.6	F	0.963	175.9	F	+0.007	+2.7	No

V/C: Intersection volume-to-capacity ratio

[1] Average intersection control delay reported in seconds per vehicle (sec/veh)

[2] Includes estimated ambient annual growth of 1% per City direction, plus anticipated/approved transportation system improvements

[3] Includes citywide development projects to be completed by the 25-year build-out period to 2037.

Highlighted cells indicate a projected significant traffic impact due to cumulative development conditions

PROPOSED RECOMMENDATIONS AND CONCLUSIONS

The previous section describes the major intersections in the City which are expected to experience significant traffic impacts in one or both weekday peak hours by the General Plan Build-out Year 2027. As a result, this section presents various short- and long-range recommendations developed as measures to mitigate the identified potential traffic impacts.

Short-Range Recommendations (15-Year)

The following improvement measures are recommended for implementation to support the mitigation of Future Year 2027 cumulative traffic impacts:

- Soquel Canyon Parkway at Butterfield Ranch Road (Intersection #1)

    - Modify signal phasing to include a split phase for the northwest/southeast left-turn movements. This would require changing four (4) of the signal heads from three-section protected type to four-section heads.

    - A number of special conditions may justify using split phasing at a given signalized intersection; in this case, the field data shows unusually high northeast/southwest left turns on Butterfield Ranch Road and Los Serranos Country Club Drive onto Soquel Canyon Road. A review of the existing data reveals that traffic on Soquel Canyon Road is generally characterized by major flows in the eastbound and westbound through directions. This is attributable to the proximity of the nearby routes for traffic to enter/exit the city east and west, including the SR-71 freeway interchange on Soquel Canyon Road to the east, and Pipeline Avenue, which is the only major road that connects to the southwest neighborhood (toward Carbon Canyon Road) to the west.

      Since the AM and PM peak hour conditions analyzed in this study cover the peak periods only, it should be noted that the only times when split phasing would be efficient for the northwest/southeast approaches is when there is a steady stream of left-turn movements that match the level of straight through traffic, in which case less time is wasted during the green interval than during normal phasing operations. However, if this high amount of left-turning traffic drops off at any points during the day in one or both directions, then the split phase operation would become less efficient and cause unnecessary delays.

As part of this proposed improvement, the City of Chino Hills would need to observe and record more data at this intersection, including turning movement patterns all throughout the day (not just during the peak hours) to identify the full range of times when the left-turning traffic on Butterfield Ranch Road and Los Serranos Country Club Drive is heavy enough to justify the split phase, and/or, conversely identify the times when these movements drop off to a small enough amount that the signal should be programmed to revert to normal phasing operations.

By providing the five-section signal heads for these two approaches, the City would be able to maintain the existing conventional phasing plan at the intersection (i.e., concurrent NW/SE lefts, and then throughs) during normal hours, and then have it temporarily switch to split phasing operation during the critical traffic periods of the day, as described above.

- By providing northwest/southeast split phasing operation on Los Serranos Country Club Drive and Butterfield Ranch Road during the weekday peak hours, intersection signal operations are expected to improve from LOS E to an acceptable LOS C and significant impacts will be eliminated.

- <u>Soquel Canyon Parkway at Pomona Rincon Road (Intersection #2)</u>

  - The major sources of traffic delay at this location are experienced by westbound left turns from Pomona Rincon Road onto Soquel Canyon Parkway, and by northbound through traffic on Soquel Canyon Parkway, toward SR-71. Thus, the proposed improvements at this location are aimed at reducing delays and improving peak-hour traffic flow for these two vehicular movements, as well as the westbound right-turn lane which is expected to see a significant increase in traffic with the future development of the nearby Heritage Professional Center. The proposed mitigations are as follows:

    - Remove the existing striped median on Pomona Rincon Road near the intersection and re-stripe the full roadway width to include the addition of one (1) receiving lane on Pomona Rincon Road.

    - Reconfigure the northwest approach lanes on Pomona Rincon Road (currently striped as left, shared left-right, right) to provide for dual left turns and a single dedicated right-turn lane. This will reduce a significant amount of traffic delays currently experienced on Pomona Rincon Road turning left (southbound) onto Soquel Canyon Parkway.

- Install raised right-turn "porkchop" islands at the southeast and southwest corners of the intersection, and re-configure the northbound and westbound right-turn lanes to be protected by the median islands to allow for unrestricted rights from Pomona Rincon Road onto Soquel Canyon Parkway and vice versa. This feature will achieve several benefits, including (i) reducing northbound right-turn delays from Soquel Canyon Parkway toward the high school; (ii) allowing for the #2 northbound lane to be re-striped and re-designated from shared through-right to through-only, improving northbound delays and capacity; and (iii) reducing westbound delays from Pomona Rincon Road onto Soquel Canyon Parkway.

o In conjunction with the installation/construction of the porkchop islands, adjacent acceleration lanes should be designed to allow for safe merging and weaving movements; in particular, eastbound in advance of the nearby freeway ramp, and southbound on Pomona Rincon Road as the travelway narrows to two lanes. The improvements will also require moderate signal and loop detector modification, as well as reconfiguration/relocation of pedestrian crosswalks and signals to utilize the porkchop islands as safety refuge areas.

o The proposed improvements present the most effective means of reducing peak-hour traffic delays and improving the utilization of the intersection's existing capacity. Critical AM peak hour delays will be reduced by an average of 66 seconds per vehicle, intersection capacity utilization be improved by 10%, and significant impacts will be eliminated.

- <u>Butterfield Ranch Road at Pine Avenue (Intersection #3)</u>

o The signalized intersection at Butterfield Ranch Road and Pine Avenue is expected to operate at satisfactory levels of service into the Future Year 2027. Therefore, no intersection improvement measures are recommended at this location under the projected 15-year conditions.

- <u>Chino Hills Parkway at Pipeline Avenue (Intersection #4)</u>

o Modify signal phasing to include a split phase for the eastbound/westbound left-turn movements. This would require changing four (4) of the signal heads from three-section protected type to four-section heads.

- By changing the existing signal phasing at this intersection, critical peak hour delays will be reduced by 91 seconds per vehicle, and overall operations will improve from LOS F to an acceptable LOS D, and significant impacts will be eliminated.

- Note: This signalized intersection is located on the designated SR-142 route through the City of Chino Hills and is shared by the City of Chino Hills and State of California; therefore, implementation of any proposed or future mitigation measures will be contingent upon the State's (Caltrans) acceptance/agreement and coordination of the improvements.

- Chino Hills Parkway at Peyton Drive (Intersection #5)

  - Traffic signal timing plan modification: Optimize cycle lengths and splits to address changes in traffic volumes and patterns due to ambient growth and future, cumulative citywide development. Signal timing optimization and green interval adjustments are anticipated to improve reduce overall traffic delays by an average of 17 seconds per vehicle.

  - Note: This signalized intersection is located on the designated SR-142 route through the City of Chino Hills and is shared by the City of Chino Hills and State of California; therefore, implementation of any proposed or future mitigation measures will be contingent upon the State's (Caltrans) acceptance/agreement and coordination of the improvements.

- Chino Hills Parkway at Carbon Canyon Road (Intersection #6)

  - Modify signal phasing to include a northbound right-turn protected overlap for vehicles on Carbon Canyon Road to turn east concurrently with westbound left-turning vehicles on Chino Hills Parkway. Currently the northbound right-turn movement is on permissive phase signal timing, with right turns on red (RTOR) allowed. The proposed modifications would require changing the side-mounted vehicle head on the northeast quadrant from three-section to five-section, along with the other modifications such as appropriate signal retiming, re-wiring, No U Turn signage, etc.

  - By modifying the existing northbound right-turn signal phasing at this intersection as described above, peak hour delays will be reduced by an average of 36 seconds per vehicle and significant impacts during the critical PM peak hour will be eliminated.

- Note: This signalized intersection is located on the designated SR-142 route through the City of Chino Hills and is shared by the City of Chino Hills and State of California; therefore, implementation of any proposed or future mitigation measures will be contingent upon the State's (Caltrans) acceptance/agreement and coordination of the improvements.

- Peyton Drive at Grand Avenue (Intersection #7)

  - Modify signal phasing to include a northbound right-turn protected overlap for vehicles on Peyton Drive to turn east concurrently with the westbound left-turn phase on Grand Avenue. Westbound U-turns would be maintained, as the eastbound roadway width is sufficient and would not introduce conflict with the northbound right-turn movement. Currently the northbound right-turn movement is on permissive phase signal timing, with right-turn on red allowed. The proposed modifications would require changing one (1) vehicle head on the northeast quadrant from three- to five-section type. Additional modifications such as signal retiming and re-wiring would also required.

  - By modifying the existing northbound right-turn signal phasing at this intersection, peak hour delays will be reduced by an average of 32 seconds per vehicle and significant impacts will be eliminated.

- Peyton Drive at Eucalyptus Avenue (Intersection #8)

  - As part of the City's on-going construction work for Phase 3 of the Peyton Widening project, the existing overhead utilities on the south side of Eucalyptus Avenue near this intersection will be relocated off of the existing shoulder. In order to improve the intersection's capacity, it is recommended that Eucalyptus Avenue be completed as 2-lane collector and widened to four lanes to the east and west of Peyton Drive. The following modification of eastbound and westbound approaches on Eucalyptus Avenue are then recommended:

    - Reconfigure eastbound approach lanes from L-TR to L-T-TR
    - Reconfigure westbound approach lanes from L-TR-R to L-T-TR.

  - By widening Eucalyptus Avenue and modifying the existing eastbound/westbound approaches as described above, significant impacts will be eliminated and peak hour delays will be reduced by an average of 44 seconds per vehicle.

- Pipeline Avenue at Woodview Road (Intersection #9)

  - Install a painted "porkchop" median allowing for (1) a deceleration lane for northbound vehicles turning left from northbound Pipeline Avenue onto westbound Woodview Road, and (2) an acceleration lane for eastbound vehicle turning left from Woodview Road to merge with northbound through traffic on Pipeline Avenue. This treatment would be installed with appropriate taper lengths within an appropriate distance from the intersection, and would not require reconfiguring any through lanes on other sections of Pipeline Avenue. The paved roadway width on Pipeline Avenue is 40 feet wide, and could sufficiently provide for two 15' through lanes and a 10-foot center lane for the improvements in the vicinity of Woodview Road.

- Peyton Drive at Chino Avenue (Intersection #10)

  - Although the signalized intersection at Peyton Drive and Chino Avenue is expected to operate at unsatisfactory levels of service (LOS "E") during the Future Year 2027, the addition of cumulative developments will not result in any significant traffic impacts at this location. Therefore, no intersection improvement measures are recommended under the projected 15-year conditions.

Long-Range Recommendations (25-Year)

Long-range recommendations include additional improvements necessary to help mitigate traffic impacts anticipated to occur under Build-out Year 2037 conditions, due to long-term ambient traffic growth and the construction of various citywide development projects.

- Chino Hills Parkway at Carbon Canyon Road (Intersection #6)

    - A significant number of additional trips are expected to originate on Carbon Canyon and turn right (east) onto Chino Hills Parkway during both AM and PM peak hours under future build-out conditions. As a measure to relieve the impacts generated by this traffic, it is recommended that a large-radius, channelized right-turn lane be constructed on the Carbon Canyon Road approach of the intersection.

    - The channelized lane would allow for free right-turn movements to occur independently from the traffic signal operation, and would reduce delays by about 1 minute per vehicle, on average, during the worst AM and PM peak hours of the day.

    - Given the existing absence of roadside development, major utilities, and curb, gutter and sidewalk features at this corner, this mitigation measure appears to be feasible as a long-range project. It should be noted that this signalized intersection is located on the designated SR-142 route through the City of Chino Hills and is shared by the City of Chino Hills and State of California; therefore, implementation of any proposed or future mitigation measures will be contingent upon the State's (Caltrans) acceptance/agreement and coordination of the improvements.

- Peyton Drive at Grand Avenue (Intersection #7)

    - Construct a right-turn "porkchop" island at the southeast corner and install a free right-turn lane for northbound traffic on Peyton Drive turning east onto Grand Avenue. This improvement will allow northbound right movements to continue throughout the full cycle and utilize the dedicated turn lane beyond the currently programmed northbound through and overlap phases. Based on the existing roadway alignment and opposing lane geometries on the eastbound approach to the intersection, this improvement appears to be feasible and constructible.

- By providing the free right-turn lane on the northbound approach, critical PM peak hour delays will be significantly reduced at this intersection during the 25-year build-out period.

- Pipeline Avenue at Woodview Road (Intersection #9)

  - This intersection is expected to experience a significant level of traffic delays under Build-out Year 2035 conditions without the implementation of major intersection improvement measures. This particular location is unique in that Pipeline Avenue serves as the only north/south street in the area which provides access between the southwest (Carbon Canyon) portion of the City and southeast area (Los Serranos neighborhood).

    Thus, the 9,000 vehicles per day traveling through on Pipeline Avenue is likely to increase without expanding the existing infrastructure. Woodview Road similarly functions as a connecting route from Pipeline Avenue to Peyton Drive and Carbon Canyon Road.

    In order to relieve traffic congestion passing through Pipeline Avenue, and to mitigate traffic delays at the Woodview Road intersection, it is recommended that the City actively pursue the extension of Soquel Canyon Parkway from its existing westerly terminus to Peyton Drive in the near future. This would motorists to use Peyton Drive as an alternate route to Pipeline Avenue, between Soquel Canyon Parkway and Carbon Canyon Road.

Conclusions

Minagar & Associates, Inc. conducted a traffic impact study evaluating existing and projected future transportation conditions at ten (10) major intersections in the City of Chino Hills. The study included the collection of current traffic volume counts, and documentation of prevailing roadway and roadside conditions during the morning and evening weekday commuter hours on city streets. The collected data was organized and used to develop a traffic analysis model replicating the City's existing and future forecast transportation network. Based on the outputs of the traffic model, a set of operational parameters was extracted to determine the service levels of each intersection, under various analysis scenarios, and used to identify the potential need for traffic mitigation measures under Future Year (2027) and Build-out Year (2037) General Plan scenarios.

Currently, seven out of the ten study intersections are operating under deficient conditions during either or both of the AM and PM peak weekday hours. Future traffic projections reveal that even with the implementation of currently-planned/programmed transportation infrastructure improvement projects throughout the City, the levels of service at the ten selected study intersection will progressively decline due to general traffic growth over the next 15-25 years, as well as the development of several citywide projects which will generate a significant number of peak hour trips. The City of Chino Hills' current listing of future developments shows a number of planned commercial, residential, office and other major projects located all throughout the City. The large majority of this new traffic will be generated near the Chino Valley Freeway between Chino Hills Parkway and Butterfield Ranch Road.

As part of the traffic study, specific areas of deficiency were identified at each intersection, and for each peak hour, and potential countermeasures were developed to allay any anticipated significant traffic impacts. The implementation of these mitigation measures (as proposed in the above section) at the appropriate deficient intersections significantly impacted by future developments is expected to improve intersection operational capacity conditions in support of the city's minimum goal of LOS "D".

Based on this traffic analysis of the City's 15-year and 25-year transportation and circulation conditions as part of the General Plan Update, these development projects can be accommodated within the City of Chino Hills given the implementation of the identified mitigation measures. Short-range improvements should be implemented on a priority over the next 15 years, provided adequate funding from traffic impact fees or other sources is available. Under the Build-out Year 2037 conditions, a few recommended measures have been proposed which would require a more comprehensive level of planning to determine funding source, phasing plan, right-of-way and utility limitations, and/or coordination with other agencies such as Caltrans, or the neighboring Cities of Diamond Bar and Brea.

APPENDIX A:
Intersection Turning Movement AM/PM Peak Period Traffic Counts

MINAGAR & ASSOCIATES, INC.

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Agency:
City of Chino Hills, CA

File Name : Loc1(rev)_Oct23
Site Code : 001
Start Date : 10/23/2012
Page No : 1

Groups Printed- All Vehicles - Group 1

	Soquel Canyon Pkwy. Eastbound				Soquel Canyon Pkwy. Westbound				Los Serranos Dr. Northbound				Los Serranos Dr. Southbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	2	460	56	3	15	99	63	3	83	124	170	22	255	68	25	2	1450
07:15 AM	5	342	39	6	43	133	96	3	167	228	213	2	199	72	16	0	1564
07:30 AM	6	179	25	1	31	101	49	4	49	84	84	6	111	57	21	0	808
07:45 AM	13	177	24	0	11	103	94	0	28	35	72	7	98	33	13	0	708
Total	26	1158	144	10	100	436	302	10	327	471	539	37	663	230	75	2	4530
08:00 AM	14	113	16	0	49	126	118	1	14	55	63	0	119	44	9	0	741
08:15 AM	11	212	19	2	35	114	46	0	51	26	49	2	147	46	15	0	775
08:30 AM	32	186	23	3	16	103	33	0	40	30	45	3	90	27	17	0	648
08:45 AM	4	178	22	4	28	116	59	1	19	18	45	1	126	25	8	0	654
Total	61	689	80	9	128	459	256	2	124	129	202	6	482	142	49	0	2818
BREAK																	
04:00 PM	21	80	21	23	68	241	99	6	54	54	59	8	132	61	11	6	944
04:15 PM	10	82	18	2	52	215	50	1	27	31	32	2	96	59	9	0	686
04:30 PM	8	121	27	4	53	218	76	8	32	32	42	6	72	37	14	6	756
04:45 PM	18	76	18	0	56	200	73	3	33	48	50	0	119	53	15	1	763
Total	57	359	84	29	229	874	298	18	146	165	183	16	419	210	49	13	3149
05:00 PM	20	123	30	3	67	224	83	1	29	44	61	4	156	77	21	2	945
05:15 PM	21	103	23	6	73	221	70	1	43	71	43	3	153	60	24	3	918
05:30 PM	34	97	10	4	73	259	138	0	56	60	55	15	151	46	17	0	1015
05:45 PM	14	118	11	0	62	306	120	1	43	75	60	8	151	54	11	6	1040
Total	89	441	74	13	275	1010	411	3	171	250	219	30	611	237	73	11	3918
Grand Total	233	2647	382	61	732	2779	1267	33	768	1015	1143	89	2175	819	246	26	14415
Apprch %	7	79.7	11.5	1.8	15.2	57.8	26.3	0.7	25.5	33.7	37.9	3	66.6	25.1	7.5	0.8	
Total %	1.6	18.4	2.7	0.4	5.1	19.3	8.8	0.2	5.3	7	7.9	0.6	15.1	5.7	1.7	0.2	
All Vehicles	233	2647	382	61	732	2779	1267	33	768	1015	1143	89	2175	819	246	26	14415
% All Vehicles	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Group 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Group 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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File Name : Loc1(rev)_Oct23
Site Code : 001
Start Date : 10/23/2012
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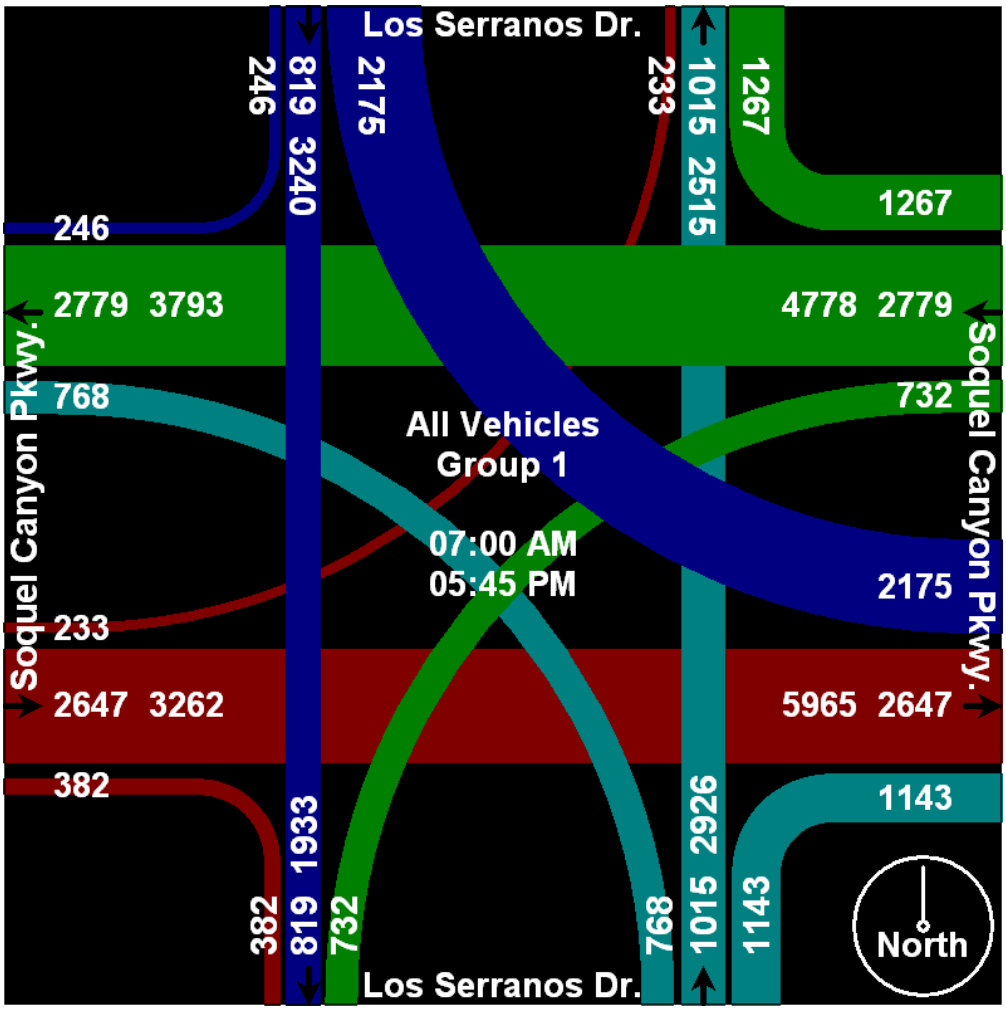

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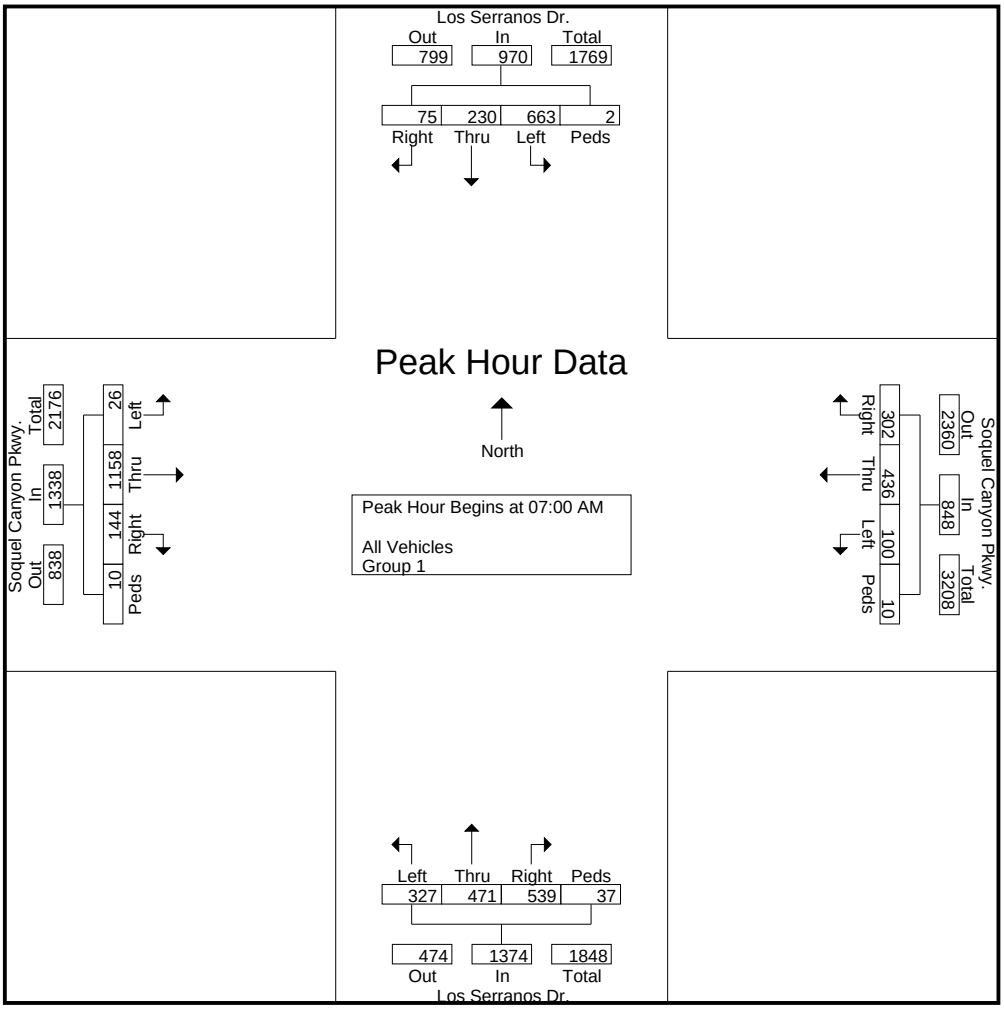
File Name : Loc1(rev)_Oct23
Site Code : 001
Start Date : 10/23/2012
Page No : 3

	Soquel Canyon Pkwy. Eastbound					Soquel Canyon Pkwy. Westbound					Los Serranos Dr. Northbound					Los Serranos Dr. Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	2	**460**	**56**	3	**521**	15	99	63	3	180	83	124	170	**22**	399	**255**	68	**25**	**2**	**350**	1450
07:15 AM	5	342	39	**6**	392	**43**	**133**	**96**	3	**275**	**167**	**228**	**213**	2	**610**	199	**72**	16	0	287	**1564**
07:30 AM	6	179	25	1	211	31	101	49	**4**	185	49	84	84	6	223	111	57	21	0	189	808
07:45 AM	**13**	177	24	0	214	11	103	94	0	208	28	35	72	7	142	98	33	13	0	144	708
Total Volume	26	1158	144	10	1338	100	436	302	10	848	327	471	539	37	1374	663	230	75	2	970	4530
% App. Total	1.9	86.5	10.8	0.7		11.8	51.4	35.6	1.2		23.8	34.3	39.2	2.7		68.4	23.7	7.7	0.2		
PHF	.500	.629	.643	.417	.642	.581	.820	.786	.625	.771	.490	.516	.633	.420	.563	.650	.799	.750	.250	.693	.724



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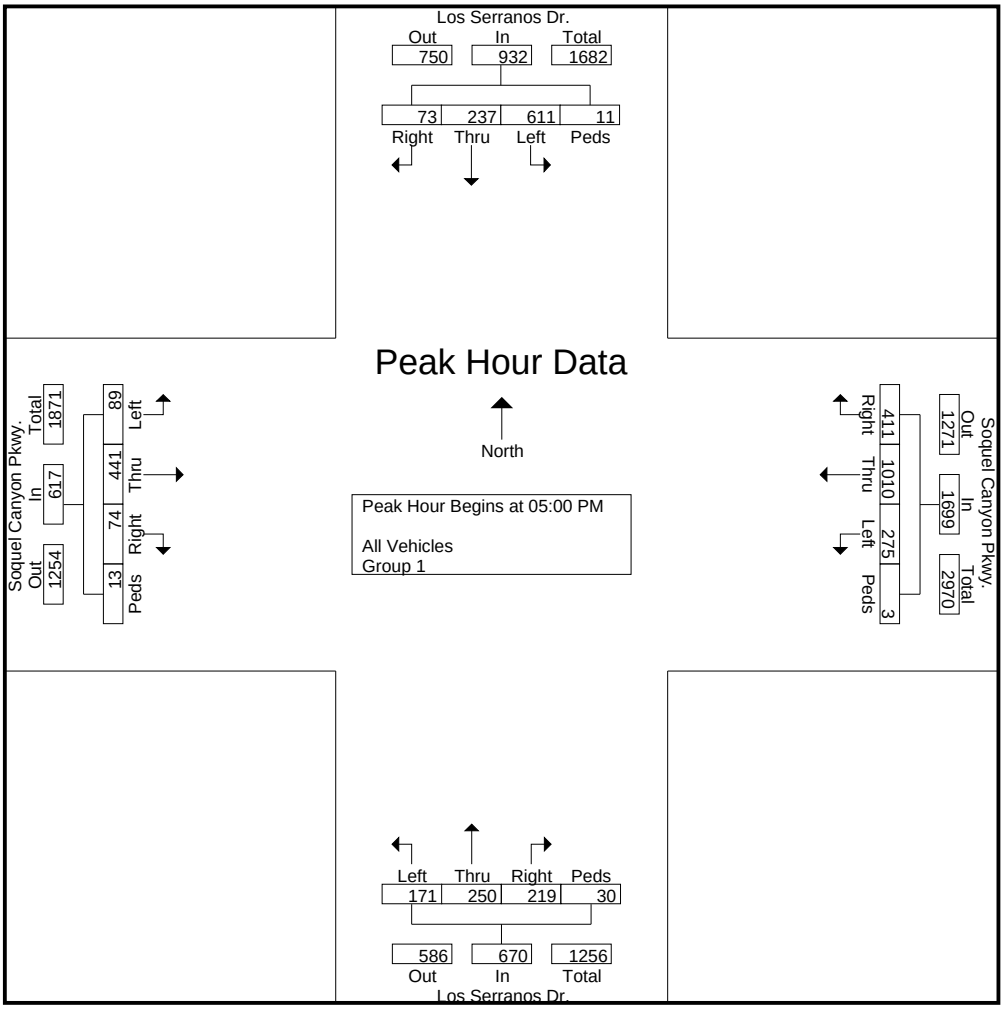
File Name : Loc1(rev)_Oct23
Site Code : 001
Start Date : 10/23/2012
Page No : 4

	Soquel Canyon Pkwy. Eastbound					Soquel Canyon Pkwy. Westbound					Los Serranos Dr. Northbound					Los Serranos Dr. Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	20	**123**	**30**	3	**176**	67	224	83	**1**	375	29	44	**61**	4	138	**156**	**77**	21	2	**256**	945
05:15 PM	21	103	23	**6**	153	**73**	221	70	1	365	43	71	43	3	160	153	60	**24**	3	240	918
05:30 PM	**34**	97	10	4	145	73	259	**138**	0	470	**56**	60	55	**15**	**186**	151	46	17	0	214	1015
05:45 PM	14	118	11	0	143	62	**306**	120	1	**489**	43	**75**	60	8	186	151	54	11	**6**	222	**1040**
Total Volume	89	441	74	13	617	275	1010	411	3	1699	171	250	219	30	670	611	237	73	11	932	3918
% App. Total	14.4	71.5	12	2.1		16.2	59.4	24.2	0.2		25.5	37.3	32.7	4.5		65.6	25.4	7.8	1.2		
PHF	.654	.896	.617	.542	.876	.942	.825	.745	.750	.869	.763	.833	.898	.500	.901	.979	.769	.760	.458	.910	.942



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Agency:
City of Chino Hills, CA

File Name : Loc2_Oct24
Site Code : 002
Start Date : 10/24/2012
Page No : 1

Groups Printed- All Vehicles - Group 1

	Soquel Canyon Rd. Eastbound				Soquel Canyon Rd. Westbound				Pomona Rincon Rd. Northbound				(no entry) Southbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	340	317	0	394	152	0	0	85	0	160	0	0	0	0	0	1448
07:15 AM	0	441	284	0	386	208	0	0	203	0	215	0	0	0	0	0	1737
07:30 AM	0	454	24	0	34	223	0	0	59	0	128	0	0	0	0	0	922
07:45 AM	0	375	5	0	25	236	0	0	2	0	18	0	0	0	0	0	661
Total	0	1610	630	0	839	819	0	0	349	0	521	0	0	0	0	0	4768
08:00 AM	0	331	14	0	17	353	0	0	1	0	21	0	0	0	0	0	737
08:15 AM	0	391	33	0	45	307	0	0	2	0	24	0	0	0	0	0	802
08:30 AM	0	394	4	0	29	226	0	0	6	0	31	0	0	0	0	0	690
08:45 AM	0	397	4	0	18	208	0	0	0	0	26	0	0	0	0	0	653
Total	0	1513	55	0	109	1094	0	0	9	0	102	0	0	0	0	0	2882
BREAK																	
04:00 PM	0	207	27	0	55	306	0	0	11	0	69	0	0	0	0	0	675
04:15 PM	0	234	12	0	45	339	0	0	4	0	48	0	0	0	0	0	682
04:30 PM	0	234	17	0	43	372	0	0	7	0	54	0	0	0	0	0	727
04:45 PM	0	260	18	0	49	323	0	0	5	0	35	0	0	0	0	0	690
Total	0	935	74	0	192	1340	0	0	27	0	206	0	0	0	0	0	2774
05:00 PM	0	251	17	0	65	407	0	0	14	0	44	0	0	0	0	0	798
05:15 PM	0	270	15	0	45	436	0	0	11	0	29	0	0	0	0	0	806
05:30 PM	0	325	15	0	46	503	0	0	6	0	41	0	0	0	0	0	936
05:45 PM	0	282	21	0	46	453	0	0	2	0	47	0	0	0	0	0	851
Total	0	1128	68	0	202	1799	0	0	33	0	161	0	0	0	0	0	3391
Grand Total	0	5186	827	0	1342	5052	0	0	418	0	990	0	0	0	0	0	13815
Apprch %	0	86.2	13.8	0	21	79	0	0	29.7	0	70.3	0	0	0	0	0	
Total %	0	37.5	6	0	9.7	36.6	0	0	3	0	7.2	0	0	0	0	0	
All Vehicles	0	5186	827	0	1342	5052	0	0	418	0	990	0	0	0	0	0	13815
% All Vehicles	0	100	100	0	100	100	0	0	100	0	100	0	0	0	0	0	100
Group 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Group 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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File Name : Loc2_Oct24
Site Code : 002
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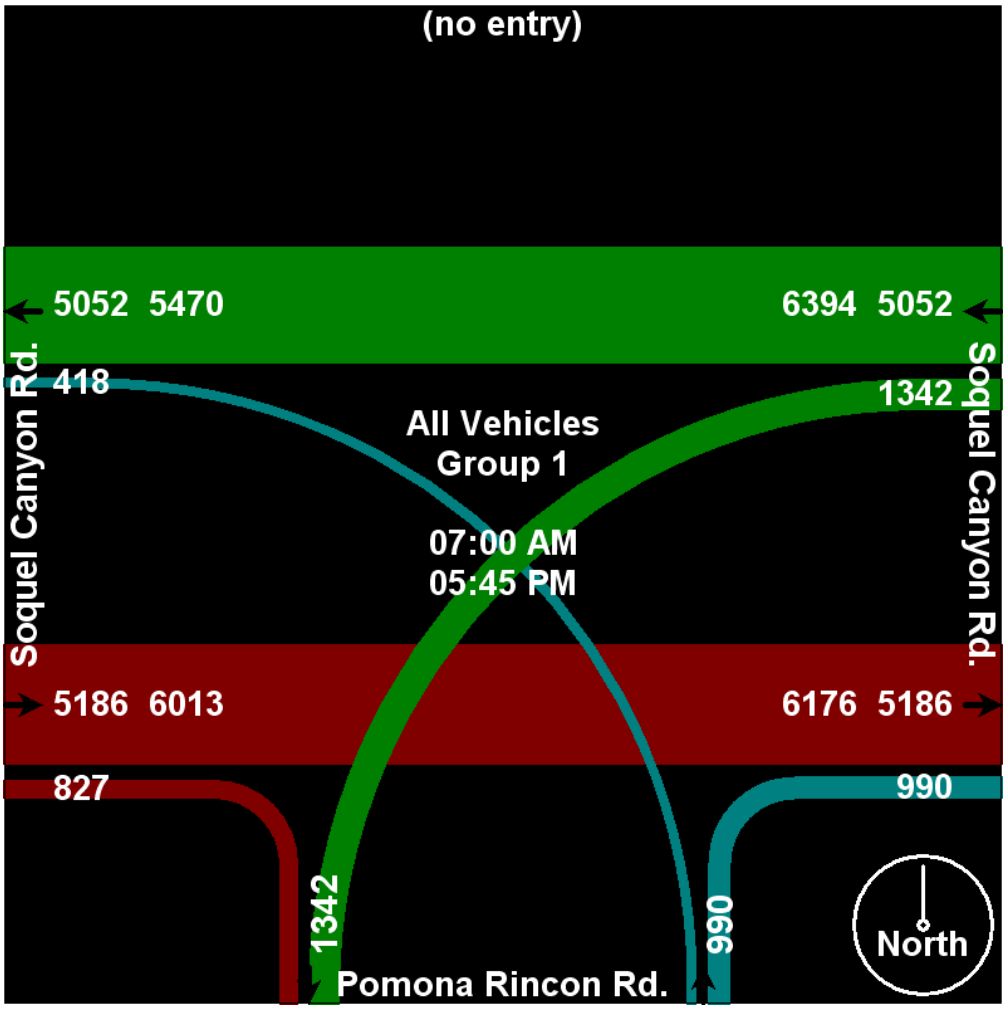

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File Name : Loc2_Oct24
Site Code : 002
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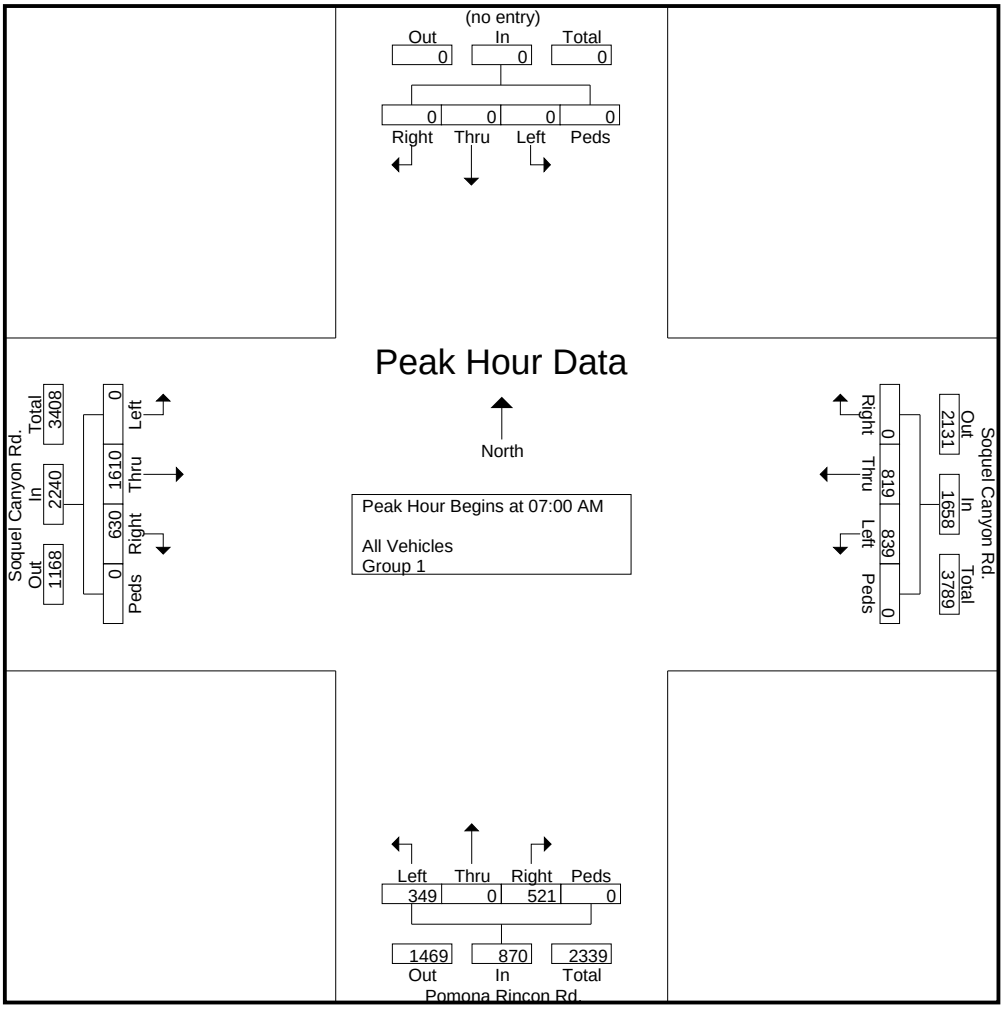
	Soquel Canyon Rd. Eastbound					Soquel Canyon Rd. Westbound					Pomona Rincon Rd. Northbound					(no entry) Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	340	**317**	0	657	**394**	152	0	0	546	85	0	160	0	245	0	0	0	0	0	1448
07:15 AM	0	441	284	0	**725**	386	208	0	0	**594**	**203**	0	**215**	0	**418**	0	0	0	0	0	**1737**
07:30 AM	0	**454**	24	0	478	34	223	0	0	257	59	0	128	0	187	0	0	0	0	0	922
07:45 AM	0	375	5	0	380	25	**236**	0	0	261	2	0	18	0	20	0	0	0	0	0	661
Total Volume	0	1610	630	0	2240	839	819	0	0	1658	349	0	521	0	870	0	0	0	0	0	4768
% App. Total	0	71.9	28.1	0		50.6	49.4	0	0		40.1	0	59.9	0		0	0	0	0		
PHF	.000	.887	.497	.000	.772	.532	.868	.000	.000	.698	.430	.000	.606	.000	.520	.000	.000	.000	.000	.000	.686



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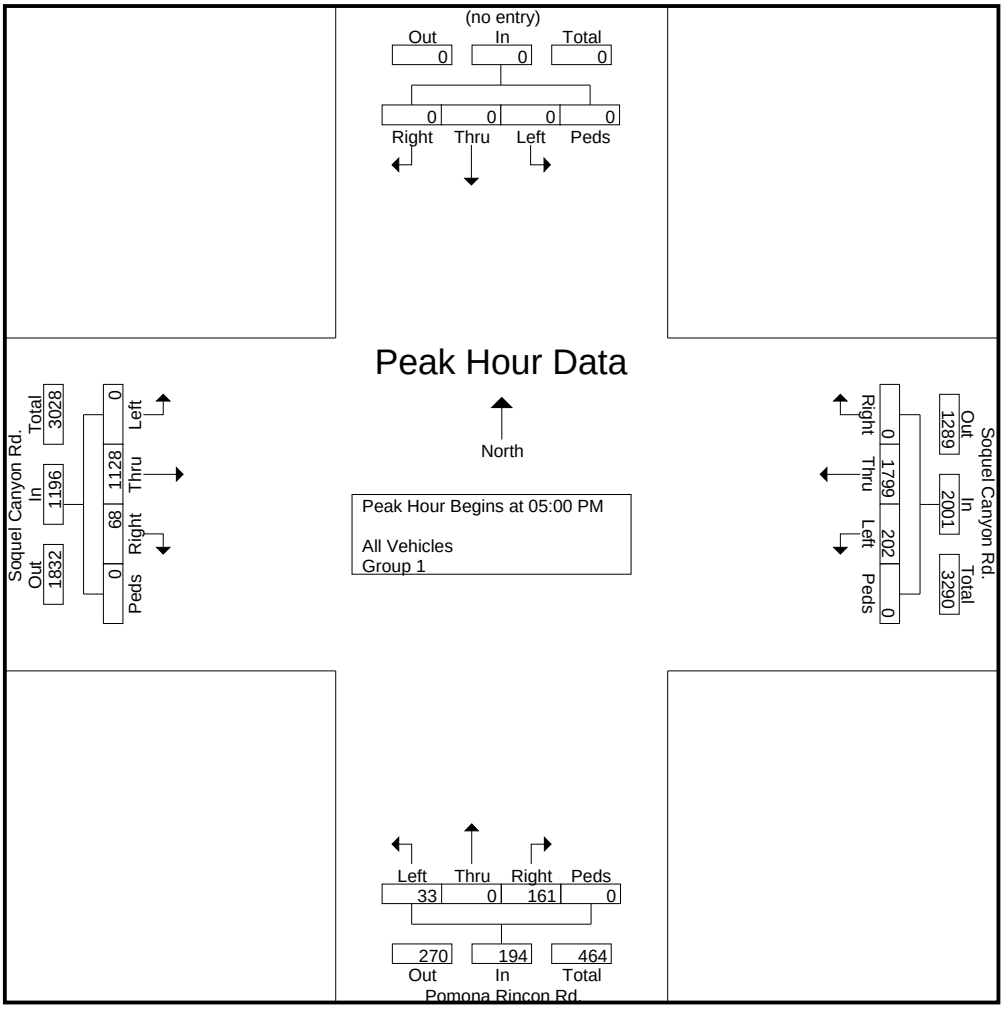
	Soquel Canyon Rd. Eastbound					Soquel Canyon Rd. Westbound					Pomona Rincon Rd. Northbound					(no entry) Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	251	17	0	268	**65**	407	0	0	472	**14**	0	44	0	**58**	0	0	0	0	0	798
05:15 PM	0	270	15	0	285	45	436	0	0	481	11	0	29	0	40	0	0	0	0	0	806
05:30 PM	0	**325**	15	0	**340**	46	**503**	0	0	**549**	6	0	41	0	47	0	0	0	0	0	**936**
05:45 PM	0	282	**21**	0	303	46	453	0	0	499	2	0	**47**	0	49	0	0	0	0	0	851
Total Volume	0	1128	68	0	1196	202	1799	0	0	2001	33	0	161	0	194	0	0	0	0	0	3391
% App. Total	0	94.3	5.7	0		10.1	89.9	0	0		17	0	83	0		0	0	0	0		
PHF	.000	.868	.810	.000	.879	.777	.894	.000	.000	.911	.589	.000	.856	.000	.836	.000	.000	.000	.000	.000	.906



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File Name : Loc3_Oct25
Site Code : 003
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Groups Printed- All Vehicles - Group 1

	Pine Ave. Eastbound				Pine Ave. Westbound				Butterfield Ranch Rd. Northbound				Butterfield Ranch Rd. Southbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	2	18	10	0	26	4	11	0	3	179	56	0	29	116	1	0	455
07:15 AM	3	14	6	0	27	4	7	0	2	113	52	0	39	213	2	0	482
07:30 AM	3	22	7	0	40	1	6	0	0	21	47	0	12	97	1	0	257
07:45 AM	0	10	4	0	28	3	3	0	1	22	35	0	17	71	1	0	195
Total	8	64	27	0	121	12	27	0	6	335	190	0	97	497	5	0	1389
08:00 AM	3	12	6	0	34	3	5	0	0	34	37	0	10	70	2	0	216
08:15 AM	1	9	7	0	45	7	9	0	0	43	35	0	11	106	2	0	275
08:30 AM	1	15	5	0	20	4	3	0	5	57	53	0	13	55	1	0	232
08:45 AM	0	6	4	0	5	4	4	0	2	27	23	0	21	40	2	0	138
Total	5	42	22	0	104	18	21	0	7	161	148	0	55	271	7	0	861
BREAK																	
04:00 PM	0	5	3	0	38	7	19	0	0	33	22	0	17	22	3	0	169
04:15 PM	0	8	4	0	29	6	7	0	3	35	16	0	13	45	0	0	166
04:30 PM	0	7	2	0	34	8	15	0	2	42	14	0	6	46	8	0	184
04:45 PM	4	3	2	0	36	5	32	0	3	48	22	0	20	50	1	0	226
Total	4	23	11	0	137	26	73	0	8	158	74	0	56	163	12	0	745
05:00 PM	0	7	2	0	60	10	24	0	2	56	20	0	21	66	3	0	271
05:15 PM	1	7	7	0	47	12	33	0	4	47	21	0	7	48	1	0	235
05:30 PM	1	7	5	0	48	17	31	0	2	40	23	0	31	78	4	0	287
05:45 PM	4	17	2	0	49	16	28	0	2	62	19	0	10	60	2	0	271
Total	6	38	16	0	204	55	116	0	10	205	83	0	69	252	10	0	1064
Grand Total	23	167	76	0	566	111	237	0	31	859	495	0	277	1183	34	0	4059
Apprch %	8.6	62.8	28.6	0	61.9	12.1	25.9	0	2.2	62	35.7	0	18.5	79.2	2.3	0	
Total %	0.6	4.1	1.9	0	13.9	2.7	5.8	0	0.8	21.2	12.2	0	6.8	29.1	0.8	0	
All Vehicles	23	167	76	0	566	111	237	0	31	859	495	0	277	1183	34	0	4059
% All Vehicles	100	100	100	0	100	100	100	0	100	100	100	0	100	100	100	0	100
Group 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Group 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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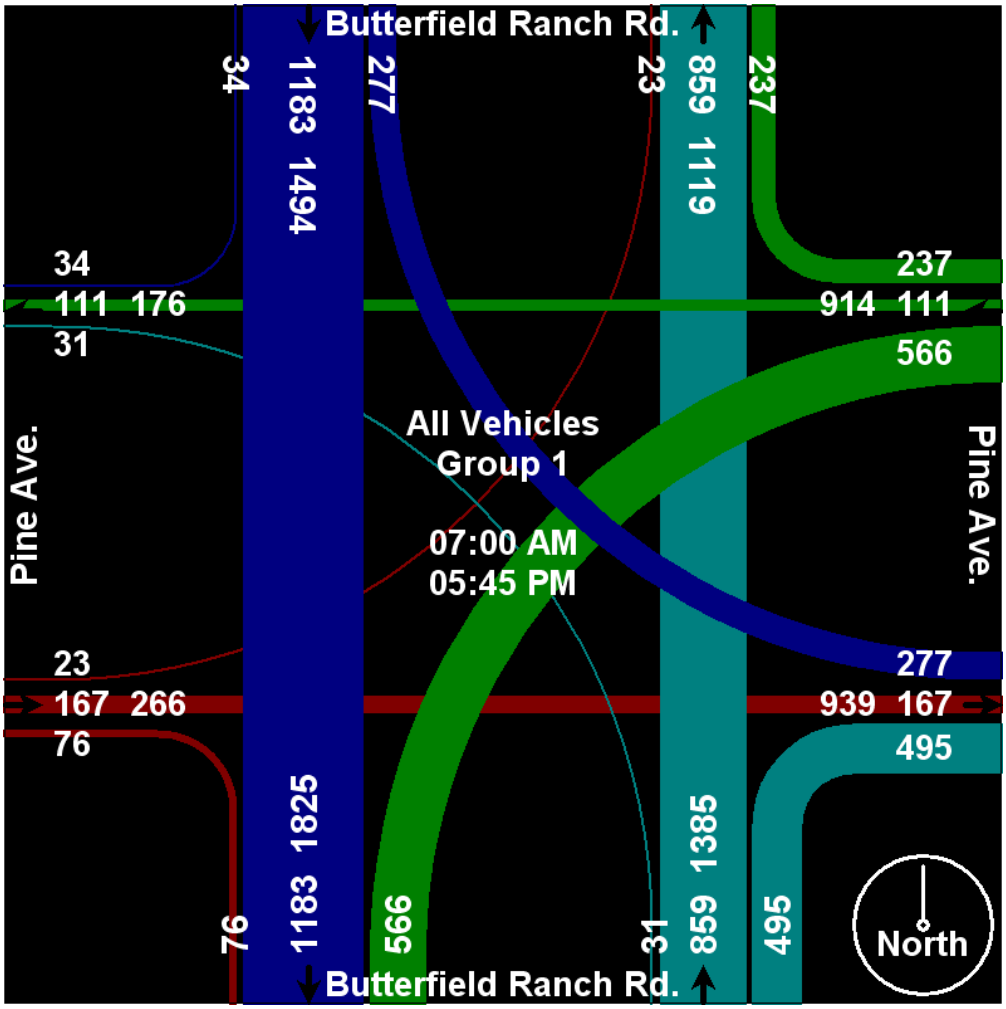

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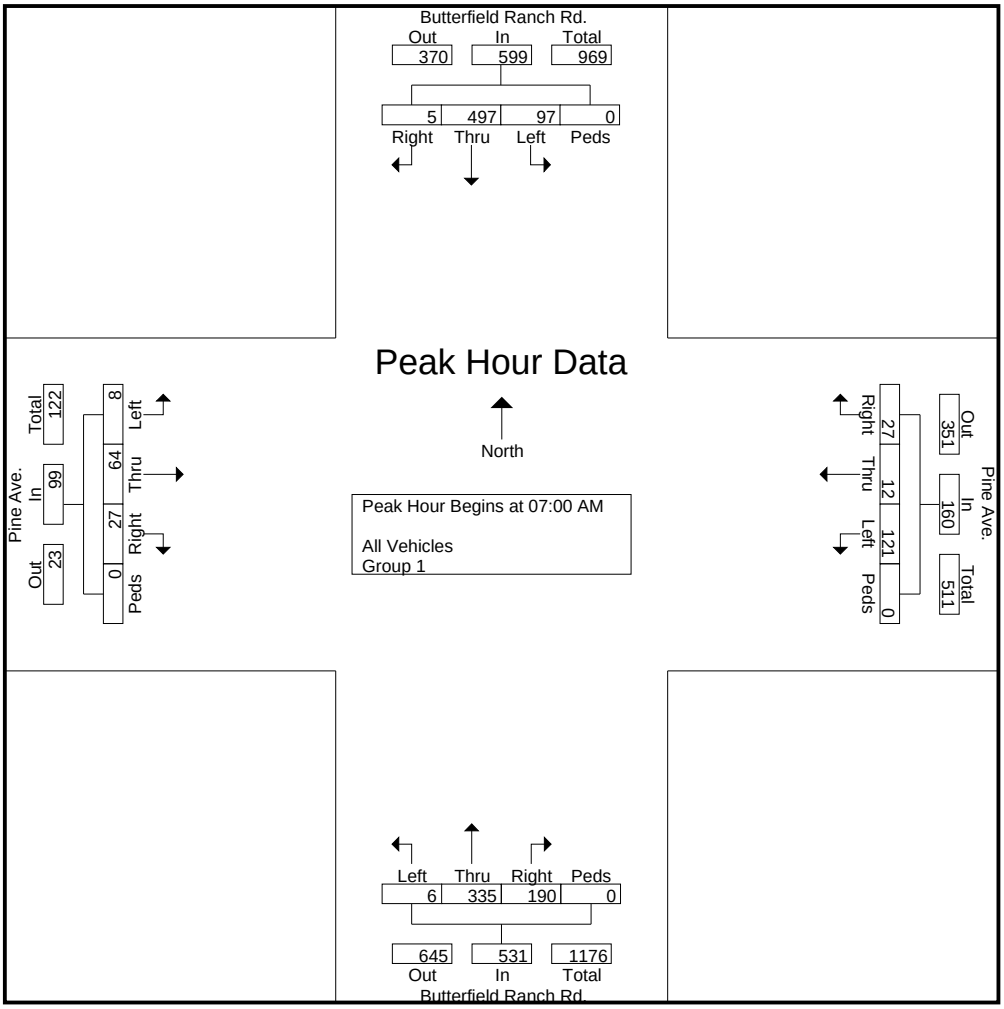
	Pine Ave. Eastbound					Pine Ave. Westbound					Butterfield Ranch Rd. Northbound					Butterfield Ranch Rd. Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	2	18	**10**	0	30	26	**4**	**11**	0	41	**3**	**179**	**56**	0	**238**	29	116	1	0	146	455
07:15 AM	**3**	14	6	0	23	27	4	7	0	38	2	113	52	0	167	**39**	**213**	**2**	0	**254**	**482**
07:30 AM	3	**22**	7	0	**32**	**40**	1	6	0	**47**	0	21	47	0	68	12	97	1	0	110	257
07:45 AM	0	10	4	0	14	28	3	3	0	34	1	22	35	0	58	17	71	1	0	89	195
Total Volume	8	64	27	0	99	121	12	27	0	160	6	335	190	0	531	97	497	5	0	599	1389
% App. Total	8.1	64.6	27.3	0		75.6	7.5	16.9	0		1.1	63.1	35.8	0		16.2	83	0.8	0		
PHF	.667	.727	.675	.000	.773	.756	.750	.614	.000	.851	.500	.468	.848	.000	.558	.622	.583	.625	.000	.590	.720



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File Name : Loc3_Oct25
Site Code : 003
Start Date : 10/25/2012
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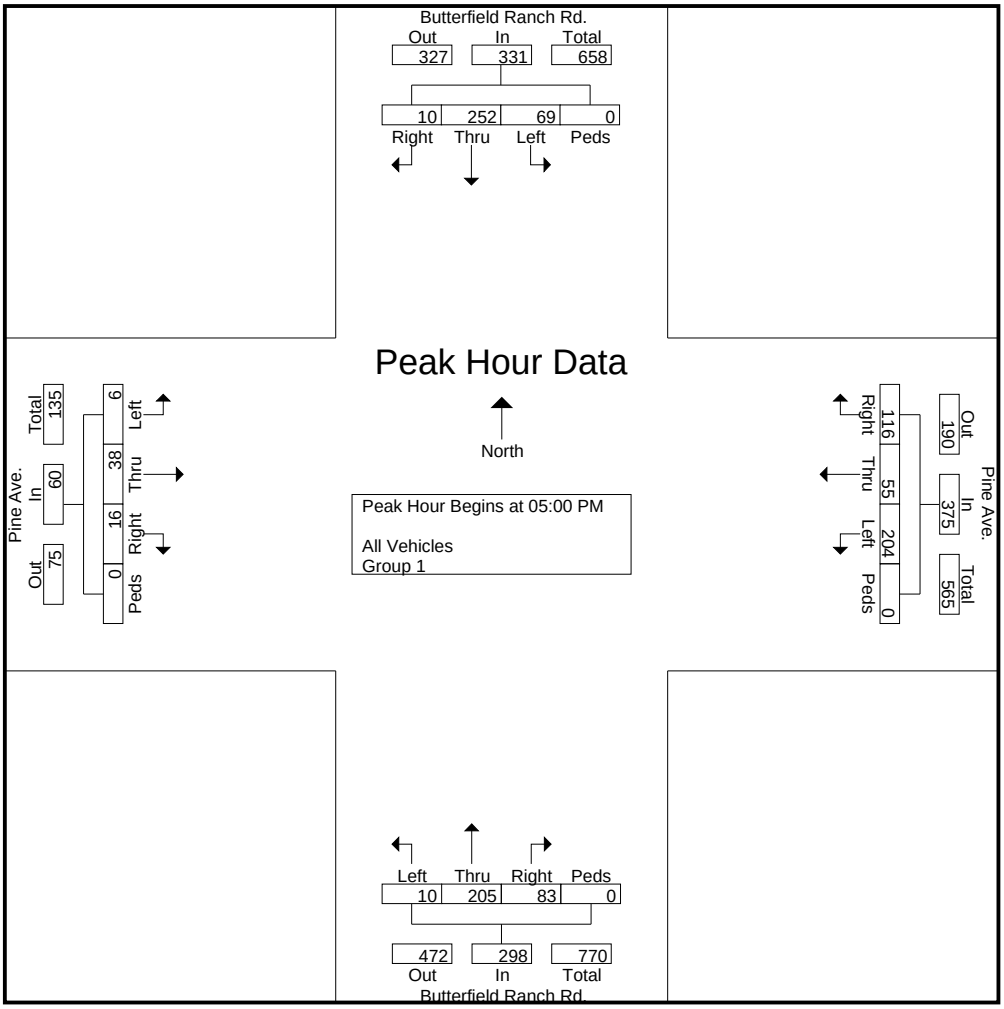
	Pine Ave. Eastbound					Pine Ave. Westbound					Butterfield Ranch Rd. Northbound					Butterfield Ranch Rd. Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	7	2	0	9	**60**	10	24	0	94	2	56	20	0	78	21	66	3	0	90	271
05:15 PM	1	7	**7**	0	15	47	12	**33**	0	92	**4**	47	21	0	72	7	48	1	0	56	235
05:30 PM	1	7	5	0	13	48	**17**	31	0	**96**	2	40	**23**	0	65	**31**	**78**	**4**	0	**113**	**287**
05:45 PM	**4**	**17**	2	0	**23**	49	16	28	0	93	2	**62**	19	0	**83**	10	60	2	0	72	271
Total Volume	6	38	16	0	60	204	55	116	0	375	10	205	83	0	298	69	252	10	0	331	1064
% App. Total	10	63.3	26.7	0		54.4	14.7	30.9	0		3.4	68.8	27.9	0		20.8	76.1	3	0		
PHF	.375	.559	.571	.000	.652	.850	.809	.879	.000	.977	.625	.827	.902	.000	.898	.556	.808	.625	.000	.732	.927



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File Name : Loc4_Oct30
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Groups Printed- All Vehicles - Group 1

	Chino Hills Pkwy. Eastbound				Chino Hills Pkwy. Westbound				Pipeline Ave. Northbound				Pipeline Ave. Southbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	53	242	13	0	20	302	75	0	87	98	104	0	46	38	38	0	1116
07:15 AM	71	270	10	0	19	353	62	0	82	112	101	0	40	41	33	0	1194
07:30 AM	45	284	12	0	21	279	42	0	67	87	56	0	30	26	24	0	973
07:45 AM	53	266	18	0	29	263	70	0	68	94	121	0	67	39	38	0	1126
Total	222	1062	53	0	89	1197	249	0	304	391	382	0	183	144	133	0	4409
08:00 AM	71	269	22	0	31	303	65	0	77	66	70	0	62	39	45	0	1120
08:15 AM	113	229	24	0	41	257	57	0	70	100	58	0	52	80	37	0	1118
08:30 AM	98	236	11	0	28	281	94	0	55	166	56	0	69	67	25	0	1186
08:45 AM	82	203	16	0	24	220	120	0	40	146	71	0	49	55	29	0	1055
Total	364	937	73	0	124	1061	336	0	242	478	255	0	232	241	136	0	4479
BREAK																	
04:00 PM	102	314	42	0	82	266	137	0	78	116	60	0	114	118	50	0	1479
04:15 PM	127	340	37	0	64	240	99	0	36	119	43	0	56	152	39	0	1352
04:30 PM	84	330	30	0	86	221	125	0	48	111	44	0	100	190	55	0	1424
04:45 PM	108	318	52	0	49	289	119	1	49	105	52	0	105	163	51	0	1461
Total	421	1302	161	0	281	1016	480	1	211	451	199	0	375	623	195	0	5716
05:00 PM	82	331	42	0	102	307	111	0	33	116	49	0	99	193	63	0	1528
05:15 PM	128	282	52	0	63	302	138	0	52	107	49	0	100	158	77	0	1508
05:30 PM	111	303	29	0	60	307	113	0	63	93	35	0	126	205	59	0	1504
05:45 PM	94	288	45	0	104	353	124	0	56	146	51	0	131	170	64	0	1626
Total	415	1204	168	0	329	1269	486	0	204	462	184	0	456	726	263	0	6166
Grand Total	1422	4505	455	0	823	4543	1551	1	961	1782	1020	0	1246	1734	727	0	20770
Apprch %	22.3	70.6	7.1	0	11.9	65.7	22.4	0	25.5	47.4	27.1	0	33.6	46.8	19.6	0	
Total %	6.8	21.7	2.2	0	4	21.9	7.5	0	4.6	8.6	4.9	0	6	8.3	3.5	0	
All Vehicles	1422	4505	455	0	823	4543	1551	1	961	1782	1020	0	1246	1734	727	0	20770
% All Vehicles	100	100	100	0	100	100	100	100	100	100	100	0	100	100	100	0	100
Group 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Group 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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File Name : Loc4_Oct30
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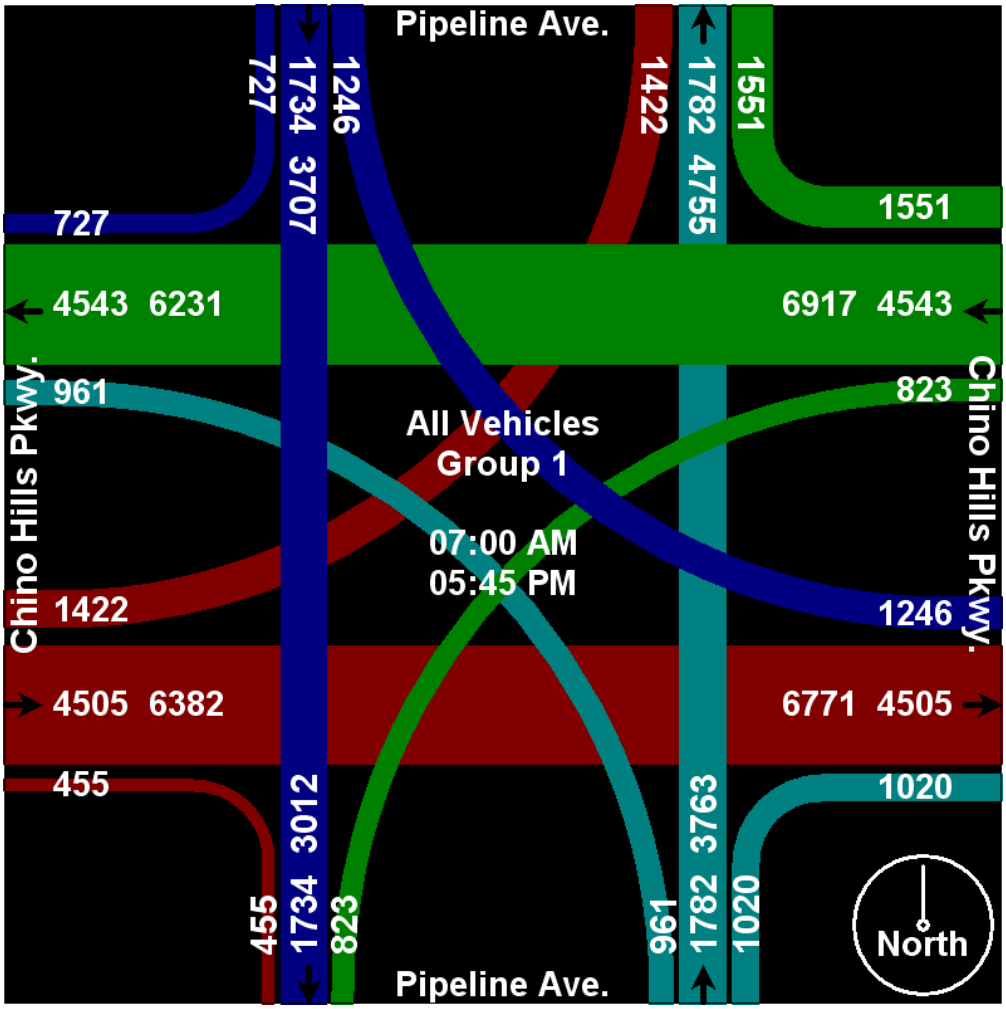

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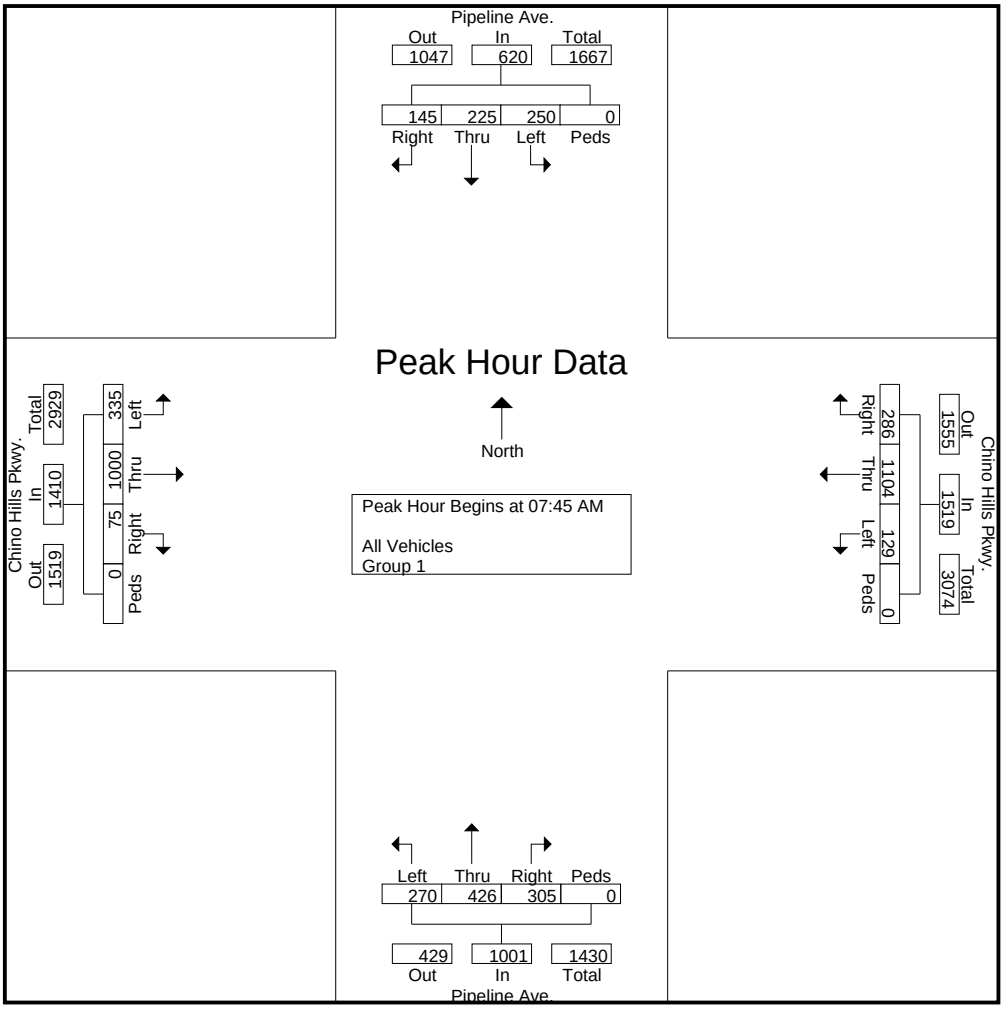
	Chino Hills Pkwy. Eastbound					Chino Hills Pkwy. Westbound					Pipeline Ave. Northbound					Pipeline Ave. Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	53	266	18	0	337	29	263	70	0	362	68	94	**121**	0	**283**	67	39	38	0	144	1126
08:00 AM	71	**269**	22	0	362	31	**303**	65	0	399	**77**	66	70	0	213	62	39	**45**	0	146	1120
08:15 AM	**113**	229	**24**	0	**366**	**41**	257	57	0	355	70	100	58	0	228	52	**80**	37	0	**169**	1118
08:30 AM	98	236	11	0	345	28	281	**94**	0	**403**	55	**166**	56	0	277	**69**	67	25	0	161	**1186**
Total Volume	335	1000	75	0	1410	129	1104	286	0	1519	270	426	305	0	1001	250	225	145	0	620	4550
% App. Total	23.8	70.9	5.3	0		8.5	72.7	18.8	0		27	42.6	30.5	0		40.3	36.3	23.4	0		
PHF	.741	.929	.781	.000	.963	.787	.911	.761	.000	.942	.877	.642	.630	.000	.884	.906	.703	.806	.000	.917	.959



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File Name : Loc4_Oct30
Site Code : 004
Start Date : 10/30/2012
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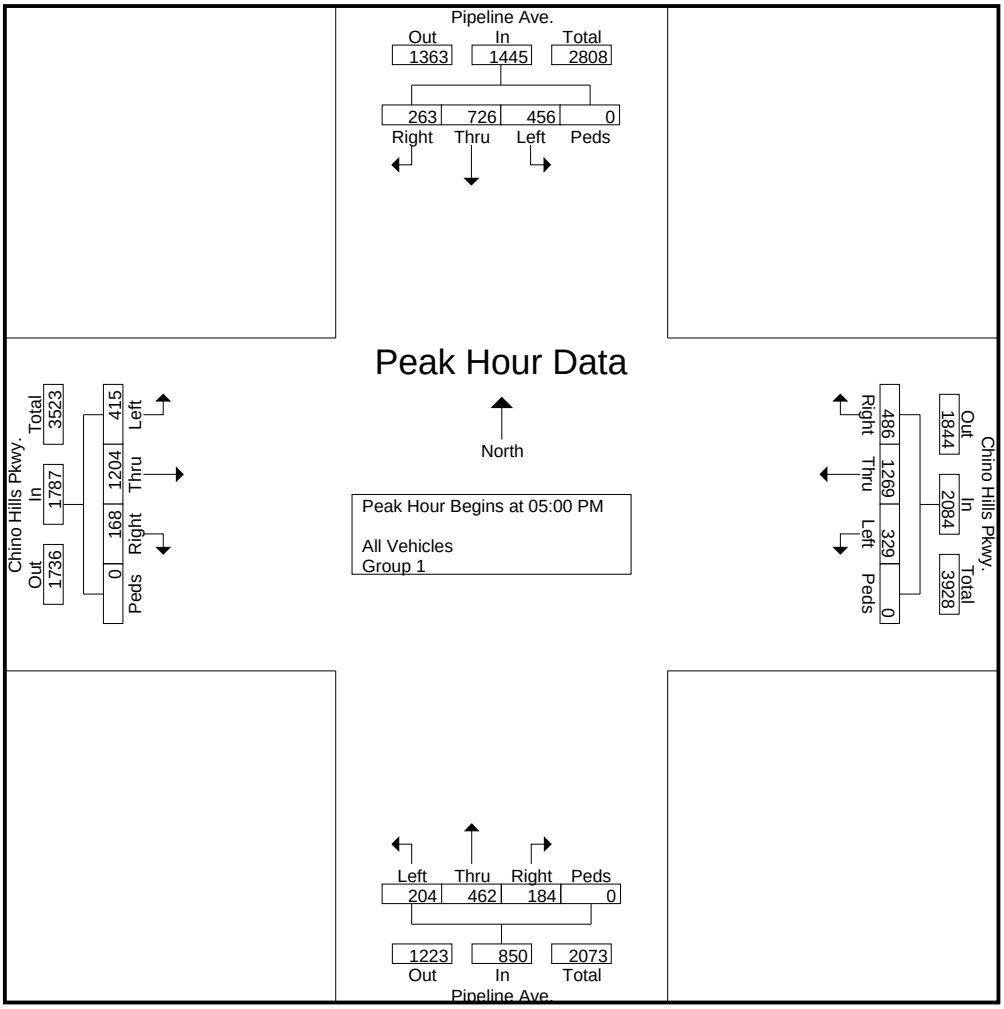
	Chino Hills Pkwy. Eastbound					Chino Hills Pkwy. Westbound					Pipeline Ave. Northbound					Pipeline Ave. Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	82	**331**	42	0	455	102	307	111	0	520	33	116	49	0	198	99	193	63	0	355	1528
05:15 PM	**128**	282	**52**	0	**462**	63	302	**138**	0	503	52	107	49	0	208	100	158	**77**	0	335	1508
05:30 PM	111	303	29	0	443	60	307	113	0	480	**63**	93	35	0	191	126	**205**	59	0	**390**	1504
05:45 PM	94	288	45	0	427	**104**	**353**	124	0	**581**	56	**146**	**51**	0	**253**	**131**	170	64	0	365	**1626**
Total Volume	415	1204	168	0	1787	329	1269	486	0	2084	204	462	184	0	850	456	726	263	0	1445	6166
% App. Total	23.2	67.4	9.4	0		15.8	60.9	23.3	0		24	54.4	21.6	0		31.6	50.2	18.2	0		
PHF	.811	.909	.808	.000	.967	.791	.899	.880	.000	.897	.810	.791	.902	.000	.840	.870	.885	.854	.000	.926	.948



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Agency:
City of Chino Hills, CA

File Name : Loc5_Oct31
Site Code : 005
Start Date : 10/31/2012
Page No : 1

Groups Printed- All Vehicles - Group 1

	Chino Hills Pkwy Eastbound				Chino Hills Pkwy Westbound				Peyton Dr. Northbound				Peyton Dr. Southbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	109	146	9	0	52	275	60	0	157	118	129	0	72	48	78	0	1253
07:15 AM	56	112	16	0	98	284	56	0	149	58	154	0	56	51	71	0	1161
07:30 AM	30	151	23	0	64	228	61	0	157	189	203	0	46	63	82	0	1297
07:45 AM	49	138	23	0	24	281	48	0	88	109	114	0	61	52	61	0	1048
Total	244	547	71	0	238	1068	225	0	551	474	600	0	235	214	292	0	4759
08:00 AM	38	143	20	0	46	157	45	0	68	141	55	0	38	56	56	0	863
08:15 AM	48	148	18	0	50	219	61	0	66	138	97	0	48	71	96	0	1060
08:30 AM	50	150	20	0	63	198	77	0	105	128	154	1	67	72	89	0	1174
08:45 AM	36	186	10	0	36	243	53	0	114	161	87	1	59	59	56	0	1101
Total	172	627	68	0	195	817	236	0	353	568	393	2	212	258	297	0	4198
BREAK																	
04:00 PM	108	389	116	0	68	160	65	0	52	127	54	0	82	116	57	0	1394
04:15 PM	94	450	121	0	112	181	68	0	43	125	40	0	71	163	48	0	1516
04:30 PM	86	483	160	0	76	180	77	0	61	96	53	0	90	131	39	0	1532
04:45 PM	88	393	121	0	115	190	52	0	50	156	60	0	92	157	45	0	1519
Total	376	1715	518	0	371	711	262	0	206	504	207	0	335	567	189	0	5961
05:00 PM	74	350	114	0	121	196	32	0	82	112	69	0	105	201	86	0	1542
05:15 PM	93	395	165	0	137	185	35	0	70	113	82	0	98	175	69	0	1617
05:30 PM	118	491	181	0	99	197	38	0	64	94	50	0	87	196	53	0	1668
05:45 PM	91	457	216	0	106	182	36	0	61	100	44	0	79	204	42	0	1618
Total	376	1693	676	0	463	760	141	0	277	419	245	0	369	776	250	0	6445
Grand Total	1168	4582	1333	0	1267	3356	864	0	1387	1965	1445	2	1151	1815	1028	0	21363
Apprch %	16.5	64.7	18.8	0	23.1	61.2	15.7	0	28.9	40.9	30.1	0	28.8	45.4	25.7	0	
Total %	5.5	21.4	6.2	0	5.9	15.7	4	0	6.5	9.2	6.8	0	5.4	8.5	4.8	0	
All Vehicles	1168	4582	1333	0	1267	3356	864	0	1387	1965	1445	2	1151	1815	1028	0	21363
% All Vehicles	100	100	100	0	100	100	100	0	100	100	100	100	100	100	100	0	100
Group 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Group 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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File Name : Loc5_Oct31
Site Code : 005
Start Date : 10/31/2012
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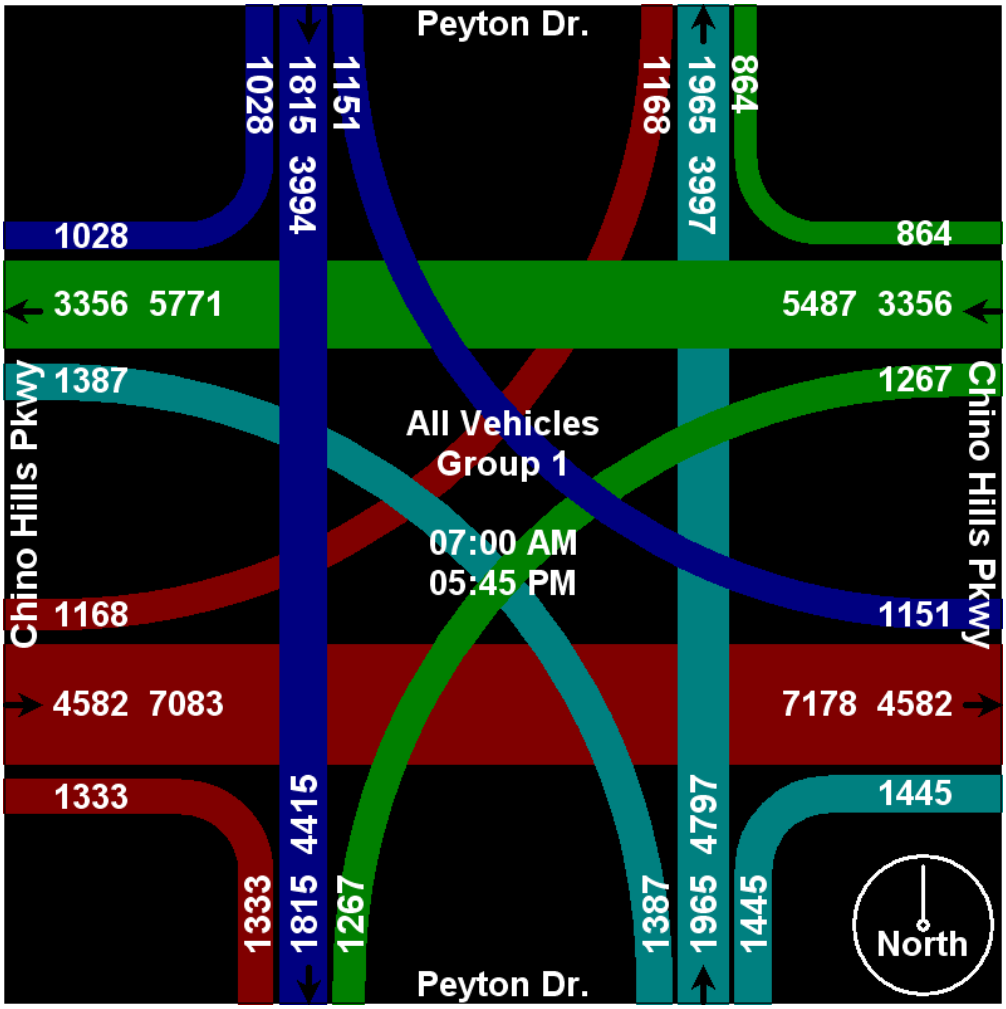

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File Name : Loc5_Oct31
Site Code : 005
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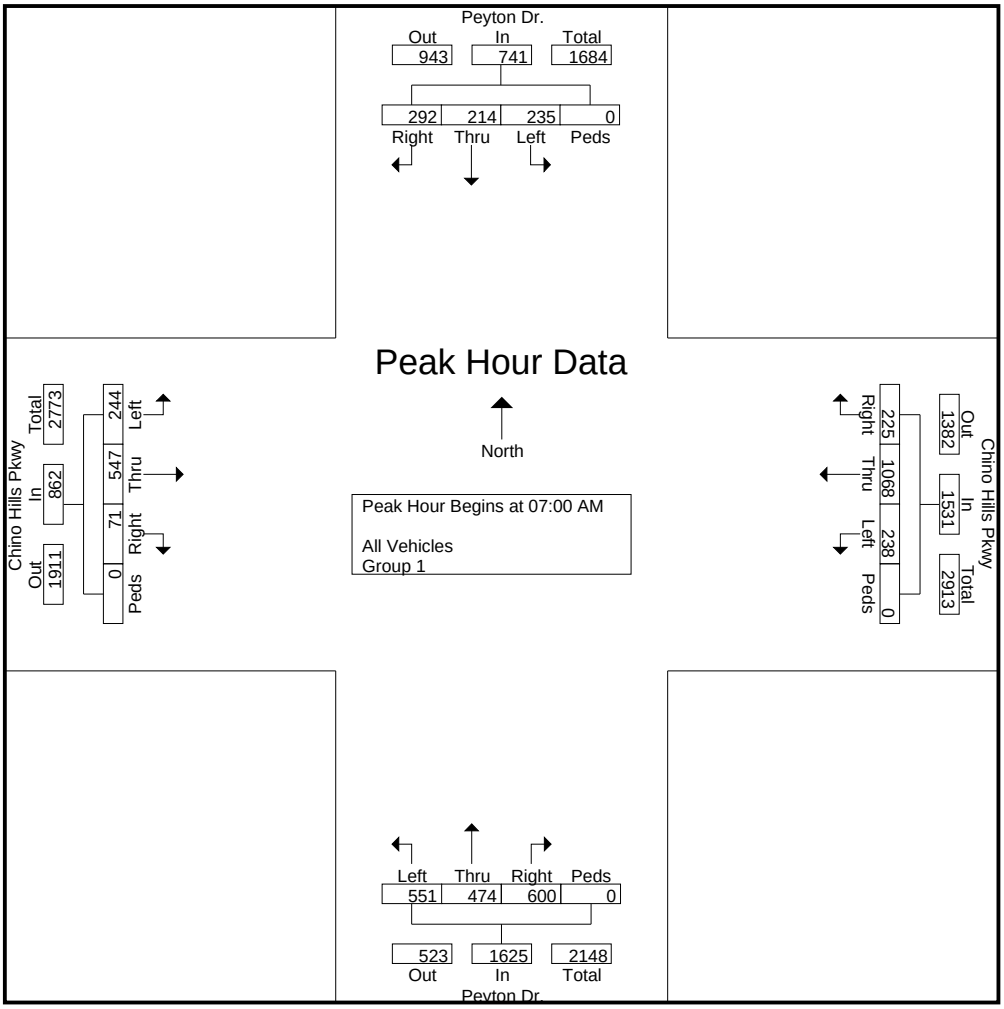
	Chino Hills Pkwy Eastbound					Chino Hills Pkwy Westbound					Peyton Dr. Northbound					Peyton Dr. Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	**109**	146	9	0	**264**	52	275	60	0	387	**157**	118	129	0	404	**72**	48	78	0	**198**	1253
07:15 AM	56	112	16	0	184	**98**	**284**	56	0	**438**	149	58	154	0	361	56	51	71	0	178	1161
07:30 AM	30	**151**	**23**	0	204	64	228	**61**	0	353	157	**189**	**203**	0	**549**	46	**63**	**82**	0	191	**1297**
07:45 AM	49	138	23	0	210	24	281	48	0	353	88	109	114	0	311	61	52	61	0	174	1048
Total Volume	244	547	71	0	862	238	1068	225	0	1531	551	474	600	0	1625	235	214	292	0	741	4759
% App. Total	28.3	63.5	8.2	0		15.5	69.8	14.7	0		33.9	29.2	36.9	0		31.7	28.9	39.4	0		
PHF	.560	.906	.772	.000	.816	.607	.940	.922	.000	.874	.877	.627	.739	.000	.740	.816	.849	.890	.000	.936	.917



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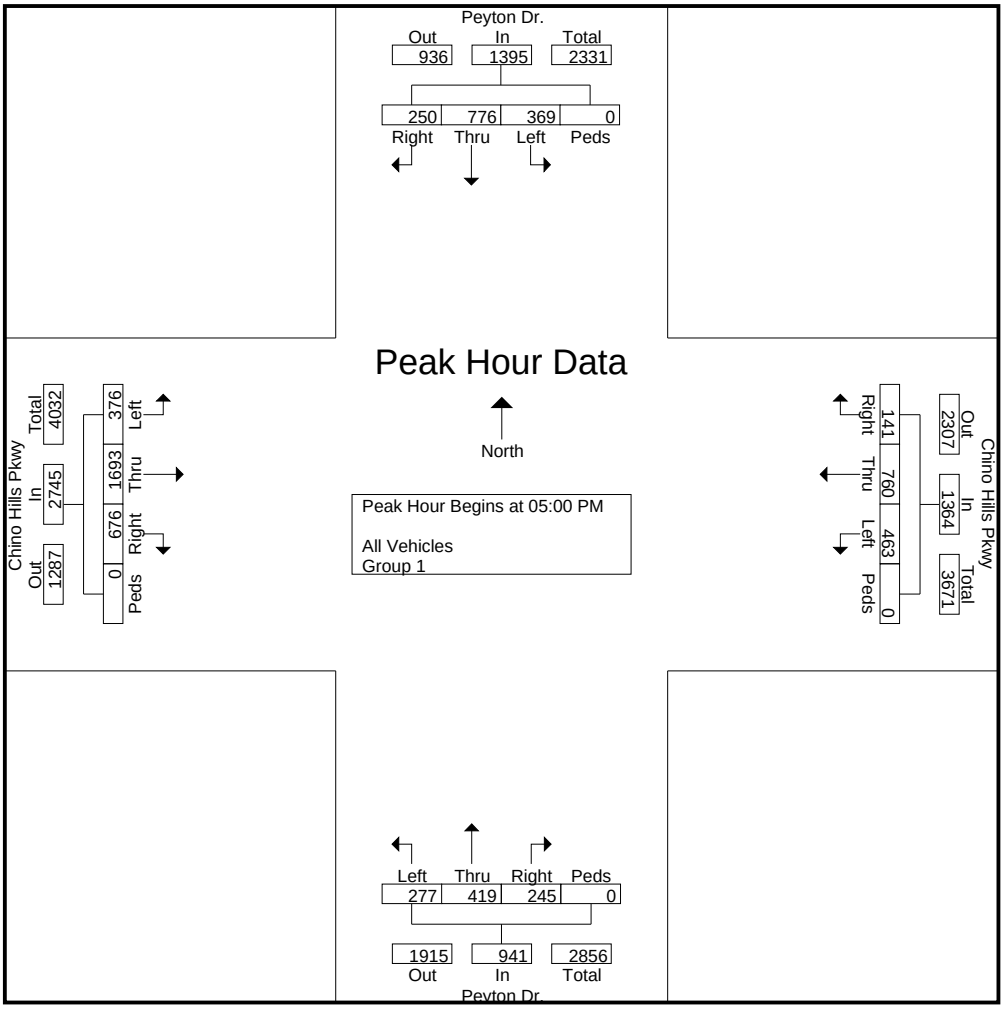
File Name : Loc5_Oct31
Site Code : 005
Start Date : 10/31/2012
Page No : 4

	Chino Hills Pkwy Eastbound					Chino Hills Pkwy Westbound					Peyton Dr. Northbound					Peyton Dr. Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	74	350	114	0	538	121	196	32	0	349	**82**	112	69	0	263	**105**	201	**86**	0	**392**	1542
05:15 PM	93	395	165	0	653	**137**	185	35	0	**357**	70	**113**	**82**	0	**265**	98	175	69	0	342	1617
05:30 PM	**118**	**491**	181	0	**790**	99	**197**	**38**	0	334	64	94	50	0	208	87	196	53	0	336	**1668**
05:45 PM	91	457	**216**	0	764	106	182	36	0	324	61	100	44	0	205	79	**204**	42	0	325	1618
Total Volume	376	1693	676	0	2745	463	760	141	0	1364	277	419	245	0	941	369	776	250	0	1395	6445
% App. Total	13.7	61.7	24.6	0		33.9	55.7	10.3	0		29.4	44.5	26	0		26.5	55.6	17.9	0		
PHF	.797	.862	.782	.000	.869	.845	.964	.928	.000	.955	.845	.927	.747	.000	.888	.879	.951	.727	.000	.890	.966



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File Name : Loc6_Nov1
Site Code : 006
Start Date : 11/1/2012
Page No : 1

Groups Printed- All Vehicles - Group 1

	Chino HIlls Pkwy. Eastbound				Chino HIlls Pkwy. Westbound				Carbon Canyon Rd. Northbound				Rustic Dr. Southbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	1	132	129	0	370	186	3	0	89	1	95	0	0	1	0	0	1007
07:15 AM	1	119	233	0	321	173	9	0	65	0	73	0	0	0	0	0	994
07:30 AM	0	127	129	0	295	159	6	0	57	0	74	0	0	0	0	0	847
07:45 AM	0	105	91	0	260	186	1	0	47	1	97	0	0	0	0	0	788
Total	2	483	582	0	1246	704	19	0	258	2	339	0	0	1	0	0	3636
08:00 AM	0	158	57	1	216	140	2	0	45	0	80	0	0	0	0	0	699
08:15 AM	0	198	73	0	200	151	2	0	28	0	124	1	0	0	0	0	777
08:30 AM	0	132	66	0	238	149	1	0	38	0	132	0	1	0	0	0	757
08:45 AM	0	121	52	0	180	187	0	0	70	0	76	0	0	0	0	0	686
Total	0	609	248	1	834	627	5	0	181	0	412	1	1	0	0	0	2919
BREAK																	
04:00 PM	0	291	45	0	118	118	2	0	65	3	504	0	0	0	0	0	1146
04:15 PM	0	266	36	0	82	99	5	0	113	0	531	0	1	0	0	0	1133
04:30 PM	0	283	40	0	119	136	2	0	57	1	475	0	0	0	0	0	1113
04:45 PM	0	292	39	0	94	142	5	0	105	0	594	1	0	2	0	0	1274
Total	0	1132	160	0	413	495	14	0	340	4	2104	1	1	2	0	0	4666
05:00 PM	0	303	69	0	94	144	0	0	96	1	470	0	0	0	0	0	1177
05:15 PM	0	299	49	0	85	183	1	0	146	0	490	0	1	0	0	0	1254
05:30 PM	1	291	29	0	104	164	3	0	122	0	502	0	1	0	0	0	1217
05:45 PM	0	303	41	0	93	158	2	0	100	0	521	0	1	0	0	0	1219
Total	1	1196	188	0	376	649	6	0	464	1	1983	0	3	0	0	0	4867
Grand Total	3	3420	1178	1	2869	2475	44	0	1243	7	4838	2	5	3	0	0	16088
Apprch %	0.1	74.3	25.6	0	53.2	45.9	0.8	0	20.4	0.1	79.4	0	62.5	37.5	0	0	
Total %	0	21.3	7.3	0	17.8	15.4	0.3	0	7.7	0	30.1	0	0	0	0	0	
All Vehicles	3	3420	1178	1	2869	2475	44	0	1243	7	4838	2	5	3	0	0	16088
% All Vehicles	100	100	100	100	100	100	100	0	100	100	100	100	100	100	0	0	100
Group 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Group 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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File Name : Loc6_Nov1
Site Code : 006
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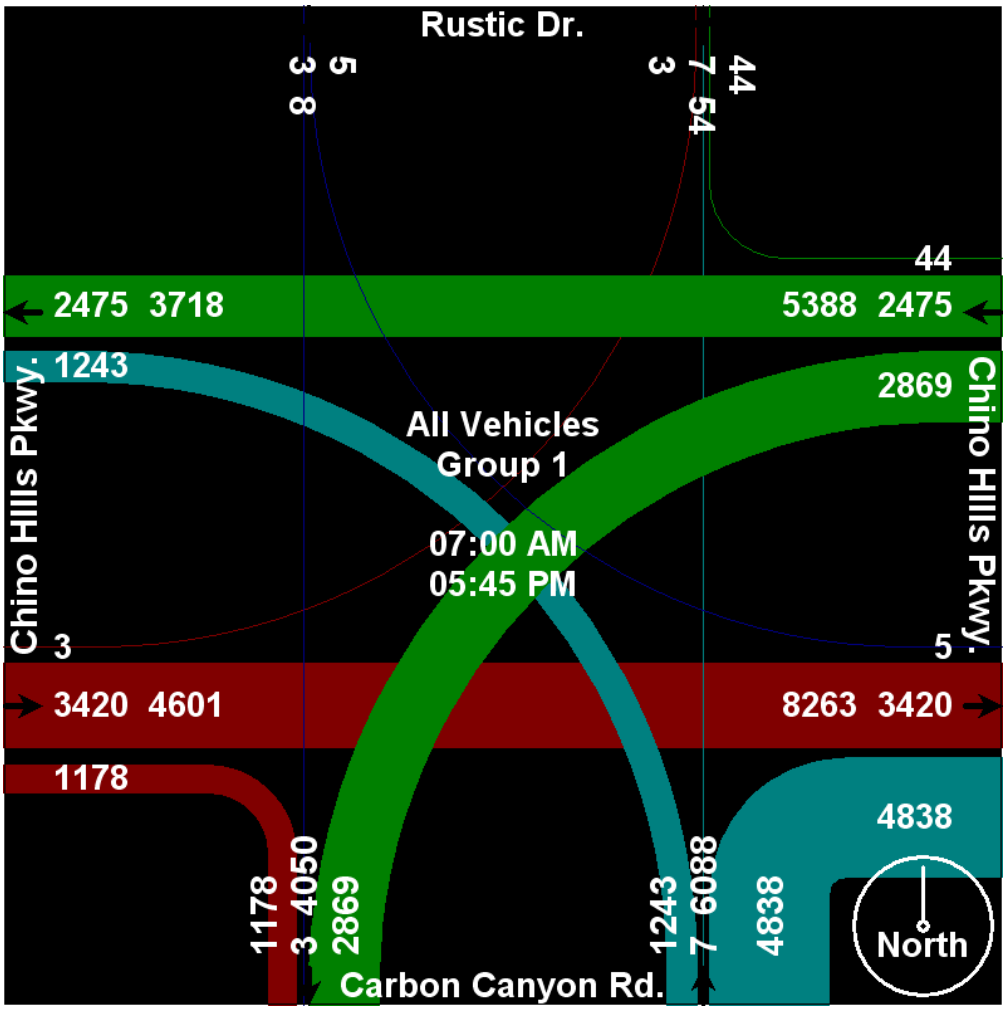

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File Name : Loc6_Nov1
Site Code : 006
Start Date : 11/1/2012
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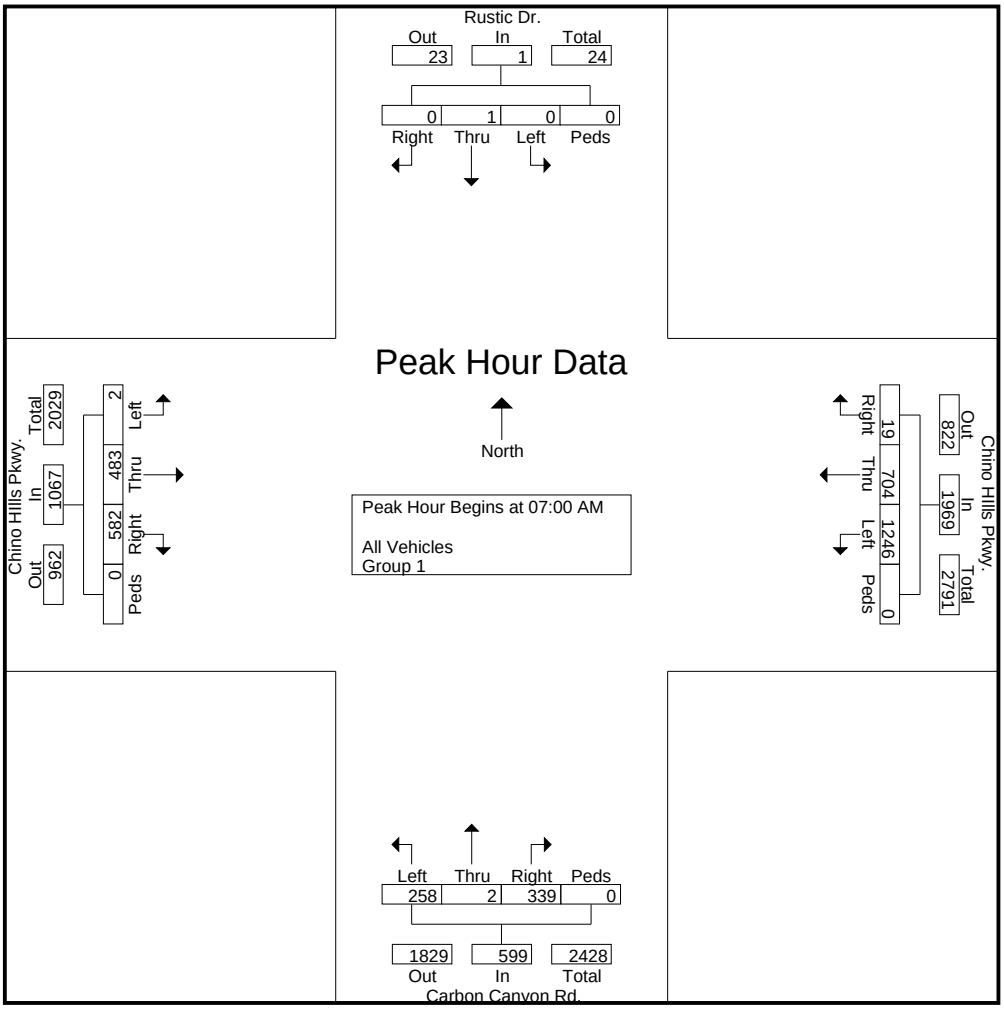
	Chino Hills Pkwy. Eastbound					Chino Hills Pkwy. Westbound					Carbon Canyon Rd. Northbound					Rustic Dr. Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	**1**	**132**	129	0	262	**370**	**186**	3	0	**559**	**89**	**1**	95	0	**185**	0	**1**	0	0	**1**	**1007**
07:15 AM	1	119	**233**	0	**353**	321	173	**9**	0	503	65	0	73	0	138	0	0	0	0	0	994
07:30 AM	0	127	129	0	256	295	159	6	0	460	57	0	74	0	131	0	0	0	0	0	847
07:45 AM	0	105	91	0	196	260	186	1	0	447	47	1	**97**	0	145	0	0	0	0	0	788
Total Volume	2	483	582	0	1067	1246	704	19	0	1969	258	2	339	0	599	0	1	0	0	1	3636
% App. Total	0.2	45.3	54.5	0		63.3	35.8	1	0		43.1	0.3	56.6	0		0	100	0	0		
PHF	.500	.915	.624	.000	.756	.842	.946	.528	.000	.881	.725	.500	.874	.000	.809	.000	.250	.000	.000	.250	.903



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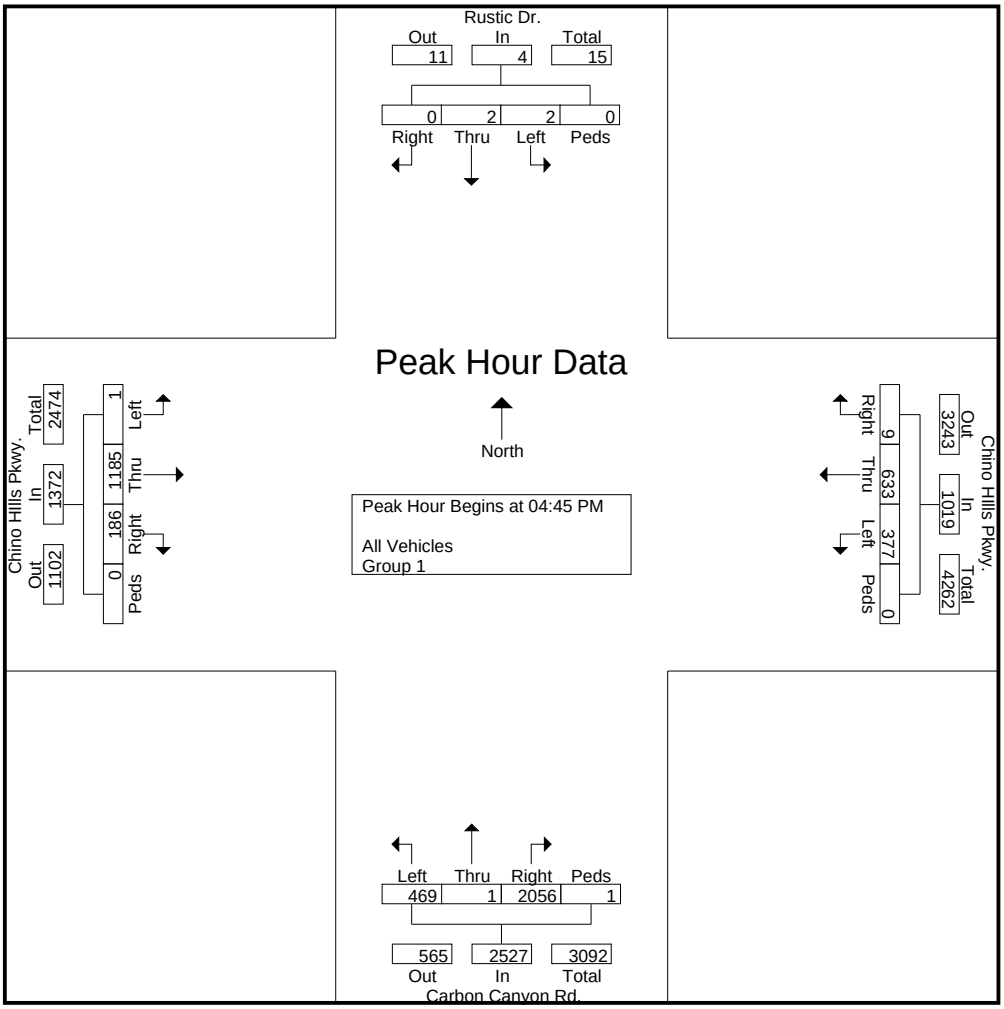
File Name : Loc6_Nov1
Site Code : 006
Start Date : 11/1/2012
Page No : 4

	Chino HIlls Pkwy. Eastbound					Chino HIlls Pkwy. Westbound					Carbon Canyon Rd. Northbound					Rustic Dr. Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	292	39	0	331	94	142	**5**	0	241	105	0	**594**	**1**	**700**	0	**2**	0	0	**2**	**1274**
05:00 PM	0	**303**	**69**	0	**372**	94	144	0	0	238	96	**1**	470	0	567	0	0	0	0	0	1177
05:15 PM	0	299	49	0	348	85	**183**	1	0	269	**146**	0	490	0	636	**1**	0	0	0	1	1254
05:30 PM	**1**	291	29	0	321	**104**	164	3	0	**271**	122	0	502	0	624	1	0	0	0	1	1217
Total Volume	1	1185	186	0	1372	377	633	9	0	1019	469	1	2056	1	2527	2	2	0	0	4	4922
% App. Total	0.1	86.4	13.6	0		37	62.1	0.9	0		18.6	0	81.4	0		50	50	0	0		
PHF	.250	.978	.674	.000	.922	.906	.865	.450	.000	.940	.803	.250	.865	.250	.903	.500	.250	.000	.000	.500	.966



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File Name : Loc7_Nov6
Site Code : 007
Start Date : 11/6/2012
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Groups Printed- All Vehicles - Group 1

	Grand Ave. Eastbound				Grand Ave. Westbound				Peyton Dr. Northbound				Peyton Dr. Southbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	35	160	192	0	49	186	21	0	121	153	66	0	83	242	99	0	1407
07:15 AM	88	191	107	0	49	248	37	0	237	252	110	0	46	162	58	0	1585
07:30 AM	80	203	103	1	35	280	40	0	144	206	63	0	50	123	80	0	1408
07:45 AM	128	317	128	0	80	255	33	0	50	139	33	0	69	132	79	0	1443
Total	331	871	530	1	213	969	131	0	552	750	272	0	248	659	316	0	5843
08:00 AM	117	256	72	0	65	275	28	0	52	104	61	0	61	146	97	1	1335
08:15 AM	59	244	55	0	64	161	16	0	64	130	67	0	70	170	70	0	1170
08:30 AM	92	202	46	0	70	183	42	0	60	155	62	0	48	94	61	0	1115
08:45 AM	37	150	36	0	38	133	23	0	23	98	56	0	36	115	28	0	773
Total	305	852	209	0	237	752	109	0	199	487	246	0	215	525	256	1	4393
BREAK																	
04:00 PM	160	278	67	0	100	123	51	0	84	211	118	0	106	141	51	0	1490
04:15 PM	120	311	68	0	90	177	71	0	71	220	114	0	103	168	38	0	1551
04:30 PM	153	289	45	0	79	188	72	0	74	198	116	0	106	177	85	0	1582
04:45 PM	114	330	70	0	97	204	55	0	79	161	111	0	90	215	71	0	1597
Total	547	1208	250	0	366	692	249	0	308	790	459	0	405	701	245	0	6220
05:00 PM	132	304	60	0	117	194	44	1	66	174	99	0	117	193	58	0	1559
05:15 PM	138	310	64	0	93	168	63	0	77	199	116	2	92	163	59	0	1544
05:30 PM	149	259	60	0	101	186	35	1	45	156	110	0	89	143	50	0	1384
05:45 PM	167	320	66	0	66	192	57	0	39	101	100	0	98	133	54	0	1393
Total	586	1193	250	0	377	740	199	2	227	630	425	2	396	632	221	0	5880
Grand Total	1769	4124	1239	1	1193	3153	688	2	1286	2657	1402	2	1264	2517	1038	1	22336
Apprch %	24.8	57.8	17.4	0	23.7	62.6	13.7	0	24.1	49.7	26.2	0	26.2	52.2	21.5	0	
Total %	7.9	18.5	5.5	0	5.3	14.1	3.1	0	5.8	11.9	6.3	0	5.7	11.3	4.6	0	
All Vehicles	1769	4124	1239	1	1193	3153	688	2	1286	2657	1402	2	1264	2517	1038	1	22336
% All Vehicles	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Group 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Group 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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City of Chino Hills, CA

File Name : Loc7_Nov6
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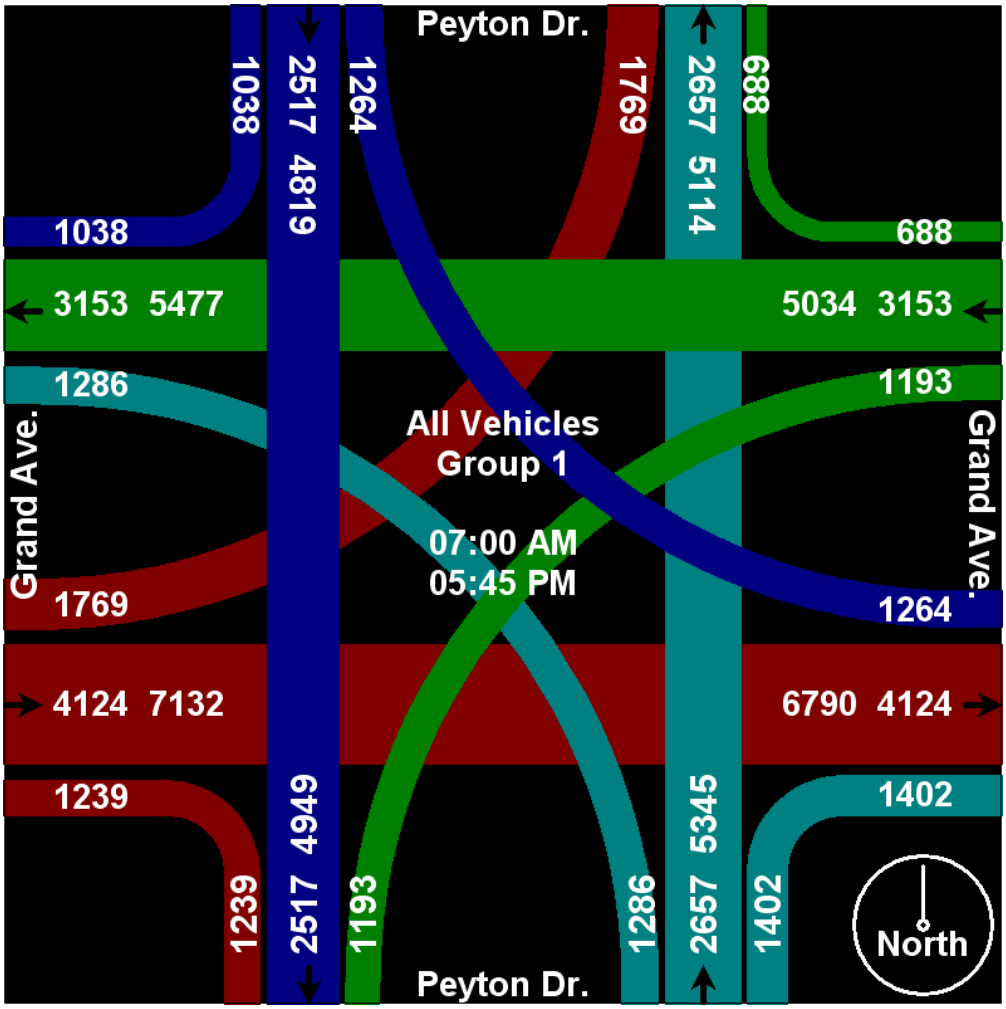

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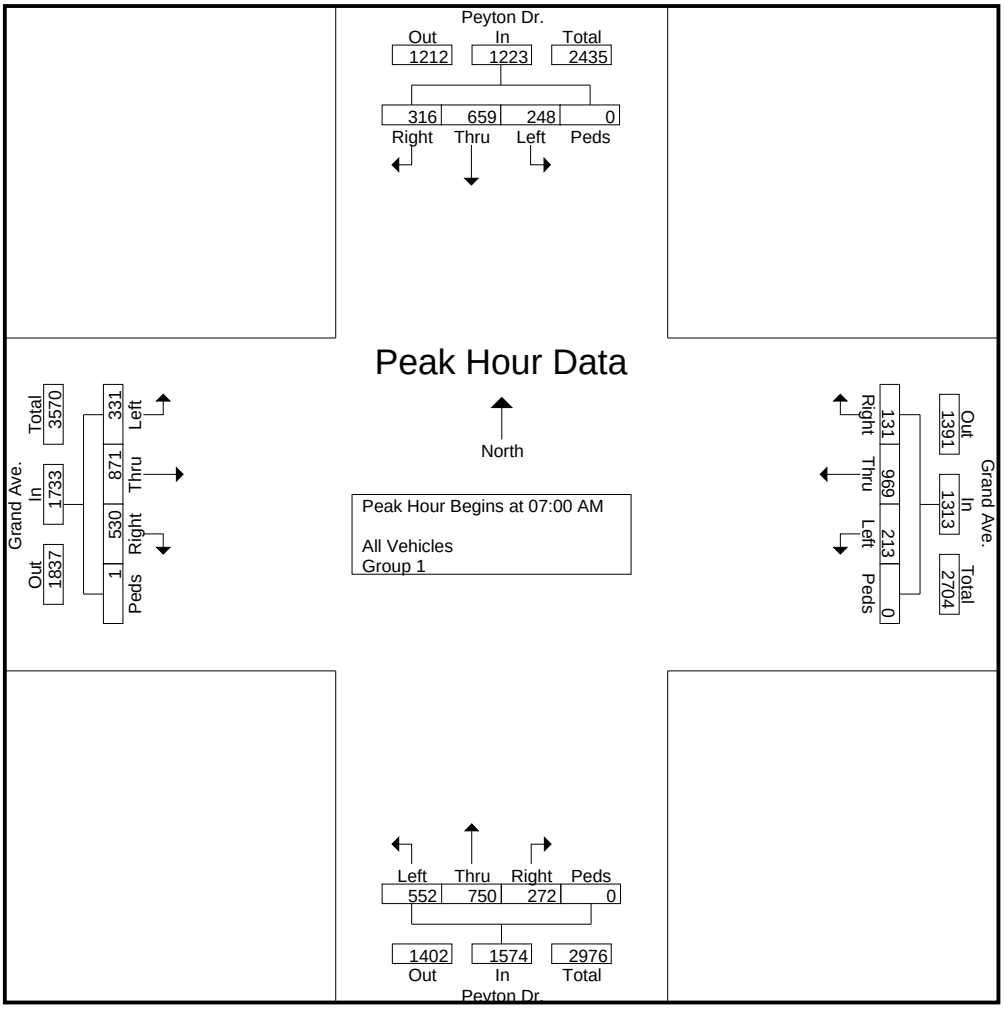
	Grand Ave. Eastbound					Grand Ave. Westbound					Peyton Dr. Northbound					Peyton Dr. Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	35	160	**192**	0	387	49	186	21	0	256	121	153	66	0	340	**83**	**242**	**99**	0	**424**	1407
07:15 AM	88	191	107	0	386	49	248	37	0	334	**237**	**252**	**110**	0	**599**	46	162	58	0	266	**1585**
07:30 AM	80	203	103	**1**	387	35	**280**	**40**	0	355	144	206	63	0	413	50	123	80	0	253	1408
07:45 AM	**128**	**317**	128	0	**573**	**80**	255	33	0	**368**	50	139	33	0	222	69	132	79	0	280	1443
Total Volume	331	871	530	1	1733	213	969	131	0	1313	552	750	272	0	1574	248	659	316	0	1223	5843
% App. Total	19.1	50.3	30.6	0.1		16.2	73.8	10	0		35.1	47.6	17.3	0		20.3	53.9	25.8	0		
PHF	.646	.687	.690	.250	.756	.666	.865	.819	.000	.892	.582	.744	.618	.000	.657	.747	.681	.798	.000	.721	.922



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File Name : Loc7_Nov6
Site Code : 007
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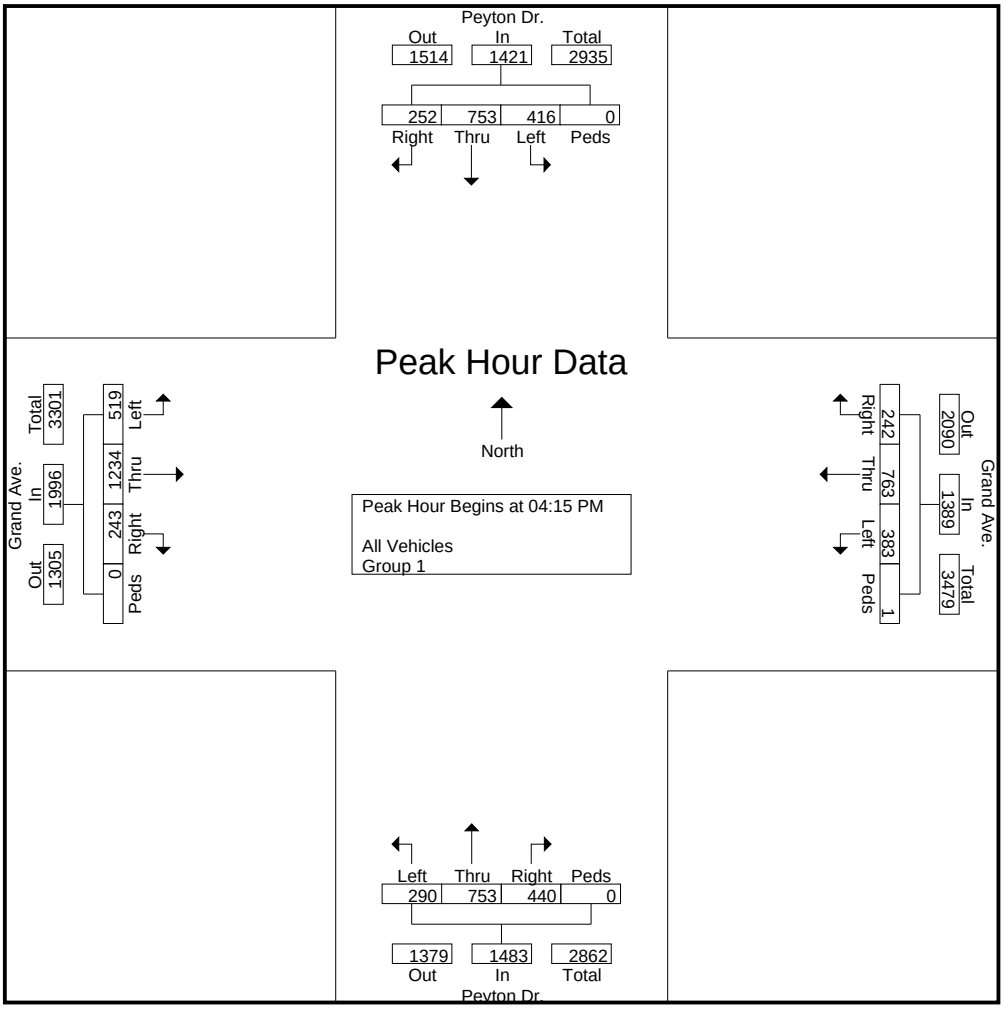
	Grand Ave. Eastbound					Grand Ave. Westbound					Peyton Dr. Northbound					Peyton Dr. Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	120	311	68	0	499	90	177	71	0	338	71	**220**	114	0	**405**	103	168	38	0	309	1551
04:30 PM	**153**	289	45	0	487	79	188	**72**	0	339	74	198	**116**	0	388	106	177	**85**	0	368	1582
04:45 PM	114	**330**	**70**	0	**514**	97	**204**	55	0	**356**	**79**	161	111	0	351	90	**215**	71	0	**376**	**1597**
05:00 PM	132	304	60	0	496	**117**	194	44	**1**	356	66	174	99	0	339	**117**	193	58	0	368	1559
Total Volume	519	1234	243	0	1996	383	763	242	1	1389	290	753	440	0	1483	416	753	252	0	1421	6289
% App. Total	26	61.8	12.2	0		27.6	54.9	17.4	0.1		19.6	50.8	29.7	0		29.3	53	17.7	0		
PHF	.848	.935	.868	.000	.971	.818	.935	.840	.250	.975	.918	.856	.948	.000	.915	.889	.876	.741	.000	.945	.985



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File Name : Loc8_Nov7
Site Code : 008
Start Date : 11/7/2012
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Groups Printed- All Vehicles - Group 1

	Eucalyptus Ave. Eastbound				Eucalyptus Ave. Westbound				Peyton Dr. Northbound				Peyton Dr. Southbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	143	9	0	0	32	35	148	0	3	349	7	0	112	100	74	0	1012
07:15 AM	134	28	2	0	53	32	167	0	0	390	2	0	184	96	155	0	1243
07:30 AM	64	48	2	0	47	50	46	0	1	218	28	0	57	140	44	0	745
07:45 AM	43	45	2	0	27	67	45	0	2	184	17	0	49	104	22	0	607
Total	384	130	6	0	159	184	406	0	6	1141	54	0	402	440	295	0	3607
08:00 AM	55	73	1	0	39	47	54	0	1	132	26	0	40	109	22	0	599
08:15 AM	51	142	1	0	48	54	30	0	5	145	42	0	40	100	30	0	688
08:30 AM	50	126	2	0	93	96	62	0	1	234	73	0	60	109	26	0	932
08:45 AM	58	91	1	0	16	55	37	0	4	181	13	0	35	84	32	0	607
Total	214	432	5	0	196	252	183	0	11	692	154	0	175	402	110	0	2826
BREAK																	
04:00 PM	66	57	6	0	45	44	71	0	4	218	33	0	71	150	57	0	822
04:15 PM	74	68	5	0	28	69	78	1	3	223	30	0	67	164	96	0	906
04:30 PM	79	41	5	0	57	104	71	0	9	186	23	0	76	229	105	0	985
04:45 PM	56	82	4	0	53	107	72	0	12	225	30	0	63	194	84	0	982
Total	275	248	20	0	183	324	292	1	28	852	116	0	277	737	342	0	3695
05:00 PM	65	91	3	0	38	103	49	0	14	216	31	0	56	194	116	0	976
05:15 PM	90	90	5	0	45	158	49	0	19	242	26	0	78	211	182	1	1196
05:30 PM	83	111	13	0	46	125	79	0	63	220	34	0	77	205	158	0	1214
05:45 PM	96	141	14	0	58	140	66	2	64	210	56	0	76	251	134	4	1312
Total	334	433	35	0	187	526	243	2	160	888	147	0	287	861	590	5	4698
Grand Total	1207	1243	66	0	725	1286	1124	3	205	3573	471	0	1141	2440	1337	5	14826
Apprch %	48	49.4	2.6	0	23.1	41	35.8	0.1	4.8	84.1	11.1	0	23.2	49.6	27.2	0.1	
Total %	8.1	8.4	0.4	0	4.9	8.7	7.6	0	1.4	24.1	3.2	0	7.7	16.5	9	0	
All Vehicles	1207	1243	66	0	725	1286	1124	3	205	3573	471	0	1141	2440	1337	5	14826
% All Vehicles	100	100	100	0	100	100	100	100	100	100	100	0	100	100	100	100	100
Group 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Group 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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File Name : Loc8_Nov7
Site Code : 008
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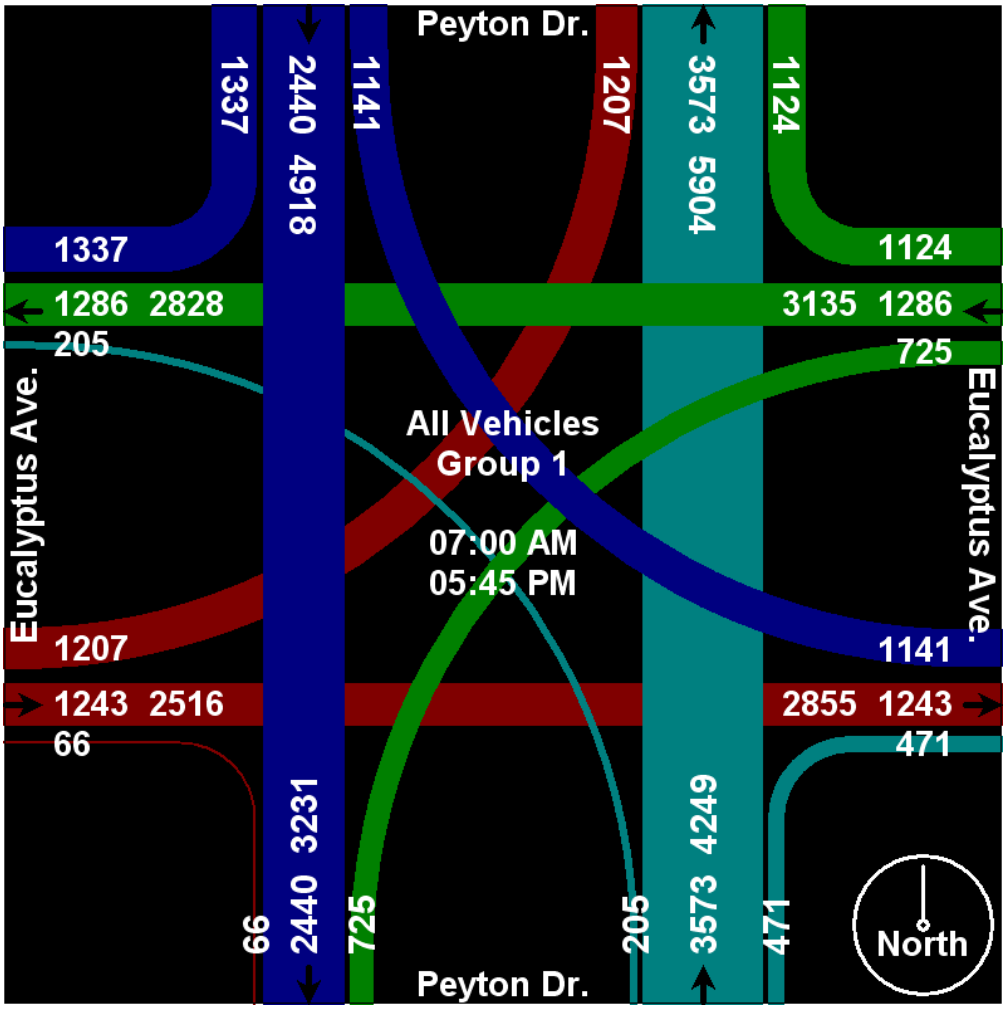

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File Name : Loc8_Nov7
Site Code : 008
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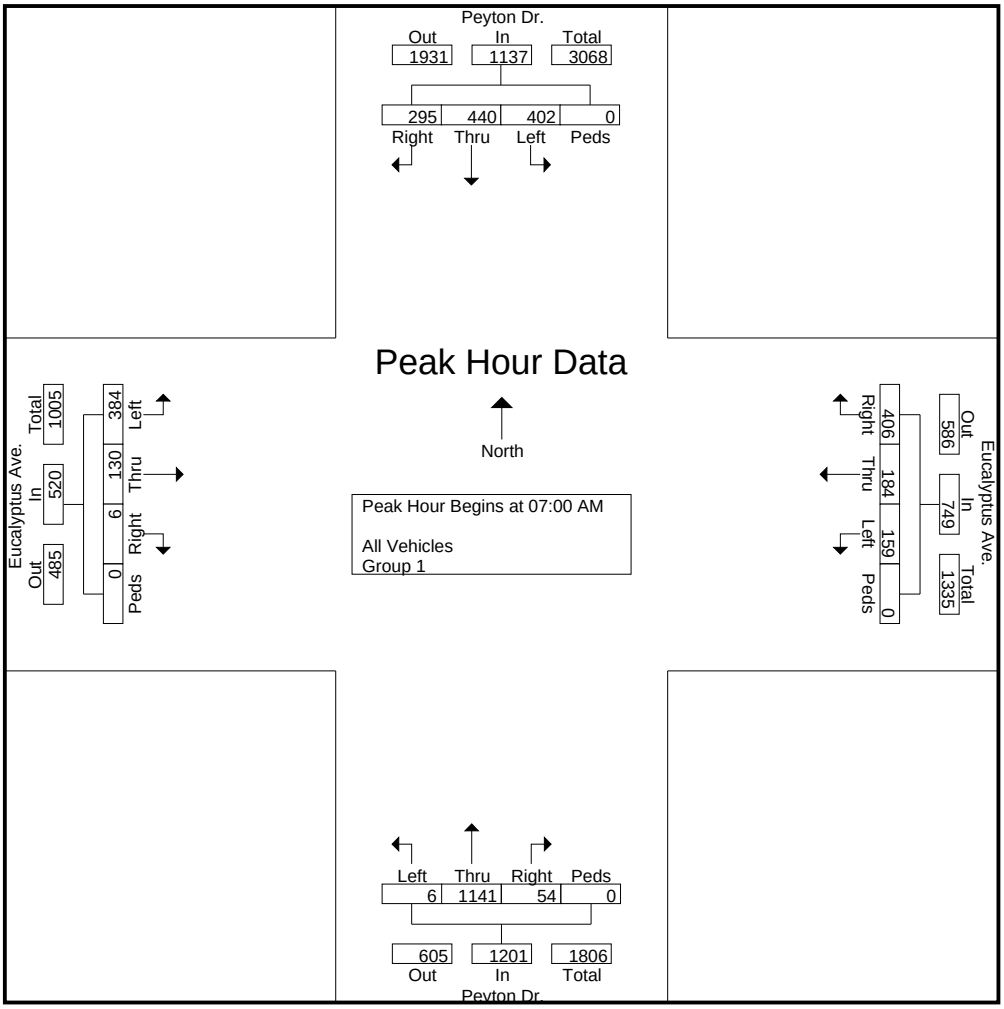
	Eucalyptus Ave. Eastbound					Eucalyptus Ave. Westbound					Peyton Dr. Northbound					Peyton Dr. Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	**143**	9	0	0	152	32	35	148	0	215	**3**	349	7	0	359	112	100	74	0	286	1012
07:15 AM	134	28	**2**	0	**164**	**53**	32	**167**	0	**252**	0	**390**	2	0	**392**	**184**	96	**155**	0	**435**	**1243**
07:30 AM	64	**48**	2	0	114	47	50	46	0	143	1	218	**28**	0	247	57	**140**	44	0	241	745
07:45 AM	43	45	2	0	90	27	**67**	45	0	139	2	184	17	0	203	49	104	22	0	175	607
Total Volume	384	130	6	0	520	159	184	406	0	749	6	1141	54	0	1201	402	440	295	0	1137	3607
% App. Total	73.8	25	1.2	0		21.2	24.6	54.2	0		0.5	95	4.5	0		35.4	38.7	25.9	0		
PHF	.671	.677	.750	.000	.793	.750	.687	.608	.000	.743	.500	.731	.482	.000	.766	.546	.786	.476	.000	.653	.725



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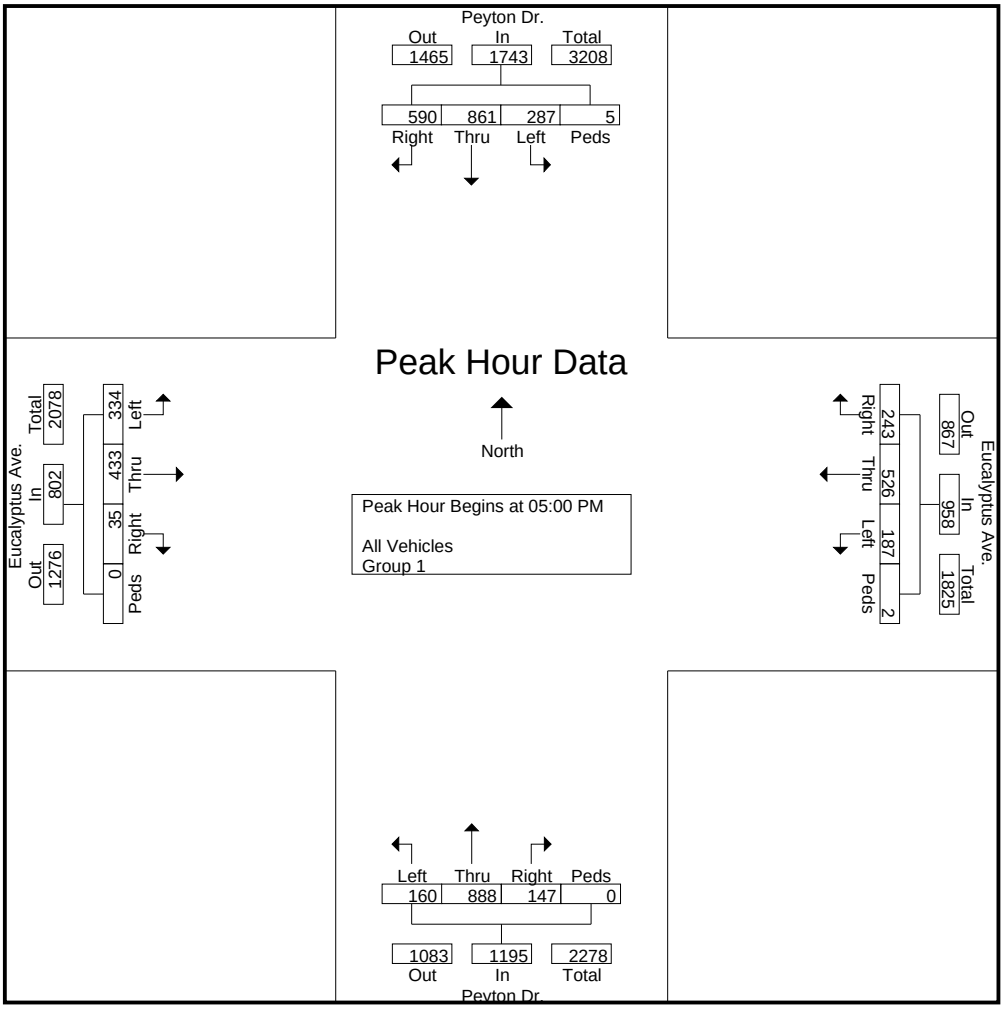
File Name : Loc8_Nov7
Site Code : 008
Start Date : 11/7/2012
Page No : 4

	Eucalyptus Ave. Eastbound					Eucalyptus Ave. Westbound					Peyton Dr. Northbound					Peyton Dr. Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	65	91	3	0	159	38	103	49	0	190	14	216	31	0	261	56	194	116	0	366	976
05:15 PM	90	90	5	0	185	45	**158**	49	0	252	19	**242**	26	0	287	**78**	211	**182**	1	**472**	1196
05:30 PM	83	111	13	0	207	46	125	**79**	0	250	63	220	34	0	317	77	205	158	0	440	1214
05:45 PM	**96**	**141**	**14**	0	**251**	**58**	140	66	**2**	**266**	**64**	210	**56**	0	**330**	76	**251**	134	**4**	465	**1312**
Total Volume	334	433	35	0	802	187	526	243	2	958	160	888	147	0	1195	287	861	590	5	1743	4698
% App. Total	41.6	54	4.4	0		19.5	54.9	25.4	0.2		13.4	74.3	12.3	0		16.5	49.4	33.8	0.3		
PHF	.870	.768	.625	.000	.799	.806	.832	.769	.250	.900	.625	.917	.656	.000	.905	.920	.858	.810	.313	.923	.895



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Agency:
City of Chino Hills, CA

File Name : Loc9_Nov9
Site Code : 009
Start Date : 11/8/2012

Groups Printed- All Vehicles - Group 1

	Woodview Rd. Eastbound			Pipeline Ave. Northbound			Pipeline Ave. Southbound			
Start Time	Left	Right	Peds	Left	Thru	Peds	Thru	Right	Peds	Int. Total
07:00 AM	10	149	0	88	88	0	101	1	0	437
07:15 AM	3	102	0	204	126	0	80	2	0	517
07:30 AM	3	86	0	200	79	0	65	5	0	438
07:45 AM	7	67	0	37	48	0	73	2	0	234
Total	23	404	0	529	341	0	319	10	0	1626
08:00 AM	9	36	0	29	30	0	40	3	0	147
08:15 AM	14	26	0	58	55	0	42	8	0	203
08:30 AM	7	46	0	44	73	0	32	2	0	204
08:45 AM	7	31	0	11	49	0	26	4	0	128
Total	37	139	0	142	207	0	140	17	0	682
BREAK										
04:00 PM	10	38	0	36	57	0	77	6	0	224
04:15 PM	8	32	0	32	45	0	56	10	0	183
04:30 PM	7	39	0	32	44	0	41	5	0	168
04:45 PM	10	46	0	38	49	0	56	8	0	207
Total	35	155	0	138	195	0	230	29	0	782
05:00 PM	3	57	0	27	55	0	72	9	0	223
05:15 PM	5	23	0	54	51	0	42	5	0	180
05:30 PM	10	59	0	39	83	0	58	7	0	256
05:45 PM	12	32	0	35	55	0	72	8	0	214
Total	30	171	0	155	244	0	244	29	0	873
Grand Total	125	869	0	964	987	0	933	85	0	3963
Apprch %	12.6	87.4	0	49.4	50.6	0	91.7	8.3	0	
Total %	3.2	21.9	0	24.3	24.9	0	23.5	2.1	0	
All Vehicles	125	869	0	964	987	0	933	85	0	3963
% All Vehicles	100	100	0	100	100	0	100	100	0	100
Group 1	0	0	0	0	0	0	0	0	0	0
% Group 1	0	0	0	0	0	0	0	0	0	0

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File Name : Loc9_Nov9
Site Code : 009
Start Date : 11/8/2012
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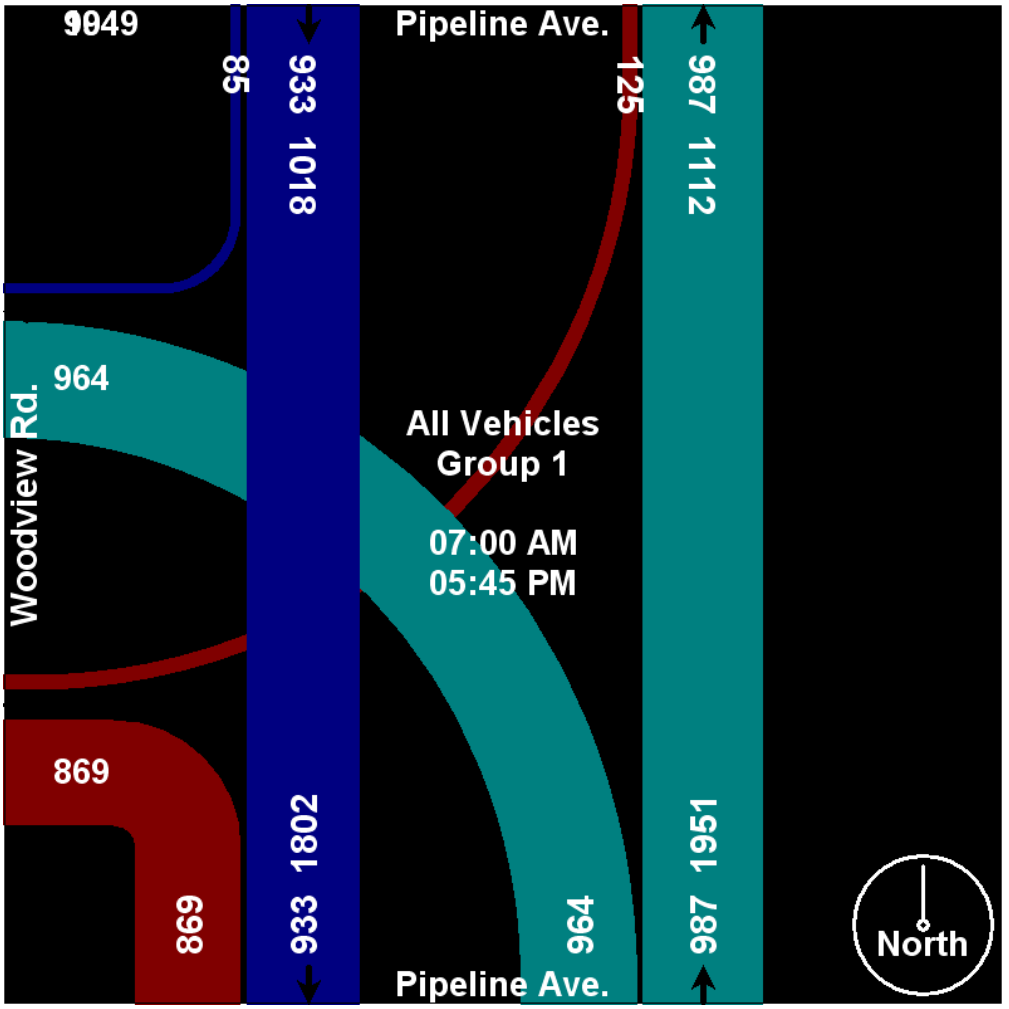

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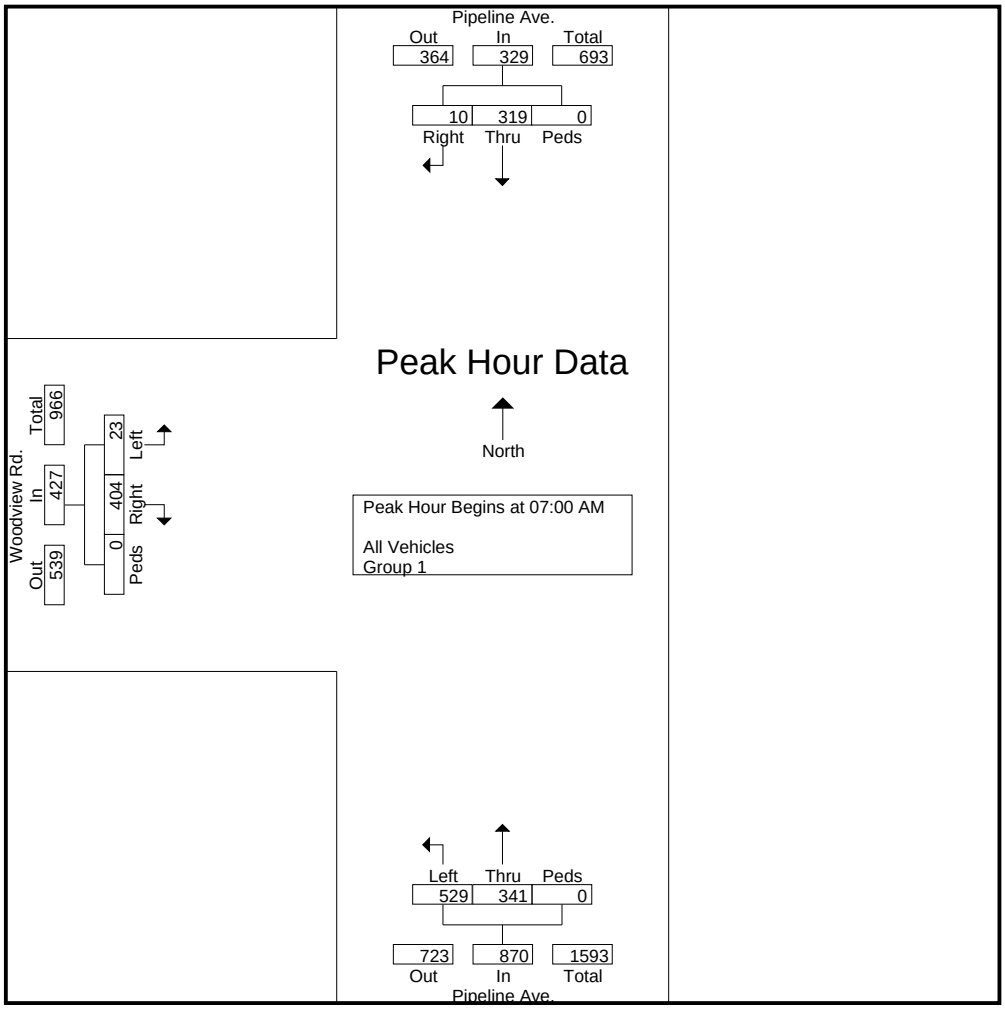
File Name : Loc9_Nov9
Site Code : 009
Start Date : 11/8/2012
Page No : 3

	Woodview Rd. Eastbound				Pipeline Ave. Northbound				Pipeline Ave. Southbound				
Start Time	Left	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	**10**	**149**	0	**159**	88	88	0	176	**101**	1	0	**102**	437
07:15 AM	3	102	0	105	**204**	**126**	0	**330**	80	2	0	82	**517**
07:30 AM	3	86	0	89	200	79	0	279	65	**5**	0	70	438
07:45 AM	7	67	0	74	37	48	0	85	73	2	0	75	234
Total Volume	23	404	0	427	529	341	0	870	319	10	0	329	1626
% App. Total	5.4	94.6	0		60.8	39.2	0		97	3	0		
PHF	.575	.678	.000	.671	.648	.677	.000	.659	.790	.500	.000	.806	.786



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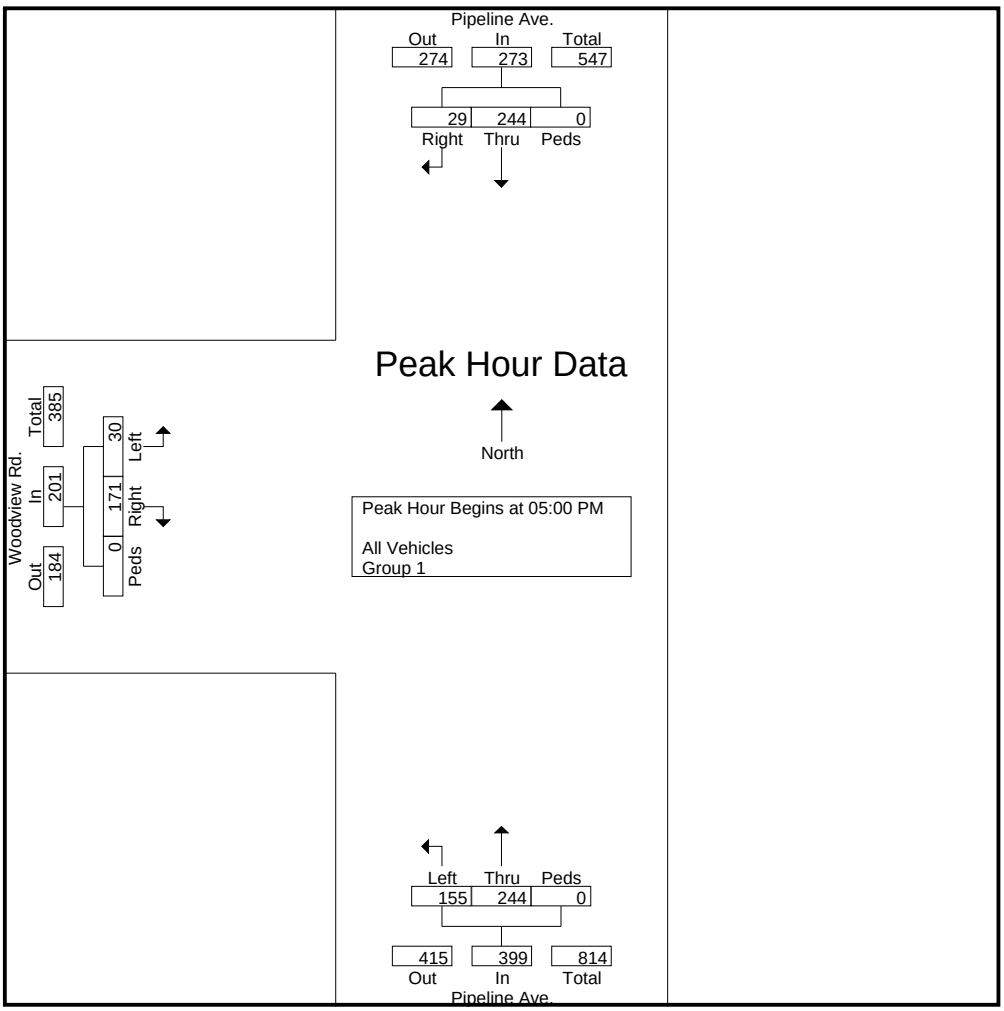
File Name : Loc9_Nov9
Site Code : 009
Start Date : 11/8/2012
Page No : 4

	Woodview Rd. Eastbound				Pipeline Ave. Northbound				Pipeline Ave. Southbound				
Start Time	Left	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:00 PM													
05:00 PM	3	57	0	60	27	55	0	82	**72**	**9**	0	**81**	223
05:15 PM	5	23	0	28	**54**	51	0	105	42	5	0	47	180
05:30 PM	10	**59**	0	**69**	39	**83**	0	**122**	58	7	0	65	**256**
05:45 PM	**12**	32	0	44	35	55	0	90	72	8	0	80	214
Total Volume	30	171	0	201	155	244	0	399	244	29	0	273	873
% App. Total	14.9	85.1	0		38.8	61.2	0		89.4	10.6	0		
PHF	.625	.725	.000	.728	.718	.735	.000	.818	.847	.806	.000	.843	.853



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Agency:
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File Name : Loc10_Nov13
Site Code : 010
Start Date : 11/13/2012
Page No : 1

Groups Printed- All Vehicles - Group 1

	Chino Ave. Eastbound				Chino Ave. Westbound				Peyton Dr. Northbound				Peyton Dr. Southbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	40	58	67	0	34	25	33	0	43	159	33	0	38	172	18	0	720
07:15 AM	63	53	30	0	30	40	31	0	58	253	58	0	30	117	38	0	801
07:30 AM	79	72	32	0	33	126	29	0	28	204	70	1	54	142	68	0	938
07:45 AM	88	107	52	0	47	202	42	0	75	185	23	0	53	144	97	0	1115
Total	270	290	181	0	144	393	135	0	204	801	184	1	175	575	221	0	3574
08:00 AM	119	169	93	0	29	47	38	0	42	185	70	0	76	157	49	0	1074
08:15 AM	61	70	43	0	32	42	46	0	20	177	52	0	44	131	29	0	747
BREAK																	
Total	180	239	136	0	61	89	84	0	62	362	122	0	120	288	78	0	1821
BREAK																	
04:00 PM	33	21	30	0	53	35	96	0	14	225	46	0	119	262	54	0	988
04:15 PM	26	46	85	0	38	56	174	0	41	239	29	0	111	267	53	0	1165
04:30 PM	30	47	47	0	42	44	139	0	39	221	37	0	108	262	53	0	1069
04:45 PM	24	51	44	0	82	49	134	0	26	260	48	0	114	266	42	0	1140
Total	113	165	206	0	215	184	543	0	120	945	160	0	452	1057	202	0	4362
05:00 PM	43	39	55	0	60	51	165	0	29	226	44	0	158	349	59	0	1278
05:15 PM	37	38	62	0	71	32	113	1	32	241	49	0	140	282	48	0	1146
05:30 PM	29	64	58	0	68	82	130	0	31	223	40	0	156	317	55	0	1253
05:45 PM	15	44	13	0	30	32	63	0	4	97	20	0	77	121	33	0	549
Total	124	185	188	0	229	197	471	1	96	787	153	0	531	1069	195	0	4226
Grand Total	687	879	711	0	649	863	1233	1	482	2895	619	1	1278	2989	696	0	13983
Apprch %	30.2	38.6	31.2	0	23.6	31.4	44.9	0	12.1	72.4	15.5	0	25.8	60.2	14	0	
Total %	4.9	6.3	5.1	0	4.6	6.2	8.8	0	3.4	20.7	4.4	0	9.1	21.4	5	0	
All Vehicles	687	879	711	0	649	863	1233	1	482	2895	619	1	1278	2989	696	0	13983
% All Vehicles	100	100	100	0	100	100	100	100	100	100	100	100	100	100	100	0	100
Group 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Group 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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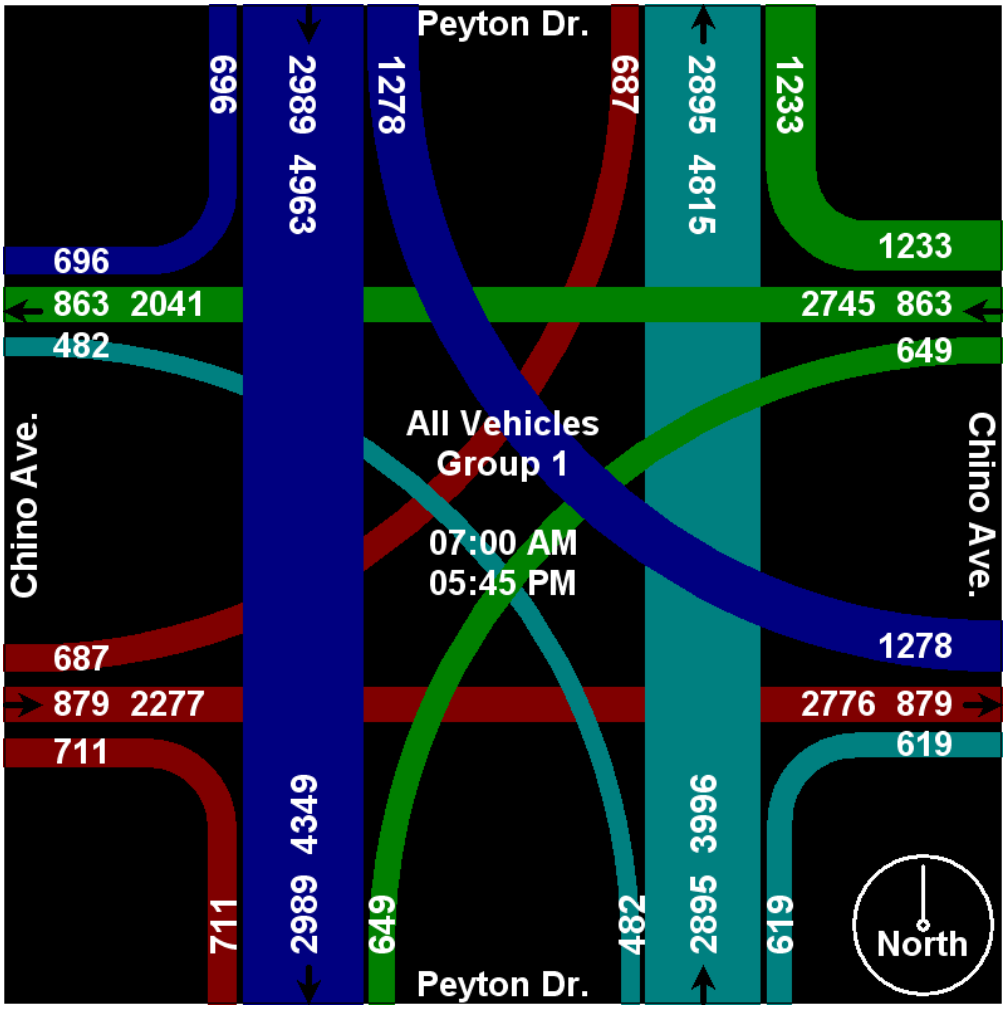
City of Chino Hills, CA

File Name : Loc10_Nov13
Site Code : 010
Start Date : 11/13/2012
Page No : 2



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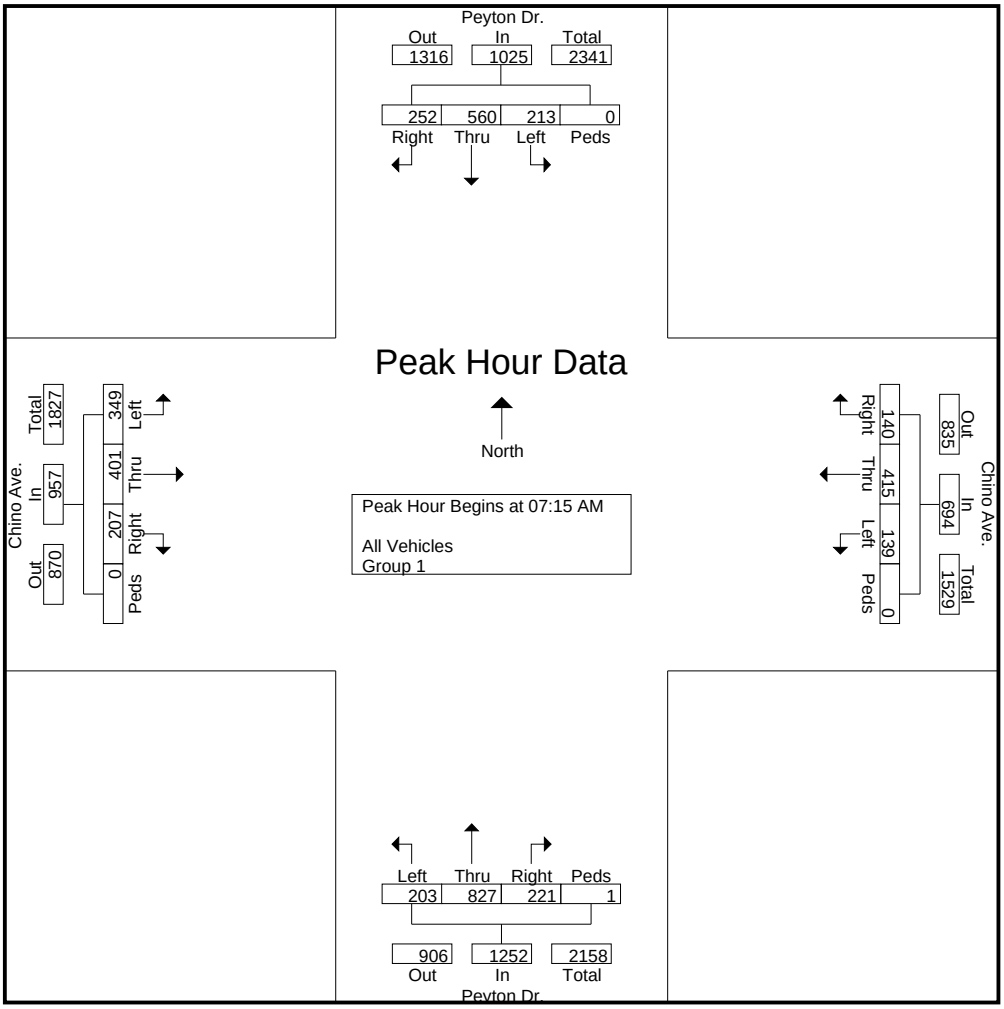
	Chino Ave. Eastbound					Chino Ave. Westbound					Peyton Dr. Northbound					Peyton Dr. Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	63	53	30	0	146	30	40	31	0	101	58	**253**	58	0	**369**	30	117	38	0	185	801
07:30 AM	79	72	32	0	183	33	126	29	0	188	28	204	**70**	**1**	303	54	142	68	0	264	938
07:45 AM	88	107	52	0	247	**47**	**202**	**42**	0	**291**	**75**	185	23	0	283	53	144	**97**	0	**294**	**1115**
08:00 AM	**119**	**169**	**93**	0	**381**	29	47	38	0	114	42	185	70	0	297	**76**	**157**	49	0	282	1074
Total Volume	349	401	207	0	957	139	415	140	0	694	203	827	221	1	1252	213	560	252	0	1025	3928
% App. Total	36.5	41.9	21.6	0		20	59.8	20.2	0		16.2	66.1	17.7	0.1		20.8	54.6	24.6	0		
PHF	.733	.593	.556	.000	.628	.739	.514	.833	.000	.596	.677	.817	.789	.250	.848	.701	.892	.649	.000	.872	.881



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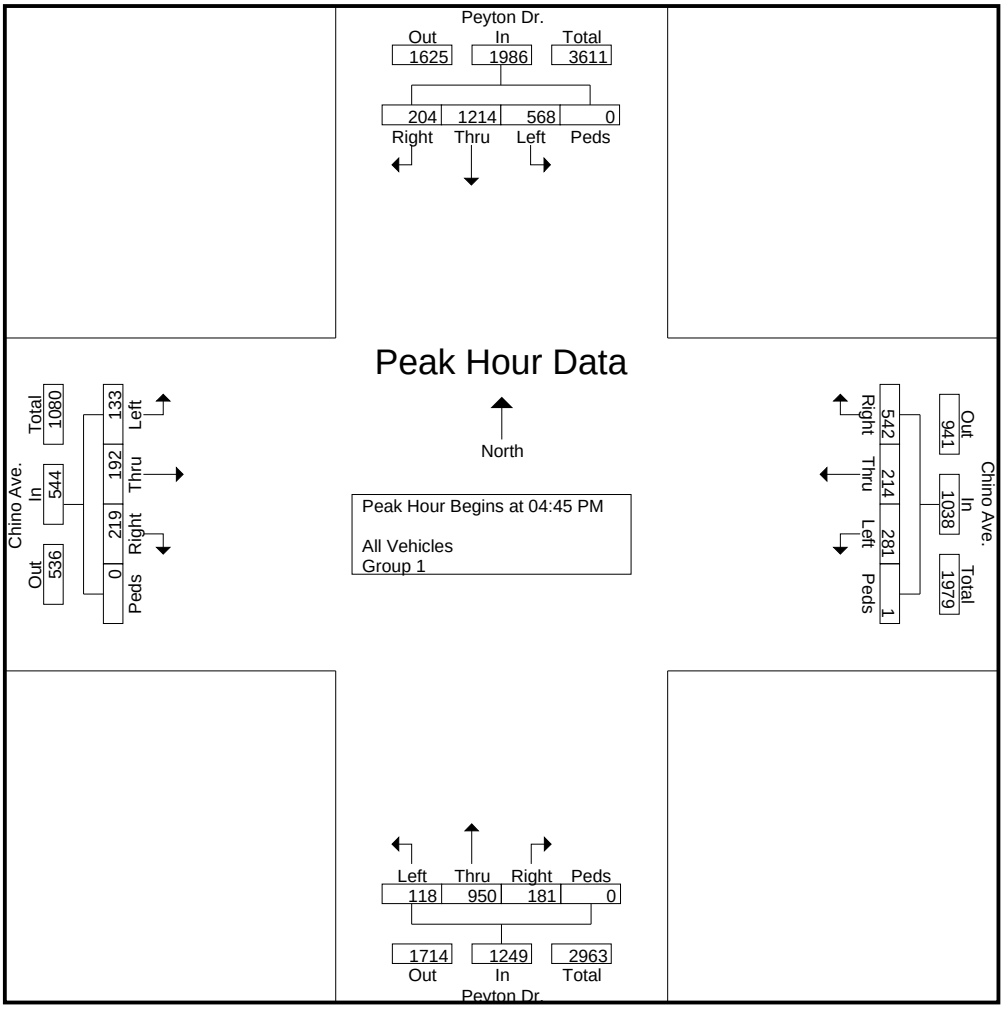
File Name : Loc10_Nov13
Site Code : 010
Start Date : 11/13/2012
Page No : 4

	Chino Ave. Eastbound					Chino Ave. Westbound					Peyton Dr. Northbound					Peyton Dr. Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	24	51	44	0	119	**82**	49	134	0	265	26	**260**	48	0	**334**	114	266	42	0	422	1140
05:00 PM	**43**	39	55	0	137	60	51	**165**	0	276	29	226	44	0	299	**158**	**349**	**59**	0	**566**	**1278**
05:15 PM	37	38	**62**	0	137	71	32	113	**1**	217	**32**	241	**49**	0	322	140	282	48	0	470	1146
05:30 PM	29	**64**	58	0	**151**	68	**82**	130	0	**280**	31	223	40	0	294	156	317	55	0	528	1253
Total Volume	133	192	219	0	544	281	214	542	1	1038	118	950	181	0	1249	568	1214	204	0	1986	4817
% App. Total	24.4	35.3	40.3	0		27.1	20.6	52.2	0.1		9.4	76.1	14.5	0		28.6	61.1	10.3	0		
PHF	.773	.750	.883	.000	.901	.857	.652	.821	.250	.927	.922	.913	.923	.000	.935	.899	.870	.864	.000	.877	.942



APPENDIX B:
Synchro 8.0 Level of Service Traffic Model Output Worksheets

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	26	1158	144	100	436	302	663	230	75	327	471	539
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	180.0	176.5	176.5	180.0	176.5	176.5	180.0	176.5	176.5	176.5
Lanes	1	3	0	2	3	0	2	2	0	2	1	2
Cap, veh/h	38	1282	160	145	1058	450	725	938	300	437	490	967
Arrive On Green	0.02	0.28	0.28	0.04	0.30	0.30	0.22	0.37	0.37	0.13	0.28	0.28
Sat Flow, veh/h	1681	4617	576	3261	3529	1500	3261	2564	820	3261	1765	3000
Grp Volume(v), veh/h	28	962	454	109	474	328	721	170	162	355	512	586
Grp Sat Flow(s),veh/h/ln	1681	1765	1663	1630	1765	1500	1630	1765	1620	1630	1765	1500
Q Serve(g_s), s	1.5	24.4	24.4	3.0	9.8	17.6	19.9	6.1	6.3	9.5	25.0	14.8
Cycle Q Clear(g_c), s	1.5	24.4	24.4	3.0	9.8	17.6	19.9	6.1	6.3	9.5	25.0	14.8
Prop In Lane	1.00		0.35	1.00		1.00	1.00		0.51	1.00		1.00
Lane Grp Cap(c), veh/h	38	980	462	145	1058	450	725	646	593	437	490	967
V/C Ratio(X)	0.74	0.98	0.98	0.75	0.45	0.73	1.00	0.26	0.27	0.81	1.04	0.61
Avail Cap(c_a), veh/h	93	980	462	145	1058	450	725	646	593	580	490	967
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.7	32.3	32.3	42.5	25.5	28.2	35.0	20.0	20.1	37.9	32.5	25.7
Incr Delay (d2), s/veh	24.8	24.7	37.6	19.6	1.4	10.0	32.1	0.2	0.2	6.5	52.7	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.9	13.9	14.8	1.6	4.5	7.8	11.2	2.7	2.6	4.3	18.1	5.6
Lane Grp Delay (d), s/veh	68.5	56.9	69.9	62.1	26.9	38.2	67.1	20.2	20.3	44.4	85.2	26.8
Lane Grp LOS	E	E	E	E	C	D	E	C	C	D	F	C
Approach Vol, veh/h		1444			911			1053			1453	
Approach Delay, s/veh		61.2			35.2			52.3			51.7	
Approach LOS		E			D			D			D	

Timer												
Assigned Phs	5	2		1	6		7	4		3	8	
Phs Duration (G+Y+Rc), s	6.0	29.0		8.0	31.0		24.0	36.9		16.1	29.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	5.0	25.0		4.0	24.0		20.0	29.0		16.0	25.0	
Max Q Clear Time (g_c+I1), s	3.5	26.4		5.0	19.6		21.9	8.3		11.5	27.0	
Green Ext Time (p_c), s	0.0	0.0		0.0	3.9		0.0	8.3		0.5	0.0	

Intersection Summary			
HCM 2010 Ctrl Delay			51.6
HCM 2010 LOS			D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	335	1000	75	129	1104	286	270	426	305	250	225	145
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	180.0
Lanes	1	3	1	1	2	1	1	2	0	1	2	0
Cap, veh/h	321	2166	614	168	1123	477	320	384	274	244	317	197
Arrive On Green	0.19	0.41	0.41	0.10	0.32	0.32	0.19	0.20	0.20	0.15	0.16	0.16
Sat Flow, veh/h	1681	5294	1500	1681	3529	1500	1681	1918	1370	1681	2040	1266
Grp Volume(v), veh/h	364	1087	82	140	1200	311	293	426	369	272	211	192
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1681	1765	1500	1681	1765	1523	1681	1765	1541
Q Serve(g_s), s	21.0	16.8	3.8	9.0	35.0	19.6	18.8	22.0	22.0	16.0	12.6	13.2
Cycle Q Clear(g_c), s	21.0	16.8	3.8	9.0	35.0	19.6	18.8	22.0	22.0	16.0	12.6	13.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.90	1.00		0.82
Lane Grp Cap(c), veh/h	321	2166	614	168	1123	477	320	353	305	244	274	239
V/C Ratio(X)	1.13	0.50	0.13	0.83	1.07	0.65	0.92	1.21	1.21	1.11	0.77	0.80
Avail Cap(c_a), veh/h	321	2166	614	260	1123	477	336	353	305	244	274	239
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.5	24.2	20.3	48.6	37.5	32.3	43.7	44.0	44.0	47.0	44.6	44.8
Incr Delay (d2), s/veh	91.7	0.2	0.1	12.6	47.2	3.1	28.2	116.6	121.9	91.1	18.6	24.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	17.2	7.5	1.4	4.5	22.8	7.8	10.6	21.3	18.9	13.0	7.1	6.8
Lane Grp Delay (d), s/veh	136.2	24.4	20.4	61.2	84.7	35.4	71.9	160.6	165.9	138.1	63.1	69.1
Lane Grp LOS	F	C	C	E	F	D	E	F	F	F	E	E
Approach Vol, veh/h		1533			1651			1088			675	
Approach Delay, s/veh		50.7			73.4			138.5			95.0	
Approach LOS		D			E			F			F	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	25.0	49.0		15.0	39.0		24.9	26.0		20.0	21.1	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	21.0	39.0		17.0	35.0		22.0	22.0		16.0	16.0	
Max Q Clear Time (g_c+I1), s	23.0	18.8		11.0	37.0		20.8	24.0		18.0	15.2	
Green Ext Time (p_c), s	0.0	16.7		0.2	0.0		0.1	0.0		0.0	0.5	

Intersection Summary	
HCM 2010 Ctrl Delay	83.6
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	244	547	71	238	1068	225	551	474	600	235	214	292
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	176.5
Lanes	2	2	1	2	2	1	2	2	0	1	2	1
Cap, veh/h	267	1096	466	321	1155	491	676	529	450	244	840	480
Arrive On Green	0.08	0.31	0.31	0.10	0.33	0.33	0.21	0.30	0.30	0.15	0.24	0.24
Sat Flow, veh/h	3261	3529	1500	3261	3529	1500	3261	1765	1500	1681	3529	1500
Grp Volume(v), veh/h	265	595	77	259	1161	245	599	515	652	255	233	317
Grp Sat Flow(s),veh/h/ln	1630	1765	1500	1630	1765	1500	1630	1765	1500	1681	1765	1500
Q Serve(g_s), s	8.9	15.4	4.1	8.6	36.0	14.4	19.6	31.7	33.0	16.0	5.9	20.0
Cycle Q Clear(g_c), s	8.9	15.4	4.1	8.6	36.0	14.4	19.6	31.7	33.0	16.0	5.9	20.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	267	1096	466	321	1155	491	676	529	450	244	840	480
V/C Ratio(X)	0.99	0.54	0.17	0.81	1.01	0.50	0.89	0.97	1.45	1.04	0.28	0.66
Avail Cap(c_a), veh/h	267	1096	466	415	1155	491	800	529	450	244	840	480
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.5	31.4	27.6	48.5	37.0	29.8	42.3	38.1	38.5	47.0	34.2	32.3
Incr Delay (d2), s/veh	53.2	0.6	0.2	8.7	27.7	0.8	10.4	32.9	214.2	69.3	0.8	7.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	5.7	6.9	1.6	4.0	20.3	5.6	9.2	18.9	39.1	11.6	2.7	8.5
Lane Grp Delay (d), s/veh	103.6	32.0	27.7	57.2	64.7	30.5	52.7	71.0	252.7	116.3	35.0	39.2
Lane Grp LOS	F	C	C	E	F	C	D	E	F	F	D	D
Approach Vol, veh/h		937			1665			1766			805	
Approach Delay, s/veh		51.9			58.5			131.9			62.4	
Approach LOS		D			E			F			E	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	13.0	38.2		14.8	40.0		26.8	37.0		20.0	30.2	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	9.0	31.0		14.0	36.0		27.0	33.0		16.0	22.0	
Max Q Clear Time (g_c+I1), s	10.9	17.4		10.6	38.0		21.6	35.0		18.0	22.0	
Green Ext Time (p_c), s	0.0	10.2		0.3	0.0		1.2	0.0		0.0	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	83.0
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	331	871	530	213	969	131	522	750	272	248	659	316
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0
Lanes	2	2	1	2	2	1	2	3	1	2	3	0
Cap, veh/h	400	1233	524	301	1126	478	582	1064	301	582	709	301
Arrive On Green	0.12	0.35	0.35	0.09	0.32	0.32	0.18	0.20	0.20	0.18	0.20	0.20
Sat Flow, veh/h	3261	3529	1500	3261	3529	1500	3261	5294	1500	3261	3529	1500
Grp Volume(v), veh/h	360	947	576	232	1053	142	567	815	296	270	716	343
Grp Sat Flow(s),veh/h/ln	1630	1765	1500	1630	1765	1500	1630	1765	1500	1630	1765	1500
Q Serve(g_s), s	9.8	21.4	31.3	6.2	25.9	6.4	15.5	13.0	17.6	6.6	18.0	18.0
Cycle Q Clear(g_c), s	9.8	21.4	31.3	6.2	25.9	6.4	15.5	13.0	17.6	6.6	18.0	18.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	400	1233	524	301	1126	478	582	1064	301	582	709	301
V/C Ratio(X)	0.90	0.77	1.10	0.77	0.94	0.30	0.97	0.77	0.98	0.46	1.01	1.14
Avail Cap(c_a), veh/h	400	1233	524	328	1143	486	582	1064	301	582	709	301
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.7	25.9	29.1	39.7	29.6	22.9	36.6	33.8	35.6	32.9	35.8	35.8
Incr Delay (d2), s/veh	22.5	3.0	69.1	10.0	13.8	0.3	30.5	5.3	47.5	2.6	36.1	94.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	5.3	9.8	21.5	3.0	13.3	2.4	8.8	6.3	10.5	3.0	11.5	14.7
Lane Grp Delay (d), s/veh	61.3	28.9	98.2	49.7	43.4	23.3	67.1	39.1	83.1	35.6	71.9	130.2
Lane Grp LOS	E	C	F	D	D	C	E	D	F	D	F	F
Approach Vol, veh/h		1883			1427			1678			1329	
Approach Delay, s/veh		56.3			42.4			56.3			79.6	
Approach LOS		E			D			E			E	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	15.0	35.3		12.3	32.6		20.0	22.0		20.0	22.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	11.0	31.0		9.0	29.0		16.0	18.0		16.0	18.0	
Max Q Clear Time (g_c+I1), s	11.8	33.3		8.2	27.9		17.5	19.6		8.6	20.0	
Green Ext Time (p_c), s	0.0	0.0		0.1	0.6		0.0	0.0		0.5	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	58.1
HCM 2010 LOS	E

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	349	401	207	139	415	140	213	560	252	203	827	221
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	180.0
Lanes	1	3	1	1	2	1	2	3	0	2	3	0
Cap, veh/h	402	1517	430	185	555	236	594	844	359	594	964	256
Arrive On Green	0.24	0.29	0.29	0.11	0.16	0.16	0.18	0.24	0.24	0.18	0.24	0.24
Sat Flow, veh/h	1681	5294	1500	1681	3529	1500	3261	3529	1500	3261	4033	1072
Grp Volume(v), veh/h	379	436	225	151	451	152	232	609	274	221	786	353
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1681	1765	1500	1630	1765	1500	1630	1765	1576
Q Serve(g_s), s	19.5	5.6	11.1	7.7	10.8	8.3	5.5	13.9	14.9	5.2	19.2	19.3
Cycle Q Clear(g_c), s	19.5	5.6	11.1	7.7	10.8	8.3	5.5	13.9	14.9	5.2	19.2	19.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.68
Lane Grp Cap(c), veh/h	402	1517	430	185	555	236	594	844	359	594	844	377
V/C Ratio(X)	0.94	0.29	0.52	0.82	0.81	0.64	0.39	0.72	0.76	0.37	0.93	0.94
Avail Cap(c_a), veh/h	402	1517	430	306	643	273	594	844	359	594	844	377
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.8	24.4	26.3	38.2	35.7	34.7	31.6	30.7	31.1	31.5	32.7	32.8
Incr Delay (d2), s/veh	30.7	0.1	1.2	8.5	6.9	4.1	1.9	5.3	14.3	1.8	18.2	32.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	11.5	2.5	4.2	3.8	5.3	3.4	2.4	6.7	7.0	2.3	10.5	11.0
Lane Grp Delay (d), s/veh	63.5	24.5	27.5	46.7	42.6	38.8	33.5	36.0	45.4	33.3	50.9	65.5
Lane Grp LOS	E	C	C	D	D	D	C	D	D	C	D	E
Approach Vol, veh/h		1040			754			1115			1360	
Approach Delay, s/veh		39.3			42.7			37.8			51.9	
Approach LOS		D			D			D			D	

Timer												
Assigned Phs	7	4		3	8		1	6		5	2	
Phs Duration (G+Y+Rc), s	25.0	29.2		13.7	17.8		20.0	25.0		20.0	25.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	21.0	21.0		16.0	16.0		16.0	21.0		16.0	21.0	
Max Q Clear Time (g_c+I1), s	21.5	13.1		9.7	12.8		7.5	16.9		7.2	21.3	
Green Ext Time (p_c), s	0.0	4.3		0.2	1.0		0.5	3.5		0.5	0.0	

Intersection Summary			
HCM 2010 Ctrl Delay		43.5	
HCM 2010 LOS		D	

Notes

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	349	521	1610	630	839	819
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	0.86	0.86	0.97	0.91
Frt	0.94	0.85	0.99	0.85	1.00	1.00
Flt Protected	0.97	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3120	1365	4501	1290	3252	4818
Flt Permitted	0.97	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3120	1365	4501	1290	3252	4818
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	379	566	1750	685	912	890
RTOR Reduction (vph)	142	2	10	255	0	0
Lane Group Flow (vph)	503	298	1884	286	912	890
Turn Type	NA	pm+ov	NA	Perm	Prot	NA
Protected Phases	8	1	2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	15.9	40.9	37.0	37.0	25.0	66.0
Effective Green, g (s)	15.9	40.9	37.0	37.0	25.0	66.0
Actuated g/C Ratio	0.18	0.45	0.41	0.41	0.28	0.73
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	551	681	1852	530	904	3537
v/s Ratio Prot	c0.16	0.12	c0.42		c0.28	0.18
v/s Ratio Perm		0.10		0.22		
v/c Ratio	0.91	0.44	1.02	0.54	1.01	0.25
Uniform Delay, d1	36.3	16.7	26.5	20.0	32.5	3.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	19.5	0.5	25.3	3.9	32.1	0.2
Delay (s)	55.8	17.1	51.8	23.9	64.6	4.1
Level of Service	E	B	D	C	E	A
Approach Delay (s)	43.5		45.6			34.7
Approach LOS	D		D			C

Intersection Summary			
HCM 2000 Control Delay	41.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	89.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	89.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	8	64	27	121	12	27	6	335	190	97	497	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		0.97	0.95	0.95	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.96		1.00	0.94	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	1687		3252	1574	1425	1676	3353	1500	3252	3353	1500
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1676	1687		3252	1574	1425	1676	3353	1500	3252	3353	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	70	29	132	13	29	7	364	207	105	540	5
RTOR Reduction (vph)	0	25	0	0	7	15	0	0	100	0	0	3
Lane Group Flow (vph)	9	74	0	132	15	5	7	364	107	105	540	2
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases						8			2			6
Actuated Green, G (s)	0.7	8.8		6.0	14.1	14.1	0.7	23.7	29.7	3.1	26.1	26.1
Effective Green, g (s)	0.7	8.8		6.0	14.1	14.1	0.7	23.7	29.7	3.1	26.1	26.1
Actuated g/C Ratio	0.01	0.15		0.10	0.24	0.24	0.01	0.41	0.52	0.05	0.45	0.45
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	20	257		338	385	348	20	1379	877	175	1519	679
v/s Ratio Prot	0.01	c0.04		c0.04	0.01		0.00	0.11	0.01	c0.03	c0.16	
v/s Ratio Perm						0.00			0.06			0.00
v/c Ratio	0.45	0.29		0.39	0.04	0.01	0.35	0.26	0.12	0.60	0.36	0.00
Uniform Delay, d1	28.3	21.6		24.1	16.6	16.5	28.2	11.2	7.2	26.6	10.3	8.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.3	0.6		0.7	0.0	0.0	10.3	0.5	0.1	5.5	0.7	0.0
Delay (s)	43.5	22.3		24.8	16.6	16.5	38.5	11.7	7.3	32.1	10.9	8.6
Level of Service	D	C		C	B	B	D	B	A	C	B	A
Approach Delay (s)		24.0			22.8			10.4			14.3	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	57.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	38.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	483	582	1246	704	19	258	2	339	0	1	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		1.00	0.95	0.95		1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.85	0.85		1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		1.00	
Satd. Flow (prot)	1676	3353	1500	3252	3340		1676	1428	1425		1765	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.76	1.00	1.00		1.00	
Satd. Flow (perm)	1676	3353	1500	3252	3340		1336	1428	1425		1765	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	525	633	1354	765	21	280	2	368	0	1	0
RTOR Reduction (vph)	0	0	304	0	2	0	0	146	146	0	0	0
Lane Group Flow (vph)	2	525	329	1354	784	0	280	40	38	0	1	0
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	7	4		3				2			6	
Permitted Phases			4		8		2		2	6		
Actuated Green, G (s)	0.8	20.2	20.2	34.0	53.4		17.0	17.0	17.0		17.0	
Effective Green, g (s)	0.8	20.2	20.2	34.0	53.4		17.0	17.0	17.0		17.0	
Actuated g/C Ratio	0.01	0.24	0.24	0.41	0.64		0.20	0.20	0.20		0.20	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	16	814	364	1328	2143		272	291	291		360	
v/s Ratio Prot	0.00	0.16		c0.42				0.03			0.00	
v/s Ratio Perm			c0.22		0.23		c0.21		0.03			
v/c Ratio	0.12	0.64	0.90	1.02	0.37		1.03	0.14	0.13		0.00	
Uniform Delay, d1	40.9	28.3	30.6	24.6	7.0		33.1	27.1	27.1		26.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	3.5	1.8	25.0	29.7	0.1		62.4	1.0	0.9		0.0	
Delay (s)	44.4	30.0	55.5	54.3	7.1		95.5	28.1	28.0		26.4	
Level of Service	D	C	E	D	A		F	C	C		C	
Approach Delay (s)		44.0			37.0			57.1			26.4	
Approach LOS		D			D			E			C	

Intersection Summary			
HCM 2000 Control Delay	42.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	83.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	384	130	6	159	184	406	6	1141	54	402	440	295
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	0.95	0.95	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.94	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	1752		1676	1574	1425	1676	1753		1676	1765	1500
Flt Permitted	0.15	1.00		0.59	1.00	1.00	0.49	1.00		0.05	1.00	1.00
Satd. Flow (perm)	261	1752		1040	1574	1425	865	1753		89	1765	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	417	141	7	173	200	441	7	1240	59	437	478	321
RTOR Reduction (vph)	0	1	0	0	16	26	0	1	0	0	0	123
Lane Group Flow (vph)	417	147	0	173	321	278	7	1298	0	437	478	198
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	46.0	27.7		37.3	23.0	43.0	76.0	75.2		99.2	94.4	94.4
Effective Green, g (s)	46.0	27.7		37.3	23.0	43.0	76.0	75.2		99.2	94.4	94.4
Actuated g/C Ratio	0.30	0.18		0.24	0.15	0.28	0.50	0.49		0.65	0.62	0.62
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	253	316		312	236	437	433	860		264	1087	924
v/s Ratio Prot	c0.20	0.08		0.05	0.20	0.08	0.00	0.74		c0.22	0.27	
v/s Ratio Perm	c0.29			0.08		0.11	0.01			c0.85		0.13
v/c Ratio	1.65	0.47		0.55	1.36	0.64	0.02	1.51		1.66	0.44	0.21
Uniform Delay, d1	46.2	56.1		48.9	65.1	48.3	19.5	39.0		55.0	15.5	13.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	308.8	1.1		2.1	186.8	3.0	0.0	235.2		311.2	1.3	0.5
Delay (s)	355.0	57.2		51.0	251.9	51.3	19.5	274.2		366.3	16.8	13.5
Level of Service	F	E		D	F	D	B	F		F	B	B
Approach Delay (s)		277.0			134.3			272.9			139.5	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	202.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.71		
Actuated Cycle Length (s)	153.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	145.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Intersection Delay, s/veh	68.2

Movement	NBL	NBT	SBT	SBR	NEL	NER
Vol, veh/h	529	341	319	10	23	404
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	575	371	347	11	25	439

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	358	0	-	0	1873	352
Stage 1	-	-	-	-	352	-
Stage 2	-	-	-	-	1521	-
Follow-up Headway	2.218	-	-	-	3.518	3.318
Pot Capacity-1 Maneuver	1201	-	-	-	79	692
Stage 1	-	-	-	-	712	-
Stage 2	-	-	-	-	199	-
Time blocked-Platoon, %		-	-	-		
Mov Capacity-1 Maneuver	1201	-	-	-	31	692
Mov Capacity-2 Maneuver	-	-	-	-	31	-
Stage 1	-	-	-	-	712	-
Stage 2	-	-	-	-	79	-

Approach	NB	SB	NE
HCM Control Delay, s	6	0	246

Minor Lane / Major Mvmt	NELn1	NBL	NBT	SBT	SBR
Capacity (veh/h)	322	1201	-	-	-
HCM Lane V/C Ratio	1.441	0.479	-	-	-
HCM Control Delay (s)	246.3	10.719	0	-	-
HCM Lane LOS	F	B	A		
HCM 95th %tile Q(veh)	24.788	2.665	-	-	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	89	441	74	275	1010	411	661	237	73	171	250	219
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	180.0	176.5	176.5	180.0	176.5	176.5	180.0	176.5	176.5	176.5
Lanes	1	3	0	2	3	0	2	2	0	2	1	2
Cap, veh/h	112	1322	216	375	1238	504	764	861	258	258	308	869
Arrive On Green	0.07	0.30	0.30	0.12	0.35	0.35	0.23	0.33	0.33	0.08	0.17	0.17
Sat Flow, veh/h	1681	4441	725	3261	3580	1457	3261	2610	781	3261	1765	3000
Grp Volume(v), veh/h	97	378	181	299	1082	463	718	172	165	186	272	238
Grp Sat Flow(s),veh/h/ln	1681	1765	1637	1630	1765	1508	1630	1765	1627	1630	1765	1500
Q Serve(g_s), s	5.1	7.6	7.8	8.0	25.9	26.0	19.4	6.5	6.8	5.0	13.5	5.5
Cycle Q Clear(g_c), s	5.1	7.6	7.8	8.0	25.9	26.0	19.4	6.5	6.8	5.0	13.5	5.5
Prop In Lane	1.00		0.44	1.00		0.97	1.00		0.48	1.00		1.00
Lane Grp Cap(c), veh/h	112	1051	487	375	1220	521	764	582	536	258	308	869
V/C Ratio(X)	0.86	0.36	0.37	0.80	0.89	0.89	0.94	0.30	0.31	0.72	0.88	0.27
Avail Cap(c_a), veh/h	112	1051	487	473	1220	521	764	582	536	364	315	881
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.4	24.8	24.9	38.6	27.7	27.7	33.7	22.3	22.4	40.3	36.1	24.6
Incr Delay (d2), s/veh	45.4	1.0	2.2	7.4	9.7	19.6	19.5	0.3	0.3	4.1	23.9	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	3.6	3.4	3.4	3.7	12.9	12.5	9.9	2.9	2.8	2.2	8.0	2.0
Lane Grp Delay (d), s/veh	86.8	25.7	27.0	46.0	37.4	47.3	53.2	22.6	22.7	44.4	60.0	24.7
Lane Grp LOS	F	C	C	D	D	D	D	C	C	D	E	C
Approach Vol, veh/h		656			1844			1055			696	
Approach Delay, s/veh		35.1			41.3			43.4			43.8	
Approach LOS		D			D			D			D	

Timer												
Assigned Phs	5	2		1	6		7	4		3	8	
Phs Duration (G+Y+Rc), s	10.0	30.7		14.3	35.0		25.0	33.6		11.1	19.6	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	6.0	24.0		13.0	31.0		21.0	27.0		10.0	16.0	
Max Q Clear Time (g_c+I1), s	7.1	9.8		10.0	28.0		21.4	8.8		7.0	15.5	
Green Ext Time (p_c), s	0.0	11.0		0.3	2.7		0.0	4.5		0.2	0.2	

Intersection Summary	
HCM 2010 Ctrl Delay	41.3
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	415	1204	168	329	1269	486	204	462	184	456	726	263
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	180.0
Lanes	1	3	1	1	2	1	1	2	0	1	2	0
Cap, veh/h	325	1482	420	370	1082	460	168	449	178	347	726	263
Arrive On Green	0.19	0.28	0.28	0.22	0.31	0.31	0.10	0.19	0.19	0.21	0.29	0.29
Sat Flow, veh/h	1681	5294	1500	1681	3529	1500	1681	2407	954	1681	2475	896
Grp Volume(v), veh/h	451	1309	183	358	1379	528	222	367	335	496	562	513
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1681	1765	1500	1681	1765	1596	1681	1765	1607
Q Serve(g_s), s	29.0	35.5	15.0	31.7	46.0	46.0	15.0	28.0	28.0	31.0	44.0	44.0
Cycle Q Clear(g_c), s	29.0	35.5	15.0	31.7	46.0	46.0	15.0	28.0	28.0	31.0	44.0	44.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.60	1.00		0.56
Lane Grp Cap(c), veh/h	325	1482	420	370	1082	460	168	329	298	347	518	471
V/C Ratio(X)	1.39	0.88	0.44	0.97	1.27	1.15	1.32	1.11	1.12	1.43	1.09	1.09
Avail Cap(c_a), veh/h	325	1482	420	370	1082	460	168	329	298	347	518	471
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.5	51.7	44.3	58.0	52.0	52.0	67.5	61.0	61.0	59.5	53.0	53.0
Incr Delay (d2), s/veh	192.6	6.6	0.7	38.3	130.6	89.2	179.8	84.3	89.6	208.6	65.1	67.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	30.1	17.2	5.9	17.8	40.5	29.2	15.0	20.6	19.1	33.7	29.5	27.1
Lane Grp Delay (d), s/veh	253.1	58.3	45.0	96.3	182.6	141.2	247.3	145.3	150.6	268.1	118.1	120.2
Lane Grp LOS	F	E	D	F	F	F	F	F	F	F	F	F
Approach Vol, veh/h		1943			2265			924			1571	
Approach Delay, s/veh		102.3			159.3			171.7			166.1	
Approach LOS		F			F			F			F	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	33.0	46.0		37.0	50.0		19.0	32.0		35.0	48.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	29.0	42.0		33.0	46.0		15.0	28.0		31.0	44.0	
Max Q Clear Time (g_c+I1), s	31.0	37.5		33.7	48.0		17.0	30.0		33.0	46.0	
Green Ext Time (p_c), s	0.0	4.4		0.0	0.0		0.0	0.0		0.0	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	146.1
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	376	1693	676	463	760	141	277	419	245	369	776	250
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	176.5
Lanes	2	2	1	2	2	1	2	2	0	1	2	1
Cap, veh/h	463	1482	630	391	1404	597	283	363	211	303	941	613
Arrive On Green	0.14	0.42	0.42	0.12	0.40	0.40	0.09	0.17	0.17	0.18	0.27	0.27
Sat Flow, veh/h	3261	3529	1500	3261	3529	1500	3261	2097	1218	1681	3529	1500
Grp Volume(v), veh/h	409	1840	735	503	826	153	301	382	339	401	843	272
Grp Sat Flow(s),veh/h/ln	1630	1765	1500	1630	1765	1500	1630	1765	1550	1681	1765	1500
Q Serve(g_s), s	18.5	63.0	63.0	18.0	27.6	10.3	13.0	26.0	26.0	27.0	34.5	19.6
Cycle Q Clear(g_c), s	18.5	63.0	63.0	18.0	27.6	10.3	13.0	26.0	26.0	27.0	34.5	19.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.79	1.00		1.00
Lane Grp Cap(c), veh/h	463	1482	630	391	1404	597	283	306	269	303	941	613
V/C Ratio(X)	0.88	1.24	1.17	1.29	0.59	0.26	1.07	1.25	1.26	1.33	0.90	0.44
Avail Cap(c_a), veh/h	587	1482	630	391	1404	597	283	306	269	303	941	613
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	63.1	43.5	43.5	66.0	35.5	30.3	68.5	62.0	62.0	61.5	53.0	32.0
Incr Delay (d2), s/veh	12.4	114.5	91.4	146.7	0.6	0.2	71.8	136.8	143.7	167.7	12.9	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	8.7	51.8	40.0	15.7	12.6	4.0	8.4	23.6	21.2	25.9	17.5	7.9
Lane Grp Delay (d), s/veh	75.6	158.0	134.9	212.7	36.1	30.5	140.3	198.8	205.7	229.2	65.9	34.3
Lane Grp LOS	E	F	F	F	D	C	F	F	F	F	E	C
Approach Vol, veh/h		2984			1482			1022			1516	
Approach Delay, s/veh		141.0			95.5			183.8			103.4	
Approach LOS		F			F			F			F	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	25.3	67.0		22.0	63.7		17.0	30.0		31.0	44.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	27.0	63.0		18.0	54.0		13.0	26.0		27.0	40.0	
Max Q Clear Time (g_c+I1), s	20.5	65.0		20.0	29.6		15.0	28.0		29.0	36.5	
Green Ext Time (p_c), s	0.9	0.0		0.0	22.6		0.0	0.0		0.0	2.9	

Intersection Summary												
HCM 2010 Ctrl Delay			129.5									
HCM 2010 LOS			F									

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	519	1234	243	383	763	242	290	753	440	416	753	252
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0
Lanes	2	2	1	2	2	1	2	3	1	2	3	0
Cap, veh/h	632	1341	570	391	1080	459	326	953	270	522	913	304
Arrive On Green	0.19	0.38	0.38	0.12	0.31	0.31	0.10	0.18	0.18	0.16	0.24	0.24
Sat Flow, veh/h	3261	3529	1500	3261	3529	1500	3261	5294	1500	3261	3806	1265
Grp Volume(v), veh/h	564	1341	264	416	829	263	315	818	478	452	758	334
Grp Sat Flow(s),veh/h/ln	1630	1765	1500	1630	1765	1500	1630	1765	1500	1630	1765	1541
Q Serve(g_s), s	16.9	38.0	13.2	12.0	21.3	14.8	9.6	15.0	18.0	13.5	20.8	21.0
Cycle Q Clear(g_c), s	16.9	38.0	13.2	12.0	21.3	14.8	9.6	15.0	18.0	13.5	20.8	21.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.82
Lane Grp Cap(c), veh/h	632	1341	570	391	1080	459	326	953	270	522	847	370
V/C Ratio(X)	0.89	1.00	0.46	1.06	0.77	0.57	0.97	0.86	1.77	0.87	0.90	0.90
Avail Cap(c_a), veh/h	685	1341	570	391	1080	459	326	953	270	522	847	370
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.3	31.0	23.3	44.0	31.5	29.2	44.8	39.8	41.0	41.0	36.8	36.9
Incr Delay (d2), s/veh	13.3	24.5	0.6	63.3	3.4	1.7	40.7	9.9	361.4	17.4	14.0	27.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	8.1	21.0	4.9	8.4	9.9	5.7	5.8	7.5	33.9	6.8	10.8	11.0
Lane Grp Delay (d), s/veh	52.6	55.5	23.9	107.3	34.9	30.9	85.5	49.7	402.4	58.3	50.8	64.5
Lane Grp LOS	D	E	C	F	C	C	F	D	F	E	D	E
Approach Vol, veh/h		2169			1508			1611			1544	
Approach Delay, s/veh		50.9			54.1			161.3			55.9	
Approach LOS		D			D			F			E	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	23.4	42.0		16.0	34.6		14.0	22.0		20.0	28.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	21.0	38.0		12.0	29.0		10.0	18.0		16.0	24.0	
Max Q Clear Time (g_c+I1), s	18.9	40.0		14.0	23.3		11.6	20.0		15.5	23.0	
Green Ext Time (p_c), s	0.5	0.0		0.0	5.3		0.0	0.0		0.1	0.9	

Intersection Summary		
HCM 2010 Ctrl Delay		78.8
HCM 2010 LOS		E

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	133	192	219	281	214	542	568	1214	204	118	950	181
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	180.0
Lanes	1	3	1	1	2	1	2	3	0	2	3	0
Cap, veh/h	149	941	267	280	902	383	652	1326	223	580	1201	229
Arrive On Green	0.09	0.18	0.18	0.17	0.26	0.26	0.20	0.30	0.30	0.18	0.28	0.28
Sat Flow, veh/h	1681	5294	1500	1681	3529	1500	3261	4420	743	3261	4325	823
Grp Volume(v), veh/h	145	209	238	305	233	589	617	1054	488	128	843	387
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1681	1765	1500	1630	1765	1634	1630	1765	1619
Q Serve(g_s), s	7.7	3.0	14.0	15.0	4.7	23.0	16.8	26.8	26.8	3.0	20.4	20.4
Cycle Q Clear(g_c), s	7.7	3.0	14.0	15.0	4.7	23.0	16.8	26.8	26.8	3.0	20.4	20.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.45	1.00		0.51
Lane Grp Cap(c), veh/h	149	941	267	280	902	383	652	1059	490	580	980	450
V/C Ratio(X)	0.97	0.22	0.89	1.09	0.26	1.54	0.95	1.00	1.00	0.22	0.86	0.86
Avail Cap(c_a), veh/h	149	941	267	280	902	383	652	1059	490	580	980	450
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.9	31.7	36.2	37.5	26.7	33.5	35.5	31.4	31.4	31.7	30.8	30.9
Incr Delay (d2), s/veh	64.5	0.1	29.1	79.6	0.2	254.2	24.2	26.6	39.6	0.9	9.7	19.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	6.0	1.3	7.4	12.5	2.1	35.6	9.1	15.5	16.1	1.3	10.2	10.6
Lane Grp Delay (d), s/veh	105.4	31.8	65.3	117.1	26.9	287.7	59.8	58.0	71.1	32.5	40.6	49.9
Lane Grp LOS	F	C	E	F	C	F	E	E	E	C	D	D
Approach Vol, veh/h		592			1127			2159			1358	
Approach Delay, s/veh		63.3			187.6			61.5			42.5	
Approach LOS		E			F			E			D	

Timer												
Assigned Phs	7	4		3	8		1	6		5	2	
Phs Duration (G+Y+Rc), s	12.0	20.0		19.0	27.0		22.0	31.0		20.0	29.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	8.0	16.0		15.0	23.0		18.0	27.0		16.0	25.0	
Max Q Clear Time (g_c+I1), s	9.7	16.0		17.0	25.0		18.8	28.8		5.0	22.4	
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0		0.0	0.0		0.3	2.5	

Intersection Summary	
HCM 2010 Ctrl Delay	83.9
HCM 2010 LOS	F

Notes

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	33	161	1128	68	202	1799
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	0.86	0.86	0.97	0.91
Frt	0.89	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.99	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3015	1365	4549	1290	3252	4818
Flt Permitted	0.99	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3015	1365	4549	1290	3252	4818
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	175	1226	74	220	1955
RTOR Reduction (vph)	77	6	1	35	0	0
Lane Group Flow (vph)	47	81	1232	32	220	1955
Turn Type	NA	pm+ov	NA	Perm	Prot	NA
Protected Phases	8	1	2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	5.2	10.2	19.8	19.8	5.0	28.8
Effective Green, g (s)	5.2	10.2	19.8	19.8	5.0	28.8
Actuated g/C Ratio	0.12	0.24	0.47	0.47	0.12	0.69
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	373	461	2144	608	387	3303
v/s Ratio Prot	0.02	c0.02	0.27		0.07	c0.41
v/s Ratio Perm		0.04		0.02		
v/c Ratio	0.13	0.18	0.57	0.05	0.57	0.59
Uniform Delay, d1	16.4	12.6	8.0	6.0	17.5	3.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.2	1.1	0.2	1.9	0.8
Delay (s)	16.5	12.8	9.2	6.2	19.4	4.3
Level of Service	B	B	A	A	B	A
Approach Delay (s)	15.0		9.0			5.8
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	7.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	42.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	38	16	204	55	116	83	205	10	69	252	10
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		0.97	0.95	0.95	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.96		1.00	0.94	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	1687		3252	1579	1425	1676	3353	1500	3252	3353	1500
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1676	1687		3252	1579	1425	1676	3353	1500	3252	3353	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	41	17	222	60	126	90	223	11	75	274	11
RTOR Reduction (vph)	0	15	0	0	30	69	0	0	5	0	0	7
Lane Group Flow (vph)	7	43	0	222	68	19	90	223	6	75	274	4
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases						8			2			6
Actuated Green, G (s)	0.7	5.6		6.2	11.1	11.1	3.3	21.6	27.8	2.2	20.5	20.5
Effective Green, g (s)	0.7	5.6		6.2	11.1	11.1	3.3	21.6	27.8	2.2	20.5	20.5
Actuated g/C Ratio	0.01	0.11		0.12	0.22	0.22	0.06	0.42	0.54	0.04	0.40	0.40
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	22	183		390	339	306	107	1403	924	138	1332	595
v/s Ratio Prot	0.00	0.03		c0.07	c0.04		c0.05	0.07	0.00	0.02	c0.08	
v/s Ratio Perm						0.01			0.00			0.00
v/c Ratio	0.32	0.23		0.57	0.20	0.06	0.84	0.16	0.01	0.54	0.21	0.01
Uniform Delay, d1	25.2	21.0		21.4	16.6	16.1	23.9	9.3	5.5	24.2	10.2	9.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.2	0.7		1.9	0.3	0.1	41.8	0.2	0.0	4.3	0.3	0.0
Delay (s)	33.4	21.7		23.3	16.9	16.2	65.7	9.6	5.5	28.5	10.6	9.4
Level of Service	C	C		C	B	B	E	A	A	C	B	A
Approach Delay (s)		23.0			20.3			25.0			14.3	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	19.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	51.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	35.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	1185	186	377	633	9	469	1	2056	2	2	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		0.97	0.95		1.00	0.95	0.95	1.00	1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.85	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	3285		3252	3346		1676	1425	1425	1676	1765	
Flt Permitted	0.95	1.00		0.95	1.00		0.76	1.00	1.00	0.05	1.00	
Satd. Flow (perm)	1676	3285		3252	3346		1335	1425	1425	93	1765	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1288	202	410	688	10	510	1	2235	2	2	0
RTOR Reduction (vph)	0	8	0	0	1	0	0	96	96	0	0	0
Lane Group Flow (vph)	1	1482	0	410	697	0	510	1023	1021	2	2	0
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	7	4		3				2			6	
Permitted Phases					8		2		2	6		
Actuated Green, G (s)	0.8	51.2		14.0	64.4		76.0	76.0	76.0	76.0	76.0	
Effective Green, g (s)	0.8	51.2		14.0	64.4		76.0	76.0	76.0	76.0	76.0	
Actuated g/C Ratio	0.01	0.33		0.09	0.42		0.50	0.50	0.50	0.50	0.50	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	8	1097		297	1406		662	706	706	46	875	
v/s Ratio Prot	0.00	c0.45		c0.13				c0.72			0.00	
v/s Ratio Perm					0.21		0.38		0.72	0.02		
v/c Ratio	0.12	1.35		1.38	0.50		0.77	1.45	1.45	0.04	0.00	
Uniform Delay, d1	75.9	51.0		69.6	32.5		31.5	38.6	38.6	19.9	19.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.9	164.0		190.9	0.3		5.5	209.8	208.6	1.8	0.0	
Delay (s)	82.8	215.0		260.5	32.8		37.0	248.4	247.2	21.7	19.5	
Level of Service	F	F		F	C		D	F	F	C	B	
Approach Delay (s)		214.9			117.1			208.6			20.6	
Approach LOS		F			F			F			C	

Intersection Summary			
HCM 2000 Control Delay	191.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.40		
Actuated Cycle Length (s)	153.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	143.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	334	433	35	187	526	243	160	888	147	287	861	590
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	0.95	0.95	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.99	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	1745		1676	1666	1425	1676	1727		1676	1765	1500
Flt Permitted	0.12	1.00		0.13	1.00	1.00	0.07	1.00		0.06	1.00	1.00
Satd. Flow (perm)	208	1745		228	1666	1425	122	1727		114	1765	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	363	471	38	203	572	264	174	965	160	312	936	641
RTOR Reduction (vph)	0	2	0	0	2	38	0	4	0	0	0	147
Lane Group Flow (vph)	363	507	0	203	596	200	174	1121	0	312	936	494
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	48.0	34.0		42.0	31.0	42.0	64.0	58.0		73.0	63.0	63.0
Effective Green, g (s)	48.0	34.0		42.0	31.0	42.0	64.0	58.0		73.0	63.0	63.0
Actuated g/C Ratio	0.37	0.26		0.32	0.24	0.32	0.49	0.45		0.56	0.48	0.48
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	234	456		196	397	504	131	770		196	855	726
v/s Ratio Prot	c0.17	0.29		0.09	0.36	0.03	0.06	0.65		c0.13	0.53	
v/s Ratio Perm	c0.40			0.25		0.11	0.59			c0.76		0.33
v/c Ratio	1.55	1.11		1.04	1.50	0.40	1.33	1.46		1.59	1.09	0.68
Uniform Delay, d1	36.9	48.0		38.0	49.5	34.2	32.6	36.0		41.6	33.5	25.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	268.1	76.1		74.0	238.9	0.5	190.8	212.1		289.1	59.9	5.1
Delay (s)	305.0	124.1		112.0	288.4	34.7	223.3	248.1		330.7	93.4	30.9
Level of Service	F	F		F	F	C	F	F		F	F	C
Approach Delay (s)		199.4			195.8			244.8			111.4	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	177.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.64		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	142.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Intersection Delay, s/veh	4.8

Movement	NBL	NBT	SBT	SBR	NEL	NER
Vol, veh/h	155	244	244	29	30	171
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	168	265	265	32	33	186

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	297	0	-	0	883	281
Stage 1	-	-	-	-	281	-
Stage 2	-	-	-	-	602	-
Follow-up Headway	2.218	-	-	-	3.518	3.318
Pot Capacity-1 Maneuver	1264	-	-	-	316	758
Stage 1	-	-	-	-	767	-
Stage 2	-	-	-	-	547	-
Time blocked-Platoon, %		-	-	-		
Mov Capacity-1 Maneuver	1264	-	-	-	267	758
Mov Capacity-2 Maneuver	-	-	-	-	267	-
Stage 1	-	-	-	-	767	-
Stage 2	-	-	-	-	462	-

Approach	NB	SB	NE
HCM Control Delay, s	3	0	14

Minor Lane / Major Mvmt	NELn1	NBL	NBT	SBT	SBR
Capacity (veh/h)	595	1264	-	-	-
HCM Lane V/C Ratio	0.367	0.133	-	-	-
HCM Control Delay (s)	14.5	8.286	0	-	-
HCM Lane LOS	B	A	A		
HCM 95th %tile Q(veh)	1.681	0.46	-	-	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	26	1158	144	100	436	302	663	230	75	327	471	539
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	180.0	176.5	176.5	180.0	176.5	176.5	180.0	176.5	176.5	176.5
Lanes	1	3	0	2	3	0	2	2	0	2	1	2
Cap, veh/h	42	1283	160	145	1049	446	725	896	287	490	490	967
Arrive On Green	0.02	0.28	0.28	0.04	0.30	0.30	0.22	0.35	0.35	0.15	0.28	0.28
Sat Flow, veh/h	1681	4617	575	3261	3529	1500	3261	2562	822	3261	1765	3000
Grp Volume(v), veh/h	33	1116	526	126	550	381	836	198	187	412	594	680
Grp Sat Flow(s),veh/h/ln	1681	1765	1663	1630	1765	1500	1630	1765	1620	1630	1765	1500
Q Serve(g_s), s	1.8	25.0	25.0	3.5	11.7	21.5	20.0	7.4	7.6	11.1	25.0	17.9
Cycle Q Clear(g_c), s	1.8	25.0	25.0	3.5	11.7	21.5	20.0	7.4	7.6	11.1	25.0	17.9
Prop In Lane	1.00		0.35	1.00		1.00	1.00		0.51	1.00		1.00
Lane Grp Cap(c), veh/h	42	980	462	145	1049	446	725	617	566	490	490	967
V/C Ratio(X)	0.79	1.14	1.14	0.87	0.52	0.85	1.15	0.32	0.33	0.84	1.21	0.70
Avail Cap(c_a), veh/h	93	980	462	145	1049	446	725	617	566	580	490	967
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.6	32.5	32.5	42.7	26.3	29.8	35.0	21.4	21.5	37.2	32.5	26.7
Incr Delay (d2), s/veh	26.7	74.7	85.8	39.4	1.9	18.5	84.5	0.3	0.3	9.4	113.0	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	1.1	21.1	21.3	2.2	5.4	10.3	16.7	3.2	3.1	5.2	26.3	6.8
Lane Grp Delay (d), s/veh	70.3	107.2	118.3	82.1	28.2	48.3	119.5	21.7	21.9	46.5	145.5	29.1
Lane Grp LOS	E	F	F	F	C	D	F	C	C	D	F	C
Approach Vol, veh/h		1675			1057			1221			1686	
Approach Delay, s/veh		110.0			41.9			88.7			74.4	
Approach LOS		F			D			F			E	

Timer												
Assigned Phs	5	2		1	6		7	4		3	8	
Phs Duration (G+Y+Rc), s	6.2	29.0		8.0	30.8		24.0	35.5		17.5	29.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	5.0	25.0		4.0	24.0		20.0	29.0		16.0	25.0	
Max Q Clear Time (g_c+I1), s	3.8	27.0		5.5	23.5		22.0	9.6		13.1	27.0	
Green Ext Time (p_c), s	0.0	0.0		0.0	0.4		0.0	9.6		0.5	0.0	

Intersection Summary												
HCM 2010 Ctrl Delay			82.0									
HCM 2010 LOS			F									

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	335	1000	75	129	1104	286	270	426	305	250	225	145
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	180.0
Lanes	1	3	1	1	2	1	1	2	0	1	2	0
Cap, veh/h	321	2091	593	192	1123	477	336	383	274	244	296	185
Arrive On Green	0.19	0.40	0.40	0.11	0.32	0.32	0.20	0.20	0.20	0.15	0.15	0.15
Sat Flow, veh/h	1681	5294	1500	1681	3529	1500	1681	1915	1372	1681	2034	1271
Grp Volume(v), veh/h	422	1261	95	163	1392	361	340	495	427	315	245	222
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1681	1765	1500	1681	1765	1523	1681	1765	1540
Q Serve(g_s), s	21.0	20.8	4.5	10.5	35.0	23.8	22.0	22.0	22.0	16.0	15.2	15.8
Cycle Q Clear(g_c), s	21.0	20.8	4.5	10.5	35.0	23.8	22.0	22.0	22.0	16.0	15.2	15.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.90	1.00		0.83
Lane Grp Cap(c), veh/h	321	2091	593	192	1123	477	336	353	305	244	257	224
V/C Ratio(X)	1.32	0.60	0.16	0.85	1.24	0.76	1.01	1.40	1.40	1.29	0.96	0.99
Avail Cap(c_a), veh/h	321	2091	593	260	1123	477	336	353	305	244	257	224
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.5	26.4	21.5	47.8	37.5	33.7	44.0	44.0	44.0	47.0	46.6	46.9
Incr Delay (d2), s/veh	162.3	0.5	0.1	17.6	115.5	6.8	52.0	197.3	199.9	157.0	45.8	57.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	23.5	9.2	1.7	5.5	33.5	9.8	14.3	29.2	25.4	17.5	10.1	9.8
Lane Grp Delay (d), s/veh	206.8	26.9	21.6	65.4	153.0	40.5	96.0	241.3	243.9	204.0	92.5	104.4
Lane Grp LOS	F	C	C	E	F	D	F	F	F	F	F	F
Approach Vol, veh/h		1778			1916			1262			782	
Approach Delay, s/veh		69.3			124.4			203.0			140.8	
Approach LOS		E			F			F			F	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	25.0	47.5		16.5	39.0		26.0	26.0		20.0	20.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	21.0	39.0		17.0	35.0		22.0	22.0		16.0	16.0	
Max Q Clear Time (g_c+I1), s	23.0	22.8		12.5	37.0		24.0	24.0		18.0	17.8	
Green Ext Time (p_c), s	0.0	14.8		0.2	0.0		0.0	0.0		0.0	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	126.9
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	244	547	71	238	1068	225	551	474	600	235	214	292
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	176.5
Lanes	2	2	1	2	2	1	2	2	0	2	2	1
Cap, veh/h	271	1076	457	361	1174	499	761	574	488	362	717	430
Arrive On Green	0.08	0.30	0.30	0.11	0.33	0.33	0.23	0.33	0.33	0.11	0.20	0.20
Sat Flow, veh/h	3261	3529	1500	3261	3529	1500	3261	1765	1500	3261	3529	1500
Grp Volume(v), veh/h	308	690	90	300	1347	284	695	598	757	296	270	368
Grp Sat Flow(s),veh/h/ln	1630	1765	1500	1630	1765	1500	1630	1765	1500	1630	1765	1500
Q Serve(g_s), s	9.0	18.3	4.8	9.8	36.0	16.9	22.5	35.2	35.2	9.6	7.1	22.0
Cycle Q Clear(g_c), s	9.0	18.3	4.8	9.8	36.0	16.9	22.5	35.2	35.2	9.6	7.1	22.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	271	1076	457	361	1174	499	761	574	488	362	717	430
V/C Ratio(X)	1.14	0.64	0.20	0.83	1.15	0.57	0.91	1.04	1.55	0.82	0.38	0.86
Avail Cap(c_a), veh/h	271	1076	457	422	1174	499	813	574	488	482	717	430
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.6	32.5	27.8	47.1	36.1	29.8	40.4	36.5	36.5	47.0	37.2	36.5
Incr Delay (d2), s/veh	96.5	1.3	0.2	11.6	76.8	1.5	14.1	48.7	257.8	8.0	1.5	19.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	7.4	8.3	1.8	4.7	28.5	6.5	10.8	23.6	48.4	4.4	3.4	11.7
Lane Grp Delay (d), s/veh	146.2	33.8	28.0	58.7	112.9	31.3	54.6	85.2	294.3	55.0	38.7	55.8
Lane Grp LOS	F	C	C	E	F	C	D	F	F	E	D	E
Approach Vol, veh/h		1088			1931			2050			934	
Approach Delay, s/veh		65.1			92.5			152.0			50.6	
Approach LOS		E			F			F			D	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	13.0	37.0		16.0	40.0		29.3	39.2		16.0	26.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	9.0	31.0		14.0	36.0		27.0	33.0		16.0	22.0	
Max Q Clear Time (g_c+I1), s	11.0	20.3		11.8	38.0		24.5	37.2		11.6	24.0	
Green Ext Time (p_c), s	0.0	9.1		0.2	0.0		0.8	0.0		0.4	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	101.4
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	331	871	530	213	969	131	522	750	272	248	659	316
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0
Lanes	2	2	1	2	2	1	2	3	1	2	3	0
Cap, veh/h	399	1216	517	326	1137	483	580	1059	300	580	706	300
Arrive On Green	0.12	0.34	0.34	0.10	0.32	0.32	0.18	0.20	0.20	0.18	0.20	0.20
Sat Flow, veh/h	3261	3529	1500	3261	3529	1500	3261	5294	1500	3261	3529	1500
Grp Volume(v), veh/h	417	1098	668	269	1222	165	658	946	343	313	831	398
Grp Sat Flow(s),veh/h/ln	1630	1765	1500	1630	1765	1500	1630	1765	1500	1630	1765	1500
Q Serve(g_s), s	11.0	26.6	31.0	7.3	29.0	7.5	16.0	15.7	18.0	7.9	18.0	18.0
Cycle Q Clear(g_c), s	11.0	26.6	31.0	7.3	29.0	7.5	16.0	15.7	18.0	7.9	18.0	18.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	399	1216	517	326	1137	483	580	1059	300	580	706	300
V/C Ratio(X)	1.05	0.90	1.29	0.83	1.07	0.34	1.14	0.89	1.14	0.54	1.18	1.33
Avail Cap(c_a), veh/h	399	1216	517	326	1137	483	580	1059	300	580	706	300
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.5	28.1	29.5	39.7	30.5	23.2	37.0	35.1	36.0	33.7	36.0	36.0
Incr Delay (d2), s/veh	57.7	9.6	145.7	15.7	49.1	0.4	80.5	11.5	96.5	3.6	94.1	168.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	7.7	13.1	32.3	3.7	20.2	2.8	13.0	8.0	14.8	3.5	17.2	20.8
Lane Grp Delay (d), s/veh	97.2	37.7	175.2	55.5	79.6	23.6	117.5	46.6	132.5	37.2	130.1	204.3
Lane Grp LOS	F	D	F	E	F	C	F	D	F	D	F	F
Approach Vol, veh/h		2183			1656			1947			1542	
Approach Delay, s/veh		91.1			70.1			85.7			130.4	
Approach LOS		F			E			F			F	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	15.0	35.0		13.0	33.0		20.0	22.0		20.0	22.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	11.0	31.0		9.0	29.0		16.0	18.0		16.0	18.0	
Max Q Clear Time (g_c+I1), s	13.0	33.0		9.3	31.0		18.0	20.0		9.9	20.0	
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0		0.0	0.0		0.6	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	93.2
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	349	401	207	139	415	140	213	560	252	203	827	221
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	180.0
Lanes	1	3	1	1	2	1	2	3	0	2	3	0
Cap, veh/h	395	1492	423	210	604	257	584	830	353	584	947	253
Arrive On Green	0.24	0.28	0.28	0.12	0.17	0.17	0.18	0.24	0.24	0.18	0.24	0.24
Sat Flow, veh/h	1681	5294	1500	1681	3529	1500	3261	3529	1500	3261	4028	1076
Grp Volume(v), veh/h	440	506	261	175	523	177	269	706	318	256	914	408
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1681	1765	1500	1630	1765	1500	1630	1765	1575
Q Serve(g_s), s	21.0	6.8	13.5	9.1	12.9	9.9	6.6	17.1	18.4	6.2	21.0	21.0
Cycle Q Clear(g_c), s	21.0	6.8	13.5	9.1	12.9	9.9	6.6	17.1	18.4	6.2	21.0	21.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.68
Lane Grp Cap(c), veh/h	395	1492	423	210	604	257	584	830	353	584	830	370
V/C Ratio(X)	1.11	0.34	0.62	0.84	0.87	0.69	0.46	0.85	0.90	0.44	1.10	1.10
Avail Cap(c_a), veh/h	395	1492	423	301	632	269	584	830	353	584	830	370
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.1	25.5	27.9	38.2	36.0	34.8	32.8	32.6	33.1	32.6	34.1	34.1
Incr Delay (d2), s/veh	79.6	0.1	2.7	12.8	11.7	6.9	2.6	10.6	28.4	2.4	62.6	77.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	17.6	3.0	5.3	4.6	6.6	4.2	2.9	8.8	9.7	2.8	16.6	16.3
Lane Grp Delay (d), s/veh	113.7	25.6	30.6	50.9	47.7	41.7	35.4	43.3	61.6	35.0	96.7	111.3
Lane Grp LOS	F	C	C	D	D	D	D	D	E	D	F	F
Approach Vol, veh/h		1207			875			1293			1578	
Approach Delay, s/veh		58.8			47.1			46.1			90.5	
Approach LOS		E			D			D			F	

Timer												
Assigned Phs	7	4		3	8		1	6		5	2	
Phs Duration (G+Y+Rc), s	25.0	29.2		15.1	19.3		20.0	25.0		20.0	25.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	21.0	21.0		16.0	16.0		16.0	21.0		16.0	21.0	
Max Q Clear Time (g_c+I1), s	23.0	15.5		11.1	14.9		8.6	20.4		8.2	23.0	
Green Ext Time (p_c), s	0.0	3.6		0.2	0.4		0.5	0.6		0.5	0.0	

Intersection Summary												
HCM 2010 Ctrl Delay			63.5									
HCM 2010 LOS			E									

Notes

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	349	521	1610	630	839	819
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	0.86	0.86	0.97	0.91
Frt	0.94	0.85	0.99	0.85	1.00	1.00
Flt Protected	0.97	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3120	1365	4501	1290	3252	4818
Flt Permitted	0.97	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3120	1365	4501	1290	3252	4818
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	116%	116%	116%	116%	116%	116%
Adj. Flow (vph)	440	657	2030	794	1058	1033
RTOR Reduction (vph)	141	1	10	253	0	0
Lane Group Flow (vph)	608	347	2187	374	1058	1033
Turn Type	NA	pm+ov	NA	Perm	Prot	NA
Protected Phases	8	1	2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	16.0	41.0	37.0	37.0	25.0	66.0
Effective Green, g (s)	16.0	41.0	37.0	37.0	25.0	66.0
Actuated g/C Ratio	0.18	0.46	0.41	0.41	0.28	0.73
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	554	682	1850	530	903	3533
v/s Ratio Prot	c0.19	0.14	c0.49		c0.33	0.21
v/s Ratio Perm		0.11		0.29		
v/c Ratio	1.10	0.51	1.18	0.71	1.17	0.29
Uniform Delay, d1	37.0	17.4	26.5	22.0	32.5	4.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	67.9	0.6	87.9	7.7	89.0	0.2
Delay (s)	104.9	18.0	114.4	29.7	121.5	4.3
Level of Service	F	B	F	C	F	A
Approach Delay (s)	77.3		95.6			63.6
Approach LOS	E		F			E

Intersection Summary			
HCM 2000 Control Delay	81.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	102.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	8	64	27	121	12	27	6	335	190	97	497	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		0.97	0.95	0.95	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.96		1.00	0.94	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	1686		3252	1570	1425	1676	3353	1500	3252	3353	1500
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1676	1686		3252	1570	1425	1676	3353	1500	3252	3353	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Adj. Flow (vph)	10	81	34	153	15	34	8	422	240	122	627	6
RTOR Reduction (vph)	0	29	0	0	8	17	0	0	119	0	0	3
Lane Group Flow (vph)	10	86	0	153	18	6	8	422	121	122	627	3
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases						8			2			6
Actuated Green, G (s)	0.7	9.0		6.0	14.3	14.3	0.7	22.7	28.7	3.1	25.1	25.1
Effective Green, g (s)	0.7	9.0		6.0	14.3	14.3	0.7	22.7	28.7	3.1	25.1	25.1
Actuated g/C Ratio	0.01	0.16		0.11	0.25	0.25	0.01	0.40	0.51	0.05	0.44	0.44
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	20	267		343	395	358	20	1340	863	177	1481	662
v/s Ratio Prot	0.01	c0.05		c0.05	0.01		0.00	0.13	0.01	c0.04	c0.19	
v/s Ratio Perm						0.00			0.07			0.00
v/c Ratio	0.50	0.32		0.45	0.04	0.02	0.40	0.31	0.14	0.69	0.42	0.00
Uniform Delay, d1	27.9	21.2		23.8	16.1	16.0	27.8	11.7	7.5	26.4	10.9	8.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	18.3	0.7		0.9	0.0	0.0	12.6	0.6	0.1	10.6	0.9	0.0
Delay (s)	46.2	21.9		24.8	16.1	16.0	40.5	12.3	7.6	37.0	11.8	8.9
Level of Service	D	C		C	B	B	D	B	A	D	B	A
Approach Delay (s)		23.8			22.7			11.0			15.8	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	56.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	41.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	483	582	1246	704	19	258	2	339	0	1	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		1.00	0.95	0.95		1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.85	0.85		1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		1.00	
Satd. Flow (prot)	1676	3353	1500	3252	3340		1676	1428	1425		1765	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.76	1.00	1.00		1.00	
Satd. Flow (perm)	1676	3353	1500	3252	3340		1336	1428	1425		1765	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Adj. Flow (vph)	3	609	734	1571	888	24	325	3	427	0	1	0
RTOR Reduction (vph)	0	0	300	0	2	0	0	170	169	0	0	0
Lane Group Flow (vph)	3	609	434	1571	910	0	325	47	44	0	1	0
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	7	4		3				2			6	
Permitted Phases			4		8		2		2	6		
Actuated Green, G (s)	0.8	20.2	20.2	34.0	53.4		17.0	17.0	17.0		17.0	
Effective Green, g (s)	0.8	20.2	20.2	34.0	53.4		17.0	17.0	17.0		17.0	
Actuated g/C Ratio	0.01	0.24	0.24	0.41	0.64		0.20	0.20	0.20		0.20	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	16	814	364	1328	2143		272	291	291		360	
v/s Ratio Prot	0.00	0.18		c0.48				0.03			0.00	
v/s Ratio Perm			c0.29		0.27		c0.24		0.03			
v/c Ratio	0.19	0.75	1.19	1.18	0.42		1.19	0.16	0.15		0.00	
Uniform Delay, d1	40.9	29.1	31.5	24.6	7.3		33.1	27.2	27.2		26.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	5.6	3.8	110.7	90.3	0.1		117.9	1.2	1.1		0.0	
Delay (s)	46.5	32.9	142.2	114.9	7.5		151.0	28.4	28.3		26.4	
Level of Service	D	C	F	F	A		F	C	C		C	
Approach Delay (s)		92.5			75.5			81.1			26.4	
Approach LOS		F			E			F			C	

Intersection Summary			
HCM 2000 Control Delay	81.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	83.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	101.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	384	130	6	159	184	406	6	1141	54	402	440	295
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.91	
Frt	1.00	0.99		1.00	0.94	0.85	1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	1752		1676	1574	1425	1676	3353	1500	1676	4528	
Flt Permitted	0.14	1.00		0.65	1.00	1.00	0.30	1.00	1.00	0.07	1.00	
Satd. Flow (perm)	243	1752		1144	1574	1425	522	3353	1500	117	4528	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Adj. Flow (vph)	484	164	8	200	232	512	8	1439	68	507	555	372
RTOR Reduction (vph)	0	1	0	0	17	42	0	0	43	0	75	0
Lane Group Flow (vph)	484	171	0	200	374	311	8	1439	25	507	852	0
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	56.0	39.2		37.8	25.0	54.0	57.0	56.2	56.2	89.2	84.4	
Effective Green, g (s)	56.0	39.2		37.8	25.0	54.0	57.0	56.2	56.2	89.2	84.4	
Actuated g/C Ratio	0.37	0.26		0.25	0.16	0.35	0.37	0.37	0.37	0.58	0.55	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	341	448		326	256	539	200	1230	550	363	2494	
v/s Ratio Prot	c0.25	0.10		0.05	0.24	0.11	0.00	0.43		c0.26	0.19	
v/s Ratio Perm	c0.27			0.10		0.11	0.01		0.02	c0.55		
v/c Ratio	1.42	0.38		0.61	1.46	0.58	0.04	1.17	0.05	1.40	0.34	
Uniform Delay, d1	47.9	47.0		49.5	64.1	40.3	30.3	48.5	31.2	51.9	19.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	205.1	0.5		3.4	228.2	1.5	0.1	85.5	0.2	194.5	0.4	
Delay (s)	253.0	47.5		52.9	292.3	41.8	30.4	134.0	31.4	246.4	19.4	
Level of Service	F	D		D	F	D	C	F	C	F	B	
Approach Delay (s)		199.1			147.9			128.8			99.7	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	133.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.46		
Actuated Cycle Length (s)	153.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	127.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	279.5

Movement	NBL	NBT	SBT	SBR	NEL	NER
Vol, veh/h	529	341	319	10	23	404
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	667	430	402	13	29	509

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	415	0	-	0	2173	409
Stage 1	-	-	-	-	409	-
Stage 2	-	-	-	-	1764	-
Follow-up Headway	2.218	-	-	-	3.518	3.318
Pot Capacity-1 Maneuver	1144	-	-	-	51	642
Stage 1	-	-	-	-	671	-
Stage 2	-	-	-	-	151	-
Time blocked-Platoon, %		-	-	-		
Mov Capacity-1 Maneuver	1144	-	-	-	# 12	642
Mov Capacity-2 Maneuver	-	-	-	-	# 12	-
Stage 1	-	-	-	-	671	-
Stage 2	-	-	-	-	35	-

Approach	NB	SB	NE
HCM Control Delay, s	8	0	$ 1049

Minor Lane / Major Mvmt	NELn1	NBL	NBT	SBT	SBR
Capacity (veh/h)	168	1144	-	-	-
HCM Lane V/C Ratio	3.205	0.583	-	-	-
HCM Control Delay (s)	$ 1048.8	12.449	0	-	-
HCM Lane LOS	F	B	A		
HCM 95th %tile Q(veh)	50.312	3.935	-	-	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	89	441	74	275	1010	411	661	237	73	171	250	219
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	180.0	176.5	176.5	180.0	176.5	176.5	180.0	176.5	176.5	176.5
Lanes	1	3	0	2	3	0	2	2	0	2	1	2
Cap, veh/h	112	1254	206	419	1236	499	761	841	254	288	314	919
Arrive On Green	0.07	0.28	0.28	0.13	0.34	0.34	0.23	0.32	0.32	0.09	0.18	0.18
Sat Flow, veh/h	1681	4437	729	3261	3589	1450	3261	2605	786	3261	1765	3000
Grp Volume(v), veh/h	112	440	209	347	1252	539	833	201	190	216	315	276
Grp Sat Flow(s),veh/h/ln	1681	1765	1636	1630	1765	1509	1630	1765	1626	1630	1765	1500
Q Serve(g_s), s	6.0	9.2	9.4	9.3	31.0	31.0	21.0	7.8	8.1	5.8	16.0	6.3
Cycle Q Clear(g_c), s	6.0	9.2	9.4	9.3	31.0	31.0	21.0	7.8	8.1	5.8	16.0	6.3
Prop In Lane	1.00		0.45	1.00		0.96	1.00		0.48	1.00		1.00
Lane Grp Cap(c), veh/h	112	997	462	419	1216	520	761	570	525	288	314	919
V/C Ratio(X)	1.00	0.44	0.45	0.83	1.03	1.04	1.09	0.35	0.36	0.75	1.00	0.30
Avail Cap(c_a), veh/h	112	997	462	471	1216	520	761	570	525	362	314	919
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.0	26.5	26.5	38.2	29.5	29.5	34.5	23.3	23.4	40.1	37.0	23.8
Incr Delay (d2), s/veh	84.9	1.4	3.2	10.7	33.7	49.5	61.6	0.4	0.4	6.5	51.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	5.2	4.2	4.2	4.5	19.0	18.6	15.0	3.4	3.3	2.7	11.6	2.3
Lane Grp Delay (d), s/veh	126.9	27.9	29.7	48.9	63.2	79.0	96.1	23.6	23.8	46.6	88.8	24.0
Lane Grp LOS	F	C	C	D	F	F	F	C	C	D	F	C
Approach Vol, veh/h		761			2138			1224			807	
Approach Delay, s/veh		43.0			64.9			73.0			55.4	
Approach LOS		D			E			E			E	

Timer												
Assigned Phs	5	2		1	6		7	4		3	8	
Phs Duration (G+Y+Rc), s	10.0	29.4		15.6	35.0		25.0	33.1		11.9	20.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	6.0	24.0		13.0	31.0		21.0	27.0		10.0	16.0	
Max Q Clear Time (g_c+I1), s	8.0	11.4		11.3	33.0		23.0	10.1		7.8	18.0	
Green Ext Time (p_c), s	0.0	10.8		0.2	0.0		0.0	5.2		0.2	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	62.0
HCM 2010 LOS	E

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	415	1204	168	329	1269	486	204	462	184	456	726	263
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	180.0
Lanes	1	3	1	1	2	1	1	2	0	1	2	0
Cap, veh/h	325	1482	420	370	1082	460	168	449	178	347	727	262
Arrive On Green	0.19	0.28	0.28	0.22	0.31	0.31	0.10	0.19	0.19	0.21	0.29	0.29
Sat Flow, veh/h	1681	5294	1500	1681	3529	1500	1681	2405	955	1681	2477	894
Grp Volume(v), veh/h	523	1518	212	415	1600	613	257	427	388	575	650	597
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1681	1765	1500	1681	1765	1596	1681	1765	1607
Q Serve(g_s), s	29.0	42.0	17.8	33.0	46.0	46.0	15.0	28.0	28.0	31.0	44.0	44.0
Cycle Q Clear(g_c), s	29.0	42.0	17.8	33.0	46.0	46.0	15.0	28.0	28.0	31.0	44.0	44.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.60	1.00		0.56
Lane Grp Cap(c), veh/h	325	1482	420	370	1082	460	168	329	298	347	518	471
V/C Ratio(X)	1.61	1.02	0.50	1.12	1.48	1.33	1.53	1.30	1.30	1.66	1.26	1.27
Avail Cap(c_a), veh/h	325	1482	420	370	1082	460	168	329	298	347	518	471
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.5	54.0	45.3	58.5	52.0	52.0	67.5	61.0	61.0	59.5	53.0	53.0
Incr Delay (d2), s/veh	288.2	29.7	1.0	84.3	220.2	164.0	265.8	154.5	157.8	307.5	130.5	135.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	38.7	23.3	7.0	23.1	54.0	38.7	19.0	27.0	24.7	43.3	38.9	36.1
Lane Grp Delay (d), s/veh	348.7	83.7	46.3	142.8	272.2	216.0	333.3	215.5	218.8	367.0	183.5	188.5
Lane Grp LOS	F	F	D	F	F	F	F	F	F	F	F	F
Approach Vol, veh/h		2253			2628			1072			1822	
Approach Delay, s/veh		141.7			238.7			245.0			243.1	
Approach LOS		F			F			F			F	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	33.0	46.0		37.0	50.0		19.0	32.0		35.0	48.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	29.0	42.0		33.0	46.0		15.0	28.0		31.0	44.0	
Max Q Clear Time (g_c+I1), s	31.0	44.0		35.0	48.0		17.0	30.0		33.0	46.0	
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	212.5
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	376	1693	676	463	760	141	277	419	245	369	776	250
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	176.5
Lanes	2	2	1	2	2	1	2	2	0	2	2	1
Cap, veh/h	523	1482	630	391	1339	569	283	408	239	515	941	641
Arrive On Green	0.16	0.42	0.42	0.12	0.38	0.38	0.09	0.20	0.20	0.16	0.27	0.27
Sat Flow, veh/h	3261	3529	1500	3261	3529	1500	3261	2092	1222	3261	3529	1500
Grp Volume(v), veh/h	474	2135	852	584	958	178	349	445	392	465	978	315
Grp Sat Flow(s),veh/h/ln	1630	1765	1500	1630	1765	1500	1630	1765	1549	1630	1765	1500
Q Serve(g_s), s	21.4	63.0	63.0	18.0	34.7	12.5	13.0	29.3	29.3	21.0	40.0	22.8
Cycle Q Clear(g_c), s	21.4	63.0	63.0	18.0	34.7	12.5	13.0	29.3	29.3	21.0	40.0	22.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.79	1.00		1.00
Lane Grp Cap(c), veh/h	523	1482	630	391	1339	569	283	345	302	515	941	641
V/C Ratio(X)	0.91	1.44	1.35	1.49	0.72	0.31	1.24	1.29	1.30	0.90	1.04	0.49
Avail Cap(c_a), veh/h	587	1482	630	391	1339	569	283	345	302	587	941	641
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	61.8	43.5	43.5	66.0	39.6	32.8	68.5	60.4	60.4	62.0	55.0	31.1
Incr Delay (d2), s/veh	16.6	202.0	168.9	234.8	1.8	0.3	132.5	151.5	155.2	16.0	40.0	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	10.4	69.8	53.5	20.5	16.2	4.8	10.8	28.0	24.9	10.1	23.5	9.1
Lane Grp Delay (d), s/veh	78.4	245.5	212.4	300.8	41.5	33.1	201.0	211.8	215.5	78.0	95.0	33.8
Lane Grp LOS	E	F	F	F	D	C	F	F	F	E	F	C
Approach Vol, veh/h		3461			1720			1186			1758	
Approach Delay, s/veh		214.5			128.7			209.9			79.5	
Approach LOS		F			F			F			E	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	28.1	67.0		22.0	60.9		17.0	33.3		27.7	44.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	27.0	63.0		18.0	54.0		13.0	26.0		27.0	40.0	
Max Q Clear Time (g_c+I1), s	23.4	65.0		20.0	36.7		15.0	31.3		23.0	42.0	
Green Ext Time (p_c), s	0.7	0.0		0.0	16.9		0.0	0.0		0.7	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	166.4
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	519	1234	243	383	763	242	290	753	440	416	753	252
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0
Lanes	2	2	1	2	2	1	2	3	1	2	3	0
Cap, veh/h	685	1341	570	391	1024	435	326	953	270	522	912	305
Arrive On Green	0.21	0.38	0.38	0.12	0.29	0.29	0.10	0.18	0.18	0.16	0.24	0.24
Sat Flow, veh/h	3261	3529	1500	3261	3529	1500	3261	5294	1500	3261	3799	1271
Grp Volume(v), veh/h	654	1556	306	483	962	305	366	949	555	525	881	386
Grp Sat Flow(s),veh/h/ln	1630	1765	1500	1630	1765	1500	1630	1765	1500	1630	1765	1540
Q Serve(g_s), s	19.8	38.0	15.9	12.0	26.6	18.1	10.0	17.9	18.0	16.0	24.0	24.0
Cycle Q Clear(g_c), s	19.8	38.0	15.9	12.0	26.6	18.1	10.0	17.9	18.0	16.0	24.0	24.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.82
Lane Grp Cap(c), veh/h	685	1341	570	391	1024	435	326	953	270	522	847	370
V/C Ratio(X)	0.96	1.16	0.54	1.23	0.94	0.70	1.12	1.00	2.06	1.01	1.04	1.04
Avail Cap(c_a), veh/h	685	1341	570	391	1024	435	326	953	270	522	847	370
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.0	31.0	24.1	44.0	34.6	31.6	45.0	41.0	41.0	42.0	38.0	38.0
Incr Delay (d2), s/veh	23.9	80.8	1.0	125.8	15.7	5.0	87.1	28.2	487.6	41.0	42.0	58.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	10.4	31.4	6.0	11.8	13.9	7.4	8.1	10.5	43.4	9.6	15.5	15.2
Lane Grp Delay (d), s/veh	62.9	111.8	25.1	169.8	50.4	36.6	132.1	69.1	528.6	83.0	80.0	96.4
Lane Grp LOS	E	F	C	F	D	D	F	E	F	F	F	F
Approach Vol, veh/h		2516			1750			1870			1792	
Approach Delay, s/veh		88.5			81.0			217.8			84.4	
Approach LOS		F			F			F			F	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	25.0	42.0		16.0	33.0		14.0	22.0		20.0	28.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	21.0	38.0		12.0	29.0		10.0	18.0		16.0	24.0	
Max Q Clear Time (g_c+I1), s	21.8	40.0		14.0	28.6		12.0	20.0		18.0	26.0	
Green Ext Time (p_c), s	0.0	0.0		0.0	0.4		0.0	0.0		0.0	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	116.4
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	133	192	219	281	214	542	568	1214	204	118	950	181
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	180.0
Lanes	1	3	1	1	2	1	2	3	0	2	3	0
Cap, veh/h	149	941	267	280	902	383	652	1327	222	580	1202	229
Arrive On Green	0.09	0.18	0.18	0.17	0.26	0.26	0.20	0.30	0.30	0.18	0.28	0.28
Sat Flow, veh/h	1681	5294	1500	1681	3529	1500	3261	4423	740	3261	4326	823
Grp Volume(v), veh/h	168	242	276	354	270	683	716	1221	567	149	977	449
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1681	1765	1500	1630	1765	1634	1630	1765	1619
Q Serve(g_s), s	8.0	3.5	16.0	15.0	5.6	23.0	18.0	27.0	27.0	3.5	24.9	24.9
Cycle Q Clear(g_c), s	8.0	3.5	16.0	15.0	5.6	23.0	18.0	27.0	27.0	3.5	24.9	24.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.45	1.00		0.51
Lane Grp Cap(c), veh/h	149	941	267	280	902	383	652	1059	490	580	980	450
V/C Ratio(X)	1.12	0.26	1.03	1.26	0.30	1.78	1.10	1.15	1.16	0.26	1.00	1.00
Avail Cap(c_a), veh/h	149	941	267	280	902	383	652	1059	490	580	980	450
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.0	31.9	37.0	37.5	27.0	33.5	36.0	31.5	31.5	31.9	32.5	32.5
Incr Delay (d2), s/veh	111.0	0.1	64.5	144.1	0.2	362.2	65.1	79.8	91.6	1.1	28.0	41.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	8.0	1.6	10.8	17.5	2.4	47.1	13.2	23.4	23.4	1.5	14.7	15.2
Lane Grp Delay (d), s/veh	152.0	32.0	101.5	181.6	27.2	395.7	101.1	111.3	123.1	33.0	60.5	74.2
Lane Grp LOS	F	C	F	F	C	F	F	F	F	C	E	E
Approach Vol, veh/h		686			1307			2504			1575	
Approach Delay, s/veh		89.4			261.6			111.1			61.8	
Approach LOS		F			F			F			E	

Timer												
Assigned Phs	7	4		3	8		1	6		5	2	
Phs Duration (G+Y+Rc), s	12.0	20.0		19.0	27.0		22.0	31.0		20.0	29.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	8.0	16.0		15.0	23.0		18.0	27.0		16.0	25.0	
Max Q Clear Time (g_c+I1), s	10.0	18.0		17.0	25.0		20.0	29.0		5.5	26.9	
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0		0.0	0.0		0.3	0.0	

Intersection Summary												
HCM 2010 Ctrl Delay			128.2									
HCM 2010 LOS			F									

Notes

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	33	161	1128	68	202	1799
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	0.86	0.86	0.97	0.91
Frt	0.89	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.99	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3016	1365	4549	1290	3252	4818
Flt Permitted	0.99	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3016	1365	4549	1290	3252	4818
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	116%	116%	116%	116%	116%	116%
Adj. Flow (vph)	42	203	1422	86	255	2268
RTOR Reduction (vph)	89	2	1	41	0	0
Lane Group Flow (vph)	55	99	1430	36	255	2268
Turn Type	NA	pm+ov	NA	Perm	Prot	NA
Protected Phases	8	1	2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	5.3	10.3	19.8	19.8	5.0	28.8
Effective Green, g (s)	5.3	10.3	19.8	19.8	5.0	28.8
Actuated g/C Ratio	0.13	0.24	0.47	0.47	0.12	0.68
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	379	463	2139	606	386	3295
v/s Ratio Prot	0.02	c0.03	0.31		0.08	c0.47
v/s Ratio Perm		0.05		0.03		
v/c Ratio	0.14	0.21	0.67	0.06	0.66	0.69
Uniform Delay, d1	16.4	12.7	8.6	6.1	17.7	4.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.2	1.7	0.2	4.2	1.2
Delay (s)	16.6	12.9	10.3	6.3	21.9	5.2
Level of Service	B	B	B	A	C	A
Approach Delay (s)	15.1		10.1			6.9
Approach LOS	B		B			A

Intersection Summary			
HCM 2000 Control Delay	8.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	42.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	38	16	204	55	116	83	205	10	69	252	10
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		0.97	0.95	0.95	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.96		1.00	0.94	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	1687		3252	1579	1425	1676	3353	1500	3252	3353	1500
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1676	1687		3252	1579	1425	1676	3353	1500	3252	3353	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Adj. Flow (vph)	8	48	20	257	69	146	105	258	13	87	318	13
RTOR Reduction (vph)	0	18	0	0	35	80	0	0	6	0	0	8
Lane Group Flow (vph)	8	50	0	257	78	22	105	258	7	87	318	5
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases						8			2			6
Actuated Green, G (s)	0.7	5.9		6.1	11.3	11.3	4.8	22.9	29.0	2.2	20.3	20.3
Effective Green, g (s)	0.7	5.9		6.1	11.3	11.3	4.8	22.9	29.0	2.2	20.3	20.3
Actuated g/C Ratio	0.01	0.11		0.11	0.21	0.21	0.09	0.43	0.55	0.04	0.38	0.38
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	22	187		373	336	303	151	1446	932	134	1281	573
v/s Ratio Prot	0.00	0.03		c0.08	c0.05		c0.06	c0.08	0.00	0.03	c0.09	
v/s Ratio Perm						0.02			0.00			0.00
v/c Ratio	0.36	0.27		0.69	0.23	0.07	0.70	0.18	0.01	0.65	0.25	0.01
Uniform Delay, d1	26.0	21.6		22.6	17.3	16.7	23.4	9.3	5.5	25.1	11.2	10.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.9	0.8		5.2	0.4	0.1	13.0	0.3	0.0	10.4	0.5	0.0
Delay (s)	35.9	22.4		27.8	17.7	16.8	36.5	9.6	5.5	35.4	11.7	10.2
Level of Service	D	C		C	B	B	D	A	A	D	B	B
Approach Delay (s)		23.8			23.0			16.9			16.6	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	53.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	38.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	1185	186	377	633	9	469	1	2056	2	2	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		0.97	0.95		1.00	0.95	0.95	1.00	1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.85	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	3285		3252	3346		1676	1425	1425	1676	1765	
Flt Permitted	0.95	1.00		0.95	1.00		0.76	1.00	1.00	0.05	1.00	
Satd. Flow (perm)	1676	3285		3252	3346		1334	1425	1425	93	1765	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Adj. Flow (vph)	1	1494	235	475	798	11	591	1	2592	3	3	0
RTOR Reduction (vph)	0	8	0	0	1	0	0	95	95	0	0	0
Lane Group Flow (vph)	1	1721	0	475	808	0	591	1202	1201	3	3	0
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	7	4		3				2			6	
Permitted Phases					8		2		2	6		
Actuated Green, G (s)	0.8	51.2		14.0	64.4		76.0	76.0	76.0	76.0	76.0	
Effective Green, g (s)	0.8	51.2		14.0	64.4		76.0	76.0	76.0	76.0	76.0	
Actuated g/C Ratio	0.01	0.33		0.09	0.42		0.50	0.50	0.50	0.50	0.50	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	8	1097		297	1406		661	706	706	46	875	
v/s Ratio Prot	0.00	c0.52		c0.15				c0.84			0.00	
v/s Ratio Perm					0.24		0.44		0.84	0.03		
v/c Ratio	0.12	1.57		1.60	0.57		0.89	1.70	1.70	0.07	0.00	
Uniform Delay, d1	75.9	51.0		69.6	33.9		35.0	38.6	38.6	20.1	19.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.9	260.4		285.0	0.6		14.5	322.1	321.4	2.7	0.0	
Delay (s)	82.8	311.4		354.6	34.5		49.5	360.7	360.0	22.8	19.5	
Level of Service	F	F		F	C		D	F	F	C	B	
Approach Delay (s)		311.3			152.9			302.6			21.2	
Approach LOS		F			F			F			C	

Intersection Summary			
HCM 2000 Control Delay	273.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.64		
Actuated Cycle Length (s)	153.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	164.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	334	433	35	187	526	243	160	888	147	287	861	590
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.91	
Frt	1.00	0.99		1.00	0.99	0.85	1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	1745		1676	1665	1425	1676	3353	1500	1676	4524	
Flt Permitted	0.09	1.00		0.10	1.00	1.00	0.11	1.00	1.00	0.10	1.00	
Satd. Flow (perm)	160	1745		176	1665	1425	186	3353	1500	168	4524	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Adj. Flow (vph)	421	546	44	236	663	306	202	1120	185	362	1086	744
RTOR Reduction (vph)	0	2	0	0	1	43	0	0	101	0	95	0
Lane Group Flow (vph)	421	588	0	236	693	232	202	1120	84	362	1735	0
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	64.0	45.0		55.0	40.0	56.0	47.0	38.0	38.0	58.0	45.0	
Effective Green, g (s)	64.0	45.0		55.0	40.0	56.0	47.0	38.0	38.0	58.0	45.0	
Actuated g/C Ratio	0.49	0.35		0.42	0.31	0.43	0.36	0.29	0.29	0.45	0.35	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	312	604		247	512	657	170	980	438	260	1566	
v/s Ratio Prot	c0.21	0.34		0.11	0.42	0.04	0.08	0.33		c0.17	0.38	
v/s Ratio Perm	c0.46			0.29		0.12	0.35		0.06	c0.45		
v/c Ratio	1.35	0.97		0.96	1.35	0.35	1.19	1.14	0.19	1.39	1.21dr	
Uniform Delay, d1	41.4	41.9		37.3	45.0	24.8	35.3	46.0	34.5	39.9	42.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	177.0	29.8		44.6	171.2	0.3	128.7	76.6	1.0	198.4	58.4	
Delay (s)	218.4	71.7		81.9	216.2	25.2	164.0	122.6	35.5	238.3	100.9	
Level of Service	F	E		F	F	C	F	F	D	F	F	
Approach Delay (s)		132.8			146.3			117.5			123.6	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	128.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.43		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	125.4%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	5.7

Movement	NBL	NBT	SBT	SBR	NEL	NER
Vol, veh/h	155	244	244	29	30	171
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	195	308	308	37	38	216

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	344	0	-	0	1025	326
Stage 1	-	-	-	-	326	-
Stage 2	-	-	-	-	699	-
Follow-up Headway	2.218	-	-	-	3.518	3.318
Pot Capacity-1 Maneuver	1215	-	-	-	260	715
Stage 1	-	-	-	-	731	-
Stage 2	-	-	-	-	493	-
Time blocked-Platoon, %		-	-	-		
Mov Capacity-1 Maneuver	1215	-	-	-	210	715
Mov Capacity-2 Maneuver	-	-	-	-	210	-
Stage 1	-	-	-	-	731	-
Stage 2	-	-	-	-	397	-

Approach	NB	SB	NE
HCM Control Delay, s	3	0	18

Minor Lane / Major Mvmt	NELn1	NBL	NBT	SBT	SBR
Capacity (veh/h)	526	1215	-	-	-
HCM Lane V/C Ratio	0.482	0.161	-	-	-
HCM Control Delay (s)	18	8.53	0	-	-
HCM Lane LOS	C	A	A		
HCM 95th %tile Q(veh)	2.592	0.572	-	-	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	30	1352	190	176	510	352	777	271	87	447	546	779
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	180.0	176.5	176.5	180.0	176.5	176.5	180.0	176.5	176.5	176.5
Lanes	1	3	0	2	3	0	2	2	0	2	1	2
Cap, veh/h	42	1262	177	145	1049	446	725	850	268	554	490	967
Arrive On Green	0.02	0.28	0.28	0.04	0.30	0.30	0.22	0.33	0.33	0.17	0.28	0.28
Sat Flow, veh/h	1681	4542	639	3261	3529	1500	3261	2574	812	3261	1765	3000
Grp Volume(v), veh/h	33	1142	535	191	554	383	845	200	190	486	593	847
Grp Sat Flow(s),veh/h/ln	1681	1765	1652	1630	1765	1500	1630	1765	1621	1630	1765	1500
Q Serve(g_s), s	1.8	25.0	25.0	4.0	11.8	21.7	20.0	7.7	8.0	13.1	25.0	24.0
Cycle Q Clear(g_c), s	1.8	25.0	25.0	4.0	11.8	21.7	20.0	7.7	8.0	13.1	25.0	24.0
Prop In Lane	1.00		0.39	1.00		1.00	1.00		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	42	980	459	145	1049	446	725	583	535	554	490	967
V/C Ratio(X)	0.79	1.16	1.17	1.32	0.53	0.86	1.17	0.34	0.35	0.88	1.21	0.88
Avail Cap(c_a), veh/h	93	980	459	145	1049	446	725	583	535	580	490	967
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.6	32.5	32.5	43.0	26.4	29.8	35.0	22.8	22.9	36.4	32.5	28.8
Incr Delay (d2), s/veh	26.7	85.4	96.2	183.3	1.9	18.9	89.4	0.3	0.4	13.9	112.2	9.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	1.1	22.5	22.5	5.3	5.4	10.4	17.1	3.4	3.3	6.4	26.2	10.0
Lane Grp Delay (d), s/veh	70.3	117.9	128.7	226.3	28.3	48.8	124.4	23.1	23.3	50.3	144.7	37.9
Lane Grp LOS	E	F	F	F	C	D	F	C	C	D	F	D
Approach Vol, veh/h		1710			1128			1235			1926	
Approach Delay, s/veh		120.3			68.8			92.4			73.9	
Approach LOS		F			E			F			E	

Timer												
Assigned Phs	5	2		1	6		7	4		3	8	
Phs Duration (G+Y+Rc), s	6.2	29.0		8.0	30.8		24.0	33.7		19.3	29.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	5.0	25.0		4.0	24.0		20.0	29.0		16.0	25.0	
Max Q Clear Time (g_c+I1), s	3.8	27.0		6.0	23.7		22.0	10.0		15.1	27.0	
Green Ext Time (p_c), s	0.0	0.0		0.0	0.3		0.0	10.4		0.2	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	90.0
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	389	1279	119	150	1389	332	367	495	354	290	261	168
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	180.0
Lanes	1	3	1	1	2	1	1	2	0	1	2	0
Cap, veh/h	321	2091	593	192	1123	477	336	383	274	244	296	185
Arrive On Green	0.19	0.40	0.40	0.11	0.32	0.32	0.20	0.20	0.20	0.15	0.15	0.15
Sat Flow, veh/h	1681	5294	1500	1681	3529	1500	1681	1916	1371	1681	2034	1271
Grp Volume(v), veh/h	423	1390	129	163	1510	361	399	495	428	315	245	222
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1681	1765	1500	1681	1765	1523	1681	1765	1540
Q Serve(g_s), s	21.0	23.7	6.3	10.5	35.0	23.8	22.0	22.0	22.0	16.0	15.2	15.8
Cycle Q Clear(g_c), s	21.0	23.7	6.3	10.5	35.0	23.8	22.0	22.0	22.0	16.0	15.2	15.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.90	1.00		0.83
Lane Grp Cap(c), veh/h	321	2091	593	192	1123	477	336	353	305	244	257	224
V/C Ratio(X)	1.32	0.66	0.22	0.85	1.34	0.76	1.19	1.40	1.40	1.29	0.96	0.99
Avail Cap(c_a), veh/h	321	2091	593	260	1123	477	336	353	305	244	257	224
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.5	27.3	22.0	47.8	37.5	33.7	44.0	44.0	44.0	47.0	46.6	46.9
Incr Delay (d2), s/veh	163.6	0.8	0.2	17.6	161.1	6.8	110.1	197.9	200.5	157.0	45.8	57.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	23.6	10.6	2.3	5.5	40.6	9.8	19.7	29.3	25.5	17.5	10.1	9.8
Lane Grp Delay (d), s/veh	208.1	28.1	22.2	65.4	198.6	40.5	154.1	241.9	244.5	204.0	92.5	104.4
Lane Grp LOS	F	C	C	E	F	D	F	F	F	F	F	F
Approach Vol, veh/h		1942			2034			1322			782	
Approach Delay, s/veh		66.9			159.9			216.2			140.8	
Approach LOS		E			F			F			F	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	25.0	47.5		16.5	39.0		26.0	26.0		20.0	20.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	21.0	39.0		17.0	35.0		22.0	22.0		16.0	16.0	
Max Q Clear Time (g_c+I1), s	23.0	25.7		12.5	37.0		24.0	24.0		18.0	17.8	
Green Ext Time (p_c), s	0.0	12.6		0.2	0.0		0.0	0.0		0.0	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	140.0
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	309	797	82	276	1399	262	639	551	696	273	249	348
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	176.5
Lanes	2	2	1	2	2	1	2	2	0	2	2	1
Cap, veh/h	271	1076	457	361	1174	499	761	574	488	363	717	430
Arrive On Green	0.08	0.30	0.30	0.11	0.33	0.33	0.23	0.33	0.33	0.11	0.20	0.20
Sat Flow, veh/h	3261	3529	1500	3261	3529	1500	3261	1765	1500	3261	3529	1500
Grp Volume(v), veh/h	336	866	89	300	1521	285	695	599	757	297	271	378
Grp Sat Flow(s),veh/h/ln	1630	1765	1500	1630	1765	1500	1630	1765	1500	1630	1765	1500
Q Serve(g_s), s	9.0	24.5	4.7	9.8	36.0	17.0	22.5	35.2	35.2	9.6	7.2	22.0
Cycle Q Clear(g_c), s	9.0	24.5	4.7	9.8	36.0	17.0	22.5	35.2	35.2	9.6	7.2	22.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	271	1076	457	361	1174	499	761	574	488	363	717	430
V/C Ratio(X)	1.24	0.80	0.19	0.83	1.30	0.57	0.91	1.04	1.55	0.82	0.38	0.88
Avail Cap(c_a), veh/h	271	1076	457	422	1174	499	813	574	488	482	717	430
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.6	34.7	27.8	47.1	36.1	29.8	40.4	36.5	36.5	47.0	37.2	36.9
Incr Delay (d2), s/veh	135.2	4.6	0.2	11.6	139.6	1.6	14.1	49.5	258.4	8.1	1.5	21.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	8.9	11.6	1.8	4.7	38.7	6.6	10.8	23.7	48.4	4.5	3.4	12.4
Lane Grp Delay (d), s/veh	184.9	39.2	28.0	58.7	175.7	31.3	54.6	86.1	295.0	55.1	38.7	58.7
Lane Grp LOS	F	D	C	E	F	C	D	F	F	E	D	E
Approach Vol, veh/h		1291			2106			2051			946	
Approach Delay, s/veh		76.4			139.5			152.5			51.9	
Approach LOS		E			F			F			D	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	13.0	37.0		16.0	40.0		29.3	39.2		16.1	26.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	9.0	31.0		14.0	36.0		27.0	33.0		16.0	22.0	
Max Q Clear Time (g_c+I1), s	11.0	26.5		11.8	38.0		24.5	37.2		11.6	24.0	
Green Ext Time (p_c), s	0.0	4.3		0.2	0.0		0.8	0.0		0.4	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	118.0
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	385	1046	615	253	1197	154	606	893	332	290	771	367
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0
Lanes	2	2	1	2	2	1	2	3	1	2	3	0
Cap, veh/h	399	1216	517	326	1137	483	580	1059	300	580	706	300
Arrive On Green	0.12	0.34	0.34	0.10	0.32	0.32	0.18	0.20	0.20	0.18	0.20	0.20
Sat Flow, veh/h	3261	3529	1500	3261	3529	1500	3261	5294	1500	3261	3529	1500
Grp Volume(v), veh/h	418	1137	668	275	1301	167	659	971	361	315	838	399
Grp Sat Flow(s),veh/h/ln	1630	1765	1500	1630	1765	1500	1630	1765	1500	1630	1765	1500
Q Serve(g_s), s	11.0	28.0	31.0	7.5	29.0	7.6	16.0	16.2	18.0	7.9	18.0	18.0
Cycle Q Clear(g_c), s	11.0	28.0	31.0	7.5	29.0	7.6	16.0	16.2	18.0	7.9	18.0	18.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	399	1216	517	326	1137	483	580	1059	300	580	706	300
V/C Ratio(X)	1.05	0.94	1.29	0.84	1.14	0.35	1.14	0.92	1.20	0.54	1.19	1.33
Avail Cap(c_a), veh/h	399	1216	517	326	1137	483	580	1059	300	580	706	300
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.5	28.5	29.5	39.8	30.5	23.3	37.0	35.3	36.0	33.7	36.0	36.0
Incr Delay (d2), s/veh	58.5	13.2	145.7	17.9	75.6	0.4	81.2	13.7	118.8	3.6	98.1	169.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	7.8	14.2	32.3	3.9	24.4	2.8	13.1	8.4	16.7	3.5	17.6	20.9
Lane Grp Delay (d), s/veh	98.0	41.8	175.2	57.7	106.1	23.7	118.2	49.0	154.8	37.3	134.1	205.7
Lane Grp LOS	F	D	F	E	F	C	F	D	F	D	F	F
Approach Vol, veh/h		2223			1743			1991			1552	
Approach Delay, s/veh		92.4			90.5			91.1			132.9	
Approach LOS		F			F			F			F	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	15.0	35.0		13.0	33.0		20.0	22.0		20.0	22.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	11.0	31.0		9.0	29.0		16.0	18.0		16.0	18.0	
Max Q Clear Time (g_c+I1), s	13.0	33.0		9.5	31.0		18.0	20.0		9.9	20.0	
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0		0.0	0.0		0.6	0.0	

Intersection Summary		
HCM 2010 Ctrl Delay		100.0
HCM 2010 LOS		F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	405	466	240	163	481	162	247	657	292	235	974	266
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	180.0
Lanes	1	3	1	1	2	1	2	3	0	2	3	0
Cap, veh/h	395	1485	421	212	604	257	584	830	353	584	943	257
Arrive On Green	0.24	0.28	0.28	0.13	0.17	0.17	0.18	0.24	0.24	0.18	0.24	0.24
Sat Flow, veh/h	1681	5294	1500	1681	3529	1500	3261	3529	1500	3261	4008	1093
Grp Volume(v), veh/h	440	507	261	177	523	176	268	714	317	255	932	416
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1681	1765	1500	1630	1765	1500	1630	1765	1572
Q Serve(g_s), s	21.0	6.8	13.5	9.2	12.9	9.8	6.6	17.3	18.3	6.2	21.0	21.0
Cycle Q Clear(g_c), s	21.0	6.8	13.5	9.2	12.9	9.8	6.6	17.3	18.3	6.2	21.0	21.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.70
Lane Grp Cap(c), veh/h	395	1485	421	212	604	257	584	830	353	584	830	370
V/C Ratio(X)	1.11	0.34	0.62	0.84	0.87	0.69	0.46	0.86	0.90	0.44	1.12	1.12
Avail Cap(c_a), veh/h	395	1485	421	301	632	269	584	830	353	584	830	370
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.1	25.6	28.0	38.1	36.0	34.7	32.8	32.7	33.1	32.6	34.1	34.1
Incr Delay (d2), s/veh	79.5	0.1	2.8	13.1	11.7	6.7	2.6	11.3	28.0	2.4	70.9	84.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	17.6	3.0	5.3	4.7	6.6	4.1	2.9	8.9	9.6	2.7	17.5	17.0
Lane Grp Delay (d), s/veh	113.7	25.7	30.8	51.2	47.7	41.4	35.4	44.0	61.1	35.0	105.1	119.0
Lane Grp LOS	F	C	C	D	D	D	D	D	E	C	F	F
Approach Vol, veh/h		1208			876			1299			1603	
Approach Delay, s/veh		58.8			47.2			46.4			97.5	
Approach LOS		E			D			D			F	

Timer												
Assigned Phs	7	4		3	8		1	6		5	2	
Phs Duration (G+Y+Rc), s	25.0	29.0		15.2	19.3		20.0	25.0		20.0	25.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	21.0	21.0		16.0	16.0		16.0	21.0		16.0	21.0	
Max Q Clear Time (g_c+I1), s	23.0	15.5		11.2	14.9		8.6	20.3		8.2	23.0	
Green Ext Time (p_c), s	0.0	3.6		0.2	0.4		0.5	0.7		0.5	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	66.0
HCM 2010 LOS	E

Notes

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	417	732	2040	749	1118	1004
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	0.86	0.86	0.97	0.91
Frt	0.93	0.85	0.99	0.85	1.00	1.00
Flt Protected	0.97	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3101	1365	4513	1290	3252	4818
Flt Permitted	0.97	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3101	1365	4513	1290	3252	4818
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	453	796	2217	814	1215	1091
RTOR Reduction (vph)	177	1	7	251	0	0
Lane Group Flow (vph)	674	397	2348	425	1215	1091
Turn Type	NA	pm+ov	NA	Perm	Prot	NA
Protected Phases	8	1	2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	16.0	41.0	37.0	37.0	25.0	66.0
Effective Green, g (s)	16.0	41.0	37.0	37.0	25.0	66.0
Actuated g/C Ratio	0.18	0.46	0.41	0.41	0.28	0.73
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	551	682	1855	530	903	3533
v/s Ratio Prot	c0.22	0.16	c0.52		c0.37	0.23
v/s Ratio Perm		0.13		0.33		
v/c Ratio	1.22	0.58	1.27	0.80	1.35	0.31
Uniform Delay, d1	37.0	18.2	26.5	23.3	32.5	4.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	116.1	1.3	124.0	12.1	162.9	0.2
Delay (s)	153.1	19.4	150.5	35.3	195.4	4.4
Level of Service	F	B	F	D	F	A
Approach Delay (s)	110.5		124.8			105.0
Approach LOS	F		F			F

Intersection Summary			
HCM 2000 Control Delay	115.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.28		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	111.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	74	31	184	14	43	7	422	366	132	605	6
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		0.97	0.95	0.95	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.96		1.00	0.92	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	1686		3252	1543	1425	1676	3353	1500	3252	3353	1500
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1676	1686		3252	1543	1425	1676	3353	1500	3252	3353	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	10	80	34	200	15	47	8	459	398	143	658	7
RTOR Reduction (vph)	0	29	0	0	13	22	0	0	201	0	0	4
Lane Group Flow (vph)	10	85	0	200	19	8	8	459	197	143	658	3
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases						8			2			6
Actuated Green, G (s)	0.7	8.7		6.2	14.2	14.2	0.7	20.9	27.1	3.0	23.2	23.2
Effective Green, g (s)	0.7	8.7		6.2	14.2	14.2	0.7	20.9	27.1	3.0	23.2	23.2
Actuated g/C Ratio	0.01	0.16		0.11	0.26	0.26	0.01	0.38	0.49	0.05	0.42	0.42
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	21	267		367	399	369	21	1278	851	178	1419	635
v/s Ratio Prot	0.01	c0.05		c0.06	0.01		0.00	0.14	0.03	c0.04	c0.20	
v/s Ratio Perm						0.01			0.11			0.00
v/c Ratio	0.48	0.32		0.54	0.05	0.02	0.38	0.36	0.23	0.80	0.46	0.00
Uniform Delay, d1	26.9	20.4		23.0	15.2	15.1	26.8	12.1	7.9	25.6	11.3	9.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	16.0	0.7		1.7	0.1	0.0	11.2	0.8	0.1	22.4	1.1	0.0
Delay (s)	42.9	21.1		24.6	15.3	15.1	38.0	12.9	8.0	48.0	12.4	9.1
Level of Service	D	C		C	B	B	D	B	A	D	B	A
Approach Delay (s)		22.9			22.4			10.9			18.7	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	54.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	671	679	1546	897	22	315	2	505	0	1	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		1.00	0.95	0.95		1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.85	0.85		1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		1.00	
Satd. Flow (prot)	1676	3353	1500	3252	3341		1676	1427	1425		1765	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.76	1.00	1.00		1.00	
Satd. Flow (perm)	1676	3353	1500	3252	3341		1336	1427	1425		1765	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	729	738	1680	975	24	342	2	549	0	1	0
RTOR Reduction (vph)	0	0	299	0	2	0	0	219	218	0	0	0
Lane Group Flow (vph)	2	729	439	1680	997	0	342	58	56	0	1	0
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	7	4		3				2			6	
Permitted Phases			4		8		2		2	6		
Actuated Green, G (s)	0.8	20.2	20.2	34.0	53.4		17.0	17.0	17.0		17.0	
Effective Green, g (s)	0.8	20.2	20.2	34.0	53.4		17.0	17.0	17.0		17.0	
Actuated g/C Ratio	0.01	0.24	0.24	0.41	0.64		0.20	0.20	0.20		0.20	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	16	814	364	1328	2144		272	291	291		360	
v/s Ratio Prot	0.00	0.22		c0.52				0.04			0.00	
v/s Ratio Perm			c0.29		0.30		c0.26		0.04			
v/c Ratio	0.12	0.90	1.21	1.27	0.47		1.26	0.20	0.19		0.00	
Uniform Delay, d1	40.9	30.5	31.5	24.6	7.6		33.1	27.5	27.4		26.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	3.5	12.4	115.8	125.4	0.2		142.1	1.5	1.5		0.0	
Delay (s)	44.4	42.9	147.3	150.0	7.8		175.2	29.0	28.9		26.4	
Level of Service	D	D	F	F	A		F	C	C		C	
Approach Delay (s)		95.3			97.0			85.0			26.4	
Approach LOS		F			F			F			C	

Intersection Summary			
HCM 2000 Control Delay	94.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.24		
Actuated Cycle Length (s)	83.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	104.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	454	151	7	184	213	471	7	1354	63	466	520	345
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.91	
Frt	1.00	0.99		1.00	0.94	0.85	1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	1752		1676	1574	1425	1676	3353	1500	1676	4529	
Flt Permitted	0.15	1.00		0.51	1.00	1.00	0.29	1.00	1.00	0.05	1.00	
Satd. Flow (perm)	261	1752		901	1574	1425	515	3353	1500	89	4529	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	493	164	8	200	232	512	8	1472	68	507	565	375
RTOR Reduction (vph)	0	1	0	0	16	26	0	0	35	0	74	0
Lane Group Flow (vph)	493	171	0	200	375	327	8	1472	33	507	866	0
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	46.0	27.4		37.6	23.0	43.0	76.0	75.2	75.2	99.2	94.4	
Effective Green, g (s)	46.0	27.4		37.6	23.0	43.0	76.0	75.2	75.2	99.2	94.4	
Actuated g/C Ratio	0.30	0.18		0.25	0.15	0.28	0.50	0.49	0.49	0.65	0.62	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	253	313		294	236	437	261	1645	736	264	2790	
v/s Ratio Prot	c0.24	0.10		0.06	0.24	0.10	0.00	0.44		c0.25	0.19	
v/s Ratio Perm	c0.34			0.10		0.13	0.02		0.02	c0.99		
v/c Ratio	1.95	0.55		0.68	1.59	0.75	0.03	0.89	0.05	1.92	0.31	
Uniform Delay, d1	46.2	57.3		49.9	65.1	50.2	19.5	35.4	20.3	53.6	14.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	441.0	2.0		6.3	284.0	6.9	0.0	8.0	0.1	428.0	0.3	
Delay (s)	487.3	59.2		56.3	349.1	57.1	19.6	43.4	20.4	481.6	14.2	
Level of Service	F	E		E	F	E	B	D	C	F	B	
Approach Delay (s)		376.5			177.8			42.2			178.0	
Approach LOS		F			F			D			F	

Intersection Summary			
HCM 2000 Control Delay	161.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.00		
Actuated Cycle Length (s)	153.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	128.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Intersection Delay, s/veh	417.2

Movement	NBL	NBT	SBT	SBR	NEL	NER
Vol, veh/h	614	450	402	12	27	469
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	667	489	437	13	29	510

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	450	0	-	0	2267	443
Stage 1	-	-	-	-	443	-
Stage 2	-	-	-	-	1824	-
Follow-up Headway	2.218	-	-	-	3.518	3.318
Pot Capacity-1 Maneuver	1110	-	-	-	45	615
Stage 1	-	-	-	-	647	-
Stage 2	-	-	-	-	141	-
Time blocked-Platoon, %		-	-	-		
Mov Capacity-1 Maneuver	1110	-	-	-	# 8	615
Mov Capacity-2 Maneuver	-	-	-	-	# 8	-
Stage 1	-	-	-	-	647	-
Stage 2	-	-	-	-	# 25	-

Approach	NB	SB	NE
HCM Control Delay, s	8	0	$ 1644

Minor Lane / Major Mvmt	NELn1	NBL	NBT	SBT	SBR
Capacity (veh/h)	120	1110	-	-	-
HCM Lane V/C Ratio	4.493	0.601	-	-	-
HCM Control Delay (s)	$ 1644.4	13.007	0	-	-
HCM Lane LOS	F	B	A		
HCM 95th %tile Q(veh)	56.001	4.204	-	-	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	103	523	140	510	1191	484	771	277	85	246	294	363
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	180.0	176.5	176.5	180.0	176.5	176.5	180.0	176.5	176.5	176.5
Lanes	1	3	0	2	3	0	2	2	0	2	1	2
Cap, veh/h	112	1080	282	471	1237	498	761	804	241	336	314	967
Arrive On Green	0.07	0.27	0.27	0.14	0.34	0.34	0.23	0.31	0.31	0.10	0.18	0.18
Sat Flow, veh/h	1681	4049	1058	3261	3592	1446	3261	2609	782	3261	1765	3000
Grp Volume(v), veh/h	112	493	227	554	1272	549	838	202	191	267	320	395
Grp Sat Flow(s),veh/h/ln	1681	1765	1578	1630	1765	1509	1630	1765	1627	1630	1765	1500
Q Serve(g_s), s	6.0	10.7	11.1	13.0	31.0	31.0	21.0	8.0	8.3	7.2	16.0	9.2
Cycle Q Clear(g_c), s	6.0	10.7	11.1	13.0	31.0	31.0	21.0	8.0	8.3	7.2	16.0	9.2
Prop In Lane	1.00		0.67	1.00		0.96	1.00		0.48	1.00		1.00
Lane Grp Cap(c), veh/h	112	941	421	471	1216	520	761	544	501	336	314	967
V/C Ratio(X)	1.00	0.52	0.54	1.18	1.05	1.06	1.10	0.37	0.38	0.80	1.02	0.41
Avail Cap(c_a), veh/h	112	941	421	471	1216	520	761	544	501	362	314	967
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.0	28.1	28.3	38.5	29.5	29.5	34.5	24.3	24.4	39.4	37.0	23.8
Incr Delay (d2), s/veh	84.9	2.1	4.9	99.6	38.8	55.0	64.0	0.4	0.5	10.9	56.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	5.2	4.9	4.9	11.8	19.9	19.4	15.2	3.6	3.4	3.5	11.9	3.4
Lane Grp Delay (d), s/veh	126.9	30.2	33.1	138.1	68.3	84.5	98.5	24.7	24.9	50.4	93.0	24.1
Lane Grp LOS	F	C	C	F	F	F	F	C	C	D	F	C
Approach Vol, veh/h		832			2375			1231			982	
Approach Delay, s/veh		44.0			88.4			75.0			53.7	
Approach LOS		D			F			E			D	

Timer												
Assigned Phs	5	2		1	6		7	4		3	8	
Phs Duration (G+Y+Rc), s	10.0	28.0		17.0	35.0		25.0	31.7		13.3	20.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	6.0	24.0		13.0	31.0		21.0	27.0		10.0	16.0	
Max Q Clear Time (g_c+I1), s	8.0	13.1		15.0	33.0		23.0	10.3		9.2	18.0	
Green Ext Time (p_c), s	0.0	9.7		0.0	0.0		0.0	5.7		0.1	0.0	

Intersection Summary			
HCM 2010 Ctrl Delay			72.2
HCM 2010 LOS			E

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	481	1602	252	382	1758	564	289	551	213	534	849	305
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	180.0
Lanes	1	3	1	1	2	1	1	2	0	1	2	0
Cap, veh/h	325	1482	420	370	1082	460	168	453	175	347	729	261
Arrive On Green	0.19	0.28	0.28	0.22	0.31	0.31	0.10	0.19	0.19	0.21	0.29	0.29
Sat Flow, veh/h	1681	5294	1500	1681	3529	1500	1681	2426	938	1681	2484	889
Grp Volume(v), veh/h	523	1741	274	415	1911	613	314	436	395	580	654	601
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1681	1765	1500	1681	1765	1599	1681	1765	1608
Q Serve(g_s), s	29.0	42.0	24.1	33.0	46.0	46.0	15.0	28.0	28.0	31.0	44.0	44.0
Cycle Q Clear(g_c), s	29.0	42.0	24.1	33.0	46.0	46.0	15.0	28.0	28.0	31.0	44.0	44.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.59	1.00		0.55
Lane Grp Cap(c), veh/h	325	1482	420	370	1082	460	168	329	299	347	518	472
V/C Ratio(X)	1.61	1.17	0.65	1.12	1.77	1.33	1.87	1.32	1.32	1.67	1.26	1.27
Avail Cap(c_a), veh/h	325	1482	420	370	1082	460	168	329	299	347	518	472
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.5	54.0	47.6	58.5	52.0	52.0	67.5	61.0	61.0	59.5	53.0	53.0
Incr Delay (d2), s/veh	288.2	86.0	3.6	84.3	348.3	164.0	412.6	164.7	167.6	313.8	133.6	138.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	38.7	31.0	9.8	23.1	73.3	38.7	25.9	28.0	25.6	43.9	39.3	36.5
Lane Grp Delay (d), s/veh	348.7	140.0	51.1	142.8	400.3	216.0	480.1	225.7	228.6	373.3	186.6	191.9
Lane Grp LOS	F	F	D	F	F	F	F	F	F	F	F	F
Approach Vol, veh/h		2538			2939			1145			1835	
Approach Delay, s/veh		173.4			325.5			296.5			247.4	
Approach LOS		F			F			F			F	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	33.0	46.0		37.0	50.0		19.0	32.0		35.0	48.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	29.0	42.0		33.0	46.0		15.0	28.0		31.0	44.0	
Max Q Clear Time (g_c+I1), s	31.0	44.0		35.0	48.0		17.0	30.0		33.0	46.0	
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	259.0
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	462	2221	784	537	1211	173	321	488	284	433	903	324
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	176.5
Lanes	2	2	1	2	2	1	2	2	0	2	2	1
Cap, veh/h	548	1482	630	391	1313	558	283	406	236	521	941	652
Arrive On Green	0.17	0.42	0.42	0.12	0.37	0.37	0.09	0.19	0.19	0.16	0.27	0.27
Sat Flow, veh/h	3261	3529	1500	3261	3529	1500	3261	2095	1219	3261	3529	1500
Grp Volume(v), veh/h	502	2414	852	584	1316	188	349	446	393	471	982	352
Grp Sat Flow(s),veh/h/ln	1630	1765	1500	1630	1765	1500	1630	1765	1550	1630	1765	1500
Q Serve(g_s), s	22.7	63.0	63.0	18.0	55.8	13.5	13.0	29.0	29.0	21.3	40.0	26.0
Cycle Q Clear(g_c), s	22.7	63.0	63.0	18.0	55.8	13.5	13.0	29.0	29.0	21.3	40.0	26.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.79	1.00		1.00
Lane Grp Cap(c), veh/h	548	1482	630	391	1313	558	283	342	300	521	941	652
V/C Ratio(X)	0.92	1.63	1.35	1.49	1.00	0.34	1.24	1.31	1.31	0.90	1.04	0.54
Avail Cap(c_a), veh/h	587	1482	630	391	1313	558	283	342	300	587	941	652
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	61.4	43.5	43.5	66.0	47.1	33.8	68.5	60.5	60.5	61.9	55.0	31.3
Incr Delay (d2), s/veh	18.6	285.9	168.9	234.8	25.4	0.4	132.5	157.4	161.0	16.4	41.3	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	11.1	87.1	53.5	20.5	30.2	5.2	10.8	28.3	25.2	10.3	23.7	10.4
Lane Grp Delay (d), s/veh	80.0	329.4	212.4	300.8	72.5	34.2	201.0	217.9	221.5	78.3	96.3	34.5
Lane Grp LOS	E	F	F	F	F	C	F	F	F	E	F	C
Approach Vol, veh/h		3768			2088			1188			1805	
Approach Delay, s/veh		269.7			132.9			214.1			79.5	
Approach LOS		F			F			F			E	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	29.2	67.0		22.0	59.8		17.0	33.0		28.0	44.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	27.0	63.0		18.0	54.0		13.0	26.0		27.0	40.0	
Max Q Clear Time (g_c+I1), s	24.7	65.0		20.0	57.8		15.0	31.0		23.3	42.0	
Green Ext Time (p_c), s	0.5	0.0		0.0	0.0		0.0	0.0		0.7	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	191.2
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	611	1530	282	457	971	286	336	903	522	487	904	297
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0
Lanes	2	2	1	2	2	1	2	3	1	2	3	0
Cap, veh/h	685	1341	570	391	1024	435	326	953	270	522	917	301
Arrive On Green	0.21	0.38	0.38	0.12	0.29	0.29	0.10	0.18	0.18	0.16	0.24	0.24
Sat Flow, veh/h	3261	3529	1500	3261	3529	1500	3261	5294	1500	3261	3819	1253
Grp Volume(v), veh/h	664	1663	307	497	1055	311	365	982	567	529	908	398
Grp Sat Flow(s),veh/h/ln	1630	1765	1500	1630	1765	1500	1630	1765	1500	1630	1765	1544
Q Serve(g_s), s	20.2	38.0	16.0	12.0	29.0	18.6	10.0	18.0	18.0	16.0	24.0	24.0
Cycle Q Clear(g_c), s	20.2	38.0	16.0	12.0	29.0	18.6	10.0	18.0	18.0	16.0	24.0	24.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.81
Lane Grp Cap(c), veh/h	685	1341	570	391	1024	435	326	953	270	522	847	370
V/C Ratio(X)	0.97	1.24	0.54	1.27	1.03	0.71	1.12	1.03	2.10	1.01	1.07	1.07
Avail Cap(c_a), veh/h	685	1341	570	391	1024	435	326	953	270	522	847	370
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.2	31.0	24.2	44.0	35.5	31.8	45.0	41.0	41.0	42.0	38.0	38.0
Incr Delay (d2), s/veh	26.9	114.5	1.0	140.4	36.3	5.5	86.1	37.2	507.4	43.0	52.2	67.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	10.9	37.7	6.0	12.6	18.0	7.6	8.1	11.3	44.9	9.7	16.7	16.2
Lane Grp Delay (d), s/veh	66.1	145.5	25.2	184.4	71.8	37.3	131.1	78.2	548.4	85.0	90.2	105.8
Lane Grp LOS	E	F	C	F	F	D	F	F	F	F	F	F
Approach Vol, veh/h		2634			1863			1914			1835	
Approach Delay, s/veh		111.5			96.1			227.6			92.1	
Approach LOS		F			F			F			F	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	25.0	42.0		16.0	33.0		14.0	22.0		20.0	28.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	21.0	38.0		12.0	29.0		10.0	18.0		16.0	24.0	
Max Q Clear Time (g_c+I1), s	22.2	40.0		14.0	31.0		12.0	20.0		18.0	26.0	
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	130.6
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	154	232	254	343	253	629	659	1426	237	137	1115	232
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	180.0
Lanes	1	3	1	1	2	1	2	3	0	2	3	0
Cap, veh/h	149	941	267	280	902	383	652	1329	220	580	1182	246
Arrive On Green	0.09	0.18	0.18	0.17	0.26	0.26	0.20	0.30	0.30	0.18	0.28	0.28
Sat Flow, veh/h	1681	5294	1500	1681	3529	1500	3261	4430	735	3261	4254	884
Grp Volume(v), veh/h	167	252	276	373	275	684	716	1234	574	149	1006	458
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1681	1765	1500	1630	1765	1635	1630	1765	1609
Q Serve(g_s), s	8.0	3.7	16.0	15.0	5.7	23.0	18.0	27.0	27.0	3.5	25.0	25.0
Cycle Q Clear(g_c), s	8.0	3.7	16.0	15.0	5.7	23.0	18.0	27.0	27.0	3.5	25.0	25.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.45	1.00		0.55
Lane Grp Cap(c), veh/h	149	941	267	280	902	383	652	1059	491	580	980	447
V/C Ratio(X)	1.12	0.27	1.03	1.33	0.30	1.78	1.10	1.17	1.17	0.26	1.03	1.03
Avail Cap(c_a), veh/h	149	941	267	280	902	383	652	1059	491	580	980	447
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.0	31.9	37.0	37.5	27.0	33.5	36.0	31.5	31.5	31.9	32.5	32.5
Incr Delay (d2), s/veh	108.8	0.2	64.5	171.7	0.2	363.3	65.1	84.9	96.6	1.1	35.5	49.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	7.9	1.6	10.8	19.7	2.5	47.2	13.2	24.1	24.1	1.5	15.7	16.0
Lane Grp Delay (d), s/veh	149.8	32.1	101.5	209.2	27.2	396.8	101.1	116.4	128.1	33.0	68.0	81.8
Lane Grp LOS	F	C	F	F	C	F	F	F	F	C	F	F
Approach Vol, veh/h		695			1332			2524			1613	
Approach Delay, s/veh		87.9			268.0			114.7			68.7	
Approach LOS		F			F			F			E	

Timer												
Assigned Phs	7	4		3	8		1	6		5	2	
Phs Duration (G+Y+Rc), s	12.0	20.0		19.0	27.0		22.0	31.0		20.0	29.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	8.0	16.0		15.0	23.0		18.0	27.0		16.0	25.0	
Max Q Clear Time (g_c+I1), s	10.0	18.0		17.0	25.0		20.0	29.0		5.5	27.0	
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0		0.0	0.0		0.3	0.0	

Intersection Summary												
HCM 2010 Ctrl Delay			132.8									
HCM 2010 LOS			F									

Notes

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	80	508	1432	111	487	2262
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	0.86	0.86	0.97	0.91
Frt	0.89	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.99	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	2997	1365	4548	1290	3252	4818
Flt Permitted	0.99	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	2997	1365	4548	1290	3252	4818
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	552	1557	121	529	2459
RTOR Reduction (vph)	205	1	1	64	0	0
Lane Group Flow (vph)	158	275	1568	45	529	2459
Turn Type	NA	pm+ov	NA	Perm	Prot	NA
Protected Phases	8	1	2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	7.3	12.3	17.0	17.0	5.0	26.0
Effective Green, g (s)	7.3	12.3	17.0	17.0	5.0	26.0
Actuated g/C Ratio	0.18	0.30	0.41	0.41	0.12	0.63
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	529	538	1872	530	393	3033
v/s Ratio Prot	0.05	c0.06	0.34		c0.16	c0.51
v/s Ratio Perm		0.14		0.03		
v/c Ratio	0.30	0.51	0.84	0.08	1.35	0.81
Uniform Delay, d1	14.8	12.0	10.9	7.4	18.1	5.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.8	4.7	0.3	171.9	2.5
Delay (s)	15.1	12.8	15.6	7.7	190.0	8.3
Level of Service	B	B	B	A	F	A
Approach Delay (s)	14.1		15.1			40.4
Approach LOS	B		B			D

Intersection Summary			
HCM 2000 Control Delay	29.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	41.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	44	19	395	64	166	96	294	102	108	354	12
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		0.97	0.95	0.95	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.95		1.00	0.93	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	1684		3252	1561	1425	1676	3353	1500	3252	3353	1500
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1676	1684		3252	1561	1425	1676	3353	1500	3252	3353	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	8	48	21	429	70	180	104	320	111	117	385	13
RTOR Reduction (vph)	0	19	0	0	45	93	0	0	56	0	0	9
Lane Group Flow (vph)	8	50	0	429	84	28	104	320	56	117	385	4
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases						8			2			6
Actuated Green, G (s)	0.7	5.9		6.2	11.4	11.4	4.5	18.7	24.9	3.0	17.2	17.2
Effective Green, g (s)	0.7	5.9		6.2	11.4	11.4	4.5	18.7	24.9	3.0	17.2	17.2
Actuated g/C Ratio	0.01	0.12		0.12	0.23	0.23	0.09	0.38	0.50	0.06	0.35	0.35
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	23	199		404	357	326	151	1259	870	195	1158	518
v/s Ratio Prot	0.00	0.03		c0.13	c0.05		c0.06	0.10	0.01	0.04	c0.11	
v/s Ratio Perm						0.02			0.03			0.00
v/c Ratio	0.35	0.25		1.06	0.23	0.08	0.69	0.25	0.06	0.60	0.33	0.01
Uniform Delay, d1	24.3	19.9		21.8	15.6	15.1	22.0	10.7	6.4	22.8	12.1	10.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.9	0.7		62.1	0.3	0.1	12.3	0.5	0.0	4.9	0.8	0.0
Delay (s)	33.2	20.6		83.9	16.0	15.2	34.3	11.2	6.5	27.7	12.8	10.7
Level of Service	C	C		F	B	B	C	B	A	C	B	B
Approach Delay (s)		21.9			58.8			14.7			16.2	
Approach LOS		C			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	32.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	49.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	44.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	1557	220	565	1016	10	554	1	2544	2	2	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		0.97	0.95		1.00	0.95	0.95	1.00	1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.85	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	3291		3252	3348		1676	1425	1425	1676	1765	
Flt Permitted	0.95	1.00		0.95	1.00		0.76	1.00	1.00	0.05	1.00	
Satd. Flow (perm)	1676	3291		3252	3348		1335	1425	1425	93	1765	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1692	239	614	1104	11	602	1	2765	2	2	0
RTOR Reduction (vph)	0	7	0	0	1	0	0	95	95	0	0	0
Lane Group Flow (vph)	1	1924	0	614	1114	0	602	1289	1287	2	2	0
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	7	4		3				2			6	
Permitted Phases					8		2		2	6		
Actuated Green, G (s)	0.8	51.2		14.0	64.4		76.0	76.0	76.0	76.0	76.0	
Effective Green, g (s)	0.8	51.2		14.0	64.4		76.0	76.0	76.0	76.0	76.0	
Actuated g/C Ratio	0.01	0.33		0.09	0.42		0.50	0.50	0.50	0.50	0.50	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	8	1099		297	1407		662	706	706	46	875	
v/s Ratio Prot	0.00	c0.58		c0.19				c0.90			0.00	
v/s Ratio Perm					0.33		0.45		0.90	0.02		
v/c Ratio	0.12	1.75		2.07	0.79		0.91	1.83	1.82	0.04	0.00	
Uniform Delay, d1	75.9	51.0		69.6	38.6		35.4	38.6	38.6	19.9	19.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.9	341.5		491.8	3.1		16.4	377.0	375.7	1.8	0.0	
Delay (s)	82.8	392.5		561.4	41.7		51.8	415.6	414.3	21.7	19.5	
Level of Service	F	F		F	D		D	F	F	C	B	
Approach Delay (s)		392.3			226.3			350.1			20.6	
Approach LOS		F			F			F			C	

Intersection Summary			
HCM 2000 Control Delay	331.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.82		
Actuated Cycle Length (s)	153.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	177.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	393	502	41	217	610	282	186	1078	171	333	1041	693
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.91	
Frt	1.00	0.99		1.00	0.99	0.85	1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	1745		1676	1665	1425	1676	3353	1500	1676	4529	
Flt Permitted	0.12	1.00		0.13	1.00	1.00	0.07	1.00	1.00	0.10	1.00	
Satd. Flow (perm)	208	1745		228	1665	1425	122	3353	1500	168	4529	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	427	546	45	236	663	307	202	1172	186	362	1132	753
RTOR Reduction (vph)	0	2	0	0	2	28	0	0	92	0	92	0
Lane Group Flow (vph)	427	589	0	236	692	248	202	1172	94	362	1793	0
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	48.0	34.0		42.0	31.0	42.0	64.0	58.0	58.0	73.0	63.0	
Effective Green, g (s)	48.0	34.0		42.0	31.0	42.0	64.0	58.0	58.0	73.0	63.0	
Actuated g/C Ratio	0.37	0.26		0.32	0.24	0.32	0.49	0.45	0.45	0.56	0.48	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	234	456		196	397	504	131	1495	669	221	2194	
v/s Ratio Prot	c0.20	0.34		0.10	0.42	0.04	0.07	0.35		c0.14	0.40	
v/s Ratio Perm	c0.48			0.29		0.13	0.69		0.06	c0.78		
v/c Ratio	1.82	1.29		1.20	1.74	0.49	1.54	0.78	0.14	1.64	0.92dr	
Uniform Delay, d1	36.9	48.0		38.0	49.5	35.4	28.1	30.7	21.3	32.4	28.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	387.5	146.7		130.1	345.2	0.8	278.2	4.2	0.4	306.7	3.5	
Delay (s)	424.3	194.7		168.1	394.7	36.2	306.3	34.9	21.7	339.0	32.1	
Level of Service	F	F		F	F	D	F	C	C	F	C	
Approach Delay (s)		291.0			268.3			68.4			81.6	
Approach LOS		F			F			E			F	

Intersection Summary			
HCM 2000 Control Delay	150.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.78		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	127.2%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	6

Movement	NBL	NBT	SBT	SBR	NEL	NER
Vol, veh/h	180	350	348	34	35	198
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	196	380	378	37	38	215

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	415	0	-	0	1169	397
Stage 1	-	-	-	-	397	-
Stage 2	-	-	-	-	772	-
Follow-up Headway	2.218	-	-	-	3.518	3.318
Pot Capacity-1 Maneuver	1144	-	-	-	213	652
Stage 1	-	-	-	-	679	-
Stage 2	-	-	-	-	456	-
Time blocked-Platoon, %		-	-	-		
Mov Capacity-1 Maneuver	1144	-	-	-	167	652
Mov Capacity-2 Maneuver	-	-	-	-	167	-
Stage 1	-	-	-	-	679	-
Stage 2	-	-	-	-	357	-

Approach	NB	SB	NE
HCM Control Delay, s	3	0	22

Minor Lane / Major Mvmt	NELn1	NBL	NBT	SBT	SBR
Capacity (veh/h)	454	1144	-	-	-
HCM Lane V/C Ratio	0.558	0.171	-	-	-
HCM Control Delay (s)	22.5	8.795	0	-	-
HCM Lane LOS	C	A	A		
HCM 95th %tile Q(veh)	3.34	0.616	-	-	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	30	1352	190	176	510	352	777	271	87	447	546	779
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	180.0	176.5	176.5	180.0	176.5	176.5	180.0	176.5	176.5	176.5
Lanes	1	3	0	2	3	0	2	2	0	2	1	2
Cap, veh/h	46	1701	239	195	1436	610	1259	994	314	1259	681	1338
Arrive On Green	0.03	0.37	0.37	0.06	0.41	0.41	0.39	0.39	0.39	0.39	0.39	0.39
Sat Flow, veh/h	1681	4542	639	3261	3529	1500	3261	2574	812	3261	1765	3000
Grp Volume(v), veh/h	33	1142	535	191	554	383	845	200	190	486	593	847
Grp Sat Flow(s),veh/h/ln	1681	1765	1652	1630	1765	1500	1630	1765	1621	1630	1765	1500
Q Serve(g_s), s	1.3	20.0	20.0	3.9	7.4	13.6	14.3	5.3	5.4	7.2	20.8	14.6
Cycle Q Clear(g_c), s	1.3	20.0	20.0	3.9	7.4	13.6	14.3	5.3	5.4	7.2	20.8	14.6
Prop In Lane	1.00		0.39	1.00		1.00	1.00		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	46	1321	618	195	1436	610	1259	681	626	1259	681	1338
V/C Ratio(X)	0.72	0.86	0.87	0.98	0.39	0.63	0.67	0.29	0.30	0.39	0.87	0.63
Avail Cap(c_a), veh/h	126	1321	618	195	1436	610	1416	766	704	1259	681	1338
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.2	19.3	19.3	31.3	13.9	15.8	17.0	14.2	14.3	14.8	19.0	14.3
Incr Delay (d2), s/veh	18.6	7.7	15.0	57.8	0.8	4.8	1.1	0.2	0.3	0.2	11.8	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.8	9.5	10.2	3.1	3.2	5.5	5.7	2.2	2.1	2.8	10.8	5.0
Lane Grp Delay (d), s/veh	50.8	27.0	34.3	89.2	14.7	20.6	18.1	14.4	14.5	15.0	30.7	15.3
Lane Grp LOS	D	C	C	F	B	C	B	B	B	B	C	B
Approach Vol, veh/h		1710			1128			1235			1926	
Approach Delay, s/veh		29.8			29.3			16.9			20.0	
Approach LOS		C			C			B			B	

Timer												
Assigned Phs	5	2		1	6			4			8	
Phs Duration (G+Y+Rc), s	5.8	29.0		8.0	31.2			29.8			29.8	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0			4.0			4.0	
Max Green Setting (Gmax), s	5.0	25.0		4.0	24.0			29.0			25.0	
Max Q Clear Time (g_c+I1), s	3.3	22.0		5.9	15.6			16.3			22.8	
Green Ext Time (p_c), s	0.0	2.8		0.0	7.7			9.4			2.1	

Intersection Summary			
HCM 2010 Ctrl Delay			23.9
HCM 2010 LOS			C

Notes

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	417	732	2040	749	1118	1004
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00	0.91	1.00	0.97	0.91
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3252	1500	4818	1500	3252	4818
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3252	1500	4818	1500	3252	4818
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	453	796	2217	814	1215	1091
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	453	796	2217	814	1215	1091
Turn Type	NA	Free	NA	Free	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		Free		Free		
Actuated Green, G (s)	17.0	130.0	56.0	130.0	45.0	105.0
Effective Green, g (s)	17.0	130.0	56.0	130.0	45.0	105.0
Actuated g/C Ratio	0.13	1.00	0.43	1.00	0.35	0.81
Clearance Time (s)	4.0		4.0		4.0	4.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	425	1500	2075	1500	1125	3891
v/s Ratio Prot	c0.14		c0.46		c0.37	0.23
v/s Ratio Perm		0.53		0.54		
v/c Ratio	1.07	0.53	1.07	0.54	1.08	0.28
Uniform Delay, d1	56.5	0.0	37.0	0.0	42.5	3.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	62.3	1.3	41.0	1.4	51.2	0.2
Delay (s)	118.8	1.3	78.0	1.4	93.7	3.3
Level of Service	F	A	E	A	F	A
Approach Delay (s)	43.9		57.4			50.9
Approach LOS	D		E			D

Intersection Summary			
HCM 2000 Control Delay	52.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	97.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	389	1279	119	150	1389	332	367	495	354	290	261	168
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	180.0
Lanes	1	3	1	1	2	1	1	2	0	1	2	0
Cap, veh/h	709	2233	633	709	1489	633	428	488	349	311	376	235
Arrive On Green	0.42	0.42	0.42	0.42	0.42	0.42	0.25	0.25	0.25	0.19	0.19	0.19
Sat Flow, veh/h	1681	5294	1500	1681	3529	1500	1681	1916	1371	1681	2034	1271
Grp Volume(v), veh/h	423	1390	129	163	1510	361	399	495	428	315	245	222
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1681	1765	1500	1681	1765	1523	1681	1765	1540
Q Serve(g_s), s	16.8	17.8	4.7	5.4	36.5	15.8	20.1	22.0	22.0	16.0	11.4	11.8
Cycle Q Clear(g_c), s	16.8	17.8	4.7	5.4	36.5	15.8	20.1	22.0	22.0	16.0	11.4	11.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.90	1.00		0.83
Lane Grp Cap(c), veh/h	709	2233	633	709	1489	633	428	449	387	311	327	285
V/C Ratio(X)	0.60	0.62	0.20	0.23	1.01	0.57	0.93	1.10	1.10	1.01	0.75	0.78
Avail Cap(c_a), veh/h	758	2388	677	709	1489	633	428	449	387	311	327	285
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.3	19.6	15.8	16.0	25.0	19.0	31.5	32.2	32.2	35.2	33.4	33.5
Incr Delay (d2), s/veh	1.1	0.5	0.2	0.2	26.9	1.2	27.5	73.6	76.8	54.4	14.7	18.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	6.9	7.6	1.7	2.2	20.9	5.8	11.7	18.8	16.5	11.4	6.4	6.0
Lane Grp Delay (d), s/veh	20.5	20.1	16.0	16.2	51.9	20.3	59.0	105.8	109.0	89.6	48.1	52.2
Lane Grp LOS	C	C	B	B	F	C	E	F	F	F	D	D
Approach Vol, veh/h		1942			2034			1322			782	
Approach Delay, s/veh		19.9			43.5			92.7			66.0	
Approach LOS		B			D			F			E	

Timer								
Assigned Phs		4			8		5	2		1	6	
Phs Duration (G+Y+Rc), s		40.5			40.5		26.0	26.0		20.0	20.0	
Change Period (Y+Rc), s		4.0			4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s		39.0			35.0		22.0	22.0		16.0	16.0	
Max Q Clear Time (g_c+I1), s		19.8			38.5		22.1	24.0		18.0	13.8	
Green Ext Time (p_c), s		16.7			0.0		0.0	0.0		0.0	1.6	

Intersection Summary	
HCM 2010 Ctrl Delay	49.5
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	309	797	82	276	1399	262	639	551	696	273	249	348
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	176.5
Lanes	2	2	1	2	2	1	2	2	0	2	2	1
Cap, veh/h	283	1294	550	348	1365	580	760	612	520	239	660	410
Arrive On Green	0.09	0.37	0.37	0.11	0.39	0.39	0.23	0.35	0.35	0.07	0.19	0.19
Sat Flow, veh/h	3261	3529	1500	3261	3529	1500	3261	1765	1500	3261	3529	1500
Grp Volume(v), veh/h	336	866	89	300	1521	285	695	599	757	297	271	378
Grp Sat Flow(s),veh/h/ln	1630	1765	1500	1630	1765	1500	1630	1765	1500	1630	1765	1500
Q Serve(g_s), s	13.0	30.9	6.0	13.6	58.0	21.6	31.2	50.4	52.0	11.0	10.1	28.0
Cycle Q Clear(g_c), s	13.0	30.9	6.0	13.6	58.0	21.6	31.2	50.4	52.0	11.0	10.1	28.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	283	1294	550	348	1365	580	760	612	520	239	660	410
V/C Ratio(X)	1.19	0.67	0.16	0.86	1.11	0.49	0.91	0.98	1.46	1.24	0.41	0.92
Avail Cap(c_a), veh/h	283	1294	550	435	1365	580	891	612	520	239	660	410
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	68.5	39.9	32.0	65.9	46.0	34.8	56.1	48.5	49.0	69.5	53.7	52.9
Incr Delay (d2), s/veh	114.8	1.3	0.1	13.6	62.2	0.6	12.5	31.6	215.6	139.2	1.9	28.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	10.1	14.3	2.3	6.5	37.9	8.3	14.6	28.2	51.2	9.3	4.8	17.5
Lane Grp Delay (d), s/veh	183.3	41.2	32.1	79.5	108.2	35.5	68.6	80.1	264.6	208.7	55.6	81.3
Lane Grp LOS	F	D	C	E	F	D	E	F	F	F	E	F
Approach Vol, veh/h		1291			2106			2051			946	
Approach Delay, s/veh		77.6			94.3			144.3			113.9	
Approach LOS		E			F			F			F	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	17.0	59.0		20.0	62.0		39.0	56.0		15.0	32.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	13.0	51.0		20.0	58.0		41.0	52.0		11.0	22.0	
Max Q Clear Time (g_c+I1), s	15.0	32.9		15.6	60.0		33.2	54.0		13.0	30.0	
Green Ext Time (p_c), s	0.0	15.6		0.4	0.0		1.8	0.0		0.0	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	109.8
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	393	502	41	217	610	282	186	1078	171	333	1041	693
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.95		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	3315		1676	3194		1676	1728		1676	1765	1500
Flt Permitted	0.17	1.00		0.17	1.00		0.07	1.00		0.07	1.00	1.00
Satd. Flow (perm)	294	3315		307	3194		124	1728		116	1765	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	427	546	45	236	663	307	202	1172	186	362	1132	753
RTOR Reduction (vph)	0	5	0	0	45	0	0	5	0	0	0	160
Lane Group Flow (vph)	427	586	0	236	925	0	202	1353	0	362	1132	593
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	37.0	24.0		35.0	23.0		63.0	57.0		72.0	62.0	62.0
Effective Green, g (s)	37.0	24.0		35.0	23.0		63.0	57.0		72.0	62.0	62.0
Actuated g/C Ratio	0.31	0.20		0.29	0.19		0.52	0.48		0.60	0.52	0.52
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	240	663		226	612		142	820		212	911	775
v/s Ratio Prot	c0.19	0.18		0.10	0.29		0.07	0.78		c0.16	0.64	
v/s Ratio Perm	c0.36			0.20			0.67			c0.87		0.40
v/c Ratio	1.78	0.88		1.04	1.51		1.42	1.65		1.71	1.24	0.77
Uniform Delay, d1	36.4	46.6		37.5	48.5		31.3	31.5		39.1	29.0	23.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	367.0	13.3		71.9	238.3		226.0	298.1		337.7	118.5	7.1
Delay (s)	403.4	60.0		109.4	286.8		257.3	329.6		376.8	147.5	30.3
Level of Service	F	E		F	F		F	F		F	F	C
Approach Delay (s)		204.0			252.1			320.3			145.2	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	221.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.79		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	154.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	26	1158	144	100	436	302	663	230	75	327	471	539
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	180.0	176.5	176.5	180.0	176.5	176.5	180.0	176.5	176.5	176.5
Lanes	1	3	0	2	3	0	2	2	0	2	1	2
Cap, veh/h	44	1284	159	145	1044	444	725	867	277	528	490	967
Arrive On Green	0.03	0.28	0.28	0.04	0.30	0.30	0.22	0.34	0.34	0.16	0.28	0.28
Sat Flow, veh/h	1681	4621	572	3261	3529	1500	3261	2566	819	3261	1765	3000
Grp Volume(v), veh/h	36	1229	582	139	607	420	922	218	206	455	655	750
Grp Sat Flow(s),veh/h/ln	1681	1765	1664	1630	1765	1500	1630	1765	1620	1630	1765	1500
Q Serve(g_s), s	1.9	25.0	25.0	3.8	13.2	24.6	20.0	8.4	8.7	12.2	25.0	20.3
Cycle Q Clear(g_c), s	1.9	25.0	25.0	3.8	13.2	24.6	20.0	8.4	8.7	12.2	25.0	20.3
Prop In Lane	1.00		0.34	1.00		1.00	1.00		0.51	1.00		1.00
Lane Grp Cap(c), veh/h	44	980	462	145	1044	444	725	597	548	528	490	967
V/C Ratio(X)	0.81	1.25	1.26	0.96	0.58	0.95	1.27	0.37	0.38	0.86	1.34	0.78
Avail Cap(c_a), veh/h	93	980	462	145	1044	444	725	597	548	580	490	967
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.6	32.5	32.5	42.9	26.9	31.0	35.0	22.5	22.6	36.7	32.5	27.6
Incr Delay (d2), s/veh	28.4	122.8	132.8	62.3	2.4	31.2	133.3	0.4	0.4	11.8	164.7	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	1.2	27.6	27.3	2.8	6.1	13.1	21.6	3.7	3.5	5.9	33.3	8.0
Lane Grp Delay (d), s/veh	72.0	155.3	165.3	105.2	29.3	62.2	168.3	22.9	23.0	48.5	197.2	31.6
Lane Grp LOS	E	F	F	F	C	E	F	C	C	D	F	C
Approach Vol, veh/h		1847			1166			1346			1860	
Approach Delay, s/veh		156.8			50.2			122.5			94.1	
Approach LOS		F			D			F			F	

Timer												
Assigned Phs	5	2		1	6		7	4		3	8	
Phs Duration (G+Y+Rc), s	6.4	29.0		8.0	30.6		24.0	34.4		18.6	29.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	5.0	25.0		4.0	24.0		20.0	29.0		16.0	25.0	
Max Q Clear Time (g_c+I1), s	3.9	27.0		5.8	26.6		22.0	10.7		14.2	27.0	
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0		0.0	10.4		0.3	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	110.6
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	335	1000	75	129	1104	286	270	426	305	250	225	145
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	180.0
Lanes	1	3	1	1	2	1	1	2	0	1	2	0
Cap, veh/h	321	2041	578	208	1123	477	336	383	274	244	295	186
Arrive On Green	0.19	0.39	0.39	0.12	0.32	0.32	0.20	0.20	0.20	0.15	0.15	0.15
Sat Flow, veh/h	1681	5294	1500	1681	3529	1500	1681	1917	1370	1681	2028	1276
Grp Volume(v), veh/h	466	1391	104	179	1536	398	376	546	471	348	271	244
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1681	1765	1500	1681	1765	1523	1681	1765	1539
Q Serve(g_s), s	21.0	24.1	5.0	11.5	35.0	27.1	22.0	22.0	22.0	16.0	16.0	16.0
Cycle Q Clear(g_c), s	21.0	24.1	5.0	11.5	35.0	27.1	22.0	22.0	22.0	16.0	16.0	16.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.90	1.00		0.83
Lane Grp Cap(c), veh/h	321	2041	578	208	1123	477	336	353	305	244	257	224
V/C Ratio(X)	1.45	0.68	0.18	0.86	1.37	0.83	1.12	1.55	1.55	1.42	1.06	1.09
Avail Cap(c_a), veh/h	321	2041	578	260	1123	477	336	353	305	244	257	224
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.5	28.2	22.3	47.3	37.5	34.8	44.0	44.0	44.0	47.0	47.0	47.0
Incr Delay (d2), s/veh	220.2	0.9	0.1	20.8	171.3	12.1	85.1	259.6	261.8	212.8	72.1	85.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	28.6	10.7	1.9	6.2	42.2	11.8	17.4	35.4	30.7	21.3	12.3	11.6
Lane Grp Delay (d), s/veh	264.7	29.1	22.5	68.1	208.8	46.9	129.1	303.6	305.8	259.8	119.1	132.6
Lane Grp LOS	F	C	C	E	F	D	F	F	F	F	F	F
Approach Vol, veh/h		1961			2113			1393			863	
Approach Delay, s/veh		84.7			166.3			257.3			179.6	
Approach LOS		F			F			F			F	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	25.0	46.4		17.6	39.0		26.0	26.0		20.0	20.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	21.0	39.0		17.0	35.0		22.0	22.0		16.0	16.0	
Max Q Clear Time (g_c+I1), s	23.0	26.1		13.5	37.0		24.0	24.0		18.0	18.0	
Green Ext Time (p_c), s	0.0	12.3		0.2	0.0		0.0	0.0		0.0	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	162.9
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	244	547	71	238	1068	225	551	474	600	235	214	292
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	176.5
Lanes	2	2	1	2	2	1	2	2	0	2	2	1
Cap, veh/h	267	1024	435	388	1155	491	800	575	489	390	706	423
Arrive On Green	0.08	0.29	0.29	0.12	0.33	0.33	0.25	0.33	0.33	0.12	0.20	0.20
Sat Flow, veh/h	3261	3529	1500	3261	3529	1500	3261	1765	1500	3261	3529	1500
Grp Volume(v), veh/h	339	761	99	331	1486	313	767	659	835	327	298	406
Grp Sat Flow(s),veh/h/ln	1630	1765	1500	1630	1765	1500	1630	1765	1500	1630	1765	1500
Q Serve(g_s), s	9.0	21.5	5.5	10.9	36.0	19.5	25.5	35.8	35.8	10.8	8.1	22.0
Cycle Q Clear(g_c), s	9.0	21.5	5.5	10.9	36.0	19.5	25.5	35.8	35.8	10.8	8.1	22.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	267	1024	435	388	1155	491	800	575	489	390	706	423
V/C Ratio(X)	1.27	0.74	0.23	0.85	1.29	0.64	0.96	1.15	1.71	0.84	0.42	0.96
Avail Cap(c_a), veh/h	267	1024	435	415	1155	491	800	575	489	474	706	423
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.5	35.3	29.7	47.5	37.0	31.5	40.9	37.1	37.1	47.4	38.4	38.9
Incr Delay (d2), s/veh	147.9	3.0	0.3	15.0	135.6	2.7	22.2	84.9	327.7	10.7	1.8	34.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	9.3	10.0	2.1	5.4	37.6	7.7	13.0	29.5	58.0	5.1	3.8	15.2
Lane Grp Delay (d), s/veh	198.4	38.3	29.9	62.5	172.6	34.2	63.1	122.0	364.7	58.0	40.3	73.8
Lane Grp LOS	F	D	C	E	F	C	E	F	F	E	D	E
Approach Vol, veh/h		1199			2130			2261			1031	
Approach Delay, s/veh		82.9			135.1			191.7			59.1	
Approach LOS		F			F			F			E	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	13.0	35.9		17.1	40.0		31.0	39.8		17.2	26.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	9.0	31.0		14.0	36.0		27.0	33.0		16.0	22.0	
Max Q Clear Time (g_c+I1), s	11.0	23.5		12.9	38.0		27.5	37.8		12.8	24.0	
Green Ext Time (p_c), s	0.0	6.9		0.1	0.0		0.0	0.0		0.4	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	133.1
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	331	871	530	213	969	131	522	750	272	248	659	316
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0
Lanes	2	2	1	2	2	1	2	3	1	2	3	0
Cap, veh/h	399	1216	517	326	1137	483	580	1059	300	580	706	300
Arrive On Green	0.12	0.34	0.34	0.10	0.32	0.32	0.18	0.20	0.20	0.18	0.20	0.20
Sat Flow, veh/h	3261	3529	1500	3261	3529	1500	3261	5294	1500	3261	3529	1500
Grp Volume(v), veh/h	461	1212	737	296	1348	182	726	1043	378	345	917	440
Grp Sat Flow(s),veh/h/ln	1630	1765	1500	1630	1765	1500	1630	1765	1500	1630	1765	1500
Q Serve(g_s), s	11.0	30.9	31.0	8.1	29.0	8.4	16.0	17.7	18.0	8.8	18.0	18.0
Cycle Q Clear(g_c), s	11.0	30.9	31.0	8.1	29.0	8.4	16.0	17.7	18.0	8.8	18.0	18.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	399	1216	517	326	1137	483	580	1059	300	580	706	300
V/C Ratio(X)	1.16	1.00	1.43	0.91	1.19	0.38	1.25	0.99	1.26	0.60	1.30	1.47
Avail Cap(c_a), veh/h	399	1216	517	326	1137	483	580	1059	300	580	706	300
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.5	29.5	29.5	40.1	30.5	23.5	37.0	35.9	36.0	34.0	36.0	36.0
Incr Delay (d2), s/veh	95.3	25.0	202.9	27.8	92.5	0.5	127.4	24.3	141.1	4.5	144.9	227.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	9.8	17.5	40.5	4.6	27.1	3.1	16.8	10.1	18.5	3.9	22.1	25.7
Lane Grp Delay (d), s/veh	134.8	54.5	232.4	67.9	123.0	24.0	164.4	60.2	177.1	38.5	180.9	263.4
Lane Grp LOS	F	D	F	E	F	C	F	E	F	D	F	F
Approach Vol, veh/h		2410			1826			2147			1702	
Approach Delay, s/veh		124.3			104.2			116.0			173.3	
Approach LOS		F			F			F			F	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	15.0	35.0		13.0	33.0		20.0	22.0		20.0	22.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	11.0	31.0		9.0	29.0		16.0	18.0		16.0	18.0	
Max Q Clear Time (g_c+I1), s	13.0	33.0		10.1	31.0		18.0	20.0		10.8	20.0	
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0		0.0	0.0		0.6	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	127.9
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	349	401	207	139	415	140	213	560	252	203	827	221
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	180.0
Lanes	1	3	1	1	2	1	2	3	0	2	3	0
Cap, veh/h	392	1460	414	227	627	267	580	824	350	580	940	251
Arrive On Green	0.23	0.28	0.28	0.14	0.18	0.18	0.18	0.23	0.23	0.18	0.23	0.23
Sat Flow, veh/h	1681	5294	1500	1681	3529	1500	3261	3529	1500	3261	4030	1075
Grp Volume(v), veh/h	486	558	288	193	577	195	296	779	351	282	1008	450
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1681	1765	1500	1630	1765	1500	1630	1765	1575
Q Serve(g_s), s	21.0	7.7	15.5	10.1	14.5	11.1	7.4	19.5	21.0	7.0	21.0	21.0
Cycle Q Clear(g_c), s	21.0	7.7	15.5	10.1	14.5	11.1	7.4	19.5	21.0	7.0	21.0	21.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.68
Lane Grp Cap(c), veh/h	392	1460	414	227	627	267	580	824	350	580	824	368
V/C Ratio(X)	1.24	0.38	0.70	0.85	0.92	0.73	0.51	0.95	1.00	0.49	1.22	1.22
Avail Cap(c_a), veh/h	392	1460	414	299	627	267	580	824	350	580	824	368
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.5	26.4	29.2	38.0	36.4	35.0	33.5	33.9	34.5	33.3	34.5	34.5
Incr Delay (d2), s/veh	127.7	0.2	5.0	16.0	18.9	9.8	3.2	20.7	48.8	2.9	111.6	122.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	22.6	3.4	6.3	5.3	8.1	4.9	3.3	10.9	12.5	3.1	21.9	20.7
Lane Grp Delay (d), s/veh	162.2	26.5	34.3	54.0	55.2	44.8	36.7	54.6	83.3	36.2	146.1	157.3
Lane Grp LOS	F	C	C	D	E	D	D	D	F	D	F	F
Approach Vol, veh/h		1332			965			1426			1740	
Approach Delay, s/veh		77.7			52.9			58.0			131.2	
Approach LOS		E			D			E			F	

Timer												
Assigned Phs	7	4		3	8		1	6		5	2	
Phs Duration (G+Y+Rc), s	25.0	28.8		16.2	20.0		20.0	25.0		20.0	25.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	21.0	21.0		16.0	16.0		16.0	21.0		16.0	21.0	
Max Q Clear Time (g_c+I1), s	23.0	17.5		12.1	16.5		9.4	23.0		9.0	23.0	
Green Ext Time (p_c), s	0.0	2.6		0.2	0.0		0.6	0.0		0.6	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	85.2
HCM 2010 LOS	F

Notes

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	349	521	1610	630	839	819
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	0.86	0.86	0.97	0.91
Frt	0.94	0.85	0.99	0.85	1.00	1.00
Flt Protected	0.97	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3120	1365	4501	1290	3252	4818
Flt Permitted	0.97	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3120	1365	4501	1290	3252	4818
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	128%	128%	128%	128%	128%	128%
Adj. Flow (vph)	486	725	2240	877	1167	1139
RTOR Reduction (vph)	141	0	10	252	0	0
Lane Group Flow (vph)	686	384	2414	441	1167	1139
Turn Type	NA	pm+ov	NA	Perm	Prot	NA
Protected Phases	8	1	2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	16.0	41.0	37.0	37.0	25.0	66.0
Effective Green, g (s)	16.0	41.0	37.0	37.0	25.0	66.0
Actuated g/C Ratio	0.18	0.46	0.41	0.41	0.28	0.73
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	554	682	1850	530	903	3533
v/s Ratio Prot	c0.22	0.16	c0.54		c0.36	0.24
v/s Ratio Perm		0.13		0.34		
v/c Ratio	1.24	0.56	1.30	0.83	1.29	0.32
Uniform Delay, d1	37.0	17.9	26.5	23.7	32.5	4.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	122.4	1.1	141.2	14.2	139.9	0.2
Delay (s)	159.4	19.0	167.7	37.9	172.4	4.4
Level of Service	F	B	F	D	F	A
Approach Delay (s)	114.8		138.9			89.4
Approach LOS	F		F			F

Intersection Summary			
HCM 2000 Control Delay	117.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.29		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	111.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	8	64	27	121	12	27	6	335	190	97	497	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		0.97	0.95	0.95	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.96		1.00	0.94	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	1686		3252	1572	1425	1676	3353	1500	3252	3353	1500
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1676	1686		3252	1572	1425	1676	3353	1500	3252	3353	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	128%	128%	128%	128%	128%	128%	128%	128%	128%	128%	128%	128%
Adj. Flow (vph)	11	89	38	168	17	38	8	466	264	135	691	7
RTOR Reduction (vph)	0	29	0	0	9	19	0	0	132	0	0	4
Lane Group Flow (vph)	11	98	0	168	20	7	8	466	132	135	691	3
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases						8			2			6
Actuated Green, G (s)	0.7	9.1		6.1	14.5	14.5	0.7	22.1	28.2	3.0	24.4	24.4
Effective Green, g (s)	0.7	9.1		6.1	14.5	14.5	0.7	22.1	28.2	3.0	24.4	24.4
Actuated g/C Ratio	0.01	0.16		0.11	0.26	0.26	0.01	0.39	0.50	0.05	0.43	0.43
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	20	272		352	404	367	20	1316	857	173	1453	650
v/s Ratio Prot	0.01	c0.06		c0.05	0.01		0.00	0.14	0.02	c0.04	c0.21	
v/s Ratio Perm						0.00			0.07			0.00
v/c Ratio	0.55	0.36		0.48	0.05	0.02	0.40	0.35	0.15	0.78	0.48	0.00
Uniform Delay, d1	27.6	21.0		23.6	15.7	15.6	27.6	12.1	7.6	26.3	11.4	9.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	28.9	0.8		1.0	0.1	0.0	12.6	0.7	0.1	20.0	1.1	0.0
Delay (s)	56.5	21.8		24.6	15.8	15.6	40.2	12.8	7.7	46.4	12.5	9.1
Level of Service	E	C		C	B	B	D	B	A	D	B	A
Approach Delay (s)		24.6			22.4			11.3			18.0	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	56.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	483	582	1246	704	19	258	2	339	0	1	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		1.00	0.95	0.95		1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.85	0.85		1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		1.00	
Satd. Flow (prot)	1676	3353	1500	3252	3340		1676	1428	1425		1765	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.76	1.00	1.00		1.00	
Satd. Flow (perm)	1676	3353	1500	3252	3340		1336	1428	1425		1765	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	128%	128%	128%	128%	128%	128%	128%	128%	128%	128%	128%	128%
Adj. Flow (vph)	3	672	810	1734	979	26	359	3	472	0	1	0
RTOR Reduction (vph)	0	0	298	0	2	0	0	188	188	0	0	0
Lane Group Flow (vph)	3	672	512	1734	1003	0	359	51	48	0	1	0
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	7	4		3				2			6	
Permitted Phases			4		8		2		2	6		
Actuated Green, G (s)	0.8	20.2	20.2	34.0	53.4		17.0	17.0	17.0		17.0	
Effective Green, g (s)	0.8	20.2	20.2	34.0	53.4		17.0	17.0	17.0		17.0	
Actuated g/C Ratio	0.01	0.24	0.24	0.41	0.64		0.20	0.20	0.20		0.20	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	16	814	364	1328	2143		272	291	291		360	
v/s Ratio Prot	0.00	0.20		c0.53				0.04			0.00	
v/s Ratio Perm			c0.34		0.30		c0.27		0.03			
v/c Ratio	0.19	0.83	1.41	1.31	0.47		1.32	0.18	0.17		0.00	
Uniform Delay, d1	40.9	29.8	31.5	24.6	7.6		33.1	27.3	27.3		26.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	5.6	6.9	198.3	143.1	0.2		167.4	1.3	1.2		0.0	
Delay (s)	46.5	36.7	229.8	167.7	7.8		200.5	28.6	28.5		26.4	
Level of Service	D	D	F	F	A		F	C	C		C	
Approach Delay (s)		142.0			109.1			102.6			26.4	
Approach LOS		F			F			F			C	

Intersection Summary			
HCM 2000 Control Delay	117.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	83.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	110.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	384	130	6	159	184	406	6	1141	54	402	440	295
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.91	
Frt	1.00	0.99		1.00	0.94	0.85	1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	1754		1676	1574	1425	1676	3353	1500	1676	4528	
Flt Permitted	0.14	1.00		0.64	1.00	1.00	0.27	1.00	1.00	0.07	1.00	
Satd. Flow (perm)	243	1754		1127	1574	1425	473	3353	1500	117	4528	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	128%	128%	128%	128%	128%	128%	128%	128%	128%	128%	128%	128%
Adj. Flow (vph)	534	181	8	221	256	565	8	1587	75	559	612	410
RTOR Reduction (vph)	0	1	0	0	17	42	0	0	47	0	75	0
Lane Group Flow (vph)	534	188	0	221	414	348	8	1587	28	559	947	0
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	56.0	39.0		38.0	25.0	54.0	57.0	56.2	56.2	89.2	84.4	
Effective Green, g (s)	56.0	39.0		38.0	25.0	54.0	57.0	56.2	56.2	89.2	84.4	
Actuated g/C Ratio	0.37	0.25		0.25	0.16	0.35	0.37	0.37	0.37	0.58	0.55	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	341	446		326	256	539	182	1230	550	363	2494	
v/s Ratio Prot	c0.28	0.11		0.06	0.26	0.12	0.00	0.47		c0.29	0.21	
v/s Ratio Perm	c0.30			0.11		0.12	0.02		0.02	c0.60		
v/c Ratio	1.57	0.42		0.68	1.62	0.65	0.04	1.29	0.05	1.54	0.38	
Uniform Delay, d1	47.9	47.7		50.2	64.1	41.6	30.3	48.5	31.3	51.9	19.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	268.5	0.6		5.5	295.5	2.7	0.1	136.8	0.2	256.4	0.4	
Delay (s)	316.4	48.3		55.7	359.6	44.2	30.4	185.3	31.5	308.2	20.0	
Level of Service	F	D		E	F	D	C	F	C	F	B	
Approach Delay (s)		246.3			177.1			177.7			121.9	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	169.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.61		
Actuated Cycle Length (s)	153.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	139.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	1302.9

Movement	NBL	NBT	SBT	SBR	NEL	NER
Vol, veh/h	529	341	319	10	23	404
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	736	474	444	14	32	562

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	458	0	-	0	2397	451
Stage 1	-	-	-	-	451	-
Stage 2	-	-	-	-	1946	-
Follow-up Headway	2.218	-	-	-	3.518	3.318
Pot Capacity-1 Maneuver	1103	-	-	-	37	608
Stage 1	-	-	-	-	642	-
Stage 2	-	-	-	-	122	-
Time blocked-Platoon, %		-	-	-		
Mov Capacity-1 Maneuver	1103	-	-	-	# 3	608
Mov Capacity-2 Maneuver	-	-	-	-	# 3	-
Stage 1	-	-	-	-	642	-
Stage 2	-	-	-	-	# 11	-

Approach	NB	SB	NE
HCM Control Delay, s	9	0	$ 4944

Minor Lane / Major Mvmt	NELn1	NBL	NBT	SBT	SBR
Capacity (veh/h)	51	1103	-	-	-
HCM Lane V/C Ratio	11.649	0.667	-	-	-
HCM Control Delay (s)	$ 4943.5	14.546	0	-	-
HCM Lane LOS	F	B	A		
HCM 95th %tile Q(veh)	71.023	5.384	-	-	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	89	441	74	275	1010	411	661	237	73	171	250	219
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	180.0	176.5	176.5	180.0	176.5	176.5	180.0	176.5	176.5	176.5
Lanes	1	3	0	2	3	0	2	2	0	2	1	2
Cap, veh/h	112	1210	200	451	1240	496	761	823	250	309	314	948
Arrive On Green	0.07	0.27	0.27	0.14	0.34	0.34	0.23	0.32	0.32	0.09	0.18	0.18
Sat Flow, veh/h	1681	4433	732	3261	3600	1440	3261	2600	790	3261	1765	3000
Grp Volume(v), veh/h	124	487	230	383	1377	600	920	222	210	238	348	305
Grp Sat Flow(s),veh/h/ln	1681	1765	1635	1630	1765	1511	1630	1765	1625	1630	1765	1500
Q Serve(g_s), s	6.0	10.5	10.7	10.3	31.0	31.0	21.0	8.9	9.1	6.4	16.0	7.0
Cycle Q Clear(g_c), s	6.0	10.5	10.7	10.3	31.0	31.0	21.0	8.9	9.1	6.4	16.0	7.0
Prop In Lane	1.00		0.45	1.00		0.95	1.00		0.49	1.00		1.00
Lane Grp Cap(c), veh/h	112	963	446	451	1216	520	761	558	514	309	314	948
V/C Ratio(X)	1.11	0.51	0.52	0.85	1.13	1.15	1.21	0.40	0.41	0.77	1.11	0.32
Avail Cap(c_a), veh/h	112	963	446	471	1216	520	761	558	514	362	314	948
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.0	27.6	27.7	37.9	29.5	29.5	34.5	24.1	24.1	39.8	37.0	23.4
Incr Delay (d2), s/veh	116.6	1.9	4.2	13.4	70.4	89.2	106.3	0.5	0.5	8.4	83.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	6.2	4.9	4.9	5.1	25.2	24.3	19.7	3.9	3.7	3.0	14.3	2.6
Lane Grp Delay (d), s/veh	158.6	29.5	31.9	51.2	99.9	118.7	140.8	24.5	24.7	48.2	120.5	23.6
Lane Grp LOS	F	C	C	D	F	F	F	C	C	D	F	C
Approach Vol, veh/h		841			2360			1352			891	
Approach Delay, s/veh		49.2			96.8			103.7			68.0	
Approach LOS		D			F			F			E	

Timer												
Assigned Phs	5	2		1	6		7	4		3	8	
Phs Duration (G+Y+Rc), s	10.0	28.6		16.4	35.0		25.0	32.5		12.5	20.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	6.0	24.0		13.0	31.0		21.0	27.0		10.0	16.0	
Max Q Clear Time (g_c+I1), s	8.0	12.7		12.3	33.0		23.0	11.1		8.4	18.0	
Green Ext Time (p_c), s	0.0	10.2		0.1	0.0		0.0	5.6		0.1	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	86.4
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	415	1204	168	329	1269	486	204	462	184	456	726	263
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	180.0
Lanes	1	3	1	1	2	1	1	2	0	1	2	0
Cap, veh/h	325	1482	420	370	1082	460	168	449	179	347	728	261
Arrive On Green	0.19	0.28	0.28	0.22	0.31	0.31	0.10	0.19	0.19	0.21	0.29	0.29
Sat Flow, veh/h	1681	5294	1500	1681	3529	1500	1681	2404	957	1681	2483	890
Grp Volume(v), veh/h	577	1675	234	458	1766	676	284	472	427	634	715	661
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1681	1765	1500	1681	1765	1596	1681	1765	1608
Q Serve(g_s), s	29.0	42.0	20.0	33.0	46.0	46.0	15.0	28.0	28.0	31.0	44.0	44.0
Cycle Q Clear(g_c), s	29.0	42.0	20.0	33.0	46.0	46.0	15.0	28.0	28.0	31.0	44.0	44.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.60	1.00		0.55
Lane Grp Cap(c), veh/h	325	1482	420	370	1082	460	168	329	298	347	518	472
V/C Ratio(X)	1.78	1.13	0.56	1.24	1.63	1.47	1.69	1.43	1.43	1.83	1.38	1.40
Avail Cap(c_a), veh/h	325	1482	420	370	1082	460	168	329	298	347	518	472
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.5	54.0	46.1	58.5	52.0	52.0	67.5	61.0	61.0	59.5	53.0	53.0
Incr Delay (d2), s/veh	361.3	67.6	1.6	128.5	288.5	222.9	334.7	211.4	213.4	382.5	183.1	193.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	45.3	28.5	7.9	27.7	64.3	46.2	22.3	32.2	29.3	50.5	46.5	43.7
Lane Grp Delay (d), s/veh	421.8	121.6	47.7	187.0	340.5	274.9	402.2	272.4	274.4	442.0	236.1	246.4
Lane Grp LOS	F	F	D	F	F	F	F	F	F	F	F	F
Approach Vol, veh/h		2486			2900			1183			2010	
Approach Delay, s/veh		184.3			301.0			304.3			304.5	
Approach LOS		F			F			F			F	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	33.0	46.0		37.0	50.0		19.0	32.0		35.0	48.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	29.0	42.0		33.0	46.0		15.0	28.0		31.0	44.0	
Max Q Clear Time (g_c+I1), s	31.0	44.0		35.0	48.0		17.0	30.0		33.0	46.0	
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	268.4
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	376	1693	676	463	760	141	277	419	245	369	776	250
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	176.5
Lanes	2	2	1	2	2	1	2	2	0	2	2	1
Cap, veh/h	565	1482	630	391	1294	550	283	382	223	557	941	660
Arrive On Green	0.17	0.42	0.42	0.12	0.37	0.37	0.09	0.18	0.18	0.17	0.27	0.27
Sat Flow, veh/h	3261	3529	1500	3261	3529	1500	3261	2091	1223	3261	3529	1500
Grp Volume(v), veh/h	523	2355	941	644	1057	196	385	492	432	513	1080	348
Grp Sat Flow(s),veh/h/ln	1630	1765	1500	1630	1765	1500	1630	1765	1549	1630	1765	1500
Q Serve(g_s), s	23.7	63.0	63.0	18.0	40.6	14.3	13.0	27.4	27.4	23.2	40.0	25.4
Cycle Q Clear(g_c), s	23.7	63.0	63.0	18.0	40.6	14.3	13.0	27.4	27.4	23.2	40.0	25.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.79	1.00		1.00
Lane Grp Cap(c), veh/h	565	1482	630	391	1294	550	283	322	283	557	941	660
V/C Ratio(X)	0.93	1.59	1.49	1.65	0.82	0.36	1.36	1.53	1.53	0.92	1.15	0.53
Avail Cap(c_a), veh/h	587	1482	630	391	1294	550	283	322	283	587	941	660
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	61.0	43.5	43.5	66.0	42.9	34.6	68.5	61.3	61.3	61.2	55.0	30.6
Incr Delay (d2), s/veh	20.4	268.1	230.5	302.0	4.2	0.4	184.3	252.7	254.9	19.5	78.9	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	11.7	83.4	64.3	24.1	19.4	5.6	12.8	35.2	31.1	11.5	28.6	10.2
Lane Grp Delay (d), s/veh	81.4	311.6	274.0	368.0	47.2	35.0	252.8	314.0	316.2	80.7	133.9	33.6
Lane Grp LOS	F	F	F	F	D	C	F	F	F	F	F	C
Approach Vol, veh/h		3819			1897			1309			1941	
Approach Delay, s/veh		270.8			154.8			296.7			101.9	
Approach LOS		F			F			F			F	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	30.0	67.0		22.0	59.0		17.0	31.4		29.6	44.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	27.0	63.0		18.0	54.0		13.0	26.0		27.0	40.0	
Max Q Clear Time (g_c+I1), s	25.7	65.0		20.0	42.6		15.0	29.4		25.2	42.0	
Green Ext Time (p_c), s	0.3	0.0		0.0	11.3		0.0	0.0		0.4	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	213.5
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	519	1234	243	383	763	242	290	753	440	416	753	252
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0
Lanes	2	2	1	2	2	1	2	3	1	2	3	0
Cap, veh/h	685	1341	570	391	1024	435	326	953	270	522	912	305
Arrive On Green	0.21	0.38	0.38	0.12	0.29	0.29	0.10	0.18	0.18	0.16	0.24	0.24
Sat Flow, veh/h	3261	3529	1500	3261	3529	1500	3261	5294	1500	3261	3798	1272
Grp Volume(v), veh/h	722	1717	338	533	1062	337	403	1048	612	579	974	425
Grp Sat Flow(s),veh/h/ln	1630	1765	1500	1630	1765	1500	1630	1765	1500	1630	1765	1540
Q Serve(g_s), s	21.0	38.0	18.0	12.0	29.0	20.6	10.0	18.0	18.0	16.0	24.0	24.0
Cycle Q Clear(g_c), s	21.0	38.0	18.0	12.0	29.0	20.6	10.0	18.0	18.0	16.0	24.0	24.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.83
Lane Grp Cap(c), veh/h	685	1341	570	391	1024	435	326	953	270	522	847	370
V/C Ratio(X)	1.05	1.28	0.59	1.36	1.04	0.77	1.24	1.10	2.27	1.11	1.15	1.15
Avail Cap(c_a), veh/h	685	1341	570	391	1024	435	326	953	270	522	847	370
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.5	31.0	24.8	44.0	35.5	32.5	45.0	41.0	41.0	42.0	38.0	38.0
Incr Delay (d2), s/veh	49.6	132.0	1.6	178.8	38.3	8.5	129.8	60.4	581.7	73.0	81.0	94.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	13.4	41.0	6.8	14.7	18.2	8.7	10.0	13.4	50.5	11.9	20.1	18.9
Lane Grp Delay (d), s/veh	89.1	163.0	26.5	222.8	73.8	41.0	174.8	101.4	622.7	115.0	119.0	132.2
Lane Grp LOS	F	F	C	F	F	D	F	F	F	F	F	F
Approach Vol, veh/h		2777			1932			2063			1978	
Approach Delay, s/veh		127.2			109.2			270.4			120.7	
Approach LOS		F			F			F			F	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	25.0	42.0		16.0	33.0		14.0	22.0		20.0	28.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	21.0	38.0		12.0	29.0		10.0	18.0		16.0	24.0	
Max Q Clear Time (g_c+I1), s	23.0	40.0		14.0	31.0		12.0	20.0		18.0	26.0	
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	

Intersection Summary		
HCM 2010 Ctrl Delay		155.5
HCM 2010 LOS		F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	133	192	219	281	214	542	568	1214	204	118	950	181
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	180.0
Lanes	1	3	1	1	2	1	2	3	0	2	3	0
Cap, veh/h	149	941	267	280	902	383	652	1328	222	580	1201	229
Arrive On Green	0.09	0.18	0.18	0.17	0.26	0.26	0.20	0.30	0.30	0.18	0.28	0.28
Sat Flow, veh/h	1681	5294	1500	1681	3529	1500	3261	4425	739	3261	4325	824
Grp Volume(v), veh/h	185	267	305	391	298	754	790	1345	628	164	1079	495
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1681	1765	1500	1630	1765	1634	1630	1765	1619
Q Serve(g_s), s	8.0	3.9	16.0	15.0	6.2	23.0	18.0	27.0	27.0	3.9	25.0	25.0
Cycle Q Clear(g_c), s	8.0	3.9	16.0	15.0	6.2	23.0	18.0	27.0	27.0	3.9	25.0	25.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.45	1.00		0.51
Lane Grp Cap(c), veh/h	149	941	267	280	902	383	652	1059	490	580	980	450
V/C Ratio(X)	1.24	0.28	1.14	1.40	0.33	1.97	1.21	1.27	1.28	0.28	1.10	1.10
Avail Cap(c_a), veh/h	149	941	267	280	902	383	652	1059	490	580	980	450
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.0	32.0	37.0	37.5	27.2	33.5	36.0	31.5	31.5	32.0	32.5	32.5
Incr Delay (d2), s/veh	151.6	0.2	99.6	198.5	0.2	444.5	109.0	129.0	141.7	1.2	60.3	72.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	9.7	1.7	13.4	21.7	2.7	55.8	17.2	30.6	30.2	1.7	19.1	19.1
Lane Grp Delay (d), s/veh	192.6	32.2	136.6	236.0	27.5	478.0	145.0	160.5	173.2	33.3	92.8	105.2
Lane Grp LOS	F	C	F	F	C	F	F	F	F	C	F	F
Approach Vol, veh/h		757			1443			2763			1738	
Approach Delay, s/veh		113.4			319.4			158.9			90.7	
Approach LOS		F			F			F			F	

Timer												
Assigned Phs	7	4		3	8		1	6		5	2	
Phs Duration (G+Y+Rc), s	12.0	20.0		19.0	27.0		22.0	31.0		20.0	29.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	8.0	16.0		15.0	23.0		18.0	27.0		16.0	25.0	
Max Q Clear Time (g_c+I1), s	10.0	18.0		17.0	25.0		20.0	29.0		5.9	27.0	
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0		0.0	0.0		0.3	0.0	

Intersection Summary												
HCM 2010 Ctrl Delay			170.6									
HCM 2010 LOS			F									

Notes

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	33	161	1128	68	202	1799
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	0.86	0.86	0.97	0.91
Frt	0.89	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.99	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3016	1365	4549	1290	3252	4818
Flt Permitted	0.99	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3016	1365	4549	1290	3252	4818
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	128%	128%	128%	128%	128%	128%
Adj. Flow (vph)	46	224	1569	95	281	2503
RTOR Reduction (vph)	98	2	1	46	0	0
Lane Group Flow (vph)	60	110	1578	39	281	2503
Turn Type	NA	pm+ov	NA	Perm	Prot	NA
Protected Phases	8	1	2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	5.2	10.2	19.1	19.1	5.0	28.1
Effective Green, g (s)	5.2	10.2	19.1	19.1	5.0	28.1
Actuated g/C Ratio	0.13	0.25	0.46	0.46	0.12	0.68
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	379	469	2103	596	393	3278
v/s Ratio Prot	0.02	c0.03	0.35		0.09	c0.52
v/s Ratio Perm		0.05		0.03		
v/c Ratio	0.16	0.24	0.75	0.07	0.72	0.76
Uniform Delay, d1	16.1	12.4	9.1	6.2	17.5	4.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.3	2.5	0.2	6.1	1.7
Delay (s)	16.3	12.7	11.7	6.4	23.5	6.1
Level of Service	B	B	B	A	C	A
Approach Delay (s)	14.8		11.4			7.9
Approach LOS	B		B			A

Intersection Summary			
HCM 2000 Control Delay	9.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	41.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	38	16	204	55	116	83	205	10	69	252	10
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		0.97	0.95	0.95	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.96		1.00	0.94	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	1687		3252	1580	1425	1676	3353	1500	3252	3353	1500
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1676	1687		3252	1580	1425	1676	3353	1500	3252	3353	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	128%	128%	128%	128%	128%	128%	128%	128%	128%	128%	128%	128%
Adj. Flow (vph)	8	53	22	284	77	161	115	285	14	96	351	14
RTOR Reduction (vph)	0	20	0	0	38	88	0	0	6	0	0	9
Lane Group Flow (vph)	8	55	0	284	87	25	115	285	8	96	351	5
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases						8			2			6
Actuated Green, G (s)	0.7	5.9		6.2	11.4	11.4	4.7	22.0	28.2	2.2	19.5	19.5
Effective Green, g (s)	0.7	5.9		6.2	11.4	11.4	4.7	22.0	28.2	2.2	19.5	19.5
Actuated g/C Ratio	0.01	0.11		0.12	0.22	0.22	0.09	0.42	0.54	0.04	0.37	0.37
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	22	190		385	344	310	150	1410	923	136	1250	559
v/s Ratio Prot	0.00	0.03		c0.09	c0.06		c0.07	0.09	0.00	0.03	c0.10	
v/s Ratio Perm						0.02			0.00			0.00
v/c Ratio	0.36	0.29		0.74	0.25	0.08	0.77	0.20	0.01	0.71	0.28	0.01
Uniform Delay, d1	25.6	21.3		22.3	16.9	16.3	23.3	9.6	5.6	24.7	11.5	10.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.9	0.9		7.2	0.4	0.1	20.6	0.3	0.0	15.4	0.6	0.0
Delay (s)	35.5	22.1		29.5	17.3	16.4	43.8	9.9	5.6	40.1	12.0	10.4
Level of Service	D	C		C	B	B	D	A	A	D	B	B
Approach Delay (s)		23.4			23.7			19.2			17.8	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	52.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	40.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	1185	186	377	633	9	469	1	2056	2	2	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		0.97	0.95		1.00	0.95	0.95	1.00	1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.85	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	3285		3252	3346		1676	1425	1425	1676	1765	
Flt Permitted	0.95	1.00		0.95	1.00		0.76	1.00	1.00	0.05	1.00	
Satd. Flow (perm)	1676	3285		3252	3346		1334	1425	1425	93	1765	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	128%	128%	128%	128%	128%	128%	128%	128%	128%	128%	128%	128%
Adj. Flow (vph)	1	1649	259	525	881	13	653	1	2861	3	3	0
RTOR Reduction (vph)	0	8	0	0	1	0	0	95	95	0	0	0
Lane Group Flow (vph)	1	1900	0	525	893	0	653	1337	1335	3	3	0
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	7	4		3				2			6	
Permitted Phases					8		2		2	6		
Actuated Green, G (s)	0.8	51.2		14.0	64.4		76.0	76.0	76.0	76.0	76.0	
Effective Green, g (s)	0.8	51.2		14.0	64.4		76.0	76.0	76.0	76.0	76.0	
Actuated g/C Ratio	0.01	0.33		0.09	0.42		0.50	0.50	0.50	0.50	0.50	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	8	1097		297	1406		661	706	706	46	875	
v/s Ratio Prot	0.00	c0.58		c0.16				c0.94			0.00	
v/s Ratio Perm					0.27		0.49		0.94	0.03		
v/c Ratio	0.12	1.73		1.77	0.64		0.99	1.89	1.89	0.07	0.00	
Uniform Delay, d1	75.9	51.0		69.6	35.1		38.1	38.6	38.6	20.1	19.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.9	333.2		358.9	0.9		31.6	407.4	406.1	2.7	0.0	
Delay (s)	82.8	384.2		428.5	36.1		69.8	446.0	444.7	22.8	19.5	
Level of Service	F	F		F	D		E	F	F	C	B	
Approach Delay (s)		384.1			181.3			375.6			21.2	
Approach LOS		F			F			F			C	

Intersection Summary			
HCM 2000 Control Delay	337.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.82		
Actuated Cycle Length (s)	153.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	180.3%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	334	433	35	187	526	243	160	888	147	287	861	590
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.91	
Frt	1.00	0.99		1.00	0.99	0.85	1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	1745		1676	1665	1425	1676	3353	1500	1676	4524	
Flt Permitted	0.09	1.00		0.10	1.00	1.00	0.11	1.00	1.00	0.10	1.00	
Satd. Flow (perm)	160	1745		176	1665	1425	186	3353	1500	168	4524	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	128%	128%	128%	128%	128%	128%	128%	128%	128%	128%	128%	128%
Adj. Flow (vph)	465	602	49	260	732	338	223	1235	205	399	1198	821
RTOR Reduction (vph)	0	2	0	0	1	43	0	0	101	0	95	0
Lane Group Flow (vph)	465	649	0	260	765	261	223	1235	104	399	1924	0
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	64.0	45.0		55.0	40.0	56.0	47.0	38.0	38.0	58.0	45.0	
Effective Green, g (s)	64.0	45.0		55.0	40.0	56.0	47.0	38.0	38.0	58.0	45.0	
Actuated g/C Ratio	0.49	0.35		0.42	0.31	0.43	0.36	0.29	0.29	0.45	0.35	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	312	604		247	512	657	170	980	438	260	1566	
v/s Ratio Prot	c0.23	0.37		0.12	0.46	0.05	0.09	0.37		c0.19	0.43	
v/s Ratio Perm	c0.50			0.32		0.13	0.38		0.07	c0.49		
v/c Ratio	1.49	1.07		1.05	1.49	0.40	1.31	1.26	0.24	1.53	1.34dr	
Uniform Delay, d1	41.4	42.5		38.9	45.0	25.4	35.3	46.0	35.0	39.9	42.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	237.0	58.3		71.8	232.2	0.4	175.8	125.4	1.3	259.0	108.8	
Delay (s)	278.4	100.8		110.7	277.2	25.8	211.2	171.4	36.2	298.9	151.3	
Level of Service	F	F		F	F	C	F	F	D	F	F	
Approach Delay (s)		174.8			187.2			160.1			175.6	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	173.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.58		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	137.0%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	6.8

Movement	NBL	NBT	SBT	SBR	NEL	NER
Vol, veh/h	155	244	244	29	30	171
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	216	339	339	40	42	238

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	380	0	-	0	1131	360
Stage 1	-	-	-	-	360	-
Stage 2	-	-	-	-	771	-
Follow-up Headway	2.218	-	-	-	3.518	3.318
Pot Capacity-1 Maneuver	1178	-	-	-	225	684
Stage 1	-	-	-	-	706	-
Stage 2	-	-	-	-	456	-
Time blocked-Platoon, %		-	-	-		
Mov Capacity-1 Maneuver	1178	-	-	-	174	684
Mov Capacity-2 Maneuver	-	-	-	-	174	-
Stage 1	-	-	-	-	706	-
Stage 2	-	-	-	-	353	-

Approach	NB	SB	NE
HCM Control Delay, s	3	0	23

Minor Lane / Major Mvmt	NELn1	NBL	NBT	SBT	SBR
Capacity (veh/h)	476	1178	-	-	-
HCM Lane V/C Ratio	0.588	0.183	-	-	-
HCM Control Delay (s)	22.8	8.74	0	-	-
HCM Lane LOS	C	A	A		
HCM 95th %tile Q(veh)	3.712	0.669	-	-	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	33	1491	207	188	562	389	857	298	96	497	603	844
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	180.0	176.5	176.5	180.0	176.5	176.5	180.0	176.5	176.5	176.5
Lanes	1	3	0	2	3	0	2	2	0	2	1	2
Cap, veh/h	44	1265	175	145	1044	444	725	829	262	580	490	967
Arrive On Green	0.03	0.28	0.28	0.04	0.30	0.30	0.22	0.32	0.32	0.18	0.28	0.28
Sat Flow, veh/h	1681	4553	630	3261	3529	1500	3261	2574	812	3261	1765	3000
Grp Volume(v), veh/h	36	1255	591	204	611	423	932	220	208	540	655	917
Grp Sat Flow(s),veh/h/ln	1681	1765	1654	1630	1765	1500	1630	1765	1621	1630	1765	1500
Q Serve(g_s), s	1.9	25.0	25.0	4.0	13.3	24.9	20.0	8.7	9.0	14.7	25.0	25.0
Cycle Q Clear(g_c), s	1.9	25.0	25.0	4.0	13.3	24.9	20.0	8.7	9.0	14.7	25.0	25.0
Prop In Lane	1.00		0.38	1.00		1.00	1.00		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	44	980	459	145	1044	444	725	569	522	580	490	967
V/C Ratio(X)	0.81	1.28	1.29	1.41	0.59	0.95	1.29	0.39	0.40	0.93	1.34	0.95
Avail Cap(c_a), veh/h	93	980	459	145	1044	444	725	569	522	580	490	967
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.6	32.5	32.5	43.0	27.0	31.1	35.0	23.6	23.7	36.5	32.5	29.8
Incr Delay (d2), s/veh	28.4	134.1	144.4	219.4	2.4	32.5	139.2	0.4	0.5	22.0	164.7	17.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	1.2	29.1	28.6	6.1	6.1	13.3	22.2	3.8	3.6	7.8	33.3	12.2
Lane Grp Delay (d), s/veh	72.0	166.6	176.9	262.4	29.4	63.6	174.2	24.1	24.2	58.5	197.2	47.6
Lane Grp LOS	E	F	F	F	C	E	F	C	C	E	F	D
Approach Vol, veh/h		1882			1238			1360			2112	
Approach Delay, s/veh		168.0			79.5			126.9			96.8	
Approach LOS		F			E			F			F	

Timer												
Assigned Phs	5	2		1	6		7	4		3	8	
Phs Duration (G+Y+Rc), s	6.4	29.0		8.0	30.6		24.0	33.0		20.0	29.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	5.0	25.0		4.0	24.0		20.0	29.0		16.0	25.0	
Max Q Clear Time (g_c+I1), s	3.9	27.0		6.0	26.9		22.0	11.0		16.7	27.0	
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0		0.0	11.1		0.0	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	120.1
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	429	1399	128	165	1521	366	400	546	390	320	288	186
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	180.0
Lanes	1	3	1	1	2	1	1	2	0	1	2	0
Cap, veh/h	321	2041	578	208	1123	477	336	383	274	244	295	186
Arrive On Green	0.19	0.39	0.39	0.12	0.32	0.32	0.20	0.20	0.20	0.15	0.15	0.15
Sat Flow, veh/h	1681	5294	1500	1681	3529	1500	1681	1917	1370	1681	2028	1276
Grp Volume(v), veh/h	466	1521	139	179	1653	398	435	546	471	348	271	244
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1681	1765	1500	1681	1765	1523	1681	1765	1539
Q Serve(g_s), s	21.0	27.2	6.9	11.5	35.0	27.1	22.0	22.0	22.0	16.0	16.0	16.0
Cycle Q Clear(g_c), s	21.0	27.2	6.9	11.5	35.0	27.1	22.0	22.0	22.0	16.0	16.0	16.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.90	1.00		0.83
Lane Grp Cap(c), veh/h	321	2041	578	208	1123	477	336	353	305	244	257	224
V/C Ratio(X)	1.45	0.75	0.24	0.86	1.47	0.83	1.29	1.55	1.55	1.42	1.06	1.09
Avail Cap(c_a), veh/h	321	2041	578	260	1123	477	336	353	305	244	257	224
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.5	29.1	22.9	47.3	37.5	34.8	44.0	44.0	44.0	47.0	47.0	47.0
Incr Delay (d2), s/veh	220.2	1.5	0.2	20.8	217.3	12.1	152.8	259.6	261.8	212.8	72.1	85.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	28.6	12.3	2.6	6.2	49.3	11.8	23.7	35.4	30.7	21.3	12.3	11.6
Lane Grp Delay (d), s/veh	264.7	30.7	23.1	68.1	254.8	46.9	196.8	303.6	305.8	259.8	119.1	132.6
Lane Grp LOS	F	C	C	E	F	D	F	F	F	F	F	F
Approach Vol, veh/h		2126			2230			1452			863	
Approach Delay, s/veh		81.5			202.7			272.3			179.6	
Approach LOS		F			F			F			F	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	25.0	46.4		17.6	39.0		26.0	26.0		20.0	20.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	21.0	39.0		17.0	35.0		22.0	22.0		16.0	16.0	
Max Q Clear Time (g_c+I1), s	23.0	29.2		13.5	37.0		24.0	24.0		18.0	18.0	
Green Ext Time (p_c), s	0.0	9.5		0.2	0.0		0.0	0.0		0.0	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	176.2
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	340	862	91	305	1527	289	608	607	768	301	275	383
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	176.5
Lanes	2	2	1	2	2	1	2	2	0	2	2	1
Cap, veh/h	274	1059	450	391	1186	504	735	548	465	393	725	434
Arrive On Green	0.08	0.30	0.30	0.12	0.34	0.34	0.23	0.31	0.31	0.12	0.21	0.21
Sat Flow, veh/h	3261	3529	1500	3261	3529	1500	3261	1765	1500	3261	3529	1500
Grp Volume(v), veh/h	370	937	99	332	1660	314	661	660	835	327	299	416
Grp Sat Flow(s),veh/h/ln	1630	1765	1500	1630	1765	1500	1630	1765	1500	1630	1765	1500
Q Serve(g_s), s	9.0	27.1	5.3	10.7	36.0	18.8	21.1	33.2	33.2	10.5	7.9	22.0
Cycle Q Clear(g_c), s	9.0	27.1	5.3	10.7	36.0	18.8	21.1	33.2	33.2	10.5	7.9	22.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	274	1059	450	391	1186	504	735	548	465	393	725	434
V/C Ratio(X)	1.35	0.89	0.22	0.85	1.40	0.62	0.90	1.21	1.79	0.83	0.41	0.96
Avail Cap(c_a), veh/h	274	1059	450	426	1186	504	822	548	465	487	725	434
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.1	35.8	28.1	46.2	35.6	29.9	40.3	37.0	37.0	46.1	37.0	37.4
Incr Delay (d2), s/veh	180.2	9.1	0.2	14.0	185.1	2.4	12.0	108.8	365.9	9.8	1.7	34.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	10.6	13.4	2.0	5.2	46.5	7.3	9.9	31.3	59.8	4.9	3.7	15.1
Lane Grp Delay (d), s/veh	229.2	44.9	28.4	60.2	220.7	32.3	52.3	145.8	402.8	55.9	38.7	71.5
Lane Grp LOS	F	D	C	E	F	C	D	F	F	E	D	E
Approach Vol, veh/h		1406			2306			2156			1042	
Approach Delay, s/veh		92.2			171.9			216.7			57.2	
Approach LOS		F			F			F			E	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	13.0	36.1		16.9	40.0		28.2	37.2		16.9	26.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	9.0	31.0		14.0	36.0		27.0	33.0		16.0	22.0	
Max Q Clear Time (g_c+I1), s	11.0	29.1		12.7	38.0		23.1	35.2		12.5	24.0	
Green Ext Time (p_c), s	0.0	1.8		0.2	0.0		1.0	0.0		0.4	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	152.4
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	425	1151	678	279	1313	170	668	983	364	319	851	404
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0
Lanes	2	2	1	2	2	1	2	3	1	2	3	0
Cap, veh/h	399	1216	517	326	1137	483	580	1059	300	580	706	300
Arrive On Green	0.12	0.34	0.34	0.10	0.32	0.32	0.18	0.20	0.20	0.18	0.20	0.20
Sat Flow, veh/h	3261	3529	1500	3261	3529	1500	3261	5294	1500	3261	3529	1500
Grp Volume(v), veh/h	462	1251	737	303	1427	185	726	1068	396	347	925	439
Grp Sat Flow(s),veh/h/ln	1630	1765	1500	1630	1765	1500	1630	1765	1500	1630	1765	1500
Q Serve(g_s), s	11.0	31.0	31.0	8.3	29.0	8.6	16.0	18.0	18.0	8.8	18.0	18.0
Cycle Q Clear(g_c), s	11.0	31.0	31.0	8.3	29.0	8.6	16.0	18.0	18.0	8.8	18.0	18.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	399	1216	517	326	1137	483	580	1059	300	580	706	300
V/C Ratio(X)	1.16	1.03	1.43	0.93	1.25	0.38	1.25	1.01	1.32	0.60	1.31	1.46
Avail Cap(c_a), veh/h	399	1216	517	326	1137	483	580	1059	300	580	706	300
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.5	29.5	29.5	40.2	30.5	23.6	37.0	36.0	36.0	34.0	36.0	36.0
Incr Delay (d2), s/veh	96.2	33.5	202.9	32.1	122.0	0.5	127.4	29.8	165.5	4.5	149.7	226.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	9.9	19.0	40.5	4.9	31.7	3.2	16.8	10.9	20.5	3.9	22.6	25.6
Lane Grp Delay (d), s/veh	135.7	63.0	232.4	72.3	152.5	24.1	164.4	65.8	201.5	38.6	185.7	262.0
Lane Grp LOS	F	F	F	E	F	C	F	F	F	D	F	F
Approach Vol, veh/h		2450			1915			2190			1711	
Approach Delay, s/veh		127.7			127.4			123.0			175.4	
Approach LOS		F			F			F			F	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	15.0	35.0		13.0	33.0		20.0	22.0		20.0	22.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	11.0	31.0		9.0	29.0		16.0	18.0		16.0	18.0	
Max Q Clear Time (g_c+I1), s	13.0	33.0		10.3	31.0		18.0	20.0		10.8	20.0	
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0		0.0	0.0		0.6	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	136.3
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	447	514	265	180	531	179	273	724	323	260	1074	293
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	180.0
Lanes	1	3	1	1	2	1	2	3	0	2	3	0
Cap, veh/h	392	1450	411	230	627	267	580	824	350	580	935	255
Arrive On Green	0.23	0.27	0.27	0.14	0.18	0.18	0.18	0.23	0.23	0.18	0.23	0.23
Sat Flow, veh/h	1681	5294	1500	1681	3529	1500	3261	3529	1500	3261	4009	1092
Grp Volume(v), veh/h	486	559	288	196	577	195	297	787	351	283	1027	458
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1681	1765	1500	1630	1765	1500	1630	1765	1572
Q Serve(g_s), s	21.0	7.7	15.5	10.3	14.5	11.1	7.4	19.8	21.0	7.0	21.0	21.0
Cycle Q Clear(g_c), s	21.0	7.7	15.5	10.3	14.5	11.1	7.4	19.8	21.0	7.0	21.0	21.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.69
Lane Grp Cap(c), veh/h	392	1450	411	230	627	267	580	824	350	580	824	367
V/C Ratio(X)	1.24	0.39	0.70	0.85	0.92	0.73	0.51	0.96	1.00	0.49	1.25	1.25
Avail Cap(c_a), veh/h	392	1450	411	299	627	267	580	824	350	580	824	367
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.5	26.5	29.4	37.9	36.4	35.0	33.5	34.0	34.5	33.3	34.5	34.5
Incr Delay (d2), s/veh	127.7	0.2	5.2	16.4	18.9	9.8	3.2	22.3	48.8	2.9	121.5	132.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	22.6	3.4	6.3	5.4	8.1	4.9	3.3	11.2	12.5	3.1	23.0	21.6
Lane Grp Delay (d), s/veh	162.2	26.7	34.6	54.4	55.2	44.8	36.7	56.3	83.3	36.2	156.0	166.8
Lane Grp LOS	F	C	C	D	E	D	D	E	F	D	F	F
Approach Vol, veh/h		1333			968			1435			1768	
Approach Delay, s/veh		77.8			52.9			58.9			139.6	
Approach LOS		E			D			E			F	

Timer												
Assigned Phs	7	4		3	8		1	6		5	2	
Phs Duration (G+Y+Rc), s	25.0	28.7		16.3	20.0		20.0	25.0		20.0	25.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	21.0	21.0		16.0	16.0		16.0	21.0		16.0	21.0	
Max Q Clear Time (g_c+I1), s	23.0	17.5		12.3	16.5		9.4	23.0		9.0	23.0	
Green Ext Time (p_c), s	0.0	2.6		0.2	0.0		0.6	0.0		0.6	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	88.3
HCM 2010 LOS	F

Notes

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	459	795	2233	824	1219	1102
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	0.86	0.86	0.97	0.91
Frt	0.93	0.85	0.99	0.85	1.00	1.00
Flt Protected	0.97	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3104	1365	4513	1290	3252	4818
Flt Permitted	0.97	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3104	1365	4513	1290	3252	4818
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	499	864	2427	896	1325	1198
RTOR Reduction (vph)	171	0	7	251	0	0
Lane Group Flow (vph)	751	441	2572	493	1325	1198
Turn Type	NA	pm+ov	NA	Perm	Prot	NA
Protected Phases	8	1	2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	16.0	41.0	37.0	37.0	25.0	66.0
Effective Green, g (s)	16.0	41.0	37.0	37.0	25.0	66.0
Actuated g/C Ratio	0.18	0.46	0.41	0.41	0.28	0.73
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	551	682	1855	530	903	3533
v/s Ratio Prot	c0.24	0.18	c0.57		c0.41	0.25
v/s Ratio Perm		0.14		0.38		
v/c Ratio	1.36	0.65	1.39	0.93	1.47	0.34
Uniform Delay, d1	37.0	18.9	26.5	25.3	32.5	4.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	174.8	2.1	177.3	25.0	216.4	0.3
Delay (s)	211.8	21.0	203.8	50.3	248.9	4.5
Level of Service	F	C	F	D	F	A
Approach Delay (s)	150.1		169.4			132.9
Approach LOS	F		F			F

Intersection Summary			
HCM 2000 Control Delay	153.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.41		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	121.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	82	35	199	15	47	8	462	389	143	664	6
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		0.97	0.95	0.95	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.96		1.00	0.92	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	1686		3252	1540	1425	1676	3353	1500	3252	3353	1500
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1676	1686		3252	1540	1425	1676	3353	1500	3252	3353	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	89	38	216	16	51	9	502	423	155	722	7
RTOR Reduction (vph)	0	29	0	0	14	24	0	0	213	0	0	4
Lane Group Flow (vph)	11	98	0	216	21	8	9	502	210	155	722	3
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases						8			2			6
Actuated Green, G (s)	0.7	8.9		6.3	14.5	14.5	0.7	21.1	27.4	2.9	23.3	23.3
Effective Green, g (s)	0.7	8.9		6.3	14.5	14.5	0.7	21.1	27.4	2.9	23.3	23.3
Actuated g/C Ratio	0.01	0.16		0.11	0.26	0.26	0.01	0.38	0.50	0.05	0.42	0.42
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	21	271		371	404	374	21	1281	853	170	1415	633
v/s Ratio Prot	0.01	c0.06		c0.07	0.01		0.01	0.15	0.03	c0.05	c0.22	
v/s Ratio Perm						0.01			0.11			0.00
v/c Ratio	0.52	0.36		0.58	0.05	0.02	0.43	0.39	0.25	0.91	0.51	0.00
Uniform Delay, d1	27.1	20.6		23.2	15.2	15.1	27.1	12.4	8.0	26.0	11.7	9.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	21.6	0.8		2.3	0.1	0.0	13.4	0.9	0.2	44.3	1.3	0.0
Delay (s)	48.7	21.4		25.5	15.3	15.1	40.5	13.3	8.1	70.3	13.1	9.2
Level of Service	D	C		C	B	B	D	B	A	E	B	A
Approach Delay (s)		23.6			23.1			11.2			23.1	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	55.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	729	749	1696	981	24	346	3	546	0	1	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		1.00	0.95	0.95		1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.85	0.85		1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		1.00	
Satd. Flow (prot)	1676	3353	1500	3252	3341		1676	1428	1425		1765	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.76	1.00	1.00		1.00	
Satd. Flow (perm)	1676	3353	1500	3252	3341		1336	1428	1425		1765	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	792	814	1843	1066	26	376	3	593	0	1	0
RTOR Reduction (vph)	0	0	298	0	2	0	0	236	236	0	0	0
Lane Group Flow (vph)	3	792	516	1843	1090	0	376	64	60	0	1	0
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	7	4		3				2			6	
Permitted Phases			4		8		2		2	6		
Actuated Green, G (s)	0.8	20.2	20.2	34.0	53.4		17.0	17.0	17.0		17.0	
Effective Green, g (s)	0.8	20.2	20.2	34.0	53.4		17.0	17.0	17.0		17.0	
Actuated g/C Ratio	0.01	0.24	0.24	0.41	0.64		0.20	0.20	0.20		0.20	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	16	814	364	1328	2144		272	291	291		360	
v/s Ratio Prot	0.00	0.24		c0.57				0.04			0.00	
v/s Ratio Perm			c0.34		0.33		c0.28		0.04			
v/c Ratio	0.19	0.97	1.42	1.39	0.51		1.38	0.22	0.21		0.00	
Uniform Delay, d1	40.9	31.2	31.5	24.6	7.9		33.1	27.6	27.5		26.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	5.6	24.9	203.0	179.2	0.2		193.3	1.7	1.6		0.0	
Delay (s)	46.5	56.1	234.5	203.8	8.1		226.4	29.3	29.1		26.4	
Level of Service	D	E	F	F	A		F	C	C		C	
Approach Delay (s)		146.3			131.0			105.5			26.4	
Approach LOS		F			F			F			C	

Intersection Summary			
HCM 2000 Control Delay	131.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.39		
Actuated Cycle Length (s)	83.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	113.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	501	166	8	204	236	520	8	1490	69	573	563	381
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.91	
Frt	1.00	0.99		1.00	0.94	0.85	1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	1752		1676	1575	1425	1676	3353	1500	1676	4526	
Flt Permitted	0.14	1.00		0.64	1.00	1.00	0.27	1.00	1.00	0.07	1.00	
Satd. Flow (perm)	243	1752		1127	1575	1425	471	3353	1500	119	4526	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	545	180	9	222	257	565	9	1620	75	623	612	414
RTOR Reduction (vph)	0	1	0	0	17	42	0	0	48	0	78	0
Lane Group Flow (vph)	545	188	0	222	415	348	9	1620	27	623	948	0
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	56.0	39.0		38.0	25.0	54.0	57.0	55.4	55.4	88.4	82.8	
Effective Green, g (s)	56.0	39.0		38.0	25.0	54.0	57.0	55.4	55.4	88.4	82.8	
Actuated g/C Ratio	0.37	0.26		0.25	0.16	0.35	0.37	0.36	0.36	0.58	0.54	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	343	448		327	258	542	188	1218	545	365	2459	
v/s Ratio Prot	c0.28	0.11		0.06	0.26	0.12	0.00	0.48		c0.32	0.21	
v/s Ratio Perm	c0.30			0.11		0.12	0.02		0.02	c0.67		
v/c Ratio	1.59	0.42		0.68	1.61	0.64	0.05	1.33	0.05	1.71	0.39	
Uniform Delay, d1	47.6	47.3		49.8	63.7	41.1	30.0	48.5	31.4	51.5	20.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	278.5	0.6		5.5	291.7	2.6	0.1	154.3	0.2	329.6	0.5	
Delay (s)	326.1	47.9		55.3	355.4	43.7	30.1	202.8	31.6	381.0	20.6	
Level of Service	F	D		E	F	D	C	F	C	F	C	
Approach Delay (s)		254.4			175.1			194.3			156.8	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	186.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.72		
Actuated Cycle Length (s)	152.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	143.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Intersection Delay, s/veh	3734.4

Movement	NBL	NBT	SBT	SBR	NEL	NER
Vol, veh/h	677	490	440	13	29	517
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	736	533	478	14	32	562

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	492	0	-	0	2489	485
Stage 1	-	-	-	-	485	-
Stage 2	-	-	-	-	2004	-
Follow-up Headway	2.218	-	-	-	3.518	3.318
Pot Capacity-1 Maneuver	1071	-	-	-	32	582
Stage 1	-	-	-	-	619	-
Stage 2	-	-	-	-	114	-
Time blocked-Platoon, %		-	-	-		
Mov Capacity-1 Maneuver	1071	-	-	-	# 1	582
Mov Capacity-2 Maneuver	-	-	-	-	# 1	-
Stage 1	-	-	-	-	619	-
Stage 2	-	-	-	-	# 3	-

Approach	NB	SB	NE
HCM Control Delay, s	9	0	$ 14795

Minor Lane / Major Mvmt	NELn1	NBL	NBT	SBT	SBR
Capacity (veh/h)	18	1071	-	-	-
HCM Lane V/C Ratio	32.971	0.687	-	-	-
HCM Control Delay (s)	$ 14795.3	15.391	0	-	-
HCM Lane LOS	F	C	A		
HCM 95th %tile Q(veh)	74.906	5.788	-	-	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	114	575	149	543	1312	533	850	305	93	267	324	389
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	180.0	176.5	176.5	180.0	176.5	176.5	180.0	176.5	176.5	176.5
Lanes	1	3	0	2	3	0	2	2	0	2	1	2
Cap, veh/h	112	1087	276	471	1242	494	761	787	236	356	314	967
Arrive On Green	0.07	0.27	0.27	0.14	0.34	0.34	0.23	0.30	0.30	0.11	0.18	0.18
Sat Flow, veh/h	1681	4075	1036	3261	3606	1435	3261	2609	780	3261	1765	3000
Grp Volume(v), veh/h	124	540	247	590	1395	610	924	223	210	290	352	423
Grp Sat Flow(s),veh/h/ln	1681	1765	1582	1630	1765	1511	1630	1765	1624	1630	1765	1500
Q Serve(g_s), s	6.0	11.9	12.2	13.0	31.0	31.0	21.0	9.1	9.3	7.8	16.0	10.0
Cycle Q Clear(g_c), s	6.0	11.9	12.2	13.0	31.0	31.0	21.0	9.1	9.3	7.8	16.0	10.0
Prop In Lane	1.00		0.66	1.00		0.95	1.00		0.48	1.00		1.00
Lane Grp Cap(c), veh/h	112	941	422	471	1216	521	761	533	490	356	314	967
V/C Ratio(X)	1.11	0.57	0.59	1.25	1.15	1.17	1.21	0.42	0.43	0.81	1.12	0.44
Avail Cap(c_a), veh/h	112	941	422	471	1216	521	761	533	490	362	314	967
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.0	28.6	28.7	38.5	29.5	29.5	34.5	25.1	25.2	39.2	37.0	24.1
Incr Delay (d2), s/veh	116.6	2.5	5.9	130.3	76.5	96.0	108.5	0.5	0.6	13.1	87.9	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	6.2	5.5	5.4	13.8	26.3	25.3	19.9	4.0	3.8	3.9	14.7	3.7
Lane Grp Delay (d), s/veh	158.6	31.1	34.5	168.8	106.0	125.5	143.0	25.6	25.8	52.3	124.9	24.4
Lane Grp LOS	F	C	C	F	F	F	F	C	C	D	F	C
Approach Vol, veh/h		911			2595			1357			1065	
Approach Delay, s/veh		49.4			124.8			105.5			65.2	
Approach LOS		D			F			F			E	

Timer												
Assigned Phs	5	2		1	6		7	4		3	8	
Phs Duration (G+Y+Rc), s	10.0	28.0		17.0	35.0		25.0	31.2		13.8	20.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	6.0	24.0		13.0	31.0		21.0	27.0		10.0	16.0	
Max Q Clear Time (g_c+I1), s	8.0	14.2		15.0	33.0		23.0	11.3		9.8	18.0	
Green Ext Time (p_c), s	0.0	9.0		0.0	0.0		0.0	6.1		0.0	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	98.1
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	531	1745	272	421	1910	622	313	606	236	589	936	337
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	180.0
Lanes	1	3	1	1	2	1	1	2	0	1	2	0
Cap, veh/h	325	1482	420	370	1082	460	168	452	176	347	730	260
Arrive On Green	0.19	0.28	0.28	0.22	0.31	0.31	0.10	0.19	0.19	0.21	0.29	0.29
Sat Flow, veh/h	1681	5294	1500	1681	3529	1500	1681	2420	943	1681	2488	885
Grp Volume(v), veh/h	577	1897	296	458	2076	676	340	481	435	640	718	665
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1681	1765	1500	1681	1765	1598	1681	1765	1608
Q Serve(g_s), s	29.0	42.0	26.6	33.0	46.0	46.0	15.0	28.0	28.0	31.0	44.0	44.0
Cycle Q Clear(g_c), s	29.0	42.0	26.6	33.0	46.0	46.0	15.0	28.0	28.0	31.0	44.0	44.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.59	1.00		0.55
Lane Grp Cap(c), veh/h	325	1482	420	370	1082	460	168	329	298	347	518	472
V/C Ratio(X)	1.78	1.28	0.70	1.24	1.92	1.47	2.02	1.46	1.46	1.84	1.39	1.41
Avail Cap(c_a), veh/h	325	1482	420	370	1082	460	168	329	298	347	518	472
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.5	54.0	48.4	58.5	52.0	52.0	67.5	61.0	61.0	59.5	53.0	53.0
Incr Delay (d2), s/veh	361.3	131.2	5.3	128.5	416.6	222.9	480.6	222.6	224.4	390.2	185.9	196.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	45.3	37.2	10.9	27.7	83.5	46.2	29.1	33.3	30.3	51.2	46.9	44.1
Lane Grp Delay (d), s/veh	421.8	185.2	53.7	187.0	468.6	274.9	548.1	283.6	285.4	449.7	238.9	249.5
Lane Grp LOS	F	F	D	F	F	F	F	F	F	F	F	F
Approach Vol, veh/h		2770			3210			1256			2023	
Approach Delay, s/veh		220.4			387.6			355.9			309.1	
Approach LOS		F			F			F			F	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	33.0	46.0		37.0	50.0		19.0	32.0		35.0	48.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	29.0	42.0		33.0	46.0		15.0	28.0		31.0	44.0	
Max Q Clear Time (g_c+I1), s	31.0	44.0		35.0	48.0		17.0	30.0		33.0	46.0	
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	

Intersection Summary			
HCM 2010 Ctrl Delay		316.1	
HCM 2010 LOS		F	

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	507	2424	865	593	1302	189	355	538	314	477	996	354
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	176.5
Lanes	2	2	1	2	2	1	2	2	0	2	2	1
Cap, veh/h	587	1482	630	391	1271	540	283	379	221	561	941	670
Arrive On Green	0.18	0.42	0.42	0.12	0.36	0.36	0.09	0.18	0.18	0.17	0.27	0.27
Sat Flow, veh/h	3261	3529	1500	3261	3529	1500	3261	2094	1220	3261	3529	1500
Grp Volume(v), veh/h	551	2635	940	645	1415	205	386	493	433	518	1083	385
Grp Sat Flow(s),veh/h/ln	1630	1765	1500	1630	1765	1500	1630	1765	1549	1630	1765	1500
Q Serve(g_s), s	25.0	63.0	63.0	18.0	54.0	15.2	13.0	27.2	27.2	23.5	40.0	28.7
Cycle Q Clear(g_c), s	25.0	63.0	63.0	18.0	54.0	15.2	13.0	27.2	27.2	23.5	40.0	28.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.79	1.00		1.00
Lane Grp Cap(c), veh/h	587	1482	630	391	1271	540	283	320	281	561	941	670
V/C Ratio(X)	0.94	1.78	1.49	1.65	1.11	0.38	1.37	1.54	1.54	0.92	1.15	0.57
Avail Cap(c_a), veh/h	587	1482	630	391	1271	540	283	320	281	587	941	670
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.7	43.5	43.5	66.0	48.0	35.6	68.5	61.4	61.4	61.1	55.0	30.9
Incr Delay (d2), s/veh	23.1	352.7	229.8	303.1	62.5	0.4	185.8	258.8	260.9	19.9	80.2	3.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	12.5	100.8	64.2	24.2	35.6	5.9	12.9	35.5	31.4	11.6	28.8	11.6
Lane Grp Delay (d), s/veh	83.8	396.2	273.3	369.1	110.5	36.0	254.3	320.2	322.3	81.1	135.2	34.5
Lane Grp LOS	F	F	F	F	F	D	F	F	F	F	F	C
Approach Vol, veh/h		4126			2265			1312			1986	
Approach Delay, s/veh		326.5			177.4			301.5			101.5	
Approach LOS		F			F			F			F	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	31.0	67.0		22.0	58.0		17.0	31.2		29.8	44.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	27.0	63.0		18.0	54.0		13.0	26.0		27.0	40.0	
Max Q Clear Time (g_c+I1), s	27.0	65.0		20.0	56.0		15.0	29.2		25.5	42.0	
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0		0.0	0.0		0.4	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	242.1
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	673	1679	311	503	1063	315	371	994	585	536	995	328
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0
Lanes	2	2	1	2	2	1	2	3	1	2	3	0
Cap, veh/h	685	1341	570	391	1024	435	326	953	270	522	915	302
Arrive On Green	0.21	0.38	0.38	0.12	0.29	0.29	0.10	0.18	0.18	0.16	0.24	0.24
Sat Flow, veh/h	3261	3529	1500	3261	3529	1500	3261	5294	1500	3261	3814	1258
Grp Volume(v), veh/h	732	1825	338	547	1155	342	403	1080	636	583	1001	438
Grp Sat Flow(s),veh/h/ln	1630	1765	1500	1630	1765	1500	1630	1765	1500	1630	1765	1543
Q Serve(g_s), s	21.0	38.0	18.0	12.0	29.0	21.0	10.0	18.0	18.0	16.0	24.0	24.0
Cycle Q Clear(g_c), s	21.0	38.0	18.0	12.0	29.0	21.0	10.0	18.0	18.0	16.0	24.0	24.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.82
Lane Grp Cap(c), veh/h	685	1341	570	391	1024	435	326	953	270	522	847	370
V/C Ratio(X)	1.07	1.36	0.59	1.40	1.13	0.79	1.24	1.13	2.36	1.12	1.18	1.18
Avail Cap(c_a), veh/h	685	1341	570	391	1024	435	326	953	270	522	847	370
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.5	31.0	24.8	44.0	35.5	32.6	45.0	41.0	41.0	42.0	38.0	38.0
Incr Delay (d2), s/veh	54.4	167.2	1.6	194.0	70.5	9.2	129.8	73.2	621.4	75.8	94.0	106.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	13.8	47.5	6.8	15.5	22.8	8.9	10.0	14.5	53.4	12.1	21.6	20.2
Lane Grp Delay (d), s/veh	93.9	198.2	26.5	238.0	106.0	41.9	174.8	114.2	662.4	117.8	132.0	144.3
Lane Grp LOS	F	F	C	F	F	D	F	F	F	F	F	F
Approach Vol, veh/h		2895			2044			2119			2022	
Approach Delay, s/veh		151.8			130.6			290.2			130.6	
Approach LOS		F			F			F			F	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	25.0	42.0		16.0	33.0		14.0	22.0		20.0	28.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	21.0	38.0		12.0	29.0		10.0	18.0		16.0	24.0	
Max Q Clear Time (g_c+I1), s	23.0	40.0		14.0	31.0		12.0	20.0		18.0	26.0	
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	

Intersection Summary		
HCM 2010 Ctrl Delay		174.6
HCM 2010 LOS		F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	170	255	280	377	279	694	727	1572	261	151	1229	254
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	180.0
Lanes	1	3	1	1	2	1	2	3	0	2	3	0
Cap, veh/h	149	941	267	280	902	383	652	1330	219	580	1183	244
Arrive On Green	0.09	0.18	0.18	0.17	0.26	0.26	0.20	0.30	0.30	0.18	0.28	0.28
Sat Flow, veh/h	1681	5294	1500	1681	3529	1500	3261	4434	731	3261	4260	879
Grp Volume(v), veh/h	185	277	304	410	303	754	790	1358	635	164	1107	505
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1681	1765	1500	1630	1765	1636	1630	1765	1610
Q Serve(g_s), s	8.0	4.1	16.0	15.0	6.3	23.0	18.0	27.0	27.0	3.9	25.0	25.0
Cycle Q Clear(g_c), s	8.0	4.1	16.0	15.0	6.3	23.0	18.0	27.0	27.0	3.9	25.0	25.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.45	1.00		0.55
Lane Grp Cap(c), veh/h	149	941	267	280	902	383	652	1059	491	580	980	447
V/C Ratio(X)	1.24	0.29	1.14	1.46	0.34	1.97	1.21	1.28	1.29	0.28	1.13	1.13
Avail Cap(c_a), veh/h	149	941	267	280	902	383	652	1059	491	580	980	447
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.0	32.1	37.0	37.5	27.3	33.5	36.0	31.5	31.5	32.0	32.5	32.5
Incr Delay (d2), s/veh	151.6	0.2	98.2	227.3	0.2	444.5	109.0	134.3	147.2	1.2	71.1	83.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	9.7	1.8	13.3	24.0	2.8	55.8	17.2	31.4	31.0	1.7	20.6	20.3
Lane Grp Delay (d), s/veh	192.6	32.3	135.2	264.8	27.5	478.0	145.0	165.8	178.7	33.3	103.6	115.6
Lane Grp LOS	F	C	F	F	C	F	F	F	F	C	F	F
Approach Vol, veh/h		766			1467			2783			1776	
Approach Delay, s/veh		111.9			325.4			162.8			100.5	
Approach LOS		F			F			F			F	

Timer												
Assigned Phs	7	4		3	8		1	6		5	2	
Phs Duration (G+Y+Rc), s	12.0	20.0		19.0	27.0		22.0	31.0		20.0	29.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	8.0	16.0		15.0	23.0		18.0	27.0		16.0	25.0	
Max Q Clear Time (g_c+I1), s	10.0	18.0		17.0	25.0		20.0	29.0		5.9	27.0	
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0		0.0	0.0		0.3	0.0	

Intersection Summary												
HCM 2010 Ctrl Delay			175.9									
HCM 2010 LOS			F									

Notes

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	84	527	1568	119	512	2478
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	0.86	0.86	0.97	0.91
Frt	0.89	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.99	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	2998	1365	4548	1290	3252	4818
Flt Permitted	0.99	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	2998	1365	4548	1290	3252	4818
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	91	573	1704	129	557	2693
RTOR Reduction (vph)	204	1	1	68	0	0
Lane Group Flow (vph)	174	285	1716	48	557	2693
Turn Type	NA	pm+ov	NA	Perm	Prot	NA
Protected Phases	8	1	2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	7.5	12.5	17.1	17.1	5.0	26.1
Effective Green, g (s)	7.5	12.5	17.1	17.1	5.0	26.1
Actuated g/C Ratio	0.18	0.30	0.41	0.41	0.12	0.63
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	540	541	1869	530	390	3022
v/s Ratio Prot	0.06	c0.06	0.38		c0.17	c0.56
v/s Ratio Perm		0.15		0.04		
v/c Ratio	0.32	0.53	0.92	0.09	1.43	0.89
Uniform Delay, d1	14.8	12.1	11.6	7.5	18.3	6.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.9	8.7	0.3	207.0	4.5
Delay (s)	15.2	13.0	20.3	7.8	225.3	11.0
Level of Service	B	B	C	A	F	B
Approach Delay (s)	14.3		19.5			47.7
Approach LOS	B		B			D

Intersection Summary			
HCM 2000 Control Delay	34.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	41.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	8	49	20	419	70	179	106	318	103	116	385	13
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		0.97	0.95	0.95	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.96		1.00	0.93	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	1687		3252	1562	1425	1676	3353	1500	3252	3353	1500
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1676	1687		3252	1562	1425	1676	3353	1500	3252	3353	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	53	22	455	76	195	115	346	112	126	418	14
RTOR Reduction (vph)	0	19	0	0	49	101	0	0	56	0	0	9
Lane Group Flow (vph)	9	56	0	455	91	30	115	346	56	126	418	5
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases						8			2			6
Actuated Green, G (s)	0.7	6.0		6.3	11.6	11.6	4.5	18.8	25.1	3.0	17.3	17.3
Effective Green, g (s)	0.7	6.0		6.3	11.6	11.6	4.5	18.8	25.1	3.0	17.3	17.3
Actuated g/C Ratio	0.01	0.12		0.13	0.23	0.23	0.09	0.38	0.50	0.06	0.35	0.35
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	23	202		408	361	329	150	1258	871	194	1157	517
v/s Ratio Prot	0.01	0.03		c0.14	c0.06		c0.07	0.10	0.01	0.04	c0.12	
v/s Ratio Perm						0.02			0.03			0.00
v/c Ratio	0.39	0.28		1.12	0.25	0.09	0.77	0.28	0.06	0.65	0.36	0.01
Uniform Delay, d1	24.5	20.1		21.9	15.7	15.1	22.3	10.9	6.4	23.0	12.3	10.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.7	0.7		79.6	0.4	0.1	20.6	0.5	0.0	7.3	0.9	0.0
Delay (s)	35.1	20.8		101.5	16.1	15.2	42.9	11.4	6.5	30.3	13.1	10.8
Level of Service	D	C		F	B	B	D	B	A	C	B	B
Approach Delay (s)		22.3			69.5			16.8			17.0	
Approach LOS		C			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	36.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	50.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	1699	242	611	1092	12	610	1	2791	3	3	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		0.97	0.95		1.00	0.95	0.95	1.00	1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.85	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	3290		3252	3347		1676	1425	1425	1676	1765	
Flt Permitted	0.95	1.00		0.95	1.00		0.76	1.00	1.00	0.05	1.00	
Satd. Flow (perm)	1676	3290		3252	3347		1334	1425	1425	93	1765	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1847	263	664	1187	13	663	1	3034	3	3	0
RTOR Reduction (vph)	0	7	0	0	1	0	0	95	95	0	0	0
Lane Group Flow (vph)	1	2103	0	664	1199	0	663	1423	1422	3	3	0
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	7	4		3				2			6	
Permitted Phases					8		2		2	6		
Actuated Green, G (s)	0.8	51.2		14.0	64.4		76.0	76.0	76.0	76.0	76.0	
Effective Green, g (s)	0.8	51.2		14.0	64.4		76.0	76.0	76.0	76.0	76.0	
Actuated g/C Ratio	0.01	0.33		0.09	0.42		0.50	0.50	0.50	0.50	0.50	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	8	1099		297	1406		661	706	706	46	875	
v/s Ratio Prot	0.00	c0.64		c0.20				c1.00			0.00	
v/s Ratio Perm					0.36		0.50		1.00	0.03		
v/c Ratio	0.12	1.91		2.24	0.85		1.00	2.02	2.01	0.07	0.00	
Uniform Delay, d1	75.9	51.0		69.6	40.1		38.6	38.6	38.6	20.1	19.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.9	414.4		566.8	5.2		35.7	462.2	461.5	2.7	0.0	
Delay (s)	82.8	465.4		636.4	45.4		74.3	500.8	500.1	22.8	19.5	
Level of Service	F	F		F	D		E	F	F	C	B	
Approach Delay (s)		465.2			255.9			424.1			21.2	
Approach LOS		F			F			F			C	

Intersection Summary			
HCM 2000 Control Delay	394.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.00		
Actuated Cycle Length (s)	153.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	192.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	433	554	45	239	673	311	205	1185	188	367	1144	964
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.91	
Frt	1.00	0.99		1.00	0.99	0.85	1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	1745		1676	1665	1425	1676	3353	1500	1676	4487	
Flt Permitted	0.09	1.00		0.10	1.00	1.00	0.11	1.00	1.00	0.10	1.00	
Satd. Flow (perm)	160	1745		176	1665	1425	186	3353	1500	168	4487	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	471	602	49	260	732	338	223	1288	204	399	1243	1048
RTOR Reduction (vph)	0	2	0	0	1	43	0	0	101	0	117	0
Lane Group Flow (vph)	471	649	0	260	765	261	223	1288	103	399	2174	0
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	64.0	45.0		55.0	40.0	56.0	47.0	38.0	38.0	58.0	45.0	
Effective Green, g (s)	64.0	45.0		55.0	40.0	56.0	47.0	38.0	38.0	58.0	45.0	
Actuated g/C Ratio	0.49	0.35		0.42	0.31	0.43	0.36	0.29	0.29	0.45	0.35	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	312	604		247	512	657	170	980	438	260	1553	
v/s Ratio Prot	c0.23	0.37		0.12	0.46	0.05	0.09	0.38		c0.19	0.48	
v/s Ratio Perm	c0.51			0.32		0.13	0.38		0.07	c0.49		
v/c Ratio	1.51	1.07		1.05	1.49	0.40	1.31	1.31	0.23	1.53	1.65dr	
Uniform Delay, d1	41.4	42.5		38.9	45.0	25.4	35.3	46.0	35.0	39.9	42.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	245.3	58.3		71.8	232.2	0.4	175.8	148.7	1.3	259.0	183.9	
Delay (s)	286.7	100.8		110.7	277.2	25.8	211.2	194.7	36.2	298.9	226.4	
Level of Service	F	F		F	F	C	F	F	D	F	F	
Approach Delay (s)		178.8			187.2			178.0			237.2	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	203.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.59		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	140.8%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	83

Movement	NBL	NBT	SBT	SBR	NEL	NER
Vol, veh/h	198	379	377	37	38	219
Conflicting Peds, #/hr	0	0	0	0	312	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	215	412	410	40	41	238

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	762	0	-	0	1584	742
Stage 1	-	-	-	-	742	-
Stage 2	-	-	-	-	842	-
Follow-up Headway	2.218	-	-	-	3.518	3.318
Pot Capacity-1 Maneuver	850	-	-	-	119	416
Stage 1	-	-	-	-	471	-
Stage 2	-	-	-	-	423	-
Time blocked-Platoon, %		-	-	-		
Mov Capacity-1 Maneuver	850	-	-	-	44	308
Mov Capacity-2 Maneuver	-	-	-	-	44	-
Stage 1	-	-	-	-	349	-
Stage 2	-	-	-	-	210	-

Approach	NB	SB	NE
HCM Control Delay, s	4	0	$ 395

Minor Lane / Major Mvmt	NELn1	NBL	NBT	SBT	SBR
Capacity (veh/h)	163	850	-	-	-
HCM Lane V/C Ratio	1.714	0.253	-	-	-
HCM Control Delay (s)	$ 394.6	10.665	0	-	-
HCM Lane LOS	F	B	A		
HCM 95th %tile Q(veh)	19.827	1.004	-	-	-

Notes

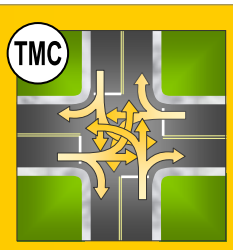
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

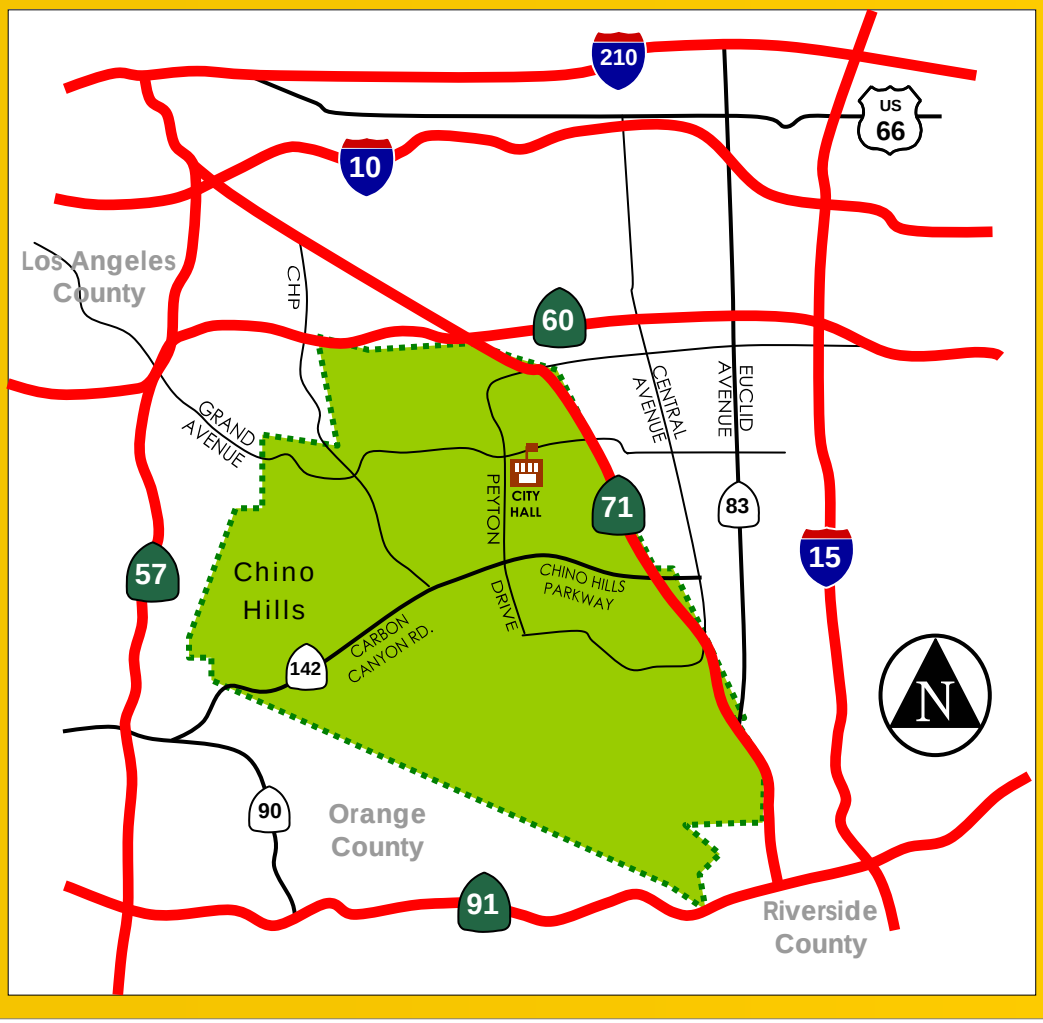
APPENDIX C:
Citywide Roadway Traffic Volume Counts Inventory Report for the General Plan Update

INVENTORY OF CITYWIDE TRAFFIC VOLUME COUNTS

for the

City of Chino Hills' General Plan Update and Traffic Study





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	200	600	600	200	400	200
Level of Service	E	A	D	A	C	B
Approach Delay (s)		19.0	29.0		21.2	
Approach LOS		B	C		C	

Intersection Summary			
HCM Average Control Delay	23.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	81.8	Sum of lost time (s)	9.0
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		
! Phase conflict between lane groups.			
c Critical Lane Group			

PRESENTED TO:

City of Chino Hills
Community Development Department
14000 City Center Drive
Chino Hills, CA 91709

PREPARED BY:

MINAGAR & ASSOCIATES, INC.
Transportation Planning – Traffic Engineering – ITS Consultants
18662 MacArthur Boulevard, Suite 435
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20 Years of Excellence

January 24, 2013

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SECTION 1

Map and List of Traffic Volume Count Locations and Counter Locations

SECTION 1: Average Daily Traffic (ADT) for Roadway Segment Locations #1-29

#	Street Name	Roadway Segment		ADT	MPH	Dist	Yr
		From	To				
1	AVENIDA DE LAS FLORES	CHINO HILLS PKWY	PASEO DEL PALACIO	1,186	25	0.1	2012
2	BAYBERRY DRIVE	TALL OAK DR	OAK CREEK RD	2,044	35	1	2012
3	BAYBERRY DRIVE	OAK CREEK RD	PEYTON DR	2,281	35	0.1	2012
4	BAYBERRY DRIVE	PEYTON DR	TERN ST	625	25	0.2	2012
5	BAYBERRY DRIVE	TERN ST	ZENOBIA LN	795	25	1	2012
6	BAYBERRY DRIVE	ZENOBIA LN	PIPELINE AVE	1,896	25	0.2	2012
7	BEVERLY GLEN ROAD	PEYTON DR	PEYTON DR	776	25	0.1	2012
8	BIRD FARM ROAD	VALLE VISTA DR	POMONA RINCON RD	5,760	30	0.7	2012
9	BUTTERFIELD RANCH RD	SOQUEL CNYN PKWY	PICASSO DR	9,592	55	0.5	2012
10	BUTTERFIELD RANCH RD	PICASSO DR	PINE AVE	6,214	55	0.8	2012
11	BUTTERFIELD RANCH RD	MYSTIC CANYON RD	SR-71	4,080	45	0.8	2012
12	CALLE MADRID	EUCALYPTUS AVE	PASEO DEL PALACIO	1,548	25	0.1	2012
13	CALLE SAN MARCOS	OLYMPIC VIEW DR	GRAND AVE	2,751	25	0.3	2012
14	CANON LANE	HIGHLAND PASS RD	CARBON CANYON RD	801	35	0.2	2012
15	CARRIAGE HILLS LANE	CARBON CNYN RD	OLD CARBON CNYN RD	69	25	0.4	2012
16	CENTRAL AVENUE	SR-71	CITY LIMITS (EAST)	20,093	45	0.4	2012
17	CHINO AVENUE	CITY LIMITS (WEST)	ROCK SPRINGS DR	5,666	50	0.7	2012
18	CHINO AVENUE	ROCK SPRINGS DR	EAGLE CANYON DR	4,933	45	0.9	2012
19	CHINO AVENUE	EAGLE CANYON DR	PEYTON DR	9,563	45	0.2	2012
20	CHINO AVENUE	PEYTON DR	EMERALD WY	17,440	45	0.2	2012
21	CHINO AVENUE	EMERALD WY	SR-71	18,319	45	0.4	2012
22	CHINO HILLS PARKWAY	CITY LIMITS (WEST)	GRAND AVE	10,635	50	1	2012
23	CHINO HILLS PARKWAY	GRAND AVE	EUCALYPTUS AVE	18,849	45	1	2012
24	CHINO HILLS PARKWAY	EUCALYPTUS AVE	CARBON CANYON RD	16,231	45	0.4	2012
25	CHINO HILLS PARKWAY	PEYTON DR	PIPELINE AVE	27,941	45	1	2012
26	CHINO HILLS PARKWAY	PIPELINE AVE	SR-71	38362	40	0.4	2012
27	CHINO HILLS PARKWAY	SR-71	CITY LIMITS (EAST)	11,815	40	0.7	2012
28	COUNTRY CLUB DRIVE	PIPELINE AVE	LOS SERRANOS BLVD	491	25	0.5	2012
29	COUNTRY CLUB DRIVE	LOS SERRANOS BLVD	VALLE VISTA BLVD	1,045	25	0.6	2012

SECTION 1: Average Daily Traffic (ADT) for Roadway Segment Locations #30-54

#	Street Name	Roadway Segment		ADT	MPH	Dist	Yr
		From	To				
30	EAGLE CANYON DRIVE	WANDERING RIDGE DR	CHINO AVE	653	25	0.2	2012
31	ELINVAR DRIVE	SOQUEL CNYN PKWY	SAPPHIRE RD	979	35	0.2	2012
32	ENGLISH ROAD	END (WEST)	PEYTON DR	930	25	1	2012
33	EUCALYPTUS AVENUE	RANCHO HILLS DR	CALLE BARCELONA	2,905	45	0.8	2012
34	EUCALYPTUS AVENUE	CALLE BARCELONA	RIDGEVIEW DR	6,072	45	0.7	2012
35	EUCALYPTUS AVENUE	RIDGEVIEW DR	CHINO HILLS PKWY	7,118	40	0.2	2012
36	EUCALYPTUS AVENUE	CHINO HILLS PKWY	GALLOPING HILLS RD	8,162	40	0.1	2012
37	EUCALYPTUS AVENUE	PEYTON DR	PIPELINE AVE	11,228	45	0.9	2012
38	FOUNDERS DRIVE	GRAND AVE	CHINO HILLS PKWY	4,620	35	0.6	2012
39	FROST AVENUE	CHINO HILLS PKWY	PEYTON DR	2,488	40	0.3	2012
40	PEYTON DRIVE	GAREY AVE	SR-71	18,963	45	0.1	2012
41	PEYTON DRIVE	SR-71	CHINO AVE	24,581	45	0.6	2012
42	PEYTON DRIVE	CHINO AVE	BEDFORD LN	21,250	45	0.2	2012
43	PEYTON DRIVE	GRAND AVE	EUCALYPTUS AVE	20,797	40	0.9	2012
44	PEYTON DRIVE	EUCALYPTUS AVE	CHINO HILLS PKWY	13,498	45	0.5	2012
45	PEYTON DRIVE	BAYBERRY DR	WOODVIEW RD	4,368	45	0.2	2012
46	PIPELINE AVENUE	GLEN RIDGE DR	VALLE VISTA DR	9,107	35	0.7	2012
47	PIPELINE AVENUE	VALLE VISTA DR	WOODVIEW RD	5,769	35	0.3	2012
48	PIPELINE AVENUE	WOODVIEW RD	WINGED FOOT WY	8,320	40	0.6	2012
49	PIPELINE AVENUE	WINGED FOOT WY	SOQUEL CANYON PKWY	8,080	40	0.1	2012
50	POMONA RINCON ROAD	SOQUEL CANYON PKWY	PICASSO DR	5,770	40	1	2012
51	RIDGEVIEW DRIVE	WINDMILL CREEK DR	EUCALYPTUS AVE	1,927	30	0.3	2012
52	SOQUEL CANYON PKWY	PIPELINE AVE	PINEHURST DR	8,605	50	0.2	2012
53	SOQUEL CANYON PKWY	ELINVAR DR	BUTTERFIELD RANCH RD	13,032	50	0.6	2012
54	SR-142	CANYON HILLS RD	ROSEMARY LN	15,012	35	0.9	2012

24-Hour Weekday Roadway

Machine Traffic Volume Count Sheets

Prepared by NDS/ATD

VOLUME

Avenida De Las Flores from Chino Hills Pkwy to Paseo de Palacio

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_001

DAILY TOTALS	NB	SB	EB	WB	Total
	575	611	0	0	1,186

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	1		2						3		12:00	6		2						8	
00:15	1		0						1		12:15	5		6						11	
00:30	0		0						0		12:30	5		10						15	
00:45	0	2	0	2					0	4	12:45	3	19	13	31					16	50
01:00	2		1						3		13:00	8		5						13	
01:15	0		1						1		13:15	5		12						17	
01:30	0		0						0		13:30	7		8						15	
01:45	0	2	1	3					1	5	13:45	6	26	10	35					16	61
02:00	2		1						3		14:00	8		19						27	
02:15	0		0						0		14:15	9		13						22	
02:30	0		0						0		14:30	14		19						33	
02:45	0	2	0	1					0	3	14:45	10	41	9	60					19	101
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03:15	2		1						3		15:15	9		7						16	
03:30	1		0						1		15:30	2		16						18	
03:45	1	4	0	1					1	5	15:45	8	27	7	40					15	67
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05:30	6		2						8		17:30	5		8						13	
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06:00	11		0						11		18:00	13		9						22	
06:15	11		1						12		18:15	8		12						20	
06:30	12		2						14		18:30	11		11						22	
06:45	18	52	3	6					21	58	18:45	4	36	20	52					24	88
07:00	33		8						41		19:00	6		17						23	
07:15	13		9						22		19:15	6		10						16	
07:30	16		5						21		19:30	7		9						16	
07:45	12	74	2	24					14	98	19:45	0	19	18	54					18	73
08:00	12		14						26		20:00	4		11						15	
08:15	11		1						12		20:15	3		11						14	
08:30	16		5						21		20:30	4		9						13	
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09:15	7		5						12		21:15	4		9						13	
09:30	13		5						18		21:30	1		3						4	
09:45	11	42	2	20					13	62	21:45	1	12	11	28					12	40
10:00	5		3						8		22:00	0		0						0	
10:15	10		7						17		22:15	0		3						3	
10:30	8		9						17		22:30	0		3						3	
10:45	3	26	2	21					5	47	22:45	1	1	2	8					3	9
11:00	9		14						23		23:00	0		4						4	
11:15	10		2						12		23:15	2		2						4	
11:30	8		8						16		23:30	2		0						2	
11:45	8	35	3	27					11	62	23:45	1	5	5	11					6	16
TOTALS		310		131						441	TOTALS		265		480						745
SPLIT %		70.3%		29.7%						37.2%	SPLIT %		35.6%		64.4%						62.8%

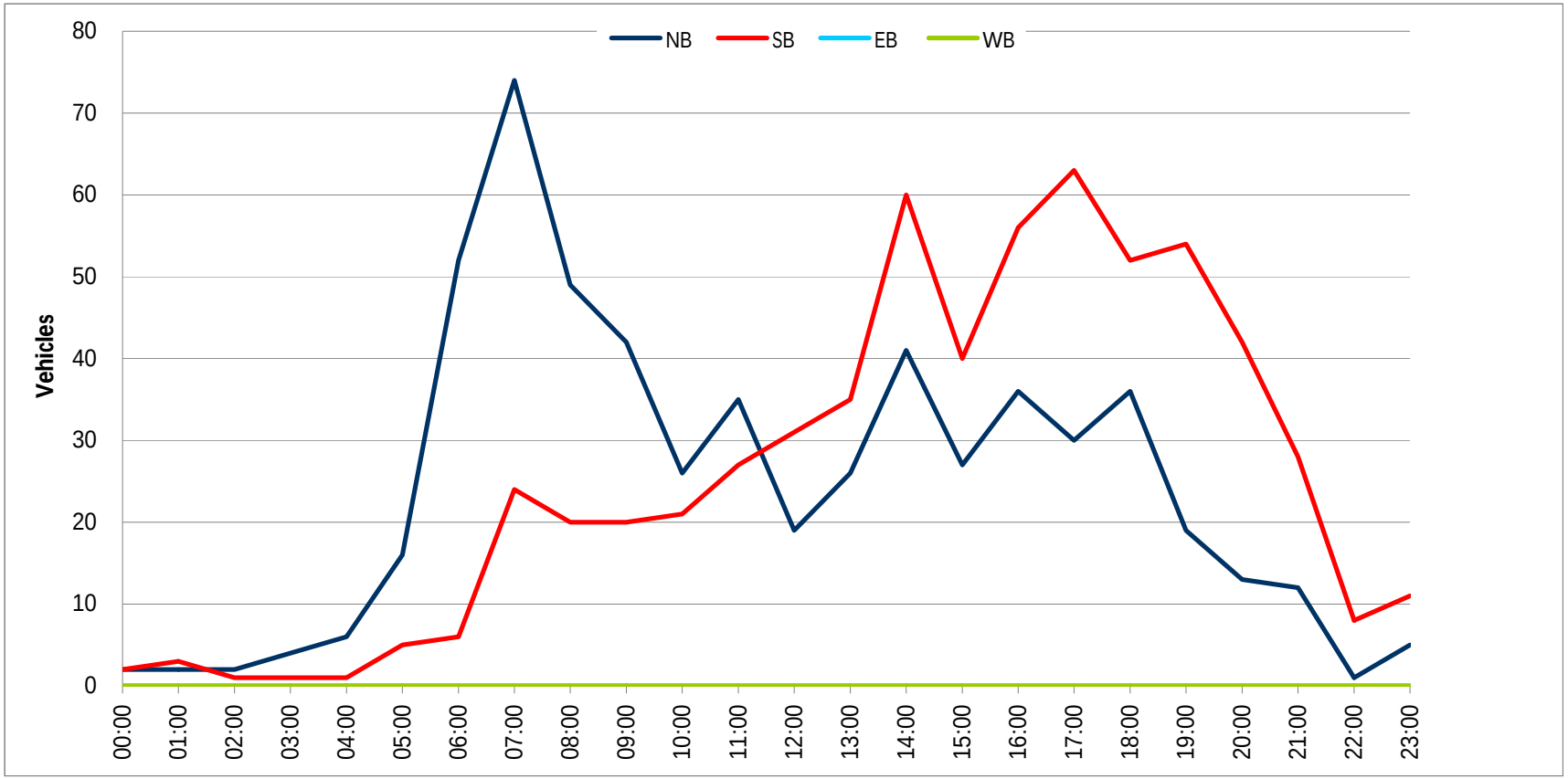
DAILY TOTALS	NB	SB	EB	WB	Total
	575	611	0	0	1,186

AM Peak Hour	06:45	10:15			06:45	PM Peak Hour	17:45	16:30			16:30
AM Pk Volume	80	32			105	PM Pk Volume	42	74			112
Pk Hr Factor	0.606	0.571			0.640	Pk Hr Factor	0.808	0.771			0.737
7 - 9 Volume	123	44	0	0	167	4 - 6 Volume	66	119	0	0	185
7 - 9 Peak Hour	07:00	07:15			07:00	4 - 6 Peak Hour	16:30	16:30			16:30
7 - 9 Pk Volume	74	30	0	0	98	4 - 6 Pk Volume	38	74	0	0	112
Pk Hr Factor	0.561	0.536	0.000	0.000	0.598	Pk Hr Factor	0.679	0.771	0.000	0.000	0.737

Prepared by NDS/ATD

Project #: CA12_6151_001 **City:** Chino Hills

Location: Avenida De Las Flores from Chino Hills Pkwy **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Bayberry Dr from Tall Oak Dr to Oak Creek Rd

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_002

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	997	1,047	2,044

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			1		2		3		12:00			24		7		31	
00:15			0		1		1		12:15			5		13		18	
00:30			0		1		1		12:30			14		13		27	
00:45			0	1	3	7	3	8	12:45			9	52	13	46	22	98
01:00			0		1		1		13:00			5		6		11	
01:15			1		0		1		13:15			10		12		22	
01:30			0		1		1		13:30			12		9		21	
01:45			1	2	0	2	1	4	13:45			14	41	11	38	25	79
02:00			1		0		1		14:00			18		15		33	
02:15			0		0		0		14:15			17		19		36	
02:30			0		0		0		14:30			9		24		33	
02:45			1	2	0		1	2	14:45			13	57	38	96	51	153
03:00			0		0		0		15:00			11		40		51	
03:15			0		0		0		15:15			36		44		80	
03:30			0		0		0		15:30			61		16		77	
03:45			1	1	0		1	1	15:45			18	126	25	125	43	251
04:00			3		0		3		16:00			12		24		36	
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04:30			3		0		3		16:30			12		18		30	
04:45			7	16	0	1	7	17	16:45			8	44	19	78	27	122
05:00			9		0		9		17:00			13		24		37	
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05:30			6		0		6		17:30			11		27		38	
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06:15			16		1		17		18:15			15		15		30	
06:30			15		6		21		18:30			4		15		19	
06:45			33	76	5	15	38	91	18:45			6	33	23	74	29	107
07:00			36		8		44		19:00			16		21		37	
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07:45			18	105	15	53	33	158	19:45			2	32	8	59	10	91
08:00			26		10		36		20:00			3		11		14	
08:15			33		64		97		20:15			4		12		16	
08:30			82		62		144		20:30			5		13		18	
08:45			19	160	9	145	28	305	20:45			5	17	12	48	17	65
09:00			13		10		23		21:00			3		12		15	
09:15			10		8		18		21:15			3		5		8	
09:30			16		9		25		21:30			6		11		17	
09:45			17	56	8	35	25	91	21:45			2	14	8	36	10	50
10:00			13		10		23		22:00			1		11		12	
10:15			7		7		14		22:15			1		8		9	
10:30			14		10		24		22:30			3		1		4	
10:45			10	44	6	33	16	77	22:45			0	5	5	25	5	30
11:00			6		5		11		23:00			1		3		4	
11:15			9		6		15		23:15			3		0		3	
11:30			15		11		26		23:30			0		4		4	
11:45			11	41	16	38	27	79	23:45			1	5	0	7	1	12
TOTALS				526		331		857	TOTALS				471		716		1187
SPLIT %				61.4%		38.6%		41.9%	SPLIT %				39.7%		60.3%		58.1%

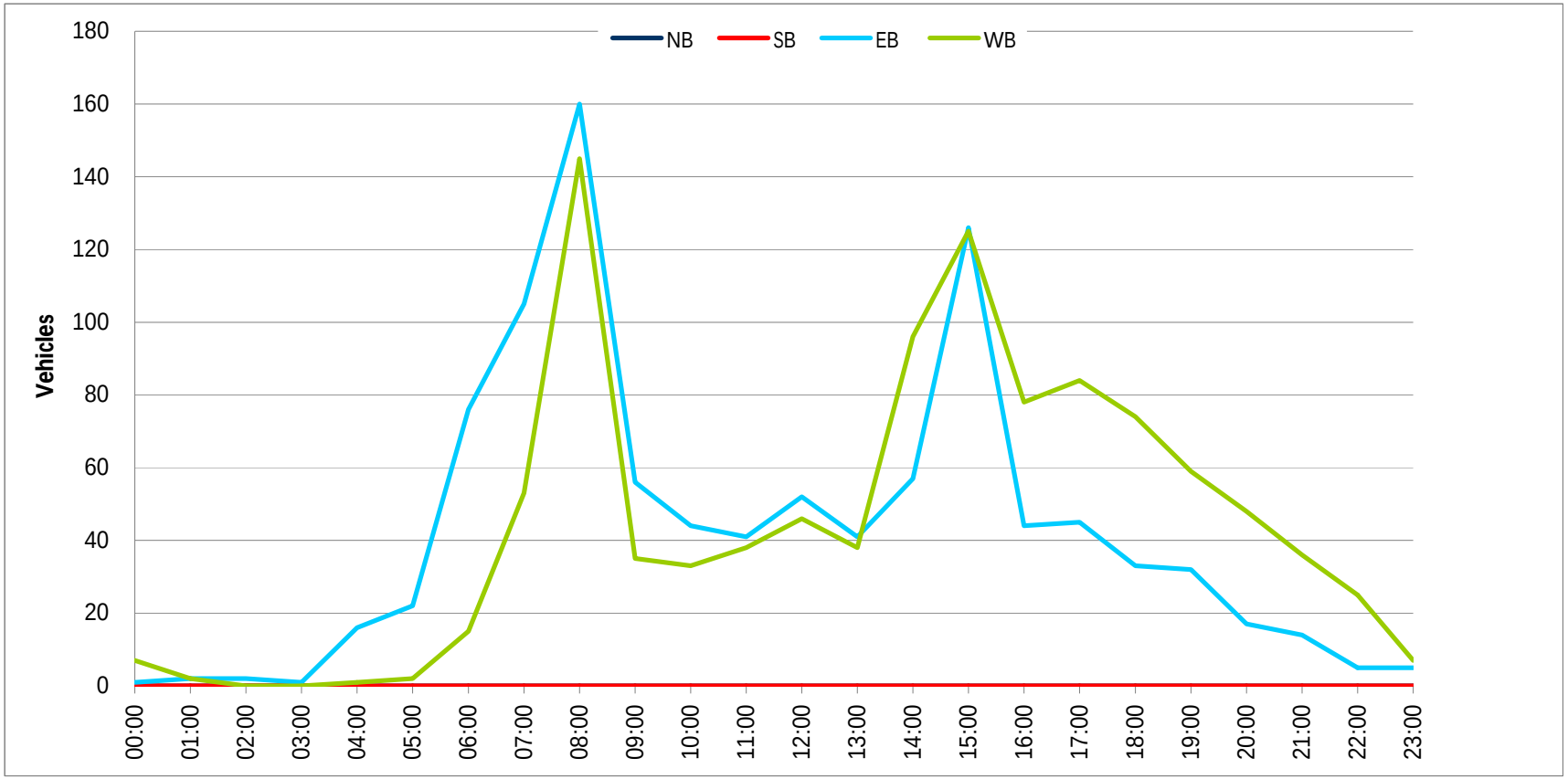
DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	997	1,047	2,044

AM Peak Hour			08:00	07:45	07:45	PM Peak Hour			15:15	14:30	14:45
AM Pk Volume			160	151	310	PM Pk Volume			127	146	259
Pk Hr Factor			0.488	0.590	0.538	Pk Hr Factor			0.520	0.830	0.809
7 - 9 Volume	0	0	265	198	463	4 - 6 Volume	0	0	89	162	251
7 - 9 Peak Hour			08:00	07:45	07:45	4 - 6 Peak Hour			16:30	16:45	16:45
7 - 9 Pk Volume	0	0	160	151	310	4 - 6 Pk Volume	0	0	46	87	132
Pk Hr Factor	0.000	0.000	0.488	0.590	0.538	Pk Hr Factor	0.000	0.000	0.885	0.806	0.868

Prepared by NDS/ATD

Project #: CA12_6151_002 **City:** Chino Hills

Location: Bayberry Dr from Tall Oak Dr to Oak Creek **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Bayberry Dr from Peyton Dr to Oakcreek Rd

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_004

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	1,188	1,093	2,281

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			3		1		4		12:00			16		14		30	
00:15			1		1		2		12:15			10		10		20	
00:30			1		1		2		12:30			10		13		23	
00:45			0	5	0	3	0	8	12:45			14	50	13	50	27	100
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01:15			0		0		0		13:15			7		11		18	
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01:45			0	2	0	4	0	6	13:45			17	41	23	50	40	91
02:00			1		0		1		14:00			24		16		40	
02:15			1		1		2		14:15			22		18		40	
02:30			0		0		0		14:30			15		29		44	
02:45			0	2	1	2	1	4	14:45			17	78	41	104	58	182
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03:15			1		0		1		15:15			22		29		51	
03:30			0		0		0		15:30			46		22		68	
03:45			2	3	0		2	3	15:45			23	115	16	98	39	213
04:00			2		0		2		16:00			20		21		41	
04:15			4		0		4		16:15			16		31		47	
04:30			4		1		5		16:30			14		23		37	
04:45			3	13	0	1	3	14	16:45			10	60	20	95	30	155
05:00			6		1		7		17:00			11		37		48	
05:15			9		2		11		17:15			17		19		36	
05:30			14		1		15		17:30			18		31		49	
05:45			9	38	3	7	12	45	17:45			15	61	27	114	42	175
06:00			11		1		12		18:00			9		18		27	
06:15			18		1		19		18:15			23		17		40	
06:30			31		8		39		18:30			16		20		36	
06:45			41	101	4	14	45	115	18:45			10	58	28	83	38	141
07:00			70		15		85		19:00			7		20		27	
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07:45			24	165	9	72	33	237	19:45			8	32	16	72	24	104
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08:30			51		36		87		20:30			4		15		19	
08:45			16	112	6	90	22	202	20:45			5	19	21	65	26	84
09:00			25		6		31		21:00			7		15		22	
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09:30			21		10		31		21:30			5		11		16	
09:45			25	85	7	28	32	113	21:45			6	23	7	44	13	67
10:00			11		9		20		22:00			2		3		5	
10:15			10		12		22		22:15			3		11		14	
10:30			16		5		21		22:30			0		4		4	
10:45			14	51	6	32	20	83	22:45			1	6	9	27	10	33
11:00			17		5		22		23:00			1		2		3	
11:15			23		7		30		23:15			2		1		3	
11:30			11		9		20		23:30			1		2		3	
11:45			11	62	10	31	21	93	23:45			2	6	2	7	4	13
TOTALS				639		284		923	TOTALS				549		809		1358
SPLIT %				69.2%		30.8%		40.5%	SPLIT %				40.4%		59.6%		59.5%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	1,188	1,093	2,281

AM Peak Hour			06:30	07:45	06:45	PM Peak Hour			15:00	14:30	14:45
AM Pk Volume			184	93	249	PM Pk Volume			115	130	232
Pk Hr Factor			0.657	0.567	0.732	Pk Hr Factor			0.625	0.793	0.853
7 - 9 Volume	0	0	277	162	439	4 - 6 Volume	0	0	121	209	330
7 - 9 Peak Hour			07:00	07:45	07:00	4 - 6 Peak Hour			17:00	17:00	17:00
7 - 9 Pk Volume	0	0	165	93	237	4 - 6 Pk Volume	0	0	61	114	175
Pk Hr Factor	0.000	0.000	0.589	0.567	0.697	Pk Hr Factor	0.000	0.000	0.847	0.770	0.893

Prepared by NDS/ATD

Project #: CA12_6151_004 **City:** Chino Hills

Location: Bayberry Dr from Peyton Dr to Oakcreek Rd **Date:** 11/27/2012

Prepared by NDS/ATD

VOLUME

Bayberry Dr from Peyton Dr to Tern St

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_005

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	319	306	625

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			1		0		1		12:00			9		5		14	
00:15			0		0		0		12:15			2		4		6	
00:30			0		0		0		12:30			2		1		3	
00:45			0	1	0		0	1	12:45			3	16	2	12	5	28
01:00			0		1		1		13:00			4		2		6	
01:15			0		0		0		13:15			4		2		6	
01:30			0		0		0		13:30			2		3		5	
01:45			0		2	3	2	3	13:45			1	11	8	15	9	26
02:00			0		0		0		14:00			4		6		10	
02:15			0		1		1		14:15			3		4		7	
02:30			0		0		0		14:30			7		1		8	
02:45			0		0	1	0	1	14:45			6	20	9	20	15	40
03:00			0		0		0		15:00			6		3		9	
03:15			0		1		1		15:15			6		5		11	
03:30			0		0		0		15:30			16		5		21	
03:45			0		0	1	0	1	15:45			3	31	7	20	10	51
04:00			0		0		0		16:00			5		3		8	
04:15			0		0		0		16:15			9		4		13	
04:30			0		2		2		16:30			5		3		8	
04:45			0		1	3	1	3	16:45			8	27	3	13	11	40
05:00			2		1		3		17:00			12		5		17	
05:15			0		2		2		17:15			11		13		24	
05:30			0		2		2		17:30			8		5		13	
05:45			0	2	5	10	5	12	17:45			9	40	5	28	14	68
06:00			0		1		1		18:00			9		8		17	
06:15			0		4		4		18:15			5		3		8	
06:30			1		2		3		18:30			5		9		14	
06:45			4	5	5	12	9	17	18:45			7	26	5	25	12	51
07:00			8		8		16		19:00			5		6		11	
07:15			4		10		14		19:15			7		2		9	
07:30			2		5		7		19:30			10		1		11	
07:45			1	15	9	32	10	47	19:45			4	26	1	10	5	36
08:00			3		5		8		20:00			3		2		5	
08:15			2		13		15		20:15			3		3		6	
08:30			12		5		17		20:30			8		2		10	
08:45			1	18	4	27	5	45	20:45			2	16	3	10	5	26
09:00			2		0		2		21:00			4		1		5	
09:15			4		5		9		21:15			4		3		7	
09:30			4		1		5		21:30			2		2		4	
09:45			2	12	4	10	6	22	21:45			1	11	3	9	4	20
10:00			5		5		10		22:00			1		0		1	
10:15			2		4		6		22:15			0		1		1	
10:30			2		2		4		22:30			2		1		3	
10:45			7	16	3	14	10	30	22:45			0	3	0	2	0	5
11:00			4		3		7		23:00			3		2		5	
11:15			5		7		12		23:15			0		0		0	
11:30			4		3		7		23:30			0		1		1	
11:45			7	20	11	24	18	44	23:45			0	3	2	5	2	8
TOTALS				89		137		226	TOTALS				230		169		399
SPLIT %				39.4%		60.6%		36.2%	SPLIT %				57.6%		42.4%		63.8%

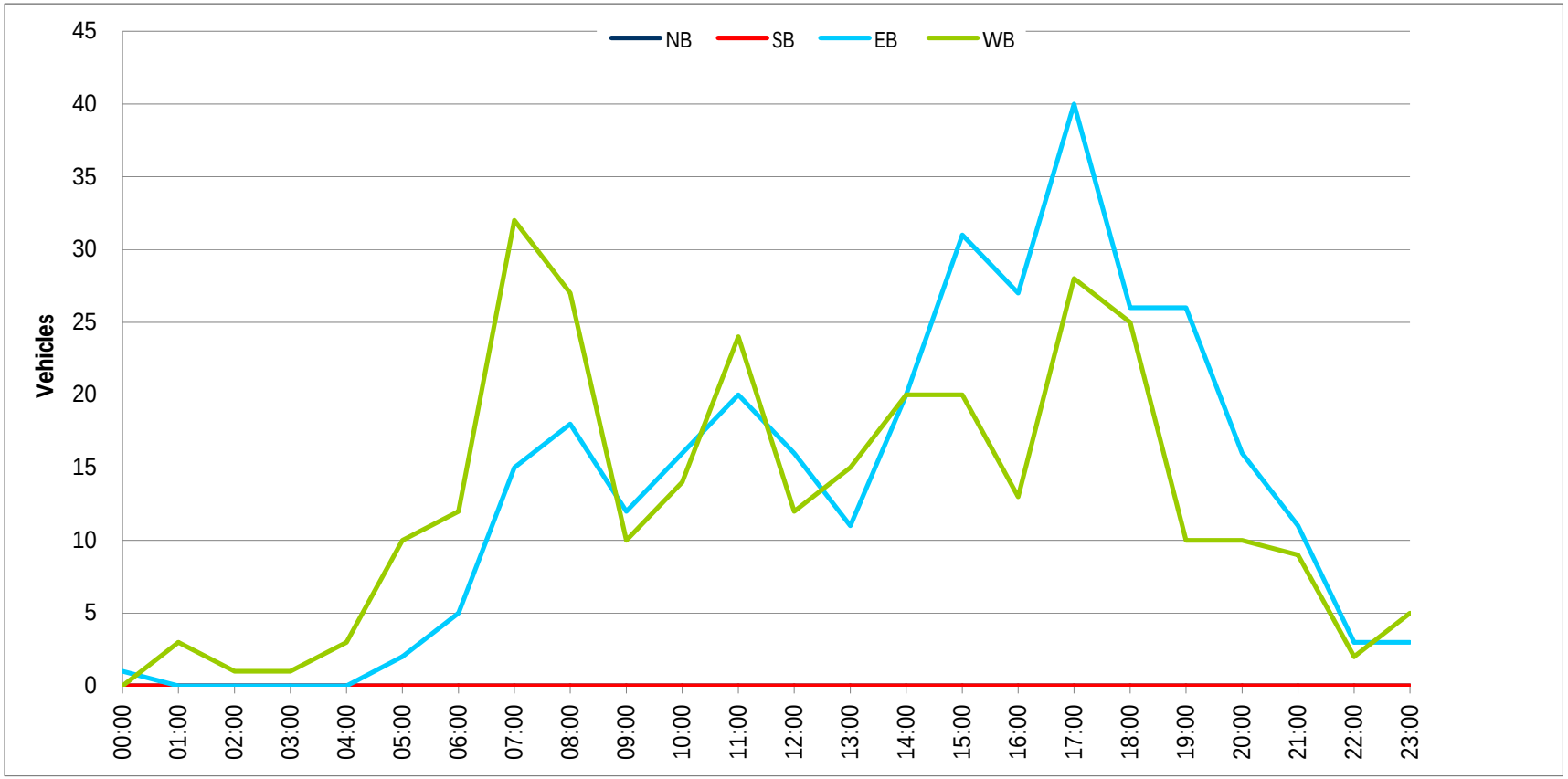
DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	319	306	625

AM Peak Hour			11:15	07:00	11:15	PM Peak Hour			17:00	17:15	17:00
AM Pk Volume			25	32	51	PM Pk Volume			40	31	68
Pk Hr Factor			0.694	0.800	0.708	Pk Hr Factor			0.833	0.596	0.708
7 - 9 Volume	0	0	33	59	92	4 - 6 Volume	0	0	67	41	108
7 - 9 Peak Hour			07:45	07:00	07:45	4 - 6 Peak Hour			17:00	17:00	17:00
7 - 9 Pk Volume	0	0	18	32	50	4 - 6 Pk Volume	0	0	40	28	68
Pk Hr Factor	0.000	0.000	0.375	0.800	0.735	Pk Hr Factor	0.000	0.000	0.833	0.538	0.708

Prepared by NDS/ATD

Project #: CA12_6151_005 **City:** Chino Hills

Location: Bayberry Dr from Peyton Dr to Tern St **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Bayberry Dr from Tern St to Zenobia Ln

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_003

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	411	384	795

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			0		0		0		12:00			7		4		11	
00:15			2		0		2		12:15			11		7		18	
00:30			1		0		1		12:30			5		5		10	
00:45			0	3	1	1	1	4	12:45			9	32	5	21	14	53
01:00			1		0		1		13:00			3		5		8	
01:15			0		0		0		13:15			8		12		20	
01:30			0		0		0		13:30			8		2		10	
01:45			0	1	1	1	1	2	13:45			5	24	5	24	10	48
02:00			0		0		0		14:00			8		8		16	
02:15			0		0		0		14:15			6		2		8	
02:30			1		0		1		14:30			7		11		18	
02:45			1	2	0		1	2	14:45			8	29	7	28	15	57
03:00			0		0		0		15:00			9		6		15	
03:15			1		2		3		15:15			9		3		12	
03:30			0		0		0		15:30			4		3		7	
03:45			0	1	0	2	0	3	15:45			12	34	8	20	20	54
04:00			0		1		1		16:00			8		6		14	
04:15			1		1		2		16:15			9		8		17	
04:30			1		0		1		16:30			4		2		6	
04:45			1	3	1	3	2	6	16:45			5	26	4	20	9	46
05:00			0		1		1		17:00			12		9		21	
05:15			0		1		1		17:15			5		9		14	
05:30			0		3		3		17:30			11		12		23	
05:45			0		7	12	7	12	17:45			11	39	6	36	17	75
06:00			1		3		4		18:00			9		7		16	
06:15			1		5		6		18:15			11		4		15	
06:30			6		3		9		18:30			9		8		17	
06:45			2	10	3	14	5	24	18:45			9	38	7	26	16	64
07:00			3		5		8		19:00			13		6		19	
07:15			5		5		10		19:15			6		7		13	
07:30			4		7		11		19:30			9		3		12	
07:45			2	14	6	23	8	37	19:45			5	33	4	20	9	53
08:00			2		7		9		20:00			8		7		15	
08:15			3		18		21		20:15			5		2		7	
08:30			15		8		23		20:30			8		2		10	
08:45			4	24	5	38	9	62	20:45			5	26	6	17	11	43
09:00			5		4		9		21:00			4		2		6	
09:15			6		2		8		21:15			4		5		9	
09:30			6		10		16		21:30			4		1		5	
09:45			3	20	4	20	7	40	21:45			4	16	3	11	7	27
10:00			4		8		12		22:00			1		3		4	
10:15			2		4		6		22:15			1		3		4	
10:30			3		3		6		22:30			2		1		3	
10:45			4	13	3	18	7	31	22:45			0	4	0	7	0	11
11:00			3		3		6		23:00			2		1		3	
11:15			3		4		7		23:15			0		1		1	
11:30			5		4		9		23:30			2		2		4	
11:45			4	15	7	18	11	33	23:45			0	4	0	4	0	8
TOTALS				106		150		256	TOTALS				305		234		539
SPLIT %				41.4%		58.6%		32.2%	SPLIT %				56.6%		43.4%		67.8%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	411	384	795

AM Peak Hour			08:30	07:45	08:00	PM Peak Hour			17:30	17:00	17:00
AM Pk Volume			30	39	62	PM Pk Volume			42	36	75
Pk Hr Factor			0.500	0.542	0.674	Pk Hr Factor			0.955	0.750	0.815
7 - 9 Volume	0	0	38	61	99	4 - 6 Volume	0	0	65	56	121
7 - 9 Peak Hour			08:00	07:45	08:00	4 - 6 Peak Hour			17:00	17:00	17:00
7 - 9 Pk Volume	0	0	24	39	62	4 - 6 Pk Volume	0	0	39	36	75
Pk Hr Factor	0.000	0.000	0.400	0.542	0.674	Pk Hr Factor	0.000	0.000	0.813	0.750	0.815

Prepared by NDS/ATD

Project #: CA12_6151_003 **City:** Chino Hills

Location: Bayberry Dr from Tern St to Zenobia Ln **Date:** 11/27/2012

Prepared by NDS/ATD

VOLUME

Bayberry Dr from Pipeline Ave to Zenobia Ln

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_006

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	994	902	1,896

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			3		1		4		12:00			15		10		25	
00:15			1		2		3		12:15			14		13		27	
00:30			0		1		1		12:30			17		9		26	
00:45			0	4	2	6	2	10	12:45			11	57	13	45	24	102
01:00			2		3		5		13:00			7		15		22	
01:15			1		1		2		13:15			13		9		22	
01:30			0		2		2		13:30			11		12		23	
01:45			0	3	2	8	2	11	13:45			19	50	12	48	31	98
02:00			2		1		3		14:00			38		13		51	
02:15			0		2		2		14:15			14		13		27	
02:30			0		0		0		14:30			13		31		44	
02:45			2	4	0	3	2	7	14:45			18	83	30	87	48	170
03:00			2		1		3		15:00			15		22		37	
03:15			0		0		0		15:15			9		13		22	
03:30			0		0		0		15:30			15		22		37	
03:45			1	3	0	1	1	4	15:45			14	53	27	84	41	137
04:00			3		0		3		16:00			13		26		39	
04:15			7		2		9		16:15			14		17		31	
04:30			5		1		6		16:30			12		23		35	
04:45			3	18	0	3	3	21	16:45			19	58	24	90	43	148
05:00			11		0		11		17:00			15		20		35	
05:15			12		2		14		17:15			12		22		34	
05:30			13		0		13		17:30			12		24		36	
05:45			7	43	1	3	8	46	17:45			13	52	28	94	41	146
06:00			10		3		13		18:00			21		15		36	
06:15			14		2		16		18:15			15		19		34	
06:30			10		8		18		18:30			15		15		30	
06:45			31	65	6	19	37	84	18:45			11	62	18	67	29	129
07:00			51		12		63		19:00			10		20		30	
07:15			28		23		51		19:15			11		13		24	
07:30			34		12		46		19:30			19		15		34	
07:45			12	125	6	53	18	178	19:45			11	51	9	57	20	108
08:00			23		3		26		20:00			7		18		25	
08:15			22		5		27		20:15			3		8		11	
08:30			13		5		18		20:30			3		9		12	
08:45			18	76	7	20	25	96	20:45			3	16	8	43	11	59
09:00			8		9		17		21:00			4		7		11	
09:15			16		6		22		21:15			11		4		15	
09:30			10		6		16		21:30			5		10		15	
09:45			15	49	5	26	20	75	21:45			4	24	11	32	15	56
10:00			17		4		21		22:00			6		7		13	
10:15			8		10		18		22:15			1		4		5	
10:30			9		9		18		22:30			1		6		7	
10:45			7	41	8	31	15	72	22:45			1	9	9	26	10	35
11:00			10		10		20		23:00			2		3		5	
11:15			9		13		22		23:15			2		4		6	
11:30			7		10		17		23:30			4		4		8	
11:45			12	38	8	41	20	79	23:45			2	10	4	15	6	25
TOTALS				469		214		683	TOTALS				525		688		1213
SPLIT %				68.7%		31.3%		36.0%	SPLIT %				43.3%		56.7%		64.0%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	994	902	1,896

AM Peak Hour			06:45	06:45	06:45	PM Peak Hour			13:45	14:15	14:00
AM Pk Volume			144	53	197	PM Pk Volume			84	96	170
Pk Hr Factor			0.706	0.576	0.782	Pk Hr Factor			0.553	0.774	0.833
7 - 9 Volume	0	0	201	73	274	4 - 6 Volume	0	0	110	184	294
7 - 9 Peak Hour			07:00	07:00	07:00	4 - 6 Peak Hour			16:15	17:00	16:00
7 - 9 Pk Volume	0	0	125	53	178	4 - 6 Pk Volume	0	0	60	94	148
Pk Hr Factor	0.000	0.000	0.613	0.576	0.706	Pk Hr Factor	0.000	0.000	0.789	0.839	0.860

Prepared by NDS/ATD

Project #: CA12_6151_006 **City:** Chino Hills

Location: Bayberry Dr from Pipeline Ave to Zenobia Ln **Date:** 11/27/2012

Prepared by NDS/ATD

VOLUME

Beverly Glen Rd from Peyton Dr to Peyton Dr

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_007

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	368	408	776

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			0		2		2		12:00			3		5		8	
00:15			0		1		1		12:15			10		4		14	
00:30			0		0		0		12:30			3		3		6	
00:45			0		0	3	0	3	12:45			3	19	2	14	5	33
01:00			1		0		1		13:00			2		3		5	
01:15			1		1		2		13:15			3		3		6	
01:30			1		0		1		13:30			2		5		7	
01:45			2	5	1	2	3	7	13:45			4	11	4	15	8	26
02:00			2		1		3		14:00			5		6		11	
02:15			1		0		1		14:15			3		6		9	
02:30			0		0		0		14:30			8		7		15	
02:45			0	3	0	1	0	4	14:45			7	23	7	26	14	49
03:00			1		1		2		15:00			3		8		11	
03:15			0		0		0		15:15			7		8		15	
03:30			1		0		1		15:30			5		7		12	
03:45			0	2	0	1	0	3	15:45			2	17	12	35	14	52
04:00			0		0		0		16:00			3		4		7	
04:15			2		1		3		16:15			4		13		17	
04:30			2		0		2		16:30			4		11		15	
04:45			2	6	0	1	2	7	16:45			2	13	7	35	9	48
05:00			2		0		2		17:00			5		9		14	
05:15			2		0		2		17:15			4		14		18	
05:30			3		2		5		17:30			5		10		15	
05:45			4	11	0	2	4	13	17:45			4	18	19	52	23	70
06:00			6		4		10		18:00			6		7		13	
06:15			6		2		8		18:15			6		13		19	
06:30			6		1		7		18:30			4		11		15	
06:45			8	26	4	11	12	37	18:45			6	22	14	45	20	67
07:00			17		4		21		19:00			5		6		11	
07:15			8		3		11		19:15			5		10		15	
07:30			14		2		16		19:30			4		11		15	
07:45			21	60	2	11	23	71	19:45			7	21	7	34	14	55
08:00			12		7		19		20:00			2		5		7	
08:15			7		3		10		20:15			0		9		9	
08:30			5		1		6		20:30			3		13		16	
08:45			5	29	1	12	6	41	20:45			1	6	5	32	6	38
09:00			9		2		11		21:00			3		7		10	
09:15			3		1		4		21:15			0		7		7	
09:30			6		4		10		21:30			2		8		10	
09:45			4	22	8	15	12	37	21:45			2	7	4	26	6	33
10:00			8		0		8		22:00			1		2		3	
10:15			5		0		5		22:15			0		3		3	
10:30			6		2		8		22:30			4		1		5	
10:45			4	23	3	5	7	28	22:45			0	5	1	7	1	12
11:00			7		2		9		23:00			0		4		4	
11:15			6		5		11		23:15			2		2		4	
11:30			2		1		3		23:30			0		3		3	
11:45			1	16	5	13	6	29	23:45			1	3	1	10	2	13
TOTALS				203		77		280	TOTALS				165		331		496
SPLIT %				72.5%		27.5%		36.1%	SPLIT %				33.3%		66.7%		63.9%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	368	408	776

AM Peak Hour			07:00	11:45	07:00	PM Peak Hour			14:30	17:00	17:00
AM Pk Volume			60	17	71	PM Pk Volume			25	52	70
Pk Hr Factor			0.714	0.850	0.772	Pk Hr Factor			0.781	0.684	0.761
7 - 9 Volume	0	0	89	23	112	4 - 6 Volume	0	0	31	87	118
7 - 9 Peak Hour			07:00	07:15	07:00	4 - 6 Peak Hour			17:00	17:00	17:00
7 - 9 Pk Volume	0	0	60	14	71	4 - 6 Pk Volume	0	0	18	52	70
Pk Hr Factor	0.000	0.000	0.714	0.500	0.772	Pk Hr Factor	0.000	0.000	0.900	0.684	0.761

Prepared by NDS/ATD

Project #: CA12_6151_007 **City:** Chino Hills

Location: Beverly Glen Rd from Peyton Dr to Peyton **Date:** 11/27/2012

Prepared by NDS/ATD

VOLUME

Bird Farm Rd from Pomona Rincon Rd to Valle Vista Dr

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_008

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	2,923	2,837	5,760

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			9		2		11		12:00			53		53		106	
00:15			8		1		9		12:15			37		37		74	
00:30			9		6		15		12:30			24		47		71	
00:45			5	31	3	12	8	43	12:45			35	149	36	173	71	322
01:00			6		1		7		13:00			39		33		72	
01:15			4		4		8		13:15			30		40		70	
01:30			3		2		5		13:30			38		37		75	
01:45			3	16	1	8	4	24	13:45			39	146	37	147	76	293
02:00			6		3		9		14:00			88		34		122	
02:15			5		0		5		14:15			61		48		109	
02:30			2		1		3		14:30			74		83		157	
02:45			2	15	3	7	5	22	14:45			43	266	83	248	126	514
03:00			3		2		5		15:00			51		45		96	
03:15			4		1		5		15:15			50		48		98	
03:30			2		6		8		15:30			42		30		72	
03:45			0	9	4	13	4	22	15:45			45	188	42	165	87	353
04:00			4		4		8		16:00			50		46		96	
04:15			3		10		13		16:15			55		40		95	
04:30			3		12		15		16:30			60		38		98	
04:45			3	13	7	33	10	46	16:45			49	214	34	158	83	372
05:00			2		10		12		17:00			58		30		88	
05:15			3		19		22		17:15			62		58		120	
05:30			7		22		29		17:30			59		53		112	
05:45			6	18	32	83	38	101	17:45			61	240	28	169	89	409
06:00			11		19		30		18:00			32		32		64	
06:15			7		22		29		18:15			52		24		76	
06:30			13		25		38		18:30			53		28		81	
06:45			37	68	33	99	70	167	18:45			44	181	42	126	86	307
07:00			67		68		135		19:00			50		37		87	
07:15			61		109		170		19:15			50		26		76	
07:30			50		90		140		19:30			48		19		67	
07:45			67	245	59	326	126	571	19:45			28	176	23	105	51	281
08:00			59		90		149		20:00			35		22		57	
08:15			44		89		133		20:15			30		19		49	
08:30			39		46		85		20:30			42		15		57	
08:45			33	175	43	268	76	443	20:45			31	138	18	74	49	212
09:00			25		26		51		21:00			32		22		54	
09:15			18		35		53		21:15			20		28		48	
09:30			26		36		62		21:30			26		14		40	
09:45			22	91	29	126	51	217	21:45			35	113	11	75	46	188
10:00			29		36		65		22:00			26		14		40	
10:15			24		32		56		22:15			13		10		23	
10:30			19		29		48		22:30			17		3		20	
10:45			33	105	42	139	75	244	22:45			11	67	5	32	16	99
11:00			39		30		69		23:00			14		9		23	
11:15			61		46		107		23:15			8		7		15	
11:30			64		52		116		23:30			7		3		10	
11:45			57	221	102	230	159	451	23:45			9	38	2	21	11	59
TOTALS				1007		1344		2351	TOTALS				1916		1493		3409
SPLIT %				42.8%		57.2%		40.8%	SPLIT %				56.2%		43.8%		59.2%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	2,923	2,837	5,760

AM Peak Hour			07:00	07:15	07:15	PM Peak Hour			14:00	14:15	14:00
AM Pk Volume			245	348	585	PM Pk Volume			266	259	514
Pk Hr Factor			0.914	0.798	0.860	Pk Hr Factor			0.756	0.780	0.818
7 - 9 Volume	0	0	420	594	1014	4 - 6 Volume	0	0	454	327	781
7 - 9 Peak Hour			07:00	07:15	07:15	4 - 6 Peak Hour			17:00	16:45	17:00
7 - 9 Pk Volume	0	0	245	348	585	4 - 6 Pk Volume	0	0	240	175	409
Pk Hr Factor	0.000	0.000	0.914	0.798	0.860	Pk Hr Factor	0.000	0.000	0.968	0.754	0.852

Prepared by NDS/ATD

Project #: CA12_6151_008 **City:** Chino Hills

Location: Bird Farm Rd from Pomona Rincon Rd to **Date:** 11/27/2012

Prepared by NDS/ATD

VOLUME

Butterfield Ranch Rd from Soquel Canyon Pkwy to Picasso Dr

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_011

DAILY TOTALS	NB	SB	EB	WB	Total
	5,205	4,387	0	0	9,592

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	6		7						13		12:00	66		52						118	
00:15	3		7						10		12:15	61		48						109	
00:30	1		4						5		12:30	55		50						105	
00:45	3	13	2	20					5	33	12:45	51	233	42	192					93	425
01:00	3		3						6		13:00	46		47						93	
01:15	1		3						4		13:15	84		57						141	
01:30	4		2						6		13:30	99		47						146	
01:45	1	9	2	10					3	19	13:45	73	302	67	218					140	520
02:00	0		3						3		14:00	59		91						150	
02:15	1		2						3		14:15	131		100						231	
02:30	1		2						3		14:30	339		99						438	
02:45	2	4	1	8					3	12	14:45	181	710	86	376					267	1086
03:00	3		0						3		15:00	87		85						172	
03:15	3		1						4		15:15	106		77						183	
03:30	0		0						0		15:30	96		112						208	
03:45	3	9	0	1					3	10	15:45	83	372	100	374					183	746
04:00	7		3						10		16:00	78		83						161	
04:15	3		0						3		16:15	62		77						139	
04:30	7		3						10		16:30	87		74						161	
04:45	10	27	4	10					14	37	16:45	102	329	106	340					208	669
05:00	16		2						18		17:00	90		87						177	
05:15	14		2						16		17:15	76		112						188	
05:30	25		5						30		17:30	83		99						182	
05:45	23	78	8	17					31	95	17:45	101	350	98	396					199	746
06:00	31		10						41		18:00	67		84						151	
06:15	47		21						68		18:15	71		101						172	
06:30	56		29						85		18:30	54		87						141	
06:45	116	250	68	128					184	378	18:45	51	243	99	371					150	614
07:00	247		115						362		19:00	59		82						141	
07:15	395		128						523		19:15	42		84						126	
07:30	103		68						171		19:30	41		67						108	
07:45	98	843	75	386					173	1229	19:45	42	184	70	303					112	487
08:00	88		72						160		20:00	35		56						91	
08:15	87		78						165		20:15	32		74						106	
08:30	103		71						174		20:30	43		71						114	
08:45	78	356	42	263					120	619	20:45	16	126	47	248					63	374
09:00	52		35						87		21:00	18		47						65	
09:15	60		29						89		21:15	25		41						66	
09:30	48		27						75		21:30	16		44						60	
09:45	56	216	31	122					87	338	21:45	21	80	38	170					59	250
10:00	43		32						75		22:00	25		34						59	
10:15	41		33						74		22:15	10		21						31	
10:30	43		33						76		22:30	9		15						24	
10:45	51	178	40	138					91	316	22:45	6	50	12	82					18	132
11:00	41		40						81		23:00	5		14						19	
11:15	55		36						91		23:15	5		14						19	
11:30	52		37						89		23:30	4		12						16	
11:45	75	223	51	164					126	387	23:45	6	20	10	50					16	70
TOTALS		2206		1267						3473	TOTALS		2999		3120						6119
SPLIT %		63.5%		36.5%						36.2%	SPLIT %		49.0%		51.0%						63.8%

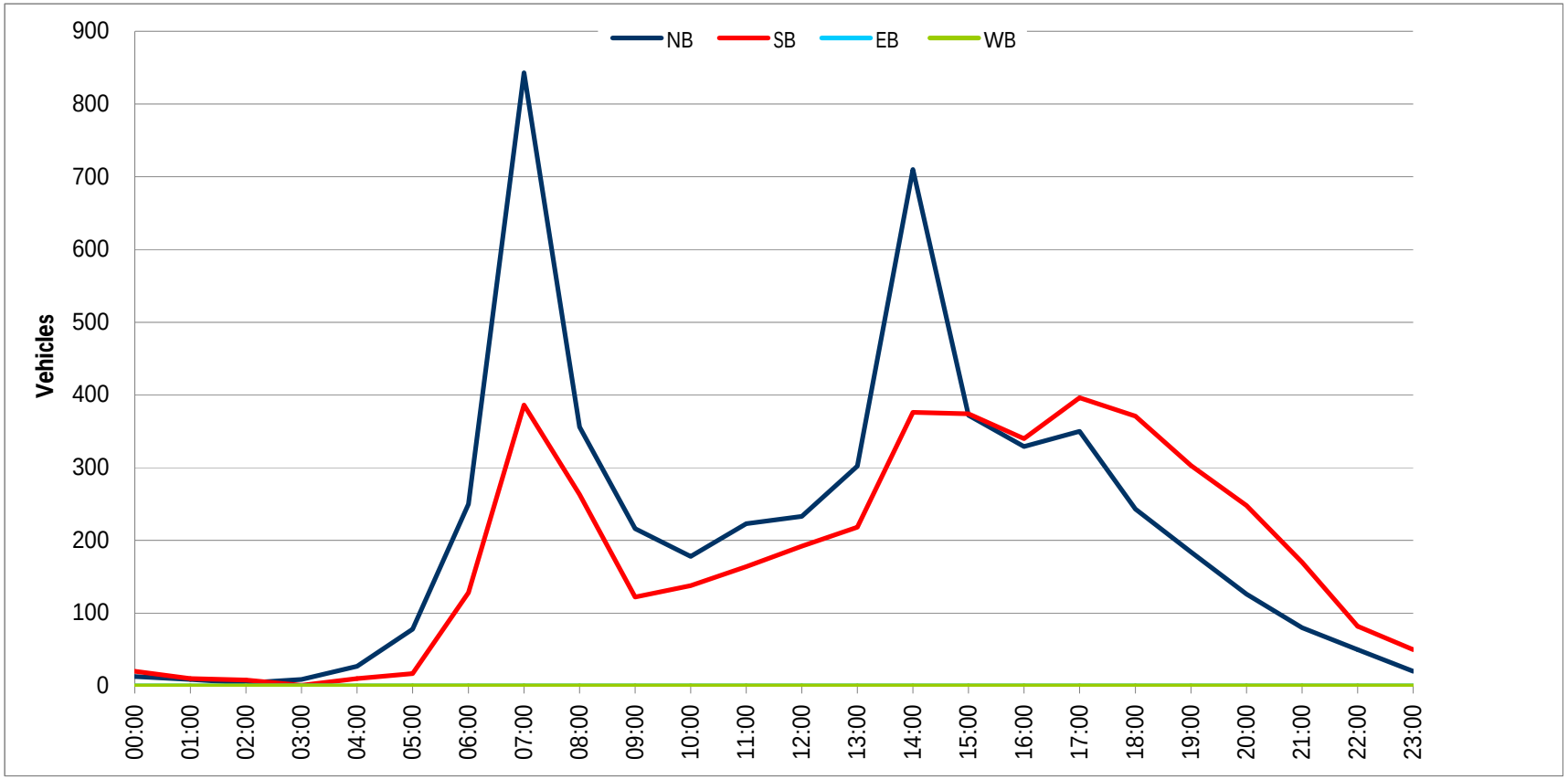
DAILY TOTALS	NB	SB	EB	WB	Total
	5,205	4,387	0	0	9,592

AM Peak Hour	06:45	07:00			06:45	PM Peak Hour	14:15	16:45			14:15
AM Pk Volume	861	386			1240	PM Pk Volume	738	404			1108
Pk Hr Factor	0.545	0.754			0.593	Pk Hr Factor	0.544	0.902			0.632
7 - 9 Volume	1199	649	0	0	1848	4 - 6 Volume	679	736	0	0	1415
7 - 9 Peak Hour	07:00	07:00			07:00	4 - 6 Peak Hour	16:30	16:45			16:45
7 - 9 Pk Volume	843	386	0	0	1229	4 - 6 Pk Volume	355	404	0	0	755
Pk Hr Factor	0.534	0.754	0.000	0.000	0.587	Pk Hr Factor	0.870	0.902	0.000	0.000	0.907

Prepared by NDS/ATD

Project #: CA12_6151_011 **City:** Chino Hills

Location: Butterfield Ranch Rd from Soquel Canyon **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Butterfield Ranch Rd from Picasso Dr to Pine Ave

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_010

DAILY TOTALS	NB	SB	EB	WB	Total
	2,919	3,295	0	0	6,214

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	8		6						14		12:00	36		33						69	
00:15	2		6						8		12:15	37		28						65	
00:30	2		2						4		12:30	32		34						66	
00:45	3	15	0	14					3	29	12:45	40	145	39	134					79	279
01:00	3		2						5		13:00	35		41						76	
01:15	3		2						5		13:15	39		36						75	
01:30	0		0						0		13:30	39		37						76	
01:45	1	7	3	7					4	14	13:45	48	161	53	167					101	328
02:00	0		2						2		14:00	42		51						93	
02:15	2		1						3		14:15	77		55						132	
02:30	1		1						2		14:30	71		119						190	
02:45	1	4	1	5					2	9	14:45	50	240	79	304					129	544
03:00	2		1						3		15:00	44		67						111	
03:15	0		0						0		15:15	51		53						104	
03:30	0		0						0		15:30	78		59						137	
03:45	2	4	0	1					2	5	15:45	56	229	60	239					116	468
04:00	2		4						6		16:00	48		59						107	
04:15	0		4						4		16:15	47		64						111	
04:30	2		2						4		16:30	66		48						114	
04:45	3	7	3	13					6	20	16:45	63	224	69	240					132	464
05:00	2		9						11		17:00	75		60						135	
05:15	7		6						13		17:15	60		79						139	
05:30	6		12						18		17:30	59		79						138	
05:45	12	27	20	47					32	74	17:45	80	274	71	289					151	563
06:00	16		20						36		18:00	67		58						125	
06:15	9		26						35		18:15	66		66						132	
06:30	24		48						72		18:30	53		63						116	
06:45	69	118	61	155					130	273	18:45	39	225	51	238					90	463
07:00	163		92						255		19:00	41		47						88	
07:15	137		157						294		19:15	36		37						73	
07:30	25		92						117		19:30	27		39						66	
07:45	31	356	69	410					100	766	19:45	40	144	33	156					73	300
08:00	44		57						101		20:00	23		32						55	
08:15	59		75						134		20:15	25		37						62	
08:30	46		56						102		20:30	31		42						73	
08:45	33	182	39	227					72	409	20:45	18	97	33	144					51	241
09:00	30		26						56		21:00	19		30						49	
09:15	24		26						50		21:15	16		19						35	
09:30	32		31						63		21:30	18		30						48	
09:45	36	122	29	112					65	234	21:45	16	69	22	101					38	170
10:00	21		20						41		22:00	20		22						42	
10:15	29		30						59		22:15	10		7						17	
10:30	22		25						47		22:30	4		9						13	
10:45	28	100	32	107					60	207	22:45	4	38	9	47					13	85
11:00	24		30						54		23:00	4		2						6	
11:15	26		26						52		23:15	6		3						9	
11:30	32		32						64		23:30	5		3						8	
11:45	25	107	39	127					64	234	23:45	9	24	3	11					12	35
TOTALS		1049		1225						2274	TOTALS		1870		2070						3940
SPLIT %		46.1%		53.9%						36.6%	SPLIT %		47.5%		52.5%						63.4%

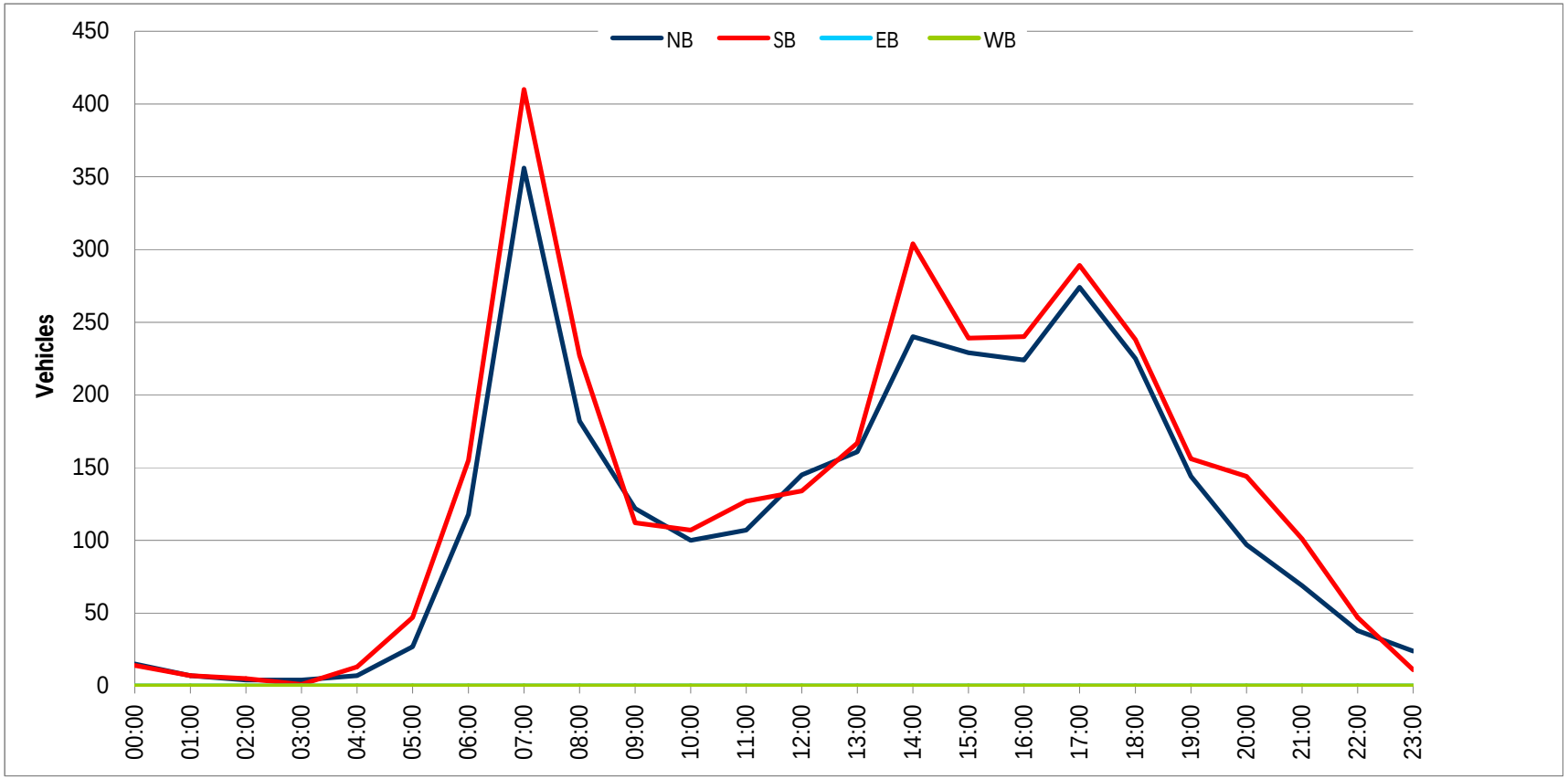
DAILY TOTALS	NB	SB	EB	WB	Total
	2,919	3,295	0	0	6,214

AM Peak Hour	06:45	07:00			06:45	PM Peak Hour	17:00	14:15			17:00
AM Pk Volume	394	410			796	PM Pk Volume	274	320			563
Pk Hr Factor	0.604	0.653			0.677	Pk Hr Factor	0.856	0.672			0.932
7 - 9 Volume	538	637	0	0	1175	4 - 6 Volume	498	529	0	0	1027
7 - 9 Peak Hour	07:00	07:00			07:00	4 - 6 Peak Hour	17:00	17:00			17:00
7 - 9 Pk Volume	356	410	0	0	766	4 - 6 Pk Volume	274	289	0	0	563
Pk Hr Factor	0.546	0.653	0.000	0.000	0.651	Pk Hr Factor	0.856	0.915	0.000	0.000	0.932

Prepared by NDS/ATD

Project #: CA12_6151_010 **City:** Chino Hills

Location: Butterfield Ranch Rd from Picasso Dr to Pine **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Butterfield Ranch Rd from Mystic Canyon Rd to SR-71

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_009

DAILY TOTALS	NB	SB	EB	WB	Total
	1,832	2,248	0	0	4,080

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	3		5						8		12:00	25		20						45	
00:15	3		1						4		12:15	21		22						43	
00:30	1		1						2		12:30	22		19						41	
00:45	3	10	0	7					3	17	12:45	18	86	25	86					43	172
01:00	0		0						0		13:00	23		20						43	
01:15	4		2						6		13:15	26		23						49	
01:30	2		2						4		13:30	23		26						49	
01:45	1	7	2	6					3	13	13:45	31	103	19	88					50	191
02:00	0		1						1		14:00	28		25						53	
02:15	1		0						1		14:15	32		17						49	
02:30	0		0						0		14:30	32		51						83	
02:45	2	3	0	1					2	4	14:45	22	114	43	136					65	250
03:00	2		0						2		15:00	40		38						78	
03:15	1		0						1		15:15	40		37						77	
03:30	2		0						2		15:30	70		27						97	
03:45	2	7	2	2					4	9	15:45	40	190	27	129					67	319
04:00	2		3						5		16:00	32		26						58	
04:15	1		9						10		16:15	29		29						58	
04:30	1		4						5		16:30	34		23						57	
04:45	2	6	7	23					9	29	16:45	51	146	42	120					93	266
05:00	2		12						14		17:00	30		23						53	
05:15	4		12						16		17:15	29		42						71	
05:30	4		13						17		17:30	44		36						80	
05:45	8	18	19	56					27	74	17:45	46	149	36	137					82	286
06:00	9		22						31		18:00	53		39						92	
06:15	7		28						35		18:15	35		35						70	
06:30	12		52						64		18:30	29		24						53	
06:45	34	62	71	173					105	235	18:45	22	139	27	125					49	264
07:00	73		104						177		19:00	31		25						56	
07:15	40		131						171		19:15	31		24						55	
07:30	23		105						128		19:30	20		31						51	
07:45	17	153	67	407					84	560	19:45	25	107	17	97					42	204
08:00	22		68						90		20:00	14		15						29	
08:15	27		100						127		20:15	17		12						29	
08:30	36		53						89		20:30	18		21						39	
08:45	24	109	32	253					56	362	20:45	8	57	19	67					27	124
09:00	34		30						64		21:00	17		13						30	
09:15	20		21						41		21:15	11		13						24	
09:30	15		20						35		21:30	12		14						26	
09:45	21	90	22	93					43	183	21:45	12	52	14	54					26	106
10:00	12		15						27		22:00	7		12						19	
10:15	19		14						33		22:15	11		11						22	
10:30	20		23						43		22:30	12		7						19	
10:45	20	71	11	63					31	134	22:45	8	38	5	35					13	73
11:00	24		13						37		23:00	4		3						7	
11:15	19		20						39		23:15	5		7						12	
11:30	26		24						50		23:30	7		1						8	
11:45	23	92	22	79					45	171	23:45	7	23	0	11					7	34
TOTALS		628		1163						1791	TOTALS		1204		1085						2289
SPLIT %		35.1%		64.9%						43.9%	SPLIT %		52.6%		47.4%						56.1%

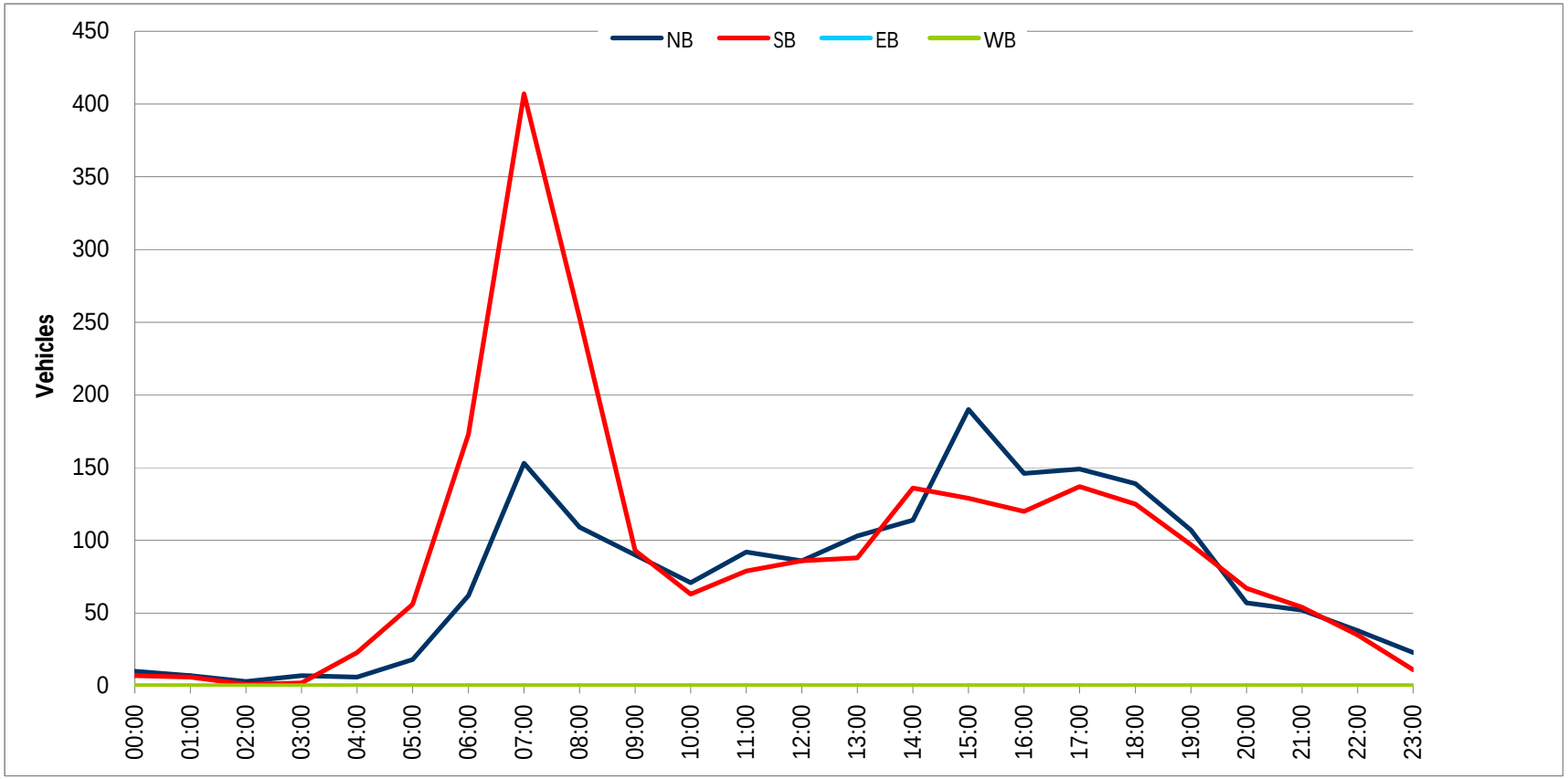
DAILY TOTALS	NB	SB	EB	WB	Total
	1,832	2,248	0	0	4,080

AM Peak Hour	06:45	06:45			06:45	PM Peak Hour	15:00	14:30			17:15
AM Pk Volume	170	411			581	PM Pk Volume	190	169			325
Pk Hr Factor	0.582	0.784			0.821	Pk Hr Factor	0.679	0.828			0.883
7 - 9 Volume	262	660	0	0	922	4 - 6 Volume	295	257	0	0	552
7 - 9 Peak Hour	07:00	07:00			07:00	4 - 6 Peak Hour	16:45	16:45			16:45
7 - 9 Pk Volume	153	407	0	0	560	4 - 6 Pk Volume	154	143	0	0	297
Pk Hr Factor	0.524	0.777	0.000	0.000	0.791	Pk Hr Factor	0.755	0.851	0.000	0.000	0.798

Prepared by NDS/ATD

Project #: CA12_6151_009 **City:** Chino Hills

Location: Butterfield Ranch Rd from Mystic Canyon Rd **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Calle Madrid from Eucalyptus Ave to Paseo del Palacio

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_012

DAILY TOTALS	NB	SB	EB	WB	Total
	754	794	0	0	1,548

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	0		1						1		12:00	5		5						10	
00:15	0		2						2		12:15	11		11						22	
00:30	0		1						1		12:30	9		11						20	
00:45	0		0	4					0	4	12:45	9	34	7	34					16	68
01:00	1		2						3		13:00	6		6						12	
01:15	0		0						0		13:15	12		7						19	
01:30	0		1						1		13:30	19		14						33	
01:45	1	2	0	3					1	5	13:45	11	48	10	37					21	85
02:00	1		0						1		14:00	14		16						30	
02:15	0		0						0		14:15	17		17						34	
02:30	1		1						2		14:30	13		19						32	
02:45	0	2	0	1					0	3	14:45	15	59	14	66					29	125
03:00	0		1						1		15:00	14		36						50	
03:15	0		1						1		15:15	8		10						18	
03:30	0		0						0		15:30	14		17						31	
03:45	0		0	2					0	2	15:45	9	45	13	76					22	121
04:00	2		0						2		16:00	16		20						36	
04:15	1		1						2		16:15	10		17						27	
04:30	2		0						2		16:30	11		20						31	
04:45	3	8	1	2					4	10	16:45	12	49	27	84					39	133
05:00	6		1						7		17:00	11		19						30	
05:15	5		4						9		17:15	14		17						31	
05:30	5		1						6		17:30	8		17						25	
05:45	5	21	1	7					6	28	17:45	5	38	23	76					28	114
06:00	11		2						13		18:00	9		14						23	
06:15	13		2						15		18:15	14		21						35	
06:30	12		3						15		18:30	7		12						19	
06:45	26	62	8	15					34	77	18:45	9	39	23	70					32	109
07:00	23		17						40		19:00	2		17						19	
07:15	24		5						29		19:15	7		12						19	
07:30	16		10						26		19:30	4		10						14	
07:45	34	97	6	38					40	135	19:45	9	22	9	48					18	70
08:00	31		20						51		20:00	10		15						25	
08:15	13		15						28		20:15	5		17						22	
08:30	13		8						21		20:30	2		5						7	
08:45	13	70	10	53					23	123	20:45	4	21	12	49					16	70
09:00	11		9						20		21:00	1		3						4	
09:15	10		5						15		21:15	5		11						16	
09:30	8		3						11		21:30	1		2						3	
09:45	3	32	8	25					11	57	21:45	5	12	4	20					9	32
10:00	11		9						20		22:00	3		12						15	
10:15	11		5						16		22:15	4		2						6	
10:30	8		6						14		22:30	1		1						2	
10:45	12	42	6	26					18	68	22:45	0	8	2	17					2	25
11:00	7		6						13		23:00	3		3						6	
11:15	12		4						16		23:15	0		1						1	
11:30	13		6						19		23:30	1		3						4	
11:45	7	39	16	32					23	71	23:45	0	4	2	9					2	13
TOTALS		375		208						583	TOTALS		379		586						965
SPLIT %		64.3%		35.7%						37.7%	SPLIT %		39.3%		60.7%						62.3%

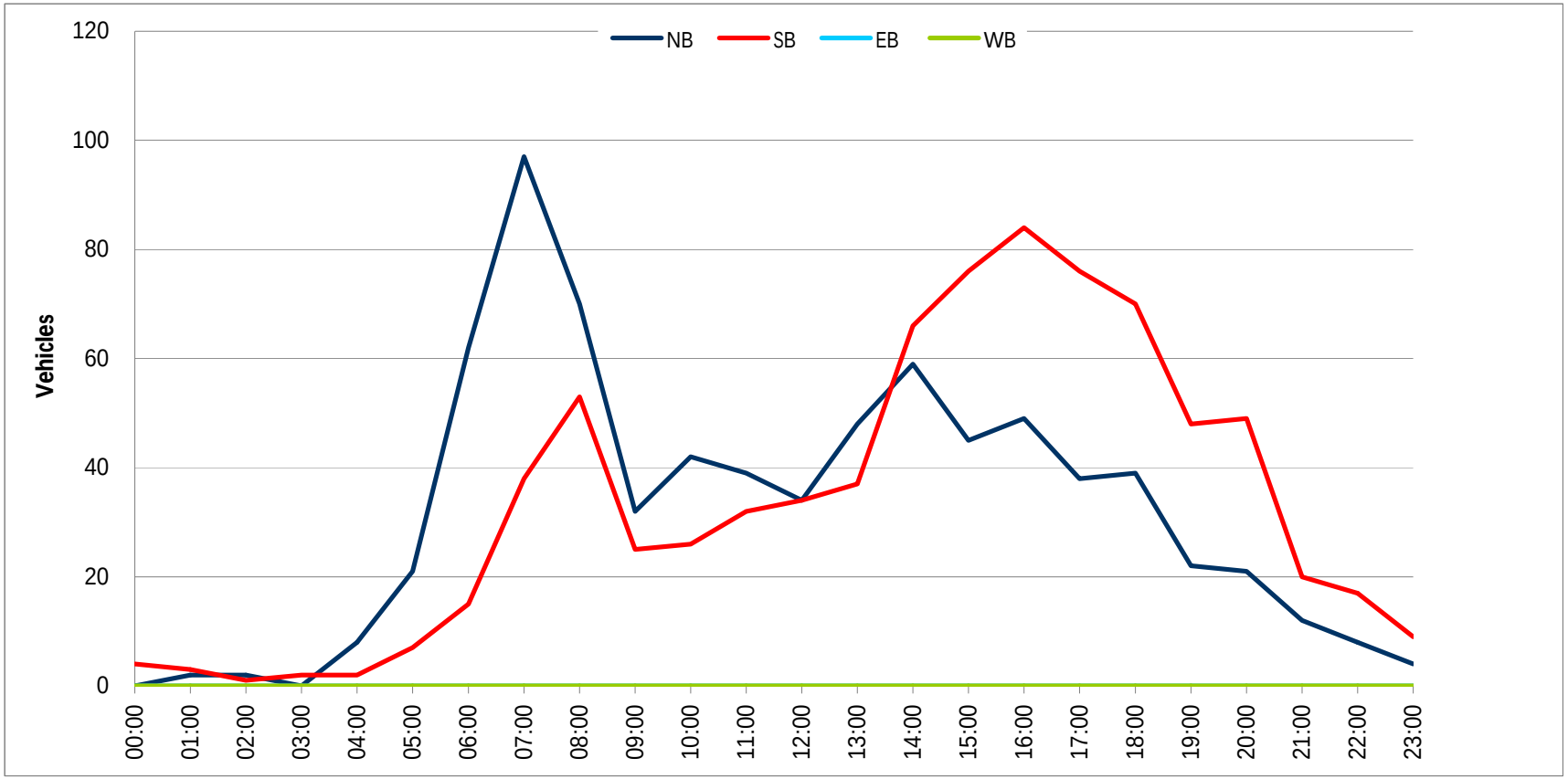
DAILY TOTALS	NB	SB	EB	WB	Total
	754	794	0	0	1,548

AM Peak Hour	07:15	08:00			07:15	PM Peak Hour	13:30	14:15			14:15
AM Pk Volume	105	53			146	PM Pk Volume	61	86			145
Pk Hr Factor	0.772	0.663			0.716	Pk Hr Factor	0.803	0.597			0.725
7 - 9 Volume	167	91	0	0	258	4 - 6 Volume	87	160	0	0	247
7 - 9 Peak Hour	07:15	08:00			07:15	4 - 6 Peak Hour	16:00	16:00			16:00
7 - 9 Pk Volume	105	53	0	0	146	4 - 6 Pk Volume	49	84	0	0	133
Pk Hr Factor	0.772	0.663	0.000	0.000	0.716	Pk Hr Factor	0.766	0.778	0.000	0.000	0.853

Prepared by NDS/ATD

Project #: CA12_6151_012 **City:** Chino Hills

Location: Calle Madrid from Eucalyptus Ave to Paseo **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Calle San Marcos from Grand Ave to Olympic View Dr

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_013

DAILY TOTALS	NB	SB	EB	WB	Total
	1,387	1,364	0	0	2,751

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	1		1						2		12:00	15		11						26	
00:15	0		0						0		12:15	9		7						16	
00:30	1		0						1		12:30	16		7						23	
00:45	0	2	0	1					0	3	12:45	7	47	11	36					18	83
01:00	0		0						0		13:00	12		5						17	
01:15	0		0						0		13:15	14		11						25	
01:30	0		0						0		13:30	8		13						21	
01:45	0		0						0		13:45	17	51	24	53					41	104
02:00	0		0						0		14:00	54		59						113	
02:15	0		1						1		14:15	16		41						57	
02:30	0		0						0		14:30	19		55						74	
02:45	0		0	1					0	1	14:45	32	121	36	191					68	312
03:00	1		1						2		15:00	94		42						136	
03:15	0		1						1		15:15	34		26						60	
03:30	2		0						2		15:30	18		27						45	
03:45	1	4	0	2					1	6	15:45	33	179	20	115					53	294
04:00	0		0						0		16:00	22		14						36	
04:15	0		1						1		16:15	15		9						24	
04:30	1		0						1		16:30	19		12						31	
04:45	0	1	0	1					0	2	16:45	24	80	17	52					41	132
05:00	0		3						3		17:00	33		10						43	
05:15	1		5						6		17:15	26		17						43	
05:30	0		6						6		17:30	22		21						43	
05:45	3	4	7	21					10	25	17:45	22	103	26	74					48	177
06:00	1		12						13		18:00	20		22						42	
06:15	2		9						11		18:15	40		22						62	
06:30	3		11						14		18:30	28		11						39	
06:45	6	12	19	51					25	63	18:45	26	114	12	67					38	181
07:00	9		26						35		19:00	19		13						32	
07:15	20		49						69		19:15	14		7						21	
07:30	79		111						190		19:30	14		9						23	
07:45	117	225	116	302					233	527	19:45	9	56	2	31					11	87
08:00	113		105						218		20:00	9		7						16	
08:15	51		20						71		20:15	13		5						18	
08:30	15		14						29		20:30	12		14						26	
08:45	6	185	11	150					17	335	20:45	11	45	8	34					19	79
09:00	4		13						17		21:00	7		8						15	
09:15	9		12						21		21:15	9		3						12	
09:30	8		12						20		21:30	9		4						13	
09:45	8	29	7	44					15	73	21:45	6	31	3	18					9	49
10:00	12		13						25		22:00	2		2						4	
10:15	8		10						18		22:15	4		0						4	
10:30	3		8						11		22:30	2		1						3	
10:45	4	27	11	42					15	69	22:45	2	10	3	6					5	16
11:00	14		15						29		23:00	1		5						6	
11:15	6		18						24		23:15	0		2						2	
11:30	13		18						31		23:30	1		0						1	
11:45	24	57	10	61					34	118	23:45	2	4	4	11					6	15
TOTALS		546		676						1222	TOTALS		841		688						1529
SPLIT %		44.7%		55.3%						44.4%	SPLIT %		55.0%		45.0%						55.6%

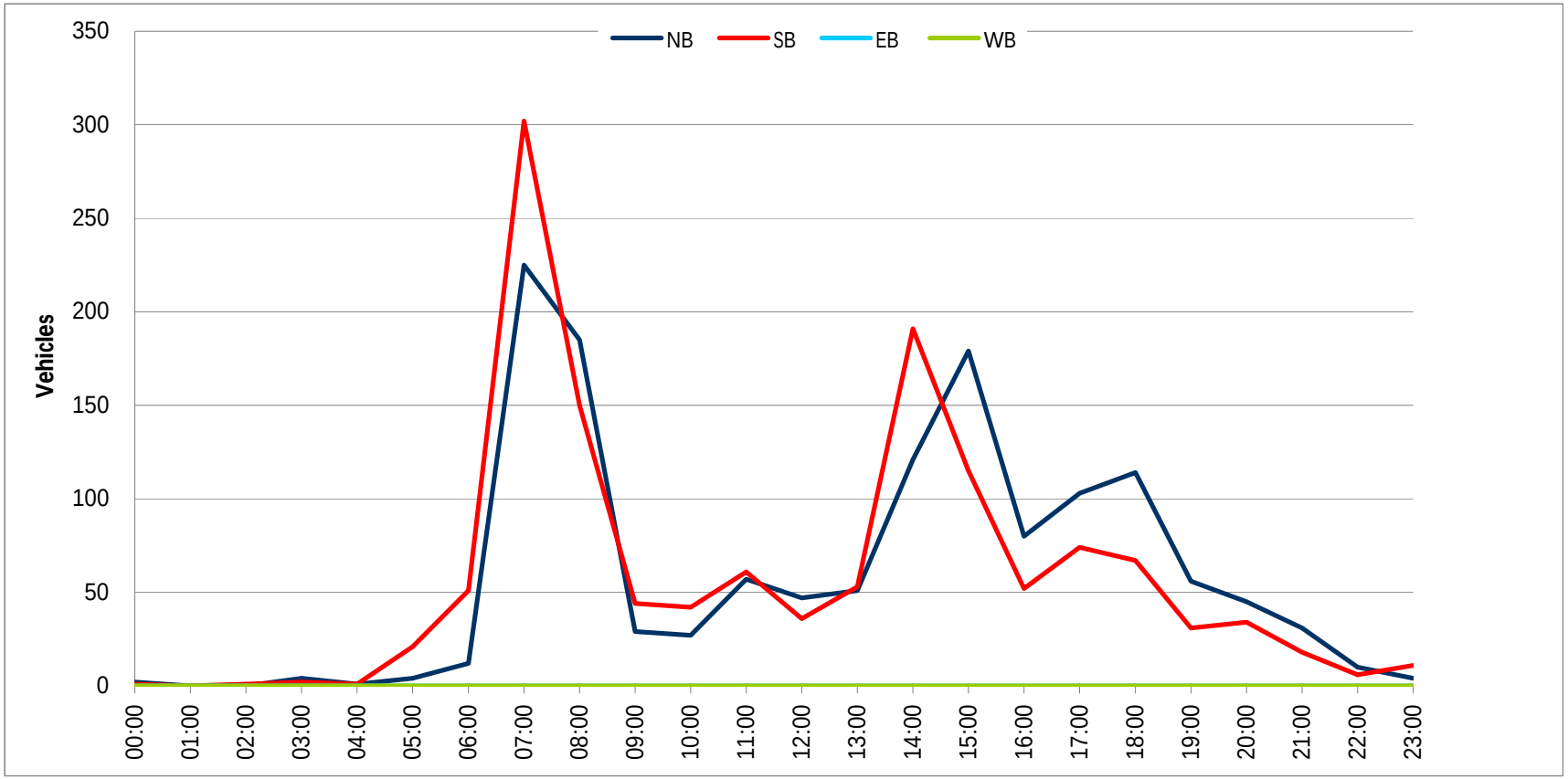
DAILY TOTALS	NB	SB	EB	WB	Total
	1,387	1,364	0	0	2,751

AM Peak Hour	07:30	07:15			07:30	PM Peak Hour	14:30	14:00			14:30
AM Pk Volume	360	381			712	PM Pk Volume	179	191			338
Pk Hr Factor	0.769	0.821			0.764	Pk Hr Factor	0.476	0.809			0.621
7 - 9 Volume	410	452	0	0	862	4 - 6 Volume	183	126	0	0	309
7 - 9 Peak Hour	07:30	07:15			07:30	4 - 6 Peak Hour	16:45	17:00			17:00
7 - 9 Pk Volume	360	381	0	0	712	4 - 6 Pk Volume	105	74	0	0	177
Pk Hr Factor	0.769	0.821	0.000	0.000	0.764	Pk Hr Factor	0.795	0.712	0.000	0.000	0.922

Prepared by NDS/ATD

Project #: CA12_6151_013 **City:** Chino Hills

Location: Calle San Marcos from Grand Ave to **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Canon Ln from Carbon Canyon Rd to Highland Pass Rd

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_014

DAILY TOTALS	NB	SB	EB	WB	Total
	414	387	0	0	801

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	0		2						2		12:00	10		3						13	
00:15	0		0						0		12:15	3		4						7	
00:30	0		0						0		12:30	12		4						16	
00:45	1	1	0	2					1	3	12:45	5	30	8	19					13	49
01:00	0		1						1		13:00	7		11						18	
01:15	0		0						0		13:15	6		10						16	
01:30	1		0						1		13:30	7		11						18	
01:45	0	1	0	1					0	2	13:45	4	24	9	41					13	65
02:00	1		1						2		14:00	5		10						15	
02:15	0		0						0		14:15	5		11						16	
02:30	0		0						0		14:30	13		3						16	
02:45	1	2	0	1					1	3	14:45	6	29	8	32					14	61
03:00	0		0						0		15:00	6		13						19	
03:15	0		0						0		15:15	7		3						10	
03:30	0		0						0		15:30	13		7						20	
03:45	0		0						0		15:45	6	32	6	29					12	61
04:00	0		0						0		16:00	4		9						13	
04:15	0		1						1		16:15	7		6						13	
04:30	0		0						0		16:30	5		5						10	
04:45	1	1	0	1					1	2	16:45	6	22	6	26					12	48
05:00	0		2						2		17:00	8		2						10	
05:15	0		4						4		17:15	9		4						13	
05:30	0		5						5		17:30	7		3						10	
05:45	2	2	0	11					2	13	17:45	6	30	4	13					10	43
06:00	7		0						7		18:00	5		3						8	
06:15	7		8						15		18:15	5		4						9	
06:30	3		10						13		18:30	4		4						8	
06:45	4	21	13	31					17	52	18:45	9	23	2	13					11	36
07:00	3		6						9		19:00	7		2						9	
07:15	5		11						16		19:15	6		1						7	
07:30	10		4						14		19:30	6		3						9	
07:45	9	27	8	29					17	56	19:45	7	26	0	6					7	32
08:00	3		7						10		20:00	6		2						8	
08:15	11		15						26		20:15	6		1						7	
08:30	4		9						13		20:30	3		1						4	
08:45	7	25	11	42					18	67	20:45	1	16	1	5					2	21
09:00	8		5						13		21:00	7		1						8	
09:15	6		7						13		21:15	8		2						10	
09:30	7		9						16		21:30	4		1						5	
09:45	4	25	4	25					8	50	21:45	1	20	0	4					1	24
10:00	6		11						17		22:00	0		0						0	
10:15	8		3						11		22:15	3		0						3	
10:30	4		8						12		22:30	1		2						3	
10:45	6	24	2	24					8	48	22:45	0	4	0	2					0	6
11:00	5		4						9		23:00	0		0						0	
11:15	5		4						9		23:15	1		1						2	
11:30	7		13						20		23:30	2		0						2	
11:45	5	22	8	29					13	51	23:45	4	7	0	1					4	8
TOTALS		151		196						347	TOTALS		263		191						454
SPLIT %		43.5%		56.5%						43.3%	SPLIT %		57.9%		42.1%						56.7%

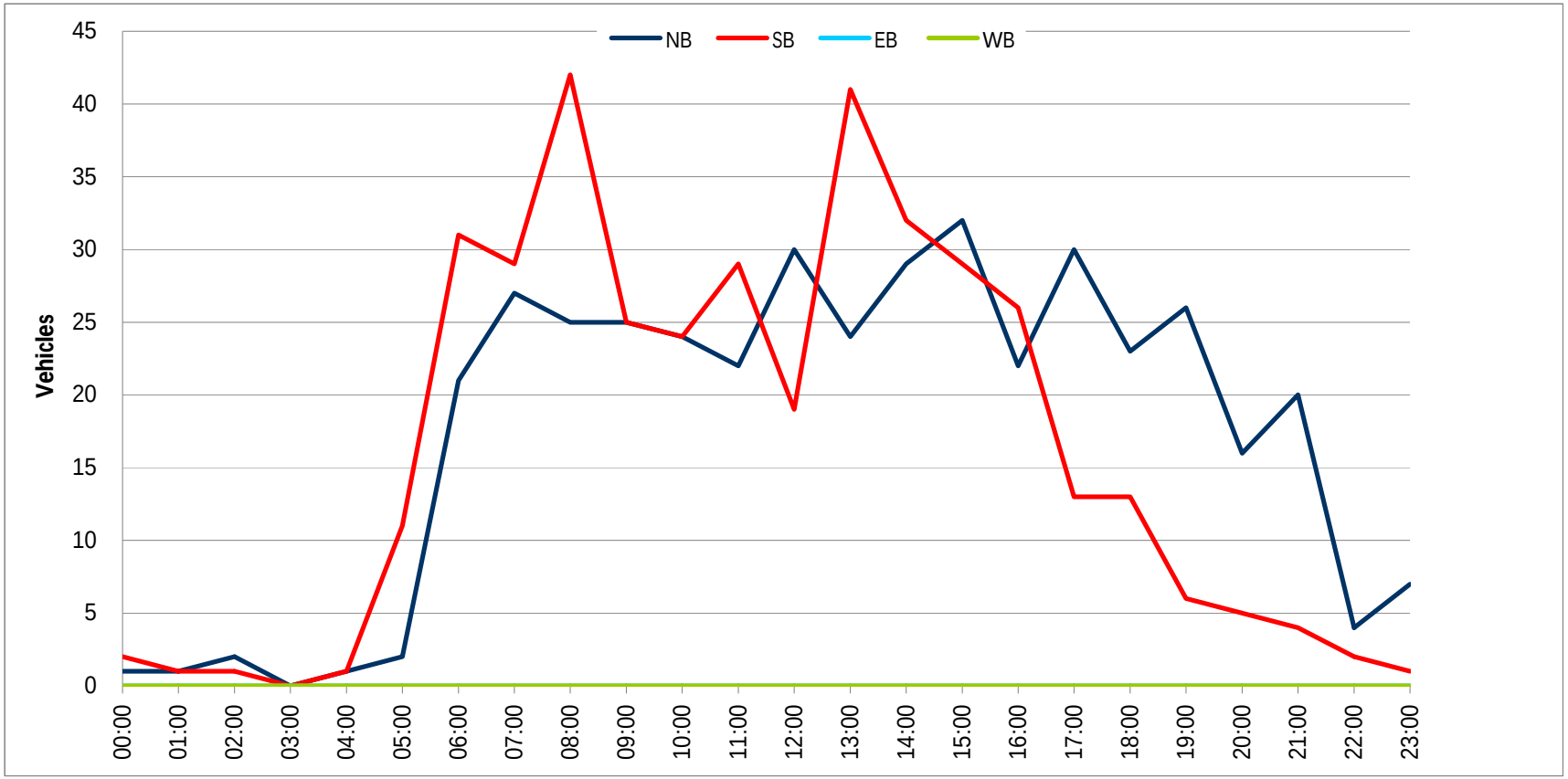
DAILY TOTALS	NB	SB	EB	WB	Total
	414	387	0	0	801

AM Peak Hour	07:30	08:00			08:15	PM Peak Hour	14:30	13:00			12:45
AM Pk Volume	33	42			70	PM Pk Volume	32	41			65
Pk Hr Factor	0.750	0.700			0.673	Pk Hr Factor	0.615	0.932			0.903
7 - 9 Volume	52	71	0	0	123	4 - 6 Volume	52	39	0	0	91
7 - 9 Peak Hour	07:30	08:00			07:30	4 - 6 Peak Hour	16:45	16:00			16:00
7 - 9 Pk Volume	33	42	0	0	67	4 - 6 Pk Volume	30	26	0	0	48
Pk Hr Factor	0.750	0.700	0.000	0.000	0.644	Pk Hr Factor	0.833	0.722	0.000	0.000	0.923

Prepared by NDS/ATD

Project #: CA12_6151_014 **City:** Chino Hills

Location: Canon Ln from Carbon Canyon Rd to **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Carriage Hills Ln from Carbon Canyon Rd to Old Carbon Rd

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_015

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	26	43	69

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			0		0		0		12:00			2		1		3	
00:15			1		0		1		12:15			1		3		4	
00:30			0		0		0		12:30			1		2		3	
00:45			0	1	0		0	1	12:45			0	4	1	7	1	11
01:00			0		1		1		13:00			1		1		2	
01:15			0		1		1		13:15			0		1		1	
01:30			0		2		2		13:30			0		0		0	
01:45			1	1	0	4	1	5	13:45			1	2	1	3	2	5
02:00			0		0		0		14:00			0		1		1	
02:15			0		0		0		14:15			1		0		1	
02:30			0		0		0		14:30			0		0		0	
02:45			0		0		0		14:45			1	2	1	2	2	4
03:00			0		0		0		15:00			0		2		2	
03:15			0		0		0		15:15			1		3		4	
03:30			0		0		0		15:30			1		3		4	
03:45			1	1	0		1	1	15:45			0	2	0	8	0	10
04:00			0		0		0		16:00			0		1		1	
04:15			0		0		0		16:15			0		0		0	
04:30			0		0		0		16:30			0		0		0	
04:45			0		0		0		16:45			1	1	0	1	1	2
05:00			0		0		0		17:00			0		3		3	
05:15			0		1		1		17:15			0		1		1	
05:30			0		0		0		17:30			1		1		2	
05:45			0		0	1	0	1	17:45			1	2	0	5	1	7
06:00			0		0		0		18:00			0		1		1	
06:15			0		0		0		18:15			0		0		0	
06:30			0		0		0		18:30			1		0		1	
06:45			0		0		0		18:45			0	1	0	1	0	2
07:00			0		0		0		19:00			0		0		0	
07:15			0		0		0		19:15			0		0		0	
07:30			0		0		0		19:30			0		0		0	
07:45			0		1	1	1	1	19:45			0		0		0	
08:00			0		0		0		20:00			0		1		1	
08:15			0		1		1		20:15			0		0		0	
08:30			1		0		1		20:30			1		0		1	
08:45			0	1	1	2	1	3	20:45			0	1	0	1	0	2
09:00			0		0		0		21:00			1		0		1	
09:15			0		0		0		21:15			1		1		2	
09:30			1		1		2		21:30			0		0		0	
09:45			0	1	0	1	0	2	21:45			0	2	0	1	0	3
10:00			0		1		1		22:00			0		0		0	
10:15			0		0		0		22:15			2		0		2	
10:30			1		0		1		22:30			0		1		1	
10:45			0	1	1	2	1	3	22:45			0	2	0	1	0	3
11:00			0		1		1		23:00			0		0		0	
11:15			0		1		1		23:15			0		0		0	
11:30			1		0		1		23:30			0		0		0	
11:45			0	1	0	2	0	3	23:45			0		0		0	
TOTALS				7		13		20	TOTALS				19		30		49
SPLIT %				35.0%		65.0%		29.0%	SPLIT %				38.8%		61.2%		71.0%

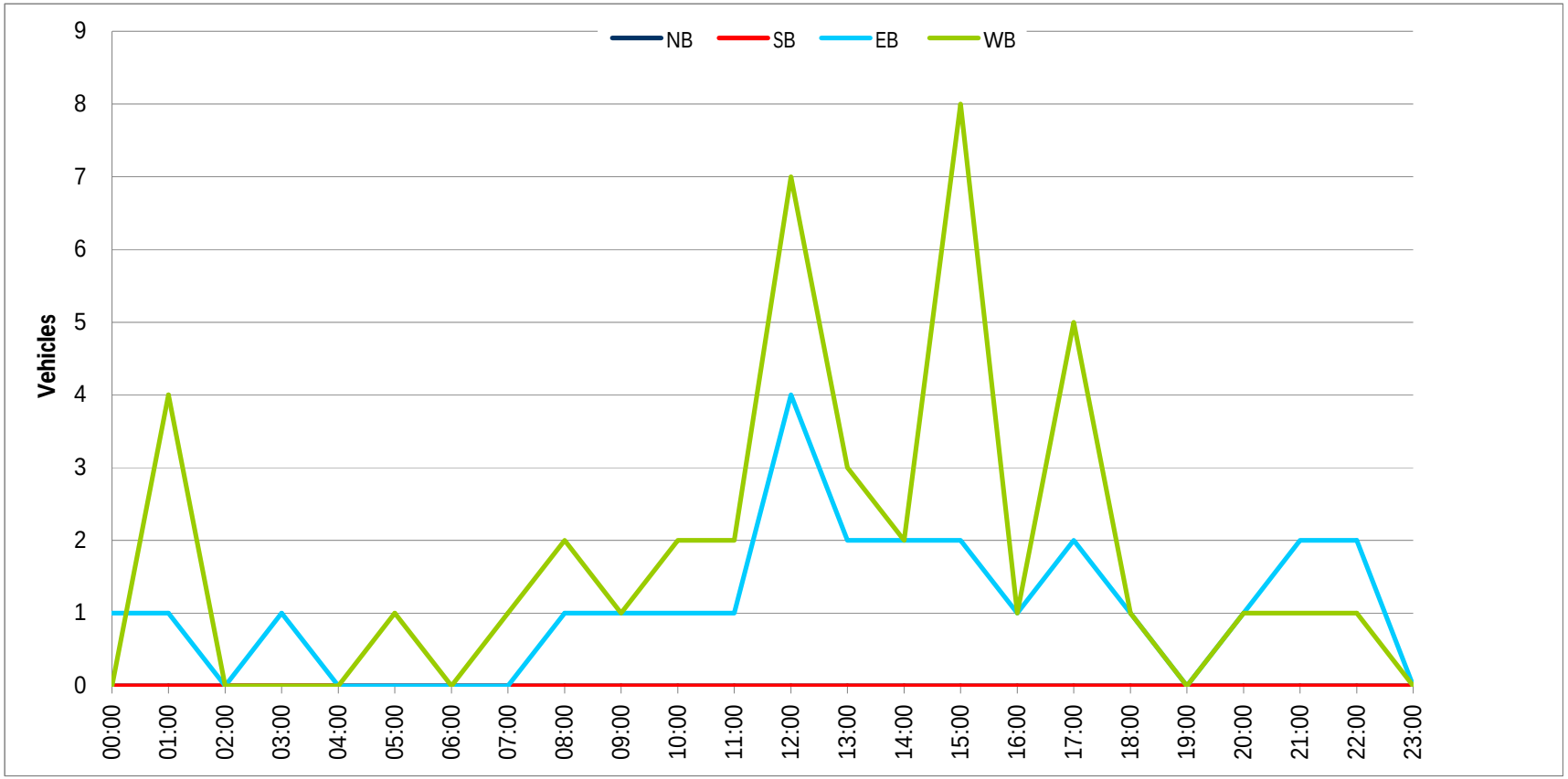
DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	26	43	69

AM Peak Hour			11:30	11:45	11:45	PM Peak Hour			12:00	14:45	14:45
AM Pk Volume			4	6	10	PM Pk Volume			4	9	12
Pk Hr Factor			0.500	0.500	0.625	Pk Hr Factor			0.500	0.750	0.750
7 - 9 Volume	0	0	1	3	4	4 - 6 Volume	0	0	3	6	9
7 - 9 Peak Hour			07:45	07:30	07:45	4 - 6 Peak Hour			16:45	16:45	16:45
7 - 9 Pk Volume	0	0	1	2	3	4 - 6 Pk Volume	0	0	2	5	7
Pk Hr Factor	0.000	0.000	0.250	0.500	0.750	Pk Hr Factor	0.000	0.000	0.500	0.417	0.583

Prepared by NDS/ATD

Project #: CA12_6151_015 **City:** Chino Hills

Location: Carriage Hills Ln from Carbon Canyon Rd to **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Central Ave from City limits (East) to SR-71

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_016

DAILY TOTALS	NB	SB	EB	WB	Total
	9,925	10,168	0	0	20,093

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	19		14						33		12:00	176		150						326	
00:15	16		11						27		12:15	159		172						331	
00:30	17		5						22		12:30	193		170						363	
00:45	4	56	10	40					14	96	12:45	174	702	153	645					327	1347
01:00	5		4						9		13:00	151		172						323	
01:15	10		5						15		13:15	137		163						300	
01:30	5		11						16		13:30	206		161						367	
01:45	2	22	7	27					9	49	13:45	197	691	164	660					361	1351
02:00	7		4						11		14:00	193		153						346	
02:15	8		8						16		14:15	177		152						329	
02:30	7		8						15		14:30	227		142						369	
02:45	7	29	11	31					18	60	14:45	213	810	188	635					401	1445
03:00	8		14						22		15:00	185		158						343	
03:15	7		8						15		15:15	168		170						338	
03:30	8		29						37		15:30	246		187						433	
03:45	9	32	25	76					34	108	15:45	192	791	171	686					363	1477
04:00	6		23						29		16:00	200		153						353	
04:15	12		37						49		16:15	183		162						345	
04:30	15		89						104		16:30	207		167						374	
04:45	29	62	122	271					151	333	16:45	214	804	173	655					387	1459
05:00	19		62						81		17:00	222		180						402	
05:15	19		94						113		17:15	223		203						426	
05:30	31		150						181		17:30	192		164						356	
05:45	45	114	206	512					251	626	17:45	143	780	152	699					295	1479
06:00	74		137						211		18:00	176		138						314	
06:15	68		138						206		18:15	148		101						249	
06:30	86		183						269		18:30	135		128						263	
06:45	120	348	225	683					345	1031	18:45	143	602	127	494					270	1096
07:00	99		149						248		19:00	130		104						234	
07:15	176		177						353		19:15	126		81						207	
07:30	143		195						338		19:30	95		107						202	
07:45	169	587	256	777					425	1364	19:45	82	433	76	368					158	801
08:00	122		181						303		20:00	103		69						172	
08:15	128		162						290		20:15	72		69						141	
08:30	117		153						270		20:30	69		57						126	
08:45	130	497	148	644					278	1141	20:45	55	299	46	241					101	540
09:00	154		140						294		21:00	69		35						104	
09:15	124		141						265		21:15	62		39						101	
09:30	139		133						272		21:30	43		53						96	
09:45	139	556	138	552					277	1108	21:45	53	227	54	181					107	408
10:00	123		122						245		22:00	78		19						97	
10:15	121		119						240		22:15	58		25						83	
10:30	143		147						290		22:30	53		30						83	
10:45	155	542	153	541					308	1083	22:45	39	228	12	86					51	314
11:00	160		142						302		23:00	26		12						38	
11:15	158		161						319		23:15	25		14						39	
11:30	157		136						293		23:30	21		23						44	
11:45	145	620	159	598					304	1218	23:45	21	93	17	66					38	159
TOTALS		3465		4752						8217	TOTALS		6460		5416						11876
SPLIT %		42.2%		57.8%						40.9%	SPLIT %		54.4%		45.6%						59.1%

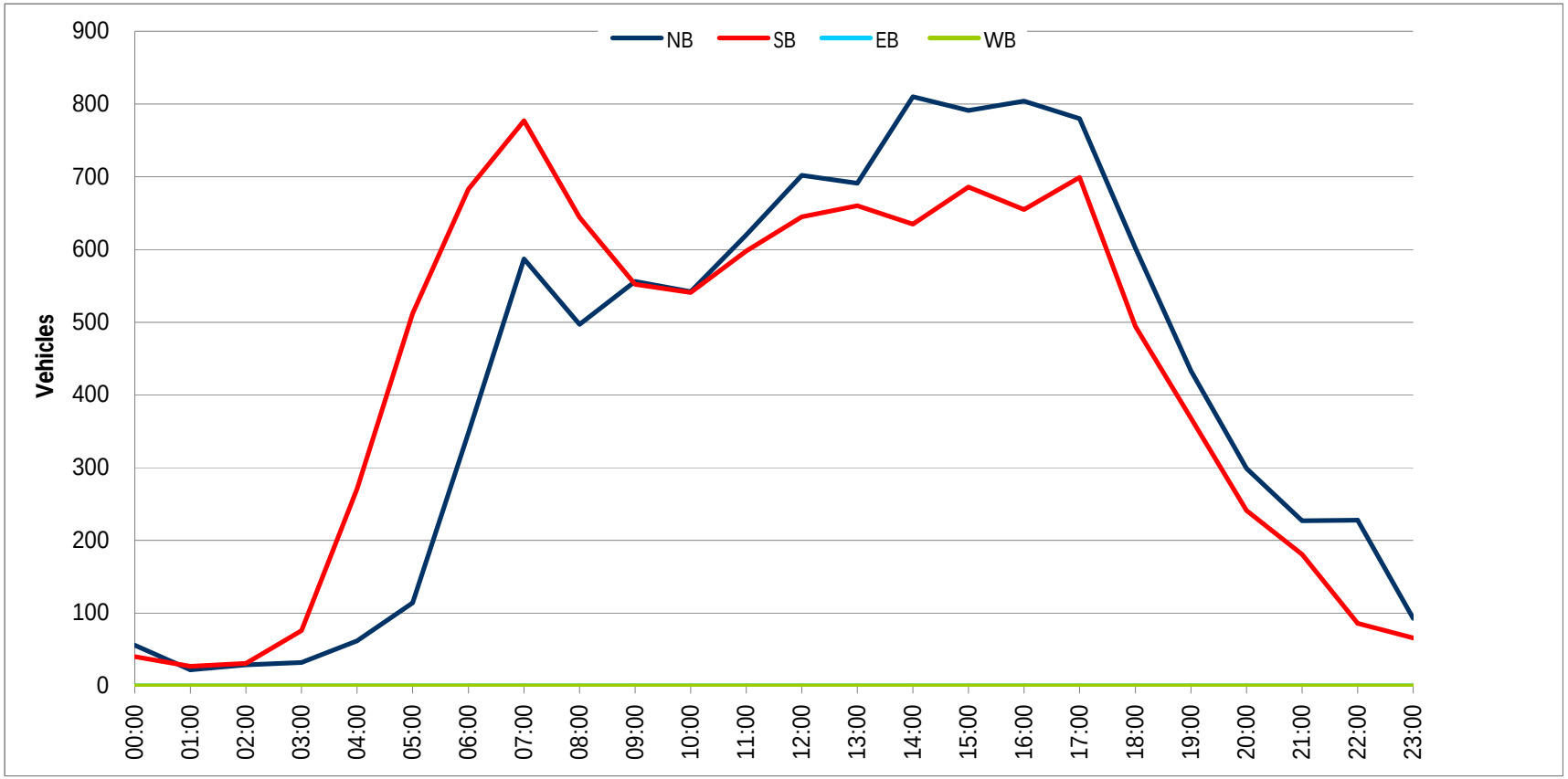
DAILY TOTALS	NB	SB	EB	WB	Total
	9,925	10,168	0	0	20,093

AM Peak Hour	11:45	07:15			07:15	PM Peak Hour	16:30	16:30			16:30
AM Pk Volume	673	809			1419	PM Pk Volume	866	723			1589
Pk Hr Factor	0.872	0.790			0.835	Pk Hr Factor	0.971	0.890			0.933
7 - 9 Volume	1084	1421	0	0	2505	4 - 6 Volume	1584	1354	0	0	2938
7 - 9 Peak Hour	07:15	07:15			07:15	4 - 6 Peak Hour	16:30	16:30			16:30
7 - 9 Pk Volume	610	809	0	0	1419	4 - 6 Pk Volume	866	723	0	0	1589
Pk Hr Factor	0.866	0.790	0.000	0.000	0.835	Pk Hr Factor	0.971	0.890	0.000	0.000	0.933

Prepared by NDS/ATD

Project #: CA12_6151_016 **City:** Chino Hills

Location: Central Ave from City limits (East) to SR-71 **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Chino Ave from City limits (west) to Rock Springs Dr

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_017

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	2,983	2,683	5,666

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			12		6		18		12:00			28		37		65	
00:15			9		3		12		12:15			41		28		69	
00:30			4		2		6		12:30			25		39		64	
00:45			10	35	3	14	13	49	12:45			34	128	35	139	69	267
01:00			2		2		4		13:00			45		29		74	
01:15			3		1		4		13:15			36		23		59	
01:30			1		4		5		13:30			32		31		63	
01:45			1	7	1	8	2	15	13:45			38	151	27	110	65	261
02:00			2		1		3		14:00			44		32		76	
02:15			4		4		8		14:15			46		38		84	
02:30			3		0		3		14:30			48		41		89	
02:45			4	13	4	9	8	22	14:45			44	182	39	150	83	332
03:00			1		0		1		15:00			85		46		131	
03:15			3		3		6		15:15			68		35		103	
03:30			2		3		5		15:30			68		25		93	
03:45			1	7	4	10	5	17	15:45			64	285	31	137	95	422
04:00			2		8		10		16:00			63		34		97	
04:15			3		11		14		16:15			66		37		103	
04:30			4		12		16		16:30			72		43		115	
04:45			1	10	16	47	17	57	16:45			75	276	32	146	107	422
05:00			4		29		33		17:00			78		32		110	
05:15			0		24		24		17:15			98		42		140	
05:30			3		38		41		17:30			101		37		138	
05:45			1	8	45	136	46	144	17:45			96	373	29	140	125	513
06:00			9		48		57		18:00			107		36		143	
06:15			5		47		52		18:15			87		45		132	
06:30			5		51		56		18:30			90		40		130	
06:45			6	25	78	224	84	249	18:45			66	350	27	148	93	498
07:00			22		98		120		19:00			70		27		97	
07:15			21		70		91		19:15			47		22		69	
07:30			18		94		112		19:30			51		23		74	
07:45			31	92	88	350	119	442	19:45			42	210	13	85	55	295
08:00			31		91		122		20:00			62		17		79	
08:15			23		59		82		20:15			34		24		58	
08:30			18		54		72		20:30			38		19		57	
08:45			28	100	57	261	85	361	20:45			55	189	19	79	74	268
09:00			15		43		58		21:00			25		11		36	
09:15			24		51		75		21:15			19		14		33	
09:30			19		34		53		21:30			32		10		42	
09:45			24	82	46	174	70	256	21:45			30	106	6	41	36	147
10:00			24		36		60		22:00			27		9		36	
10:15			19		27		46		22:15			23		8		31	
10:30			14		30		44		22:30			19		2		21	
10:45			36	93	29	122	65	215	22:45			19	88	4	23	23	111
11:00			23		24		47		23:00			9		2		11	
11:15			28		39		67		23:15			17		2		19	
11:30			34		24		58		23:30			19		2		21	
11:45			25	110	32	119	57	229	23:45			18	63	5	11	23	74
TOTALS				582		1474		2056	TOTALS				2401		1209		3610
SPLIT %				28.3%		71.7%		36.3%	SPLIT %				66.5%		33.5%		63.7%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	2,983	2,683	5,666

AM Peak Hour			11:30	07:00	07:15	PM Peak Hour			17:15	14:15	17:15
AM Pk Volume			128	350	444	PM Pk Volume			402	164	546
Pk Hr Factor			0.780	0.893	0.910	Pk Hr Factor			0.939	0.891	0.955
7 - 9 Volume	0	0	192	611	803	4 - 6 Volume	0	0	649	286	935
7 - 9 Peak Hour			07:30	07:00	07:15	4 - 6 Peak Hour			17:00	16:30	17:00
7 - 9 Pk Volume	0	0	103	350	444	4 - 6 Pk Volume	0	0	373	149	513
Pk Hr Factor	0.000	0.000	0.831	0.893	0.910	Pk Hr Factor	0.000	0.000	0.923	0.866	0.916

Prepared by NDS/ATD

Project #: CA12_6151_017 **City:** Chino Hills

Location: Chino Ave from City limits (west) to Rock **Date:** 11/27/2012

Prepared by NDS/ATD

VOLUME

Chino Ave from Rock Springs Dr to Eagle Canyon Dr

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_018

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	2,403	2,530	4,933

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			4		5		9		12:00			34		29		63	
00:15			3		9		12		12:15			33		31		64	
00:30			1		3		4		12:30			26		46		72	
00:45			4	12	2	19	6	31	12:45			29	122	35	141	64	263
01:00			2		1		3		13:00			44		25		69	
01:15			2		1		3		13:15			35		28		63	
01:30			0		5		5		13:30			29		29		58	
01:45			2	6	2	9	4	15	13:45			39	147	32	114	71	261
02:00			0		0		0		14:00			49		36		85	
02:15			3		4		7		14:15			41		37		78	
02:30			1		2		3		14:30			34		43		77	
02:45			2	6	7	13	9	19	14:45			47	171	43	159	90	330
03:00			0		1		1		15:00			63		74		137	
03:15			1		2		3		15:15			58		41		99	
03:30			0		1		1		15:30			49		33		82	
03:45			0	1	1	5	1	6	15:45			43	213	28	176	71	389
04:00			1		6		7		16:00			34		45		79	
04:15			3		5		8		16:15			47		46		93	
04:30			3		6		9		16:30			47		44		91	
04:45			4	11	5	22	9	33	16:45			52	180	47	182	99	362
05:00			5		11		16		17:00			49		49		98	
05:15			0		9		9		17:15			61		38		99	
05:30			4		23		27		17:30			76		47		123	
05:45			12	21	31	74	43	95	17:45			75	261	42	176	117	437
06:00			17		27		44		18:00			51		43		94	
06:15			13		34		47		18:15			57		50		107	
06:30			9		27		36		18:30			50		55		105	
06:45			22	61	51	139	73	200	18:45			47	205	36	184	83	389
07:00			38		58		96		19:00			40		33		73	
07:15			21		48		69		19:15			23		21		44	
07:30			31		64		95		19:30			33		30		63	
07:45			56	146	73	243	129	389	19:45			36	132	24	108	60	240
08:00			56		69		125		20:00			37		28		65	
08:15			24		47		71		20:15			19		36		55	
08:30			19		44		63		20:30			25		21		46	
08:45			29	128	33	193	62	321	20:45			27	108	18	103	45	211
09:00			23		33		56		21:00			17		16		33	
09:15			28		36		64		21:15			17		20		37	
09:30			18		17		35		21:30			19		16		35	
09:45			30	99	33	119	63	218	21:45			16	69	17	69	33	138
10:00			25		28		53		22:00			13		10		23	
10:15			32		24		56		22:15			9		12		21	
10:30			27		31		58		22:30			8		4		12	
10:45			28	112	21	104	49	216	22:45			8	38	10	36	18	74
11:00			27		26		53		23:00			6		8		14	
11:15			37		39		76		23:15			11		3		14	
11:30			30		21		51		23:30			8		4		12	
11:45			30	124	33	119	63	243	23:45			5	30	8	23	13	53
TOTALS				727		1059		1786	TOTALS				1676		1471		3147
SPLIT %				40.7%		59.3%		36.2%	SPLIT %				53.3%		46.7%		63.8%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	2,403	2,530	4,933

AM Peak Hour			07:30	07:15	07:30	PM Peak Hour			17:15	14:30	17:30
AM Pk Volume			167	254	420	PM Pk Volume			263	201	441
Pk Hr Factor			0.746	0.870	0.814	Pk Hr Factor			0.865	0.679	0.896
7 - 9 Volume	0	0	274	436	710	4 - 6 Volume	0	0	441	358	799
7 - 9 Peak Hour			07:30	07:15	07:30	4 - 6 Peak Hour			17:00	16:15	17:00
7 - 9 Pk Volume	0	0	167	254	420	4 - 6 Pk Volume	0	0	261	186	437
Pk Hr Factor	0.000	0.000	0.746	0.870	0.814	Pk Hr Factor	0.000	0.000	0.859	0.949	0.888

Prepared by NDS/ATD

Project #: CA12_6151_018 **City:** Chino Hills

Location: Chino Ave from Rock Springs Dr to Eagle **Date:** 11/27/2012

Prepared by NDS/ATD

VOLUME

Chino Ave from Eagle Canyon Dr to Peyton Dr

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_019

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	4,732	4,831	9,563

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			2		8		10		12:00			62		51		113	
00:15			4		5		9		12:15			54		53		107	
00:30			3		12		15		12:30			62		72		134	
00:45			2	11	3	28	5	39	12:45			53	231	77	253	130	484
01:00			1		6		7		13:00			73		50		123	
01:15			4		4		8		13:15			61		64		125	
01:30			1		5		6		13:30			50		57		107	
01:45			4	10	1	16	5	26	13:45			71	255	89	260	160	515
02:00			0		2		2		14:00			90		101		191	
02:15			3		4		7		14:15			81		115		196	
02:30			2		3		5		14:30			58		156		214	
02:45			3	8	1	10	4	18	14:45			89	318	160	532	249	850
03:00			0		0		0		15:00			225		155		380	
03:15			1		1		2		15:15			134		83		217	
03:30			3		0		3		15:30			95		73		168	
03:45			6	10	1	2	7	12	15:45			77	531	77	388	154	919
04:00			5		3		8		16:00			64		81		145	
04:15			5		0		5		16:15			82		81		163	
04:30			12		1		13		16:30			68		79		147	
04:45			11	33	1	5	12	38	16:45			83	297	92	333	175	630
05:00			18		4		22		17:00			87		89		176	
05:15			10		7		17		17:15			88		97		185	
05:30			18		12		30		17:30			98		103		201	
05:45			25	71	19	42	44	113	17:45			82	355	91	380	173	735
06:00			41		27		68		18:00			74		89		163	
06:15			42		29		71		18:15			77		94		171	
06:30			44		34		78		18:30			76		94		170	
06:45			72	199	49	139	121	338	18:45			60	287	76	353	136	640
07:00			110		63		173		19:00			48		65		113	
07:15			78		80		158		19:15			45		67		112	
07:30			84		133		217		19:30			39		71		110	
07:45			179	451	166	442	345	893	19:45			43	175	67	270	110	445
08:00			205		173		378		20:00			47		69		116	
08:15			144		47		191		20:15			26		58		84	
08:30			67		56		123		20:30			32		49		81	
08:45			75	491	47	323	122	814	20:45			33	138	43	219	76	357
09:00			59		33		92		21:00			18		49		67	
09:15			63		47		110		21:15			20		37		57	
09:30			41		63		104		21:30			19		32		51	
09:45			86	249	41	184	127	433	21:45			17	74	28	146	45	220
10:00			53		44		97		22:00			8		22		30	
10:15			63		40		103		22:15			7		24		31	
10:30			51		45		96		22:30			10		23		33	
10:45			56	223	41	170	97	393	22:45			10	35	12	81	22	116
11:00			46		50		96		23:00			4		17		21	
11:15			65		71		136		23:15			11		6		17	
11:30			75		47		122		23:30			7		7		14	
11:45			66	252	47	215	113	467	23:45			6	28	10	40	16	68
TOTALS				2008		1576		3584	TOTALS				2724		3255		5979
SPLIT %				56.0%		44.0%		37.5%	SPLIT %				45.6%		54.4%		62.5%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	4,732	4,831	9,563

AM Peak Hour			07:30	07:15	07:30	PM Peak Hour			14:45	14:15	14:30
AM Pk Volume			612	552	1131	PM Pk Volume			543	586	1060
Pk Hr Factor			0.746	0.798	0.748	Pk Hr Factor			0.603	0.916	0.697
7 - 9 Volume	0	0	942	765	1707	4 - 6 Volume	0	0	652	713	1365
7 - 9 Peak Hour			07:30	07:15	07:30	4 - 6 Peak Hour			16:45	16:45	16:45
7 - 9 Pk Volume	0	0	612	552	1131	4 - 6 Pk Volume	0	0	356	381	737
Pk Hr Factor	0.000	0.000	0.746	0.798	0.748	Pk Hr Factor	0.000	0.000	0.908	0.925	0.917

Prepared by NDS/ATD

Project #: CA12_6151_019 **City:** Chino Hills

Location: Chino Ave from Eagle Canyon Dr to Peyton **Date:** 11/27/2012

Prepared by NDS/ATD

VOLUME

Chino Ave from Peyton Dr to Emerald Way

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_020

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	8,453	8,987	17,440

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			5		9		14		12:00			127		157		284	
00:15			4		20		24		12:15			144		154		298	
00:30			0		18		18		12:30			117		163		280	
00:45			3	12	7	54	10	66	12:45			118	506	173	647	291	1153
01:00			4		4		8		13:00			116		159		275	
01:15			1		7		8		13:15			120		168		288	
01:30			8		6		14		13:30			138		133		271	
01:45			4	17	3	20	7	37	13:45			133	507	189	649	322	1156
02:00			2		5		7		14:00			154		158		312	
02:15			3		1		4		14:15			144		169		313	
02:30			3		3		6		14:30			150		186		336	
02:45			3	11	0	9	3	20	14:45			141	589	200	713	341	1302
03:00			2		2		4		15:00			206		175		381	
03:15			1		1		2		15:15			188		150		338	
03:30			7		3		10		15:30			151		173		324	
03:45			13	23	5	11	18	34	15:45			160	705	134	632	294	1337
04:00			13		6		19		16:00			149		177		326	
04:15			13		3		16		16:15			165		188		353	
04:30			26		7		33		16:30			163		200		363	
04:45			36	88	10	26	46	114	16:45			194	671	172	737	366	1408
05:00			28		8		36		17:00			156		161		317	
05:15			29		13		42		17:15			183		245		428	
05:30			36		23		59		17:30			199		195		394	
05:45			44	137	34	78	78	215	17:45			185	723	204	805	389	1528
06:00			57		41		98		18:00			180		183		363	
06:15			51		34		85		18:15			185		158		343	
06:30			68		57		125		18:30			151		198		349	
06:45			90	266	88	220	178	486	18:45			138	654	144	683	282	1337
07:00			105		78		183		19:00			141		172		313	
07:15			98		75		173		19:15			99		143		242	
07:30			123		147		270		19:30			95		125		220	
07:45			182	508	162	462	344	970	19:45			81	416	109	549	190	965
08:00			200		134		334		20:00			99		94		193	
08:15			167		110		277		20:15			90		83		173	
08:30			93		95		188		20:30			68		79		147	
08:45			127	587	105	444	232	1031	20:45			68	325	73	329	141	654
09:00			101		85		186		21:00			72		82		154	
09:15			113		110		223		21:15			54		66		120	
09:30			92		106		198		21:30			48		63		111	
09:45			103	409	122	423	225	832	21:45			49	223	25	236	74	459
10:00			100		120		220		22:00			26		43		69	
10:15			111		114		225		22:15			28		37		65	
10:30			113		134		247		22:30			26		43		69	
10:45			116	440	129	497	245	937	22:45			19	99	23	146	42	245
11:00			98		145		243		23:00			17		29		46	
11:15			114		122		236		23:15			14		7		21	
11:30			142		141		283		23:30			16		27		43	
11:45			127	481	138	546	265	1027	23:45			9	56	8	71	17	127
TOTALS				2979		2790		5769	TOTALS				5474		6197		11671
SPLIT %				51.6%		48.4%		33.1%	SPLIT %				46.9%		53.1%		66.9%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	8,453	8,987	17,440

AM Peak Hour			07:30	11:45	07:30	PM Peak Hour			17:30	17:15	17:15
AM Pk Volume			672	612	1225	PM Pk Volume			749	827	1574
Pk Hr Factor			0.840	0.939	0.890	Pk Hr Factor			0.941	0.844	0.919
7 - 9 Volume	0	0	1095	906	2001	4 - 6 Volume	0	0	1394	1542	2936
7 - 9 Peak Hour			07:30	07:30	07:30	4 - 6 Peak Hour			16:45	17:00	17:00
7 - 9 Pk Volume	0	0	672	553	1225	4 - 6 Pk Volume	0	0	732	805	1528
Pk Hr Factor	0.000	0.000	0.840	0.853	0.890	Pk Hr Factor	0.000	0.000	0.920	0.821	0.893

Prepared by NDS/ATD

Project #: CA12_6151_020 **City:** Chino Hills

Location: Chino Ave from Peyton Dr to Emerald Way **Date:** 11/27/2012

Prepared by NDS/ATD

VOLUME

Chino Ave from Emerald Wy to SR-71

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_021

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	9,322	8,997	18,319

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			6		8		14		12:00			125		152		277	
00:15			4		17		21		12:15			154		152		306	
00:30			0		15		15		12:30			152		141		293	
00:45			4	14	10	50	14	64	12:45			122	553	163	608	285	1161
01:00			7		6		13		13:00			129		149		278	
01:15			6		9		15		13:15			142		159		301	
01:30			6		7		13		13:30			139		135		274	
01:45			5	24	3	25	8	49	13:45			143	553	173	616	316	1169
02:00			7		10		17		14:00			167		155		322	
02:15			5		13		18		14:15			159		164		323	
02:30			7		7		14		14:30			155		182		337	
02:45			3	22	2	32	5	54	14:45			156	637	172	673	328	1310
03:00			6		2		8		15:00			223		166		389	
03:15			2		3		5		15:15			172		142		314	
03:30			4		4		8		15:30			175		155		330	
03:45			13	25	4	13	17	38	15:45			174	744	143	606	317	1350
04:00			19		7		26		16:00			160		166		326	
04:15			16		3		19		16:15			194		200		394	
04:30			31		7		38		16:30			194		185		379	
04:45			42	108	10	27	52	135	16:45			215	763	186	737	401	1500
05:00			37		10		47		17:00			167		159		326	
05:15			40		13		53		17:15			208		241		449	
05:30			42		21		63		17:30			223		195		418	
05:45			52	171	34	78	86	249	17:45			195	793	206	801	401	1594
06:00			57		41		98		18:00			206		197		403	
06:15			68		36		104		18:15			171		173		344	
06:30			85		63		148		18:30			173		187		360	
06:45			120	330	106	246	226	576	18:45			144	694	165	722	309	1416
07:00			133		89		222		19:00			138		168		306	
07:15			119		79		198		19:15			122		148		270	
07:30			146		140		286		19:30			85		140		225	
07:45			192	590	164	472	356	1062	19:45			92	437	111	567	203	1004
08:00			190		152		342		20:00			119		102		221	
08:15			184		107		291		20:15			93		92		185	
08:30			113		96		209		20:30			69		75		144	
08:45			134	621	113	468	247	1089	20:45			69	350	71	340	140	690
09:00			126		84		210		21:00			83		81		164	
09:15			118		113		231		21:15			51		87		138	
09:30			100		109		209		21:30			46		46		92	
09:45			118	462	127	433	245	895	21:45			53	233	35	249	88	482
10:00			113		119		232		22:00			28		49		77	
10:15			137		115		252		22:15			20		40		60	
10:30			123		127		250		22:30			32		48		80	
10:45			127	500	120	481	247	981	22:45			19	99	30	167	49	266
11:00			121		138		259		23:00			22		24		46	
11:15			115		122		237		23:15			21		10		31	
11:30			128		126		254		23:30			19		23		42	
11:45			163	527	137	523	300	1050	23:45			10	72	6	63	16	135
TOTALS				3394		2848		6242	TOTALS				5928		6149		12077
SPLIT %				54.4%		45.6%		34.1%	SPLIT %				49.1%		50.9%		65.9%

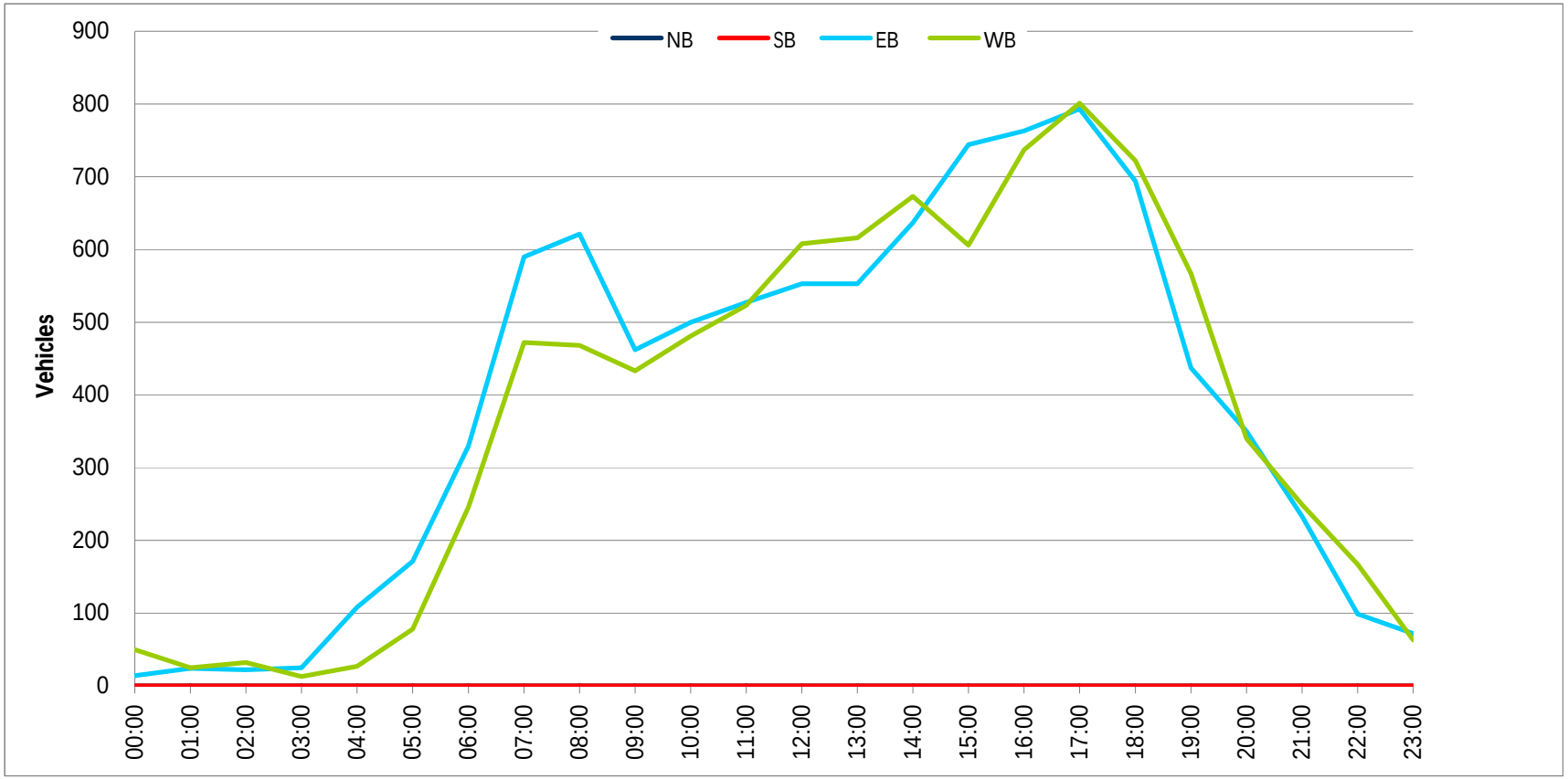
DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	9,322	8,997	18,319

AM Peak Hour			07:30	11:45	07:30	PM Peak Hour			17:15	17:15	17:15
AM Pk Volume			712	582	1275	PM Pk Volume			832	839	1671
Pk Hr Factor			0.927	0.957	0.895	Pk Hr Factor			0.933	0.870	0.930
7 - 9 Volume	0	0	1211	940	2151	4 - 6 Volume	0	0	1556	1538	3094
7 - 9 Peak Hour			07:30	07:30	07:30	4 - 6 Peak Hour			16:45	17:00	16:45
7 - 9 Pk Volume	0	0	712	563	1275	4 - 6 Pk Volume	0	0	813	801	1594
Pk Hr Factor	0.000	0.000	0.927	0.858	0.895	Pk Hr Factor	0.000	0.000	0.911	0.831	0.888

Prepared by NDS/ATD

Project #: CA12_6151_021 **City:** Chino Hills

Location: Chino Ave from Emerald Wy to SR-71 **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Chino Hills Pkwy from City limits (west) to Grand Ave

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_023

DAILY TOTALS	NB	SB	EB	WB	Total
	6,028	4,607	0	0	10,635

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	3		17						20		12:00	82		34						116	
00:15	8		11						19		12:15	68		40						108	
00:30	2		11						13		12:30	61		45						106	
00:45	3	16	14	53					17	69	12:45	63	274	42	161					105	435
01:00	6		9						15		13:00	72		30						102	
01:15	4		5						9		13:15	55		38						93	
01:30	3		5						8		13:30	67		25						92	
01:45	3	16	5	24					8	40	13:45	62	256	23	116					85	372
02:00	1		5						6		14:00	69		27						96	
02:15	1		6						7		14:15	59		35						94	
02:30	1		6						7		14:30	78		54						132	
02:45	1	4	6	23					7	27	14:45	68	274	46	162					114	436
03:00	3		2						5		15:00	108		57						165	
03:15	7		2						9		15:15	79		63						142	
03:30	8		1						9		15:30	89		58						147	
03:45	4	22	1	6					5	28	15:45	84	360	72	250					156	610
04:00	12		1						13		16:00	94		61						155	
04:15	17		3						20		16:15	76		80						156	
04:30	21		5						26		16:30	98		97						195	
04:45	34	84	5	14					39	98	16:45	85	353	123	361					208	714
05:00	53		14						67		17:00	101		155						256	
05:15	49		11						60		17:15	132		144						276	
05:30	58		13						71		17:30	105		139						244	
05:45	51	211	33	71					84	282	17:45	104	442	140	578					244	1020
06:00	62		27						89		18:00	97		144						241	
06:15	83		39						122		18:15	91		139						230	
06:30	102		40						142		18:30	74		149						223	
06:45	138	385	51	157					189	542	18:45	68	330	122	554					190	884
07:00	163		59						222		19:00	63		112						175	
07:15	228		47						275		19:15	66		105						171	
07:30	189		69						258		19:30	59		93						152	
07:45	196	776	83	258					279	1034	19:45	44	232	89	399					133	631
08:00	178		69						247		20:00	37		85						122	
08:15	152		49						201		20:15	42		73						115	
08:30	143		41						184		20:30	30		66						96	
08:45	121	594	56	215					177	809	20:45	38	147	59	283					97	430
09:00	117		38						155		21:00	30		73						103	
09:15	116		44						160		21:15	33		71						104	
09:30	98		39						137		21:30	28		49						77	
09:45	89	420	35	156					124	576	21:45	21	112	57	250					78	362
10:00	99		30						129		22:00	21		38						59	
10:15	73		35						108		22:15	28		45						73	
10:30	89		36						125		22:30	14		28						42	
10:45	71	332	36	137					107	469	22:45	17	80	37	148					54	228
11:00	76		27						103		23:00	7		31						38	
11:15	64		42						106		23:15	5		27						32	
11:30	78		24						102		23:30	4		18						22	
11:45	71	289	35	128					106	417	23:45	3	19	27	103					30	122
TOTALS		3149		1242						4391	TOTALS		2879		3365						6244
SPLIT %		71.7%		28.3%						41.3%	SPLIT %		46.1%		53.9%						58.7%

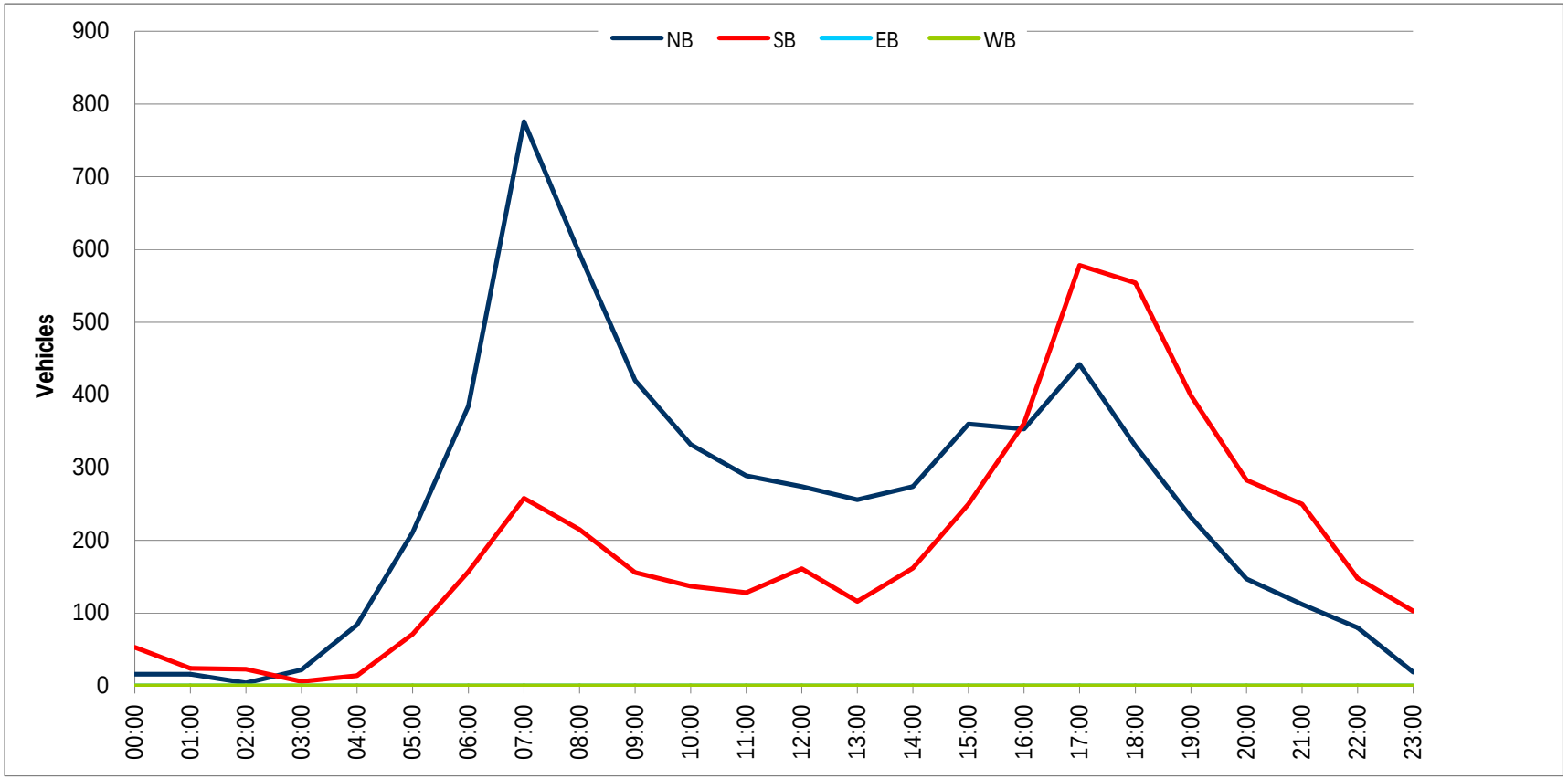
DAILY TOTALS	NB	SB	EB	WB	Total
	6,028	4,607	0	0	10,635

AM Peak Hour	07:15	07:30			07:15	PM Peak Hour	17:00	17:00			17:00
AM Pk Volume	791	270			1059	PM Pk Volume	442	578			1020
Pk Hr Factor	0.867	0.813			0.949	Pk Hr Factor	0.837	0.932			0.924
7 - 9 Volume	1370	473	0	0	1843	4 - 6 Volume	795	939	0	0	1734
7 - 9 Peak Hour	07:15	07:30			07:15	4 - 6 Peak Hour	17:00	17:00			17:00
7 - 9 Pk Volume	791	270	0	0	1059	4 - 6 Pk Volume	442	578	0	0	1020
Pk Hr Factor	0.867	0.813	0.000	0.000	0.949	Pk Hr Factor	0.837	0.932	0.000	0.000	0.924

Prepared by NDS/ATD

Project #: CA12_6151_023 **City:** Chino Hills

Location: Chino Hills Pkwy from City limits (west) to **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Chino Hills Pkwy from Grand Ave to Eucalyptus Ave

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_022

DAILY TOTALS	NB	SB	EB	WB	Total
	10,147	8,702	0	0	18,849

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	19		16						35		12:00	158		104						262	
00:15	8		16						24		12:15	139		105						244	
00:30	7		8						15		12:30	174		97						271	
00:45	8	42	12	52					20	94	12:45	138	609	92	398					230	1007
01:00	9		12						21		13:00	150		109						259	
01:15	7		10						17		13:15	125		111						236	
01:30	5		7						12		13:30	135		110						245	
01:45	7	28	10	39					17	67	13:45	137	547	104	434					241	981
02:00	4		11						15		14:00	121		120						241	
02:15	2		10						12		14:15	143		158						301	
02:30	5		10						15		14:30	208		126						334	
02:45	2	13	6	37					8	50	14:45	199	671	162	566					361	1237
03:00	4		8						12		15:00	178		196						374	
03:15	10		4						14		15:15	165		177						342	
03:30	9		8						17		15:30	145		149						294	
03:45	8	31	3	23					11	54	15:45	155	643	158	680					313	1323
04:00	13		10						23		16:00	133		171						304	
04:15	21		10						31		16:15	141		197						338	
04:30	20		14						34		16:30	174		162						336	
04:45	52	106	17	51					69	157	16:45	171	619	225	755					396	1374
05:00	43		17						60		17:00	196		214						410	
05:15	63		22						85		17:15	196		236						432	
05:30	58		20						78		17:30	182		246						428	
05:45	90	254	39	98					129	352	17:45	182	756	247	943					429	1699
06:00	103		31						134		18:00	192		217						409	
06:15	123		54						177		18:15	152		212						364	
06:30	188		52						240		18:30	168		201						369	
06:45	173	587	88	225					261	812	18:45	143	655	196	826					339	1481
07:00	254		145						399		19:00	156		161						317	
07:15	175		96						271		19:15	123		145						268	
07:30	185		95						280		19:30	93		136						229	
07:45	174	788	103	439					277	1227	19:45	117	489	99	541					216	1030
08:00	160		108						268		20:00	114		110						224	
08:15	204		134						338		20:15	86		90						176	
08:30	223		116						339		20:30	98		92						190	
08:45	236	823	114	472					350	1295	20:45	86	384	78	370					164	754
09:00	190		104						294		21:00	52		88						140	
09:15	174		90						264		21:15	86		82						168	
09:30	150		54						204		21:30	65		75						140	
09:45	122	636	94	342					216	978	21:45	58	261	69	314					127	575
10:00	148		79						227		22:00	35		57						92	
10:15	117		83						200		22:15	34		54						88	
10:30	121		90						211		22:30	45		47						92	
10:45	101	487	101	353					202	840	22:45	33	147	49	207					82	354
11:00	120		96						216		23:00	22		37						59	
11:15	138		85						223		23:15	18		39						57	
11:30	133		112						245		23:30	16		34						50	
11:45	104	495	110	403					214	898	23:45	20	76	24	134					44	210
TOTALS		4290		2534						6824	TOTALS		5857		6168						12025
SPLIT %		62.9%		37.1%						36.2%	SPLIT %		48.7%		51.3%						63.8%

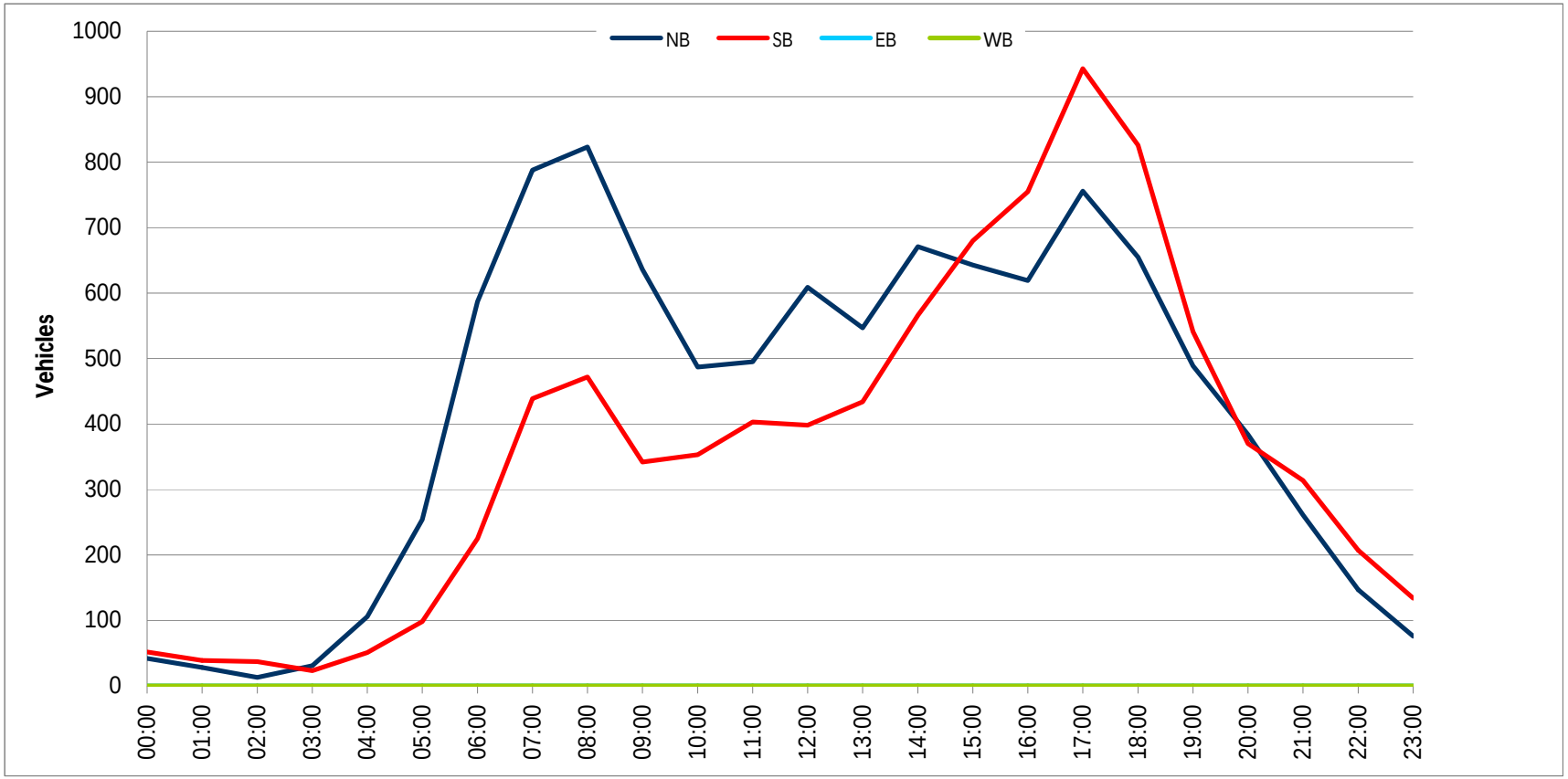
DAILY TOTALS	NB	SB	EB	WB	Total
	10,147	8,702	0	0	18,849

AM Peak Hour	08:15	08:00			08:15	PM Peak Hour	17:00	17:15			17:00
AM Pk Volume	853	472			1321	PM Pk Volume	756	946			1699
Pk Hr Factor	0.904	0.881			0.944	Pk Hr Factor	0.964	0.957			0.983
7 - 9 Volume	1611	911	0	0	2522	4 - 6 Volume	1375	1698	0	0	3073
7 - 9 Peak Hour	08:00	08:00			08:00	4 - 6 Peak Hour	17:00	17:00			17:00
7 - 9 Pk Volume	823	472	0	0	1295	4 - 6 Pk Volume	756	943	0	0	1699
Pk Hr Factor	0.872	0.881	0.000	0.000	0.925	Pk Hr Factor	0.964	0.954	0.000	0.000	0.983

Prepared by NDS/ATD

Project #: CA12_6151_022 **City:** Chino Hills

Location: Chino Hills Pkwy from Grand Ave to **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Chino Hills Pkwy from Eucalyptus Ave to Carbon Canyon Rd

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_024

DAILY TOTALS	NB	SB	EB	WB	Total
	7,955	8,276	0	0	16,231

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	7		12						19		12:00	106		87						193	
00:15	4		7						11		12:15	82		112						194	
00:30	4		6						10		12:30	63		104						167	
00:45	11	26	7	32					18	58	12:45	95	346	81	384					176	730
01:00	9		5						14		13:00	86		102						188	
01:15	8		1						9		13:15	94		108						202	
01:30	1		4						5		13:30	94		105						199	
01:45	4	22	5	15					9	37	13:45	100	374	93	408					193	782
02:00	4		4						8		14:00	92		106						198	
02:15	6		4						10		14:15	109		106						215	
02:30	4		4						8		14:30	124		120						244	
02:45	3	17	5	17					8	34	14:45	147	472	134	466					281	938
03:00	3		2						5		15:00	136		212						348	
03:15	3		2						5		15:15	116		183						299	
03:30	8		4						12		15:30	156		136						292	
03:45	6	20	1	9					7	29	15:45	168	576	164	695					332	1271
04:00	11		9						20		16:00	146		175						321	
04:15	10		9						19		16:15	155		167						322	
04:30	13		11						24		16:30	147		168						315	
04:45	25	59	16	45					41	104	16:45	155	603	177	687					332	1290
05:00	40		16						56		17:00	158		183						341	
05:15	50		24						74		17:15	172		181						353	
05:30	51		37						88		17:30	171		167						338	
05:45	66	207	41	118					107	325	17:45	191	692	222	753					413	1445
06:00	93		97						190		18:00	150		201						351	
06:15	91		86						177		18:15	171		185						356	
06:30	145		87						232		18:30	147		160						307	
06:45	181	510	115	385					296	895	18:45	126	594	181	727					307	1321
07:00	205		159						364		19:00	95		145						240	
07:15	186		161						347		19:15	112		137						249	
07:30	175		149						324		19:30	92		108						200	
07:45	159	725	130	599					289	1324	19:45	73	372	87	477					160	849
08:00	157		157						314		20:00	91		81						172	
08:15	162		149						311		20:15	55		90						145	
08:30	130		115						245		20:30	64		79						143	
08:45	157	606	128	549					285	1155	20:45	52	262	80	330					132	592
09:00	148		102						250		21:00	60		80						140	
09:15	96		113						209		21:15	58		69						127	
09:30	91		88						179		21:30	39		51						90	
09:45	70	405	84	387					154	792	21:45	28	185	42	242					70	427
10:00	86		74						160		22:00	40		41						81	
10:15	76		95						171		22:15	27		47						74	
10:30	84		75						159		22:30	20		35						55	
10:45	96	342	84	328					180	670	22:45	22	109	32	155					54	264
11:00	74		86						160		23:00	15		32						47	
11:15	97		87						184		23:15	17		22						39	
11:30	96		93						189		23:30	9		19						28	
11:45	103	370	112	378					215	748	23:45	20	61	17	90					37	151
TOTALS		3309		2862						6171	TOTALS		4646		5414						10060
SPLIT %		53.6%		46.4%						38.0%	SPLIT %		46.2%		53.8%						62.0%

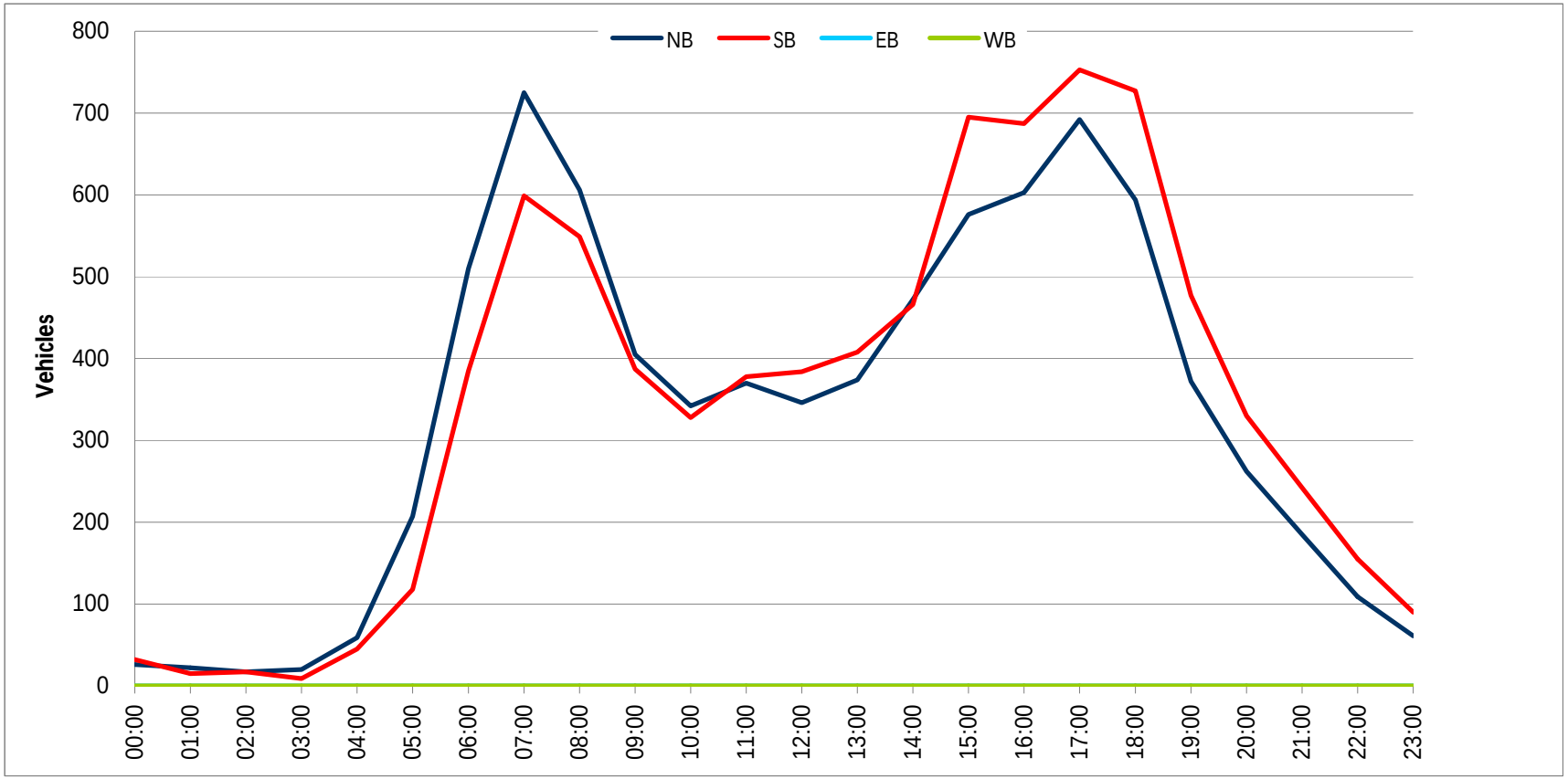
DAILY TOTALS	NB	SB	EB	WB	Total
	7,955	8,276	0	0	16,231

AM Peak Hour	06:45	07:00			06:45	PM Peak Hour	17:00	17:30			17:30
AM Pk Volume	747	599			1331	PM Pk Volume	692	775			1458
Pk Hr Factor	0.911	0.930			0.914	Pk Hr Factor	0.906	0.873			0.883
7 - 9 Volume	1331	1148	0	0	2479	4 - 6 Volume	1295	1440	0	0	2735
7 - 9 Peak Hour	07:00	07:00			07:00	4 - 6 Peak Hour	17:00	17:00			17:00
7 - 9 Pk Volume	725	599	0	0	1324	4 - 6 Pk Volume	692	753	0	0	1445
Pk Hr Factor	0.884	0.930	0.000	0.000	0.909	Pk Hr Factor	0.906	0.848	0.000	0.000	0.875

Prepared by NDS/ATD

Project #: CA12_6151_024 **City:** Chino Hills

Location: Chino Hills Pkwy from Eucalyptus Ave to **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Chino Hills Pkwy from Peyton Dr to Pipeline Ave

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_053

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	13,586	14,355	27,941

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			25		19		44		12:00			160		198		358	
00:15			19		11		30		12:15			172		156		328	
00:30			21		16		37		12:30			162		189		351	
00:45			19	84	14	60	33	144	12:45			158	652	146	689	304	1341
01:00			22		4		26		13:00			157		162		319	
01:15			7		4		11		13:15			181		170		351	
01:30			14		8		22		13:30			183		176		359	
01:45			4	47	9	25	13	72	13:45			184	705	198	706	382	1411
02:00			11		7		18		14:00			183		199		382	
02:15			7		3		10		14:15			205		203		408	
02:30			10		7		17		14:30			206		241		447	
02:45			7	35	9	26	16	61	14:45			260	854	268	911	528	1765
03:00			3		8		11		15:00			219		315		534	
03:15			7		15		22		15:15			212		329		541	
03:30			5		9		14		15:30			234		314		548	
03:45			11	26	15	47	26	73	15:45			257	922	324	1282	581	2204
04:00			16		17		33		16:00			206		309		515	
04:15			23		36		59		16:15			191		342		533	
04:30			26		38		64		16:30			251		289		540	
04:45			25	90	57	148	82	238	16:45			245	893	322	1262	567	2155
05:00			45		51		96		17:00			249		308		557	
05:15			69		79		148		17:15			288		308		596	
05:30			115		75		190		17:30			235		347		582	
05:45			157	386	88	293	245	679	17:45			277	1049	334	1297	611	2346
06:00			210		98		308		18:00			278		331		609	
06:15			277		110		387		18:15			226		330		556	
06:30			267		143		410		18:30			172		298		470	
06:45			247	1001	216	567	463	1568	18:45			259	935	275	1234	534	2169
07:00			304		255		559		19:00			167		215		382	
07:15			270		272		542		19:15			224		191		415	
07:30			251		318		569		19:30			188		163		351	
07:45			221	1046	267	1112	488	2158	19:45			162	741	162	731	324	1472
08:00			268		260		528		20:00			173		113		286	
08:15			256		296		552		20:15			140		101		241	
08:30			202		241		443		20:30			128		102		230	
08:45			209	935	212	1009	421	1944	20:45			125	566	92	408	217	974
09:00			168		186		354		21:00			114		95		209	
09:15			136		162		298		21:15			105		61		166	
09:30			138		160		298		21:30			122		86		208	
09:45			144	586	150	658	294	1244	21:45			99	440	61	303	160	743
10:00			123		143		266		22:00			69		48		117	
10:15			118		169		287		22:15			89		65		154	
10:30			148		144		292		22:30			74		44		118	
10:45			143	532	166	622	309	1154	22:45			57	289	34	191	91	480
11:00			160		146		306		23:00			38		36		74	
11:15			147		161		308		23:15			38		20		58	
11:30			149		170		319		23:30			18		19		37	
11:45			185	641	196	673	381	1314	23:45			37	131	26	101	63	232
TOTALS				5409		5240		10649	TOTALS				8177		9115		17292
SPLIT %				50.8%		49.2%		38.1%	SPLIT %				47.3%		52.7%		61.9%

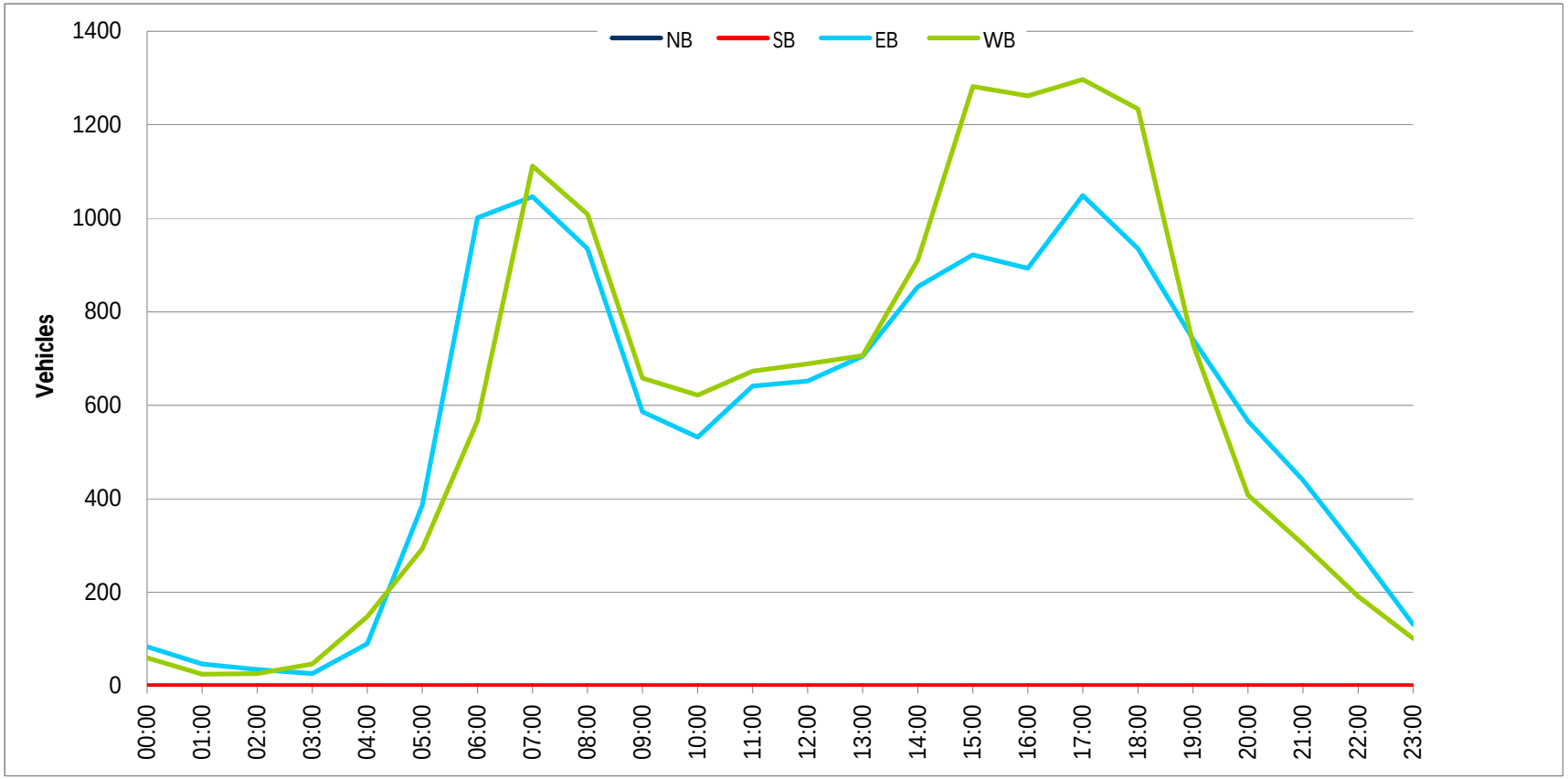
DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	13,586	14,355	27,941

AM Peak Hour			06:15	07:30	07:00	PM Peak Hour			17:15	17:30	17:15
AM Pk Volume			1095	1141	2158	PM Pk Volume			1078	1342	2398
Pk Hr Factor			0.900	0.897	0.948	Pk Hr Factor			0.936	0.967	0.981
7 - 9 Volume	0	0	1981	2121	4102	4 - 6 Volume	0	0	1942	2559	4501
7 - 9 Peak Hour			07:00	07:30	07:00	4 - 6 Peak Hour			17:00	17:00	17:00
7 - 9 Pk Volume	0	0	1046	1141	2158	4 - 6 Pk Volume	0	0	1049	1297	2346
Pk Hr Factor	0.000	0.000	0.860	0.897	0.948	Pk Hr Factor	0.000	0.000	0.911	0.934	0.960

Prepared by NDS/ATD

Project #: CA12_6151_053 **City:** Chino Hills

Location: Chino Hills Pkwy from Peyton Dr to Pipeline **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Chino Hills Pkwy from Pipeline Ave to SR-71

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_054

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	19,835	18,527	38,362

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			31		27		58		12:00			287		300		587	
00:15			19		26		45		12:15			267		305		572	
00:30			20		23		43		12:30			309		294		603	
00:45			20	90	17	93	37	183	12:45			275	1138	271	1170	546	2308
01:00			11		29		40		13:00			290		238		528	
01:15			15		10		25		13:15			276		267		543	
01:30			15		14		29		13:30			270		228		498	
01:45			16	57	7	60	23	117	13:45			290	1126	272	1005	562	2131
02:00			8		18		26		14:00			274		240		514	
02:15			16		14		30		14:15			277		286		563	
02:30			13		7		20		14:30			367		291		658	
02:45			9	46	13	52	22	98	14:45			301	1219	322	1139	623	2358
03:00			18		14		32		15:00			329		328		657	
03:15			23		15		38		15:15			386		297		683	
03:30			18		8		26		15:30			388		294		682	
03:45			22	81	19	56	41	137	15:45			369	1472	342	1261	711	2733
04:00			32		16		48		16:00			413		312		725	
04:15			51		21		72		16:15			419		302		721	
04:30			63		24		87		16:30			373		334		707	
04:45			97	243	35	96	132	339	16:45			380	1585	391	1339	771	2924
05:00			83		47		130		17:00			400		383		783	
05:15			125		79		204		17:15			383		444		827	
05:30			123		110		233		17:30			442		413		855	
05:45			145	476	158	394	303	870	17:45			416	1641	392	1632	808	3273
06:00			154		188		342		18:00			414		368		782	
06:15			180		266		446		18:15			384		360		744	
06:30			209		246		455		18:30			376		274		650	
06:45			287	830	263	963	550	1793	18:45			302	1476	357	1359	659	2835
07:00			336		293		629		19:00			299		297		596	
07:15			393		305		698		19:15			282		282		564	
07:30			398		272		670		19:30			241		245		486	
07:45			364	1491	300	1170	664	2661	19:45			226	1048	210	1034	436	2082
08:00			314		320		634		20:00			201		232		433	
08:15			331		287		618		20:15			195		186		381	
08:30			316		296		612		20:30			179		193		372	
08:45			269	1230	294	1197	563	2427	20:45			162	737	133	744	295	1481
09:00			271		242		513		21:00			157		146		303	
09:15			256		237		493		21:15			132		131		263	
09:30			250		193		443		21:30			131		137		268	
09:45			211	988	233	905	444	1893	21:45			130	550	134	548	264	1098
10:00			209		191		400		22:00			102		106		208	
10:15			233		224		457		22:15			82		100		182	
10:30			240		209		449		22:30			71		94		165	
10:45			223	905	210	834	433	1739	22:45			54	309	65	365	119	674
11:00			217		229		446		23:00			50		60		110	
11:15			219		216		435		23:15			46		42		88	
11:30			255		235		490		23:30			40		37		77	
11:45			239	930	248	928	487	1858	23:45			31	167	44	183	75	350
TOTALS				7367		6748		14115	TOTALS				12468		11779		24247
SPLIT %				52.2%		47.8%		36.8%	SPLIT %				51.4%		48.6%		63.2%

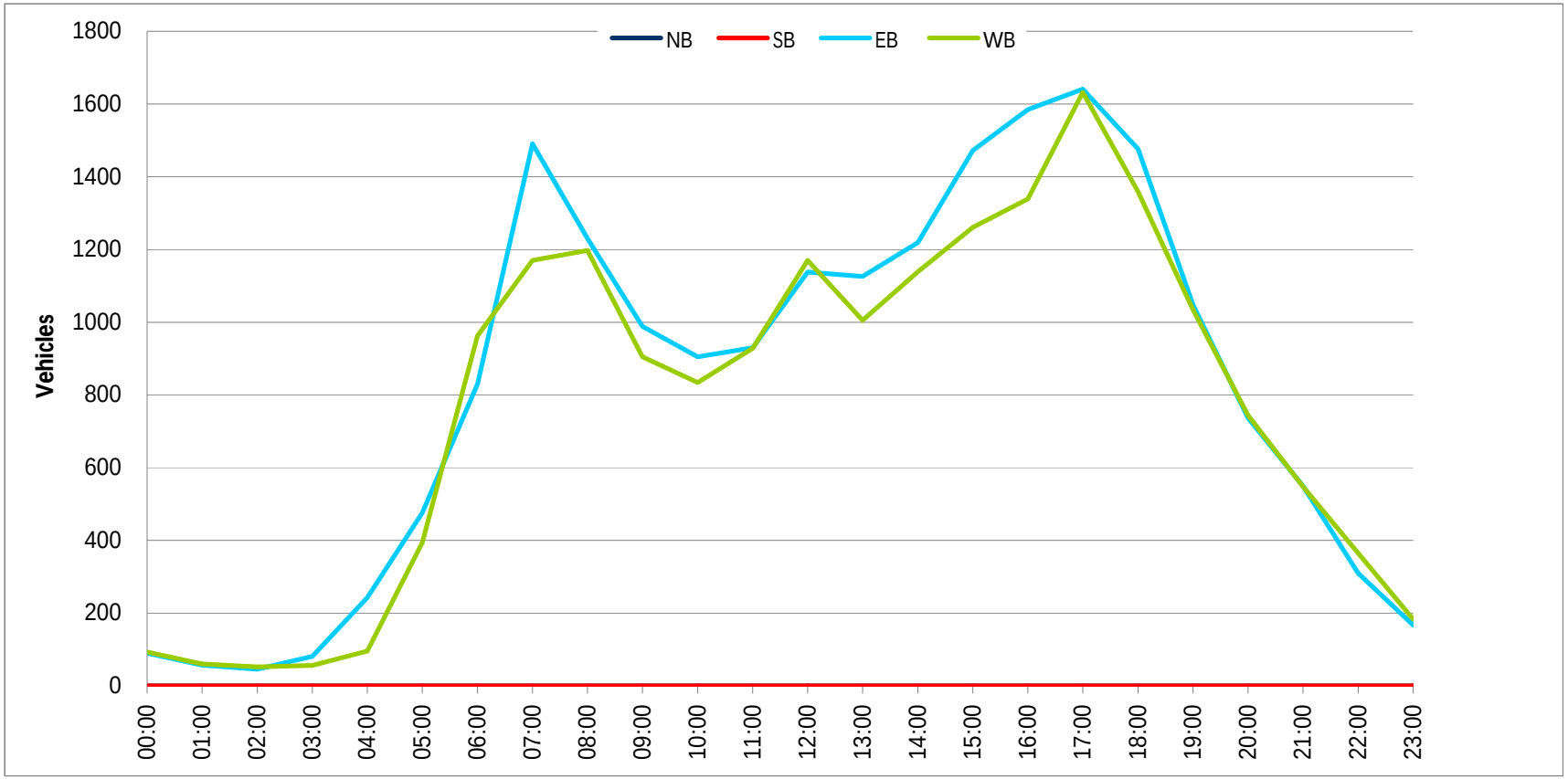
DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	19,835	18,527	38,362

AM Peak Hour			07:00	07:45	07:15	PM Peak Hour			17:30	17:00	17:00
AM Pk Volume			1491	1203	2666	PM Pk Volume			1656	1632	3273
Pk Hr Factor			0.937	0.940	0.955	Pk Hr Factor			0.937	0.919	0.957
7 - 9 Volume	0	0	2721	2367	5088	4 - 6 Volume	0	0	3226	2971	6197
7 - 9 Peak Hour			07:00	07:45	07:15	4 - 6 Peak Hour			17:00	17:00	17:00
7 - 9 Pk Volume	0	0	1491	1203	2666	4 - 6 Pk Volume	0	0	1641	1632	3273
Pk Hr Factor	0.000	0.000	0.937	0.940	0.955	Pk Hr Factor	0.000	0.000	0.928	0.919	0.957

Prepared by NDS/ATD

Project #: CA12_6151_054 **City:** Chino Hills

Location: Chino Hills Pkwy from Pipeline Ave to SR-71 **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Chino Hills Pkwy from SR-71 to City limits (east)

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_025

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	6,521	5,294	11,815

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			13		5		18		12:00			91		96		187	
00:15			5		1		6		12:15			89		108		197	
00:30			5		3		8		12:30			88		93		181	
00:45			2	25	1	10	3	35	12:45			103	371	70	367	173	738
01:00			0		5		5		13:00			91		68		159	
01:15			3		6		9		13:15			98		56		154	
01:30			6		3		9		13:30			85		64		149	
01:45			2	11	1	15	3	26	13:45			94	368	109	297	203	665
02:00			2		0		2		14:00			89		75		164	
02:15			4		3		7		14:15			96		82		178	
02:30			2		1		3		14:30			105		92		197	
02:45			6	14	1	5	7	19	14:45			127	417	73	322	200	739
03:00			5		5		10		15:00			150		88		238	
03:15			2		2		4		15:15			143		75		218	
03:30			4		7		11		15:30			136		107		243	
03:45			7	18	2	16	9	34	15:45			130	559	75	345	205	904
04:00			15		2		17		16:00			179		94		273	
04:15			10		9		19		16:15			157		73		230	
04:30			17		11		28		16:30			175		102		277	
04:45			22	64	15	37	37	101	16:45			162	673	124	393	286	1066
05:00			15		20		35		17:00			154		108		262	
05:15			27		38		65		17:15			162		100		262	
05:30			43		61		104		17:30			140		94		234	
05:45			53	138	96	215	149	353	17:45			161	617	84	386	245	1003
06:00			48		104		152		18:00			162		95		257	
06:15			49		124		173		18:15			126		72		198	
06:30			54		101		155		18:30			119		64		183	
06:45			103	254	105	434	208	688	18:45			131	538	60	291	191	829
07:00			101		137		238		19:00			100		46		146	
07:15			100		102		202		19:15			90		61		151	
07:30			105		95		200		19:30			62		26		88	
07:45			134	440	89	423	223	863	19:45			77	329	48	181	125	510
08:00			117		126		243		20:00			51		46		97	
08:15			89		92		181		20:15			53		41		94	
08:30			58		98		156		20:30			48		32		80	
08:45			100	364	100	416	200	780	20:45			43	195	31	150	74	345
09:00			75		77		152		21:00			53		27		80	
09:15			64		51		115		21:15			40		16		56	
09:30			47		65		112		21:30			36		35		71	
09:45			65	251	67	260	132	511	21:45			32	161	18	96	50	257
10:00			62		54		116		22:00			31		33		64	
10:15			70		51		121		22:15			32		29		61	
10:30			85		46		131		22:30			18		15		33	
10:45			75	292	64	215	139	507	22:45			20	101	10	87	30	188
11:00			76		67		143		23:00			22		6		28	
11:15			54		79		133		23:15			12		4		16	
11:30			64		88		152		23:30			12		5		17	
11:45			74	268	76	310	150	578	23:45			7	53	8	23	15	76
TOTALS				2139		2356		4495	TOTALS				4382		2938		7320
SPLIT %				47.6%		52.4%		38.0%	SPLIT %				59.9%		40.1%		62.0%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	6,521	5,294	11,815

AM Peak Hour			07:15	06:15	07:15	PM Peak Hour		16:00	16:30	16:30
AM Pk Volume			456	467	868	PM Pk Volume		673	434	1087
Pk Hr Factor			0.851	0.852	0.893	Pk Hr Factor		0.940	0.875	0.950
7 - 9 Volume	0	0	804	839	1643	4 - 6 Volume	0	1290	779	2069
7 - 9 Peak Hour			07:15	07:00	07:15	4 - 6 Peak Hour		16:00	16:30	16:30
7 - 9 Pk Volume	0	0	456	423	868	4 - 6 Pk Volume	0	673	434	1087
Pk Hr Factor	0.000	0.000	0.851	0.772	0.893	Pk Hr Factor	0.000	0.940	0.875	0.950

Prepared by NDS/ATD

Project #: CA12_6151_025 **City:** Chino Hills

Location: Chino Hills Pkwy from SR-71 to City limits **Date:** 11/27/2012

Prepared by NDS/ATD

VOLUME

Country Club Dr from Pipeline Ave to Los Serranos Blvd

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_027

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	237	254	491

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			0		0		0		12:00			5		2		7	
00:15			0		0		0		12:15			1		4		5	
00:30			1		0		1		12:30			0		1		1	
00:45			0	1	0		0	1	12:45			1	7	4	11	5	18
01:00			2		1		3		13:00			3		4		7	
01:15			0		0		0		13:15			5		6		11	
01:30			0		0		0		13:30			1		4		5	
01:45			0	2	0	1	0	3	13:45			3	12	5	19	8	31
02:00			0		0		0		14:00			10		4		14	
02:15			2		0		2		14:15			2		4		6	
02:30			0		0		0		14:30			3		5		8	
02:45			0	2	0		0	2	14:45			4	19	13	26	17	45
03:00			0		0		0		15:00			8		5		13	
03:15			0		0		0		15:15			12		11		23	
03:30			0		0		0		15:30			5		8		13	
03:45			0		0		0		15:45			3	28	5	29	8	57
04:00			0		0		0		16:00			6		8		14	
04:15			0		0		0		16:15			8		4		12	
04:30			0		0		0		16:30			2		10		12	
04:45			0		0		0		16:45			5	21	5	27	10	48
05:00			1		0		1		17:00			5		8		13	
05:15			1		2		3		17:15			2		3		5	
05:30			3		0		3		17:30			4		9		13	
05:45			3	8	2	4	5	12	17:45			3	14	4	24	7	38
06:00			0		2		2		18:00			4		7		11	
06:15			1		2		3		18:15			6		2		8	
06:30			1		0		1		18:30			4		3		7	
06:45			3	5	4	8	7	13	18:45			2	16	1	13	3	29
07:00			7		5		12		19:00			3		1		4	
07:15			5		7		12		19:15			5		5		10	
07:30			6		3		9		19:30			0		0		0	
07:45			2	20	2	17	4	37	19:45			1	9	1	7	2	16
08:00			8		7		15		20:00			1		3		4	
08:15			6		4		10		20:15			3		0		3	
08:30			3		3		6		20:30			2		2		4	
08:45			1	18	3	17	4	35	20:45			3	9	4	9	7	18
09:00			2		1		3		21:00			2		2		4	
09:15			1		0		1		21:15			1		2		3	
09:30			0		0		0		21:30			2		3		5	
09:45			3	6	1	2	4	8	21:45			4	9	1	8	5	17
10:00			2		3		5		22:00			1		1		2	
10:15			4		3		7		22:15			1		1		2	
10:30			3		2		5		22:30			1		0		1	
10:45			2	11	4	12	6	23	22:45			0	3	1	3	1	6
11:00			2		4		6		23:00			0		1		1	
11:15			6		4		10		23:15			1		0		1	
11:30			5		6		11		23:30			1		0		1	
11:45			2	15	2	16	4	31	23:45			0	2	0	1	0	3
TOTALS				88		77		165	TOTALS				149		177		326
SPLIT %				53.3%		46.7%		33.6%	SPLIT %				45.7%		54.3%		66.4%

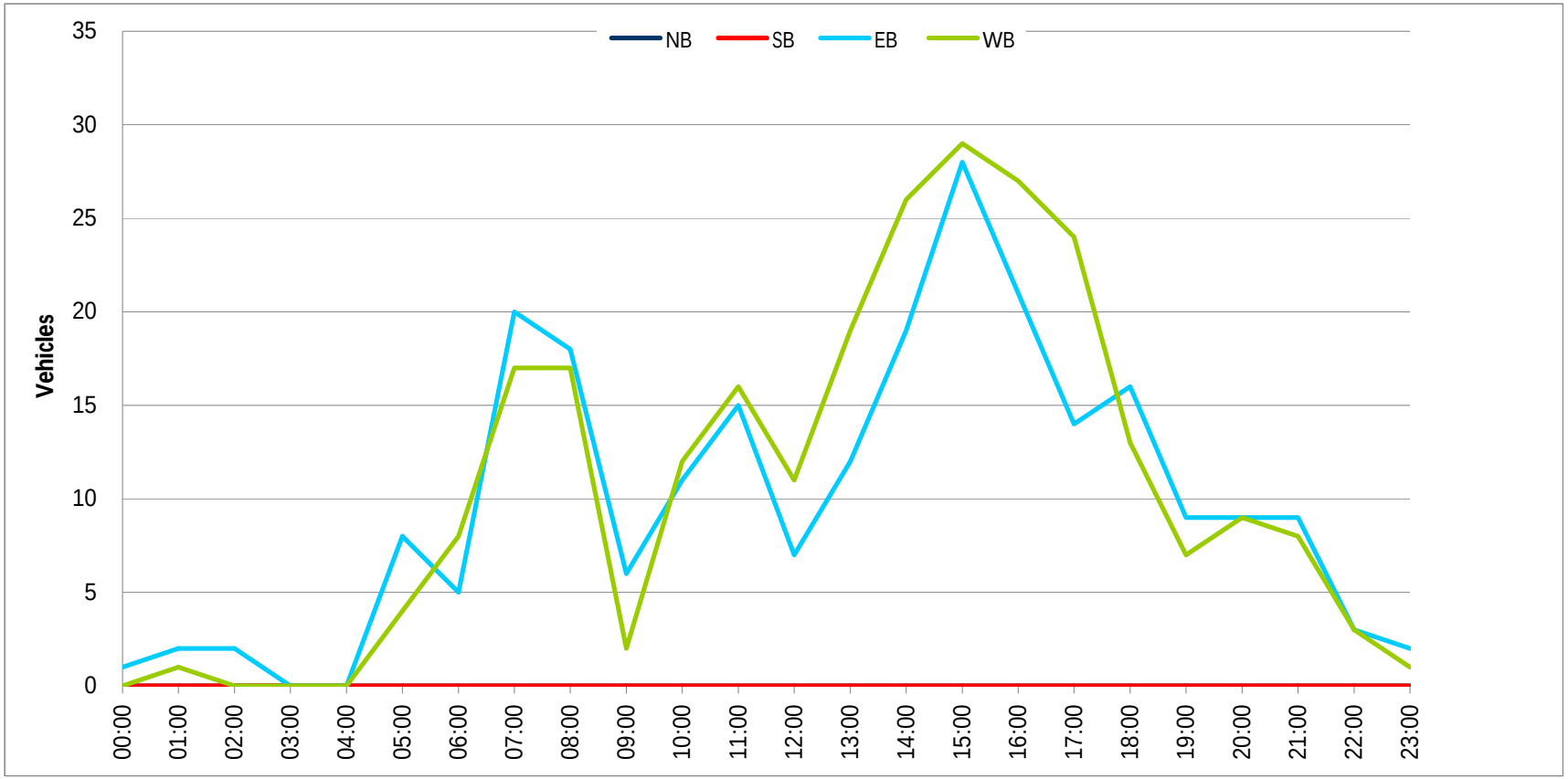
DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	237	254	491

AM Peak Hour			07:30	06:45	06:45	PM Peak Hour			14:45	14:45	14:45
AM Pk Volume			22	19	40	PM Pk Volume			29	37	66
Pk Hr Factor			0.688	0.679	0.833	Pk Hr Factor			0.604	0.712	0.717
7 - 9 Volume	0	0	38	34	72	4 - 6 Volume	0	0	35	51	86
7 - 9 Peak Hour			07:30	07:15	07:15	4 - 6 Peak Hour			16:00	16:00	16:00
7 - 9 Pk Volume	0	0	22	19	40	4 - 6 Pk Volume	0	0	21	27	48
Pk Hr Factor	0.000	0.000	0.688	0.679	0.667	Pk Hr Factor	0.000	0.000	0.656	0.675	0.857

Prepared by NDS/ATD

Project #: CA12_6151_027 **City:** Chino Hills

Location: Country Club Dr from Pipeline Ave to Los **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Country Club Dr from Los Serranos Blvd to Valle Vista Blvd

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_028

DAILY TOTALS	NB	SB	EB	WB	Total
	589	456	0	0	1,045

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	4		2						6		12:00	9		5						14	
00:15	0		0						0		12:15	6		3						9	
00:30	1		0						1		12:30	4		3						7	
00:45	1	6	1	3					2	9	12:45	5	24	6	17					11	41
01:00	2		0						2		13:00	9		3						12	
01:15	0		0						0		13:15	7		10						17	
01:30	2		0						2		13:30	6		4						10	
01:45	0	4	0						0	4	13:45	9	31	7	24					16	55
02:00	0		0						0		14:00	7		4						11	
02:15	0		1						1		14:15	14		5						19	
02:30	0		0						0		14:30	10		8						18	
02:45	0		0	1					0	1	14:45	6	37	14	31					20	68
03:00	0		0						0		15:00	13		13						26	
03:15	0		0						0		15:15	9		14						23	
03:30	1		0						1		15:30	7		11						18	
03:45	2	3	1	1					3	4	15:45	7	36	5	43					12	79
04:00	1		0						1		16:00	7		10						17	
04:15	2		0						2		16:15	17		7						24	
04:30	2		0						2		16:30	19		10						29	
04:45	3	8	0						3	8	16:45	8	51	6	33					14	84
05:00	7		1						8		17:00	13		9						22	
05:15	2		2						4		17:15	5		8						13	
05:30	8		3						11		17:30	7		14						21	
05:45	6	23	1	7					7	30	17:45	8	33	8	39					16	72
06:00	7		4						11		18:00	4		7						11	
06:15	4		2						6		18:15	14		13						27	
06:30	4		2						6		18:30	10		11						21	
06:45	12	27	4	12					16	39	18:45	7	35	10	41					17	76
07:00	16		5						21		19:00	3		7						10	
07:15	13		8						21		19:15	9		4						13	
07:30	11		3						14		19:30	4		5						9	
07:45	10	50	5	21					15	71	19:45	8	24	9	25					17	49
08:00	20		5						25		20:00	12		12						24	
08:15	10		6						16		20:15	1		8						9	
08:30	10		5						15		20:30	8		9						17	
08:45	10	50	2	18					12	68	20:45	6	27	7	36					13	63
09:00	8		1						9		21:00	5		7						12	
09:15	9		2						11		21:15	6		4						10	
09:30	1		4						5		21:30	4		5						9	
09:45	7	25	6	13					13	38	21:45	5	20	6	22					11	42
10:00	10		6						16		22:00	2		5						7	
10:15	5		4						9		22:15	2		6						8	
10:30	9		1						10		22:30	0		3						3	
10:45	7	31	10	21					17	52	22:45	3	7	4	18					7	25
11:00	8		2						10		23:00	1		1						2	
11:15	9		6						15		23:15	1		1						2	
11:30	8		6						14		23:30	2		3						5	
11:45	8	33	9	23					17	56	23:45	0	4	2	7					2	11
TOTALS		260		120						380	TOTALS		329		336						665
SPLIT %		68.4%		31.6%						36.4%	SPLIT %		49.5%		50.5%						63.6%

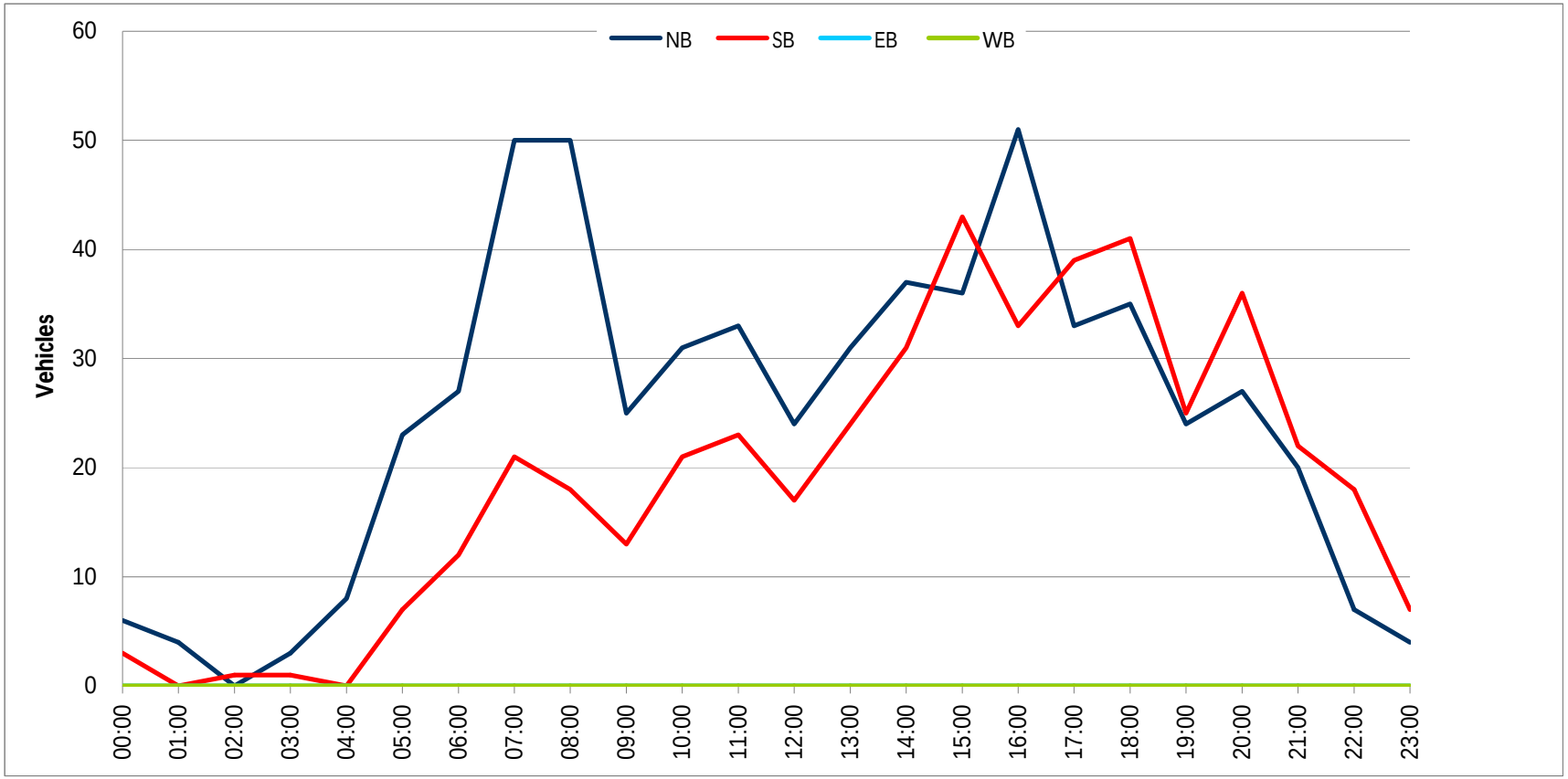
DAILY TOTALS	NB	SB	EB	WB	Total
	589	456	0	0	1,045

AM Peak Hour	07:15	11:15			07:15	PM Peak Hour	16:15	14:45			16:15
AM Pk Volume	54	26			75	PM Pk Volume	57	52			89
Pk Hr Factor	0.675	0.722			0.750	Pk Hr Factor	0.750	0.929			0.767
7 - 9 Volume	100	39	0	0	139	4 - 6 Volume	84	72	0	0	156
7 - 9 Peak Hour	07:15	07:00			07:15	4 - 6 Peak Hour	16:15	17:00			16:15
7 - 9 Pk Volume	54	21	0	0	75	4 - 6 Pk Volume	57	39	0	0	89
Pk Hr Factor	0.675	0.656	0.000	0.000	0.750	Pk Hr Factor	0.750	0.696	0.000	0.000	0.767

Prepared by NDS/ATD

Project #: CA12_6151_028 **City:** Chino Hills

Location: Country Club Dr from Los Serranos Blvd to **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Eagle Canyon Dr from Chino Ave to Wandering Ridge Dr

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_029

DAILY TOTALS	NB	SB	EB	WB	Total
	186	467	0	0	653

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	0		0						0		12:00	1		9						10	
00:15	0		1						1		12:15	3		5						8	
00:30	0		1						1		12:30	1		7						8	
00:45	0		0	2					0	2	12:45	3	8	6	27					9	35
01:00	0		0						0		13:00	7		4						11	
01:15	0		0						0		13:15	5		3						8	
01:30	0		1						1		13:30	3		6						9	
01:45	1	1	0	1					1	2	13:45	0	15	3	16					3	31
02:00	0		0						0		14:00	1		4						5	
02:15	0		0						0		14:15	0		8						8	
02:30	1		0						1		14:30	0		10						10	
02:45	0	1	0						0	1	14:45	0	1	6	28					6	29
03:00	1		2						3		15:00	0		39						39	
03:15	0		1						1		15:15	1		10						11	
03:30	0		0						0		15:30	5		9						14	
03:45	0	1	0	3					0	4	15:45	1	7	6	64					7	71
04:00	1		0						1		16:00	6		7						13	
04:15	0		0						0		16:15	7		14						21	
04:30	0		3						3		16:30	3		4						7	
04:45	0	1	1	4					1	5	16:45	10	26	10	35					20	61
05:00	0		3						3		17:00	8		4						12	
05:15	0		0						0		17:15	3		6						9	
05:30	0		7						7		17:30	8		3						11	
05:45	0		4	14					4	14	17:45	6	25	5	18					11	43
06:00	0		0						0		18:00	7		4						11	
06:15	1		3						4		18:15	5		6						11	
06:30	1		10						11		18:30	10		9						19	
06:45	0	2	8	21					8	23	18:45	9	31	1	20					10	51
07:00	1		15						16		19:00	5		2						7	
07:15	1		11						12		19:15	2		2						4	
07:30	0		11						11		19:30	7		4						11	
07:45	0	2	18	55					18	57	19:45	9	23	9	17					18	40
08:00	0		34						34		20:00	2		6						8	
08:15	0		13						13		20:15	3		2						5	
08:30	1		1						2		20:30	3		2						5	
08:45	0	1	13	61					13	62	20:45	2	10	2	12					4	22
09:00	1		5						6		21:00	2		1						3	
09:15	1		5						6		21:15	1		0						1	
09:30	1		5						6		21:30	0		0						0	
09:45	3	6	5	20					8	26	21:45	1	4	1	2					2	6
10:00	0		4						4		22:00	0		0						0	
10:15	3		8						11		22:15	2		0						2	
10:30	1		4						5		22:30	1		3						4	
10:45	4	8	5	21					9	29	22:45	1	4	2	5					3	9
11:00	2		6						8		23:00	1		0						1	
11:15	1		7						8		23:15	0		0						0	
11:30	2		3						5		23:30	2		0						2	
11:45	1	6	3	19					4	25	23:45	0	3	2	2					2	5
TOTALS		29		221						250	TOTALS		157		246						403
SPLIT %		11.6%		88.4%						38.3%	SPLIT %		39.0%		61.0%						61.7%

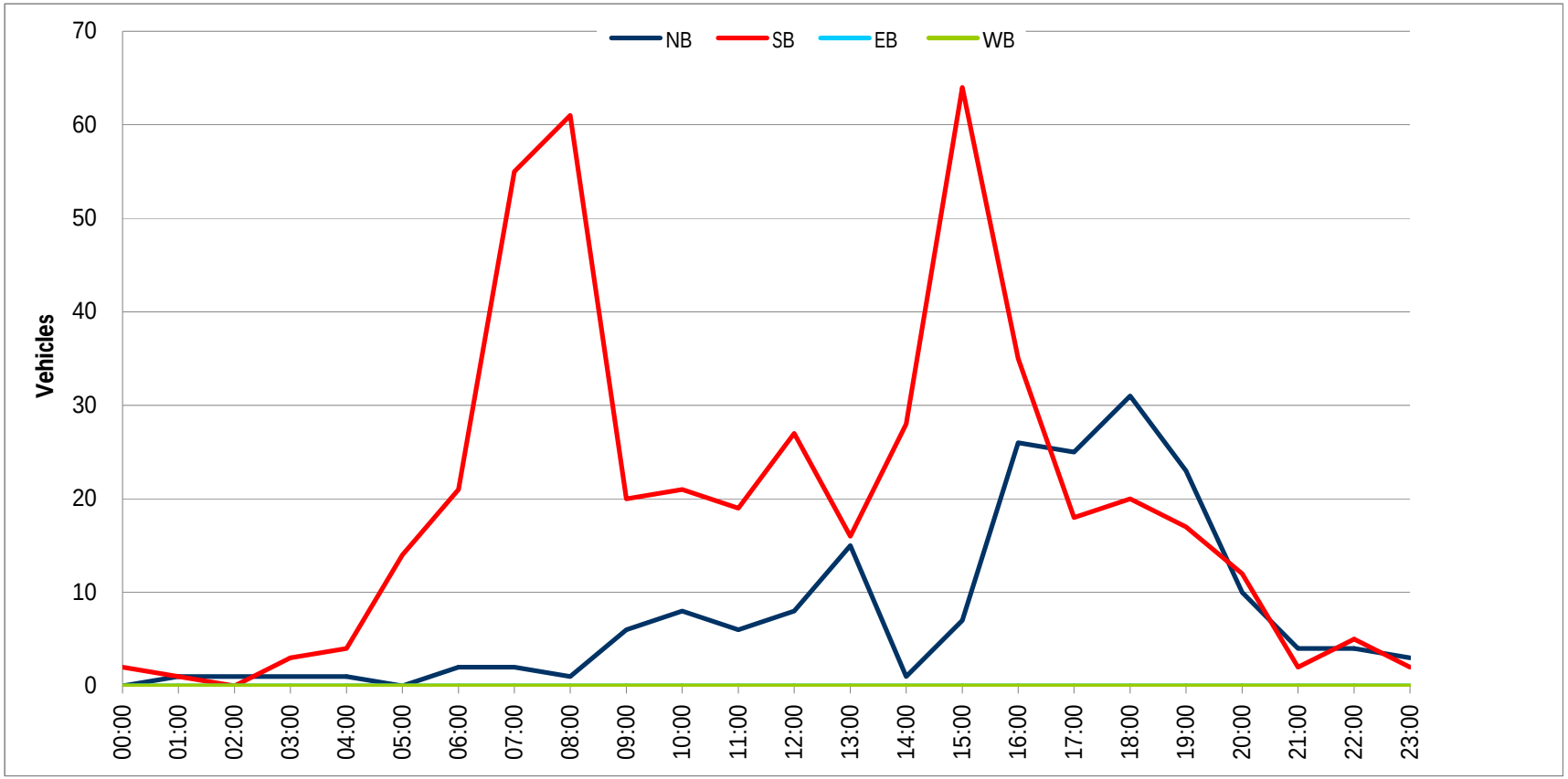
DAILY TOTALS	NB	SB	EB	WB	Total
	186	467	0	0	653

AM Peak Hour	10:15	07:30			07:30	PM Peak Hour	18:00	14:30			15:00
AM Pk Volume	10	76			76	PM Pk Volume	31	65			71
Pk Hr Factor	0.625	0.559			0.559	Pk Hr Factor	0.775	0.417			0.455
7 - 9 Volume	3	116	0	0	119	4 - 6 Volume	51	53	0	0	104
7 - 9 Peak Hour	07:00	07:30			07:30	4 - 6 Peak Hour	16:45	16:00			16:00
7 - 9 Pk Volume	2	76	0	0	76	4 - 6 Pk Volume	29	35	0	0	61
Pk Hr Factor	0.500	0.559	0.000	0.000	0.559	Pk Hr Factor	0.725	0.625	0.000	0.000	0.726

Prepared by NDS/ATD

Project #: CA12_6151_029 **City:** Chino Hills

Location: Eagle Canyon Dr from Chino Ave to **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Elinvar Dr from Soquel Canyon Pkwy to Sapphire Rd

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_030

DAILY TOTALS	NB	SB	EB	WB	Total
	477	502	0	0	979

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	0		0						0		12:00	5		5						10	
00:15	0		2						2		12:15	6		6						12	
00:30	0		1						1		12:30	8		5						13	
00:45	0		0	3					0	3	12:45	3	22	7	23					10	45
01:00	0		0						0		13:00	5		4						9	
01:15	0		0						0		13:15	4		3						7	
01:30	0		0						0		13:30	6		6						12	
01:45	0		0						0		13:45	5	20	5	18					10	38
02:00	0		0						0		14:00	9		16						25	
02:15	0		1						1		14:15	3		9						12	
02:30	0		0						0		14:30	7		9						16	
02:45	0		0	1					0	1	14:45	12	31	5	39					17	70
03:00	0		0						0		15:00	9		5						14	
03:15	0		1						1		15:15	13		11						24	
03:30	0		0						0		15:30	15		34						49	
03:45	0		0	1					0	1	15:45	5	42	13	63					18	105
04:00	0		0						0		16:00	6		3						9	
04:15	1		0						1		16:15	4		4						8	
04:30	2		1						3		16:30	8		7						15	
04:45	0	3	0	1					0	4	16:45	3	21	10	24					13	45
05:00	3		1						4		17:00	9		8						17	
05:15	1		0						1		17:15	7		12						19	
05:30	3		1						4		17:30	5		12						17	
05:45	7	14	3	5					10	19	17:45	8	29	13	45					21	74
06:00	7		1						8		18:00	9		12						21	
06:15	8		3						11		18:15	4		10						14	
06:30	8		3						11		18:30	3		10						13	
06:45	13	36	4	11					17	47	18:45	1	17	8	40					9	57
07:00	16		12						28		19:00	2		11						13	
07:15	18		5						23		19:15	3		11						14	
07:30	13		14						27		19:30	3		9						12	
07:45	14	61	5	36					19	97	19:45	3	11	6	37					9	48
08:00	20		5						25		20:00	6		3						9	
08:15	24		11						35		20:15	2		6						8	
08:30	10		18						28		20:30	4		9						13	
08:45	9	63	3	37					12	100	20:45	2	14	4	22					6	36
09:00	12		7						19		21:00	3		6						9	
09:15	7		4						11		21:15	4		6						10	
09:30	8		7						15		21:30	4		1						5	
09:45	4	31	7	25					11	56	21:45	2	13	4	17					6	30
10:00	6		3						9		22:00	1		1						2	
10:15	5		8						13		22:15	2		1						3	
10:30	4		6						10		22:30	0		2						2	
10:45	6	21	4	21					10	42	22:45	0	3	1	5					1	8
11:00	4		5						9		23:00	1		1						2	
11:15	7		4						11		23:15	0		0						0	
11:30	5		7						12		23:30	0		1						1	
11:45	7	23	8	24					15	47	23:45	1	2	2	4					3	6
TOTALS		252		165						417	TOTALS		225		337						562
SPLIT %		60.4%		39.6%						42.6%	SPLIT %		40.0%		60.0%						57.4%

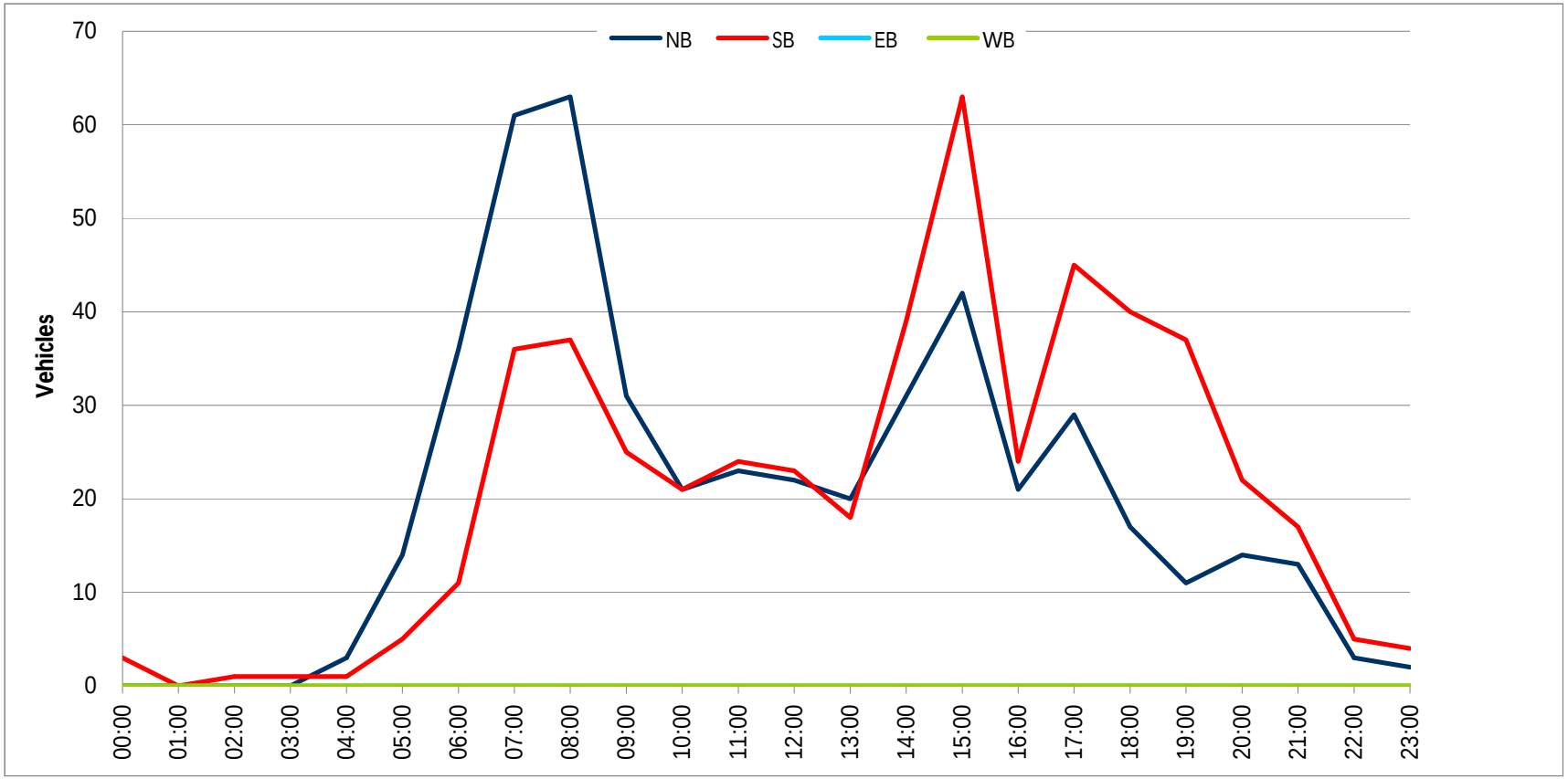
DAILY TOTALS	NB	SB	EB	WB	Total
	477	502	0	0	979

AM Peak Hour	07:30	07:45			07:45	PM Peak Hour	14:45	15:00			15:00
AM Pk Volume	71	39			107	PM Pk Volume	49	63			105
Pk Hr Factor	0.740	0.542			0.764	Pk Hr Factor	0.817	0.463			0.536
7 - 9 Volume	124	73	0	0	197	4 - 6 Volume	50	69	0	0	119
7 - 9 Peak Hour	07:30	07:45			07:45	4 - 6 Peak Hour	17:00	17:00			17:00
7 - 9 Pk Volume	71	39	0	0	107	4 - 6 Pk Volume	29	45	0	0	74
Pk Hr Factor	0.740	0.542	0.000	0.000	0.764	Pk Hr Factor	0.806	0.865	0.000	0.000	0.881

Prepared by NDS/ATD

Project #: CA12_6151_030 **City:** Chino Hills

Location: Elinvar Dr from Soquel Canyon Pkwy to **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

English Rd from Peyton Dr to End (West)

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_031

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	463	467	930

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			0		0		0		12:00			16		8		24	
00:15			0		0		0		12:15			5		4		9	
00:30			0		0		0		12:30			11		9		20	
00:45			0		1	1	1	1	12:45			5	37	7	28	12	65
01:00			1		1		2		13:00			7		5		12	
01:15			1		0		1		13:15			7		3		10	
01:30			0		0		0		13:30			7		12		19	
01:45			0	2	0	1	0	3	13:45			9	30	5	25	14	55
02:00			1		0		1		14:00			6		6		12	
02:15			0		0		0		14:15			8		13		21	
02:30			0		1		1		14:30			7		10		17	
02:45			0	1	0	1	0	2	14:45			7	28	7	36	14	64
03:00			0		0		0		15:00			8		9		17	
03:15			0		0		0		15:15			16		13		29	
03:30			1		1		2		15:30			9		7		16	
03:45			0	1	0	1	0	2	15:45			12	45	3	32	15	77
04:00			0		0		0		16:00			15		6		21	
04:15			1		0		1		16:15			10		5		15	
04:30			0		0		0		16:30			8		11		19	
04:45			0	1	0		0	1	16:45			13	46	11	33	24	79
05:00			0		0		0		17:00			15		9		24	
05:15			0		1		1		17:15			12		4		16	
05:30			1		3		4		17:30			8		9		17	
05:45			4	5	2	6	6	11	17:45			9	44	11	33	20	77
06:00			1		1		2		18:00			9		11		20	
06:15			2		6		8		18:15			5		8		13	
06:30			3		10		13		18:30			7		8		15	
06:45			5	11	14	31	19	42	18:45			6	27	8	35	14	62
07:00			5		11		16		19:00			15		2		17	
07:15			5		16		21		19:15			6		6		12	
07:30			8		7		15		19:30			4		5		9	
07:45			3	21	9	43	12	64	19:45			7	32	5	18	12	50
08:00			6		11		17		20:00			9		7		16	
08:15			7		8		15		20:15			5		1		6	
08:30			6		7		13		20:30			2		1		3	
08:45			2	21	8	34	10	55	20:45			3	19	1	10	4	29
09:00			7		7		14		21:00			1		1		2	
09:15			4		7		11		21:15			6		1		7	
09:30			5		9		14		21:30			1		4		5	
09:45			7	23	6	29	13	52	21:45			1	9	1	7	2	16
10:00			5		9		14		22:00			2		2		4	
10:15			7		6		13		22:15			0		1		1	
10:30			6		5		11		22:30			0		0		0	
10:45			7	25	6	26	13	51	22:45			0	2	0	3	0	5
11:00			6		4		10		23:00			1		3		4	
11:15			6		7		13		23:15			1		2		3	
11:30			9		8		17		23:30			0		4		4	
11:45			10	31	5	24	15	55	23:45			0	2	1	10	1	12
TOTALS				142		197		339	TOTALS				321		270		591
SPLIT %				41.9%		58.1%		36.5%	SPLIT %				54.3%		45.7%		63.5%

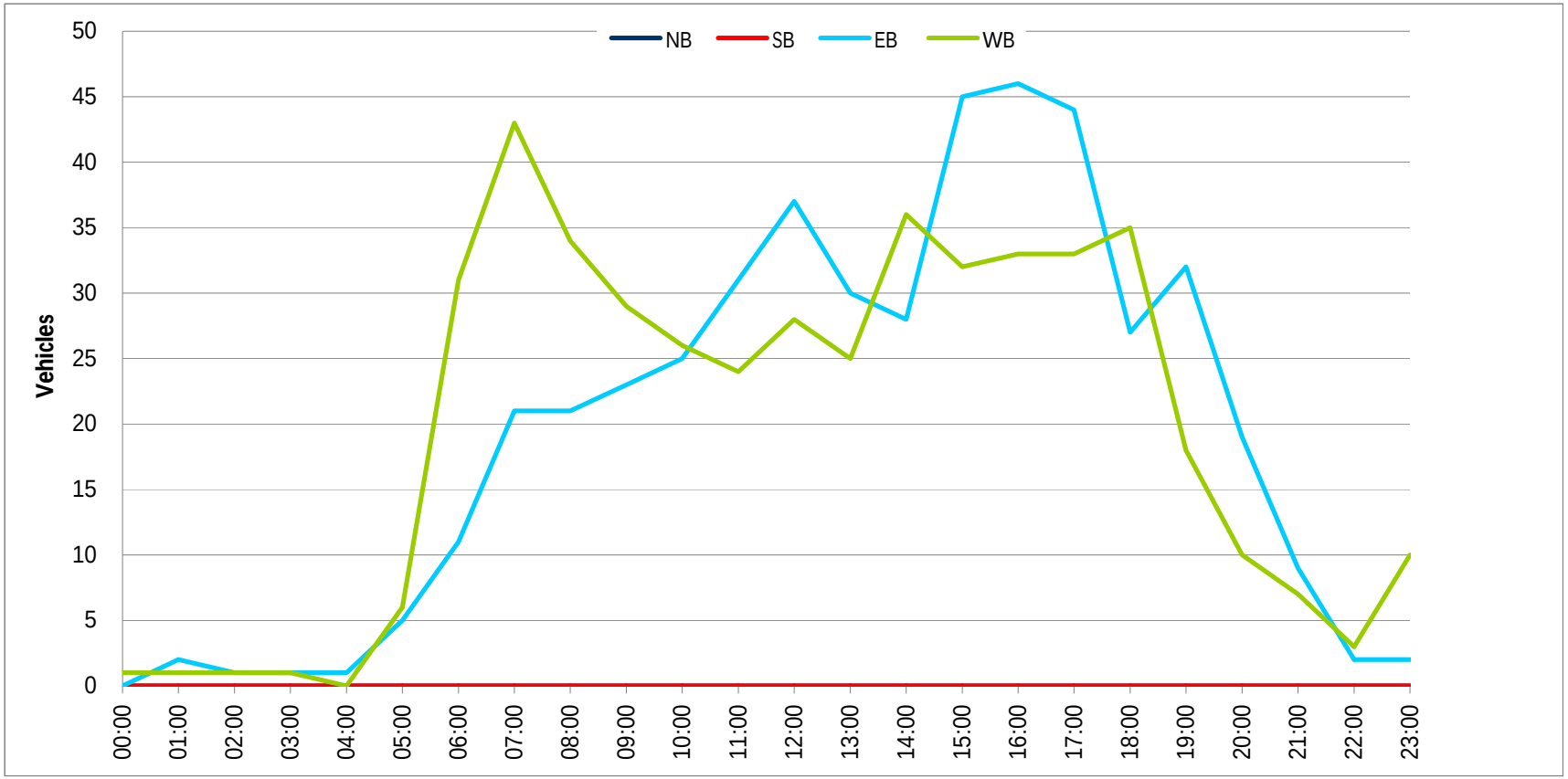
DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	463	467	930

AM Peak Hour			11:45	06:30	06:45	PM Peak Hour			15:15	14:15	16:30
AM Pk Volume			42	51	71	PM Pk Volume			52	39	83
Pk Hr Factor			0.656	0.797	0.845	Pk Hr Factor			0.813	0.750	0.865
7 - 9 Volume	0	0	42	77	119	4 - 6 Volume	0	0	90	66	156
7 - 9 Peak Hour			07:30	07:00	07:15	4 - 6 Peak Hour			16:30	16:15	16:30
7 - 9 Pk Volume	0	0	24	43	65	4 - 6 Pk Volume	0	0	48	36	83
Pk Hr Factor	0.000	0.000	0.750	0.672	0.774	Pk Hr Factor	0.000	0.000	0.800	0.818	0.865

Prepared by NDS/ATD

Project #: CA12_6151_031 **City:** Chino Hills

Location: English Rd from Peyton Dr to End (West) **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Eucalyptus Ave from Rancho Hills Dr to Calle Barcelona

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_036

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	1,812	1,093	2,905

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			0		2		2		12:00			25		20		45	
00:15			0		1		1		12:15			25		15		40	
00:30			2		2		4		12:30			23		9		32	
00:45			1	3	0	5	1	8	12:45			16	89	13	57	29	146
01:00			2		0		2		13:00			16		18		34	
01:15			1		1		2		13:15			15		12		27	
01:30			1		2		3		13:30			28		17		45	
01:45			1	5	0	3	1	8	13:45			18	77	8	55	26	132
02:00			2		1		3		14:00			22		11		33	
02:15			0		0		0		14:15			33		17		50	
02:30			0		0		0		14:30			34		22		56	
02:45			2	4	2	3	4	7	14:45			36	125	16	66	52	191
03:00			1		1		2		15:00			31		17		48	
03:15			1		0		1		15:15			30		17		47	
03:30			1		0		1		15:30			14		15		29	
03:45			2	5	0	1	2	6	15:45			30	105	19	68	49	173
04:00			2		0		2		16:00			28		23		51	
04:15			5		1		6		16:15			28		19		47	
04:30			6		0		6		16:30			12		19		31	
04:45			7	20	1	2	8	22	16:45			25	93	14	75	39	168
05:00			14		0		14		17:00			23		19		42	
05:15			14		0		14		17:15			23		22		45	
05:30			21		1		22		17:30			26		23		49	
05:45			22	71	2	3	24	74	17:45			36	108	24	88	60	196
06:00			30		4		34		18:00			13		26		39	
06:15			35		5		40		18:15			23		24		47	
06:30			29		15		44		18:30			21		22		43	
06:45			64	158	19	43	83	201	18:45			23	80	18	90	41	170
07:00			80		18		98		19:00			18		22		40	
07:15			46		21		67		19:15			14		13		27	
07:30			66		30		96		19:30			25		17		42	
07:45			38	230	15	84	53	314	19:45			13	70	16	68	29	138
08:00			54		31		85		20:00			7		18		25	
08:15			41		32		73		20:15			7		14		21	
08:30			38		15		53		20:30			10		13		23	
08:45			41	174	19	97	60	271	20:45			19	43	13	58	32	101
09:00			40		15		55		21:00			4		14		18	
09:15			17		17		34		21:15			10		6		16	
09:30			21		17		38		21:30			2		9		11	
09:45			24	102	19	68	43	170	21:45			5	21	7	36	12	57
10:00			26		17		43		22:00			3		5		8	
10:15			24		16		40		22:15			4		3		7	
10:30			29		14		43		22:30			7		4		11	
10:45			28	107	7	54	35	161	22:45			3	17	3	15	6	32
11:00			23		15		38		23:00			4		2		6	
11:15			21		12		33		23:15			2		0		2	
11:30			32		11		43		23:30			0		0		0	
11:45			22	98	12	50	34	148	23:45			1	7	2	4	3	11
TOTALS				977		413		1390	TOTALS				835		680		1515
SPLIT %				70.3%		29.7%		47.8%	SPLIT %				55.1%		44.9%		52.2%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	1,812	1,093	2,905

AM Peak Hour			06:45	07:30	06:45	PM Peak Hour			14:15	17:30	14:15
AM Pk Volume			256	108	344	PM Pk Volume			134	97	206
Pk Hr Factor			0.800	0.844	0.878	Pk Hr Factor			0.931	0.933	0.920
7 - 9 Volume	0	0	404	181	585	4 - 6 Volume	0	0	201	163	364
7 - 9 Peak Hour			07:00	07:30	07:00	4 - 6 Peak Hour			17:00	17:00	17:00
7 - 9 Pk Volume	0	0	230	108	314	4 - 6 Pk Volume	0	0	108	88	196
Pk Hr Factor	0.000	0.000	0.719	0.844	0.801	Pk Hr Factor	0.000	0.000	0.750	0.917	0.817

Prepared by NDS/ATD

Project #: CA12_6151_036 **City:** Chino Hills

Location: Eucalyptus Ave from Rancho Hills Dr to Calle **Date:** 11/27/2012

Prepared by NDS/ATD

VOLUME

Eucalyptus Ave from Calle Barcelona to Ridgeview Dr

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_035

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	2,827	3,245	6,072

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			0		5		5		12:00			36		37		73	
00:15			2		7		9		12:15			42		35		77	
00:30			2		4		6		12:30			32		25		57	
00:45			1	5	2	18	3	23	12:45			29	139	35	132	64	271
01:00			2		0		2		13:00			28		45		73	
01:15			3		2		5		13:15			26		40		66	
01:30			3		3		6		13:30			41		41		82	
01:45			1	9	1	6	2	15	13:45			31	126	41	167	72	293
02:00			2		1		3		14:00			33		50		83	
02:15			0		2		2		14:15			46		58		104	
02:30			1		2		3		14:30			59		65		124	
02:45			2	5	0	5	2	10	14:45			59	197	60	233	119	430
03:00			1		4		5		15:00			49		88		137	
03:15			1		3		4		15:15			45		57		102	
03:30			3		0		3		15:30			32		76		108	
03:45			2	7	0	7	2	14	15:45			38	164	75	296	113	460
04:00			4		0		4		16:00			44		82		126	
04:15			7		0		7		16:15			47		64		111	
04:30			8		0		8		16:30			21		75		96	
04:45			16	35	2	2	18	37	16:45			37	149	65	286	102	435
05:00			20		3		23		17:00			34		80		114	
05:15			20		1		21		17:15			42		88		130	
05:30			31		3		34		17:30			42		88		130	
05:45			26	97	9	16	35	113	17:45			49	167	81	337	130	504
06:00			44		8		52		18:00			19		85		104	
06:15			49		8		57		18:15			34		91		125	
06:30			49		22		71		18:30			37		88		125	
06:45			84	226	24	62	108	288	18:45			41	131	71	335	112	466
07:00			122		39		161		19:00			28		79		107	
07:15			89		38		127		19:15			23		59		82	
07:30			98		50		148		19:30			36		50		86	
07:45			70	379	34	161	104	540	19:45			22	109	65	253	87	362
08:00			99		71		170		20:00			18		47		65	
08:15			59		52		111		20:15			13		48		61	
08:30			58		21		79		20:30			18		46		64	
08:45			55	271	28	172	83	443	20:45			23	72	49	190	72	262
09:00			56		24		80		21:00			12		53		65	
09:15			33		29		62		21:15			17		34		51	
09:30			38		38		76		21:30			4		37		41	
09:45			33	160	29	120	62	280	21:45			8	41	24	148	32	189
10:00			47		26		73		22:00			6		23		29	
10:15			34		30		64		22:15			7		15		22	
10:30			39		21		60		22:30			8		14		22	
10:45			36	156	17	94	53	250	22:45			3	24	9	61	12	85
11:00			28		24		52		23:00			6		11		17	
11:15			44		16		60		23:15			3		12		15	
11:30			41		27		68		23:30			0		9		9	
11:45			34	147	28	95	62	242	23:45			2	11	17	49	19	60
TOTALS				1497		758		2255	TOTALS				1330		2487		3817
SPLIT %				66.4%		33.6%		37.1%	SPLIT %				34.8%		65.2%		62.9%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	2,827	3,245	6,072

AM Peak Hour			06:45	07:30	07:15	PM Peak Hour			14:15	17:30	17:00
AM Pk Volume			393	207	549	PM Pk Volume			213	345	504
Pk Hr Factor			0.805	0.729	0.807	Pk Hr Factor			0.903	0.948	0.969
7 - 9 Volume	0	0	650	333	983	4 - 6 Volume	0	0	316	623	939
7 - 9 Peak Hour			07:00	07:30	07:15	4 - 6 Peak Hour			17:00	17:00	17:00
7 - 9 Pk Volume	0	0	379	207	549	4 - 6 Pk Volume	0	0	167	337	504
Pk Hr Factor	0.000	0.000	0.777	0.729	0.807	Pk Hr Factor	0.000	0.000	0.852	0.957	0.969

Prepared by NDS/ATD

Project #: CA12_6151_035 **City:** Chino Hills

Location: Eucalyptus Ave from Calle Barcelona to **Date:** 11/27/2012

Prepared by NDS/ATD

VOLUME

Eucalyptus Ave from Ridgeview Dr to Chino Hills Pkwy

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_034

DAILY TOTALS	NB	SB	EB	WB	Total
	3,251	3,867	0	0	7,118

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	1		6						7		12:00	35		46						81	
00:15	3		6						9		12:15	39		51						90	
00:30	2		7						9		12:30	43		37						80	
00:45	1	7	2	21					3	28	12:45	37	154	45	179					82	333
01:00	1		1						2		13:00	39		48						87	
01:15	5		0						5		13:15	35		51						86	
01:30	3		2						5		13:30	49		45						94	
01:45	3	12	1	4					4	16	13:45	44	167	59	203					103	370
02:00	2		1						3		14:00	43		62						105	
02:15	1		3						4		14:15	53		72						125	
02:30	3		3						6		14:30	44		101						145	
02:45	3	9	2	9					5	18	14:45	51	191	94	329					145	520
03:00	2		1						3		15:00	97		83						180	
03:15	3		3						6		15:15	53		61						114	
03:30	2		1						3		15:30	37		81						118	
03:45	1	8	0	5					1	13	15:45	48	235	83	308					131	543
04:00	9		1						10		16:00	50		90						140	
04:15	5		2						7		16:15	47		71						118	
04:30	13		0						13		16:30	28		94						122	
04:45	21	48	1	4					22	52	16:45	51	176	84	339					135	515
05:00	21		3						24		17:00	46		92						138	
05:15	26		4						30		17:15	54		102						156	
05:30	35		4						39		17:30	53		111						164	
05:45	33	115	10	21					43	136	17:45	53	206	92	397					145	603
06:00	45		10						55		18:00	30		93						123	
06:15	57		11						68		18:15	42		101						143	
06:30	50		25						75		18:30	43		88						131	
06:45	99	251	38	84					137	335	18:45	46	161	93	375					139	536
07:00	132		48						180		19:00	30		90						120	
07:15	90		48						138		19:15	32		64						96	
07:30	92		58						150		19:30	32		62						94	
07:45	71	385	41	195					112	580	19:45	27	121	71	287					98	408
08:00	103		62						165		20:00	28		62						90	
08:15	90		50						140		20:15	15		64						79	
08:30	61		25						86		20:30	22		47						69	
08:45	63	317	38	175					101	492	20:45	25	90	63	236					88	326
09:00	50		34						84		21:00	14		57						71	
09:15	32		38						70		21:15	19		47						66	
09:30	40		37						77		21:30	5		34						39	
09:45	35	157	32	141					67	298	21:45	11	49	27	165					38	214
10:00	40		31						71		22:00	9		40						49	
10:15	42		30						72		22:15	11		18						29	
10:30	35		34						69		22:30	8		15						23	
10:45	43	160	25	120					68	280	22:45	3	31	13	86					16	117
11:00	35		31						66		23:00	11		14						25	
11:15	47		24						71		23:15	1		8						9	
11:30	58		33						91		23:30	3		17						20	
11:45	43	183	40	128					83	311	23:45	3	18	17	56					20	74
TOTALS		1652		907						2559	TOTALS		1599		2960						4559
SPLIT %		64.6%		35.4%						36.0%	SPLIT %		35.1%		64.9%						64.0%

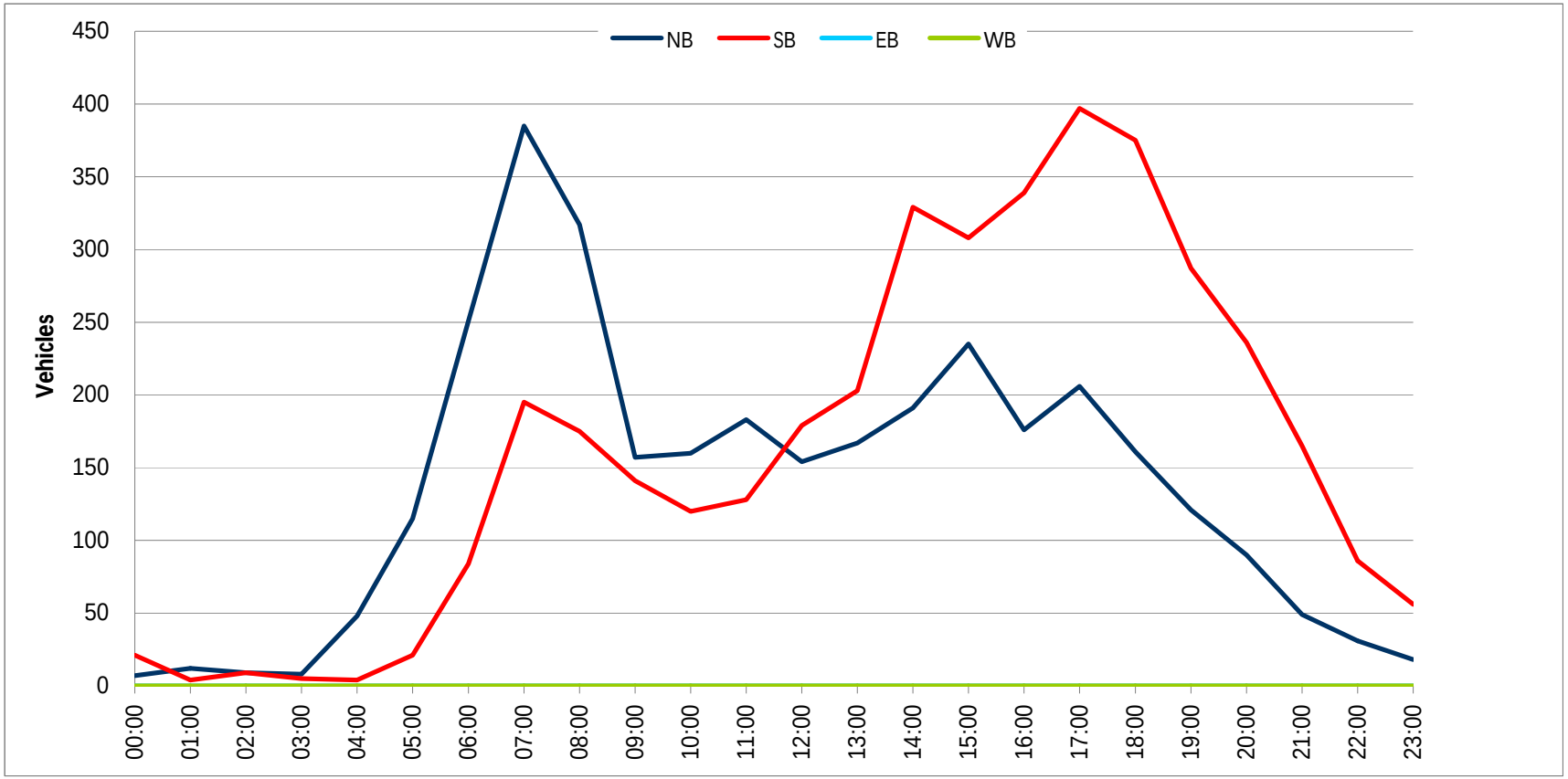
DAILY TOTALS	NB	SB	EB	WB	Total
	3,251	3,867	0	0	7,118

AM Peak Hour	06:45	07:30			06:45	PM Peak Hour	14:15	17:15			17:00
AM Pk Volume	413	211			605	PM Pk Volume	245	398			603
Pk Hr Factor	0.782	0.851			0.840	Pk Hr Factor	0.631	0.896			0.919
7 - 9 Volume	702	370	0	0	1072	4 - 6 Volume	382	736	0	0	1118
7 - 9 Peak Hour	07:00	07:30			07:00	4 - 6 Peak Hour	17:00	17:00			17:00
7 - 9 Pk Volume	385	211	0	0	580	4 - 6 Pk Volume	206	397	0	0	603
Pk Hr Factor	0.729	0.851	0.000	0.000	0.806	Pk Hr Factor	0.954	0.894	0.000	0.000	0.919

Prepared by NDS/ATD

Project #: CA12_6151_034 **City:** Chino Hills

Location: Eucalyptus Ave from Ridgeview Dr to Chino **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Eucalyptus Ave from Chino Hills Pkwy to Galloping Hills Rd

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_033

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,956	4,206	8,162

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			1		3		4		12:00			43		56		99	
00:15			4		2		6		12:15			45		53		98	
00:30			2		5		7		12:30			50		57		107	
00:45			2	9	2	12	4	21	12:45			40	178	57	223	97	401
01:00			1		1		2		13:00			59		39		98	
01:15			5		1		6		13:15			49		73		122	
01:30			1		2		3		13:30			51		55		106	
01:45			2	9	1	5	3	14	13:45			54	213	61	228	115	441
02:00			7		3		10		14:00			68		54		122	
02:15			1		2		3		14:15			86		99		185	
02:30			1		1		2		14:30			73		132		205	
02:45			1	10	1	7	2	17	14:45			63	290	94	379	157	669
03:00			3		4		7		15:00			109		66		175	
03:15			3		3		6		15:15			91		58		149	
03:30			0		1		1		15:30			48		87		135	
03:45			2	8	2	10	4	18	15:45			71	319	61	272	132	591
04:00			3		4		7		16:00			66		72		138	
04:15			5		4		9		16:15			98		70		168	
04:30			9		1		10		16:30			62		106		168	
04:45			13	30	1	10	14	40	16:45			72	298	113	361	185	659
05:00			12		8		20		17:00			99		91		190	
05:15			7		8		15		17:15			92		85		177	
05:30			12		13		25		17:30			90		108		198	
05:45			13	44	29	58	42	102	17:45			97	378	81	365	178	743
06:00			26		33		59		18:00			70		76		146	
06:15			48		43		91		18:15			74		79		153	
06:30			33		58		91		18:30			91		87		178	
06:45			115	222	64	198	179	420	18:45			99	334	71	313	170	647
07:00			154		99		253		19:00			64		73		137	
07:15			53		127		180		19:15			62		70		132	
07:30			61		84		145		19:30			48		58		106	
07:45			69	337	46	356	115	693	19:45			40	214	60	261	100	475
08:00			76		64		140		20:00			27		63		90	
08:15			90		34		124		20:15			29		63		92	
08:30			52		58		110		20:30			17		62		79	
08:45			60	278	52	208	112	486	20:45			24	97	47	235	71	332
09:00			60		38		98		21:00			24		44		68	
09:15			46		31		77		21:15			21		50		71	
09:30			40		36		76		21:30			13		23		36	
09:45			42	188	39	144	81	332	21:45			11	69	28	145	39	214
10:00			39		30		69		22:00			18		28		46	
10:15			40		39		79		22:15			11		22		33	
10:30			43		37		80		22:30			8		16		24	
10:45			57	179	44	150	101	329	22:45			7	44	15	81	22	125
11:00			40		40		80		23:00			8		10		18	
11:15			58		36		94		23:15			3		5		8	
11:30			55		47		102		23:30			4		6		10	
11:45			35	188	34	157	69	345	23:45			5	20	7	28	12	48
TOTALS				1502		1315		2817	TOTALS				2454		2891		5345
SPLIT %				53.3%		46.7%		34.5%	SPLIT %				45.9%		54.1%		65.5%

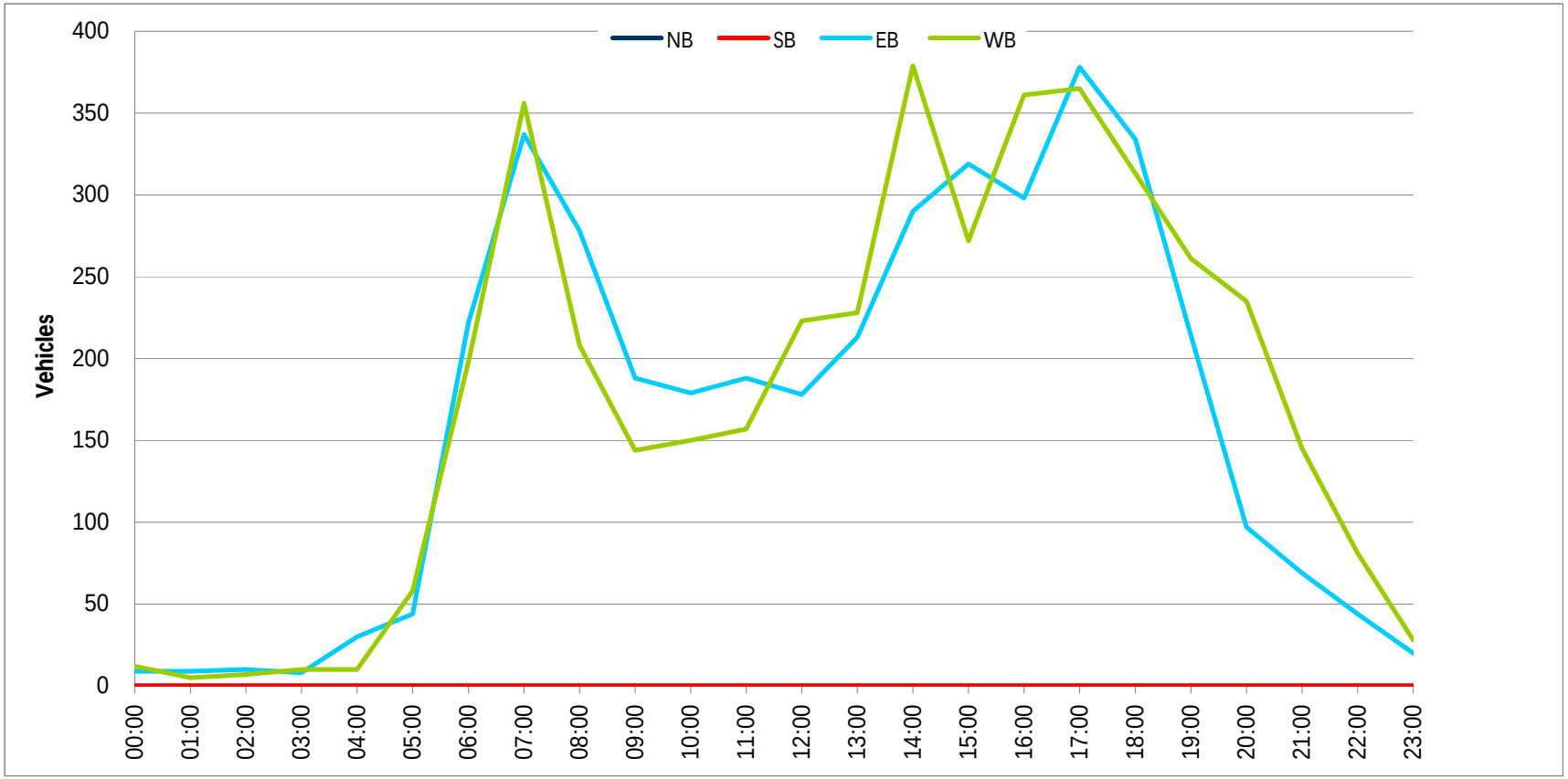
DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,956	4,206	8,162

AM Peak Hour			06:45	06:45	06:45	PM Peak Hour			17:00	16:45	16:45
AM Pk Volume			383	374	757	PM Pk Volume			378	397	750
Pk Hr Factor			0.622	0.736	0.748	Pk Hr Factor			0.955	0.878	0.947
7 - 9 Volume	0	0	615	564	1179	4 - 6 Volume	0	0	676	726	1402
7 - 9 Peak Hour			07:00	07:00	07:00	4 - 6 Peak Hour			17:00	16:45	16:45
7 - 9 Pk Volume	0	0	337	356	693	4 - 6 Pk Volume	0	0	378	397	750
Pk Hr Factor	0.000	0.000	0.547	0.701	0.685	Pk Hr Factor	0.000	0.000	0.955	0.878	0.947

Prepared by NDS/ATD

Project #: CA12_6151_033 **City:** Chino Hills

Location: Eucalyptus Ave from Chino Hills Pkwy to **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Eucalyptus Ave from Peyton Dr to Pipeline Ave

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_032

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	5,222	6,006	11,228

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			2		3		5		12:00			71		90		161	
00:15			3		2		5		12:15			86		93		179	
00:30			3		4		7		12:30			68		89		157	
00:45			2	10	3	12	5	22	12:45			68	293	81	353	149	646
01:00			3		2		5		13:00			72		82		154	
01:15			2		2		4		13:15			88		102		190	
01:30			0		1		1		13:30			70		98		168	
01:45			2	7	2	7	4	14	13:45			67	297	98	380	165	677
02:00			3		2		5		14:00			66		101		167	
02:15			1		2		3		14:15			88		123		211	
02:30			1		1		2		14:30			85		114		199	
02:45			0	5	1	6	1	11	14:45			88	327	115	453	203	780
03:00			1		1		2		15:00			112		109		221	
03:15			1		1		2		15:15			150		114		264	
03:30			1		2		3		15:30			148		110		258	
03:45			3	6	1	5	4	11	15:45			101	511	108	441	209	952
04:00			3		4		7		16:00			100		120		220	
04:15			8		4		12		16:15			114		123		237	
04:30			4		1		5		16:30			105		133		238	
04:45			11	26	3	12	14	38	16:45			117	436	176	552	293	988
05:00			10		10		20		17:00			145		127		272	
05:15			13		10		23		17:15			128		151		279	
05:30			15		19		34		17:30			137		155		292	
05:45			12	50	48	87	60	137	17:45			151	561	145	578	296	1139
06:00			25		57		82		18:00			111		131		242	
06:15			22		85		107		18:15			111		124		235	
06:30			30		65		95		18:30			101		128		229	
06:45			24	101	93	300	117	401	18:45			111	434	127	510	238	944
07:00			38		142		180		19:00			132		108		240	
07:15			46		117		163		19:15			118		84		202	
07:30			73		56		129		19:30			63		76		139	
07:45			74	231	79	394	153	625	19:45			87	400	72	340	159	740
08:00			61		76		137		20:00			74		70		144	
08:15			94		106		200		20:15			67		70		137	
08:30			120		86		206		20:30			63		64		127	
08:45			86	361	66	334	152	695	20:45			50	254	56	260	106	514
09:00			61		53		114		21:00			24		49		73	
09:15			50		60		110		21:15			24		38		62	
09:30			52		52		104		21:30			32		20		52	
09:45			43	206	61	226	104	432	21:45			15	95	38	145	53	240
10:00			55		58		113		22:00			11		23		34	
10:15			61		66		127		22:15			17		15		32	
10:30			60		56		116		22:30			6		15		21	
10:45			79	255	60	240	139	495	22:45			12	46	14	67	26	113
11:00			64		56		120		23:00			8		10		18	
11:15			63		57		120		23:15			13		7		20	
11:30			70		77		147		23:30			7		9		16	
11:45			81	278	82	272	163	550	23:45			4	32	6	32	10	64
TOTALS				1536		1895		3431	TOTALS				3686		4111		7797
SPLIT %				44.8%		55.2%		30.6%	SPLIT %				47.3%		52.7%		69.4%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	5,222	6,006	11,228

AM Peak Hour			08:00	06:30	07:45	PM Peak Hour			17:00	16:45	17:00
AM Pk Volume			361	417	696	PM Pk Volume			561	609	1139
Pk Hr Factor			0.752	0.734	0.845	Pk Hr Factor			0.929	0.865	0.962
7 - 9 Volume	0	0	592	728	1320	4 - 6 Volume	0	0	997	1130	2127
7 - 9 Peak Hour			08:00	07:00	07:45	4 - 6 Peak Hour			17:00	16:45	17:00
7 - 9 Pk Volume	0	0	361	394	696	4 - 6 Pk Volume	0	0	561	609	1139
Pk Hr Factor	0.000	0.000	0.752	0.694	0.845	Pk Hr Factor	0.000	0.000	0.929	0.865	0.962

Prepared by NDS/ATD

Project #: CA12_6151_032 **City:** Chino Hills

Location: Eucalyptus Ave from Peyton Dr to Pipeline **Date:** 11/27/2012

Prepared by NDS/ATD

VOLUME

Founders Dr from Grand Ave to Chino Hills Pkwy

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_026

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	2,489	2,131	4,620

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			3		1		4		12:00			18		16		34	
00:15			5		5		10		12:15			35		22		57	
00:30			4		0		4		12:30			24		24		48	
00:45			1	13	0	6	1	19	12:45			22	99	25	87	47	186
01:00			2		0		2		13:00			29		22		51	
01:15			5		0		5		13:15			34		28		62	
01:30			2		0		2		13:30			37		22		59	
01:45			3	12	1	1	4	13	13:45			34	134	18	90	52	224
02:00			2		0		2		14:00			30		17		47	
02:15			3		0		3		14:15			45		26		71	
02:30			1		0		1		14:30			47		23		70	
02:45			1	7	1	1	2	8	14:45			45	167	30	96	75	263
03:00			2		2		4		15:00			51		30		81	
03:15			2		2		4		15:15			46		42		88	
03:30			0		5		5		15:30			45		25		70	
03:45			2	6	2	11	4	17	15:45			51	193	21	118	72	311
04:00			3		5		8		16:00			60		18		78	
04:15			0		3		3		16:15			83		27		110	
04:30			2		6		8		16:30			49		25		74	
04:45			3	8	29	43	32	51	16:45			73	265	28	98	101	363
05:00			2		39		41		17:00			82		10		92	
05:15			2		34		36		17:15			88		29		117	
05:30			1		43		44		17:30			90		20		110	
05:45			5	10	42	158	47	168	17:45			64	324	31	90	95	414
06:00			7		54		61		18:00			66		29		95	
06:15			11		49		60		18:15			76		13		89	
06:30			10		65		75		18:30			69		24		93	
06:45			12	40	39	207	51	247	18:45			54	265	37	103	91	368
07:00			26		79		105		19:00			62		21		83	
07:15			15		50		65		19:15			48		19		67	
07:30			26		41		67		19:30			44		9		53	
07:45			23	90	68	238	91	328	19:45			39	193	14	63	53	256
08:00			34		52		86		20:00			42		17		59	
08:15			25		51		76		20:15			27		16		43	
08:30			14		63		77		20:30			29		11		40	
08:45			19	92	63	229	82	321	20:45			29	127	9	53	38	180
09:00			27		44		71		21:00			26		11		37	
09:15			19		38		57		21:15			31		7		38	
09:30			17		27		44		21:30			19		10		29	
09:45			14	77	33	142	47	219	21:45			21	97	11	39	32	136
10:00			16		30		46		22:00			16		3		19	
10:15			16		37		53		22:15			21		4		25	
10:30			17		30		47		22:30			15		8		23	
10:45			12	61	25	122	37	183	22:45			6	58	3	18	9	76
11:00			26		31		57		23:00			9		1		10	
11:15			24		30		54		23:15			8		2		10	
11:30			39		30		69		23:30			9		0		9	
11:45			30	119	23	114	53	233	23:45			6	32	1	4	7	36
TOTALS				535		1272		1807	TOTALS				1954		859		2813
SPLIT %				29.6%		70.4%		39.1%	SPLIT %				69.5%		30.5%		60.9%

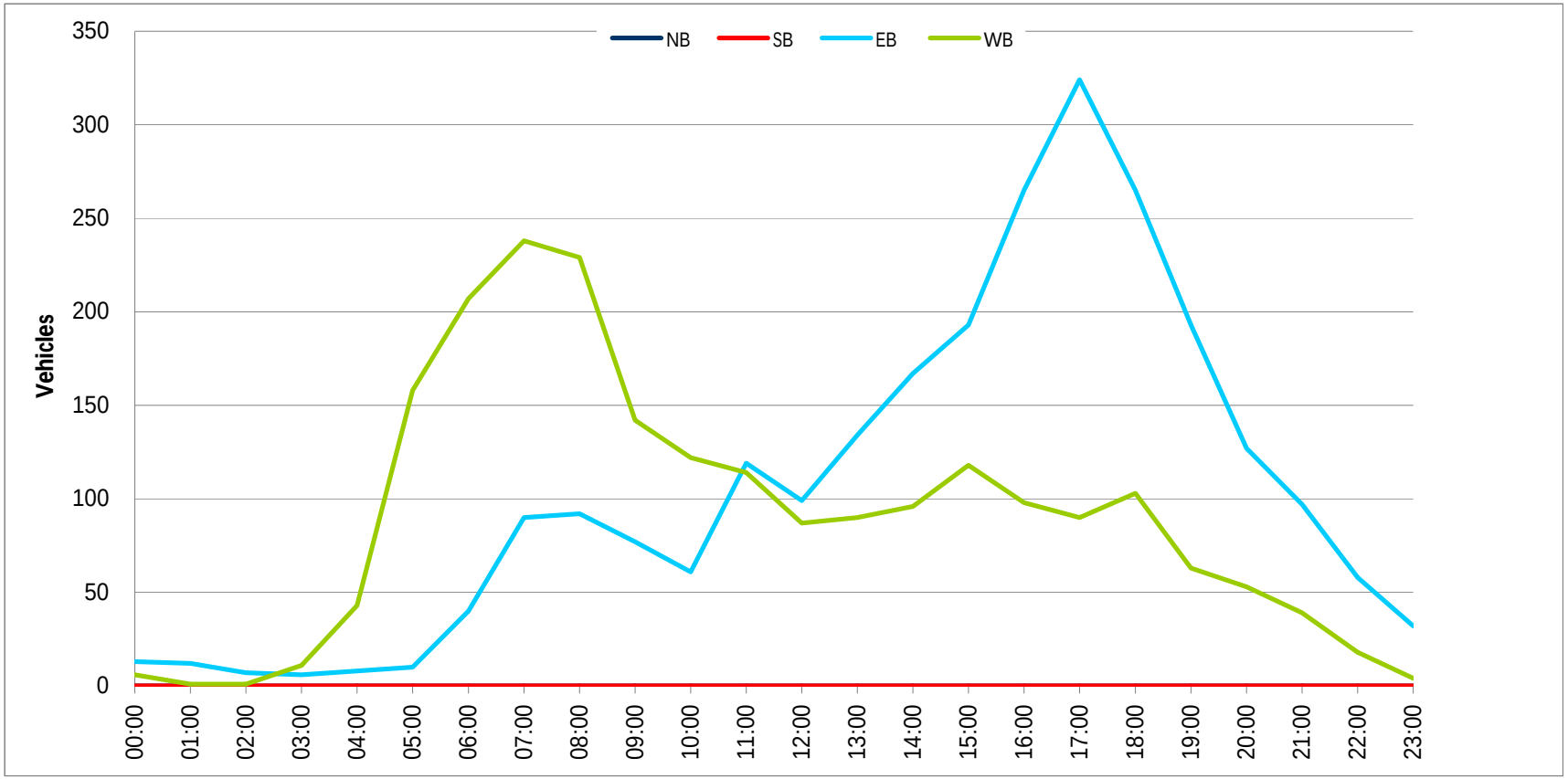
DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	2,489	2,131	4,620

AM Peak Hour			11:30	07:00	07:45	PM Peak Hour			16:45	14:45	16:45
AM Pk Volume			122	238	330	PM Pk Volume			333	127	420
Pk Hr Factor			0.782	0.753	0.907	Pk Hr Factor			0.925	0.756	0.897
7 - 9 Volume	0	0	182	467	649	4 - 6 Volume	0	0	589	188	777
7 - 9 Peak Hour			07:30	07:00	07:45	4 - 6 Peak Hour			16:45	16:00	16:45
7 - 9 Pk Volume	0	0	108	238	330	4 - 6 Pk Volume	0	0	333	98	420
Pk Hr Factor	0.000	0.000	0.794	0.753	0.907	Pk Hr Factor	0.000	0.000	0.925	0.875	0.897

Prepared by NDS/ATD

Project #: CA12_6151_026 **City:** Chino Hills

Location: Founders Dr from Grand Ave to Chino Hills **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Frost Ave from Peyton Dr to Chino Hills Pkwy

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_037

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	1,170	1,318	2,488

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			0		2		2		12:00			12		17		29	
00:15			1		2		3		12:15			15		15		30	
00:30			0		0		0		12:30			12		10		22	
00:45			0	1	1	5	1	6	12:45			13	52	15	57	28	109
01:00			0		2		2		13:00			9		9		18	
01:15			0		2		2		13:15			5		15		20	
01:30			0		2		2		13:30			9		23		32	
01:45			0		0	6	0	6	13:45			14	37	18	65	32	102
02:00			1		1		2		14:00			22		21		43	
02:15			0		0		0		14:15			10		26		36	
02:30			4		2		6		14:30			25		20		45	
02:45			0	5	0	3	0	8	14:45			10	67	18	85	28	152
03:00			1		0		1		15:00			25		38		63	
03:15			0		1		1		15:15			30		51		81	
03:30			1		0		1		15:30			44		32		76	
03:45			1	3	0	1	1	4	15:45			22	121	27	148	49	269
04:00			1		1		2		16:00			11		24		35	
04:15			3		1		4		16:15			14		26		40	
04:30			5		2		7		16:30			8		23		31	
04:45			7	16	0	4	7	20	16:45			21	54	38	111	59	165
05:00			1		0		1		17:00			15		27		42	
05:15			8		3		11		17:15			18		31		49	
05:30			12		2		14		17:30			14		32		46	
05:45			11	32	4	9	15	41	17:45			13	60	39	129	52	189
06:00			18		2		20		18:00			25		38		63	
06:15			13		2		15		18:15			27		37		64	
06:30			26		8		34		18:30			14		12		26	
06:45			37	94	9	21	46	115	18:45			17	83	28	115	45	198
07:00			39		5		44		19:00			4		30		34	
07:15			39		10		49		19:15			4		27		31	
07:30			48		23		71		19:30			9		29		38	
07:45			31	157	10	48	41	205	19:45			12	29	16	102	28	131
08:00			20		11		31		20:00			8		16		24	
08:15			36		16		52		20:15			11		16		27	
08:30			26		23		49		20:30			9		21		30	
08:45			17	99	7	57	24	156	20:45			6	34	22	75	28	109
09:00			19		6		25		21:00			8		13		21	
09:15			11		18		29		21:15			6		13		19	
09:30			15		6		21		21:30			10		22		32	
09:45			16	61	12	42	28	103	21:45			3	27	21	69	24	96
10:00			12		10		22		22:00			5		13		18	
10:15			15		12		27		22:15			3		13		16	
10:30			15		14		29		22:30			4		10		14	
10:45			18	60	20	56	38	116	22:45			1	13	2	38	3	51
11:00			11		13		24		23:00			3		7		10	
11:15			15		11		26		23:15			3		5		8	
11:30			10		19		29		23:30			1		4		5	
11:45			21	57	8	51	29	108	23:45			1	8	5	21	6	29
TOTALS				585		303		888	TOTALS				585		1015		1600
SPLIT %				65.9%		34.1%		35.7%	SPLIT %				36.6%		63.4%		64.3%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	1,170	1,318	2,488

AM Peak Hour			06:45	10:45	06:45	PM Peak Hour			15:00	15:00	15:00
AM Pk Volume			163	63	210	PM Pk Volume			121	148	269
Pk Hr Factor			0.849	0.788	0.739	Pk Hr Factor			0.688	0.725	0.830
7 - 9 Volume	0	0	256	105	361	4 - 6 Volume	0	0	114	240	354
7 - 9 Peak Hour			07:00	07:30	07:00	4 - 6 Peak Hour			16:45	17:00	16:45
7 - 9 Pk Volume	0	0	157	60	205	4 - 6 Pk Volume	0	0	68	129	196
Pk Hr Factor	0.000	0.000	0.818	0.652	0.722	Pk Hr Factor	0.000	0.000	0.810	0.827	0.831

Prepared by NDS/ATD

Project #: CA12_6151_037 **City:** Chino Hills

Location: Frost Ave from Peyton Dr to Chino Hills **Date:** 11/27/2012

Prepared by NDS/ATD

VOLUME

Peyton Dr w/o SR-71 Off-Ramp

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_043

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	11,219	7,744	18,963

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			17		20		37		12:00			158		138		296	
00:15			23		15		38		12:15			198		147		345	
00:30			16		5		21		12:30			184		124		308	
00:45			9	65	9	49	18	114	12:45			192	732	132	541	324	1273
01:00			15		9		24		13:00			190		132		322	
01:15			11		8		19		13:15			180		138		318	
01:30			15		4		19		13:30			204		125		329	
01:45			5	46	8	29	13	75	13:45			214	788	122	517	336	1305
02:00			3		3		6		14:00			200		157		357	
02:15			8		13		21		14:15			223		122		345	
02:30			5		3		8		14:30			212		129		341	
02:45			9	25	9	28	18	53	14:45			183	818	143	551	326	1369
03:00			3		4		7		15:00			206		150		356	
03:15			5		2		7		15:15			230		141		371	
03:30			7		6		13		15:30			190		140		330	
03:45			6	21	7	19	13	40	15:45			210	836	162	593	372	1429
04:00			13		6		19		16:00			197		165		362	
04:15			22		4		26		16:15			224		162		386	
04:30			23		8		31		16:30			194		156		350	
04:45			24	82	15	33	39	115	16:45			217	832	158	641	375	1473
05:00			35		11		46		17:00			232		167		399	
05:15			25		20		45		17:15			200		179		379	
05:30			36		24		60		17:30			236		185		421	
05:45			41	137	37	92	78	229	17:45			195	863	162	693	357	1556
06:00			49		42		91		18:00			175		161		336	
06:15			88		38		126		18:15			183		154		337	
06:30			104		49		153		18:30			190		140		330	
06:45			114	355	58	187	172	542	18:45			165	713	128	583	293	1296
07:00			141		71		212		19:00			156		113		269	
07:15			161		77		238		19:15			170		108		278	
07:30			180		73		253		19:30			150		98		248	
07:45			207	689	106	327	313	1016	19:45			110	586	93	412	203	998
08:00			202		110		312		20:00			124		89		213	
08:15			183		91		274		20:15			138		72		210	
08:30			177		83		260		20:30			115		59		174	
08:45			170	732	92	376	262	1108	20:45			80	457	55	275	135	732
09:00			162		96		258		21:00			87		59		146	
09:15			140		102		242		21:15			73		56		129	
09:30			153		95		248		21:30			60		44		104	
09:45			146	601	100	393	246	994	21:45			63	283	45	204	108	487
10:00			136		112		248		22:00			64		34		98	
10:15			149		116		265		22:15			44		37		81	
10:30			150		119		269		22:30			47		24		71	
10:45			151	586	122	469	273	1055	22:45			24	179	19	114	43	293
11:00			142		143		285		23:00			25		22		47	
11:15			167		119		286		23:15			26		22		48	
11:30			194		152		346		23:30			18		14		32	
11:45			202	705	129	543	331	1248	23:45			19	88	17	75	36	163
TOTALS				4044		2545		6589	TOTALS				7175		5199		12374
SPLIT %				61.4%		38.6%		34.7%	SPLIT %				58.0%		42.0%		65.3%

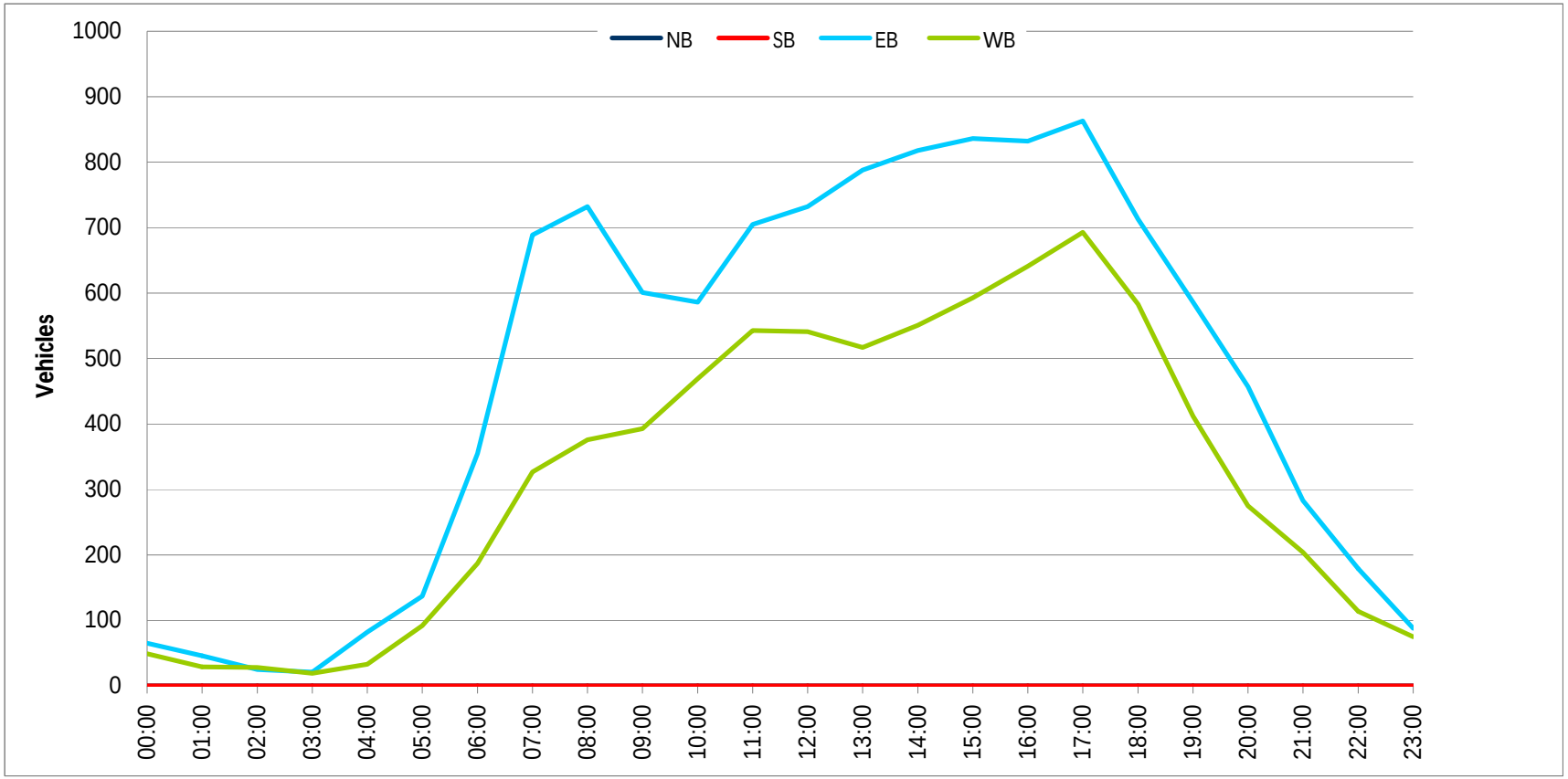
DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	11,219	7,744	18,963

AM Peak Hour			07:30	11:30	11:30	PM Peak Hour			16:45	17:00	16:45
AM Pk Volume			772	566	1318	PM Pk Volume			885	693	1574
Pk Hr Factor			0.932	0.931	0.952	Pk Hr Factor			0.938	0.936	0.935
7 - 9 Volume	0	0	1421	703	2124	4 - 6 Volume	0	0	1695	1334	3029
7 - 9 Peak Hour			07:30	07:45	07:45	4 - 6 Peak Hour			16:45	17:00	16:45
7 - 9 Pk Volume	0	0	772	390	1159	4 - 6 Pk Volume	0	0	885	693	1574
Pk Hr Factor	0.000	0.000	0.932	0.886	0.926	Pk Hr Factor	0.000	0.000	0.938	0.936	0.935

Prepared by NDS/ATD

Project #: CA12_6151_043 **City:** Chino Hills

Location: Peyton Dr w/o SR-71 Off-Ramp **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Peyton Dr from Chino Ave to SR-71

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_038

DAILY TOTALS	NB	SB	EB	WB	Total
	11,852	12,729	0	0	24,581

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	7		10						17		12:00	261		238						499	
00:15	11		14						25		12:15	223		248						471	
00:30	10		13						23		12:30	224		237						461	
00:45	4	32	4	41					8	73	12:45	232	940	221	944					453	1884
01:00	2		11						13		13:00	234		214						448	
01:15	1		5						6		13:15	244		216						460	
01:30	4		6						10		13:30	225		256						481	
01:45	3	10	4	26					7	36	13:45	214	917	250	936					464	1853
02:00	4		8						12		14:00	216		273						489	
02:15	2		2						4		14:15	215		249						464	
02:30	4		3						7		14:30	240		262						502	
02:45	1	11	1	14					2	25	14:45	240	911	268	1052					508	1963
03:00	5		3						8		15:00	277		260						537	
03:15	3		1						4		15:15	280		236						516	
03:30	10		1						11		15:30	226		263						489	
03:45	5	23	7	12					12	35	15:45	233	1016	288	1047					521	2063
04:00	7		3						10		16:00	254		249						503	
04:15	11		9						20		16:15	219		275						494	
04:30	10		10						20		16:30	254		286						540	
04:45	11	39	12	34					23	73	16:45	226	953	299	1109					525	2062
05:00	23		14						37		17:00	258		286						544	
05:15	24		31						55		17:15	263		325						588	
05:30	31		36						67		17:30	217		306						523	
05:45	47	125	47	128					94	253	17:45	241	979	281	1198					522	2177
06:00	47		81						128		18:00	220		278						498	
06:15	50		90						140		18:15	193		246						439	
06:30	95		101						196		18:30	199		246						445	
06:45	104	296	116	388					220	684	18:45	185	797	229	999					414	1796
07:00	128		132						260		19:00	182		212						394	
07:15	154		123						277		19:15	167		166						333	
07:30	168		132						300		19:30	148		175						323	
07:45	190	640	158	545					348	1185	19:45	122	619	173	726					295	1345
08:00	170		164						334		20:00	126		160						286	
08:15	170		123						293		20:15	103		140						243	
08:30	145		110						255		20:30	82		110						192	
08:45	140	625	116	513					256	1138	20:45	77	388	104	514					181	902
09:00	134		125						259		21:00	69		95						164	
09:15	128		114						242		21:15	67		72						139	
09:30	142		134						276		21:30	69		69						138	
09:45	175	579	115	488					290	1067	21:45	34	239	45	281					79	520
10:00	168		152						320		22:00	34		55						89	
10:15	183		171						354		22:15	24		35						59	
10:30	210		170						380		22:30	31		23						54	
10:45	186	747	176	669					362	1416	22:45	20	109	25	138					45	247
11:00	187		202						389		23:00	15		26						41	
11:15	189		215						404		23:15	15		23						38	
11:30	204		216						420		23:30	16		17						33	
11:45	220	800	209	842					429	1642	23:45	11	57	19	85					30	142
TOTALS		3927		3700						7627	TOTALS		7925		9029						16954
SPLIT %		51.5%		48.5%						31.0%	SPLIT %		46.7%		53.3%						69.0%

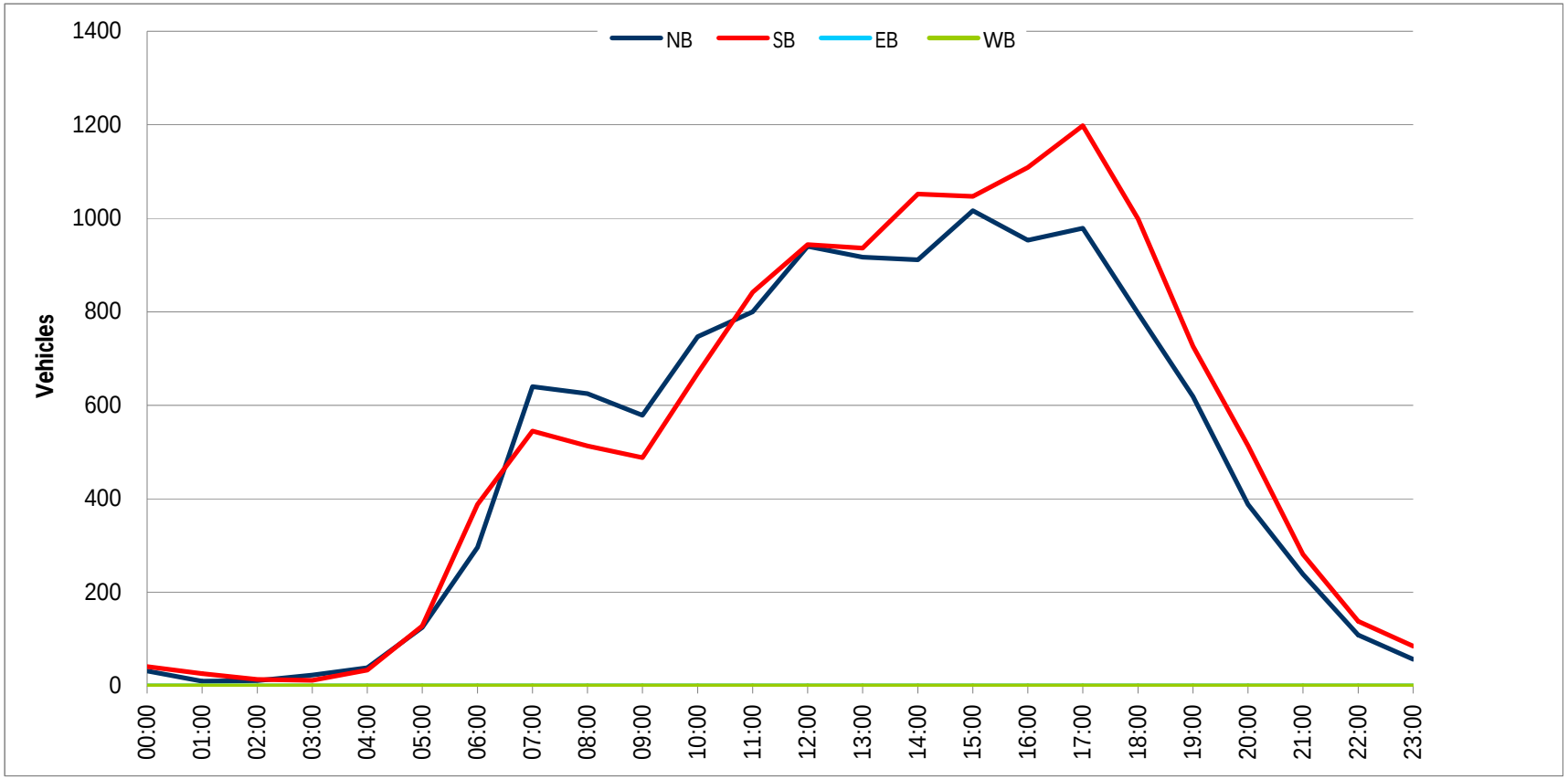
DAILY TOTALS	NB	SB	EB	WB	Total
	11,852	12,729	0	0	24,581

AM Peak Hour	11:45	11:45			11:45	PM Peak Hour	14:30	16:45			16:30
AM Pk Volume	928	932			1860	PM Pk Volume	1037	1216			2197
Pk Hr Factor	0.889	0.940			0.932	Pk Hr Factor	0.926	0.935			0.934
7 - 9 Volume	1265	1058	0	0	2323	4 - 6 Volume	1932	2307	0	0	4239
7 - 9 Peak Hour	07:30	07:15			07:30	4 - 6 Peak Hour	16:30	16:45			16:30
7 - 9 Pk Volume	698	577	0	0	1275	4 - 6 Pk Volume	1001	1216	0	0	2197
Pk Hr Factor	0.918	0.880	0.000	0.000	0.916	Pk Hr Factor	0.952	0.935	0.000	0.000	0.934

Prepared by NDS/ATD

Project #: CA12_6151_038 **City:** Chino Hills

Location: Peyton Dr from Chino Ave to SR-71 **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Peyton Dr from Chino Ave to Bedford Ln

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_042

DAILY TOTALS	NB	SB	EB	WB	Total
	10,996	10,254	0	0	21,250

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	22		26						48		12:00	158		172						330	
00:15	15		15						30		12:15	161		174						335	
00:30	11		13						24		12:30	179		167						346	
00:45	8	56	13	67					21	123	12:45	191	689	143	656					334	1345
01:00	8		6						14		13:00	158		188						346	
01:15	3		8						11		13:15	182		164						346	
01:30	12		4						16		13:30	196		158						354	
01:45	9	32	4	22					13	54	13:45	184	720	208	718					392	1438
02:00	3		6						9		14:00	205		199						404	
02:15	5		9						14		14:15	262		198						460	
02:30	5		1						6		14:30	274		209						483	
02:45	4	17	3	19					7	36	14:45	263	1004	192	798					455	1802
03:00	1		4						5		15:00	209		248						457	
03:15	5		2						7		15:15	246		229						475	
03:30	5		1						6		15:30	170		227						397	
03:45	10	21	4	11					14	32	15:45	205	830	211	915					416	1745
04:00	6		5						11		16:00	205		235						440	
04:15	12		5						17		16:15	225		212						437	
04:30	18		7						25		16:30	214		229						443	
04:45	20	56	14	31					34	87	16:45	221	865	242	918					463	1783
05:00	23		12						35		17:00	297		224						521	
05:15	28		25						53		17:15	233		221						454	
05:30	29		18						47		17:30	226		263						489	
05:45	45	125	40	95					85	220	17:45	231	987	252	960					483	1947
06:00	36		51						87		18:00	221		207						428	
06:15	58		57						115		18:15	182		203						385	
06:30	95		70						165		18:30	219		172						391	
06:45	107	296	104	282					211	578	18:45	166	788	189	771					355	1559
07:00	155		146						301		19:00	166		184						350	
07:15	200		140						340		19:15	190		145						335	
07:30	216		94						310		19:30	131		131						262	
07:45	174	745	101	481					275	1226	19:45	138	625	154	614					292	1239
08:00	170		144						314		20:00	112		121						233	
08:15	132		128						260		20:15	109		91						200	
08:30	155		93						248		20:30	81		110						191	
08:45	153	610	111	476					264	1086	20:45	70	372	81	403					151	775
09:00	121		116						237		21:00	92		63						155	
09:15	116		107						223		21:15	75		70						145	
09:30	138		106						244		21:30	64		58						122	
09:45	121	496	98	427					219	923	21:45	65	296	45	236					110	532
10:00	146		108						254		22:00	37		53						90	
10:15	133		113						246		22:15	32		45						77	
10:30	133		133						266		22:30	29		38						67	
10:45	126	538	128	482					254	1020	22:45	20	118	31	167					51	285
11:00	156		136						292		23:00	22		32						54	
11:15	150		147						297		23:15	14		18						32	
11:30	162		175						337		23:30	12		21						33	
11:45	180	648	157	615					337	1263	23:45	14	62	19	90					33	152
TOTALS		3640		3008						6648	TOTALS		7356		7246						14602
SPLIT %		54.8%		45.2%						31.3%	SPLIT %		50.4%		49.6%						68.7%

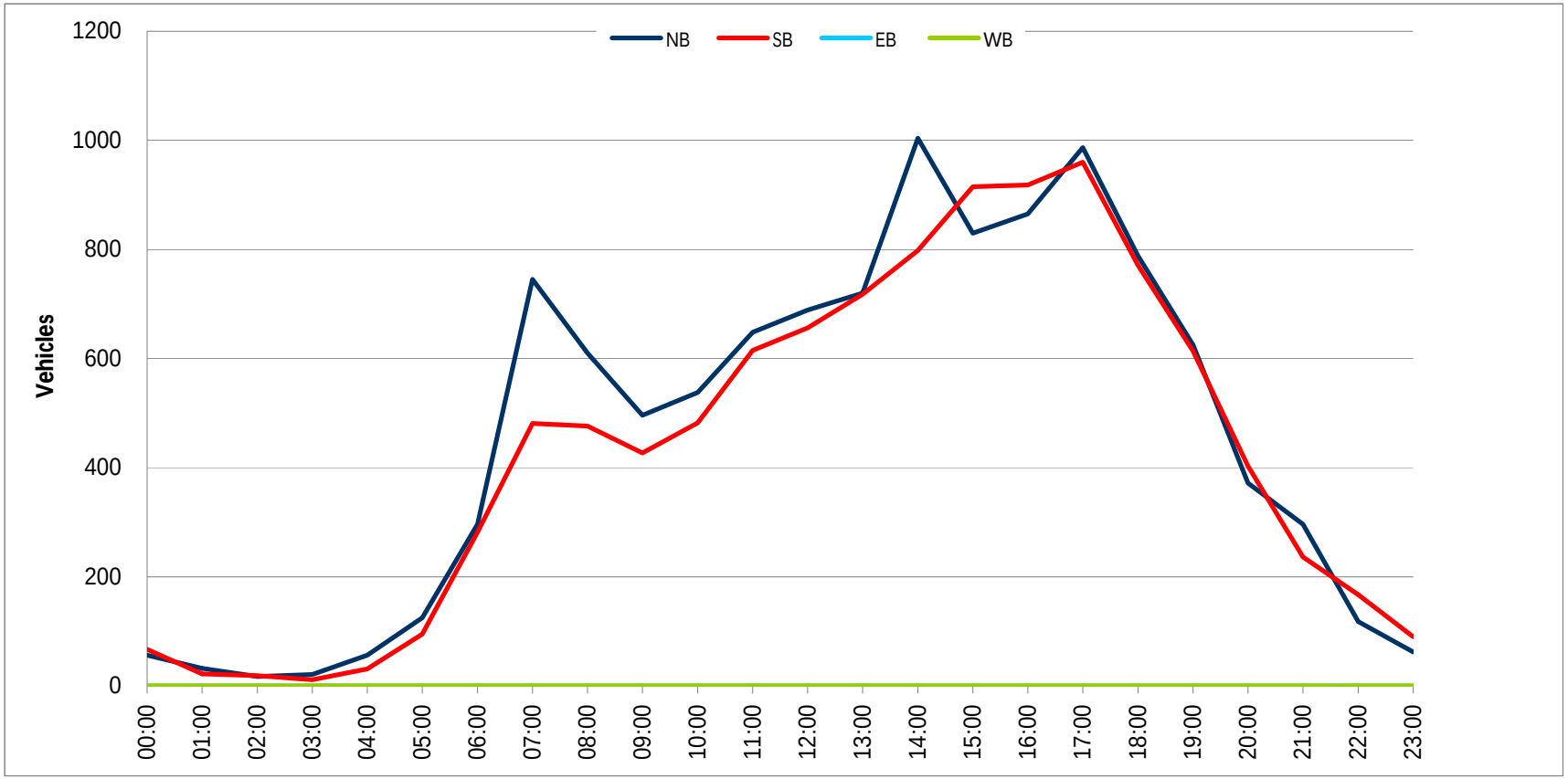
DAILY TOTALS	NB	SB	EB	WB	Total
	10,996	10,254	0	0	21,250

AM Peak Hour	07:15	11:30			11:45	PM Peak Hour	14:15	17:00			17:00
AM Pk Volume	760	678			1348	PM Pk Volume	1008	960			1947
Pk Hr Factor	0.880	0.969			0.974	Pk Hr Factor	0.920	0.913			0.934
7 - 9 Volume	1355	957	0	0	2312	4 - 6 Volume	1852	1878	0	0	3730
7 - 9 Peak Hour	07:15	07:00			07:15	4 - 6 Peak Hour	17:00	17:00			17:00
7 - 9 Pk Volume	760	481	0	0	1239	4 - 6 Pk Volume	987	960	0	0	1947
Pk Hr Factor	0.880	0.824	0.000	0.000	0.911	Pk Hr Factor	0.831	0.913	0.000	0.000	0.934

Prepared by NDS/ATD

Project #: CA12_6151_042 **City:** Chino Hills

Location: Peyton Dr from Chino Ave to Bedford Ln **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Peyton Dr from Eucalyptus Ave to Grand Ave

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_039

DAILY TOTALS	NB	SB	EB	WB	Total
	10,343	10,454	0	0	20,797

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	7		14						21		12:00	169		129						298	
00:15	6		12						18		12:15	151		140						291	
00:30	8		8						16		12:30	170		160						330	
00:45	4	25	5	39					9	64	12:45	150	640	159	588					309	1228
01:00	6		5						11		13:00	156		147						303	
01:15	2		3						5		13:15	236		162						398	
01:30	3		5						8		13:30	187		154						341	
01:45	3	14	2	15					5	29	13:45	170	749	166	629					336	1378
02:00	1		3						4		14:00	198		250						448	
02:15	1		2						3		14:15	304		276						580	
02:30	4		2						6		14:30	291		298						589	
02:45	2	8	0	7					2	15	14:45	207	1000	212	1036					419	2036
03:00	4		1						5		15:00	222		246						468	
03:15	5		1						6		15:15	235		238						473	
03:30	4		2						6		15:30	223		177						400	
03:45	4	17	0	4					4	21	15:45	212	892	182	843					394	1735
04:00	8		2						10		16:00	219		227						446	
04:15	10		2						12		16:15	223		196						419	
04:30	9		0						9		16:30	238		241						479	
04:45	23	50	3	7					26	57	16:45	236	916	254	918					490	1834
05:00	23		6						29		17:00	217		219						436	
05:15	31		16						47		17:15	189		238						427	
05:30	34		26						60		17:30	211		207						418	
05:45	58	146	40	88					98	234	17:45	185	802	215	879					400	1681
06:00	59		54						113		18:00	193		205						398	
06:15	84		112						196		18:15	162		187						349	
06:30	107		131						238		18:30	186		237						423	
06:45	101	351	195	492					296	843	18:45	224	765	208	837					432	1602
07:00	83		288						371		19:00	164		177						341	
07:15	134		261						395		19:15	166		147						313	
07:30	194		148						342		19:30	104		129						233	
07:45	148	559	118	815					266	1374	19:45	94	528	130	583					224	1111
08:00	123		128						251		20:00	108		124						232	
08:15	162		121						283		20:15	82		115						197	
08:30	177		110						287		20:30	64		104						168	
08:45	156	618	76	435					232	1053	20:45	62	316	90	433					152	749
09:00	126		103						229		21:00	51		79						130	
09:15	135		88						223		21:15	59		83						142	
09:30	128		94						222		21:30	51		66						117	
09:45	132	521	74	359					206	880	21:45	29	190	48	276					77	466
10:00	121		94						215		22:00	30		63						93	
10:15	126		99						225		22:15	13		50						63	
10:30	133		90						223		22:30	10		24						34	
10:45	126	506	110	393					236	899	22:45	17	70	25	162					42	232
11:00	121		112						233		23:00	15		19						34	
11:15	150		113						263		23:15	15		22						37	
11:30	179		146						325		23:30	8		23						31	
11:45	164	614	165	536					329	1150	23:45	8	46	16	80					24	126
TOTALS		3429		3190						6619	TOTALS		6914		7264						14178
SPLIT %		51.8%		48.2%						31.8%	SPLIT %		48.8%		51.2%						68.2%

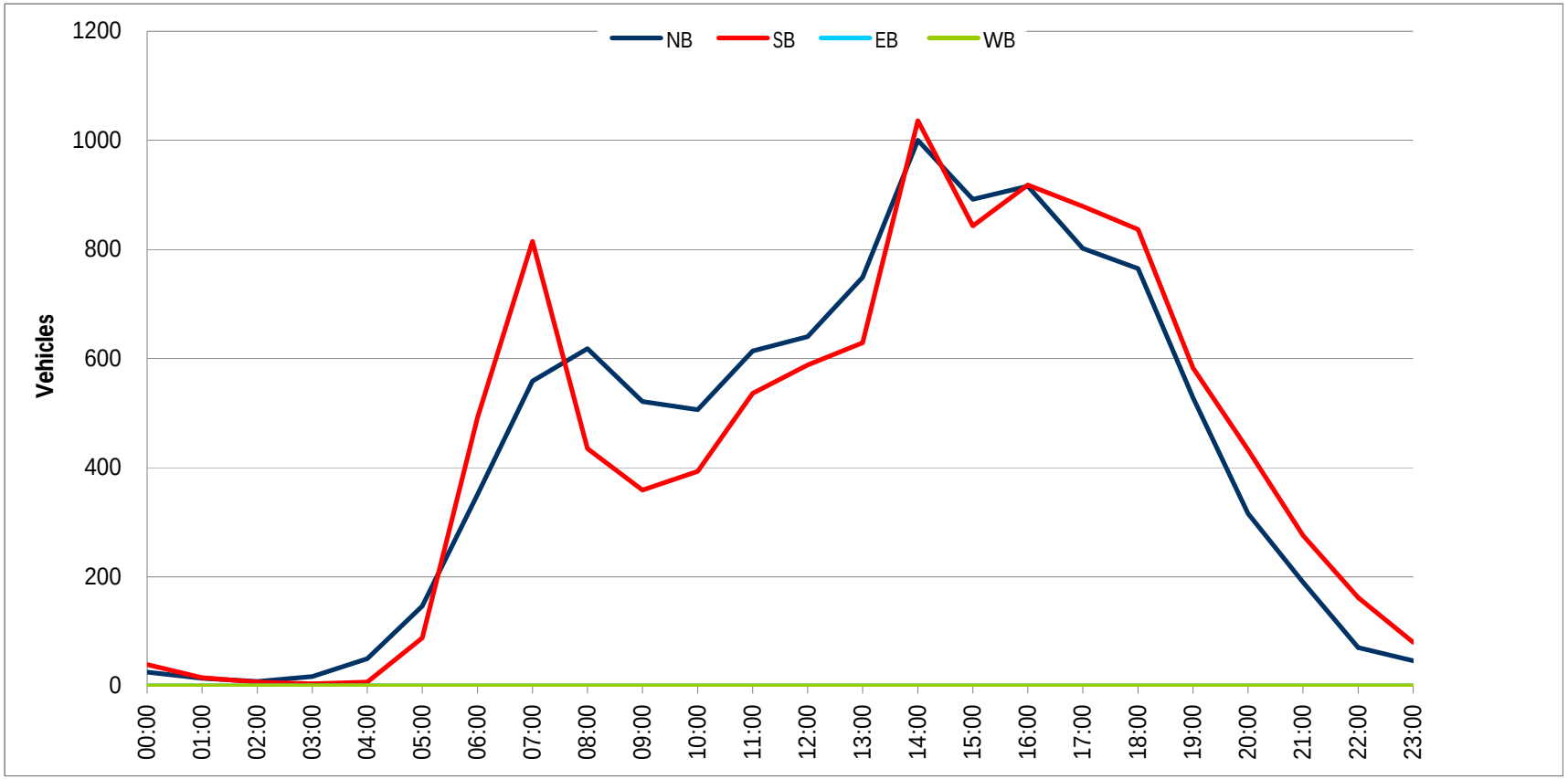
DAILY TOTALS	NB	SB	EB	WB	Total
	10,343	10,454	0	0	20,797

AM Peak Hour	11:30	06:45			06:45	PM Peak Hour	14:15	14:00			14:15
AM Pk Volume	663	892			1404	PM Pk Volume	1024	1036			2056
Pk Hr Factor	0.926	0.774			0.889	Pk Hr Factor	0.842	0.869			0.873
7 - 9 Volume	1177	1250	0	0	2427	4 - 6 Volume	1718	1797	0	0	3515
7 - 9 Peak Hour	07:30	07:00			07:00	4 - 6 Peak Hour	16:00	16:30			16:00
7 - 9 Pk Volume	627	815	0	0	1374	4 - 6 Pk Volume	916	952	0	0	1834
Pk Hr Factor	0.808	0.707	0.000	0.000	0.870	Pk Hr Factor	0.962	0.937	0.000	0.000	0.936

Prepared by NDS/ATD

Project #: CA12_6151_039 **City:** Chino Hills

Location: Peyton Dr from Eucalyptus Ave to Grand **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Peyton Dr from Chino Hills Pkwy to Eucalyptus Ave

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_040

DAILY TOTALS	NB	SB	EB	WB	Total
	6,498	7,000	0	0	13,498

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	5		10						15		12:00	98		102						200	
00:15	3		4						7		12:15	86		92						178	
00:30	3		7						10		12:30	94		101						195	
00:45	5	16	5	26					10	42	12:45	90	368	99	394					189	762
01:00	2		2						4		13:00	84		80						164	
01:15	4		3						7		13:15	86		103						189	
01:30	5		6						11		13:30	89		118						207	
01:45	2	13	4	15					6	28	13:45	111	370	101	402					212	772
02:00	0		1						1		14:00	110		134						244	
02:15	0		3						3		14:15	103		137						240	
02:30	3		4						7		14:30	97		164						261	
02:45	0	3	0	8					0	11	14:45	114	424	137	572					251	996
03:00	1		1						2		15:00	142		144						286	
03:15	2		1						3		15:15	167		151						318	
03:30	2		1						3		15:30	148		148						296	
03:45	5	10	2	5					7	15	15:45	127	584	130	573					257	1157
04:00	5		3						8		16:00	138		140						278	
04:15	10		3						13		16:15	142		114						256	
04:30	7		3						10		16:30	167		155						322	
04:45	16	38	2	11					18	49	16:45	138	585	191	600					329	1185
05:00	13		10						23		17:00	149		151						300	
05:15	22		16						38		17:15	140		155						295	
05:30	23		36						59		17:30	135		149						284	
05:45	43	101	37	99					80	200	17:45	127	551	165	620					292	1171
06:00	42		88						130		18:00	144		140						284	
06:15	52		79						131		18:15	110		150						260	
06:30	57		89						146		18:30	134		142						276	
06:45	115	266	68	324					183	590	18:45	143	531	114	546					257	1077
07:00	144		82						226		19:00	78		134						212	
07:15	143		97						240		19:15	93		93						186	
07:30	140		98						238		19:30	52		107						159	
07:45	93	520	91	368					184	888	19:45	53	276	110	444					163	720
08:00	91		97						188		20:00	43		98						141	
08:15	131		109						240		20:15	41		100						141	
08:30	148		120						268		20:30	44		98						142	
08:45	102	472	65	391					167	863	20:45	28	156	84	380					112	536
09:00	74		66						140		21:00	29		80						109	
09:15	81		63						144		21:15	42		53						95	
09:30	80		53						133		21:30	29		54						83	
09:45	76	311	53	235					129	546	21:45	17	117	44	231					61	348
10:00	66		50						116		22:00	17		42						59	
10:15	82		60						142		22:15	12		47						59	
10:30	80		60						140		22:30	5		17						22	
10:45	96	324	75	245					171	569	22:45	10	44	17	123					27	167
11:00	81		71						152		23:00	10		15						25	
11:15	105		77						182		23:15	9		17						26	
11:30	114		83						197		23:30	6		20						26	
11:45	89	389	95	326					184	715	23:45	4	29	10	62					14	91
TOTALS		2463		2053						4516	TOTALS		4035		4947						8982
SPLIT %		54.5%		45.5%						33.5%	SPLIT %		44.9%		55.1%						66.5%

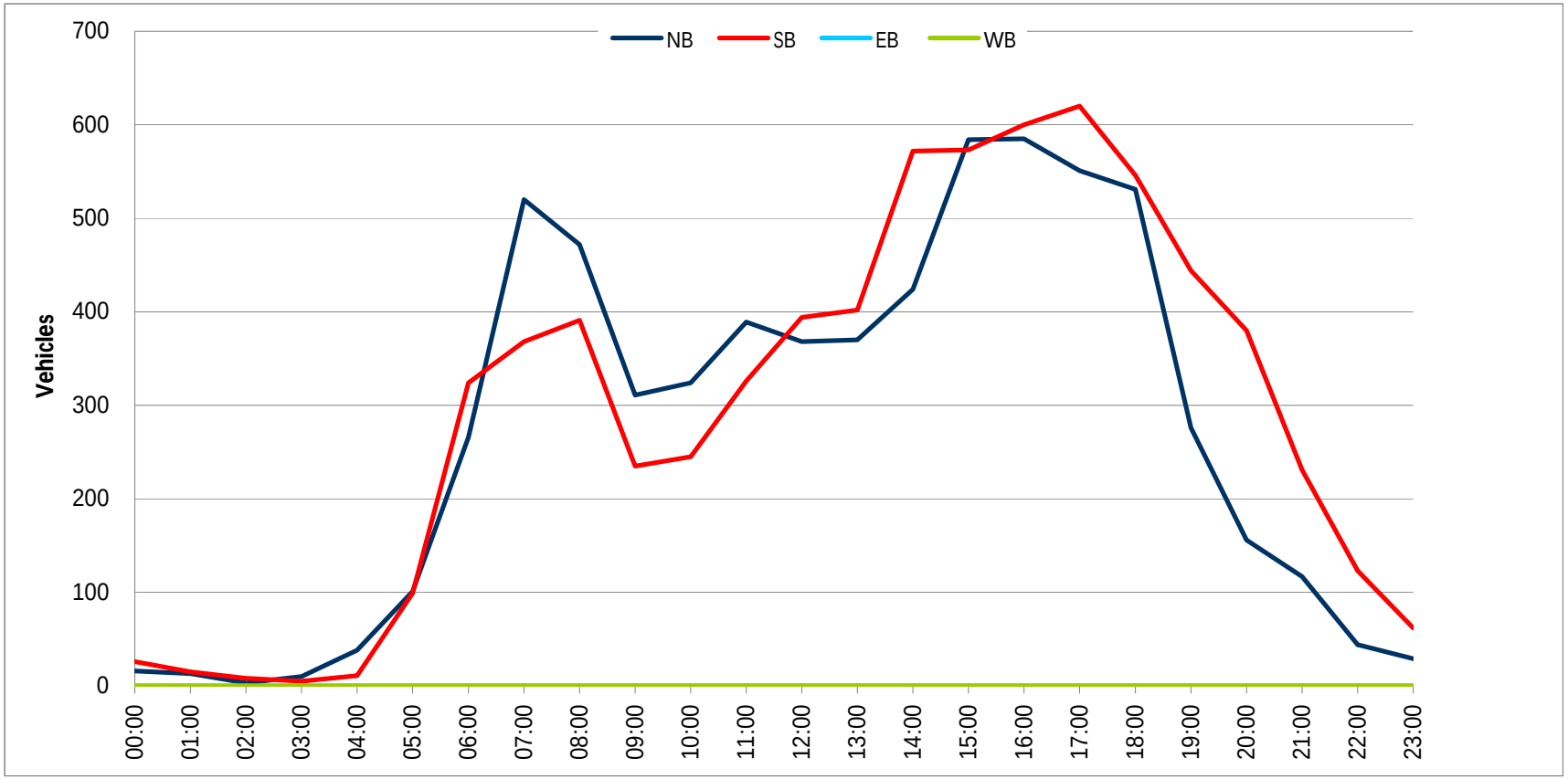
DAILY TOTALS	NB	SB	EB	WB	Total
	6,498	7,000	0	0	13,498

AM Peak Hour	06:45	07:45			07:00	PM Peak Hour	16:15	16:30			16:30
AM Pk Volume	542	417			888	PM Pk Volume	596	652			1246
Pk Hr Factor	0.941	0.869			0.925	Pk Hr Factor	0.892	0.853			0.947
7 - 9 Volume	992	759	0	0	1751	4 - 6 Volume	1136	1220	0	0	2356
7 - 9 Peak Hour	07:00	07:45			07:00	4 - 6 Peak Hour	16:15	16:30			16:30
7 - 9 Pk Volume	520	417	0	0	888	4 - 6 Pk Volume	596	652	0	0	1246
Pk Hr Factor	0.903	0.869	0.000	0.000	0.925	Pk Hr Factor	0.892	0.853	0.000	0.000	0.947

Prepared by NDS/ATD

Project #: CA12_6151_040 **City:** Chino Hills

Location: Peyton Dr from Chino Hills Pkwy to **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Peyton Dr from Bayberry Dr to Autumn Ave

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_041

DAILY TOTALS	NB	SB	EB	WB	Total
	2,179	2,189	0	0	4,368

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	0		2						2		12:00	29		32						61	
00:15	2		2						4		12:15	25		16						41	
00:30	1		3						4		12:30	28		20						48	
00:45	0	3	0	7					0	10	12:45	25	107	31	99					56	206
01:00	1		1						2		13:00	20		15						35	
01:15	1		2						3		13:15	23		20						43	
01:30	2		0						2		13:30	38		21						59	
01:45	0	4	0	3					0	7	13:45	57	138	44	100					101	238
02:00	0		1						1		14:00	38		60						98	
02:15	0		2						2		14:15	36		48						84	
02:30	0		1						1		14:30	56		36						92	
02:45	0		0	4					0	4	14:45	51	181	34	178					85	359
03:00	0		0						0		15:00	59		52						111	
03:15	2		0						2		15:15	52		48						100	
03:30	0		0						0		15:30	41		86						127	
03:45	1	3	2	2					3	5	15:45	37	189	51	237					88	426
04:00	1		1						2		16:00	33		41						74	
04:15	1		3						4		16:15	50		52						102	
04:30	3		1						4		16:30	36		47						83	
04:45	3	8	3	8					6	16	16:45	52	171	44	184					96	355
05:00	8		9						17		17:00	55		36						91	
05:15	8		6						14		17:15	37		40						77	
05:30	5		3						8		17:30	36		36						72	
05:45	17	38	8	26					25	64	17:45	31	159	46	158					77	317
06:00	17		10						27		18:00	33		41						74	
06:15	13		10						23		18:15	35		50						85	
06:30	18		22						40		18:30	41		34						75	
06:45	27	75	56	98					83	173	18:45	26	135	34	159					60	294
07:00	74		77						151		19:00	20		28						48	
07:15	131		66						197		19:15	18		34						52	
07:30	103		59						162		19:30	19		20						39	
07:45	36	344	28	230					64	574	19:45	17	74	19	101					36	175
08:00	37		33						70		20:00	22		17						39	
08:15	66		37						103		20:15	8		27						35	
08:30	51		52						103		20:30	14		14						28	
08:45	20	174	38	160					58	334	20:45	19	63	16	74					35	137
09:00	16		21						37		21:00	18		15						33	
09:15	16		17						33		21:15	14		13						27	
09:30	22		23						45		21:30	8		12						20	
09:45	22	76	27	88					49	164	21:45	5	45	15	55					20	100
10:00	19		17						36		22:00	7		6						13	
10:15	19		22						41		22:15	7		11						18	
10:30	13		17						30		22:30	3		5						8	
10:45	25	76	23	79					48	155	22:45	5	22	7	29					12	51
11:00	20		20						40		23:00	2		8						10	
11:15	19		25						44		23:15	4		7						11	
11:30	22		19						41		23:30	5		5						10	
11:45	21	82	23	87					44	169	23:45	1	12	3	23					4	35
TOTALS		883		792						1675	TOTALS		1296		1397						2693
SPLIT %		52.7%		47.3%						38.3%	SPLIT %		48.1%		51.9%						61.7%

DAILY TOTALS	NB	SB	EB	WB	Total
	2,179	2,189	0	0	4,368

AM Peak Hour	07:00	06:45			06:45	PM Peak Hour	14:30	15:00			15:00
AM Pk Volume	344	258			593	PM Pk Volume	218	237			426
Pk Hr Factor	0.656	0.838			0.753	Pk Hr Factor	0.924	0.689			0.839
7 - 9 Volume	518	390	0	0	908	4 - 6 Volume	330	342	0	0	672
7 - 9 Peak Hour	07:00	07:00			07:00	4 - 6 Peak Hour	16:15	16:00			16:15
7 - 9 Pk Volume	344	230	0	0	574	4 - 6 Pk Volume	193	184	0	0	372
Pk Hr Factor	0.656	0.747	0.000	0.000	0.728	Pk Hr Factor	0.877	0.885	0.000	0.000	0.912

Prepared by NDS/ATD

Project #: CA12_6151_041 **City:** Chino Hills

Location: Peyton Dr from Bayberry Dr to Autumn Ave **Date:** 11/27/2012

Prepared by NDS/ATD

VOLUME

Pipeline Ave from Glen Ridge Dr to Valle Vista Dr

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_045

DAILY TOTALS	NB	SB	EB	WB	Total
	4,618	4,489	0	0	9,107

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	10		9						19		12:00	79		45						124	
00:15	9		10						19		12:15	59		53						112	
00:30	2		5						7		12:30	59		60						119	
00:45	3	24	4	28					7	52	12:45	52	249	73	231					125	480
01:00	1		8						9		13:00	55		76						131	
01:15	4		3						7		13:15	52		58						110	
01:30	5		8						13		13:30	83		51						134	
01:45	1	11	3	22					4	33	13:45	48	238	68	253					116	491
02:00	3		2						5		14:00	83		97						180	
02:15	2		2						4		14:15	67		76						143	
02:30	2		2						4		14:30	80		77						157	
02:45	2	9	1	7					3	16	14:45	106	336	59	309					165	645
03:00	5		1						6		15:00	66		105						171	
03:15	3		1						4		15:15	70		110						180	
03:30	6		0						6		15:30	106		89						195	
03:45	9	23	1	3					10	26	15:45	79	321	91	395					170	716
04:00	6		1						7		16:00	79		99						178	
04:15	14		1						15		16:15	62		97						159	
04:30	17		3						20		16:30	71		79						150	
04:45	20	57	2	7					22	64	16:45	95	307	98	373					193	680
05:00	33		5						38		17:00	75		100						175	
05:15	37		5						42		17:15	85		99						184	
05:30	42		8						50		17:30	73		108						181	
05:45	41	153	6	24					47	177	17:45	76	309	106	413					182	722
06:00	56		12						68		18:00	81		104						185	
06:15	77		16						93		18:15	68		114						182	
06:30	69		18						87		18:30	69		77						146	
06:45	95	297	47	93					142	390	18:45	64	282	94	389					158	671
07:00	94		53						147		19:00	47		87						134	
07:15	109		56						165		19:15	41		103						144	
07:30	99		74						173		19:30	51		71						122	
07:45	105	407	59	242					164	649	19:45	51	190	85	346					136	536
08:00	102		52						154		20:00	46		78						124	
08:15	96		64						160		20:15	31		77						108	
08:30	101		44						145		20:30	30		62						92	
08:45	83	382	45	205					128	587	20:45	20	127	52	269					72	396
09:00	74		54						128		21:00	22		40						62	
09:15	76		41						117		21:15	23		39						62	
09:30	61		36						97		21:30	13		52						65	
09:45	45	256	42	173					87	429	21:45	23	81	47	178					70	259
10:00	60		40						100		22:00	17		31						48	
10:15	52		39						91		22:15	15		35						50	
10:30	56		34						90		22:30	11		19						30	
10:45	64	232	48	161					112	393	22:45	11	54	25	110					36	164
11:00	40		44						84		23:00	7		17						24	
11:15	78		41						119		23:15	8		13						21	
11:30	60		53						113		23:30	8		13						21	
11:45	65	243	63	201					128	444	23:45	7	30	14	57					21	87
TOTALS		2094		1166						3260	TOTALS		2524		3323						5847
SPLIT %		64.2%		35.8%						35.8%	SPLIT %		43.2%		56.8%						64.2%

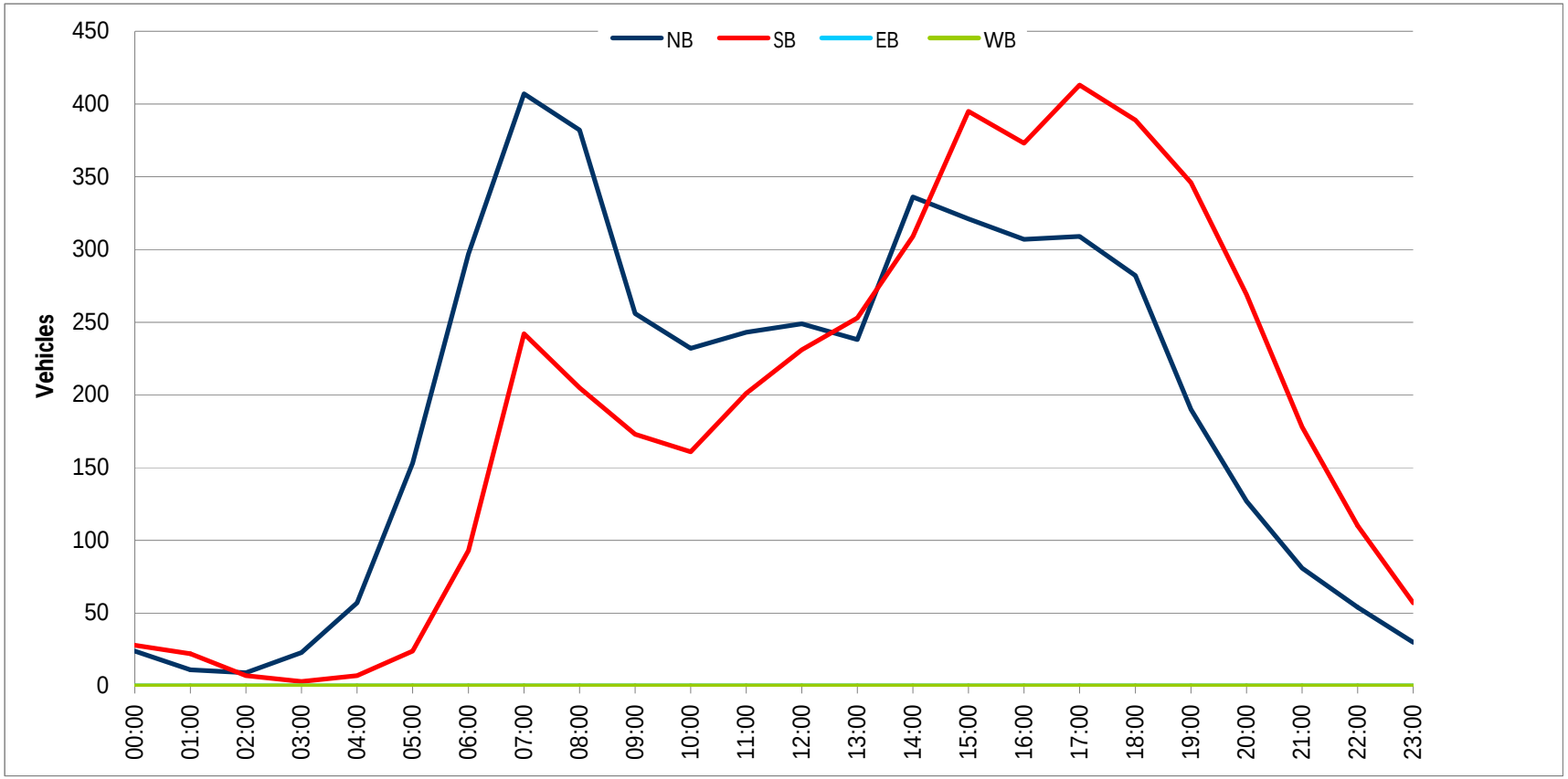
DAILY TOTALS	NB	SB	EB	WB	Total
	4,618	4,489	0	0	9,107

AM Peak Hour	07:15	07:30			07:15	PM Peak Hour	14:45	17:30			16:45
AM Pk Volume	415	249			656	PM Pk Volume	348	432			733
Pk Hr Factor	0.952	0.841			0.948	Pk Hr Factor	0.821	0.947			0.949
7 - 9 Volume	789	447	0	0	1236	4 - 6 Volume	616	786	0	0	1402
7 - 9 Peak Hour	07:15	07:30			07:15	4 - 6 Peak Hour	16:45	17:00			16:45
7 - 9 Pk Volume	415	249	0	0	656	4 - 6 Pk Volume	328	413	0	0	733
Pk Hr Factor	0.952	0.841	0.000	0.000	0.948	Pk Hr Factor	0.863	0.956	0.000	0.000	0.949

Prepared by NDS/ATD

Project #: CA12_6151_045 **City:** Chino Hills

Location: Pipeline Ave from Glen Ridge Dr to Valle **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Pipeline Ave from Valle Vista Dr to Woodview Rd

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_046

DAILY TOTALS	NB	SB	EB	WB	Total
	2,865	2,904	0	0	5,769

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	2		4						6		12:00	45		28						73	
00:15	3		6						9		12:15	33		29						62	
00:30	3		0						3		12:30	34		38						72	
00:45	1	9	1	11					2	20	12:45	27	139	42	137					69	276
01:00	3		4						7		13:00	31		25						56	
01:15	2		2						4		13:15	32		39						71	
01:30	1		0						1		13:30	42		30						72	
01:45	2	8	0	6					2	14	13:45	41	146	64	158					105	304
02:00	2		2						4		14:00	49		94						143	
02:15	2		1						3		14:15	29		59						88	
02:30	0		1						1		14:30	96		69						165	
02:45	1	5	0	4					1	9	14:45	91	265	48	270					139	535
03:00	0		0						0		15:00	51		65						116	
03:15	0		1						1		15:15	51		66						117	
03:30	2		0						2		15:30	80		39						119	
03:45	1	3	1	2					2	5	15:45	61	243	43	213					104	456
04:00	2		2						4		16:00	51		54						105	
04:15	3		6						9		16:15	43		48						91	
04:30	7		0						7		16:30	64		49						113	
04:45	4	16	2	10					6	26	16:45	69	227	53	204					122	431
05:00	11		7						18		17:00	50		54						104	
05:15	12		7						19		17:15	63		59						122	
05:30	13		9						22		17:30	65		74						139	
05:45	15	51	7	30					22	81	17:45	56	234	58	245					114	479
06:00	34		17						51		18:00	58		59						117	
06:15	34		15						49		18:15	50		64						114	
06:30	25		17						42		18:30	46		55						101	
06:45	34	127	61	110					95	237	18:45	46	200	61	239					107	439
07:00	75		115						190		19:00	30		50						80	
07:15	84		69						153		19:15	29		61						90	
07:30	67		71						138		19:30	25		42						67	
07:45	42	268	26	281					68	549	19:45	29	113	39	192					68	305
08:00	36		41						77		20:00	24		32						56	
08:15	73		40						113		20:15	20		40						60	
08:30	57		30						87		20:30	19		33						52	
08:45	43	209	43	154					86	363	20:45	12	75	28	133					40	208
09:00	39		27						66		21:00	10		28						38	
09:15	43		26						69		21:15	16		20						36	
09:30	36		20						56		21:30	12		28						40	
09:45	42	160	32	105					74	265	21:45	13	51	23	99					36	150
10:00	36		28						64		22:00	14		17						31	
10:15	21		22						43		22:15	8		16						24	
10:30	22		27						49		22:30	9		6						15	
10:45	32	111	25	102					57	213	22:45	3	34	11	50					14	84
11:00	38		29						67		23:00	4		8						12	
11:15	35		33						68		23:15	6		10						16	
11:30	41		27						68		23:30	6		7						13	
11:45	36	150	30	119					66	269	23:45	5	21	5	30					10	51
TOTALS		1117		934						2051	TOTALS		1748		1970						3718
SPLIT %		54.5%		45.5%						35.6%	SPLIT %		47.0%		53.0%						64.4%

DAILY TOTALS	NB	SB	EB	WB	Total
	2,865	2,904	0	0	5,769

AM Peak Hour	07:00	06:45			06:45	PM Peak Hour	14:30	13:45			14:30
AM Pk Volume	268	316			576	PM Pk Volume	289	286			537
Pk Hr Factor	0.798	0.687			0.758	Pk Hr Factor	0.753	0.761			0.814
7 - 9 Volume	477	435	0	0	912	4 - 6 Volume	461	449	0	0	910
7 - 9 Peak Hour	07:00	07:00			07:00	4 - 6 Peak Hour	16:45	17:00			16:45
7 - 9 Pk Volume	268	281	0	0	549	4 - 6 Pk Volume	247	245	0	0	487
Pk Hr Factor	0.798	0.611	0.000	0.000	0.722	Pk Hr Factor	0.895	0.828	0.000	0.000	0.876

Prepared by NDS/ATD

Project #: CA12_6151_046 **City:** Chino Hills

Location: Pipeline Ave from Valle Vista Dr to **Date:** 11/27/2012

Prepared by NDS/ATD

VOLUME

Pipeline Ave from Woodview Rd to Winged Foot Way

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_044

DAILY TOTALS	NB	SB	EB	WB	Total
	4,298	4,022	0	0	8,320

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	2		5						7		12:00	53		41						94	
00:15	5		4						9		12:15	46		39						85	
00:30	1		0						1		12:30	52		39						91	
00:45	2	10	1	10					3	20	12:45	36	187	41	160					77	347
01:00	1		5						6		13:00	40		29						69	
01:15	1		1						2		13:15	47		49						96	
01:30	1		0						1		13:30	75		34						109	
01:45	1	4	0	6					1	10	13:45	81	243	96	208					177	451
02:00	3		2						5		14:00	69		151						220	
02:15	2		3						5		14:15	46		99						145	
02:30	0		2						2		14:30	151		83						234	
02:45	0	5	0	7					0	12	14:45	144	410	68	401					212	811
03:00	0		0						0		15:00	85		79						164	
03:15	0		0						0		15:15	81		88						169	
03:30	2		1						3		15:30	100		82						182	
03:45	1	3	2	3					3	6	15:45	80	346	61	310					141	656
04:00	4		4						8		16:00	77		69						146	
04:15	1		9						10		16:15	69		66						135	
04:30	4		2						6		16:30	71		67						138	
04:45	4	13	3	18					7	31	16:45	92	309	71	273					163	582
05:00	11		10						21		17:00	88		79						167	
05:15	11		11						22		17:15	84		93						177	
05:30	17		13						30		17:30	99		101						200	
05:45	29	68	15	49					44	117	17:45	87	358	76	349					163	707
06:00	43		25						68		18:00	79		73						152	
06:15	37		25						62		18:15	89		87						176	
06:30	41		33						74		18:30	63		68						131	
06:45	69	190	110	193					179	383	18:45	70	301	75	303					145	604
07:00	162		201						363		19:00	54		59						113	
07:15	228		124						352		19:15	49		71						120	
07:30	120		124						244		19:30	41		45						86	
07:45	74	584	36	485					110	1069	19:45	44	188	45	220					89	408
08:00	60		73						133		20:00	45		38						83	
08:15	112		61						173		20:15	26		43						69	
08:30	78		56						134		20:30	28		43						71	
08:45	54	304	55	245					109	549	20:45	24	123	34	158					58	281
09:00	47		33						80		21:00	20		30						50	
09:15	43		35						78		21:15	27		23						50	
09:30	48		33						81		21:30	20		24						44	
09:45	51	189	46	147					97	336	21:45	18	85	28	105					46	190
10:00	42		35						77		22:00	12		20						32	
10:15	31		38						69		22:15	14		22						36	
10:30	29		33						62		22:30	12		6						18	
10:45	47	149	31	137					78	286	22:45	3	41	12	60					15	101
11:00	33		35						68		23:00	6		8						14	
11:15	40		33						73		23:15	8		9						17	
11:30	39		40						79		23:30	9		6						15	
11:45	44	156	37	145					81	301	23:45	9	32	7	30					16	62
TOTALS		1675		1445						3120	TOTALS		2623		2577						5200
SPLIT %		53.7%		46.3%						37.5%	SPLIT %		50.4%		49.6%						62.5%

DAILY TOTALS	NB	SB	EB	WB	Total
	4,298	4,022	0	0	8,320

AM Peak Hour	07:00	06:45			06:45	PM Peak Hour	14:30	13:45			14:00
AM Pk Volume	584	559			1138	PM Pk Volume	461	429			811
Pk Hr Factor	0.640	0.695			0.784	Pk Hr Factor	0.763	0.710			0.866
7 - 9 Volume	888	730	0	0	1618	4 - 6 Volume	667	622	0	0	1289
7 - 9 Peak Hour	07:00	07:00			07:00	4 - 6 Peak Hour	16:45	17:00			16:45
7 - 9 Pk Volume	584	485	0	0	1069	4 - 6 Pk Volume	363	349	0	0	707
Pk Hr Factor	0.640	0.603	0.000	0.000	0.736	Pk Hr Factor	0.917	0.864	0.000	0.000	0.884

Prepared by NDS/ATD

Project #: CA12_6151_044 **City:** Chino Hills

Location: Pipeline Ave from Woodview Rd to Winged **Date:** 11/27/2012

Prepared by NDS/ATD

VOLUME

Pipeline Ave from Winged Foot Wy to Soquel Canyon Pkwy

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_047

DAILY TOTALS	NB	SB	EB	WB	Total
	3,973	4,107	0	0	8,080

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	6		6						12		12:00	38		40						78	
00:15	5		4						9		12:15	49		41						90	
00:30	1		0						1		12:30	38		38						76	
00:45	2	14	3	13					5	27	12:45	39	164	41	160					80	324
01:00	3		6						9		13:00	42		31						73	
01:15	0		1						1		13:15	40		50						90	
01:30	2		0						2		13:30	74		32						106	
01:45	1	6	1	8					2	14	13:45	73	229	85	198					158	427
02:00	2		2						4		14:00	62		158						220	
02:15	3		3						6		14:15	45		89						134	
02:30	0		2						2		14:30	144		82						226	
02:45	0	5	0	7					0	12	14:45	144	395	73	402					217	797
03:00	0		0						0		15:00	82		75						157	
03:15	0		1						1		15:15	80		90						170	
03:30	3		1						4		15:30	108		79						187	
03:45	1	4	1	3					2	7	15:45	76	346	66	310					142	656
04:00	4		4						8		16:00	73		71						144	
04:15	1		13						14		16:15	66		69						135	
04:30	4		2						6		16:30	62		57						119	
04:45	3	12	4	23					7	35	16:45	88	289	70	267					158	556
05:00	5		12						17		17:00	85		85						170	
05:15	10		15						25		17:15	73		88						161	
05:30	16		18						34		17:30	81		90						171	
05:45	23	54	18	63					41	117	17:45	84	323	79	342					163	665
06:00	36		27						63		18:00	76		76						152	
06:15	35		27						62		18:15	73		75						148	
06:30	35		38						73		18:30	58		65						123	
06:45	51	157	112	204					163	361	18:45	60	267	75	291					135	558
07:00	145		209						354		19:00	44		60						104	
07:15	202		147						349		19:15	46		67						113	
07:30	118		127						245		19:30	36		40						76	
07:45	65	530	45	528					110	1058	19:45	40	166	45	212					85	378
08:00	48		79						127		20:00	44		37						81	
08:15	106		71						177		20:15	22		42						64	
08:30	80		66						146		20:30	30		41						71	
08:45	46	280	63	279					109	559	20:45	20	116	36	156					56	272
09:00	40		35						75		21:00	26		28						54	
09:15	34		33						67		21:15	27		24						51	
09:30	46		43						89		21:30	23		22						45	
09:45	44	164	50	161					94	325	21:45	22	98	27	101					49	199
10:00	41		33						74		22:00	13		19						32	
10:15	25		39						64		22:15	13		24						37	
10:30	22		41						63		22:30	12		7						19	
10:45	47	135	31	144					78	279	22:45	7	45	11	61					18	106
11:00	32		40						72		23:00	6		8						14	
11:15	38		29						67		23:15	5		8						13	
11:30	35		34						69		23:30	9		6						15	
11:45	40	145	42	145					82	290	23:45	9	29	7	29					16	58
TOTALS		1506		1578						3084	TOTALS		2467		2529						4996
SPLIT %		48.8%		51.2%						38.2%	SPLIT %		49.4%		50.6%						61.8%

DAILY TOTALS	NB	SB	EB	WB	Total
	3,973	4,107	0	0	8,080

AM Peak Hour	07:00	06:45			06:45	PM Peak Hour	14:30	13:45			14:00
AM Pk Volume	530	595			1111	PM Pk Volume	450	414			797
Pk Hr Factor	0.656	0.712			0.785	Pk Hr Factor	0.781	0.655			0.882
7 - 9 Volume	810	807	0	0	1617	4 - 6 Volume	612	609	0	0	1221
7 - 9 Peak Hour	07:00	07:00			07:00	4 - 6 Peak Hour	16:45	17:00			17:00
7 - 9 Pk Volume	530	528	0	0	1058	4 - 6 Pk Volume	327	342	0	0	665
Pk Hr Factor	0.656	0.632	0.000	0.000	0.747	Pk Hr Factor	0.929	0.950	0.000	0.000	0.972

Prepared by NDS/ATD

Project #: CA12_6151_047 **City:** Chino Hills

Location: Pipeline Ave from Winged Foot Wy to **Date:** 11/27/2012

Prepared by NDS/ATD

VOLUME

Pomona Rincon Rd from Soquel Canyon Pkwy to Picasso Dr

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_048

DAILY TOTALS	NB	SB	EB	WB	Total
	2,314	3,456	0	0	5,770

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	0		1						1		12:00	20		26						46	
00:15	1		3						4		12:15	24		21						45	
00:30	0		4						4		12:30	23		30						53	
00:45	0	1	3	11					3	12	12:45	15	82	20	97					35	179
01:00	0		1						1		13:00	17		18						35	
01:15	0		1						1		13:15	26		41						67	
01:30	1		0						1		13:30	30		55						85	
01:45	0	1	0	2					0	3	13:45	21	94	52	166					73	260
02:00	0		1						1		14:00	14		111						125	
02:15	1		1						2		14:15	79		200						279	
02:30	0		0						0		14:30	273		216						489	
02:45	1	2	0	2					1	4	14:45	139	505	116	643					255	1148
03:00	0		1						1		15:00	70		62						132	
03:15	2		0						2		15:15	48		53						101	
03:30	0		0						0		15:30	45		26						71	
03:45	1	3	1	2					2	5	15:45	32	195	35	176					67	371
04:00	3		1						4		16:00	42		40						82	
04:15	2		0						2		16:15	32		40						72	
04:30	3		4						7		16:30	39		35						74	
04:45	5	13	2	7					7	20	16:45	40	153	55	170					95	323
05:00	8		1						9		17:00	33		59						92	
05:15	6		1						7		17:15	41		39						80	
05:30	3		2						5		17:30	39		42						81	
05:45	9	26	2	6					11	32	17:45	25	138	28	168					53	306
06:00	8		8						16		18:00	22		25						47	
06:15	11		19						30		18:15	18		43						61	
06:30	18		45						63		18:30	24		20						44	
06:45	69	106	186	258					255	364	18:45	23	87	34	122					57	209
07:00	179		525						704		19:00	9		15						24	
07:15	279		573						852		19:15	2		13						15	
07:30	84		41						125		19:30	13		16						29	
07:45	19	561	22	1161					41	1722	19:45	8	32	10	54					18	86
08:00	20		29						49		20:00	10		15						25	
08:15	21		64						85		20:15	6		20						26	
08:30	20		9						29		20:30	4		17						21	
08:45	16	77	15	117					31	194	20:45	2	22	12	64					14	86
09:00	10		15						25		21:00	4		4						8	
09:15	13		12						25		21:15	3		19						22	
09:30	17		13						30		21:30	19		17						36	
09:45	17	57	14	54					31	111	21:45	6	32	7	47					13	79
10:00	15		7						22		22:00	3		4						7	
10:15	10		11						21		22:15	2		6						8	
10:30	17		13						30		22:30	0		3						3	
10:45	14	56	9	40					23	96	22:45	1	6	3	16					4	22
11:00	12		12						24		23:00	0		1						1	
11:15	12		10						22		23:15	0		1						1	
11:30	10		31						41		23:30	1		2						3	
11:45	29	63	16	69					45	132	23:45	1	2	0	4					1	6
TOTALS		966		1729						2695	TOTALS		1348		1727						3075
SPLIT %		35.8%		64.2%						46.7%	SPLIT %		43.8%		56.2%						53.3%

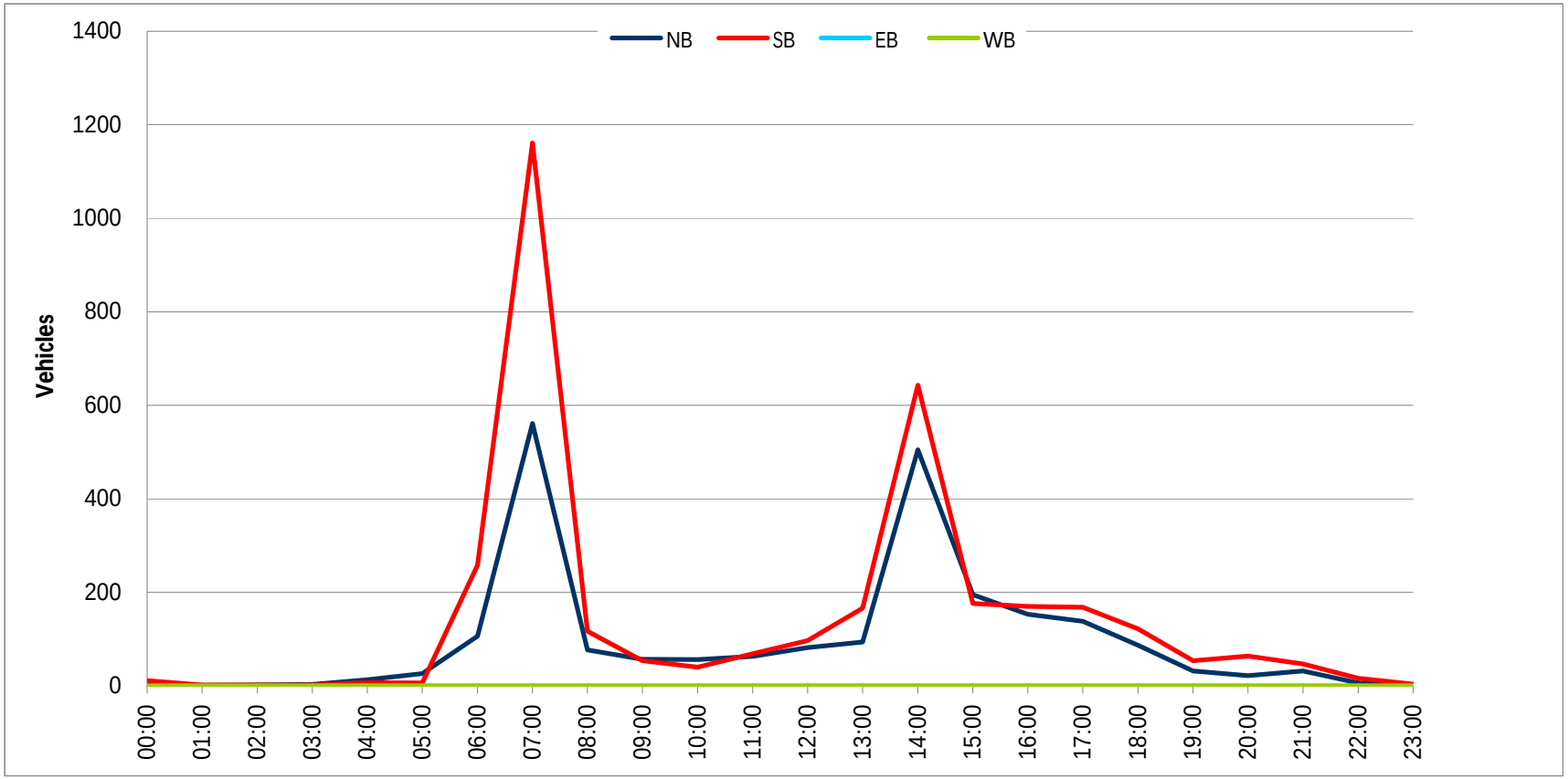
DAILY TOTALS	NB	SB	EB	WB	Total
	2,314	3,456	0	0	5,770

AM Peak Hour	06:45	06:30			06:45	PM Peak Hour	14:15	14:00			14:15
AM Pk Volume	611	1329			1936	PM Pk Volume	561	643			1155
Pk Hr Factor	0.547	0.580			0.568	Pk Hr Factor	0.514	0.744			0.590
7 - 9 Volume	638	1278	0	0	1916	4 - 6 Volume	291	338	0	0	629
7 - 9 Peak Hour	07:00	07:00			07:00	4 - 6 Peak Hour	16:00	16:45			16:45
7 - 9 Pk Volume	561	1161	0	0	1722	4 - 6 Pk Volume	153	195	0	0	348
Pk Hr Factor	0.503	0.507	0.000	0.000	0.505	Pk Hr Factor	0.911	0.826	0.000	0.000	0.916

Prepared by NDS/ATD

Project #: CA12_6151_048 **City:** Chino Hills

Location: Pomona Rincon Rd from Soquel Canyon **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Ridgeview Dr from Eucalyptus Ave to Windmill Creek Dr

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_049

DAILY TOTALS	NB	SB	EB	WB	Total
	1,064	863	0	0	1,927

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	1		1						2		12:00	12		4						16	
00:15	1		0						1		12:15	18		6						24	
00:30	3		2						5		12:30	7		5						12	
00:45	0	5	0	3					0	8	12:45	7	44	7	22					14	66
01:00	0		0						0		13:00	13		7						20	
01:15	1		2						3		13:15	12		12						24	
01:30	0		0						0		13:30	9		14						23	
01:45	0	1	0	2					0	3	13:45	15	49	6	39					21	88
02:00	0		0						0		14:00	16		11						27	
02:15	0		0						0		14:15	27		20						47	
02:30	2		0						2		14:30	45		6						51	
02:45	0	2	0						0	2	14:45	35	123	8	45					43	168
03:00	0		0						0		15:00	18		94						112	
03:15	1		0						1		15:15	13		19						32	
03:30	2		1						3		15:30	15		14						29	
03:45	2	5	0	1					2	6	15:45	11	57	10	137					21	194
04:00	1		0						1		16:00	14		15						29	
04:15	1		0						1		16:15	21		14						35	
04:30	0		0						0		16:30	20		14						34	
04:45	1	3	2	2					3	5	16:45	9	64	15	58					24	122
05:00	2		1						3		17:00	14		14						28	
05:15	5		1						6		17:15	18		13						31	
05:30	1		0						1		17:30	25		14						39	
05:45	6	14	4	6					10	20	17:45	46	103	8	49					54	152
06:00	4		4						8		18:00	46		9						55	
06:15	10		3						13		18:15	38		9						47	
06:30	9		4						13		18:30	22		16						38	
06:45	15	38	11	22					26	60	18:45	13	119	8	42					21	161
07:00	21		15						36		19:00	18		42						60	
07:15	18		7						25		19:15	11		25						36	
07:30	24		13						37		19:30	10		25						35	
07:45	39	102	14	49					53	151	19:45	2	41	17	109					19	150
08:00	59		54						113		20:00	7		16						23	
08:15	15		64						79		20:15	9		7						16	
08:30	19		7						26		20:30	6		1						7	
08:45	12	105	8	133					20	238	20:45	9	31	5	29					14	60
09:00	9		3						12		21:00	8		4						12	
09:15	9		3						12		21:15	7		4						11	
09:30	7		5						12		21:30	2		2						4	
09:45	11	36	5	16					16	52	21:45	4	21	0	10					4	31
10:00	5		7						12		22:00	7		1						8	
10:15	9		5						14		22:15	7		4						11	
10:30	8		6						14		22:30	2		2						4	
10:45	7	29	4	22					11	51	22:45	1	17	3	10					4	27
11:00	12		4						16		23:00	0		4						4	
11:15	8		8						16		23:15	1		0						1	
11:30	23		29						52		23:30	0		2						2	
11:45	9	52	10	51					19	103	23:45	2	3	0	6					2	9
TOTALS		392		307						699	TOTALS		672		556						1228
SPLIT %		56.1%		43.9%						36.3%	SPLIT %		54.7%		45.3%						63.7%

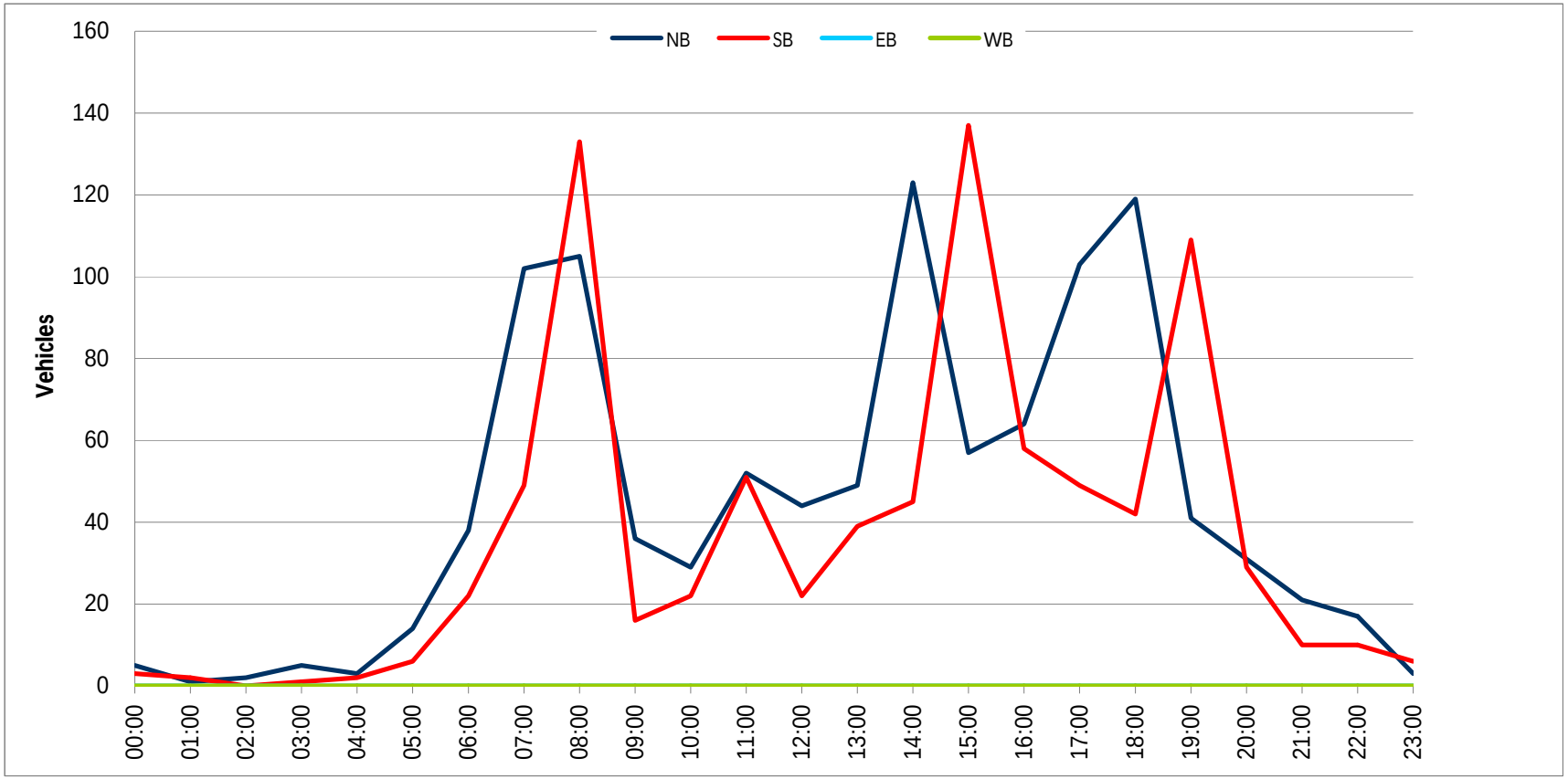
DAILY TOTALS	NB	SB	EB	WB	Total
	1,064	863	0	0	1,927

AM Peak Hour	07:15	07:30			07:30	PM Peak Hour	17:30	15:00			14:15
AM Pk Volume	140	145			282	PM Pk Volume	155	137			253
Pk Hr Factor	0.593	0.566			0.624	Pk Hr Factor	0.842	0.364			0.565
7 - 9 Volume	207	182	0	0	389	4 - 6 Volume	167	107	0	0	274
7 - 9 Peak Hour	07:15	07:30			07:30	4 - 6 Peak Hour	17:00	16:00			17:00
7 - 9 Pk Volume	140	145	0	0	282	4 - 6 Pk Volume	103	58	0	0	152
Pk Hr Factor	0.593	0.566	0.000	0.000	0.624	Pk Hr Factor	0.560	0.967	0.000	0.000	0.704

Prepared by NDS/ATD

Project #: CA12_6151_049 **City:** Chino Hills

Location: Ridgeview Dr from Eucalyptus Ave to **Date:** 11/27/2012



Prepared by NDS/ATD

VOLUME

Soquel Canyon Pkwy from Pipeline Ave to Pinehurst Dr

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_051

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	4,352	4,253	8,605

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			7		7		14		12:00			39		43		82	
00:15			4		6		10		12:15			44		49		93	
00:30			0		2		2		12:30			38		46		84	
00:45			3	14	2	17	5	31	12:45			44	165	44	182	88	347
01:00			6		3		9		13:00			34		46		80	
01:15			1		0		1		13:15			52		43		95	
01:30			1		3		4		13:30			35		73		108	
01:45			1	9	1	7	2	16	13:45			91	212	69	231	160	443
02:00			2		2		4		14:00			154		66		220	
02:15			3		3		6		14:15			98		50		148	
02:30			2		0		2		14:30			83		158		241	
02:45			0	7	1	6	1	13	14:45			73	408	139	413	212	821
03:00			0		0		0		15:00			82		81		163	
03:15			1		0		1		15:15			112		111		223	
03:30			1		2		3		15:30			97		129		226	
03:45			2	4	1	3	3	7	15:45			65	356	78	399	143	755
04:00			5		3		8		16:00			66		74		140	
04:15			13		1		14		16:15			72		69		141	
04:30			3		4		7		16:30			54		59		113	
04:45			6	27	3	11	9	38	16:45			69	261	85	287	154	548
05:00			14		7		21		17:00			86		86		172	
05:15			18		9		27		17:15			90		83		173	
05:30			20		15		35		17:30			83		95		178	
05:45			19	71	23	54	42	125	17:45			80	339	90	354	170	693
06:00			28		35		63		18:00			75		88		163	
06:15			31		31		62		18:15			78		89		167	
06:30			48		32		80		18:30			60		59		119	
06:45			121	228	59	157	180	385	18:45			80	293	67	303	147	596
07:00			212		140		352		19:00			58		54		112	
07:15			156		210		366		19:15			60		45		105	
07:30			129		105		234		19:30			43		44		87	
07:45			57	554	63	518	120	1072	19:45			42	203	44	187	86	390
08:00			85		58		143		20:00			36		46		82	
08:15			117		128		245		20:15			45		29		74	
08:30			87		105		192		20:30			39		32		71	
08:45			67	356	50	341	117	697	20:45			36	156	25	132	61	288
09:00			41		43		84		21:00			29		28		57	
09:15			46		37		83		21:15			25		28		53	
09:30			44		46		90		21:30			25		29		54	
09:45			50	181	40	166	90	347	21:45			24	103	23	108	47	211
10:00			41		36		77		22:00			20		12		32	
10:15			36		29		65		22:15			22		17		39	
10:30			45		23		68		22:30			9		13		22	
10:45			42	164	50	138	92	302	22:45			13	64	9	51	22	115
11:00			42		35		77		23:00			7		6		13	
11:15			33		39		72		23:15			6		11		17	
11:30			41		42		83		23:30			5		8		13	
11:45			36	152	37	153	73	305	23:45			7	25	10	35	17	60
TOTALS				1767		1571		3338	TOTALS				2585		2682		5267
SPLIT %				52.9%		47.1%		38.8%	SPLIT %				49.1%		50.9%		61.2%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	4,352	4,253	8,605

AM Peak Hour			06:45	07:00	06:45	PM Peak Hour			13:45	14:30	14:30
AM Pk Volume			618	518	1132	PM Pk Volume			426	489	839
Pk Hr Factor			0.729	0.617	0.773	Pk Hr Factor			0.692	0.774	0.870
7 - 9 Volume	0	0	910	859	1769	4 - 6 Volume	0	0	600	641	1241
7 - 9 Peak Hour			07:00	07:00	07:00	4 - 6 Peak Hour			17:00	17:00	17:00
7 - 9 Pk Volume	0	0	554	518	1072	4 - 6 Pk Volume	0	0	339	354	693
Pk Hr Factor	0.000	0.000	0.653	0.617	0.732	Pk Hr Factor	0.000	0.000	0.942	0.932	0.973

Prepared by NDS/ATD

Project #: CA12_6151_051 **City:** Chino Hills

Location: Soquel Canyon Pkwy from Pipeline Ave to **Date:** 11/27/2012

Prepared by NDS/ATD

VOLUME

Soquel Canyon Pkwy from Butterfield Ranch Rd to Elinvar Dr

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_050

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	6,484	6,548	13,032

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			7		13		20		12:00			74		83		157	
00:15			3		8		11		12:15			66		70		136	
00:30			1		6		7		12:30			59		52		111	
00:45			2	13	7	34	9	47	12:45			43	242	54	259	97	501
01:00			7		7		14		13:00			56		65		121	
01:15			2		1		3		13:15			58		56		114	
01:30			0		5		5		13:30			59		91		150	
01:45			3	12	1	14	4	26	13:45			79	252	94	306	173	558
02:00			3		4		7		14:00			156		83		239	
02:15			3		4		7		14:15			106		78		184	
02:30			3		0		3		14:30			122		213		335	
02:45			0	9	1	9	1	18	14:45			89	473	220	594	309	1067
03:00			0		1		1		15:00			93		155		248	
03:15			4		1		5		15:15			109		170		279	
03:30			4		2		6		15:30			235		142		377	
03:45			7	15	5	9	12	24	15:45			95	532	118	585	213	1117
04:00			13		1		14		16:00			81		102		183	
04:15			16		1		17		16:15			98		112		210	
04:30			17		1		18		16:30			79		101		180	
04:45			19	65	7	10	26	75	16:45			96	354	137	452	233	806
05:00			36		2		38		17:00			87		150		237	
05:15			43		6		49		17:15			111		133		244	
05:30			52		9		61		17:30			95		176		271	
05:45			59	190	17	34	76	224	17:45			95	388	149	608	244	996
06:00			71		17		88		18:00			88		155		243	
06:15			62		21		83		18:15			83		131		214	
06:30			102		35		137		18:30			74		115		189	
06:45			184	419	70	143	254	562	18:45			94	339	131	532	225	871
07:00			338		167		505		19:00			50		129		179	
07:15			294		240		534		19:15			70		107		177	
07:30			157		116		273		19:30			45		95		140	
07:45			124	913	73	596	197	1509	19:45			58	223	99	430	157	653
08:00			137		114		251		20:00			38		94		132	
08:15			226		190		416		20:15			41		74		115	
08:30			250		114		364		20:30			47		73		120	
08:45			126	739	66	484	192	1223	20:45			32	158	60	301	92	459
09:00			96		42		138		21:00			34		64		98	
09:15			92		61		153		21:15			29		61		90	
09:30			71		53		124		21:30			27		55		82	
09:45			98	357	65	221	163	578	21:45			22	112	50	230	72	342
10:00			81		47		128		22:00			22		37		59	
10:15			84		54		138		22:15			25		39		64	
10:30			70		33		103		22:30			11		32		43	
10:45			69	304	67	201	136	505	22:45			17	75	27	135	44	210
11:00			78		61		139		23:00			4		17		21	
11:15			60		50		110		23:15			6		24		30	
11:30			51		60		111		23:30			9		18		27	
11:45			88	277	111	282	199	559	23:45			4	23	20	79	24	102
TOTALS				3313		2037		5350	TOTALS				3171		4511		7682
SPLIT %				61.9%		38.1%		41.1%	SPLIT %				41.3%		58.7%		58.9%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	6,484	6,548	13,032

AM Peak Hour			06:45	07:00	06:45	PM Peak Hour			15:00	14:30	14:45
AM Pk Volume			973	596	1566	PM Pk Volume			532	758	1213
Pk Hr Factor			0.720	0.621	0.733	Pk Hr Factor			0.566	0.861	0.804
7 - 9 Volume	0	0	1652	1080	2732	4 - 6 Volume	0	0	742	1060	1802
7 - 9 Peak Hour			07:00	07:00	07:00	4 - 6 Peak Hour			16:45	17:00	17:00
7 - 9 Pk Volume	0	0	913	596	1509	4 - 6 Pk Volume	0	0	389	608	996
Pk Hr Factor	0.000	0.000	0.675	0.621	0.706	Pk Hr Factor	0.000	0.000	0.876	0.864	0.919

Prepared by NDS/ATD

Project #: CA12_6151_050 **City:** Chino Hills

Location: Soquel Canyon Pkwy from Butterfield Ranch **Date:** 11/27/2012

Prepared by NDS/ATD

VOLUME

SR-142 from Canyon Hills Rd to Rosemary Ln

Day: Tuesday
Date: 11/27/2012

City: Chino Hills
Project #: CA12_6151_052

DAILY TOTALS	NB	SB	EB	WB	Total
	8,041	6,971	0	0	15,012

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	10		5						15		12:00	56		54						110	
00:15	13		4						17		12:15	73		59						132	
00:30	9		1						10		12:30	58		66						124	
00:45	10	42	3	13					13	55	12:45	49	236	50	229					99	465
01:00	8		2						10		13:00	44		61						105	
01:15	5		0						5		13:15	53		58						111	
01:30	6		3						9		13:30	67		64						131	
01:45	2	21	5	10					7	31	13:45	74	238	61	244					135	482
02:00	4		0						4		14:00	82		57						139	
02:15	4		3						7		14:15	130		52						182	
02:30	3		3						6		14:30	144		60						204	
02:45	1	12	3	9					4	21	14:45	206	562	45	214					251	776
03:00	2		5						7		15:00	186		69						255	
03:15	2		7						9		15:15	252		59						311	
03:30	2		7						9		15:30	279		53						332	
03:45	4	10	14	33					18	43	15:45	331	1048	56	237					387	1285
04:00	4		17						21		16:00	315		57						372	
04:15	0		28						28		16:15	313		57						370	
04:30	4		51						55		16:30	333		53						386	
04:45	4	12	39	135					43	147	16:45	314	1275	53	220					367	1495
05:00	4		66						70		17:00	335		50						385	
05:15	3		91						94		17:15	322		52						374	
05:30	11		161						172		17:30	332		50						382	
05:45	10	28	265	583					275	611	17:45	308	1297	52	204					360	1501
06:00	14		300						314		18:00	313		36						349	
06:15	18		369						387		18:15	317		50						367	
06:30	37		341						378		18:30	280		42						322	
06:45	35	104	337	1347					372	1451	18:45	216	1126	34	162					250	1288
07:00	28		333						361		19:00	178		28						206	
07:15	45		330						375		19:15	149		31						180	
07:30	52		324						376		19:30	119		27						146	
07:45	42	167	325	1312					367	1479	19:45	91	537	14	100					105	637
08:00	39		240						279		20:00	64		12						76	
08:15	52		196						248		20:15	58		17						75	
08:30	46		202						248		20:30	57		12						69	
08:45	57	194	180	818					237	1012	20:45	58	237	13	54					71	291
09:00	27		131						158		21:00	52		14						66	
09:15	32		115						147		21:15	54		24						78	
09:30	30		100						130		21:30	63		15						78	
09:45	37	126	82	428					119	554	21:45	39	208	11	64					50	272
10:00	45		78						123		22:00	34		14						48	
10:15	46		75						121		22:15	26		12						38	
10:30	42		57						99		22:30	30		9						39	
10:45	37	170	58	268					95	438	22:45	20	110	8	43					28	153
11:00	36		60						96		23:00	18		4						22	
11:15	64		57						121		23:15	20		3						23	
11:30	47		62						109		23:30	23		7						30	
11:45	60	207	49	228					109	435	23:45	13	74	2	16					15	90
TOTALS		1093		5184						6277	TOTALS		6948		1787						8735
SPLIT %		17.4%		82.6%						41.8%	SPLIT %		79.5%		20.5%						58.2%

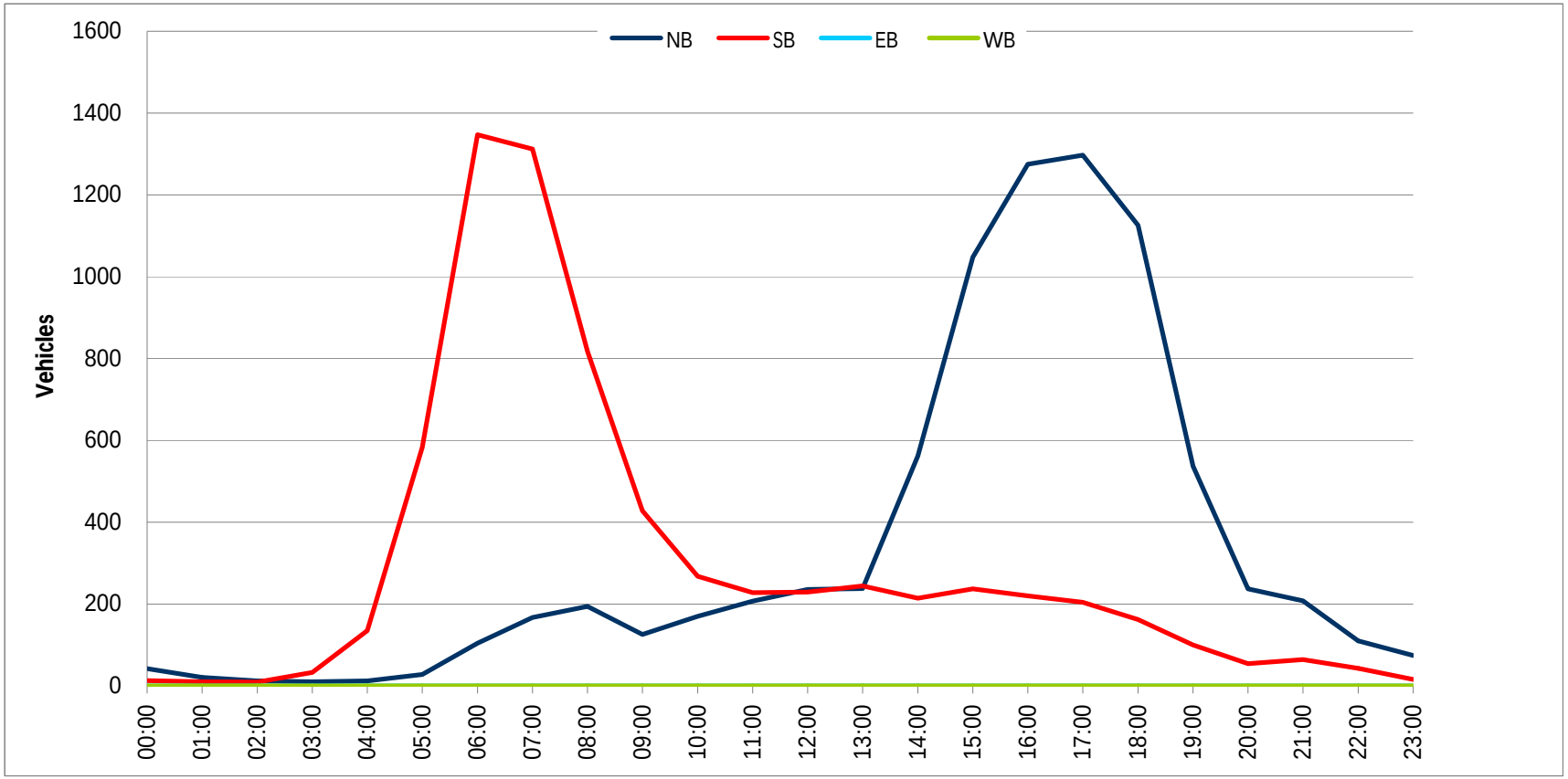
DAILY TOTALS	NB	SB	EB	WB	Total
	8,041	6,971	0	0	15,012

AM Peak Hour	11:45	06:15			06:15	PM Peak Hour	16:30	13:00			15:45
AM Pk Volume	247	1380			1498	PM Pk Volume	1304	244			1515
Pk Hr Factor	0.846	0.935			0.968	Pk Hr Factor	0.973	0.953			0.979
7 - 9 Volume	361	2130	0	0	2491	4 - 6 Volume	2572	424	0	0	2996
7 - 9 Peak Hour	08:00	07:00			07:00	4 - 6 Peak Hour	16:30	16:00			16:30
7 - 9 Pk Volume	194	1312	0	0	1479	4 - 6 Pk Volume	1304	220	0	0	1512
Pk Hr Factor	0.851	0.985	0.000	0.000	0.983	Pk Hr Factor	0.973	0.965	0.000	0.000	0.979

Prepared by NDS/ATD

Project #: CA12_6151_052 **City:** Chino Hills

Location: SR-142 from Canyon Hills Rd to Rosemary Ln **Date:** 11/27/2012



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Traffic Engineering - ITS - Transportation Planning
18662 MacArthur Boulevard, Ste. 435, Irvine, CA 92612
Ph: (949) 727-3399 - Web: minagarinc.com

Agency:
City of Chino Hills/Chino

File Name : CHP @ RamonaAv
Site Code : 011
Start Date : 1/8/2014
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Groups Printed- All Vehicles

	Chino Hills Pkwy. Eastbound				Chino Hills Pkwy. Westbound				Ramona Pkway. Northbound				Ramona Pkway. Southbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	65	158	3	1	8	223	23	0	10	100	23	0	9	50	44	1	718
07:15 AM	94	248	0	1	24	207	28	0	9	144	55	1	5	93	48	1	958
07:30 AM	153	225	1	0	17	182	32	2	6	125	27	3	22	66	82	0	943
07:45 AM	127	329	1	0	18	192	14	0	6	126	35	0	26	75	70	0	1019
Total	439	960	5	2	67	804	97	2	31	495	140	4	62	284	244	2	3638
08:00 AM	114	192	1	0	24	187	23	1	10	131	38	4	20	71	48	0	864
08:15 AM	152	243	1	0	4	216	14	0	7	123	34	0	18	64	61	0	937
08:30 AM	116	182	3	3	15	202	20	2	6	112	34	2	19	57	37	0	810
08:45 AM	112	181	1	3	9	157	18	0	7	151	24	0	25	57	58	0	803
Total	494	798	6	6	52	762	75	3	30	517	130	6	82	249	204	0	3414
BREAK																	
04:00 PM	131	269	4	5	52	293	30	0	6	174	33	6	54	123	104	2	1286
04:15 PM	101	187	1	0	19	185	26	0	9	83	42	1	29	123	95	5	906
04:30 PM	127	243	3	4	51	304	33	0	10	96	22	2	27	114	131	3	1170
04:45 PM	120	275	3	3	44	230	52	0	8	121	62	2	58	149	76	6	1209
Total	479	974	11	12	166	1012	141	0	33	474	159	11	168	509	406	16	4571
05:00 PM	144	234	1	2	73	325	29	0	14	133	32	0	65	216	159	1	1428
05:15 PM	115	296	2	2	57	230	35	0	5	146	22	2	58	148	81	1	1200
05:30 PM	108	182	2	2	38	232	36	0	15	159	39	3	74	132	81	3	1106
05:45 PM	154	267	1	0	46	273	35	0	11	176	34	0	31	113	98	0	1239
Total	521	979	6	6	214	1060	135	0	45	614	127	5	228	609	419	5	4973
Grand Total	1933	3711	28	26	499	3638	448	5	139	2100	556	26	540	1651	1273	23	16596
Apprch %	33.9	65.1	0.5	0.5	10.9	79.3	9.8	0.1	4.9	74.4	19.7	0.9	15.5	47.3	36.5	0.7	
Total %	11.6	22.4	0.2	0.2	3	21.9	2.7	0	0.8	12.7	3.4	0.2	3.3	9.9	7.7	0.1	

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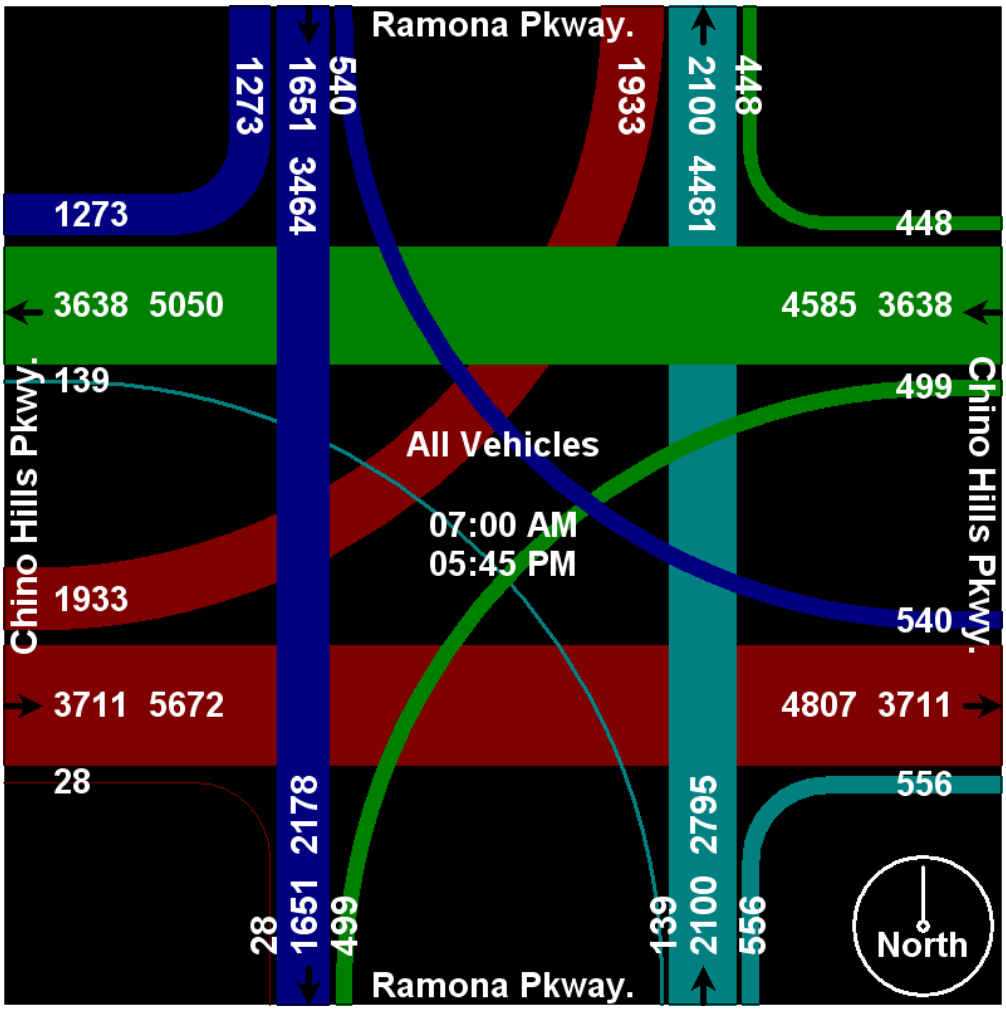

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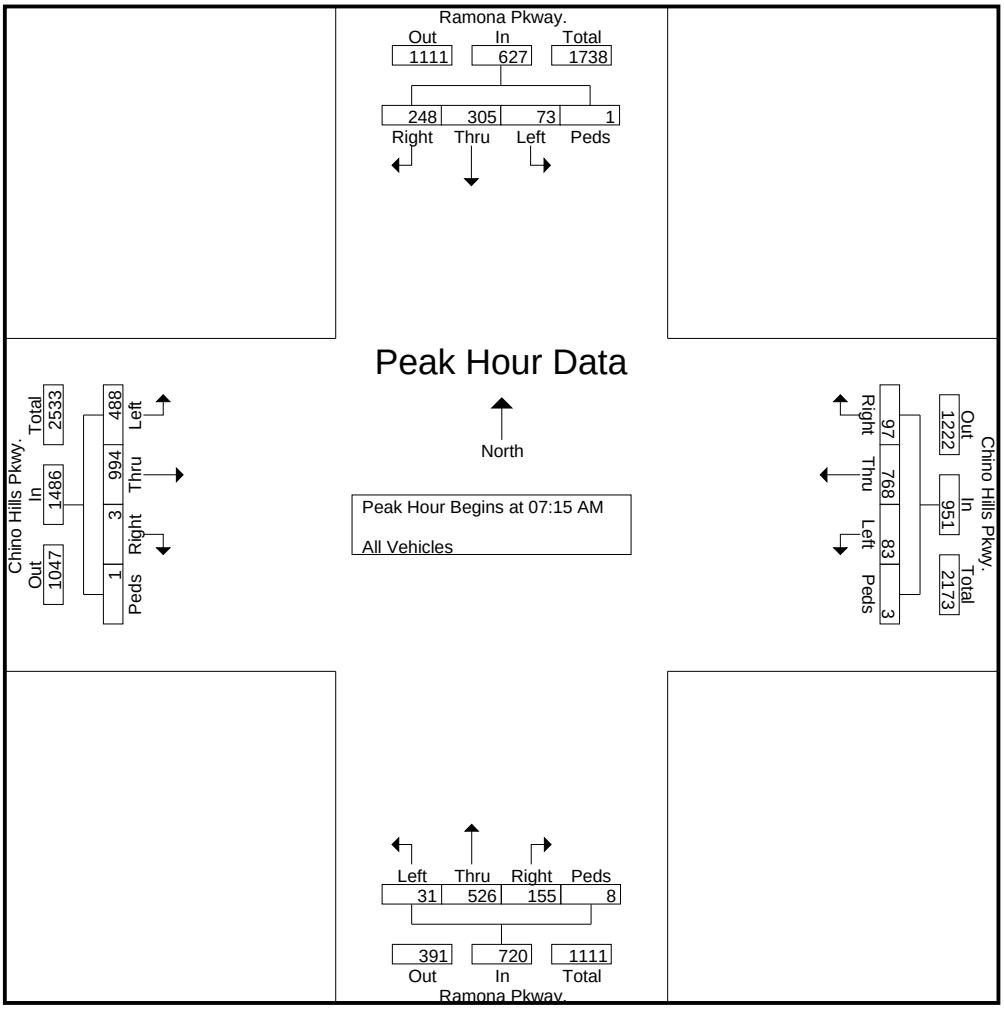
	Chino Hills Pkwy. Eastbound					Chino Hills Pkwy. Westbound					Ramona Pkway. Northbound					Ramona Pkway. Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	94	248	0	**1**	343	**24**	**207**	28	0	**259**	9	**144**	**55**	1	**209**	5	**93**	48	**1**	147	958
07:30 AM	**153**	225	**1**	0	379	17	182	**32**	**2**	233	6	125	27	3	161	22	66	**82**	0	170	943
07:45 AM	127	**329**	1	0	**457**	18	192	14	0	224	6	126	35	0	167	**26**	75	70	0	**171**	**1019**
08:00 AM	114	192	1	0	307	24	187	23	1	235	**10**	131	38	**4**	183	20	71	48	0	139	864
Total Volume	488	994	3	1	1486	83	768	97	3	951	31	526	155	8	720	73	305	248	1	627	3784
% App. Total	32.8	66.9	0.2	0.1		8.7	80.8	10.2	0.3		4.3	73.1	21.5	1.1		11.6	48.6	39.6	0.2		
PHF	.797	.755	.750	.250	.813	.865	.928	.758	.375	.918	.775	.913	.705	.500	.861	.702	.820	.756	.250	.917	.928



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File Name : CHP @ RamonaAv
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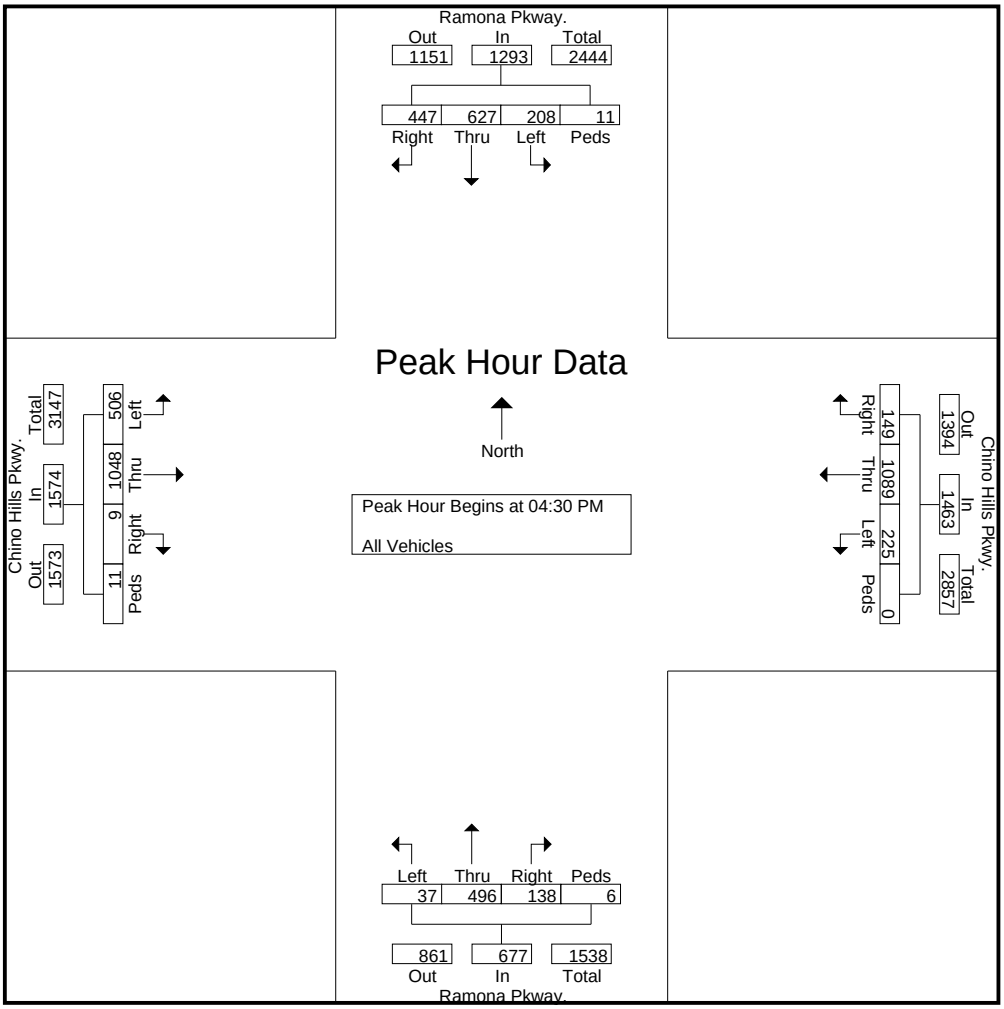
Start Date : 1/8/2014
Page No : 4

	Chino Hills Pkwy. Eastbound					Chino Hills Pkwy. Westbound					Ramona Pkway. Northbound					Ramona Pkway. Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	127	243	**3**	**4**	377	51	304	33	0	388	10	96	22	**2**	130	27	114	131	3	275	1170
04:45 PM	120	275	3	3	401	44	230	**52**	0	326	8	121	**62**	2	**193**	58	149	76	**6**	289	1209
05:00 PM	**144**	234	1	2	381	**73**	**325**	29	0	**427**	**14**	133	32	0	179	**65**	**216**	**159**	1	**441**	**1428**
05:15 PM	115	**296**	2	2	**415**	57	230	35	0	322	5	**146**	22	2	175	58	148	81	1	288	1200
Total Volume	506	1048	9	11	1574	225	1089	149	0	1463	37	496	138	6	677	208	627	447	11	1293	5007
% App. Total	32.1	66.6	0.6	0.7		15.4	74.4	10.2	0		5.5	73.3	20.4	0.9		16.1	48.5	34.6	0.9		
PHF	.878	.885	.750	.688	.948	.771	.838	.716	.000	.857	.661	.849	.556	.750	.877	.800	.726	.703	.458	.733	.877



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	488	994	3	83	768	97	31	526	155	73	305	248
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	180.0	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	176.5
Lanes	1	3	0	1	2	1	1	2	0	1	2	1
Cap, veh/h	122	1544	4	112	1011	429	50	765	224	98	1129	480
Arrive On Green	0.07	0.29	0.29	0.07	0.29	0.29	0.03	0.29	0.29	0.06	0.32	0.32
Sat Flow, veh/h	1681	5277	15	1681	3529	1500	1681	2625	769	1681	3529	1500
Grp Volume(v), veh/h	530	722	361	90	835	105	34	384	356	79	332	270
Grp Sat Flow(s),veh/h/ln	1681	1765	1762	1681	1765	1500	1681	1765	1629	1681	1765	1500
Q Serve(g_s), s	4.0	10.0	10.0	2.9	12.1	2.9	1.1	10.8	10.9	2.6	3.9	8.2
Cycle Q Clear(g_c), s	4.0	10.0	10.0	2.9	12.1	2.9	1.1	10.8	10.9	2.6	3.9	8.2
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.47	1.00		1.00
Lane Grp Cap(c), veh/h	122	1033	516	112	1011	429	50	514	475	98	1129	480
V/C Ratio(X)	4.33	0.70	0.70	0.80	0.83	0.24	0.69	0.75	0.75	0.81	0.29	0.56
Avail Cap(c_a), veh/h	122	1033	516	122	1028	437	122	514	475	122	1129	480
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.5	17.3	17.3	25.3	18.3	15.0	26.4	17.6	17.6	25.6	14.0	15.5
Incr Delay (d2), s/veh	1516.9	2.1	4.2	29.0	5.6	0.3	15.5	9.5	10.4	26.6	0.7	4.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	53.2	4.3	4.6	2.1	5.8	0.0	0.6	5.4	5.1	1.7	1.6	3.4
Lane Grp Delay (d), s/veh	1542.3	19.4	21.5	54.3	23.9	15.3	41.9	27.1	28.1	52.2	14.7	20.2
Lane Grp LOS	F	B	C	D	C	B	D	C	C	D	B	C
Approach Vol, veh/h		1613			1030			774			681	
Approach Delay, s/veh		520.3			25.7			28.2			21.2	
Approach LOS		F			C			C			C	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	8.0	20.1		7.7	19.7		5.6	20.0		7.2	21.6	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	4.0	16.0		4.0	16.0		4.0	16.0		4.0	16.0	
Max Q Clear Time (g_c+I1), s	6.0	12.0		4.9	14.1		3.1	12.9		4.6	10.2	
Green Ext Time (p_c), s	0.0	3.4		0.0	1.6		0.0	2.0		0.0	3.5	

Intersection Summary	
HCM 2010 Ctrl Delay	220.1
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	506	1048	9	225	1089	149	37	496	138	208	627	447
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	180.0	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	176.5
Lanes	1	3	0	1	2	1	1	2	0	1	2	1
Cap, veh/h	120	1497	13	120	1008	429	56	760	211	120	1144	486
Arrive On Green	0.07	0.29	0.29	0.07	0.29	0.29	0.03	0.29	0.29	0.07	0.32	0.32
Sat Flow, veh/h	1681	5240	46	1681	3529	1500	1681	2662	738	1681	3529	1500
Grp Volume(v), veh/h	550	767	382	245	1184	162	40	357	332	226	682	486
Grp Sat Flow(s),veh/h/ln	1681	1765	1757	1681	1765	1500	1681	1765	1635	1681	1765	1500
Q Serve(g_s), s	4.0	11.1	11.1	4.0	16.0	4.8	1.3	10.1	10.2	4.0	9.1	18.1
Cycle Q Clear(g_c), s	4.0	11.1	11.1	4.0	16.0	4.8	1.3	10.1	10.2	4.0	9.1	18.1
Prop In Lane	1.00		0.03	1.00		1.00	1.00		0.45	1.00		1.00
Lane Grp Cap(c), veh/h	120	1008	502	120	1008	429	56	504	467	120	1144	486
V/C Ratio(X)	4.58	0.76	0.76	2.04	1.17	0.38	0.72	0.71	0.71	1.88	0.60	1.00
Avail Cap(c_a), veh/h	120	1008	502	120	1008	429	120	504	467	120	1144	486
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.0	18.3	18.3	26.0	20.0	16.0	26.8	17.9	17.9	26.0	15.9	18.9
Incr Delay (d2), s/veh	1630.6	3.4	6.7	496.1	89.0	0.6	15.9	8.1	8.9	426.9	2.3	40.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	56.0	5.0	5.4	18.1	18.9	1.7	0.8	4.9	4.7	15.8	3.7	11.6
Lane Grp Delay (d), s/veh	1656.6	21.7	25.0	522.1	109.0	16.6	42.7	26.0	26.8	452.9	18.2	59.7
Lane Grp LOS	F	C	C	F	F	B	D	C	C	F	B	E
Approach Vol, veh/h		1699			1591			729			1394	
Approach Delay, s/veh		551.7			163.2			27.3			103.1	
Approach LOS		F			F			C			F	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	8.0	20.0		8.0	20.0		5.9	20.0		8.0	22.1	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	4.0	16.0		4.0	16.0		4.0	16.0		4.0	16.0	
Max Q Clear Time (g_c+I1), s	6.0	13.1		6.0	18.0		3.3	12.2		6.0	20.1	
Green Ext Time (p_c), s	0.0	2.7		0.0	0.0		0.0	3.0		0.0	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	251.4
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	582	1370	10	362	1427	193	43	578	200	286	739	514
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	180.0	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	176.5
Lanes	1	3	0	1	2	1	1	2	0	1	2	1
Cap, veh/h	120	1500	11	120	1008	429	62	717	248	120	1130	480
Arrive On Green	0.07	0.29	0.29	0.07	0.29	0.29	0.04	0.29	0.29	0.07	0.32	0.32
Sat Flow, veh/h	1681	5249	39	1681	3529	1500	1681	2510	866	1681	3529	1500
Grp Volume(v), veh/h	633	1001	499	393	1551	210	47	441	404	311	803	559
Grp Sat Flow(s),veh/h/ln	1681	1765	1758	1681	1765	1500	1681	1765	1612	1681	1765	1500
Q Serve(g_s), s	4.0	15.8	15.8	4.0	16.0	6.5	1.6	13.3	13.4	4.0	11.2	17.9
Cycle Q Clear(g_c), s	4.0	15.8	15.8	4.0	16.0	6.5	1.6	13.3	13.4	4.0	11.2	17.9
Prop In Lane	1.00		0.02	1.00		1.00	1.00		0.54	1.00		1.00
Lane Grp Cap(c), veh/h	120	1008	502	120	1008	429	62	504	461	120	1130	480
V/C Ratio(X)	5.27	0.99	0.99	3.27	1.54	0.49	0.75	0.88	0.88	2.59	0.71	1.16
Avail Cap(c_a), veh/h	120	1008	502	120	1008	429	120	504	461	120	1130	480
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.0	19.9	19.9	26.0	20.0	16.6	26.7	19.0	19.1	26.0	16.8	19.0
Incr Delay (d2), s/veh	1941.1	26.5	38.2	1044.3	247.1	0.9	16.7	18.8	20.3	739.4	3.8	94.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	66.3	10.1	11.7	36.4	41.1	2.3	0.9	7.7	7.2	26.2	4.8	18.6
Lane Grp Delay (d), s/veh	1967.1	46.5	58.2	1070.3	267.1	17.5	43.4	37.8	39.4	765.4	20.6	113.7
Lane Grp LOS	F	D	E	F	F	B	D	D	D	F	C	F
Approach Vol, veh/h		2133			2154			892			1673	
Approach Delay, s/veh		619.2			389.3			38.8			190.1	
Approach LOS		F			F			D			F	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	8.0	20.0		8.0	20.0		6.1	20.0		8.0	21.9	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	4.0	16.0		4.0	16.0		4.0	16.0		4.0	16.0	
Max Q Clear Time (g_c+I1), s	6.0	17.8		6.0	18.0		3.6	15.4		6.0	19.9	
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0		0.0	0.6		0.0	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	366.6
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	582	1370	10	362	1427	193	43	578	200	286	739	514
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	180.0	176.5	176.5	180.0	176.5	176.5	176.5	176.5	176.5	176.5
Lanes	2	3	0	1	3	0	1	2	1	1	2	1
Cap, veh/h	609	1575	12	381	1553	210	59	659	280	303	1169	777
Arrive On Green	0.19	0.30	0.30	0.23	0.34	0.34	0.04	0.19	0.19	0.18	0.33	0.33
Sat Flow, veh/h	3261	5249	39	1681	4568	617	1681	3529	1500	1681	3529	1500
Grp Volume(v), veh/h	633	1001	499	393	1198	563	47	628	217	311	803	559
Grp Sat Flow(s),veh/h/ln	1630	1765	1758	1681	1765	1656	1681	1765	1500	1681	1765	1500
Q Serve(g_s), s	28.0	41.6	41.6	34.0	50.8	51.0	4.2	26.4	20.6	27.0	29.5	42.9
Cycle Q Clear(g_c), s	28.0	41.6	41.6	34.0	50.8	51.0	4.2	26.4	20.6	27.0	29.5	42.9
Prop In Lane	1.00		0.02	1.00		0.37	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	609	1059	527	381	1200	563	59	659	280	303	1169	777
V/C Ratio(X)	1.04	0.95	0.95	1.03	1.00	1.00	0.79	0.95	0.77	1.03	0.69	0.72
Avail Cap(c_a), veh/h	609	1059	527	381	1200	563	78	659	280	303	1169	777
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	61.0	51.3	51.3	58.0	49.5	49.5	71.8	60.4	58.0	61.5	43.4	27.8
Incr Delay (d2), s/veh	47.3	16.3	26.2	54.5	25.5	38.1	32.0	25.3	18.7	59.1	3.3	5.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	15.9	21.3	22.7	20.6	27.4	27.7	2.3	14.3	9.5	16.7	13.8	17.3
Lane Grp Delay (d), s/veh	108.3	67.6	77.5	112.5	74.9	87.6	103.8	85.6	76.7	120.6	46.7	33.5
Lane Grp LOS	F	E	E	F	E	F	F	F	E	F	D	C
Approach Vol, veh/h		2133			2154			892			1673	
Approach Delay, s/veh		82.0			85.1			84.4			56.0	
Approach LOS		F			F			F			E	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	32.0	49.0		38.0	55.0		9.3	32.0		31.0	53.7	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	28.0	45.0		34.0	51.0		7.0	28.0		27.0	48.0	
Max Q Clear Time (g_c+I1), s	30.0	43.6		36.0	53.0		6.2	28.4		29.0	44.9	
Green Ext Time (p_c), s	0.0	1.4		0.0	0.0		0.0	0.0		0.0	2.6	

Intersection Summary	
HCM 2010 Ctrl Delay	76.9
HCM 2010 LOS	E

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	642	1496	11	389	1558	211	47	638	216	311	814	568
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	180.0	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	176.5
Lanes	1	3	0	1	2	1	1	2	0	1	2	1
Cap, veh/h	120	1500	11	120	1008	429	66	721	244	120	1122	477
Arrive On Green	0.07	0.29	0.29	0.07	0.29	0.29	0.04	0.29	0.29	0.07	0.32	0.32
Sat Flow, veh/h	1681	5249	39	1681	3529	1500	1681	2523	855	1681	3529	1500
Grp Volume(v), veh/h	698	1093	545	423	1693	229	51	485	443	338	885	617
Grp Sat Flow(s),veh/h/ln	1681	1765	1758	1681	1765	1500	1681	1765	1614	1681	1765	1500
Q Serve(g_s), s	4.0	16.0	16.0	4.0	16.0	7.2	1.7	15.1	15.2	4.0	12.8	17.8
Cycle Q Clear(g_c), s	4.0	16.0	16.0	4.0	16.0	7.2	1.7	15.1	15.2	4.0	12.8	17.8
Prop In Lane	1.00		0.02	1.00		1.00	1.00		0.53	1.00		1.00
Lane Grp Cap(c), veh/h	120	1008	502	120	1008	429	66	504	461	120	1122	477
V/C Ratio(X)	5.81	1.08	1.08	3.52	1.68	0.53	0.78	0.96	0.96	2.82	0.79	1.29
Avail Cap(c_a), veh/h	120	1008	502	120	1008	429	120	504	461	120	1122	477
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.0	20.0	20.0	26.0	20.0	16.9	26.7	19.7	19.7	26.0	17.4	19.1
Incr Delay (d2), s/veh	2184.4	54.0	64.9	1156.2	309.9	1.3	17.4	31.5	33.3	839.6	5.6	147.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	74.4	14.0	15.5	40.2	49.8	2.6	1.0	10.1	9.4	29.5	5.8	25.5
Lane Grp Delay (d), s/veh	2210.4	74.0	84.9	1182.2	329.9	18.2	44.1	51.2	53.0	865.6	23.0	166.1
Lane Grp LOS	F	F	F	F	F	B	D	D	D	F	C	F
Approach Vol, veh/h		2336			2345			979			1840	
Approach Delay, s/veh		714.9			453.2			51.7			225.8	
Approach LOS		F			F			D			F	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	8.0	20.0		8.0	20.0		6.2	20.0		8.0	21.8	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	4.0	16.0		4.0	16.0		4.0	16.0		4.0	16.0	
Max Q Clear Time (g_c+I1), s	6.0	18.0		6.0	18.0		3.7	17.2		6.0	19.8	
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	426.5
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	642	1496	11	389	1558	211	47	638	216	311	814	568
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	180.0	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5	176.5
Lanes	2	3	0	2	3	1	1	2	1	1	2	1
Cap, veh/h	627	1911	14	468	1670	473	64	679	288	297	1168	785
Arrive On Green	0.19	0.36	0.36	0.14	0.32	0.32	0.04	0.19	0.19	0.18	0.33	0.33
Sat Flow, veh/h	3261	5249	39	3261	5294	1500	1681	3529	1500	1681	3529	1500
Grp Volume(v), veh/h	698	1093	545	423	1693	229	51	693	235	338	885	617
Grp Sat Flow(s),veh/h/ln	1630	1765	1758	1630	1765	1500	1681	1765	1500	1681	1765	1500
Q Serve(g_s), s	25.0	37.1	37.1	16.6	41.0	16.0	3.9	25.0	19.5	23.0	29.1	43.0
Cycle Q Clear(g_c), s	25.0	37.1	37.1	16.6	41.0	16.0	3.9	25.0	19.5	23.0	29.1	43.0
Prop In Lane	1.00		0.02	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	627	1285	640	468	1670	473	64	679	288	297	1168	785
V/C Ratio(X)	1.11	0.85	0.85	0.90	1.01	0.48	0.79	1.02	0.81	1.14	0.76	0.79
Avail Cap(c_a), veh/h	627	1285	640	477	1670	473	78	679	288	297	1168	785
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.5	38.1	38.1	54.8	44.5	36.0	62.0	52.5	50.3	53.5	38.8	25.1
Incr Delay (d2), s/veh	71.2	5.7	10.6	20.2	25.5	0.8	35.8	40.0	21.8	94.3	4.6	7.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	16.7	17.7	18.5	8.4	22.3	6.2	2.3	14.9	9.3	17.6	13.5	17.6
Lane Grp Delay (d), s/veh	123.7	43.7	48.7	75.0	70.0	36.7	97.8	92.5	72.0	147.8	43.5	32.9
Lane Grp LOS	F	D	D	E	F	D	F	F	E	F	D	C
Approach Vol, veh/h		2336			2345			979			1840	
Approach Delay, s/veh		68.8			67.7			87.8			59.1	
Approach LOS		E			E			F			E	

Timer												
Assigned Phs	7	4		3	8		5	2		1	6	
Phs Duration (G+Y+Rc), s	29.0	51.3		22.7	45.0		9.0	29.0		27.0	47.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	25.0	47.0		19.0	41.0		6.0	25.0		23.0	42.0	
Max Q Clear Time (g_c+I1), s	27.0	39.1		18.6	43.0		5.9	27.0		25.0	45.0	
Green Ext Time (p_c), s	0.0	7.7		0.1	0.0		0.0	0.0		0.0	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	68.5
HCM 2010 LOS	E

Notes

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	153	166	135	532	550	119	90	217	53	144	738	108
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	176.5	176.5	176.5	176.5
Lanes	1	2	1	2	2	0	1	2	1	1	2	1
Cap, veh/h	127	951	404	245	759	163	122	984	531	127	993	422
Arrive On Green	0.08	0.27	0.27	0.08	0.27	0.27	0.07	0.28	0.28	0.08	0.28	0.28
Sat Flow, veh/h	1681	3529	1500	3261	2816	606	1681	3529	1500	1681	3529	1500
Grp Volume(v), veh/h	166	180	147	578	374	353	98	236	58	157	802	117
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1630	1765	1658	1681	1765	1500	1681	1765	1500
Q Serve(g_s), s	4.0	2.1	4.2	4.0	10.4	10.5	3.1	2.7	1.4	4.0	11.2	3.2
Cycle Q Clear(g_c), s	4.0	2.1	4.2	4.0	10.4	10.5	3.1	2.7	1.4	4.0	11.2	3.2
Prop In Lane	1.00		1.00	1.00		0.37	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	127	951	404	245	476	447	122	984	531	127	993	422
V/C Ratio(X)	1.31	0.19	0.36	2.36	0.79	0.79	0.80	0.24	0.11	1.24	0.81	0.28
Avail Cap(c_a), veh/h	127	1063	452	245	531	499	127	1063	565	127	1063	452
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.6	14.9	15.7	24.6	18.0	18.0	24.3	14.8	11.5	24.6	17.8	14.9
Incr Delay (d2), s/veh	185.7	0.1	0.5	622.3	7.0	7.6	29.1	0.1	0.1	158.6	4.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	8.0	0.7	1.3	22.6	4.6	4.4	2.1	1.0	0.4	7.0	4.6	1.0
Lane Grp Delay (d), s/veh	210.3	15.0	16.3	646.9	25.0	25.6	53.4	14.9	11.6	183.2	22.2	15.2
Lane Grp LOS	F	B	B	F	C	C	D	B	B	F	C	B
Approach Vol, veh/h		493			1305			392			1076	
Approach Delay, s/veh		81.2			300.6			24.1			44.9	
Approach LOS		F			F			C			D	

Timer												
Assigned Phs	1	6		5	2		7	4		3	8	
Phs Duration (G+Y+Rc), s	8.0	18.3		8.0	18.3		7.9	18.8		8.0	19.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	4.0	16.0		4.0	16.0		4.0	16.0		4.0	16.0	
Max Q Clear Time (g_c+I1), s	6.0	6.2		6.0	12.5		5.1	4.7		6.0	13.2	
Green Ext Time (p_c), s	0.0	3.9		0.0	1.8		0.0	5.1		0.0	1.7	

Intersection Summary	
HCM 2010 Ctrl Delay	150.0
HCM 2010 LOS	F

Notes

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	145	558	68	157	285	82	129	812	304	151	342	66
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	176.5	176.5	176.5	176.5
Lanes	1	2	1	2	2	0	1	2	1	1	2	1
Cap, veh/h	127	878	373	247	659	186	127	1046	558	127	1046	445
Arrive On Green	0.08	0.25	0.25	0.08	0.25	0.25	0.08	0.30	0.30	0.08	0.30	0.30
Sat Flow, veh/h	1681	3529	1500	3261	2650	748	1681	3529	1500	1681	3529	1500
Grp Volume(v), veh/h	158	607	74	171	205	194	140	883	330	164	372	72
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1630	1765	1633	1681	1765	1500	1681	1765	1500
Q Serve(g_s), s	4.0	8.2	2.1	2.7	5.2	5.4	4.0	12.4	9.3	4.0	4.4	1.9
Cycle Q Clear(g_c), s	4.0	8.2	2.1	2.7	5.2	5.4	4.0	12.4	9.3	4.0	4.4	1.9
Prop In Lane	1.00		1.00	1.00		0.46	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	127	878	373	247	439	406	127	1046	558	127	1046	445
V/C Ratio(X)	1.24	0.69	0.20	0.69	0.47	0.48	1.10	0.84	0.59	1.29	0.36	0.16
Avail Cap(c_a), veh/h	127	1070	455	247	535	495	127	1070	569	127	1070	455
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.4	18.0	15.7	23.8	16.8	16.9	24.4	17.4	13.3	24.4	14.6	13.7
Incr Delay (d2), s/veh	157.9	1.5	0.3	8.0	0.8	0.9	108.7	6.2	1.6	175.7	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	7.0	3.1	0.6	1.2	1.9	1.8	5.3	5.3	2.8	7.7	1.6	0.6
Lane Grp Delay (d), s/veh	182.3	19.4	15.9	31.8	17.6	17.8	133.0	23.6	14.9	200.1	14.8	13.9
Lane Grp LOS	F	B	B	C	B	B	F	C	B	F	B	B
Approach Vol, veh/h		839			570			1353			608	
Approach Delay, s/veh		49.8			21.9			32.8			64.7	
Approach LOS		D			C			C			E	

Timer												
Assigned Phs	1	6		5	2		7	4		3	8	
Phs Duration (G+Y+Rc), s	8.0	17.1		8.0	17.1		8.0	19.6		8.0	19.6	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	4.0	16.0		4.0	16.0		4.0	16.0		4.0	16.0	
Max Q Clear Time (g_c+I1), s	6.0	10.2		4.7	7.4		6.0	14.4		6.0	6.4	
Green Ext Time (p_c), s	0.0	2.9		0.0	3.9		0.0	1.3		0.0	5.9	

Intersection Summary	
HCM 2010 Ctrl Delay	40.9
HCM 2010 LOS	D

Notes

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	178	193	157	618	639	138	104	252	62	167	857	125
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	176.5	176.5	176.5	176.5
Lanes	1	2	1	2	2	0	1	2	1	1	2	1
Cap, veh/h	121	995	423	234	794	171	121	1014	539	121	1014	431
Arrive On Green	0.07	0.28	0.28	0.07	0.28	0.28	0.07	0.29	0.29	0.07	0.29	0.29
Sat Flow, veh/h	1681	3529	1500	3261	2815	607	1681	3529	1500	1681	3529	1500
Grp Volume(v), veh/h	193	210	171	672	436	409	113	274	67	182	932	136
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1630	1765	1658	1681	1765	1500	1681	1765	1500
Q Serve(g_s), s	4.0	2.5	5.1	4.0	13.1	13.1	3.7	3.3	1.7	4.0	14.2	4.0
Cycle Q Clear(g_c), s	4.0	2.5	5.1	4.0	13.1	13.1	3.7	3.3	1.7	4.0	14.2	4.0
Prop In Lane	1.00		1.00	1.00		0.37	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	121	995	423	234	497	467	121	1014	539	121	1014	431
V/C Ratio(X)	1.60	0.21	0.40	2.87	0.88	0.88	0.94	0.27	0.12	1.51	0.92	0.32
Avail Cap(c_a), veh/h	121	1014	431	234	507	476	121	1014	539	121	1014	431
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.9	15.3	16.2	25.9	19.1	19.1	25.7	15.3	12.0	25.9	19.2	15.6
Incr Delay (d2), s/veh	304.8	0.1	0.6	853.2	15.5	16.5	62.2	0.1	0.1	266.6	13.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	11.7	0.9	1.6	29.2	6.7	6.5	3.4	1.2	0.5	10.4	6.9	1.2
Lane Grp Delay (d), s/veh	330.7	15.4	16.8	879.0	34.6	35.5	88.0	15.5	12.1	292.4	32.2	16.0
Lane Grp LOS	F	B	B	F	C	D	F	B	B	F	C	B
Approach Vol, veh/h		574			1517			454			1250	
Approach Delay, s/veh		121.8			408.9			33.0			68.4	
Approach LOS		F			F			C			E	

Timer												
Assigned Phs	1	6		5	2		7	4		3	8	
Phs Duration (G+Y+Rc), s	8.0	19.7		8.0	19.7		8.0	20.0		8.0	20.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	4.0	16.0		4.0	16.0		4.0	16.0		4.0	16.0	
Max Q Clear Time (g_c+I1), s	6.0	7.1		6.0	15.1		5.7	5.3		6.0	16.2	
Green Ext Time (p_c), s	0.0	4.3		0.0	0.6		0.0	5.7		0.0	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	208.3
HCM 2010 LOS	F

Notes

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	168	648	79	182	331	95	150	943	353	175	397	77
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	176.5	176.5	176.5	176.5
Lanes	1	2	1	2	2	0	1	2	1	1	2	1
Cap, veh/h	124	935	397	240	702	198	124	1038	551	124	1038	441
Arrive On Green	0.07	0.26	0.26	0.07	0.26	0.26	0.07	0.29	0.29	0.07	0.29	0.29
Sat Flow, veh/h	1681	3529	1500	3261	2650	748	1681	3529	1500	1681	3529	1500
Grp Volume(v), veh/h	183	704	86	198	238	225	163	1025	384	190	432	84
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1630	1765	1633	1681	1765	1500	1681	1765	1500
Q Serve(g_s), s	4.0	10.0	2.4	3.3	6.2	6.4	4.0	15.7	11.8	4.0	5.4	2.3
Cycle Q Clear(g_c), s	4.0	10.0	2.4	3.3	6.2	6.4	4.0	15.7	11.8	4.0	5.4	2.3
Prop In Lane	1.00		1.00	1.00		0.46	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	124	935	397	240	467	432	124	1038	551	124	1038	441
V/C Ratio(X)	1.48	0.75	0.22	0.83	0.51	0.52	1.32	0.99	0.70	1.54	0.42	0.19
Avail Cap(c_a), veh/h	124	1038	441	240	519	480	124	1038	551	124	1038	441
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.2	18.4	15.6	24.9	17.0	17.1	25.2	19.1	14.6	25.2	15.5	14.4
Incr Delay (d2), s/veh	254.7	2.8	0.3	20.5	0.9	1.0	189.4	24.9	3.8	278.3	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	10.2	3.9	0.7	1.8	2.3	2.2	8.0	9.1	4.0	11.0	1.9	0.7
Lane Grp Delay (d), s/veh	279.9	21.2	15.9	45.4	17.9	18.0	214.6	44.0	18.4	303.5	15.7	14.6
Lane Grp LOS	F	C	B	D	B	B	F	D	B	F	B	B
Approach Vol, veh/h		973			661			1572			706	
Approach Delay, s/veh		69.4			26.2			55.4			93.0	
Approach LOS		E			C			E			F	

Timer												
Assigned Phs	1	6		5	2		7	4		3	8	
Phs Duration (G+Y+Rc), s	8.0	18.4		8.0	18.4		8.0	20.0		8.0	20.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	4.0	16.0		4.0	16.0		4.0	16.0		4.0	16.0	
Max Q Clear Time (g_c+I1), s	6.0	12.0		5.3	8.4		6.0	17.7		6.0	7.4	
Green Ext Time (p_c), s	0.0	2.4		0.0	4.0		0.0	0.0		0.0	6.1	

Intersection Summary	
HCM 2010 Ctrl Delay	60.7
HCM 2010 LOS	E

Notes

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	178	253	157	670	691	138	104	270	122	167	917	125
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	176.5	176.5	176.5	176.5
Lanes	1	2	1	2	2	0	1	2	1	1	2	1
Cap, veh/h	120	1008	429	233	817	163	120	1008	536	120	1008	429
Arrive On Green	0.07	0.29	0.29	0.07	0.29	0.29	0.07	0.29	0.29	0.07	0.29	0.29
Sat Flow, veh/h	1681	3529	1500	3261	2858	571	1681	3529	1500	1681	3529	1500
Grp Volume(v), veh/h	193	275	171	728	464	437	113	293	133	182	997	136
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1630	1765	1664	1681	1765	1500	1681	1765	1500
Q Serve(g_s), s	4.0	3.4	5.1	4.0	14.3	14.3	3.7	3.6	3.5	4.0	15.7	4.0
Cycle Q Clear(g_c), s	4.0	3.4	5.1	4.0	14.3	14.3	3.7	3.6	3.5	4.0	15.7	4.0
Prop In Lane	1.00		1.00	1.00		0.34	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	120	1008	429	233	504	475	120	1008	536	120	1008	429
V/C Ratio(X)	1.61	0.27	0.40	3.13	0.92	0.92	0.94	0.29	0.25	1.52	0.99	0.32
Avail Cap(c_a), veh/h	120	1008	429	233	504	475	120	1008	536	120	1008	429
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.0	15.5	16.1	26.0	19.4	19.4	25.9	15.6	12.7	26.0	19.9	15.7
Incr Delay (d2), s/veh	308.6	0.1	0.6	967.9	22.1	23.1	63.9	0.2	0.2	270.1	25.5	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	11.8	1.2	1.6	32.7	8.1	7.8	3.5	1.3	1.0	10.5	9.1	1.2
Lane Grp Delay (d), s/veh	334.6	15.6	16.7	993.9	41.5	42.5	89.8	15.7	12.9	296.1	45.4	16.1
Lane Grp LOS	F	B	B	F	D	D	F	B	B	F	D	B
Approach Vol, veh/h		639			1629			539			1315	
Approach Delay, s/veh		112.3			467.4			30.6			77.1	
Approach LOS		F			F			C			E	

Timer												
Assigned Phs	1	6		5	2		7	4		3	8	
Phs Duration (G+Y+Rc), s	8.0	20.0		8.0	20.0		8.0	20.0		8.0	20.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	4.0	16.0		4.0	16.0		4.0	16.0		4.0	16.0	
Max Q Clear Time (g_c+I1), s	6.0	7.1		6.0	16.3		5.7	5.6		6.0	17.7	
Green Ext Time (p_c), s	0.0	4.7		0.0	0.0		0.0	6.1		0.0	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	230.7
HCM 2010 LOS	F

Notes

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	168	705	79	307	463	95	150	1013	458	175	436	77
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	176.5	176.5	176.5	176.5
Lanes	1	2	1	2	2	0	1	2	1	1	2	1
Cap, veh/h	122	969	412	237	782	159	122	1024	544	122	1024	435
Arrive On Green	0.07	0.27	0.27	0.07	0.27	0.27	0.07	0.29	0.29	0.07	0.29	0.29
Sat Flow, veh/h	1681	3529	1500	3261	2847	580	1681	3529	1500	1681	3529	1500
Grp Volume(v), veh/h	183	766	86	334	311	295	163	1101	498	190	474	84
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1630	1765	1662	1681	1765	1500	1681	1765	1500
Q Serve(g_s), s	4.0	11.1	2.4	4.0	8.6	8.6	4.0	16.0	16.0	4.0	6.1	2.3
Cycle Q Clear(g_c), s	4.0	11.1	2.4	4.0	8.6	8.6	4.0	16.0	16.0	4.0	6.1	2.3
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	122	969	412	237	484	456	122	1024	544	122	1024	435
V/C Ratio(X)	1.50	0.79	0.21	1.41	0.64	0.65	1.34	1.07	0.92	1.56	0.46	0.19
Avail Cap(c_a), veh/h	122	1024	435	237	512	482	122	1024	544	122	1024	435
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.6	18.5	15.4	25.6	17.6	17.6	25.6	19.6	16.8	25.6	16.0	14.7
Incr Delay (d2), s/veh	263.2	4.1	0.2	208.6	2.5	2.8	196.7	50.5	20.2	287.2	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	10.4	4.5	0.7	8.3	3.4	3.2	8.2	12.9	7.9	11.2	2.2	0.7
Lane Grp Delay (d), s/veh	288.8	22.6	15.6	234.1	20.1	20.4	222.3	70.1	37.0	312.8	16.4	14.9
Lane Grp LOS	F	C	B	F	C	C	F	F	D	F	B	B
Approach Vol, veh/h		1035			940			1762			748	
Approach Delay, s/veh		69.1			96.3			74.8			91.5	
Approach LOS		E			F			E			F	

Timer												
Assigned Phs	1	6		5	2		7	4		3	8	
Phs Duration (G+Y+Rc), s	8.0	19.1		8.0	19.1		8.0	20.0		8.0	20.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	4.0	16.0		4.0	16.0		4.0	16.0		4.0	16.0	
Max Q Clear Time (g_c+I1), s	6.0	13.1		6.0	10.6		6.0	18.0		6.0	8.1	
Green Ext Time (p_c), s	0.0	2.0		0.0	3.5		0.0	0.0		0.0	6.1	

Intersection Summary	
HCM 2010 Ctrl Delay	80.8
HCM 2010 LOS	F

Notes

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	196	213	173	682	705	153	115	278	68	185	946	139
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	176.5	176.5	176.5	176.5
Lanes	1	2	1	2	2	0	1	2	1	1	2	1
Cap, veh/h	120	1008	429	233	804	174	120	1008	536	120	1008	429
Arrive On Green	0.07	0.29	0.29	0.07	0.29	0.29	0.07	0.29	0.29	0.07	0.29	0.29
Sat Flow, veh/h	1681	3529	1500	3261	2812	609	1681	3529	1500	1681	3529	1500
Grp Volume(v), veh/h	213	232	188	741	481	451	125	302	74	201	1028	151
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1630	1765	1657	1681	1765	1500	1681	1765	1500
Q Serve(g_s), s	4.0	2.8	5.7	4.0	15.0	15.0	4.0	3.7	1.9	4.0	16.0	4.5
Cycle Q Clear(g_c), s	4.0	2.8	5.7	4.0	15.0	15.0	4.0	3.7	1.9	4.0	16.0	4.5
Prop In Lane	1.00		1.00	1.00		0.37	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	120	1008	429	233	504	473	120	1008	536	120	1008	429
V/C Ratio(X)	1.77	0.23	0.44	3.18	0.95	0.95	1.04	0.30	0.14	1.67	1.02	0.35
Avail Cap(c_a), veh/h	120	1008	429	233	504	473	120	1008	536	120	1008	429
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.0	15.3	16.3	26.0	19.6	19.6	26.0	15.6	12.2	26.0	20.0	15.9
Incr Delay (d2), s/veh	379.9	0.1	0.7	992.9	28.6	29.8	93.6	0.2	0.1	337.0	33.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	14.1	1.0	1.8	33.5	9.2	8.8	4.6	1.3	0.6	12.7	10.3	1.4
Lane Grp Delay (d), s/veh	405.9	15.4	17.0	1018.9	48.2	49.4	119.6	15.8	12.3	363.0	53.3	16.4
Lane Grp LOS	F	B	B	F	D	D	F	B	B	F	F	B
Approach Vol, veh/h		633			1673			501			1380	
Approach Delay, s/veh		147.3			478.5			41.2			94.4	
Approach LOS		F			F			D			F	

Timer												
Assigned Phs	1	6		5	2		7	4		3	8	
Phs Duration (G+Y+Rc), s	8.0	20.0		8.0	20.0		8.0	20.0		8.0	20.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	4.0	16.0		4.0	16.0		4.0	16.0		4.0	16.0	
Max Q Clear Time (g_c+I1), s	6.0	7.7		6.0	17.0		6.0	5.7		6.0	18.0	
Green Ext Time (p_c), s	0.0	4.5		0.0	0.0		0.0	6.1		0.0	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	249.5
HCM 2010 LOS	F

Notes

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	186	716	87	201	365	105	165	1041	390	194	439	85
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	176.5	176.5	176.5	176.5
Lanes	1	2	1	2	2	0	1	2	1	1	2	1
Cap, veh/h	122	970	412	236	727	206	122	1024	544	122	1024	435
Arrive On Green	0.07	0.27	0.27	0.07	0.27	0.27	0.07	0.29	0.29	0.07	0.29	0.29
Sat Flow, veh/h	1681	3529	1500	3261	2646	751	1681	3529	1500	1681	3529	1500
Grp Volume(v), veh/h	202	778	95	218	263	248	179	1132	424	211	477	92
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1630	1765	1632	1681	1765	1500	1681	1765	1500
Q Serve(g_s), s	4.0	11.3	2.7	3.7	7.0	7.2	4.0	16.0	13.9	4.0	6.1	2.6
Cycle Q Clear(g_c), s	4.0	11.3	2.7	3.7	7.0	7.2	4.0	16.0	13.9	4.0	6.1	2.6
Prop In Lane	1.00		1.00	1.00		0.46	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	122	970	412	236	485	448	122	1024	544	122	1024	435
V/C Ratio(X)	1.66	0.80	0.23	0.92	0.54	0.55	1.47	1.11	0.78	1.73	0.47	0.21
Avail Cap(c_a), veh/h	122	1024	435	236	512	473	122	1024	544	122	1024	435
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.6	18.6	15.5	25.4	17.0	17.1	25.6	19.6	15.6	25.6	16.1	14.8
Incr Delay (d2), s/veh	329.2	4.5	0.3	37.9	1.0	1.2	249.9	61.7	7.1	360.8	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	12.6	4.6	0.9	2.5	2.6	2.5	10.0	14.5	5.1	13.7	2.2	0.8
Lane Grp Delay (d), s/veh	354.8	23.1	15.8	63.3	18.1	18.3	275.5	81.3	22.8	386.4	16.4	15.0
Lane Grp LOS	F	C	B	E	B	B	F	F	C	F	B	B
Approach Vol, veh/h		1075			729			1735			780	
Approach Delay, s/veh		84.8			31.7			87.0			116.3	
Approach LOS		F			C			F			F	

Timer												
Assigned Phs	1	6		5	2		7	4		3	8	
Phs Duration (G+Y+Rc), s	8.0	19.2		8.0	19.2		8.0	20.0		8.0	20.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	4.0	16.0		4.0	16.0		4.0	16.0		4.0	16.0	
Max Q Clear Time (g_c+I1), s	6.0	13.3		5.7	9.2		6.0	18.0		6.0	8.1	
Green Ext Time (p_c), s	0.0	1.8		0.0	4.1		0.0	0.0		0.0	6.1	

Intersection Summary	
HCM 2010 Ctrl Delay	82.4
HCM 2010 LOS	F

Notes

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	196	273	173	734	757	153	115	296	128	185	1006	139
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	176.5	176.5	176.5	176.5
Lanes	1	2	1	2	2	0	1	2	1	1	2	1
Cap, veh/h	120	1008	429	233	815	164	120	1008	536	120	1008	429
Arrive On Green	0.07	0.29	0.29	0.07	0.29	0.29	0.07	0.29	0.29	0.07	0.29	0.29
Sat Flow, veh/h	1681	3529	1500	3261	2853	575	1681	3529	1500	1681	3529	1500
Grp Volume(v), veh/h	213	297	188	798	509	480	125	322	139	201	1093	151
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1630	1765	1663	1681	1765	1500	1681	1765	1500
Q Serve(g_s), s	4.0	3.7	5.7	4.0	16.0	16.0	4.0	4.0	3.7	4.0	16.0	4.5
Cycle Q Clear(g_c), s	4.0	3.7	5.7	4.0	16.0	16.0	4.0	4.0	3.7	4.0	16.0	4.5
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	120	1008	429	233	504	475	120	1008	536	120	1008	429
V/C Ratio(X)	1.77	0.29	0.44	3.43	1.01	1.01	1.04	0.32	0.26	1.67	1.08	0.35
Avail Cap(c_a), veh/h	120	1008	429	233	504	475	120	1008	536	120	1008	429
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.0	15.6	16.3	26.0	20.0	20.0	26.0	15.7	12.8	26.0	20.0	15.9
Incr Delay (d2), s/veh	379.9	0.2	0.7	1102.7	42.5	43.8	93.6	0.2	0.3	337.0	53.9	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	14.1	1.3	1.8	37.1	11.6	11.1	4.6	1.4	1.1	12.7	13.2	1.4
Lane Grp Delay (d), s/veh	405.9	15.8	17.0	1128.7	62.5	63.8	119.6	15.9	13.0	363.0	73.9	16.4
Lane Grp LOS	F	B	B	F	F	F	F	B	B	F	F	B
Approach Vol, veh/h		698			1787			586			1445	
Approach Delay, s/veh		135.2			539.0			37.3			108.1	
Approach LOS		F			F			D			F	

Timer												
Assigned Phs	1	6		5	2		7	4		3	8	
Phs Duration (G+Y+Rc), s	8.0	20.0		8.0	20.0		8.0	20.0		8.0	20.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	4.0	16.0		4.0	16.0		4.0	16.0		4.0	16.0	
Max Q Clear Time (g_c+I1), s	6.0	7.7		6.0	18.0		6.0	6.0		6.0	18.0	
Green Ext Time (p_c), s	0.0	4.8		0.0	0.0		0.0	6.4		0.0	0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	273.6
HCM 2010 LOS	F

Notes

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	186	773	87	326	497	105	165	1111	495	194	478	85
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	176.5	176.5	176.5	176.5
Lanes	1	2	1	2	2	0	1	2	1	1	2	1
Cap, veh/h	121	993	422	234	796	167	121	1015	539	121	1015	431
Arrive On Green	0.07	0.28	0.28	0.07	0.28	0.28	0.07	0.29	0.29	0.07	0.29	0.29
Sat Flow, veh/h	1681	3529	1500	3261	2829	595	1681	3529	1500	1681	3529	1500
Grp Volume(v), veh/h	202	840	95	354	336	318	179	1208	538	211	520	92
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1630	1765	1660	1681	1765	1500	1681	1765	1500
Q Serve(g_s), s	4.0	12.5	2.7	4.0	9.4	9.5	4.0	16.0	16.0	4.0	6.9	2.6
Cycle Q Clear(g_c), s	4.0	12.5	2.7	4.0	9.4	9.5	4.0	16.0	16.0	4.0	6.9	2.6
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	121	993	422	234	496	467	121	1015	539	121	1015	431
V/C Ratio(X)	1.67	0.85	0.23	1.51	0.68	0.68	1.48	1.19	1.00	1.75	0.51	0.21
Avail Cap(c_a), veh/h	121	1015	431	234	507	477	121	1015	539	121	1015	431
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.8	18.9	15.3	25.8	17.8	17.8	25.8	19.8	17.8	25.8	16.6	15.1
Incr Delay (d2), s/veh	336.0	6.6	0.3	250.7	3.5	3.8	255.8	95.7	38.3	368.0	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	12.7	5.3	0.8	9.6	3.7	3.6	10.1	19.1	11.4	13.8	2.5	0.8
Lane Grp Delay (d), s/veh	361.8	25.5	15.6	276.5	21.2	21.6	281.6	115.6	56.1	393.8	17.0	15.3
Lane Grp LOS	F	C	B	F	C	C	F	F	E	F	B	B
Approach Vol, veh/h		1137			1008			1925			823	
Approach Delay, s/veh		84.4			111.0			114.4			113.4	
Approach LOS		F			F			F			F	

Timer												
Assigned Phs	1	6		5	2		7	4		3	8	
Phs Duration (G+Y+Rc), s	8.0	19.7		8.0	19.7		8.0	20.0		8.0	20.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	4.0	16.0		4.0	16.0		4.0	16.0		4.0	16.0	
Max Q Clear Time (g_c+I1), s	6.0	14.5		6.0	11.5		6.0	18.0		6.0	8.9	
Green Ext Time (p_c), s	0.0	1.2		0.0	3.2		0.0	0.0		0.0	5.9	

Intersection Summary	
HCM 2010 Ctrl Delay	106.6
HCM 2010 LOS	F

Notes

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	178	253	157	670	691	138	104	270	122	167	917	125
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	176.5	176.5	176.5	176.5
Lanes	1	2	1	2	2	0	1	2	1	1	2	1
Cap, veh/h	212	679	289	784	877	175	135	897	742	218	1073	456
Arrive On Green	0.13	0.19	0.19	0.24	0.31	0.31	0.08	0.25	0.25	0.13	0.30	0.30
Sat Flow, veh/h	1681	3529	1500	3261	2858	571	1681	3529	1500	1681	3529	1500
Grp Volume(v), veh/h	193	275	171	728	464	437	113	293	133	182	997	136
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1630	1765	1664	1681	1765	1500	1681	1765	1500
Q Serve(g_s), s	9.9	6.0	9.1	19.1	21.6	21.6	5.8	5.9	4.3	9.2	23.9	6.1
Cycle Q Clear(g_c), s	9.9	6.0	9.1	19.1	21.6	21.6	5.8	5.9	4.3	9.2	23.9	6.1
Prop In Lane	1.00		1.00	1.00		0.34	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	212	679	289	784	542	511	135	897	742	218	1073	456
V/C Ratio(X)	0.91	0.40	0.59	0.93	0.86	0.86	0.84	0.33	0.18	0.83	0.93	0.30
Avail Cap(c_a), veh/h	212	768	326	784	586	552	135	897	742	346	1091	464
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.7	30.9	32.2	32.4	28.5	28.5	39.6	26.5	12.2	37.1	29.5	23.3
Incr Delay (d2), s/veh	38.5	0.4	2.3	17.3	11.3	11.9	35.1	0.2	0.1	9.5	13.5	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	6.2	2.5	3.4	9.2	10.3	9.8	3.7	2.4	1.4	4.3	11.6	2.1
Lane Grp Delay (d), s/veh	76.2	31.3	34.4	49.7	39.8	40.4	74.7	26.7	12.4	46.6	43.0	23.6
Lane Grp LOS	E	C	C	D	D	D	E	C	B	D	D	C
Approach Vol, veh/h		639			1629			539			1315	
Approach Delay, s/veh		45.7			44.4			33.2			41.5	
Approach LOS		D			D			C			D	

Timer												
Assigned Phs	1	6		5	2		7	4		3	8	
Phs Duration (G+Y+Rc), s	15.0	20.8		25.0	30.8		11.0	26.2		15.3	30.5	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	11.0	19.0		21.0	29.0		7.0	16.0		18.0	27.0	
Max Q Clear Time (g_c+I1), s	11.9	11.1		21.1	23.6		7.8	7.9		11.2	25.9	
Green Ext Time (p_c), s	0.0	4.3		0.0	3.2		0.0	5.1		0.2	0.6	

Intersection Summary	
HCM 2010 Ctrl Delay	42.2
HCM 2010 LOS	D

Notes

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	168	705	79	307	463	95	150	1013	458	175	436	77
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	176.5	176.5	176.5	176.5
Lanes	1	2	1	2	2	0	1	2	1	1	2	1
Cap, veh/h	216	873	371	369	661	135	197	1180	671	209	1205	512
Arrive On Green	0.13	0.25	0.25	0.11	0.23	0.23	0.12	0.33	0.33	0.12	0.34	0.34
Sat Flow, veh/h	1681	3529	1500	3261	2847	580	1681	3529	1500	1681	3529	1500
Grp Volume(v), veh/h	183	766	86	334	311	295	163	1101	498	190	474	84
Grp Sat Flow(s),veh/h/ln	1681	1765	1500	1630	1765	1662	1681	1765	1500	1681	1765	1500
Q Serve(g_s), s	9.4	18.5	4.0	9.0	14.5	14.7	8.4	26.7	24.3	9.9	9.0	3.5
Cycle Q Clear(g_c), s	9.4	18.5	4.0	9.0	14.5	14.7	8.4	26.7	24.3	9.9	9.0	3.5
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	216	873	371	369	410	386	197	1180	671	209	1205	512
V/C Ratio(X)	0.85	0.88	0.23	0.91	0.76	0.77	0.83	0.93	0.74	0.91	0.39	0.16
Avail Cap(c_a), veh/h	247	918	390	369	410	386	304	1197	678	209	1205	512
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.7	32.0	26.6	38.8	31.7	31.7	38.2	28.5	20.2	38.2	22.2	20.3
Incr Delay (d2), s/veh	21.1	9.3	0.3	25.2	8.0	8.9	10.5	13.0	4.3	38.2	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	5.1	8.7	1.4	4.8	6.9	6.6	4.0	12.7	8.5	6.2	3.7	1.2
Lane Grp Delay (d), s/veh	58.7	41.3	26.9	63.9	39.7	40.6	48.7	41.5	24.6	76.4	22.4	20.5
Lane Grp LOS	E	D	C	E	D	D	D	D	C	E	C	C
Approach Vol, veh/h		1035			940			1762			748	
Approach Delay, s/veh		43.2			48.6			37.4			35.9	
Approach LOS		D			D			D			D	

Timer												
Assigned Phs	1	6		5	2		7	4		3	8	
Phs Duration (G+Y+Rc), s	15.4	25.9		14.0	24.5		14.4	33.6		15.0	34.2	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	13.0	23.0		10.0	20.0		16.0	30.0		11.0	25.0	
Max Q Clear Time (g_c+I1), s	11.4	20.5		11.0	16.7		10.4	28.7		11.9	11.0	
Green Ext Time (p_c), s	0.1	1.4		0.0	2.3		0.2	0.9		0.0	9.6	

Intersection Summary	
HCM 2010 Ctrl Delay	40.8
HCM 2010 LOS	D

Notes

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	196	273	173	734	757	153	115	296	128	185	1006	139
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	176.5	176.5	176.5	176.5
Lanes	2	2	1	2	2	0	1	2	1	1	2	1
Cap, veh/h	281	593	252	807	939	189	132	929	766	237	1150	489
Arrive On Green	0.09	0.17	0.17	0.25	0.33	0.33	0.08	0.26	0.26	0.14	0.33	0.33
Sat Flow, veh/h	3261	3529	1500	3261	2853	575	1681	3529	1500	1681	3529	1500
Grp Volume(v), veh/h	213	297	188	798	509	480	125	322	139	201	1093	151
Grp Sat Flow(s),veh/h/ln	1630	1765	1500	1630	1765	1663	1681	1765	1500	1681	1765	1500
Q Serve(g_s), s	5.7	6.8	10.6	21.7	24.2	24.2	6.6	6.6	4.4	10.4	26.9	6.7
Cycle Q Clear(g_c), s	5.7	6.8	10.6	21.7	24.2	24.2	6.6	6.6	4.4	10.4	26.9	6.7
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	281	593	252	807	581	548	132	929	766	237	1150	489
V/C Ratio(X)	0.76	0.50	0.75	0.99	0.88	0.88	0.94	0.35	0.18	0.85	0.95	0.31
Avail Cap(c_a), veh/h	293	635	270	807	596	561	132	929	766	359	1152	489
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.7	33.6	35.2	33.3	28.1	28.1	40.7	26.5	11.7	37.2	29.3	22.5
Incr Delay (d2), s/veh	10.4	0.7	10.1	28.8	13.6	14.3	61.2	0.2	0.1	11.2	16.1	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	2.6	2.9	4.5	11.4	11.8	11.2	4.9	2.7	1.4	4.9	13.2	2.3
Lane Grp Delay (d), s/veh	50.1	34.3	45.3	62.1	41.7	42.4	101.9	26.8	11.8	48.4	45.4	22.8
Lane Grp LOS	D	C	D	E	D	D	F	C	B	D	D	C
Approach Vol, veh/h		698			1787			586			1445	
Approach Delay, s/veh		42.1			51.0			39.3			43.4	
Approach LOS		D			D			D			D	

Timer												
Assigned Phs	1	6		5	2		7	4		3	8	
Phs Duration (G+Y+Rc), s	11.7	18.9		26.0	33.3		11.0	27.4		16.6	33.0	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	8.0	16.0		22.0	30.0		7.0	17.0		19.0	29.0	
Max Q Clear Time (g_c+I1), s	7.7	12.6		23.7	26.2		8.6	8.6		12.4	28.9	
Green Ext Time (p_c), s	0.0	2.3		0.0	2.6		0.0	5.6		0.3	0.1	

Intersection Summary	
HCM 2010 Ctrl Delay	45.7
HCM 2010 LOS	D

Notes

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	186	773	87	326	497	105	165	1111	495	194	478	85
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.5	176.5	176.5	176.5	176.5	180.0	176.5	176.5	176.5	176.5	176.5	176.5
Lanes	2	2	1	2	2	0	1	2	1	1	2	1
Cap, veh/h	261	882	375	359	792	167	211	1235	690	218	1251	532
Arrive On Green	0.08	0.25	0.25	0.11	0.28	0.28	0.13	0.35	0.35	0.13	0.35	0.35
Sat Flow, veh/h	3261	3529	1500	3261	2829	595	1681	3529	1500	1681	3529	1500
Grp Volume(v), veh/h	202	840	95	354	336	318	179	1208	538	211	520	92
Grp Sat Flow(s),veh/h/ln	1630	1765	1500	1630	1765	1660	1681	1765	1500	1681	1765	1500
Q Serve(g_s), s	6.1	23.4	5.1	10.8	16.9	17.1	10.4	33.8	30.2	12.5	11.2	4.2
Cycle Q Clear(g_c), s	6.1	23.4	5.1	10.8	16.9	17.1	10.4	33.8	30.2	12.5	11.2	4.2
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	261	882	375	359	494	465	211	1235	690	218	1251	532
V/C Ratio(X)	0.77	0.95	0.25	0.99	0.68	0.68	0.85	0.98	0.78	0.97	0.42	0.17
Avail Cap(c_a), veh/h	261	882	375	359	494	465	319	1235	690	218	1251	532
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.1	36.9	30.0	44.4	32.0	32.1	42.8	32.1	22.7	43.3	24.4	22.2
Incr Delay (d2), s/veh	13.5	19.6	0.4	43.9	3.8	4.1	12.5	20.4	5.7	51.0	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	2.9	12.1	1.8	6.5	7.5	7.2	5.0	17.3	11.1	8.1	4.6	1.5
Lane Grp Delay (d), s/veh	58.6	56.5	30.4	88.3	35.8	36.2	55.3	52.5	28.4	94.3	24.7	22.4
Lane Grp LOS	E	E	C	F	D	D	E	D	C	F	C	C
Approach Vol, veh/h		1137			1008			1925			823	
Approach Delay, s/veh		54.7			54.4			46.0			42.3	
Approach LOS		D			D			D			D	

Timer												
Assigned Phs	1	6		5	2		7	4		3	8	
Phs Duration (G+Y+Rc), s	12.0	29.0		15.0	32.0		16.6	39.0		17.0	39.4	
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Max Green Setting (Gmax), s	8.0	25.0		11.0	28.0		19.0	35.0		13.0	29.0	
Max Q Clear Time (g_c+I1), s	8.1	25.4		12.8	19.1		12.4	35.8		14.5	13.2	
Green Ext Time (p_c), s	0.0	0.0		0.0	5.6		0.2	0.0		0.0	11.4	

Intersection Summary	
HCM 2010 Ctrl Delay	49.1
HCM 2010 LOS	D

Notes

MINAGAR & ASSOCIATES, INC.
Traffic Engineering – Transportation Planning – Intelligent Transportation Systems (ITS) – CEM Consultants

20 Years of Excellence

July 11, 2013

Ms. Joann Lombardo
Community Development Director
City of Chino Hills
14000 City Center Drive
Chino Hills, CA 91709

Subject: Traffic Impact Study for the Transportation & Circulation Element for the City of Chino Hills General Plan Update – Analysis of Existing General Plan Alternatives of Transportation Modes

Dear Ms. Lombardo:

This letter confirms that subsequent to the submittal of our final report for the Traffic Impact Study for the Transportation & Circulation Element for the City of Chino Hills General Plan Update, an analysis of the existing general plan alternatives of transportation modes was conducted. Since the regional transportation agencies and commissions don't have any plans/programs for the City regarding other transportation modes from one hand and also due to the very small difference (a total increase of approximately 795 residential units and decrease of approximately 70,000 non-residential square feet) the net impact resultant will be negligible.

It has been a great pleasure to work with you and the City of Chino Hills.

Should you have any questions, please contact me at (949)727-3399, Extension 2# or via e-mail at minagarf@minagarinc.com.

Sincerely,

MINAGAR & ASSOCIATES, INC.
(A California Corporation)

Fred Minagar, MS, RCE, PE, FITE
President/Project Manager

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