CHINO VALLEY
UNIFIED SCHOOL DISTRICT
Student Achievement • Safe Schools • Positive School Climate
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June 2021 | EIR Addendum
The Preserve Chino Sphere of Influence – Subarea 2
State Clearinghouse No. 2000121036

Preserve School #2

Prepared for:

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PLACEWORKS

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1. Introduction

This document is an Addendum to the certified Environmental Impact Report for The Preserve—Chino Sphere of Influence—Sub-Area 2 (Certified EIR; State Clearinghouse No. 2000121036) for the Chino Valley Unified School District's (District) proposed Preserve K-8 School #2 project (Proposed Project). The Certified EIR is a "program" EIR for The Preserve Specific Plan (The Preserve), which was adopted by the City of Chino on March 25, 2003 (Approved Project).

Schools are a land use identified in the Approved Project and their buildout effects (along with the overall effects of The Preserve) are analyzed in the Certified EIR. However, the Approved Project does not specify the locations of schools, and the Certified EIR does not evaluate their project-level environmental effects. Therefore, this subsequent environmental analysis has been prepared to address the project-level effects caused by the Proposed Project.

1.1 PURPOSE AND BASIS FOR THIS ADDENDUM

This Addendum has been prepared in accordance with the California Environmental Quality Act (CEQA, California Public Resources Code, §§ 21000, et seq.) and the State CEQA Guidelines (California Code of Regulations, Title 14, §§ 15000, et seq.).

1.1.1 CEQA Guidelines

CEQA allows for the preparation of an Addendum to a certified EIR to document the environmental effects caused by proposed changes and/or additions to an approved project, as long as the changes and/or additions do not cause new significant or more severe environmental impacts than previously disclosed. Addendums are prepared in accordance with § 15164(a) of the State CEQA Guidelines, which states "the lead agency or a responsible agency shall prepare an addendum to a previously certified EIR if some changes or additions are necessary but none of the conditions described in § 15162 calling for preparation of a subsequent EIR have occurred". CEQA Guidelines § 15162(a) provides that preparation of a subsequent EIR is required when:

(1) Substantial project changes are proposed that will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.

(2) Substantial changes would occur with respect to the circumstances under which the project is undertaken that require major revisions to the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.

(3) New information of substantial importance that was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified or the negative declaration was adopted shows any of the following:

  (A) The project will have one or more significant effects not discussed in the previous EIR or negative declaration.

  (B) Significant effects previously examined will be substantially more severe than identified in the previous EIR.

  (C) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the project, but the project proponent declines to adopt the mitigation measures or alternatives.

  (D) Mitigation measures or alternatives that are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponent declines to adopt the mitigation measures or alternatives.

1.1.2 Addendum Procedure and Scope

Pursuant to § 15367 of the State CEQA Guidelines, Chino Valley Unified School District (District) is the CEQA lead agency for the Proposed Project. The lead agency is the public agency that has the principal responsibility for carrying out or approving a project that may have a significant effect upon the environment. The District, as the lead agency, has the authority for project approval and certification of its environmental documentation.

Based on the findings of this document, the District determined that preparation of this Addendum to the Certified EIR is the most appropriate form of environmental review required under CEQA. This Addendum concludes that the Proposed Project would not result in any new significant adverse impacts, increase the severity of significant adverse impacts previously identified and studied in the Certified EIR, or require the adoption of new or considerably different mitigation measures or alternatives. The conditions specified in § 15162(a) are not present and only minor technical changes to the Certified EIR are necessary. Therefore, preparation of a Subsequent EIR is not required.

The scope of the review for project-related impacts for this Addendum is limited to changes between the Approved Project and the proposed school. The Certified EIR and mitigation for impacts associated with the Approved Project (identified in its Mitigation Monitoring and Reporting Program) effectively serve as the baseline for the environmental impact analysis of the Proposed Project. As required by CEQA, this Addendum also addresses changes in circumstances or new information that would potentially involve new environmental impacts.

This Addendum is the primary reference document for the formulation and implementation of a mitigation monitoring plan for the Proposed Project. All applicable measures from the mitigation monitoring programs approved in conjunction with this Addendum and the Certified EIR have been incorporated into this document. This document is intended to provide sufficient information to allow the District and any other permitting agencies to evaluate the potential impacts from construction and operation of the Proposed Project.

1.1.3 Prior Project Approvals and Environmental Review Applicable to the Proposed Project

The Preserve Specific Plan was approved and its EIR was certified by the City of Chino in March 2003. The Approved Project includes a variety of land uses and allows for the development of a 5,435-acre area with up to 9,779 dwelling units on 1,236 acres; 626 acres of business uses; 586 acres of Public Facilities and rights-of-way; and approximately 2,987 acres in Open Space. Specific to school development, the Certified EIR projected 6,063 students from The Preserve, including 4,596 K-8 students; it identified two 10-acre elementary (K-6) schools and one 15-acre middle (7-8) school. The Certified EIR analyzed program-level effects of school services within The Preserve and did not analyze project-level impacts caused by placement of the future school facilities.

Since certification in March 2003, the City of Chino has approved eight addenda to the Certified EIR. None of the addenda analyzed development of the Proposed Project site or impacts related to the Proposed Project. In addition to the Certified EIR and addenda, in 2005, the District approved The Preserve, School Site #1 Project, now known as Cal Aero Preserve Academy; the District adopted a Negative Declaration as a part of its approval. Cal Aero Preserve Academy is at 15850 Main Street, one-half mile north of the project site. The campus opened in 2009 and operates a four-track calendar for elementary school and junior high school students. The campus is approximately 14 acres; during the 2018-2019 school year, it had an enrollment of 1,365 students (CDE, 2019).

This Addendum relies on environmental analysis in the Certified EIR and subsequent addenda. These environmental documents are available for review upon request at the City of Chino, Community Development Department at 13220 Central Avenue, Chino, CA 91710. The Cal Aero Preserve Academy MND is also available for review upon request at the District office at 5130 Riverside Drive, Chino, CA 91710.

In taking action on the Proposed Project, as described in Section 3, Project Description of this Addendum, the decision-making body of the District must consider the whole of the data presented in the Certified EIR, the eight addenda adopted for projects within The Preserve, and this Addendum.

1.2 CONTENT AND ORGANIZATION OF THIS ADDENDUM

This Addendum relies on the most current CEQA environmental checklist (Appendix G, CEQA Guidelines). The completed checklist and related conclusions are included and substantiated in Section 5, *Environmental Analysis*, which includes the following subheadings for each environmental topic:

- Summary of Impacts Identified in the Certified EIR
- Impacts Associated with the Proposed Project
- Adopted Mitigation Measures Applicable to the Proposed Project
- Level of Significance After Mitigation

1. Introduction

Mitigation measures from the Certified EIR that remain applicable to the Proposed Project have been carried forward in this Addendum. Where necessary, mitigation measures have been updated, refined, and/or supplemented to ensure mitigation is implemented as intended for the Proposed Project. Any changes to mitigation measures are shown in ~~strikeout~~ text to indicate deletions and underline text to signify additions and will be incorporated into the final mitigation monitoring program for the Proposed Project.

2. Environmental Setting

2.1 PROJECT LOCATION

As used in this Addendum, the term "project site" refers to a 12-acre lot southwest of the intersection of East Preserve Loop and Market Street and north of Academy Street in The Preserve Specific Plan area of the City of Chino, San Bernardino County. No physical address exists for the project site.

As shown in Figure 1, *Regional Location*, the City of Chino is west of the cities of Eastvale and Ontario, south of Montclair and unincorporated San Bernardino County, east of Pomona and Chino Hills, and north of unincorporated Riverside County. Regional access is via State Route 71 to the west, State Route 91 to the south, Interstate 15 to the east, and State Route 60 to the north. The project site is approximately 0.4 mile south and west of Pine Avenue and Hellman Avenue, respectively, and 1.5 miles east of Euclid Avenue (or State Route 83). Figure 2, *Project Location*, shows the project site and its surroundings.

2.2 ENVIRONMENTAL SETTING

The project site and surrounding areas are in the southern half of The Preserve, i.e., south of Pine Avenue. Figure 3, *The Preserve Specific Plan*, is a land use map and identifies the location of the project site within The Preserve.

2.2.1 Existing Land Use

The project site is vacant, dirt land that was rough graded in October 2020. The site slopes up from the northwest to the southeast, from an elevation of 594 ft to 579 ft, respectively. The property is above the Prado Basin high water inundation line (elevation 566 ft), which is a significant development constraint within The Preserve. The site is level with East Preserve Loop and at or near its final elevation. It is separated from the street by a chain-link fence. The site has been engineered to limit stormwater runoff. It contains two catch basins: one in the southeast corner of the property and the other near the mideastern perimeter, and a two-foot-high earth berm that extends westward from the second basin to the center of the project site. Figure 4, *Site Photographs*, depicts the current conditions of the project site.

Prior to its current condition, the site was hilly with some grasses, interspersed with paved and unpaved roadways. It was used for placement of soils from adjacent development activities and construction staging. Some areas in the eastern portion of the site were up to seven feet higher than East Preserve Loop. From approximately 1985 to at least 2009, the site was used as a dairy farm, and from 1966 to around 1985, the site was under agricultural production.

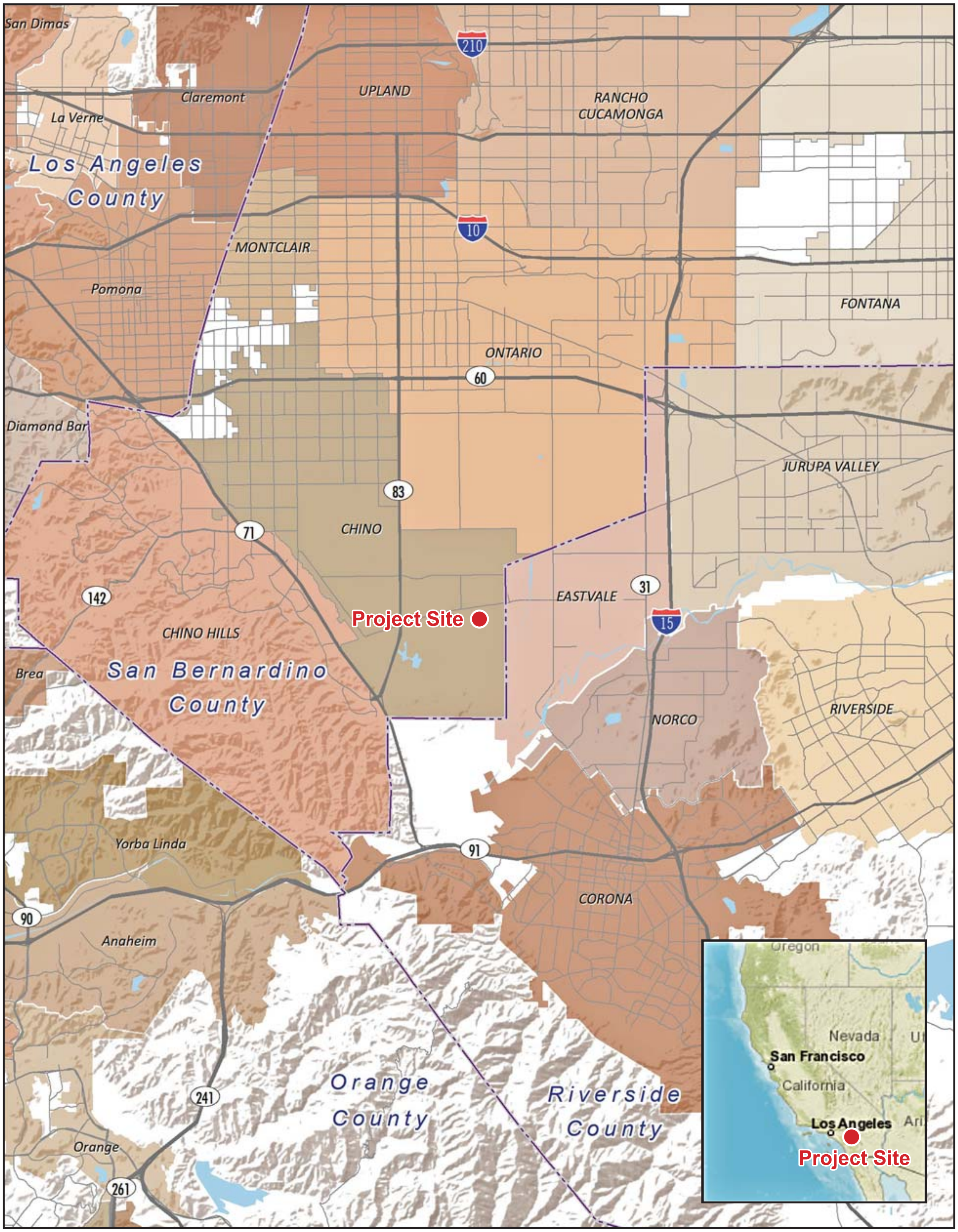
2.2.2 Surrounding Land Use

Residential uses exist to the east and northeast of the project site, and undeveloped properties are adjacent on the north, west, and south. As shown in Figure 3, the properties north and south of the site would be developed with residential uses, the property to the west would be developed with a community park, and a community retail center would be constructed to the northwest. It is anticipated that the construction of the residential uses on the north may start as early as fall 2021, the park as early as the fourth quarter of 2021, and the residential uses on the south as early as spring 2022.

2.2.3 EXISTING ZONING AND GENERAL PLAN

The Proposed Project is in The Preserve Specific Plan. According to the "Addendum to The Preserve – Chino Sphere of Influence – Sub-Area 2 Environmental Impact Report, South of Pine and Flores Project," the northern half of the project site is zoned High Density Residential (HDR) / School / Park, and the southern half is zoned School / CC Non-Residential / HDR (see Figure 3). The Proposed Project is a permitted use within the project site zoning.

Figure 1 - Regional Location



Note: Unincorporated county areas are shown in white.

Source: ESRI, 2019

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Figure 2 - Project Location

Source: Nearmap, 2019

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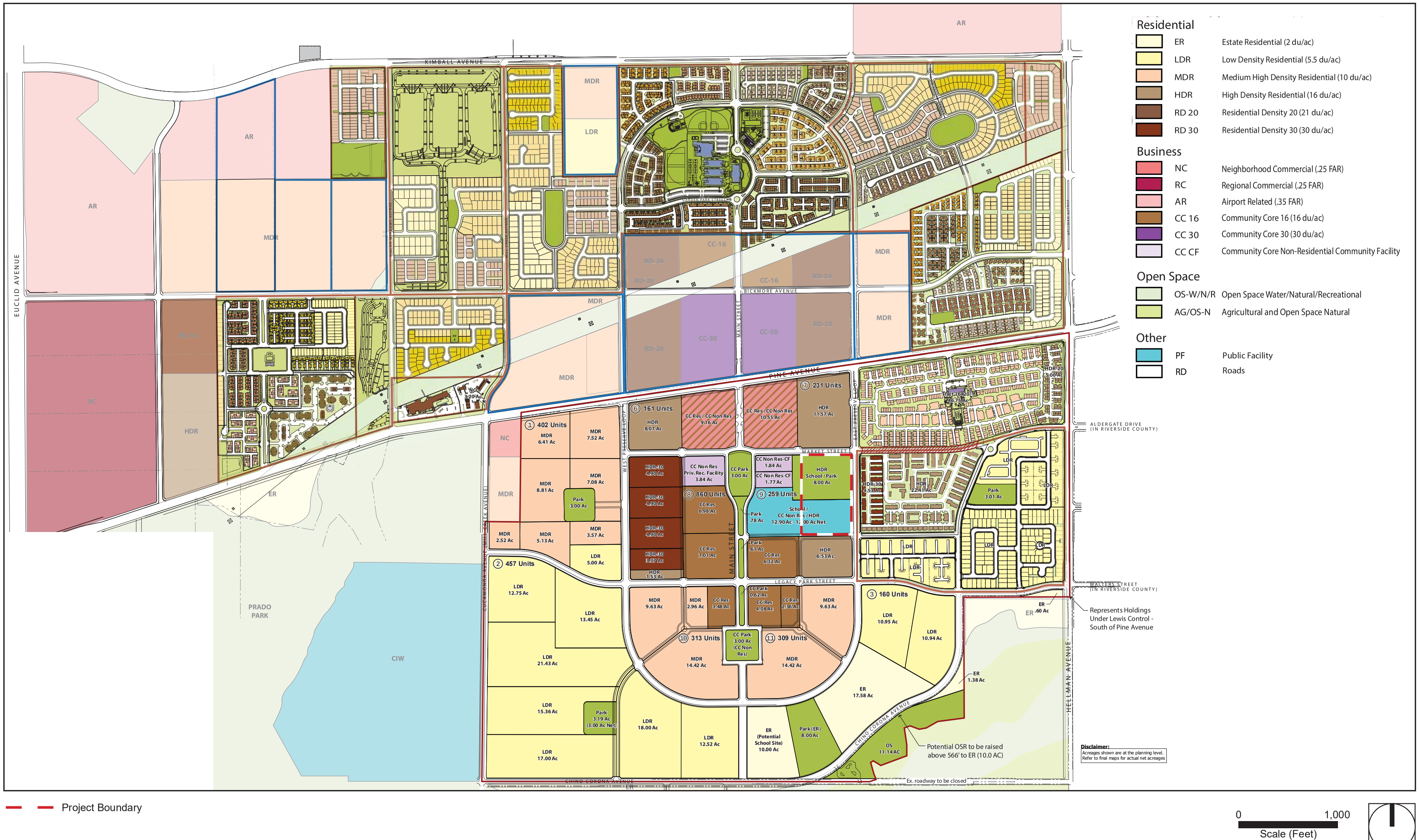
Figure 3 - The Preserve Specific Plan



Source: LDKING, 2019

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Figure 4 - Site Photographs

Photo 1. View of eastern portion of the proposed project site, looking south, near the East Preserve Loop at Market Street intersection.

Photo 2. View of the proposed project site from the south, near the southern property lines, looking north.

Source: PlaceWorks, 2021

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3. Project Description

3.1 STATEMENT OF OBJECTIVES

The District has established the following objectives for the Proposed Project:

1. Develop school facilities to house elementary and middle school students generated from The Preserve.
2. Relieve enrollment overcrowding at Cal Aero Preserve K-8 School and other District schools.
3. Design and operate a school that considers student safety and security, as well as requirements per California Code of Regulations, Title 5.
4. Operate a state-of-the-art education program, similar to other District schools, including Cal Aero K-8 School.

3.2 PROPOSED LAND USE

Project Need

The Certified EIR projected 4,596 K-8 students and identified the need for two K-6 elementary schools and one middle school. In 2009, the District opened Cal Aero Preserve Academy, which operates a four-track calendar with a maximum enrollment capacity of 1,200 students in kindergarten through eighth grades. With the continued development of the southern half of The Preserve and projected increase in elementary and middle school students in the Approved Project, the planned development of the Proposed Project to serve the area south of Pine Avenue is necessary.

Proposed Project

Site Acquisition

The Proposed Project entails acquisition of the 12-acre project site for the development and operation of a public K-8 school campus. Please see Section 2.2.1 for a description of the project site.

School Facilities

The proposed campus would include six permanent, single-story school buildings in the mid- and north-central portions of the site with a total footprint of approximately 82,000 square feet. Space for future portable classroom buildings is along the western perimeter of the property, west of the permanent buildings. The proposed school would include typical school facilities, including 36 classrooms, i.e., 4 classrooms per grade level; science/STEM labs; music classrooms; multipurpose room; kitchen; library; gymnasium with bleacher seating for up to 400 spectators; and office/administration facilities. An outdoor lunch shelter and amphitheater/assembly area are proposed in the center of the clustered school buildings. Figure 5, *Site Plan,* shows the layout of the proposed school. Figure 6, *Building Elevations,* illustrates the exterior façade of the proposed school buildings.

Outdoor Recreation

Outdoor recreational facilities are proposed in the southern one-third of the campus. The Proposed Project does not include high-intensity lighting for nighttime outdoor uses. Six basketball courts are proposed south of the school buildings, and an outdoor playground structure would be west of the basketball courts. A natural turf multipurpose field—accommodating a soccer field and/or two ball fields—would be along the southern perimeter of the site. The kindergarten play area is proposed in the northeast corner of the campus, adjacent to the kindergarten classrooms.

Onsite Infrastructure Improvements

The Proposed Project includes the installation of domestic water, fire, and sewer lines that would tie into existing and future systems under East Preserve Loop and Market Street. A network of storm drains, lines, and inlets would be strategically installed throughout the campus, including around the school buildings, along the south side of the basketball courts, and at the southeast corner of the parking lot on Market Street. Collected stormwater would be directed to one of two underground biofiltration treatment systems in the eastern perimeter of the sports field and main parking lot.

Vehicle Access and Parking

Vehicle and pedestrian entry points are proposed on East Preserve Loop and Market Street. The campus would include two onsite parking lots and student loading areas. The District expects most students to walk to/from school and home. The District does not expect any school buses to service the school; if they do, they will use the drop off lane/lot on Market Street. Parent vehicle traffic would be routed through the eastern parking lot; vehicles will be directed to enter from East Preserve Loop via the northern most driveway and exit via the southernmost driveway.

The campus would include 109 onsite parking stalls, which exceeds CDE's requirement of 81 spaces (or 2.25 spaces per classroom). The East Preserve Loop lot would include 27 stalls for visitor parking, and the Market Street lot would include 82 parking stalls for staff parking. The campus would include 8 ADA parking stalls.

A fire access road would be accessed from the Market Street and East Preserve Loop parking lots; it would skirt west and south of the cluster of school buildings.

Landscaping

The perimeter of the campus and areas around the school buildings would be landscaped with drought-resistant, low-maintenance vegetation. Plants along the perimeter of the parking lots would be less than 3.5 feet above the ground in order to ensure the line-of-sight and visibility of oncoming vehicles.

Sustainable Features

The proposed school would include sustainable features consistent with the California Green Building Standards Code (CALGreen) and would include the following improvements:

- Building oriented to maximize daylighting and minimize the need for artificial lights.
- Increased insulation values in walls and attic spaces.
- Installation of high-efficiency windows and doors.
- Installation of efficient heating, ventilation, and air conditioning (HVAC) systems for all building spaces.
- Use of Energy Star appliances.
- Installation of water-efficient plumbing fixtures for toilets and sinks.
- Installation of tankless water heater systems.
- Installation of light-emitting diode (LED) technology for all interior and exterior building areas.
- Use of recycled water for common area landscape irrigation.
- Use of drought-tolerant plants in landscape design to minimize irrigation onsite.
- Installation of water-efficient irrigation systems with smart sensor controls.
- Installation of EV charging stations.
- Installation of solar panels. 30 feet

School Operation

The proposed school would serve students in kindergarten through eighth grade living in The Preserve. The campus would have a maximum enrollment capacity of 900 students if operated on a standard school calendar or a maximum of 1,200 students on a 4-track, year-round schedule, consistent with Cal Aero Preserve Academy's school calendar (see Figure 7, *Multitrack School Calendar*). School hours would generally be from 8:30 am to 3:30 pm. To minimize potential traffic issues and congestion, the proposed school would implement staggered start and end times and a traffic and parking management plan.

Minimum days would end at noon. Similar to other public schools, the proposed school would have nighttime events such as back-to-school night, open house, talent shows, and awards ceremonies. The proposed school facilities would be available for community use through the Civic Center Act.[1]

School Construction

The District will acquire the project site as soon as the California Department of Education concurs that the site is suitable for public school construction and operation and when mutually agreeable terms in the purchase contract between the District and landowner are reached. For the purposes of the analysis completed in this Addendum, it is assumed that construction will start in mid-2022, and school will open in fall 2024; construction would last approximate 24 months. Construction staging would be set up in the eastern part of the site, which is closest to the designated access for construction vehicles on East Preserve Loop. The District and/or its

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[1] Sections 38130 et seq. of the California Education Code, known as the Civic Center Act, state that every public school in the state must make available a "civic center" for community use. Specific uses and users of the civic center are in the Education Code.

construction contractor will include construction flaggers to control traffic and place cones and construction signs indicating that the site is a construction zone.

3.3 INTENDED USES OF THIS ADDENDUM

This Addendum to the Certified EIR examines the potential environmental impacts of the Preserve K-8 School #2 project and is intended to enable the District, responsible agencies, and interested parties to make informed decisions with respect to requirement entitlements for project construction. The anticipated approvals required for the Proposed Project are:

Lead Agency	Action
CVUSD Board of Education	• Adoption of Addendum and Approval of Project
Responsible Agencies	Action
City of Chino Public Works Department	• Drainage Improvements Approval and Offsite Roadway Improvements
Santa Ana Regional Water Quality Control Board	• NPDES Permit • Notice of Intent (NOI) to Obtain Permit Coverage; Issue General Permit for Discharges of Stormwater Associated with Construction; Storm Water Pollution Prevention Plan (SWPPP)
Reviewing Agencies	Action
California Department of Education, School Facilities and Transportation Services Division	• Review School Site Selection, Design and Educational Program
California Department of General Services, Division of the State Architect	• Review Building and Construction Plans
Chino Valley Independent Fire Division	• Review Site Plan for Compliance with Onsite Fire and Emergency Access and Fire/Life Safety Apparatuses
City of Chino Police Department	• Review Site Plan for School Site Safety and Security

Figure 5 - Site Plan

Source: WLC Architects, 2020

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Figure 6 - Building Elevations

East Elevation

North Elevation

South Elevation

West Elevation

Source: WLC Architects, 2020

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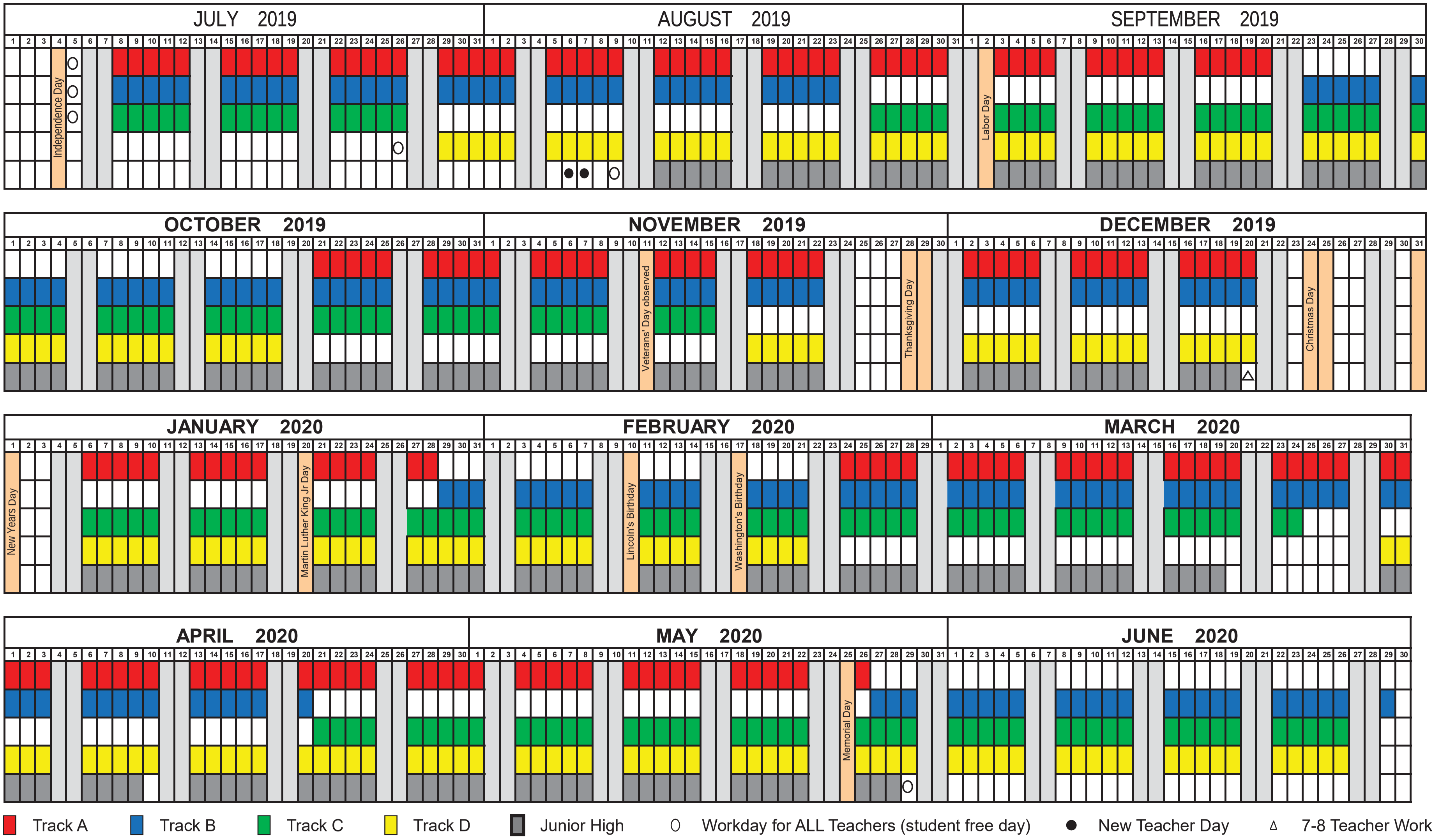
Figure 7 - Multitrack School Calendar

Chino Valley Unified Shool District

2019-2020 MULTITRACK YEAR-ROUND STUDENT ATTENDANCE CALENDAR



Source: CVUSD, 2017

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4. Environmental Checklist

4.1 BACKGROUND

1. **Project Title:** Preserve School #2

2. **Lead Agency Name and Address:**
Chino Valley Unified School District
5130 Riverside Drive
Chino, California 91710

3. **Contact Person and Phone Number:**
Gregory J. Stachura, Assistant Superintendent
909.628.1201

4. **Project Location:** The project is proposed on a 12-acre lot southwest of the intersection of East Preserve Loop and Market Street and north of Academy Street in The Preserve Specific Plan area of the City of Chino, San Bernardino County.

5. **Project Sponsor's Name and Address:**
Chino Valley Unified School District
5130 Riverside Drive
Chino, California 91710

6. **General Plan Designation:** The Preserve Specific Plan - High Density Residential (HDR)

7. **Zoning:** HDR / School / Park / CC Non-residential

8. **Description of Project**:
The Proposed Project is the acquisition of a 12-acre lot for the development and operation of a K-8 school campus.

9. **Surrounding Land Uses and Setting:**
The project site is currently surrounded by residential uses to the east and vacant land on other sides. Future developments surrounding the site include residential to the north and south, a community park to the west, and a community retail center to the northwest.

10. **Other Public Agencies Whose Approval Is Required**:
City of Chino Public Works – Drainage and Offsite Roadway Improvements
Santa Ana Regional Water Quality Control Board – NPDES Permit and SWPPP

4.2 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
☐ Biological Resources
☐ Geology / Soils
☐ Hydrology / Water Quality
☐ Noise
☐ Recreation
☐ Utilities / Service Systems
☐ Agricultural and Forest Resources
☐ Cultural Resources
☐ Greenhouse Gas Emissions
☐ Land Use / Planning
☐ Population / Housing
☐ Transportation / Traffic
☐ Wildfire
☐ Air Quality
☐ Energy
☐ Hazards & Hazardous Materials
☐ Mineral Resources
☐ Public Services
☐ Tribal Cultural Resources
☐ Mandatory Findings of Significance

4.3 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 revisions in the project have been made by or agreed to by the project proponent. 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.

☐ I find that the Proposed Project MAY have a “potentially significant impact” or “potentially significant unless mitigated” impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☒ 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 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.

Digitally signed by Gregory Stachura
DN: cn=Gregory Stachura, o=Chino Valley Unified School District, ou=Assistant Superintendent, Facilities, Planning & Operations, email=greg_stachura@chino.k12.ca.us, c=US
Date: 2021.05.25 15:28:34 -07'00'

Signature

May 25, 2021
Date

Gregory J. Stachura
Printed Name

Chino Valley Unified School District
For

4.4 EVALUATION OF ENVIRONMENTAL IMPACTS

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 the parentheses following each question. 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 would 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.

5. Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:

    a) Earlier Analyses 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). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7. Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8. This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9. The explanation of each issue should identify:

   a) the significance criteria or threshold, if any, used to evaluate each question; and

   b) the mitigation measure identified, if any, to reduce the impact to less than significance

5. Environmental Analysis

This section is provided to substantiate the conclusions set forth in the Environmental Checklist of each topical section. For each topic, conclusions of the Certified EIR are summarized. The summary is followed by an environmental impact analysis of the Preserve K-8 School #2 Project in comparison to environmental impacts of the Approved Project. Mitigation measures from the Certified EIR are listed, updated, and refined, as necessary, to reflect the Preserve #2 School Project and any new circumstances.

Additionally, the checklist questions listed under each topical section reflect the recent amendments and updates to the state guidelines for implementing CEQA, which included changes to the CEQA checklist questions. Applicable mitigation measures from the Mitigation Monitoring and Reporting Program adopted in connection with the Certified EIR are provided in each section. The below analysis discusses:

1. Whether or not the Proposed Project represents a substantial change in the Approved Project that will require major revisions to the Certified EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;

2. Whether or not substantial changes with respect to circumstances under which the Approved Project is being undertaken will require major revisions to the Certified EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or

3. If new information shows any sign of the findings in CEQA Guidelines § 15162 (a)(3).

Mitigation measures referenced are from the Certified EIR unless otherwise noted.

5.1 AESTHETICS

5.1.1 Findings of the Certified EIR

The Approved Project would change the existing land use from rural to urban and incorporate a variety of residential, commercial, industrial, institutional, recreation, and open space uses. Although the visual character and lighting levels of the project area would substantially change to reflect the urbanization, the Certified EIR concludes that with compliance with design guidelines and criteria standards established as a part of The Preserve Specific Plan, aesthetic impacts would not be significant and adverse on both project and cumulative levels.

5.1.2 Impacts Associated with the Proposed Project

Except as provided in Public Resources Code § 21099, would the project:

5. Environmental Analysis

Environmental Issues	Change in Project Requiring EIR Revisions	Change in Circum-stances Requiring EIR Revisions	New Information Showing Potentially New or Increased Significant Effects	Less Than Significant Impact and No Changes to Certified EIR	No Impact and No Changes to Certified EIR
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) In nonurbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?				X	
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?				X	

a) Have a substantial adverse effect on a scenic vista?

Less Than Significant Impact / No Changes to the Certified EIR. Since EIR certification, the northern portion of The Preserve area (i.e., north of Pine Avenue) has been developed with residential uses, The Preserve Community Center, Cal Aero Preserve Academy, streetlights, and hard surfaces. Construction of the southern portion of The Preserve began over the last few years. The area east of the project site is currently being developed with residences related to the Homecoming at The Preserve development, and the areas to the north, west, and south are vacant (see Figure 4). The project site is graded and at the same elevation as East Preserve Loop.

The Certified EIR states that visual resources in the Preserve are at or below the 566-foot Prado Dam inundation area, which is about 4.5 miles south-southwest of the project site, and that there are no visual resources on the project site. It also identifies the hills of the Cleveland National Forest to the south and the Chino Hills to the west as the most distant off-site visual features visible from The Preserve, though they are not protected. These visual features are also visible from the project site.

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

No Impact / No Changes to the Certified EIR. The project site has been rough graded and does not contain scenic resources such as trees, rock outcroppings, or historic buildings. Additionally, the project site is not visible from any officially designated state scenic highways (State Route 55, which is over 10 miles southwest of the project site), eligible state scenic highway (State Route 71, 2.8 miles southwest of the site), or designated

County scenic highway (Euclid Avenue, about 3 miles east of the site). Therefore, no impact to scenic resources near scenic highways would occur.

c) In nonurbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

Less Than Significant Impact / No Changes to the Certified EIR. See response 5.1.a, above. As shown in Figure 5, the southern third of the campus would be developed with outdoor recreational uses (turf and basketball courts), and school buildings would be in the midwestern portion of the campus. The northern and eastern perimeters of the campus would be landscaped and developed with loading zones and parking lots. The single-story school buildings would be oriented and laid out to include breaks between the buildings in order to provide visual relief (Figure 6). The proposed school has been designed in accordance with the District's design guidelines and takes into consideration applicable design guidelines and criteria established for The Preserve. Similar to Cal Aero Preserve Academy, the Proposed Project would be compatible with the visual character of the surrounding uses and would be maintained in good condition by the District. The Proposed Project would not substantially degrade the visual character or quality of the project area. No new impacts or increase in the severity of aesthetics impacts would occur, and preparation of a subsequent EIR would not be necessary.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Less Than Significant Impact / No Changes to the Certified EIR. The Proposed Project includes exterior and interior building lights and low intensity parking lot lighting. No field lighting or lighting of hardcourts for evening use is proposed. Only typical security lighting along buildings or within the parking lot would be installed. Lighting proposed for the school would be modest and would not flash or adversely affect any day or nighttime views in the area. There are no lighting sources proposed beyond that anticipated in the Certified EIR. Therefore, the Proposed Project would not result in any new impacts or increase the severity of impacts, and preparation of a subsequent EIR would not be necessary.

5.1.3 Adopted Mitigation Measures Applicable to the Proposed Project

No mitigation measures were identified in the Certified EIR, and the Proposed Project conforms with the design and landscape guidelines and criteria adopted by the District. Where applicable, it will comply with Approved Project standards.

5.1.4 Level of Significance After Mitigation

The Proposed Project's impacts are less than significant and would not be greater than those identified in the Certified EIR.

5.2 AGRICULTURE AND FORESTRY RESOURCES

5.2.1 Findings of the Certified EIR

As classified by the California Department of Conservation, buildout of the Approved Project would result in the loss of Prime Farmland, Farmland of Statewide and Local Importance, and Grazing Land. Much of The Preserve is also within the County of San Bernardino Agricultural Preserve. The loss of farmlands, acceleration of the conversion of prime agricultural land and prime farmland to urban uses, and loss of agricultural productivity are significant. Even with the implementation of the mitigation measures included in the Certified EIR, the Approved Project would continue to cause significant and unavoidable project-level and cumulatively considerable impacts on agricultural resources.

5.2.2 Impacts Associated with the Proposed Project

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 Department 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 Proposed Project:

Environmental Issues	Change in Project Requiring EIR Revisions	Change in Circum-stances Requiring EIR Revisions	New Information Showing Potentially New or Increased Significant Effects	Less Than Significant Impact and No Changes to Certified EIR	No Impact and No Changes to Certified EIR
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, or a Williamson Act contract?					X
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code § 12220(g)), timberland (as defined by Public Resources Code § 4526), or timberland zoned Timberland Production (as defined by Government Code § 51104(g))?					X
d) Result in the loss of forest land or conversion of forest land to non-forest use?					X

Environmental Issues	Change in Project Requiring EIR Revisions	Change in Circum-stances Requiring EIR Revisions	New Information Showing Potentially New or Increased Significant Effects	Less Than Significant Impact and No Changes to Certified EIR	No Impact and No Changes to Certified EIR
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 or conversion of forest land to non-forest use?					X

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?

Less Than Significant Impact / No Changes to the Certified EIR. According to the Department of Conservation Farmland Mapping and Monitoring Program, the project site is still classified as Prime Farmland. The site, however, has been rough graded and is vacant with no agricultural uses. The site is ready for development pursuant to the Approved Project, and implementation of the Proposed Project would not directly convert any farmland to nonagricultural use. Development of the project site and its impacts were analyzed in the Certified EIR, and the Proposed Project impacts would not result in greater agricultural land use impacts beyond those analyzed in Certified EIR.

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

No Impact / No Changes to the Certified EIR. The Certified EIR identified the site as being under a Williamson Act contract and within the San Bernardino County Agricultural Preserve. However, according to the City of Chino Williamson Act Map, as of January 1, 2017, the contract for the project site has been terminated. Additionally, Figure 5.2-3 of the San Bernardino Countywide Plan EIR does not identify any properties within Chino within an Agricultural Preserve Overlay. The project site is not zoned for agricultural use. The Preserve Specific Plan zones the northern half of the site High Density Residential (HDR) / School / Park, and the southern half is zoned School / CC Non-Residential / HDR. Therefore, development of the Proposed Project would not conflict with existing zoning or a Williamson Act contract. No impact would occur.

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code § 12220(g)), timberland (as defined by Public Resources Code § 4526), or timberland zoned Timberland Production (as defined by Government Code § 51104(g))?

No Impact / No Changes to the Certified EIR. No forest lands or timberlands as defined in Public Resources Code §s 12220(g) or 4526, or Government Code § 51104(g) would be impacted by the Proposed Project. Additionally, the Proposed Project site is not zoned for forest land and would not result in rezoning of forest land or timberland; see response 5.2.b. No impact would occur.

d) Result in the loss of forest land or conversion of forest land to non-forest use?

No Impact / No Changes to the Certified EIR. See response 5.2.b. There is no forest land within the boundary of the project site. Implementation of the Proposed Project would not result in the loss of forest land or conversion of forest land to nonforest use. No impact would occur.

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 or conversion of forest land to non-forest use?

Less Than Significant Impact / No Changes to the Certified EIR. The project site is graded and vacant with no agricultural or forest land uses; see sections 5.2.a and 5.2.c. Project implementation would not directly convert the site from these uses to nonagricultural or non-forest uses. However, it would contribute to the acceleration of the conversion of agricultural land to urban uses and the regional loss of agricultural productivity. Agricultural land use impacts would not be beyond those analyzed in Certified EIR, and additional environmental analysis would not be required.

5.2.3 Adopted Mitigation Measures Applicable to the Proposed Project

The following mitigation measures were identified in the Certified EIR. Applicability of each mitigation measure has been evaluated. The mitigation measures have been modified where appropriate to reflect the Proposed Project. The revisions are identified in ~~strikethrough~~ for deletion and underline for addition.

~~AG-1.~~ ~~**Agricultural Land Preservation.** The City of Chino will propose to participate in the Williamson Act Easement Exchange Program (WAEEP) and any plan that may be adopted pursuant to SB 831.~~

~~AG-2.~~ ~~**Agency Coordination and Planning for Agricultural Uses.** The City of Chino shall participate in a coordinated multi-agency planning program for sustainable agricultural uses within the Lower Chino/Prado Basin. This program should involve the principal public landowners within the basin, including but not limited to the U.S. Army Corps of Engineers, Orange County Flood Control District, and County of San Bernardino. Components of this program may include an agricultural feasibility study, acquisitions plan, and management plan for sustainable agricultural uses within the basin.~~

~~Also see Biological Resources Measure B-3(4), RMP-Urban Buffer/Transition Area~~

5.2.4 Level of Significance After Mitigation

The City of Chino has implemented Mitigation Measures AG-1 and AG-2. However, the Certified EIR concluded that even with the implementation of Mitigation Measures AG-1 and AG-2, project-level and cumulative impacts to agricultural resources would remain significant and unavoidable. The Project would continue to contribute to the acceleration of the conversion of prime farmland to urban uses, and cumulative impacts would remain significant as that of the Certified EIR. However, impacts would not be greater than previously disclosed.

5.3 AIR QUALITY

5.3.1 Findings of the Certified EIR

The Certified EIR concluded that, even after the implementation of mitigation measures, the Approved Project would result in significant short-term and long-term air-quality impacts.

- The Certified EIR determined that although construction-related dust and equipment exhaust emissions would be minimized with implementation of Mitigation Measure AQ-2, both PM_{10} and NO_x emissions would remain significant.
- Mobile source emissions were found to be the primary source of operational emissions. Because mobile source emissions would exceed the South Coast Air Quality Management District's (South Coast AQMD) significance thresholds, the project's cumulative contribution to regional air quality impacts was identified as a significant unavoidable impact of the project despite implementation of Mitigation Measure AQ-1.

In addition, the Certified EIR identified that the Approved Project would temporarily expose a substantial number of people to odors from dairy operations and co-composting during the transition from agriculture to nonagricultural use.

Consistency with the South Coast AQMD's Air Quality Management Plan (AQMP) and carbon monoxide (CO) hotspots were identified as less than significant impacts of the Approved Project in the Certified EIR.

5.3.2 Impacts Associated with the Proposed Project

Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:

Environmental Issues	Change in Project Requiring EIR Revisions	Change in Circum-stances Requiring EIR Revisions	New Information Showing Potentially New or Increased Significant Effects	Less Than Significant Impact and No Changes to Certified EIR	No Impact and No Changes to Certified EIR
a) Conflict with or obstruct implementation of the applicable air quality plan?				X	
b) 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?				X	
c) Expose sensitive receptors to substantial pollutant concentrations?				X	
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?				X	

a) Conflict with or obstruct implementation of the applicable air quality plan?

Less Than Significant Impact / No Changes to the Certified EIR. A consistency determination with an AQMP plays an important role in local agency project review by linking local planning and individual projects to the AQMP. It fulfills the CEQA goal of informing decision makers of the environmental efforts of the Project under consideration early enough to ensure that air quality concerns are fully addressed. It also provides the local agency with ongoing information as to whether they are contributing to the clean air goals in an AQMP. South Coast AQMD is responsible for developing the AQMP for the South Coast Air Basin (SoCAB) region.

Since the 2004 EIR was certified, the South Coast AQMD has adopted a new AQMP. The current air quality plan for the SoCAB region is the 2016 AQMP, which was adopted March 2017 (South Coast AQMD 2017). Regional growth projections are used by South Coast AQMD to forecast future emission levels in the SoCAB. For southern California, these regional growth projections are provided by the Southern California Association of Governments (SCAG) and are partially based on land use designations included in city/county general plans. Projects that are consistent with the local general plan are considered consistent with the air quality–related regional plan.

Changes in population, housing, or employment growth projections have the potential to affect SCAG's demographic projections, and therefore, the assumptions in AQMPs prepared for the region. The Certified EIR found that the Approved Project would be consistent with the AQMP. The entitled development for the project site is an elementary school with a maximum of 1,000 students. The Project would develop a 12-acre lot and build 82,000 square feet of educational facilities for the proposed K-8 school campus. The proposed school would serve up to 1,200 students, which is 200 more students that currently allowed under the Approved Project. This increase in building space would be smaller than the 650,000 square feet of floor area that would be subject to statewide, regional, or area-wide significance (§15206(b) of the CEQA Guidelines). Furthermore, the net increase in emissions of the Project compared to the Approved Project would not exceed the South Coast AQMD's regional operation-phase significance thresholds, and impacts would be less than significant. Therefore, no new significant impact or substantially more severe significant impacts than those identified in the Certified EIR would occur. Impacts would not be beyond those analyzed in Certified EIR.

b) 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?

Less Than Significant Impact / No Changes to the Certified EIR.

Regional Construction Impacts

Construction emission impacts associated with the Approved Project from the Certified EIR were found to be significant and unavoidable. The Proposed Project includes the construction of 6 permanent buildings, 10 future portable structures (if and when needed), visitor's and staff parking, hardcourts, and play fields. Construction of the Proposed Project would generate criteria air pollutants associated with construction equipment exhaust, fugitive dust from building construction, pavement of asphalt and nonasphalt surfaces, and architectural coating. Construction of the Proposed Project is anticipated to begin June of 2022 and last approximately 24 months. Table 1, *Maximum Daily Regional Construction Emissions*, compares emissions from the

Approved Project to the Proposed Project. The Proposed Project would not generate emissions above the maximum daily emissions identified in the Certified EIR. Further, construction emissions associated with the Proposed Project would not exceed the South Coast AQMD's regional construction thresholds. Therefore, the Proposed Project would not result in a substantial increase in magnitude of construction emissions compared to that evaluated in the 2003 EIR. Impacts would not be beyond those analyzed in Certified EIR.

Table 1 Maximum Daily Regional Construction Emissions

	Pollutants (lb/day)[1, 2]					
Construction Phase	VOC	NO$_X$	CO	SO$_2$	PM$_{10}$	PM$_{2.5}$
Certified EIR Table 5.9-6						
Construction Equipment	54	768	250	92	82	NA
Worker Commuting	1	1	8	<1	3	NA
Grading Dust	-	-	-	-	3220	NA
Maximum Daily Emissions	55	769	258	92	3305	NA
Proposed Project						
Site Preparation	3	33	20	<1	10	6
Grading	4	39	30	<1	6	3
Soil Haul	<1	1	<1	<1	<1	<1
Building Construction 2022	3	24	25	<1	4	2
Building Construction 2023	3	21	24	<1	4	1
Building Construction 2024	3	20	23	<1	3	1
Paving	2	10	15	<1	1	<1
Architectural Coating	14	1	3	<1	1	<1
Maximum Daily Construction Emissions						
Maximum Daily Emissions	14	39	30	8	10	6
Comparison of Proposed Project to Certified EIR Table 5.2-5						
Change from 2004 Certified EIR	-41	-730	-228	-84	-72	6
South Coast AQMD Threshold	75	100	550	150	150	55
Significant?	No	No	No	No	No	No

Source: CalEEMod Version 2016.3.2.25

[1] Based on the preliminary information provided by the District. Where specific information regarding project-related construction activities was not available, construction assumptions were based on CalEEMod defaults, which are based on construction surveys conducted by South Coast AQMD of construction equipment.

[2] Includes implementation of fugitive dust control measures required by South Coast AQMD under Rule 403 and Mitigation Measure AQ-2, including watering disturbed areas a minimum of two times per day, reducing speed limit to 15 miles per hour on unpaved surfaces, and replacing ground cover quickly.

Long-Term Operational Impacts

Operational emissions associated with the Approved Project were found to be significant and unavoidable. Because emissions with mobile sources alone far exceeded the thresholds, secondary operational emissions from energy consumption were not quantified at the time of the Certified EIR. However, the Certified EIR determined that because the mobile source emissions exceeded the South Coast AQMD's threshold of significance for all pollutants analyzed, the omission of power consumption emissions would not affect the project impact findings. The Proposed Project would result in a new K-8 school with painted surfaces, paved areas, and hardscape and landscape surfaces that would generate air pollutant emissions from area sources, energy use, and mobile sources. The entitled development for the project site (Approved Project) is an elementary school with a maximum of 1,000 students. The net increase in operational emissions of the Proposed Project compared to the Approved Project is shown in Table 2. As seen in Table 2, implementation of the Proposed Project's operational air pollutant emissions would not exceed the maximum daily operational emissions identified in the Certified EIR, and the net increase in emissions would not exceed the South Coast AQMD's regional operations significance thresholds. Therefore, the Proposed Project would not result in a substantial increase in emissions. Impacts would not be beyond those analyzed in the Certified EIR.

Table 2 Net Increase in Proposed Project Criteria Air Pollutant Emissions

Emissions Sector	Pounds per Day					
	VOC	NOx	CO	SO	PM_{10}	$PM_{2.5}$
Certified EIR Table 5.9-7						
Certified EIR	305	240	4,016	29	1,613	NA
Proposed Project						
Area	2	<1	<1	<1	<1	<1
Energy	<1	<1	<1	<1	<1	<1
Mobile (Passenger)[1]	<1	<1	9	<1	3	<1
Total	3	<1	9	<1	3	<1
Comparison of Proposed Project to Certified EIR Table 5.2-6						
Change from Certified EIR	-302	-239	-1,007	-28	-1,610	NA
South Coast AQMD Threshold	55	55	550	150	150	55
Exceeds Threshold	No	No	No	No	No	NA

Source: CalEEMod Version 2016.3.2.25. Highest winter or summer emissions reported.

[1] Based on the net increase in daily trips of the Proposed Project compared to the Approved Project provided by LLG.

c) Expose sensitive receptors to substantial pollutant concentrations?

Less Than Significant Impact / No Changes to the Certified EIR. The Project could expose sensitive receptors to elevated pollutant concentrations if it would cause or contribute significantly to elevated pollutant concentration levels. Unlike regional emissions, localized emissions are typically evaluated in terms of air concentration rather than mass so they can be more readily correlated to potential health effects.

Construction

Localized Significance Thresholds

Since approval of the Certified EIR, the South Coast AQMD has adopted Localized Significance Threshold (LST) that are based on the California ambient air quality standards (AAQS), which are the most stringent AAQS that have been established to provide a margin of safety in the protection of public health and welfare. They are designated to protect those sensitive receptors most susceptible to further respiratory distress, such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and people engaged in strenuous work or exercise. The screening-level construction LSTs are based on the size of the project site, distance to the nearest sensitive receptor, and source receptor area (SRA). The receptors near the project site include residents of multifamily dwellings, which are approximately 110 feet away to the east.

Air pollutant emissions generated by construction activities are anticipated to cause temporary increases in air pollutant concentrations. The project site is located within SRA 10 – Pomona Walnut Valley. Table 3 shows the maximum daily construction emissions (lbs per day) generated during onsite construction activities compared with the South Coast AQMD's screening-level construction LSTs. As shown in Table 3, the Project's construction activities would not generate emissions that exceed South Coast AQMD screening-level construction LSTs. Thus, implementation of the Project would not expose sensitive receptors to substantial pollutant concentrations. Therefore, impacts would not be beyond those analyzed in Certified EIR.

Table 3 Construction Emissions Compared to the Screening-Level LSTs

Construction Activity	Pollutants(lbs/day)[1]			
	NO_X	CO	PM_{10}[2]	$PM_{2.5}$[2]
South Coast AQMD **≤1.00** -acre LST	128	1,022	8	5
Soil Haul 2022	<1	<1	<1	<1
Paving 2024	10	15	<1	<1
Architectural Coating 2024	1	2	<1	<1
Exceeds LST?	No	No	No	No
South Coast AQMD 1.31-Acre LSTs	144	1,156	9	5
Building Construction 2022	16	16	<1	<1
Building Construction 2023	14	16	<1	<1
Building Construction 2024	13	16	<1	<1
Overlapping Building Construction, Paving, & Architectural Coating 2024	24	33	1	1
Exceeds LST?	No	No	No	No
South Coast AQMD 3.50-Acre LSTs	231	1,956	19	8
Site Preparation 2022	33	20	9	5.7
Exceeds LST?	No	No	No	No
South Coast AQMD 4.00-Acre LSTs	248	2,125	22	9
Grading 2022	39	29	5	3
Overlapping Soil Haul and Grading 2022	39	29	5	3
Exceeds LST?	No	No	No	No

Source: CalEEMod Version 2016.3.2., and South Coast AQMD 2008 and 2011.

Notes: In accordance with South Coast AQMD methodology, only onsite stationary sources and mobile equipment occurring on the project site are included in the analysis. LSTs are based on receptors within 110 feet (34 meters) of the project site in Source Receptor Area (SRA) 33 for NO_X and CO emissions, PM_{10} and $PM_{2.5}$.

[1] Based on information provided by the District. Where specific information regarding project-related construction activities or processes was not available, construction assumptions were based on CalEEMod defaults, which are based on construction surveys conducted by the South Coast AQMD.

[2] Includes implementation of fugitive dust control measures required by South Coast AQMD under Rule 403, including watering disturbed areas a minimum of two times per day, reducing speed limit to 15 miles per hour on unpaved surfaces, replacing ground cover quickly, and street sweeping with Rule 1186–compliant sweepers.

Construction Health Risk

The Certified EIR did not identify any concentrations of short-term emissions that would constitute a significant health risk as there were no guidelines available at the time of certification. The South Coast AQMD currently does not require health risk assessments to be conducted for short-term emissions from construction equipment. Emissions from construction equipment primarily consist of diesel particulate matter (DPM). The Office of Environmental Health Hazards Assessment (OEHHA) adopted new guidance for the preparation of health risk assessments in March 2015 (OEHHA 2015). OEHHA has developed a cancer risk factor and noncancer chronic reference exposure level for DPM, but these are based on continuous exposure over a 30-year time frame. No short-term acute exposure levels have been developed for DPM. South Coast AQMD currently does not require the evaluation of long-term excess cancer risk or chronic health impacts for a short-term project. The Project would be completed over approximately 24 months. When compared to a 30-year time frame, this duration would further limit exposures to onsite and offsite receptors. In addition, exhaust emissions from off-road vehicles associated construction activities would not exceed the screening-level LSTs. For these reasons, it is anticipated that construction emissions would not pose a threat to offsite receptors near the Project, and project-related construction health impacts would be less than significant. Therefore, impacts would not be beyond those analyzed in Certified EIR.

Operational Phase

CO Hotspots

The Certified EIR identified less than significant CO hotspot impacts associated with a total of 25,911 PM peak hour trips at buildout of the Approved Project. Under existing and future vehicle emission rates, a project would have to increase traffic volumes at a single intersection by more than 44,000 vehicles per hour—or 24,000 vehicles per hour where vertical and/or horizontal air does not mix—in order to generate a significant CO impact (BAAQMD 2017).[2] The Project would generate a total of 804 AM peak hour trips, substantially fewer trips compared to the Approved Project, and would be substantially below the incremental increase in peak hour vehicle trips needed to generate a significant CO impact. Implementation of the Project would not have the potential to substantially increase CO hotspots at intersections in the vicinity of the project site. Therefore, implementation of the Project would not introduce new significant impacts nor substantially more severe than the CO hotspot impacts previously identified in the Certified EIR. Impacts would not be beyond those analyzed in Certified EIR.

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[2] The CO hotspot analysis refers to the modeling conducted by the Bay Area Air Quality Management District for its CEQA Guidelines because it is based on newer data and considers the improvement in mobile-source CO emissions. Although meteorological conditions in the Bay Area differ from those in the Southern California region, the modeling conducted by BAAQMD demonstrates that the net increase in peak hour traffic volumes at an intersection in a single hour would need to be substantial. This finding is consistent with the CO hotspot analysis South Coast AQMD prepared as part of its 2003 AQMP to provide support in seeking CO attainment for the SoCAB. Based on the analysis prepared by South Coast AQMD, no CO hotspots were predicted for the SoCAB. As noted in the preceding footnote, the analysis included some of Los Angeles' busiest intersections, with daily traffic volumes of 100,000 or more peak hour vehicle trips operating at LOS E and F.

d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Less Than Significant Impact / No Changes to the Certified EIR. The Certified EIR identified that the Approved Project would temporarily expose a substantial number of people to odors from dairy operations and co-composting during the transition from agriculture to non-agricultural use. Since certification of the EIR, the area has since transitioned from agricultural use to nonagricultural uses identified in the Specific Plan. The Proposed Project would not introduce new sources of odor onsite that would adversely affect a substantial number of people. Impacts would not be beyond those analyzed in Certified EIR.

5.3.3 Adopted Mitigation Measures Applicable to the Proposed Project

The following mitigation measures were identified in the Certified EIR. Applicability of each mitigation measure has been evaluated. The mitigation measures have been modified where appropriate to reflect the Proposed Project. The revisions are identified in strikethrough for deletion and underline for addition.

~~AQ-1~~ ~~**Mobile Source Emissions/Transit.** The City of Chino shall contact appropriate transit agencies to encourage an expansion of transit services up to and within the project area. The City will coordinate with such agencies and other jurisdictions to promote express transit access from the Chino area to other regional employment centers.~~

AQ-2 **Construction Emissions.** Per SCAQMD Rule 403, the District and/or its construction contractor ~~City~~ shall enforce the following measures:

- During all construction activities, construction contractors shall use low emission mobile construction equipment where feasible to reduce the release of undesirable emissions.
- During all construction activities, construction contractors shall encourage rideshare and transit programs for project construction personnel to reduce automobile emissions.
- During all grading and site disturbance activities, construction contractors shall water active grading sites at least twice a day, and clean construction equipment in the morning and/or evening to reduce particulate emissions and fugitive dust.
- During all construction activities, construction contractors shall, as necessary, wash truck tires leaving the site to reduce the amount of particulate matter transferred to paved streets as required by SCAQMD Rule 403.
- During all construction activities, construction contractors shall sweep on and off site streets if silt is carried over to adjacent public thoroughfares~~, as determined by the City Engineer~~ to reduce the amount of particulate matter on public streets.
- During all construction activities, construction contractors shall limit traffic speeds on all unpaved road surfaces to 15 miles per hour or less to reduce fugitive dust.

- During grading and all site disturbance activities~~, at the discretion of the City's Planning Director,~~ construction contractors shall suspend grading operations during first and second stage smog alerts to reduce fugitive dust.
- During grading and all site disturbance activities~~, at the discretion of the City's Planning Director,~~ construction contractors shall suspend all grading operations when wind speeds (including instantaneous gusts) exceed 25 miles per hour to reduce fugitive dust.
- During all construction activities, the construction contractors shall maintain construction equipment engines by keeping them tuned.
- During all construction activities, the construction contractors shall use low sulfur fuel for stationary construction equipment as required by AQMD Rules 431.1 and 431.2 to reduce the release of undesirable emissions.
- During all construction activities, the construction contractors shall use existing on site electrical power sources to the maximum extent practicable. Where such power is not available, the Contractor shall use clean fuel generators during the early stages of construction to minimize or eliminate the use of portable generators and reduce the release of undesirable emissions.
- During all construction activities, the construction contractors shall use low emission, on site stationary equipment (e.g., clean fuels) to the maximum extent practicable to reduce emissions~~, as determined by the City Engineer~~.
- During all construction activities, the construction contractors~~, in conjunction with the City Engineer,~~ shall locate construction parking to minimize traffic interference on local roads.
- During all construction activities, the construction contractors shall ensure that all trucks hauling dirt, sand, soil or other loose materials are covered or should maintain at least two feet of freeboard (i.e. minimum vertical distance between top of the load and the top of the trailer) in accordance with the requirements of the California Vehicle Code § 23114 to reduce spilling of material on area roads.

5.3.4 Level of Significance After Mitigation

With implementation of these mitigation measures, impacts of the Proposed Project would not be greater than those identified in the Certified EIR.

5.4 BIOLOGICAL RESOURCES

5.4.1 Findings of the Certified EIR

The Certified EIR identified riparian woodlands along major stream channels within The Preserve area, various dairy wastewater detention basins and open water areas, and freshwater marshes as sensitive habitat. Raptors forage and nest in the various agricultural fields and eucalyptus windrows. Additionally, a variety of sensitive plant and animal species have been identified that inhabit The Preserve. The implementation of the Approved Project would result in the loss of foraging habitat, burrowing owl nesting habitat, and raptor foraging habitat, despite the incorporation of all feasible mitigation measures.

5.4.2 Impacts Associated with the Proposed Project

The analysis of impacts to biological resources incorporates by reference:

- Addendum to The Preserve – Chino Sphere of Influence – Sub-Area 2 Environmental Impact Report, South of Pine and Flores Project, Appendix C. Biological / Regulatory Assessment, prepared by Glenn Lukos Associates, dated April 19, 2016.

Would the project:

Environmental Issues	Change in Project Requiring EIR Revisions	Change in Circum-stances Requiring EIR Revisions	New Information Showing Potentially New or Increased Significant Effects	Less Than Significant Impact and No Changes to Certified EIR	No Impact and No Changes to Certified EIR
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?				X	
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?					X
c) Have a substantial adverse effect on state or federally protected wetlands (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

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Environmental Issues	Change in Project Requiring EIR Revisions	Change in Circum-stances Requiring EIR Revisions	New Information Showing Potentially New or Increased Significant Effects	Less Than Significant Impact and No Changes to Certified EIR	No Impact and No Changes to Certified EIR
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?					X

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Less Than Significant Impact / No Changes to the Certified EIR. The project site is not in an area mapped for high biological resource sensitivity (Certified EIR, Exhibit 5.4-2). Additionally, it is rough graded, and the site is void of any vegetation and waterways; consequently, Certified EIR Mitigation Measure B-2, which requires preparation of a biological study and focused studies prior to earthmoving activities, is not required. In its graded condition, the site contains no sensitive species and habitat. If the Proposed Project were approved, it is possible the project site will remain vacant for about a year until mid-2022 when construction will start. Although it is rough graded, adjacent to residential uses to its east, and surrounded by construction activities related to the Approved Project, if the Project site is left unmaintained, it is possible that burrowing owls, which are known to occur on vacant properties, could occupy the property. Therefore, impacts are potentially significant, and a modified version of Certified EIR Mitigation Measure B-3 (i.e., inclusion of the 2012 CDFW Staff Report on Burrowing Owls) would be required to reduce potential impacts to less than significant.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

No Impact / No Changes to the Certified EIR. Riparian habitats are those occurring along the banks of rivers and streams. Sensitive natural communities are natural communities that are considered rare in the region by regulatory agencies, known to provide habitat for sensitive animal or plant species, or are known to be important wildlife corridors. The project site has been rough graded and is surrounded by residential uses to the east and vacant land to the north, west, and south. There are no streams on or adjacent to the project site, and no riparian habitat exists on or adjacent to the site. The site does not contain habitat for sensitive animal or plant species. There is no sensitive natural community on or adjacent to the project site.

c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

No Impact / No Changes to the Certified EIR. Wetlands are defined under the federal Clean Water Act as land that is flooded or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that normally does support, a prevalence of vegetation adapted to life in saturated soils. Wetlands include areas such as swamps, marshes, and bogs. As mentioned, the site has been graded and is vacant. There are no jurisdictional waters on the project site, including waters of the United States subject to the jurisdiction of the Corps and Regional Board, or waters of the State subject to the jurisdiction of CDFW (United States Fish & Wildlife, 2019). No impact would occur.

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?

No Impact / No Changes to the Certified EIR. Wildlife corridors link areas of natural habitats separated by rugged terrain, changes in vegetation, or human disturbance. Corridors accommodate animal movement to enhance genetic interchange and re-colonization of the species and provide buffers for species populations to use in response to environmental changes and natural disasters. Large corridors can provide both transitory and resident habitat for a variety of species. The project site is vacant and does not contain any waterways or trees. Although wildlife may cross the site, it does not function as a wildlife movement corridor. Therefore, project development would not disturb migratory species. The Proposed Project would not lead to substantial changes that would require revisions to the previous Certified EIR due to new significant environmental effects.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

No Impact / No Changes to the Certified EIR. The City of Chino has an ordinance that outlines the process for removing and replacing street trees (Ch. 12.16.130). The Proposed Project includes installing new landscaping within the elementary school campus and along the perimeter of the project site. The Proposed Project does not include removal or replacement of street trees. Project development would not conflict with any local policies or ordinances protecting biological resources.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

No Impact / No Changes to the Certified EIR. The project site is not within an area covered by a Habitat Conservation Plan or Natural Community Conservation Plan. Therefore, the Proposed Project would have no additional impacts as compared with those studied in the Certified EIR.

5.4.3 Adopted Mitigation Measures Applicable to the Proposed Project

The following mitigation measures were identified in the Certified EIR. Applicability of each mitigation measure has been evaluated. The mitigation measures have been modified where appropriate to reflect the Proposed Project. The revisions are identified in ~~strikethrough~~ for deletion and underline for addition.

~~B-1.~~ **~~Zoning and Land Use Regulation.~~**

1. ~~All areas below the 566-foot dam inundation line, except such areas located north of Pine Avenue, will be retained within an open space or agricultural land use designation in order to provide protection for existing wildlife habitat values found in such areas and those to be created by the habitat enhancement activities described under mitigation B-3, below, as well as to avoid any new impacts.~~

2. ~~Any new development or expansions of existing land uses within the open space designations of The Preserve Specific Plan (i.e., Agriculture, Agriculture/Open Space-Natural, Open Space-Recreation, Open space-Natural and Open Space-Water) shall comply with the requirements and provisions of the Resource Management Plan (see Mitigation No. B-3, below) in order to mitigate potential adverse project-specific impacts on biological resources.~~

~~B-2.~~ **~~Required Biological Studies~~**

1. ~~Conduct a biological assessment of each specific project site to characterize the habitat types and the potential for the site to support any sensitive species or habitat.~~

2. ~~Where a sensitive species has the potential to occur, determine the level of potential for occurrence as low, moderate, or high. Provide scientific justification for this determination.~~

3. ~~If the potential for occurrence is moderate or high (e.g., the required habitat elements for this species are present and/or there has been a sighting of this species in the vicinity of the project site), conduct focused surveys within suitable habitat to determine the presence or absence of the species on the project site.~~

4 ~~Any surveys deemed necessary must be conducted by a biologist qualified to perform the needed survey(s). The City of Chino, or its consultant, will review and approve the personnel and methodology for any such proposed surveys.~~

5. ~~If a sensitive species or habitat is found to occur on a proposed project site, or occupies habitat that may be impacted directly or indirectly by the proposed project, this must be called to the City's immediate attention and documented in the biological assessment for the project.~~

6. ~~Mitigation measures to offset any potential impact to sensitive species and habitats must comply with the RMP and shall be included in the biological assessment. All lands set aside for conservation and/or other mitigation measures must be clearly documented in the final biological assessment.~~

~~B-3.~~ **~~Resources Management Plan~~**

~~A Resources Management Plan (RMP) shall be prepared by the City of Chino to provide for the implementation of the mitigation measures described below, in order to avoid, lessen and reduce impacts on the biological resources within the Preserve Specific Plan Area. The Resources Management Plan will be approved by the Chino City Council at the time of certification of the Final EIR. The RMP will formalize the City's balanced approach to land use and resource management, and provides the framework for coordinating the City's actions with other agencies, such as County of San Bernardino, CDFG, USFWS, USACE, OCFWD, and OCWD with regard to specific conservation measures and resource management initiatives within The Preserve. The RMP will focus on the development and implementation of wildlife habitat enhancement and restoration activities, primarily funded by a mitigation fee imposed on all urban development within the Project Area. The RMP will specifically address the following mitigation measures:~~

1. **~~300-acre Conservation Area.~~** ~~Provision will be made for the creation, enhancement, expansion and perpetuation of high-quality wildlife habitat in a 300-acre Conservation Area to be located generally below the 566-foot inundation line and within the boundaries of the project area. The more specific location of the conservation area will be determined through the preparation of the RMP and will depend on availability of such lands for mitigation purposes, and the suitability of land for the enhancements envisioned. Such habitat will be designed to address the impacts that will occur as the result of development of The Preserve (i.e., raptor, waterfowl and burrowing owl habitat). Key enhancements that will be provided comprise the following:~~

   ~~a.) A weed removal program and replanting of native vegetation within the 300-acre Conservation Area shall be implemented to create high quality raptor and burrowing owl foraging habitat.~~

   ~~b.) Installation and maintenance of twenty (20) artificial burrowing owl nesting sites to mitigate for the loss of burrowing owl habitat. An illustrative example of an artificial burrow is provided in Exhibit 5.4.4). Nesting sites will be located and designed to facilitate use by burrowing owls.~~

   ~~c.) Stands of trees shall be planted at a minimum of five (5) locations within the 300-acre Conservation Area to mitigate for the loss of raptor nesting/foraging habitat. Specifics regarding enhancements (i.e., location of tree stands, placement of artificial owl burrows, plant and tree species, long-term maintenance and management, etc.) will be detailed in the RMP.~~

~~d.) The City shall obtain agreements with the landowners in the 300-acre Conservation Area in the form of an irrevocable license, conservation easement, right of entry, or other legally enforceable instrument to install and maintain the above habitat enhancements and to provide the City with a perpetual right to control uses which would conflict with the land's use as wildlife habitat.~~

~~2. **Alternate Location for the 300-acre Conservation Area (if needed)** If the City is unable, or it is infeasible, to obtain the onsite mitigation agreements from property owners for all or a portion of the 300-acre conservation area, the City may acquire and enhance, or make other arrangements securing the right to permanently protect/preserve and enhance, land off-site within the Prado Basin (including Chino Hills). Such land must have similar biological value to land on-site within the areas planned for urban development (generally above the 566-foot elevation line). In addition, provisions shall be made to provide enhancements/restoration similar to the measure described in Section B-3(1), above.~~

3. **Burrowing Owls**. Pursuant to the City of Chino completed Resources Management Plan (RMP), which was developed in compliance with Certified EIR Mitigation Measure B-3, and pursuant to the 2012 CDFW Staff Report on Burrowing Owls, a qualified biologist shall conduct a pre-construction burrowing owl survey within three (3) days prior to construction activities and/or any disturbance on the project site that may impact burrowing owls and their occupied burrows. If burrowing owls are found on an individual development site, the Proposed Project could disrupt the owls, and the Project will be required to follow the CDFW burrowing owl relocation protocols, including the creation of artificial burrows, as follow:

   a.) If burrowing owls are found on an individual development site, development, including the expansion of existing land uses or other land use activities that could disrupt the owls, will be required to follow the CDFG burrowing owl relocation protocols, including the creation of artificial burrows (Exhibit 5.4.4). Key components of this protocol presently include:

      i. Occupied burrows should not be disturbed during the nesting season, from February 1 through August 31.

      ii. If owls must be moved away from the disturbance area, passive relocation is preferable to trapping.

      iii. A time period of at least one week is recommended to allow owls to move and acclimate to the alternate burrows.

      iv. Passive relocation involves encouraging owls to move from occupied burrows to alternate natural or artificial burrows that are at least 50 meters from the impact zone with a minimum of 6.5 acres of suitable foraging habitat for each pair of relocated owls (see Exhibit 5.4.4).

v. Owls should be excluded from burrows in the immediate impact zone and within a 50-meter buffer zone by installing one-way doors in burrow entrances.

vi. One-way door should be left in place for at least 48 hours to insure that owls have left the burrow before excavating the burrow.

vii. One alternate burrow (natural or artificial) should be provided for each burrow that will be excavating in the project impact zone.

viii. The project areas should be monitored daily for at least one week to confirm no owl use before excavating burrows in the immediate impact zone.

ix. When excavating burrows, hand tools should be used and the burrows should be refilled to prevent reoccupation.

x. Sections of flexible plastic pipe or burlap bags should be inserted into the tunnels during excavation to maintain an escape route for any animals that may still be located inside the burrow.

b.) In order to provide supplemental mitigation beyond the standard CDFG protocol requirements for relocation of owls, the 300-acre Conservation Area will be made available for the relocation of burrowing owls that would be displaced by development, including the creation of 20 artificial burrows. The feasibility of relocating owls from development sites to the conservation area will be reviewed on a case-by-case basis for individual development projects, subject to the evaluation and recommendations of the biological study prepared for a given site.

~~4. **Urban Buffer/Transition Area**~~

~~In order to limit urban intrusion into areas with habitat value that are below the 566-foot dam inundation line, a buffer area will be provided along the southern edge of urban development within the Preserve Specific Plan project area. The buffer will be designed to provide for limited access to habitat areas and will include provisions for the logical transition between urban structures/uses and habitat areas. Such provisions may address without limit measures regarding: location and type of land uses, lighting, vegetation and tree plantings. Specific features regarding the design, conceptual location, buffer width and/or setback requirements, timing and other features of the buffer shall be included as part of the Resources Management Plan (RMP).~~

~~While every reasonable effort will be made to seek such a buffer, this mitigation measure does not require land acquisition or obtaining any agreements with landowners in the form of an irrevocable license, conservation easement, right of entry, or other legally~~

5. Environmental Analysis

~~enforceable instrument for the purposes of providing the buffer, or for purposes of providing any of enhancements or features described under Mitigation Measure B-3(1).~~

~~5. **Surface Water and Riparian Habitat**~~

~~a.) All development will be required to satisfy any applicable requirements of USACE, Regional Water Quality Control Board and CDFG for Section 404 Clean Water Act permits and streambed alteration agreements.~~

~~b.) Drainage Area B (see, Exhibit 5.4.5) will be designed as a naturalized drainage course and enhanced to provide riparian habitat values, including plantings of appropriate native species of plants and trees. It is anticipated that these enhancements will be provided in conjunction with drainage facilities and constructed "Natural Treatment Systems" (NTS) designed to improve water quality. Exhibit 5.4.6 provides an illustrative example of how the drainage area may be designed. Specific features related to habitat values will be addressed as part of the RMP.~~

~~c.) A minimum of 10 acres of marsh and or riparian habitats shall be constructed in conjunction with drainage facilities and/or Natural Treatment Systems for water quality purposes, in order to provide mitigation for loss of the low-quality habitat values of the agricultural detention basins, as well as other surface water areas that support waterfowl.~~

~~6. **Existing Windrows**~~

~~Existing windrows that provide viable raptor habitat shall be retained and incorporated into the design of individual development projects where practical. If retention is not practical, the developer shall provide for the replacement of the windrow trees in a manner supportive of raptor habitat. The biological study prepared for the development project shall include an analysis by an ornithologist specializing in raptor biology. Such analysis shall include recommendations on the number of trees, tree specifications and location of replacement areas for windrows or stands of trees. The recommendations shall be based on biological values, as determined by the ornithologist, and in consultation with the City and the wildlife agencies. Replacement trees may be located within the 300-acre conservation area or other suitable areas located outside of the project site if consistent with the recommendations of the ornithologist.~~

~~7. **Agricultural Easements**~~

~~Under Mitigation Measure AG-1 (see Section 5.2 in the Draft EIR), which addresses mitigation for loss of prime agricultural land, the City has committed to participate in the Williamson Act Easement Exchange Program (WAEEP) and any plan that may be adopted pursuant to SB 831 for acquisition of agricultural easements or other conservation easements for the purpose of permanent agricultural land preservation.~~

~~These easements will also provide mitigation for identified impacts on biological resources in that they will preserve areas in agriculture and prevent the future development of recreational or other non-agricultural uses that could be detrimental to biological resources. Written or other evidence of participation Following Implementation of a plan for Chino Basin pursuant to SB 831 Community Development Director~~

~~8. **Mitigation Fee**~~

~~A mitigation fee shall be imposed on new development for the purpose of implementing the Biological Resource mitigation measures as described in the Resources Management Plan. The fee shall be adopted by the City Council prior to the issuance of grading permits for new residential, commercial, office, industrial development, or public facilities; provided grading permits may be issued prior to final adoption of the fee upon developer's deposit with the City of adequate cash or other form of security in excess of the proposed fee, as approved by the City Council for the City. The fee shall be structured to cover the estimated cost of the identified mitigation measures, including:~~

~~a.) Costs associated with obtaining agreements for the 300-acre conservation area with landowners in the form of conservation easements or other legally enforceable instruments as described under mitigation measures B-3-1 and B-3-2, above;~~

~~b.) Costs associated with the design, installation, and maintenance of the various enhancements and improvements described above, including such appropriate refinements/adjustments as may be identified by the RMP.~~

~~c.) Administration, management and monitoring of the 300-acre conservation area and other mitigation measures as appropriate, including adaptive management. Costs that form the basis for the mitigation fee may, at the discretion of the City, be defrayed through the use of grants or other government or private funding sources as such sources become available in the future.~~

~~Costs for wetlands/riparian enhancements shall be structured in conjunction with costs for such improvements that also serve water quality and drainage purposes, which may be funded by project drainage and/or water quality fees.~~

~~9. **Participation in Regional Efforts**~~

~~The City has had ongoing involvement with various regional conservation-related efforts. The City will continue to be involved in and coordinate with such efforts within The Preserve. These efforts include, without limitation:~~

~~a.) USACE and Orange County Water District's Prado Basin Master Plan;~~

~~b.) IEUA's Chino Creek Habitat Restoration Program;~~

~~c.) Orange County Water District's Santa Ana River Watershed program;~~

~~d.) USACE's Santa Ana River Mainstem Project;~~

~~e.) Lower Chino Basin Working Group (Santa Ana River Working Group MOU) Resources Management Planning;~~

~~f.) Chino Basin Center for Organic Materials (Santa Ana River Working Group MOU); Wildlife, Wetlands and Recreation Resource Conservation Program (Santa Ana River Working Group MOU);~~

~~g.) Urban Transition Planning Smart Growth Program (Santa Ana River Working Group MOU);~~

~~h.) Conjunctive Groundwater Management, Replenishment and Conservation Program (Santa Ana River Working Group MOU).~~

~~i.) Chino Hills State Park General Plan (February 1999).~~

~~10. **Administration and Monitoring**~~

~~The City shall use a conservancy or land trust, or other similar, qualified entity to oversee and implement the Resources Management Plan and principally manage the 300-acre conservation area. Such an entity shall have expertise in the management of land and biological resources. The chosen entity may also jointly provide a similar function to adjacent jurisdictions, provided that effective implementation of the mitigation measures described herein can be achieved. The City Council shall use its best efforts to select and enter in to necessary agreements with the chosen entity prior to acquisition of any property through an irrevocable license, conservation easement, right of entry, or other legally enforceable instrument.~~

5.4.4 Level of Significance After Mitigation

Implementation of #3 of Certified EIR Mitigation Measure B-3 would reduce project impacts on biological resources to less than significant. Project impacts would not be greater than those identified in the Certified EIR.

5.5 CULTURAL RESOURCES

5.5.1 Findings of the Certified EIR

The Certified EIR concluded that development of The Preserve area could potentially have a significant and adverse impact on undiscovered historic and prehistoric archaeological resources and recorded historic sites.

5.5.2 Impacts Associated with the Proposed Project

Would the project:

Environmental Issues	Change in Project Requiring EIR Revisions	Change in Circum-stances Requiring EIR Revisions	New Information Showing Potentially New or Increased Significant Effects	Less Than Significant Impact and No Changes to Certified EIR	No Impact and No Changes to Certified EIR
a) Cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5?					X
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?				X	
c) Disturb any human remains, including those interred outside of dedicated cemeteries?				X	

Comments:

a) Cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5?

No Impact / No Changes to the Certified EIR. CEQA Guidelines § 15064.5 defines historic resources as resources listed or determined to be eligible for listing by the State Historical Resources Commission, a local register of historical resources, or the lead agency. Generally, a resource is considered "historically significant" if it meets one of the following criteria:

i) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

ii) Is associated with the lives of persons important in our past;

iii) Embodies the distinctive characteristics of a type, period, region or method of construction, or represents the work of an important creative individual, or possesses high artistic values;

iv) Has yielded, or may be likely to yield, information important in prehistory or history.

The project site is vacant with two catch basins and a two-foot-high, east-west earth berm in the mideastern portion. There are no historical resources, as defined in § 15064.5, on the project site. Therefore, project implementation would cause no impacts to historical resources.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?

Less Than Significant Impact / No Changes to the Certified EIR. Archaeological resources are cultural resources of prehistoric or historic origin that reflect human activity. Archaeological resources include both structural ruins and buried resource (buildings, structures, objects, and sites of the built environment). The term "unique archaeological resources" is defined in PRC § 21083.2(g) as:

> … 'unique archaeological resources' means an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:
>
> (1) Contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information.
>
> (2) Has a special and particular quality such as being the oldest of its type or the best available example of its type.
>
> (3) Is directly associated with a scientifically recognized important prehistoric or historic event or person.

The entire project site was rough graded in October 2020. Approximately 144,722 cubic yards of soil were removed from the site; cuts of up to 10 feet were made on the east side of the project site and a few feet on the west. According to the geotechnical study completed in December 2019, artificial fill of up to a maximum depth of 10 feet was encountered in the geotechnical test borings; this fill was presumed to be imported soil from the development to the east of the site (Byerly 2019). It is possible that much of the artificial fill would be removed during grading activities (Byerly 2019).

Because the project site has been highly disturbed with recent grading activities, and previous agricultural uses and stockpiling, archaeological surveying as required by Certified EIR Mitigation Measure CUL-1 would not be required. A pedestrian field investigation of the site in its current condition would result in negative findings. Nevertheless, earthmoving activities related to project construction could still result in the accidental discovery of unique archaeological resources. Therefore, the Project would require archaeological monitoring, as required by Certified EIR Mitigation Measure CR-2, and potentially significant impacts to unique archaeological resources would be reduced to less than significant.

c) Disturb any human remains, including those interred outside of dedicated cemeteries?

Less Than Significant Impact / No Changes to the Certified EIR. See response 5.5.b. In the unlikely event that earth-disturbing activities conducted by the District and/or its construction contractors identify undiscovered human remains, the District will comply with Government Code §§ 27460 et seq., which requires earthmoving activities to halt until the San Bernardino County Coroner can determine whether the remains are subject to the provisions of § 27491 of the Government Code or any other related provisions of law concerning investigation of the circumstances, manner, and cause of death; and the required recommendations concerning the treatment and disposition of the human remains have been made to the person responsible for the excavation, or to his or her authorized representative, in the manner provided in § 5097.98 of the PRC. Pursuant to California Health and Safety Code § 7050.5, the coroner shall make a determination within two working days of notification of the discovery of the human remains. If the coroner determines that the remains are not subject to his or her authority and recognizes or has reason to believe that they are those of a Native American, he or she shall contact the Native American Heritage Commission by telephone within 24 hours. The District will comply with existing regulations. Impact to human remains would be less than significant.

5.5.3 Adopted Mitigation Measures Applicable to the Proposed Project

The following mitigation measures were identified in the Certified EIR. Applicability of each mitigation measure has been evaluated. The mitigation measures have been modified where appropriate to reflect the Proposed Project. The revisions are identified in ~~strikethrough~~ for deletion and <u>underline</u> for addition.

~~CR-1.~~ ~~**Archaeological Survey and Mitigation Report.** Phase 1 field surveys (surface survey and collection) by a certified archaeologist should be conducted prior to all earth disturbing activities within the plan area. Existing natural open space, agricultural open space and dairy sites are included in this survey requirement. Excluded would be heavily disturbed areas, lagoons and detention ponds, and paved areas. The archaeologist will identify all prehistoric and historic resources observed during the field survey, complete a preliminary evaluation of the resources, and recommend appropriate measures for the disposition and treatment of significant resources. A technical report shall be prepared including discussion of cultural site significance (depth, nature, condition, and extent of the resources), final mitigation recommendations, and cost estimates. Excavated finds shall be offered to the City of Chino, or its designee on a first refusal basis. Final mitigation shall be carried out based upon the report recommendations and a determination as to site disposition by the City. Possible determinations include, but are not limited to, preservation, salvage, partial salvage, or no mitigation necessary.~~

CR-2. **Archaeological Monitoring.** ~~Where recommended in culturally-sensitive areas pursuant to Survey and Mitigation Reports (CR-1 above), a~~ <u>A</u>rcheological monitoring of earth-disturbing activities shall be conducted <u>by the District and/or its construction contractor</u>. The monitoring certified archaeologist will identify any prehistoric or historic resources exposed, complete a preliminary evaluation of the resource, and recommend appropriate resource management for the treatment of the resource. If additional or unexpected archaeological features are discovered, the archaeologist shall report such findings to the City <u>and/or District</u>. If the resources are found to be significant, the archaeologist shall determine, in consultation with the City<u> and/or District</u>, appropriate actions for further exploration and/or salvage recovery.

5.5.4 Level of Significance After Mitigation

Implementation of Certified EIR Mitigation Measure CR-2 would reduce potential project impacts to subsurface cultural resources to less than significant, and Project impacts would not be greater than those identified in the Certified EIR.

5.6 ENERGY

5.6.1 Findings of the Certified EIR

The Certified EIR did not analyze energy because it was certified prior to the 2019 amendments to the CEQA Guidelines to incorporate subdivision (b) to CEQA Guidelines § 15162.2. Under Appendix F of the CEQA Guidelines, an analysis of energy impacts would be required but the amendment to § 15126.2 clarifies the need for an energy analysis.

5.6.2 Impacts Associated with the Proposed Project

Would the project:

Environmental Issues	Change in Project Requiring EIR Revisions	Change in Circum-stances Requiring EIR Revisions	New Information Showing Potentially New or Increased Significant Effects	Less Than Significant Impact and No Changes to Certified EIR	No Impact and No Changes to Certified EIR
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?				X	
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?				X	

Comments:

a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

Less Than Significant Impact / No Changes to the Certified EIR.

Short-Term Construction

Electricity

Construction of the Proposed Project would require electricity use to power the construction equipment. The electricity use during construction would vary during different phases of construction—the majority of construction equipment during site preparation, grading, and paving would be gas or diesel powered, and the later construction phases would require electricity powered equipment for interior construction and architectural coatings. The use of electricity would be temporary and would fluctuate according to the phase of construction. Additionally, it is anticipated that most electric-powered construction equipment would be hand tools (e.g., power drills, table saws, compressors) and lighting, which would result in minimal electricity usage during construction activities. Therefore, construction activities associated with the Proposed Project would not result in wasteful or unnecessary electricity demands. Impacts would not be beyond those analyzed in the Certified EIR.

Natural Gas Energy

It is not anticipated that natural gas would power construction equipment for the Proposed Project, and no natural gas demand would occur during construction. Therefore, impacts would not be beyond those analyzed in the Certified EIR.

Transportation Energy

Transportation energy use depends on the type and number of trips, vehicle miles traveled, fuel efficiency of vehicles, and travel mode. Transportation energy used during construction of the Proposed Project would come from the transport and use of construction equipment, delivery vehicles, and construction employee vehicles that would use diesel fuel and/or gasoline. The use of energy resources by these vehicles would fluctuate according to the phase of construction and would be temporary. Upon completion of project construction, all construction equipment would cease.

To limit wasteful and unnecessary energy consumption, the construction contractors would minimize nonessential idling of construction equipment in accordance with 13 CCR Article 4.8, Chapter 9, § 2449. In addition, electrical energy could potentially be available for use during construction from existing power lines and connections, which would minimize or avoid the use of generators, which are less efficient. Furthermore, construction trips would not result in unnecessary use of energy since nearby regional freeway systems provide the most direct and shortest routes from various areas of the region (e.g., I-15 and SR-183). Overall, construction fuel associated with the Proposed Project would not be inefficient, wasteful, or unnecessary. Therefore, impacts would be less than significant with respect to transportation energy during construction.

Overall, the Proposed Project would move towards the development of the school land uses considered under the Approved Project. Thus, the construction processes for the Proposed Project would be similar to the construction processes needed to develop the school land uses considered under the Approved Project. Additionally, as discussed above, construction activities associated with the Proposed Project would result in less than significant energy impacts. Thus, the short-term impacts of the Proposed Project would not result in substantial changes requiring major revisions of the Approved Project. Impacts would not be beyond those analyzed in the Certified EIR.

Long-Term Operation

Building Energy

During operation, energy would be used for heating, cooling, and ventilation of the buildings; water heating; onsite equipment; appliances; indoor, outdoor, and perimeter lighting; and security systems. Electrical and natural gas services to the project site would be provided by Southern California Edison through connections to existing offsite lines and new onsite infrastructure.

The Proposed Project would comply with the 2019 Building Energy Efficiency Standards and California Green Building Standards Code (CALGreen). In addition, the Proposed Project would include installation of a photovoltaic (PV) system, which would offset some of the electricity demand with onsite renewable electricity. Therefore, the Proposed Project would be consistent with the requirements of energy-related regulations; it would not result in wasteful or unnecessary electricity demands. In addition, per the Certified EIR, buildout of the Approved Project would result in total annual electricity demand of 164,547,624 megawatt hours per year and annual natural gas demand of 3,927,867,256 therms per year. Because the school under the Proposed Project would be within the scope of the school land uses considered under the Approved Project, it would not result in new or increase the severity of building energy impacts compared to the Approved Project. Impacts would not be beyond those analyzed in the Certified EIR.

Transportation Energy

The Proposed Project would consume transportation energy (e.g., gasoline) during operations from the use of motor vehicles The Certified EIR projected 4,596 K-8 students and identified the need for two K-6 elementary schools and one middle school. Cal Aero Preserve Academy has been open and operational with an enrollment capacity of 1,200 students. The Proposed Project would also have an enrollment capacity of 1,200 students on a 4-track, year-round schedule. This would leave a remaining allotment of 2,196 students under the Certified EIR. Though the Proposed Project would generate VMT, it would not exceed the previously analyzed impacts associated with 4,596 students.. Thus, the VMT associated with the Proposed Project would be within the overall VMT determined for the Approved Project. Furthermore, the proposed school would provide a local and closer option to the surrounding community. Additionally, schools generally generate minimal trips during summer and winter breaks and on weekends. These features and aspects of the Proposed Project could contribute to further minimizing VMT, which would contribute to reducing transportation-related fuel usage. Overall, it is expected that operation-related fuel usage associated with the Proposed Project would not be any more inefficient, wasteful, or unnecessary than similar development projects. Also, because a school would be within the scope of the land uses considered under the Approved Project, the Proposed Project would not result in new or increase the severity of transportation energy impacts compared to the Approved Project. Impacts would not be beyond those analyzed in the Certified EIR.

b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

Less Than Significant Impact / No Changes to the Certified EIR. The state's electricity grid is transitioning to renewable energy under California's Renewable Energy Program. Renewable sources of electricity include wind, small hydropower, solar, geothermal, biomass, and biogas. Electricity production from renewable sources is generally considered carbon neutral. Executive Order S-14-08, signed in November 2008, expanded the state's renewable portfolios standard (RPS) to 33 percent renewable power by 2020. This standard was adopted by the legislature in 2011 (SB X1-2). Senate Bill 350 (de Leon) was signed into law September 2015 and establishes tiered increases to the RPS—40 percent by 2024, 45 percent by 2027, and 50 percent by 2030. Senate Bill 350 also set a new goal to double the energy-efficiency savings in electricity and natural gas through energy efficiency and conservation measures. On September 10, 2018, Governor Brown signed SB 100, which supersedes the SB 350 requirements. Under SB 100, the RPS for public owned facilities and retail sellers consist of 44 percent renewable energy by 2024, 52 percent by 2027, and 60 percent by 2030. Additionally, SB 100 also established a new RPS requirement of 50 percent by 2026. The bill also established a state policy that eligible renewable energy resources and zero-carbon resources supply 100 percent of all retail sales of electricity to California end-use customers and 100 percent of electricity procured to serve all state agencies by December 31, 2045. Under SB 100 the state cannot increase carbon emissions elsewhere in the western grid or allow resource shuffling to achieve the 100 percent carbon-free electricity target.

The statewide RPS goal is not directly applicable to individual development projects, but to utilities and energy providers such as SCE, which is the utility that would provide all of electricity needs for the Proposed Project. Compliance by SCE in meeting the RPS goals would ensure that the State meets its objective in transitioning to renewable energy. In addition, similar to the land uses considered under the Approved Project, the Proposed Project would be subject to Building Energy Efficiency Standards and CALGreen. Furthermore, and as stated, the Proposed Project would install a PV system that would generate onsite renewable electricity. Thus, implementation of the Proposed Project would not conflict or obstruct plans for renewable energy and energy efficiency and no impact would occur. Additionally, the Proposed Project would not result in new or increase the severity of impacts as it pertains to consistency with renewable energy or energy efficiency plans compared to the Approved Project.

5.6.3 Adopted Mitigation Measures Applicable to the Proposed Project

There are no applicable mitigation measures to the Proposed Project.

5.6.4 Level of Significance After Mitigation

Project impacts to energy resources would be less than significant.

5.7 GEOLOGY AND SOILS

5.7.1 Findings of the Certified EIR

The Certified EIR concludes that the potentially significant geologic hazards affecting land use and development in the plan area are fault rupture and severe ground shaking due to a local moderate to large earthquake, liquefaction (including lateral spread landslides) due to shallow groundwater and severe ground shaking from local and major regional faults, and subsidence-induced ground fissures due to groundwater withdrawal.

5.7.2 Impacts Associated with the Proposed Project

The analysis in this section is based in part on the following technical reports:

- *Geotechnical Investigation, Preserve II: K-8 School, West Side of East Preserve Loop, Between Market Street and Academy Street, Chino, California*, John R. Byerly Incorporated, December 27, 2019.

A complete copy of the study is included in Appendix B of this Addendum.

Would the project:

Environmental Issues	Change in Project Requiring EIR Revisions	Change in Circum-stances Requiring EIR Revisions	New Information Showing Potentially New or Increased Significant Effects	Less Than Significant Impact and No Changes to Certified EIR	No Impact and No Changes to Certified EIR
a) Directly or indirectly cause 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 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect 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 are not available for the disposal of wastewater?				X	
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?				X	

a) **Directly or indirectly cause 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.**

No Impact / No Changes to the Certified EIR. Large and shallow earthquakes can result in surficial ground ruptures along a fault trace. The project site is not within a State of California Alquist-Priolo Earthquake Fault Zone for fault rupture hazard (CGS, 2018; City of Chino, 2010). The site is also not within or immediately adjacent to a fault zone (Morton 2004; Jennings and Bryant 2010; City of Chino 2010). Therefore, ground rupture on the project site is negligible. No impact related to ground rupture would occur.

ii) **Strong seismic ground shaking?**

Less Than Significant Impact / No Changes to the Certified EIR. The project site is in a seismically active region of Southern California with many faults within a 50-mile radius. The nearest active fault zoned by the state is the Chino Fault, approximately 3.25 miles to the southwest. The nearest mapped fault not zoned as active, but as a fault study area by the City of Chino is an unnamed fault that is 1.5 miles to the southwest. Another nearby fault mapped by the City is a segment of the Central Avenue Fault, 2.5 miles west of the site. The Central Avenue Fault is associated with the Elsinore Fault Zone, which is approximately 6 miles to the southwest and can generate larger seismic events in the region. Rupture of any of these or other faults in Southern California could cause seismic ground shaking at the project site.

The primary geologic hazard at the site is ground shaking. Moderate to severe ground shaking can be anticipated during the life of the proposed buildings. An assessment of ground motion found that the project site has a design Site Class D, which is defined as having the upper 100 feet of the subsurface underlain by stiff soil. The project site also had a Seismic Design Category of D, which corresponds to buildings and structures in areas expected to experience severe and destructive ground shaking; fortunately, the site is not close to a major fault.

Consistent with the Certified EIR (page 5.5-14), the proposed school design and construction standards will conform to higher standards of caution. The proposed school buildings have been designed in accordance with the California Building Code, the California Geological Survey "Guidelines for Evaluating and Mitigating Seismic Hazards in California," and "Checklist for the Review of Geologic/Seismic Reports for California Schools, Hospitals, and Essential Services Buildings." In compliance with Certified EIR Mitigation Measure GS-1, a geotechnical report was prepared for the Proposed Project. Recommendations included therein have been incorporated into the Proposed Project and will be implemented during construction. Additionally, the California Department of General Services, Division of the State Architect (DSA) will conduct construction plan check review. The Proposed Project will require DSA approval, who may recommend additional measures to ensure the Proposed Project meets public school building requirements. Compliance with the state's higher construction standards for public school development will reduce potential impacts related to seismic ground shaking to less than significant, and impacts would not be beyond those analyzed in Certified EIR.

iii) Seismic-related ground failure, including liquefaction?

Less Than Significant Impact / No Changes to the Certified EIR. Liquefaction refers to loose, saturated sand, or gravel deposits that lose their load-supporting capability when subjected to intense shaking. Liquefaction potential varies based upon three main contributing factors: 1) cohesionless, granular soils having relatively low densities (usually of Holocene age);[3] 2) shallow groundwater (generally less than 50 feet); and 3) moderate to high seismic ground shaking.

The Certified EIR states that liquefaction potential increases through The Preserve from north to south, generally corresponding with reduced depth to groundwater, and that accurate assessment will require data from geotechnical borings and groundwater level monitoring. Groundwater was encountered during exploratory geotechnical borings of the project site at 53 feet below surface, and according to the project's engineering geologist, it is possible that the shallowest depth to groundwater is 5 feet below the final grade. The borings also determined that subsurface soils are predominantly unconsolidated and fine-grained. Therefore, there is potential for liquefaction to occur. The recommendation included in the geotechnical study will mitigate potential liquefaction. Additionally, DSA will plan check project plans and will inspect the proposed structural improvements to ensure they comply with geotechnical recommendations and California Building Code standards. Project implementation would not result in a significant impact from liquefaction. Impacts would not be beyond those analyzed in Certified EIR.

iv) Landslides?

No Impact / No Changes to the Certified EIR. A landslide is a type of erosion in which masses of earth and rock move downslope as a single unit. Susceptibility of slopes to landslides and lurching (earth movement at right angles to a cliff or steep slope during ground shaking) depend on several factors that are usually present in combination—steep slopes, condition of rock and soil materials, presence of water, formational contacts, geologic shear zones, and seismic activity. The project site is relatively flat. No landslides were mapped on the site (Morton 2004). Therefore, landslides are not a hazard at the project site. No impact would occur.

b) Result in substantial soil erosion or the loss of topsoil?

Less Than Significant Impact / No Changes to the Certified EIR. Topsoil is the thin, rich layer of soil where most of the nutrients for plants are found and where most land-based biological activity takes place. Erosion is a normal and inevitable geologic process whereby earthen materials are loosened, worn away, decomposed, or dissolved, and removed from one place and transported to another place. Precipitation, running water, and wind are the agents of erosion.

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[3] The Holocene epoch began 12,000 to 11,500 years ago.

The project site was rough graded in October 2020, and topsoil was removed as a part of the process. The site currently contains compacted soil, two catch basins, and a two-foot high earth berm in the center of the site. Erosion control improvements were installed on the project site as a part of the rough grading activities and include the catch basins and earth berm; inlet protection, chain-link fence and gate, and silt fencing around the basins; and a variation of the following around the perimeter of the project site: gravel bag barriers, one-bag-high gravel rows, six-foot-high screen fencing, hydroseed, corrugated steel panels at the exit gate, and eight-inch-diameter fiber roll barriers. These erosion control measures would adequately limit runoff from entering East Preserve Loop. If the Proposed Project were approved, it is possible the project site remains in its current condition for about a year and/or until the District starts construction. The District would maintain the existing improvements in place, and erosion impacts would be less than significant.

Construction Phase

Because the project site is greater than an acre, development of the Proposed Project would require a new construction permit to control erosion and limit stormwater runoff. The District and/or its construction contractors would be required to apply for National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities 2009-0009-DWQ (as amended by Order No. 2010-0014-DWQ and 2012-006-DWQ), issued by the State Water Resources Control Board. Individual developers are required to submit Permit Registration Documents (PRDs) to the State Water Resources Control Board (SWRCB) for coverage under the NPDES permit prior to the start of construction. The PRDs include a Notice of Intent (NOI), risk assessment, site map, Stormwater Pollution Prevention Plan (SWPPP), annual fee, and a signed certification statement. A SWPPP requires the incorporation of BMPs to control sediment, erosion, and hazardous materials contamination of runoff during construction and prevent contaminants from reaching receiving water bodies. Construction activities would disturb an area of about nine acres and thus would be subject to the Statewide Construction General Permit. The District would obtain coverage by preparing and implementing a SWPPP. Categories of potential BMPs used in SWPPPs are described in Table 4.

Table 4 Construction BMPs

Category	Purpose	Examples
Erosion Controls and Wind Erosion Controls	• Use project scheduling and planning to reduce soil or vegetation disturbance (particularly during the rainy season) • Prevent or reduce erosion potential by diverting or controlling drainage • Prepare and stabilize disturbed soil areas	Scheduling, preservation of existing vegetation, hydraulic mulch, hydroseeding, soil binders, straw mulch, geotextile and mats, wood mulching, earth dikes and drainage swales, velocity dissipation devices, slope drains, streambank stabilization, compost blankets, soil preparation/roughening, and non-vegetative stabilization
Sediment Controls	• Filter out soil particles that have been detached and transported in water	Silt fence, sediment basin, sediment trap, check dam, fiber rolls, gravel bag berm, street sweeping and vacuuming, sandbag barrier, straw bale barrier, storm drain inlet protection, manufactured linear sediment controls, compost socks and berms, and biofilter bags

Table 4 Construction BMPs

Category	Purpose	Examples
Wind Erosion Controls	- Apply water or other dust palliatives to prevent or minimize dust nuisance	Dust control soil binders, chemical dust suppressants, covering stockpiles, permanent vegetation, mulching, watering, temporary gravel construction, synthetic covers, and minimization of disturbed area
Tracking Controls	- Minimize the tracking of soil offsite by vehicles	Stabilized construction roadways and construction entrances/exits, and entrance/outlet tire wash.
Non-storm Water Management Controls	- Prohibit discharge of materials other than stormwater, such as discharges from the cleaning, maintenance, and fueling of vehicles and equipment. - Conduct various construction operations, including paving, grinding, and concrete curing and finishing, in ways that minimize non-stormwater discharges and contamination of any such discharges.	Water conservation practices, temporary stream crossings, clear water diversions, illicit connection/discharge, potable and irrigation water management, and the proper management of the following operations: paving and grinding, dewatering, vehicle and equipment cleaning, fueling and maintenance, pile driving, concrete curing, concrete finishing, demolition adjacent to water, material over water, and temporary batch plants.
Waste Management and Controls (i.e., good housekeeping practices)	- Manage materials and wastes to avoid contamination of stormwater.	Stockpile management, spill prevention and control, solid waste management, hazardous waste management, contaminated soil management, concrete waste management, sanitary/septic waste management, liquid waste management, and management of material delivery storage and use.

Source: California Stormwater Quality Association (CASQA), California Construction Best Management Practices Handbook, July 2012.

Submittal of the PRDs and implementation of the SWPPP and the erosion control plan throughout the construction phase would address pollutants of concern. The District would comply with all applicable water quality standards and waste discharge requirements, as well as compliance with SCAQMD Rules that prohibit grading activities and site disturbance during high wind events. Therefore, erosion impacts associated with construction activities would be less than significant and would not be greater than those analyzed in Certified EIR.

Operational Phase

Once the structural improvements are completed, ground surfaces at the project site would be hardscaped, paved, and/or landscaped. No large areas of soil would be exposed to erosion. In addition, reduction of stormwater-related soil erosion would include hydrologic features designed to slow, filter, and retain stormwater onsite within landscaping and the detention basin, in compliance with San Bernardino County's Low Impact Development BMP Design Handbook. Operational phase soil erosion impacts would be less than significant and would not be beyond those analyzed in Certified EIR.

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?

Less Than Significant Impact / No Changes to the Certified EIR.

Liquefaction and Landslides. Hazards arising from liquefaction and landslides would be less than significant, as discussed above in Section 5.6.a. (iii) and (iv). Impacts would not be beyond those analyzed in Certified EIR.

Lateral spreading. Lateral spreading is the downslope movement of surface sediment due to liquefaction in a subsurface layer. Due to the relatively flat nature of the site and distance from embankments, the potential for lateral spreading is considered negligible. No impact would occur.

Subsidence. The major cause of ground subsidence is withdrawal of groundwater. Soils that are particularly subject to subsidence include those with high silt or clay content. The Proposed Project would not withdraw groundwater. Additionally, the project site is not in an area of known subsidence (USGS, 2020). According to the geotechnical study, volume loss—as much as 0.10 to 0.15 foot—may occur through subsidence during preparation of the final ground surface. Implementation of the geotechnical recommendations would reduce potential impacts to less than significant, and impacts would not be beyond those analyzed in the Certified EIR.

Seismically Induced Settlement. Seismically induced settlement occurs in dry sands—in contrast to liquefaction which occurs in saturated sand or gravel—and is often caused by loose to medium-dense granular soils densified during ground shaking. According to the geotechnical study, there is a potential for seismic settlement to occur on the project site, but it would be within tolerable limits. The Proposed Project would comply with the recommendations of the geotechnical investigation report for proper engineering design and construction, which would conform with current building codes and engineering practices. Potential impacts would be less than significant, and impacts would not be beyond those analyzed in the Certified EIR.

Collapsible Soils. Collapsible soils are typically geologically young, unconsolidated sediments of low density that may compress under the weight of structures. The project site has been rough graded, and most if not all the artificial fills on the site have been removed. Borings drilled at the site (prior to the rough grading activities in October 2020) found original ground at around the depths of where the soils were removed; the original ground consists mainly of medium- to stiff and dense soils. Impacts related to collapsible soils are not significant. Regardless, all grading operations, including the preparation of the natural ground surface, will be observed and tested by the engineer who prepared the geotechnical study. Therefore, any potential impacts related to collapsible soils would be less than significant, and impacts would not be beyond those analyzed in the Certified EIR.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?

Less Than Significant Impact / No Changes to the Certified EIR. Expansive soils swell when they become wet and shrink when they dry out, resulting in the potential for cracked building foundations and even structural distress of the buildings. Such soils can cause damage to structures. According to the geotechnical study, the site contains low to medium expansive soils. Compliance with the recommendations of the geotechnical study and DSA will ensure that the buildings will limit potential effects related to expansive soils. Impacts are less than significant and not beyond those analyzed in the Certified EIR.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

No Impact / No Changes to the Certified EIR. Project development would include installation of new laterals connecting the new buildings to sewer mains in nearby roadways. Project development would not use septic tanks or other alternative wastewater disposal systems. No geological impacts would occur from wastewater disposal systems.

f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Less Than Significant Impact / No Changes to the Certified EIR. A paleontological resource is a natural resource characterized as faunal or floral fossilized remains but may also include specimens of nonfossil material dating to any period preceding human occupation. The resources are often discovered in sedimentary formations and appear as outcroppings visible on the surface or below the ground surface. They can also be encountered during grading.

According to the Certified EIR, the only geologic unit of paleontological significance in the Preserve is older (Pleistocene) alluvium. The project site is underlain by early Pleistocene, very old alluvial fan deposits (Morton and Gray 2002). In the unlikely event that paleontological resources exist, implementation of Certified EIR Mitigation Measure CR-3 would reduce potential impacts to less than significant. Impacts would not be beyond those analyzed in the Certified EIR

5.7.3 Adopted Mitigation Measures Applicable to the Proposed Project

The following mitigation measures were identified in the Certified EIR. Applicability of each mitigation measure has been evaluated. The mitigation measures have been modified where appropriate to reflect the Proposed Project. The revisions are identified in ~~strikethrough~~ for deletion and underline for addition.

GS-1. **Geotechnical and Soils Engineering Study.** All applications for individual development projects shall include a detailed Geotechnical and Soils Engineering Study which addresses potential hazards associated with fault rupture, seismicity and ground shaking, liquefaction, subsidence and near-surface groundwater. Such studies shall:

- Conform to code requirements, and standards and guidelines established by the California Building Code ~~City of Chino~~;
- Fully and accurately reflect site conditions regarding the possible hazards identified herein; and
- Include all mitigation measures necessary for reducing risks posed by geologic hazards on the project site.

GS-2. **Conformance with Geological Study Requirements.** All individual developments shall be constructed according to requirements established in geologic studies pertaining to the project site, and general engineering practices established by the Division of the State Architect ~~City of Chino.~~

~~GS-3.~~ ~~**Soils Report – Dairy Lands.** Grading operations on all former dairy lands and other agricultural properties will be conducted in accordance with the soils report prepared by a registered soils engineer approved by the City of Chino. The soils engineer will make recommendations concerning removal of any organic material or the proper handling of such material during grading. All manure from dairy corrals and other surface areas shall be stripped and removed prior to grading operations, in accordance with applicable codes and regulations. The potential for methane in remaining soils shall be specifically addressed in soils reports on all former dairy lands and other agricultural properties. Where the potential for methane accumulation or release is identified, soils testing shall occur with results and remedial measures identified in the soils report.~~

CR-3. **Paleontological Monitoring.** Monitoring for fossil material should be conducted by a qualified paleontologist—retained by the District and/or its construction contractor—during construction grading activities within older alluvium (Pleistocene), in order to avoid any disturbances to possible unknown or unidentified paleontological resources.

5.7.4 Level of Significance After Mitigation

Implementation of the above mitigation measures would reduce potential impacts to geology and soils and paleontological resources to less than significant. Impacts would not be greater than those identified in the Certified EIR.

5.8 GREENHOUSE GAS EMISSIONS

5.8.1 Findings of the Certified EIR

The 2003 Certified EIR did not analyze greenhouse gas (GHG) emissions. GHG emissions were not specifically analyzed in this EIR because it was certified prior to the adoption of Assembly Bill 32 (AB 32) and the Senate Bill 97 (SB 97) amendments (adopted December 30, 2009, effective March 18, 2010) to the CEQA Guidelines.

5.8.2 Impacts Associated with the Proposed Project

Would the project:

Environmental Issues	Change in Project Requiring EIR Revisions	Change in Circum-stances Requiring EIR Revisions	New Information Showing Potentially New or Increased Significant Effects	Less Than Significant Impact and No Changes to Certified EIR	No Impact and No Changes to Certified EIR
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?				X	
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?				X	

Comments:

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Less Than Significant Impact / No Changes to the Certified EIR. Global climate change is not confined to a particular project area and is generally accepted as the consequence of global industrialization over the last 200 years. A typical project, even a very large one, does not generate enough greenhouse gas emissions on its own to influence global climate change significantly; hence, the issue of global climate change is, by definition, a cumulative environmental impact.

As previously mentioned, GHG emissions were not a topic of environmental concern in the Certified EIR. The Proposed Project would result in a new K-8 school with painted surfaces, paved areas, and hardscape and landscape surfaces that would generate air pollutant emissions from area sources, energy use, and mobile sources. The entitled development for the project site (Approved Project) is an elementary school with a maximum of 1,000 students. The net increase in GHG emissions associated with the Proposed Project is shown in Table 5. Annual average construction emissions were amortized over 30 years to reflect estimated building lifetime, consistent with the South Coast AQMD Working Group's methodology. Operational activities associated with the Proposed Project would result in GHG emission from transportation, area sources, energy use, water use/wastewater generation, and solid waste disposal. As shown in Table 5, the Proposed Project would generate 1,335 metric tons of carbon dioxide-equivalent ($MTCO_2e$) per year of GHG emissions) and would not exceed the South Coast AQMD Working Group threshold of 3,000 $MTCO_2e$ per year. Therefore, the Proposed Project would not result in new or substantially greater impacts related to GHG emissions and preparation of an EIR is not required.

Table 5 Net Increase in Project-Related Operation GHG Emissions

Source	Proposed Project GHG Emissions ($MTCO_2e$/Year)
Area	<1
Energy	204
Mobile[1]	269
Solid Waste	60
Water	14
Amortized Construction Emissions[1]	788
Total	1,335
South Coast AQMD Bright-Line Threshold	3,000 $MTCO_2e$/Yr
Exceeds Bright-Line Threshold?	No

Source: CalEEMod, Version 2016.3.2.25.
Notes: MTons = metric tons; $MTCO_2e$ = metric ton of carbon dioxide equivalent
[1] Based on the net increase in daily trips of the Proposed Project compared to the Approved Project provided by LLG.
[2] Total construction emission are amortized over 30 years per South Coast AQMD methodology.

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Less Than Significant Impact / No Changes to the Certified EIR. As previously mentioned, GHG emissions were not a topic of environmental concern in the Certified EIR.

CARB Scoping Plan

Since the certification of the EIR, the state has signed into law GHG emissions reduction targets for which the California Air Resources Board (CARB) is required to prepare a plan to achieve. CARB's GHG emissions reduction strategies are outlined in the Scoping Plan. The first Scoping Plan was adopted in 2008 to achieve the GHG reduction targets for year 2020 in Assembly Bill 32 (AB 32). CARB's 2017 Scoping Plan is California's current GHG reduction strategy to achieve the latest state's GHG emissions reduction target established by Senate Bill 32 (SB 32), which is to reduce emissions 40 percent below 1990 levels by 2030 (CARB 2017). The CARB Scoping Plan is applicable to state agencies and is not directly applicable to cities/counties and individual projects. Nonetheless, the Scoping Plan has been the primary tool that is used to develop performance-based and efficiency-based CEQA criteria and GHG reduction targets for climate action planning efforts. Statewide strategies to reduce GHG emissions include the Low Carbon Fuel Standard (LCFS), California Appliance Energy Efficiency regulations, California Renewable Energy Portfolio standard, changes in the corporate average fuel economy (CAFE) standards, and other early action measures would ensure the state is on target to achieve the GHG emissions reduction goals of SB 32. The Proposed Project's GHG emissions would be reduced through compliance with statewide measures that have been adopted since Assembly Bill 32 and SB 32 were adopted. Thus, the Proposed Project would not conflict with the above statewide strategies identified to implement the CARB Scoping Plan.

SCAG's Regional Transportation Plan/Sustainable Communities Strategy

At the time of the Certified EIR, Senate Bill 375 (SB 375) was not yet signed into law. Furthermore, since the certification of the Certified EIR, a number of Regional Transportation Plans/Sustainable Communities Strategies (RTP/SCS) have been adopted by the Southern California Association of Government's (SCAG) to achieve the per capita passenger vehicle reduction goals outlined in SB 375. Most recently, SCAG adopted the 2020-2045 RTP/SCS (Connect SoCal) in September 2020. Connect SoCal finds that land use strategies that focus on new housing and job growth in areas rich with destinations and mobility options would be consistent with a land use development pattern that supports and complements the proposed transportation network. The overarching strategy in the Connect SoCal Plan is to provide for a plan that allows the southern California region to grow in more compact communities in transit priority areas and priority growth areas, provide neighborhoods with efficient and plentiful public transit, establish abundant and safe opportunities to walk, bike and pursue other forms of active transportation, and preserve more of the region's remaining natural lands and farmlands (SCAG 2020). The Connect SoCal Plan contains transportation projects to help more efficiently distribute population, housing, and employment growth, as well as forecasted development that is generally consistent with regional-level general plan data so as to promote active transport and reduce GHG emissions. The projected regional development, when integrated with the proposed regional transportation network identified in the Connect SoCal Plan, would reduce per capita vehicular travel-related GHG emissions and achieve the GHG reduction per capita targets for the SCAG region.

The RTP/SCS does not require that local general plans, specific plans, or zoning be consistent with the SCS, but provides incentives for consistency for governments and developers. The Proposed Project is consistent with the Specific Plan land use for the site. Although the Proposed Project accommodates 200 additional students compared to the entitled development for the Project Site, the Proposed Project is a local serving use that has the potential to reduce student-generated VMT within the Specific Plan (see Section 5.17, Transportation). Thus, implementation of the Proposed Project would not interfere with SCAG's ability to implement the regional strategies outlined in the RTP/SCS. Therefore, no new significant impacts or substantially more severe significant impacts than those previously identified in Certified EIR would occur.

5.8.3 Adopted Mitigation Measures Applicable to the Proposed Project

The Certified EIR did not include mitigation measures for GHG emissions, and the Proposed Project does not require mitigation.

5.8.4 Level of Significance After Mitigation

Impacts related to greenhouse gas emissions would be less than significant.

5.9 HAZARDS AND HAZARDOUS MATERIALS

5.9.1 Findings of the Certified EIR

The Certified EIR identified potential hazards related to the following topics:

- **Chino Airport Operations.** There are conflicts between aircraft operations and waterfowl near airport runways, and risks related to placing people near the airport and the potential for aircraft accidents. The Approved Project has been designed to limit effects caused by airport operations.
- **Contaminated Organic Residue** (e.g. manure and other organic deposition) within the soils that remain from activities of the dairy industry. Soils may be contaminated by hazardous materials related to historical agricultural operations in The Preserve area. Each project within The Preserve is required to prepare an environmental site assessment and mitigate potential contamination based on regulated standards.
- **Vector Control.** Dairy operations have caused an increase in fly and mosquito populations. The Approved Project would reduce the volume of standing water and implement nonchemical vector control practices.
- **Electromagnetic Fields (EMFs).** The power line corridor in The Preserve could cause potential health hazards and sensitive land uses near the corridor could be exposed to EMFs. As amended via The Addendum to The Preserve – Chino Sphere of Influence – Sub-Area 2 Environmental Impact Report, South of Pine and Flores Project, the power line would be realigned along Hellman Avenue and Legacy Park Street to minimize prolonged exposure to EMFs at sensitive uses (Psomas 2014).

5.9.2 Impacts Associated with the Proposed Project

The analysis in this section is based in part on the following technical reports:

- *Geological and Environmental Hazards Assessment Report*, PlaceWorks, April 2021.
- *Preliminary Environmental Assessment: Proposed Preserve #2 Elementary School*, PlaceWorks, January 2020.

Complete copies are included in Appendices C and D of this Addendum.

Would the project:

Environmental Issues	Change in Project Requiring EIR Revisions	Change in Circum-stances Requiring EIR Revisions	New Information Showing Potentially New or Increased Significant Effects	Less Than Significant Impact and No Changes to Certified EIR	No Impact and No Changes to Certified EIR
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	

Environmental Issues	Change in Project Requiring EIR Revisions	Change in Circum-stances Requiring EIR Revisions	New Information Showing Potentially New or Increased Significant Effects	Less Than Significant Impact and No Changes to Certified EIR	No Impact and No Changes to Certified EIR
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 § 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 or excessive noise for people residing or working in the project area?				X	
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				X	
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?					X

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Less Than Significant Impact / No Changes to the Certified EIR. Construction of the Proposed Project would involve small quantities of hazardous materials such as fuels, greases, paints, and cleaning materials. The use, storage, transport, and disposal of hazardous materials are governed by regulations that are enforced by the Department of Toxic Substances Control, Environmental Protection Agency, Occupational Safety and Health Administration, and San Bernardino County Environmental Health Services. Compliance with existing laws and requirements would ensure that potentially hazardous materials are used and handled in an appropriate manner and would limit hazards.

Long-term operations of the Proposed Project would not involve routine transport, storage, use, or disposal of substantial amounts of hazardous materials. Project operation would require use of small amounts of materials such as cleansers, paints, and pesticides for cleaning and maintenance purposes. The use of these materials would be in accordance with the manufacturer's instructions for use, storage, transport, and disposal. Impacts related to hazards affecting the public and the environment through the routine transport, use, or disposal of hazardous materials would be less than significant and would not be beyond that analyzed in the Certified EIR.

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?

Less Than Significant Impact / No Changes to the Certified EIR. As mentioned in Section 5.9.2.a, the District's compliance with federal, state, and local regulations concerning the handling, transport and disposal of hazardous materials and wastes would reduce impacts to less than significant levels. This is standard practice that the District already implements for its construction projects and day-to-day operations. Notwithstanding, as required in Certified EIR Mitigation Measure HM-5, the District and its contractors will demonstrate compliance with applicable federal, state, and local laws and regulations.

Prior to being rough graded in October 2020, the project site was used for stockpiling, likely by the developments to the east of the project site. From approximately 1985 to at least 2009, the site was used as a dairy farm, and from 1966 to around 1985, the site was under agricultural production. The site's past farming and agricultural uses may have exposed site soils to pesticides and herbicides. Consistent with Certified EIR Mitigation Measure HM-3, the District prepared a Preliminary Environmental Assessment (PEA, also known as a Phase II Environmental Site Assessment) that complies with standards established by the American Society of Testing and Materials (ASTM Standard E 1527). The PEA concludes that chemical concentrations on the project site are not a risk to human health or the environment under an unrestricted residential land use scenario. In a letter dated March 24, 2021, the DTSC concurred with the findings of the PEA and recommended no further environmental investigation of the project site. Therefore, impacts from reasonably foreseeable upset of constructing and operating the proposed school would be less than significant and not beyond those analyzed in the Certified EIR.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Less Than Significant Impact / No Changes to the Certified EIR. There are no schools within a 0.25-mile of the project site. The closest school is Cal Aero Preserve Academy, approximately 0.5 mile to the north. Project construction would generate some dust and emit diesel exhaust, which can be considered hazardous. Construction would also require use of some hazardous materials mentioned in section 5.9.2.a that are regulated by federal, state, and local laws and guidelines. Temporary exposure to diesel exhaust and the use of the aforementioned substances would not pose substantial hazards to persons near the site. Emissions generated during operation may also include exhaust from vehicles and landscape equipment, such as leaf blowers. Project construction and operation would not expose persons on the project site or the nearest school to substantial hazardous emissions, materials, substances, or waste. Impacts would be less than significant and not beyond those analyzed in the Certified EIR.

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code § 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

No Impact / No Changes to the Certified EIR. California Government Code § 65962.5 requires that lists of hazardous materials sites be compiled and available to the public. These lists include:

- Hazardous waste facilities subject to corrective action.
- Hazardous waste discharges for which the State Water Resources Control Board (SWRCB) has issued certain types of orders.
- Public drinking water wells containing detectable levels of organic contaminants.
- Underground storage tanks with reported unauthorized releases.
- Solid waste disposal facilities from which hazardous waste has migrated.

Though there are properties within The Preserve area that are identified on the above lists, the project site is not on any list compiled pursuant to California Government Code § 65962.5. No impact would occur.

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 or excessive noise for people residing or working in the project area?

Less Than Significant Impact / No Changes to the Certified EIR. The project site is about one mile south-southeast of the Chino Airport and approximately 6,000 feet south of the approach runway. According to the Chino Airport Land Use Plan, the project site is in Safety Zone III/Referral Area C, where aircraft accidents and exposure to noise are less than the other areas within the airport land use plan. According to the plan, schools are normally acceptable in this zone. The California Department of Transportation, Division of Aeronautics evaluated the project site for use as a school and has no objections to the use of the site as a school (Caltrans 2019). Impacts are less than significant and not beyond those analyzed in the Certified EIR.

f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Less Than Significant Impact / No Changes to the Certified EIR. The Proposed Project would be located within the development footprint assumed in the Certified EIR, and as amended by the Addendum to The Preserve – Chino Sphere of Influence – Sub-Area 2 Environmental Impact Report, South of Pine and Flores Project (Psomas 2014). Land uses would be developed consistent with the pattern that was assumed for the Approved Project and amended Certified EIR. Additionally, the proposed campus includes an internal fire access road. Furthermore, it is possible that under catastrophic conditions, the campus can be used as an emergency shelter for the community. Impacts are less than significant and not beyond that analyzed in the Certified EIR, as amended.

g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

No Impact / No Changes to the Certified EIR. The project site is vacant undeveloped land. The surrounding properties are residential, dairy, and vacant undeveloped land. There is no wildland susceptible to wildfire on or near the site. Additionally, the project site is not within a fire hazard severity zone as mapped by the California Department of Forestry and Fire Protection (CAL FIRE). The Proposed Project would not place people or buildings at risk from wildfires, and no impact would occur.

5.9.3 Adopted Mitigation Measures Applicable to the Proposed Project

The following mitigation measures were identified in the Certified EIR. Applicability of each mitigation measure has been evaluated. The mitigation measures have been modified where appropriate to reflect the Proposed Project. The revisions are identified in ~~strikethrough~~ for deletion and underline for addition.

~~HM-1.~~ ~~**Aircraft/Waterfowl Hazards.**~~ ~~To minimize aircraft/wildlife hazards, sizeable water features that might attract waterfowl should be prohibited in the plan area east of the Airport.~~

~~HM-2.~~ ~~**Maximum Building Height.**~~ ~~The maximum building heights outside of the runway protection zones may not exceed 160 feet to prevent any conflict with adopted flight patterns.~~

HM-3. **Environmental Site Assessments.** ~~Prior to City consideration of any specific development projects within the plan area, developers will be required by t~~The District shall ~~City to~~ submit a completed Phase 1 Environmental Site Assessment and any subsequent soil hazards assessments (ESAs), which at a minimum, meet~~s~~ with the requirements of the most current standards of investigation established by the American Society of Testing and Materials (ASTM Standard E 1527) to the Department of Toxic Substances Control. The recommendations of such ESAs, including testing and soil remediation, if necessary, shall be adhered to reduce any identified hazards to acceptable levels.

~~HM-4.~~ ~~**Asbestos and Lead-Based Paint.**~~ ~~Prior to issuance of permits by the City of Chino for major renovation or demolition of any pre-1979 structure within the project area, the project developer will be required to submit documentation to the City Building Department that asbestos and lead-based paint issues are not applicable to their property, or that appropriate actions will be taken to correct any asbestos or lead-based paint issues prior to development of the site.~~

HM-5. **Compliance with Laws and Regulations.** In order to minimize risks to life and property, projects within the plan area will be required to demonstrate compliance with all applicable federal, state and local laws and regulations governing the handling, transport, treatment, generation and storage of hazardous materials.

5.9.4 Level of Significance After Mitigation

Implementation of Certified EIR Mitigation Measures HM-3 and HM-5 would reduce potential impacts related to hazards and hazardous materials to less than significant. Project impacts would not be greater than those identified in the Certified EIR.

5.10 HYDROLOGY AND WATER QUALITY

5.10.1 Findings of the Certified EIR

The Preserve plan area encompasses segments of Chino Creek, Cucamonga Creek/Mill Creek, and several ephemeral and seasonal drainages that all drain into the Santa Ana River, located south of The Preserve and within the Prado Flood Control Basin. The Certified EIR concluded that with the incorporation of design features, project-level hydrology studies, National Pollutant Discharge Elimination System (NPDES) permit program requirements, best management practices (BMPs) for point and nonpoint source pollution control, and Certified EIR Mitigation Measures HWQ-1 through HWQ-7, the flooding, hydrology, and water quality impacts would be reduced to a level that is considered less than significant.

5.10.2 Impacts Associated with the Proposed Project

The analysis in this section is based in part on the following technical reports:

- *Infiltration Rate Study for Storm Water Disposal*, John R. Byerly, Incorporated, January 13, 2020.
- *Preliminary Water Quality Management Plan*, LD King, March 31, 2020.

Complete copies are included as Appendices E and F of this Addendum.

Would the project:

Environmental Issues	Change in Project Requiring EIR Revisions	Change in Circum-stances Requiring EIR Revisions	New Information Showing Potentially New or Increased Significant Effects	Less Than Significant Impact and No Changes to Certified EIR	No Impact and No Changes to Certified EIR
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?				X	
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?				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 or through the addition of impervious surfaces, in a manner which would:					
i) result in substantial erosion or siltation on- or off-site;				X	

Environmental Issues	Change in Project Requiring EIR Revisions	Change in Circum-stances Requiring EIR Revisions	New Information Showing Potentially New or Increased Significant Effects	Less Than Significant Impact and No Changes to Certified EIR	No Impact and No Changes to Certified EIR
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;				X	
iii) 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; or				X	
iv) impede or redirect flood flows?				X	
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?					X
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?				X	

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?

Less Than Significant Impact / No Changes to the Certified EIR.

Construction Phase

See section 5.7.2.b. Water quality effects would be controlled through the development and implementation of a SWPPP in accordance with the State Water Resource Control Board's Construction General Permit (CGP) Water Quality Order 2009-0009-DWQ (as amended by Order No. 2010-0014-DWQ and 2012-006-DWQ). The SWPPP would be prepared by the Proposed Project's construction contractor and submitted to the Regional Water Quality Control Board for review and approval. The SWPPP would identify the best available economically achievable and best conventional pollutant technology to reduce pollutant discharges. Non-stormwater BMPs would also be implemented and may include controls and objectives for vehicle and equipment maintenance, cleaning and fueling, and potable water/irrigation practices. Table 4 in Section 5.6, *Geology and Soils*, lists potential BMPs used in SWPPPs. Compliance with the BMPs would manage and reduce potential soil erosion and surface and groundwater quality impacts. Therefore, construction-related water quality impacts would be similar to those of the Approved Project, which were found to be less than significant with the incorporation of mitigation measures. The project's impacts would not be beyond those analyzed in the Certified EIR

Operation Phase. Once constructed, the project site would contain school buildings and paved and landscaped areas. Although the District would maintain the property and soils would not be exposed, the proposed school would generate pollutants—such as grease, oil, suspended solids, metals, solvents, phosphates, fertilizers, and pesticides—that could contribute to the degradation of receiving waters. The Proposed Project would include two biofiltration treatment systems in the eastern perimeter of the sports field and the parking lot along East Preserve Loop. The biofiltration systems would remove pollutants from the stormwater collected before it is released into the municipal storm line. Therefore, operational impacts to surface and groundwater quality standards or waste discharge requirements would be less than significant and not beyond those analyzed in the Certified EIR.

b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

Less Than Significant Impact / No Changes to the Certified EIR. Implementation of the Proposed Project would reduce the amount of pervious areas on the project site. The Proposed Project does not include new groundwater wells. Construction and operation of the Proposed Project would not lower the groundwater table or deplete groundwater supplies. Therefore, like the Approved Project, impacts would be less than significant under the Proposed Project, and impacts remain unchanged from the Certified EIR.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

- **i) result in a substantial erosion or siltation on- or off-site;**
- **ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;**
- **iii) 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; or**
- **iv) impede or redirect flood flows?**

Less Than Significant Impact / No Changes to the Certified EIR. The project site is rough graded and contains no streams or rivers. Runoff currently sheet flows toward the southeast of the site into two catch basins. Project implementation would reduce the permeability of the site and alter its existing drainage pattern. A network of storm drains and catch basins would be strategically installed throughout the campus to capture stormwater and direct it to one of two underground biofiltration storage systems in the eastern perimeter of the sports field and main parking lot. Pollutants would be removed, and the stormwater would be stored if needed, before it is discharged into The Preserve's stormwater Line F, under East Preserve Loop.

Preliminary water quality design calculations projects 33,886 cubic feet (cf) of stormwater runoff caused by the Proposed Project. The two biofiltration systems would collect stormwater from two separate drainage management areas (DMA). The system in the playfield would collect stormwater from a DMA of 5.71 acres, inclusive of the turf field and paved areas of the basketball courts and western perimeter of the campus (DMA 1). The second system in the parking lot would collect stormwater from a DMA of 6.29 acres that would include the paved areas around the school buildings and two parking lots (DMA 2). As shown in Table 6, both biofiltration systems would be able to adequately accommodate the design capture volume of runoff.

Table 6 Biofiltration System Storage

Drainage Management Area	Area (acres)	Design Capacity Volume (cf)	Biofiltration Storage
DMA 1	5.71	10,180	10,187
DMA 2	6.29	23,705	24,362
Total	12	33,886	34,549

The installation of the proposed drainage and biofiltration storage system would reduce potential stormwater impacts to less than significant. Runoff would be captured, cleared of pollutants, stored as needed, and discharged at a flow rate acceptable to Chino Public Works. The Proposed Project would not cause erosion and siltation or contribute runoff that would exceed the capacity of the Preserve's stormwater drainage systems. The Proposed Project would not cause flooding. Accordingly, no new significant impacts or impacts of greater severity than those previously identified in the Certified EIR would occur.

d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

No Impact / No Changes to the Certified EIR.

- **Flood Hazard.** The project site is outside of 100-year flood zone. According to the City of Chino (2010), the project site is not within the boundaries of dam inundation in the event of catastrophic failure of any dams nor are there any water storage facilities that would inundate the site in case of failure. The nearest water-storage facility is Prado Dam, approximately 4.5 miles southwest of the project site. The site's elevation ranges between 594 ft and 579 ft; the site is above the 566-Foot Prado Dam Inundation Area and outside the flood zone; furthermore, based on the Prado Dam Emergency Plan Inundation Maps, flooding from dam failure would flow southwest toward the Pacific Ocean, away from the project site (USACE, 1985). However, the project site is within the dam inundation zone for the San Antonio Dam. Based on maps from the Office of Emergency Services (2015), the arrival time of floodwaters from a dam inundation from San Antonio Dam would be greater than 10 hours and 30 minutes from the time of failure. There would be ample time for students and personnel to evacuate. The closest high ground outside of the dam inundation zone is to the southwest near the Euclid Avenue overpass of State Route 71. The maximum depth of floodwaters is estimated to be two feet in depth.

- **Seiche.** A seiche is a surface wave created when a body of water is shaken, usually by earthquake activity. There are no reservoirs or water storage tanks, at or above ground level, that would pose a flood hazard to the site due to a seiche.

- **Tsunamis.** Tsunamis are a type of earthquake-induced flooding produced by large-scale sudden disturbances of the sea floor. The project site is approximately 46.5 miles inland from the Pacific Ocean. Therefore, the project site is outside the tsunami hazard zone and would not be affected by a tsunami.

The Proposed Project would not release pollutants as the result of floods, tsunami, or seiche. No impact would occur, and impacts would remain unchanged from the Certified EIR.

e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Less Than Significant Impact / No Changes to the Certified EIR. The Santa Ana Region RWQCB administers the Water Quality Control Plan for the Santa Ana River Basin. The water quality control plan includes a water supply plan, a groundwater management plan, and a waste management plan. The Regional Board achieves the goals of the plan through the issuance of waste discharge permits, either in the form of waste discharge requirements or NPDES permits. Implementation of the requirements of the NPDES permits would ensure compliance with the objectives and standards of the Water Quality Control Plan. Impacts would be less than significant, and impacts would remain unchanged from the Certified EIR.

5.10.3 Adopted Mitigation Measures Applicable to the Proposed Project

The following mitigation measures were identified in the Certified EIR. Applicability of each mitigation measure has been evaluated. The mitigation measures have been modified where appropriate to reflect the Proposed Project. The revisions are identified in ~~strikethrough~~ for deletion and underline for addition.

HWQ-1. **NPDES.** ~~All development~~ The Proposed Project shall comply with the National Pollutant Discharge Elimination System (NPDES) regulations. ~~Prior to the issuance of a grading permit, applicants~~ The District shall demonstrate compliance with NPDES Stormwater Permit requirements to the satisfaction of the Santa Ana Regional Water Quality Control Board ~~City of Chino~~. Applicable BMP provisions shall be incorporated into the NPDES Permit.

HWQ-2. **Best Management Practices.** ~~Individual projects within the specific plan area shall be reviewed by the City of Chino for the inclusion of~~ The District shall include appropriate structural and nonstructural Best Management Practices (BMPs) to control stormwater discharges and protect water quality. Structural controls may include, but are not limited to filtration, common area efficient irrigation, common area runoff minimizing landscape design, velocity dissipation devices, oil/grease separators, inlet trash racks, and catch basin stenciling. Nonstructural BMPs can include education for property owners, tenants and occupants, activity restrictions, common area landscape management, litter control, and catch basin inspection, BMP maintenance; and street sweeping.

The following are examples of BMPs that may be included within NPDES permit requirements for individual projects:

- Use of sand bags and temporary desilting basins during project grading and construction during the rainy season (October through April) to prevent discharge of sediment-laden runoff into stormwater facilities.
- Installation of landscaping as soon as practicable after completion of grading to reduce sediment transport during storms.

- Hydroseeding, soil binders or other measures to retain soil on graded building pads if they are not built upon before the onset of the rainy season.
- Incorporation of structural BMPs (e.g., grease traps, debris screens, continuous deflection separators, oil/water separators, drain inlet inserts) into the project design to provide detention and filtering of contaminants in urban runoff from the developed site prior to discharge to stormwater facilities.
- Stenciling of catch basins and other publicly visible flood control facilities with the phrase "No Dumping-Drains to the Ocean."

HWQ-3. **Best Management Practices.** The District shall apply ~~City shall review subsequent development projects within the specific plan area for the application of~~ Best Management Practices (BMPs) to reduce water pollution from urban runoff. Among the source-reduction BMPs that may be required ~~by the City for application to such projects~~ are the following:

- Animal waste reduction
- Exposure reduction
- Recycling/waste disposal
- Parking lot and street cleaning
- Infiltration (exfiltration) devices
- Oil and grease traps
- Sand traps
- Filter strips
- Regular/routine maintenance

The specific measures to be applied shall be determined in conjunction with review of required project hydrology and hydraulic studies and shall conform to City standards and the standards of the County's Municipal Stormwater Permit, under the NPDES program.

~~HWQ-4.~~ ~~**Water Quality Monitoring.** A water quality monitoring program should be implemented to regularly test the water quality at the project storm drainage outlets to Prado Lake, Chino Creek and Mill Creek. The program should be devised to differentiate the pollutant contributions of project development from dairies during the transitional period. If test results determine that the water quality standards established by the RWQCB are not being met, corrective actions acceptable to the RWQCB would be taken to improve the quality of surface runoff discharged from the outlets to a level in compliance with the adopted RWQCB standards.~~

~~HWQ-5~~ ~~In implementing the Storm Drainage Plan, the City should review subsequent development projects within the plan area for opportunities to provide 'mini-basins' for purposes of~~

~~detention, filtration and recharge to groundwater. Such basins may have the corollary benefit of providing habitat for waterfowl. Appropriate locations may include storm drain outlets to earthen channels, within or adjacent earthen channels, and at storm drain outlets to the natural open space system.~~

~~HWQ-6.~~ ~~**Storm Drain Outlets.** The City of Chino shall assure that storm drain facilities and outlets to Prado Regional Park and the natural open space system are designed in a manner that minimizes disruption of park operations and protects park and open space resources. Specific drainage facility designs at outlets to the major open space system below the 566' elevation shall be made available for review by the County of San Bernardino Flood Control District and U.S. Army Corps of Engineers, as appropriate.~~

~~HWQ-7.~~ ~~**Urban Runoff Management Plan.** Prior to any development approvals, a plan for managing urban runoff to protect sensitive drainages within the open space system shall be approved by the City of Chino. This Urban Runoff Management Plan (URMP) will be integrated with the project Storm Drain Plan, and provide the framework and mechanism for:~~

1. ~~Phased implementation of structural and non-structural best management practices (BMP's) to control stormwater discharges and protect water quality;~~

2. ~~Review of subsequent projects for inclusion of 'mini-basins' for detention, filtration and recharge to groundwater;~~

3. ~~The design and location of Natural Treatment Systems (NTS) for water quality purposes within drainages; and~~

4. ~~Implementation of a water quality monitoring program at storm drain outlets to Prado Lake, Chino Creek and Mill Creek.~~

~~The URMP shall be made available for review and comment by the Flood Control Districts of the counties of San Bernardino and Orange, the U.S. Army Corps of Engineers, and Orange County Water District during the City of Chino's review and approval process. The URMP shall assure to the satisfaction of the City of Chino that project development that drains into Chino Creek and Mill Creek will not unacceptably contribute to flooding, scour and erosion, or water quality degradation of these environmentally sensitive drainages.~~

5.10.4 Level of Significance After Mitigation

Implementation of Certified EIR Mitigation Measures HWQ-1, HWQ-2, and HWQ-3 would reduce potential impacts related to Hydrology and Water Quality to less than significant. Project impacts would not be greater than those identified in the Certified EIR.

5.11 LAND USE AND PLANNING

5.11.1 Findings of the Certified EIR

The Certified EIR concluded that the Approved Project would cause significant and unavoidable project-level and cumulative impacts related to the irreversible loss of open space and conversion of the planning area's rural community character to urban. The Certified EIR also identified temporary localized land use incompatibilities and impacts during the Approved Project's transition to the approved land use plan at project buildout, such as potential conflicts between project sites and agricultural/dairy operations.

5.11.2 Impacts Associated with the Proposed Project

Would the project:

Environmental Issues	Change in Project Requiring EIR Revisions	Change in Circum-stances Requiring EIR Revisions	New Information Showing Potentially New or Increased Significant Effects	Less Than Significant Impact and No Changes to Certified EIR	No Impact and No Changes to Certified EIR
a) Physically divide an established community?					X
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?					X

a) Physically divide an established community?

No Impact / No Changes to the Certified EIR. The project site is graded and currently surrounded by multifamily housing to the east and undeveloped land to the north, west, and south. Active dairies are farther north of Pine Avenue. Implementation of the Proposed Project would result in the types of land uses and infrastructure previously approved for The Preserve—shown in Figure 3, *The Preserve Specific Plan*—including residential uses to the north, east, and south; a community park to the west; and community commercial uses to the northwest. The proposed K-8 school would not be incompatible with the existing and planned surrounding uses, and the Proposed Project would not divide an established community or future South of Pine communities of the Approved Project. No new impact would occur, and the Proposed Project would not increase the severity of previously identified land use impacts.

b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

No Impact / No Changes to the Certified EIR. The northern half of the project site is zoned High Density Residential (HDR) / School / Park, and the southern half is zoned School / CC Non-Residential / HDR. The

Proposed Project would be consistent with and supports the zoning designated by The Preserve Development Concept, Development Plan, and Design Guidelines. The Proposed Project would also be consistent with applicable City of Chino General Plan Goals, Objectives, Policies, and Actions. Therefore, the Proposed Project would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project site. No new impact would occur, and the Proposed Project would not increase the severity of previously identified land use impacts.

5.11.3 Adopted Mitigation Measures Applicable to the Proposed Project

The following mitigation measures were identified in the Certified EIR. Applicability of each mitigation measure has been evaluated. The mitigation measures have been modified where appropriate to reflect the Proposed Project. The revisions are identified in ~~strikethrough~~ for deletion and underline for addition.

~~LU-1.~~ ~~**Chino Airport Influence Area.** The City of Chino shall provide notice of development applications within adopted airport noise and safety zones to the Airport Land Use Commission (ALUC), in compliance with the Chino Airport Comprehensive Land Use Plan (ACLUP). The City will coordinate with the ALUC to assure specific development projects' compatibility with Chino Airport operations.~~

~~LU-2.~~ ~~**Correctional Institution for Women (CIW-Chino).** Special attention should be focused during subsequent review of specific development projects on providing an adequate buffer and separation between the existing CIW-Chino and planned residential uses immediately to the east. The planned linear Community Paseo along Chino-Corona Road separating these uses should include some combination of landscape screening, berms and/or walls, and setbacks to achieve an adequate physical and visual separation between these uses.~~

5.11.4 Level of Significance After Mitigation

The Proposed Project would result in no impact to land use and planning. Impacts would not be greater than those identified in the Certified EIR.

5.12 MINERAL RESOURCES

5.12.1 Findings of the Certified EIR

The Certified EIR identified no known mineral resources within The Preserve, and no analysis was provided.

5.12.2 Impacts Associated with the Proposed Project

Would the project:

Environmental Issues	Change in Project Requiring EIR Revisions	Change in Circum-stances Requiring EIR Revisions	New Information Showing Potentially New or Increased Significant Effects	Less Than Significant Impact and No Changes to Certified EIR	No Impact and No Changes to Certified EIR
a) Result in the loss of availability of a known mineral resource that would be a value to the region and the residents of the state?					X
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

a) Result in the loss of availability of a known mineral resource that would be a value to the region and the residents of the state?

No Impact / No Changes to the Certified EIR. No active mines are mapped within the City, and no active oil wells are mapped within the boundaries of the project site. (CalGem, 2019; DOC, 2016). Implementation of the Proposed Project would not cause a loss of mineral resource valuable to the region and the state. No impact would occur.

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?

No Impact / No Changes to the Certified EIR. The project site is within an area designated in MRZ-3, which according to the Chino General Plan Open Space and Conservation element contains sand and gravel deposits, but insufficient data to ascertain whether these mineral deposits are significant. There are no locally important mineral resources on or near the project site. Therefore, project development would not cause a loss of availability of a resource, and no impact would occur.

5.12.3 Adopted Mitigation Measures Applicable to the Proposed Project

The Certified EIR did not identify any mitigation measures, and the Proposed Project would not require any mitigation measures.

5.12.4 Level of Significance After Mitigation

The Proposed Project's impacts would not be greater than those identified in the Certified EIR.

5.13 NOISE

5.13.1 Findings of the Certified EIR

The Certified EIR found that operation of heavy equipment would create potentially significant short-term noise increases, especially if the source occurs near noise-sensitive land uses. The Certified EIR also concluded that noise levels at roadways would increase due to cumulative traffic growth, including traffic from the Specific Plan, and cause potentially significant noise impacts. Finally, noise from operations of the Chino Airport, including single flyover events, could cause potentially significant noise impacts. The Certified EIR identified three mitigation measures that would reduce these potentially significant noise impacts to less than significant levels.

5.13.2 Impacts Associated with the Proposed Project

Would the project result in:

Environmental Issues	Change in Project Requiring EIR Revisions	Change in Circum-stances Requiring EIR Revisions	New Information Showing Potentially New or Increased Significant Effects	Less Than Significant Impact and No Changes to Certified EIR	No Impact and No Changes to Certified EIR
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?				X	
b) Generation of excessive groundborne vibration or groundborne noise levels?					X
c) For a project located within the vicinity of a private airstrip or 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 expose people residing or working in the project area to excessive noise levels?					X

a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Less Than Significant Impact / No Changes to the Certified EIR. The landowner rough graded the project site in October 2020, and construction of the proposed school would apply standard techniques, typical of school construction in California. The project's construction activities would not raise any substantive new noise issues that are not already addressed in the Certified EIR. Furthermore, the Project would comply with Certified EIR Mitigation Measure N-1, which requires construction noise levels to be reduced through measures that have been approved by the City.

The proposed school is a noise-sensitive use. Existing and proposed land uses adjacent to the project site are compatible (e.g., vacant lands, community park, and residential) with the proposed school operations. Additionally, the site is away from major roadways with substantial vehicle-related noises. East Preserve Loop and Market Avenue are local collector roadways, and Academy Avenue is a local street. The closest major arterial is Pine Avenue, about 900 feet north of the site. Multifamily building structures, currently planned between the project site and Pine Avenue, would attenuate noise from Pine Avenue.

Notwithstanding, the project would comply with § 14030(m) of Title 5 CCR concerning acoustics at the site. Hearing conditions shall complement the educational function by good sound control in school buildings, specifically:

- The sound conditioning in a given space is acoustically comfortable to permit instructional activities to take place in this classroom.
- Sound is transmitted without interfering with adjoining instructional spaces; e.g., room partitions are acoustically designed to minimize noise.
- The ventilation system does not transmit an inordinate sound level to the instructional program.

Consistent with Certified EIR Mitigation Measure N-2, the Project would include an acoustical study to ensure indoor and outdoor noise levels at the proposed school comply with state noise standards for school uses, which are 45 dB CNEL for indoors and 65 dB CNEL for outdoors. Impacts are less than significant.

b) Generation of excessive groundborne vibration or groundborne noise levels?

Less Than Significant Impact / No Changes to the Certified EIR. Construction vibration and groundborne noise are of concern when heavy construction occurs in close proximity to buildings or uses that are sensitive to vibration. According to the Chino Noise Ordinance, there would be less than significant impacts when there are no sensitive receptors within 50 feet of the construction, provided the construction does not include pile driving or blasting. Heavy construction activities occurred at the site when the landowner rough graded it in October 2020. However, construction of the proposed school would still require construction equipment and activities that could generate some vibration. The potential use of vibratory rollers, excavators, bulldozers, graders, and backhoe loaders would generate vibration; however, forklifts, cranes, and haul trucks would not generate substantial levels of vibration. The Project would not require pile driving or blasting. There are no vibration-sensitive buildings or uses within 50 feet of the project site. The closest noise-sensitive uses are residences 75 feet east of East Preserve Loop. The structures are approximately 100 feet east of the Project's perimeter. Therefore, potential noise and vibration impacts caused by construction of the Project at the residences would be less than significant.

Operational vibration and groundborne noise is a concern near trains or other transit corridors, which is not applicable to the Proposed Project. The proposed school would not generate vibration or groundborne noise impacts. Therefore, the Proposed Project would not result in any new impacts related to vibration, nor would it result in an increase in the severity of any significant impacts compared to those previously identified in the Certified EIR.

c) For a project located within the vicinity of a private airstrip or 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 expose people residing or working in the project area to excessive noise levels?

Less Than Significant Impact / No Changes to the Certified EIR. The project site is about a mile south-southeast of the Chino Airport and approximately 6,000 feet south of the approach runway. According to the Chino Airport Land Use Plan, the project site is in Safety Zone III/Referral Area C, where aircraft accidents and exposure to noise are less than the other areas in the airport land use plan. According to The Preserve development plan, the project site is outside the adopted 65 dB CEL noise contour of the Chino Airport, and noise exposure would be minimal in this zone.

5.13.3 Adopted Mitigation Measures Applicable to the Proposed Project

The following mitigation measures were identified in the Certified EIR. Applicability of each mitigation measure has been evaluated. The mitigation measures have been modified where appropriate to reflect the Proposed Project. The revisions are identified in ~~strikethrough~~ for deletion and underline for addition.

N-1. **Construction Noise.** The following construction noise reduction measures will be implemented:

- All construction activities conducted within 500 feet of any occupied dwelling shall not occur from 7 P.M. to 7 A.M. the following day, and at any time on Sundays or universally observed holidays.
- All construction equipment will use properly operating mufflers.
- All staging areas shall be located away from occupied dwellings and schools where feasible.
- The City of Chino will approve construction truck access routes that minimize noise intrusion into sensitive areas, such as neighborhoods, schools, and parks.

N-2. **Roadway Noise.** ~~Developers/builders shall submit~~ The District shall prepare acoustical studies to ensure that: ~~the City of Chino for subsequent tentative maps and noise sensitive uses (e.g. residences, schools, medical facilities) adjacent the principal area roadways. Such studies shall assure that:~~

- Usable exterior space meets noise standards of 65 dB CNEL through a combination of setback or barriers.
- ~~Habitable interior~~ Instructional rooms along any project perimeter near noise-impacted roadways meet the interior standard of 45 dB CNEL through dual-paned windows, central air conditioning and other structural upgrades.

~~N-3.~~ ~~**Airport Noise.** In order to ensure that noise exposure is considered in review of subsequent development projects within the plan area, and in acknowledgement of possible single-event aircraft audibility even if standards are not exceeded, the following measures will be implemented:~~

- ~~The City of Chino shall provide notice of development applications within adopted airport noise and safety zones to the Airport Land Use Commission (ALUC), in compliance with the Airport Comprehensive Land Use Plan (ACLUP). The City will coordinate with the ALUC to assure the compatibility of specific development projects with Chino Airport Operations (same as Mitigation Measure LU-1).~~
- ~~All real estate transactions within Subarea 2 within 1.0 mile of the airport boundary will contain advisory language that aircraft may be periodically audible even though the subject property is exposed to noise levels due to aviation activities that are well within State guidelines.~~

5.13.4 Level of Significance After Mitigation

The Proposed Project's noise and vibration impacts are less than significant and would not be greater than those identified in the Certified EIR.

5.14 POPULATION AND HOUSING

5.14.1 Findings of the Certified EIR

The Certified EIR noted that the Approved Project includes housing near employment and retail centers and would result in a positive impact on local economy and the environment, because it would contribute to reduced reliance on vehicle travel and possibly reduce regional work trip commutes, which has corollary air pollution and energy consumption reduction benefits. Therefore, the Certified EIR concluded that no significant impacts would occur related to housing and population.

5.14.2 Impacts Associated with the Proposed Project

Would the project:

Environmental Issues	Change in Project Requiring EIR Revisions	Change in Circum-stances Requiring EIR Revisions	New Information Showing Potentially New or Increased Significant Effects	Less Than Significant Impact and No Changes to Certified EIR	No Impact and No Changes to Certified EIR
a) Induce substantial unplanned 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 people or housing, necessitating the construction of replacement housing elsewhere?					X

a) **Induce substantial unplanned 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)?**

No Impact / No Changes to the Certified EIR. Projects that induce population growth include new roads, expanded utility lines, large employment centers, and housing. The Proposed Project would not extend infrastructure into currently unserved areas, as the project site is served by existing and planned utility laterals in The Preserve plan area. The Proposed Project would serve the student population in the southern half of The Preserve plan area, as identified in the Approved Project. No impacts related to population growth would occur, and no new information have been presented that would require preparation of an EIR.

b) **Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?**

No Impact / No Changes to the Certified EIR. The project site is graded, vacant land. Project implementation would not require the demolition or displacement of housing. No impacts related to displacement of housing would occur, and no new information have been presented that would require preparation of an EIR.

5.14.3 Adopted Mitigation Measures Applicable to the Proposed Project

No mitigation measures were identified in the Certified EIR, and the Proposed Project does not require mitigation.

5.14.4 Level of Significance After Mitigation

The Proposed Project would result in no impact to population and housing, and impacts would not be greater than those identified in the Certified EIR.

5.15 PUBLIC SERVICES

5.15.1 Findings of the Certified EIR

The Certified EIR concluded that the Approved Project would increase demands on police, fire/emergency medical, school, library, and parks/recreation services and that the impacts to these services on project and cumulative levels would be less than significant with the adherence of the public services mitigation measures in the Certified EIR.

5.15.2 Impacts Associated with the Proposed Project

Would the project:

Environmental Issues	Change in Project Requiring EIR Revisions	Change in Circum-stances Requiring EIR Revisions	New Information Showing Potentially New or Increased Significant Effects	Less Than Significant Impact and No Changes to Certified EIR	No Impact and No Changes to Certified EIR
a) 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:					
Fire protection?				X	
Police protection?				X	
Schools?					X
Parks?					X
Other public facilities?					X

a) 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:

Similar to the Approved Project, the Proposed Project would require fire protection and law enforcement services. However, it will not trigger the need for school services; rather it would provide school services to K-8 students generated from the Approved Project's planning area, particularly the areas south of Pine Avenue. The Proposed Project includes its own library and indoor and outdoor recreational facilities.

Fire protection?

Less Than Significant Impact / No Changes to the Certified EIR. The Preserve planning area is served by Chino Valley Independent Fire District's (CVIFD) Station 2 at 5551 Butterfield Ranch Road and Station 63 at 7550 Kimball Avenue. Station 63 is closest to the project site. It opened in February 2006 and serves the Chino Airport and The Preserve planning area. Developers in the planning area will pay development impact fees—defined in Chino Municipal Code § 3.40.020(A)(3) as [t]he allocation of such cost among the residential, commercial, and industrial types of development—that would offset the cost to provide fire protection services to the planning area (Certified EIR Mitigation Measure PS-F-1). The Proposed Project includes the acquisition of the project site and construction and operation of the proposed school. The Proposed Project would include the installation of utility laterals, including water lines, from the project site to those existing and/or planned for development by the Approved Project. The Proposed Project also includes design features—a fire access road and fire hydrants—that would enhance fire protection. Because the Proposed Project would not induce population growth and its operations would be typical of a K-8 public school, the Proposed Project's impact on fire protection services would be less than significant and would not be greater than what was analyzed in the Certified EIR. No changes to the Certified EIR would be required.

Police protection?

Less Than Significant Impact / No Changes to the Certified EIR. Construction of the Proposed Project may slightly increase the demand for police services related to trespass, theft, and/or vandalism. The District would fence off active construction areas, and any increase in police security during construction would be temporary and would not be greater than for other developments in the project area. Project operations would be typical of a K-8 public school, and its demand for law enforcement services would be similar to other K-8 schools. Project impacts on police protection services would not be beyond those analyzed in the Certified EIR. Implementation of Certified EIR Mitigation Measure PS-P-1, which requires collection of development impact fees, per Chino Municipal Code § 3.40.020(A)(3), would offset the costs related to expanded police protection to the planning area, including its public facilities. Therefore, project impacts on police protection services would be less than significant. No changes to the Certified EIR would be required.

Schools?

No Impact / No Changes to the Certified EIR. School services are related to the size of the residential population, the geographic area served, and community characteristics. The Proposed Project would not increase the population in the attendance boundary or otherwise increase demand for school services. The Proposed Project would benefit residents of the Approved Project and the overall school service demands within the District. The Proposed Project would cause no impact to school services, and impacts would not be greater than what was analyzed in the Certified EIR. No changes to the Certified EIR would be required.

Parks?

No Impact / No Changes to the Certified EIR. The demand for park and recreational services is generally caused by population and/or employment growth. The Proposed Project would not trigger population growth or significantly increase employment. Additionally, the Proposed Project includes its own indoor and outdoor recreational facilities. Therefore, impacts to park services would not occur, and impacts would not be greater than those analyzed in the Certified EIR. No changes to the Certified EIR would be required.

Other public facilities?

No Impact / No Changes to the Certified EIR. The Proposed Project would not result in impacts associated with the provision of other public services (e.g., libraries, hospitals, childcare, teen or senior centers) that could trigger the need for new or altered facilities. Physical impacts to public services are usually associated with population in-migration and growth, which increase the demand for public services and facilities. The Proposed Project would not induce population growth or trigger the need for additional public services not already analyzed in the Certified EIR. Additionally, the Proposed Project would include a school library/media center, nurse station, and counseling facilities. No impacts to other public facilities would occur, and impacts would not be greater than those analyzed in the Certified EIR. No changes to the Certified EIR would be required.

5.15.3 Adopted Mitigation Measures Applicable to the Proposed Project

The following mitigation measures were identified in the Certified EIR. Applicability of each mitigation measure has been evaluated. The mitigation measures have been modified where appropriate to reflect the Proposed Project. The revisions are identified in ~~strikethrough~~ for deletion and underline for addition.

~~PS-F-1.~~ ~~**Fire Service Impact Fees.** Developer impact fees shall be paid to contribute to the cost of new fire facilities, apparatus, and equipment to offset the increase in fire services demand created by the project.~~

~~PS-F-2.~~ ~~**Fire Station.** The City of Chino shall coordinate with the Fire District to assure construction of a new fire station site to serve the proposed project. The fire station shall be constructed and ready for Fire District occupancy prior to the issuance of the 1,350th building permit for the proposed project. The station location may either be within the project site or at Chino Airport, subject to agreement by San Bernardino County Department of Airports. The station shall be adequately attenuated from noise effects of airport operations.~~

PS-F-3. **Fire Protection Requirements.** Prior to construction, the ~~developer~~ District and/or the Project Architect shall contact the Fire District for verification of current fire protection development requirements. All new construction shall comply with all applicable statutes, codes, ordinances, and/or Fire District standards.

PS-F-4. **Water Lines.** Water lines within the project site shall be designed to meet fire requirements.

PS-F-5. **Fire Hydrants.** Fire hydrants shall be designed and placement specified by the Fire District at the time water lines to the project area are built or as a condition of development project approval.

~~PS-F-6.~~ ~~**Wild Land Fire Protection Services.** Upon annexation of the plan area, the City will be responsible for payment of services to the State Department of Forestry & Fire Protection in conformance with rules and standards for wild land fire areas still receiving State protection.~~

~~PS-P-1.~~ ~~**Police Services Impact Fees.** Police impact fees shall be paid to cover capital costs associated with the creation of additional facilities and improvements to service The Preserve area. The City of Chino may allow credit toward impact fees for any police facilities constructed by the developer.~~

~~PS-S-1.~~ ~~**Planning for School Services.** Developers/builders within the plan area shall work with the CVUSD to plan school service for the proposed development.~~

~~PS-S-2.~~ ~~**School Fees.** Prior to issuance of a building permit, project developers shall pay statutory developer fees to the CVUSD, form a Communities Facilities District, or provide land and~~

~~improvements pursuant to the requirements established in SB 50. The amount of fees or special taxes to be paid or land and improvements to be provided will be determined based on the established state formula for determining construction costs.~~

~~PS-S-3.~~ ~~**Construction Activity Notification.** To reduce potential safety hazards during construction, the City shall require developer notification to Chino Valley Unified School District of pending construction activity adjacent or near operating schools. Evidence of notification shall be provided to the City prior to issuance of grading and building permits for projects within any Master Plan, Tentative Map or Site Plan inclusive of, or immediately adjacent to, an operating school site.~~

~~PS-L-1.~~ ~~**Library Facilities.** The proposed project should address the need for additional library facilities and library services, and provide space or funding for library construction. The construction of a joint use library shared by the County of San Bernardino and Chino Valley Unified School District may be an appropriate option.~~

~~PS-L-2.~~ ~~**Library Impact Fees.** Project developers should contribute impact fees either toward expansion of existing library facilities or construction of new facilities, if such fees or requirements are adopted for general application by the County.~~

5.15.4 Level of Significance After Mitigation

The Proposed Project's impacts to public services are less than significant and would not be greater than those identified in the Certified EIR.

5.16 RECREATION

5.16.1 Findings of the Certified EIR

The Approved Project allocates roughly 100 acres of designated park space in order to meet the City of Chino and Quimby Act requirements. The Certified EIR states that three of the park sites may be developed jointly with the planned school sites in order to maximize joint use opportunities and to provide for a variety of recreational and athletic program needs within The Preserve. The Certified EIR therefore concluded that impacts would be less than significant with the implementation of Certified EIR Mitigation Measures PS-PR-1 and PS-PR-2.

5.16.2 Impacts Associated with the Proposed Project

Environmental Issues	Change in Project Requiring EIR Revisions	Change in Circum-stances Requiring EIR Revisions	New Information Showing Potentially New or Increased Significant Effects	Less Than Significant Impact and No Changes to Certified EIR	No Impact and No Changes to Certified EIR
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 which might have an adverse physical effect on the environment?				X	

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?

Less Than Significant Impact / No Changes to the Certified EIR. The proposed school includes outdoor and indoor recreational amenities, including a multipurpose turf field, hardcourt spaces with basketball and handball courts, jungle gyms, and a multipurpose gymnasium building. The school's recreational facilities would support all its physical educational programming needs, and students would not be required to use off-campus recreation facilities. However, if the school or District plans to use the adjacent planned park's amenities, the District will coordinate with the City and comply with established park use agreements. Impacts would be less than significant.

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

Less Than Significant Impact / No Changes to the Certified EIR. The Proposed Project includes outdoor and indoor recreational amenities (listed in 5.16.2.a) that would be available for community use pursuant to the Civic Center Act (Education Code § 38130). The Proposed Project would not be required to construct more or expand existing offsite facilities. The environmental impacts associated with the Proposed Project's recreational facilities were analyzed in the Certified EIR and herein. As documented, the Proposed Project—inclusive of its recreational facilities—would not cause new or increased significant effects than determined in the Certified EIR. Impacts would be less than significant.

5.16.3 Adopted Mitigation Measures Applicable to the Proposed Project

The following mitigation measures were identified in the Certified EIR. Applicability of each mitigation measure has been evaluated. The mitigation measures have been modified where appropriate to reflect the Proposed Project. The revisions are identified in ~~strikethrough~~ for deletion and underline for addition.

~~PS-PR-1.~~ ~~**City Park Requirements.** As Per the City of Chino, every residential developer or person who develops land for residential purposes shall dedicate a portion of such land, pay a fee, or a combination of both at the option of the city for the purpose of providing park and recreational facilities at the time and according to City standards outlined in Chapter 18.04, "Land Dedication Requirements Generally."~~

~~PS-PR-2.~~ ~~**Prado Regional Park.** The City of Chino will coordinate with San Bernardino County to assure that traffic, access control and safety needs of Prado Regional Park are met, and that the impacts of implementation of the proposed project on Prado Regional Park facilities are minimized to the extent practical. A Traffic and Access Control plan may be a component of this collaboration. The City will also assure through subsequent development reviews, that project-related drainage does not adversely affect the park and Prado Lake.~~

5.16.4 Level of Significance After Mitigation

The Proposed Project's impacts to parks and recreational facilities are less than significant and would not be greater than those analyzed in the Certified EIR.

5.17 TRANSPORTATION

5.17.1 Findings of the Certified EIR

The Certified EIR identified the need for traffic signals and roadway improvements along various roadways, intersections, and freeway segments to ensure that future levels of service (LOS) would be maintained within City of Chino and San Bernardino Congestion Management Program (CMP) standards. The Certified EIR found that the Approved Project would pay for these improvements or provide in-lieu construction of road improvements within the Approved Project area, including the proportionate share of costs associated with impacts of other regional traffic, including freeway facilities. With implementation of the identified mitigation measures (i.e., proposed roadway and intersection improvements), cumulative traffic impacts would be reduced, but not to less than significant levels. The Findings adopted as a part of the Approved Project included a Statement of Overriding Considerations for this significant impact.

5.17.2 Impacts Associated with the Proposed Project

The analysis in this section is based in part on the following technical report:

- *Revised Focused Traffic Assessment for the Chino Valley Unified School District Preserve School at South of Pine Block 9, Chino, California,* Linscott, Law & Greenspan Engineers, April 27, 2021.

A complete copy of this study is included in Appendix G of this Addendum.

Would the project:

Environmental Issues	Change in Project Requiring EIR Revisions	Change in Circum-stances Requiring EIR Revisions	New Information Showing Potentially New or Increased Significant Effects	Less Than Significant Impact and No Changes to Certified EIR	No Impact and No Changes to Certified EIR
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?				X	
b) Conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)?				X	
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				X	
d) Result in inadequate emergency access?				X	

a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

Less Than Significant Impact / No Changes to the Certified EIR.

Roadway Circulation

Operation

Consistent with Certified EIR Mitigation Measure T-9, the District retained Linscott, Law & Greenspan Engineers (LLG) to prepare a focused traffic assessment for the Proposed Project. The traffic assessment evaluated the four proposed driveways (two on East Preserve Loop and two on Main Street) and the following four intersections.

- East Preserve Loop at Market Street
- East Preserve Loop at Academy Street
- Main Street at Market Street
- Main Street at Academy Street

Although the proposed school is anticipated to operate a daily maximum enrollment of 900 K-8 students, the traffic assessment assumed a worst-case scenario of 1,200 elementary school students. Cumulative traffic impact analysis—which includes anticipated traffic from nearby operations—was conducted for two scenarios: the opening school year of 2024, and an Approved Project buildout scenario of Year 2030/2040. Trip patterns were based on discussions with the City of Chino, existing development and roadways, permitted projected developments and their related roadway improvements, and buildout conditions of The Preserve planning area.

Table 7 shows the operating levels of service (LOS) at the study intersections for the two study years. As shown, the vehicle trips generated by the Proposed Project would not significantly impact the LOS at the four study intersections and four proposed driveways. According to City of Chino traffic impact standards, they are forecast to operate at acceptable service levels of LOS C or better.

Table 7 Peak Hour Intersection Capacity Analysis Summary

Key Intersection	Control Type	Time Period	Year 2024 Cumulative Plus Project Traffic Conditions Delay (s/v)	Year 2024 Cumulative Plus Project Traffic Conditions LOS	Year 2030/2040 Buildout Plus Project Traffic Conditions Delay (s/v)	Year 2030/2040 Buildout Plus Project Traffic Conditions LOS
Main Street at Market Street	All-Way Stop	AM	6.9	A	11.3	B
		PM	7.0	A	9.8	A
East Preserve Loop at Market Street	All-Way Stop	AM	11.2	B	12.6	B
		PM	8.8	A	11.4	B
East Preserve Loop at Academy Street	Two-Way Stop	AM	9.0	A	14.4	B
		PM	8.8	A	15.8	C
Main Street at Academy Street	Two-Way Stop	AM	--	--	11.2	B
		PM	--	--	10.5	B
Market Street at Project Driveway 1	One-Way Stop	AM	8.7	A	10.5	B
		PM	8.7	A	9.2	A
Market Street at Project Driveway 2	One-Way Stop	AM	8.9	A	10.7	B
		PM	8.7	A	9.2	A
East Preserve Loop at Project Driveway 3	One-Way Stop	AM	0.0	A	0.0	A
		PM	0.0	A	0.0	A
East Preserve Loop at Project Driveway 4	One-Way Stop	AM	9.9	A	10.2	B
		PM	9.5	A	10.6	B

s/v = seconds per vehicle (delay)

Peak-hour traffic signal warrant analysis was conducted. The analysis concluded that neither the study intersections nor proposed driveways require traffic signaling. Queuing evaluations conducted determined that the pocket and stacking lengths at the study intersections and project driveways would be adequate to accommodate the proposed school operations. Therefore, operational traffic impacts would be less than significant and not greater than in the Certified EIR.

Construction

Table 8, *Construction Trips,* shows the daily vehicle trips of a typical school construction schedule and the construction activities that would be required for the Proposed Project. The number of trips is conservative and accounts for workers and vendors throughout the construction workday, between 7 am and 7 pm, Monday through Friday.

Table 8 Construction Trips

Construction Phase	Daily Worker Trips	Daily Vendor Trips	Daily Haul Trips	Total Daily Construction Trips
Utility Trenching	15	5	0	20
Fine Grading	7	5	0	12
Building Construction	43	12	0	55
Architectural Coating	7	0	0	7
Asphalt Paving + Finishing/Landscaping	19	2	0	21
Finishing/Landscaping	9	1	0	10

Source: CalEEMod Version 2016.3.1.

As shown in Table 8, the highest number of trips would occur during the building construction phase, with a maximum of 55 daily trips. This number is less than the number of average daily trips (or even AM peak hour trips) that would be generated during operation of the Proposed Project. Since construction trips would be fewer than operational trips, construction traffic impacts would be less than the Proposed Project's and considered less than significant.

Alternative Modes of Transportation

The roadway infrastructure in the vicinity of the project site has not been fully developed, including for pedestrian and bicycle travel. Streets and sidewalks are not continuous, and no bicycle lanes have been marked. Adjacent to the site, the eastern half of East Preserve Loop is developed, including with a sidewalk; the western half of East Preserve Loop adjacent to the site contains one travel lane and no sidewalks; and Market Street and Academy Street are paper streets. The western half of East Preserve Loop and the segments of Market Street and Academy Street adjacent to the site will be developed, including with sidewalks, when construction of the Proposed Project and/or adjacent planned developments commence. The Preserve developer and City of Chino will construct the street segments adjacent to the project site, consistent with the Approved Project. Project implementation would include the development of the sidewalk segments adjoining the project site and would not impede The Preserve developer or City's efforts to install bicycle lanes, as identified in the Approved Project.

The Approved Project includes a potential one-way, continuous local transit loop that would provide stops to major features in The Preserve planning community and connection points with the regional transit system and bus service. The route, as shown in Certified EIR Exhibit 5.7-6, would traverse East Preserve Loop, and the nearest transit stop has been identified on East Preserve Loop, north of Market Street. Because the transit stop is not adjacent to the project site and because the Proposed Project includes an onsite school bus loading area in the northern parking lot, project development is not anticipated to conflict with the potential future operation of the local transit. The Proposed Project would not affect other regional transit systems and services because none currently operate within The Preserve planning area.

Therefore, the Proposed Project would not conflict with programs, plans, ordinances, and policies established by the City of Chino and San Bernardino County CMP. Project impacts on the circulation system and alternative modes of transportation would be less than significant and not greater than those identified in the Certified EIR.

b) Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?

Less Than Significant Impact / No Changes to the Certified EIR. CEQA Guidelines § 15064.3 was developed in response to Senate Bill 743, which eliminated auto delay, LOS, and similar measures of vehicular capacity or traffic congestion as a basis for determining significant impacts. The new criteria "shall promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses" (Public Resources Code § 21099(b)(1)). Vehicle miles traveled (VMT) is the new indicator of the travel levels on the roadway system by motor vehicles.

The proposed school would serve the Approved Project, which identified the construction of up to three schools, and the Proposed Project would be the second school constructed. The first was Cal Aero Preserve K-8 Academy at 15850 Main Street, approximately three-quarters of a mile north of the project site. Once open, students residing south of Pine Avenue would attend the proposed school, and those living north of Pine Avenue would attend Cal Aero. In the event the Proposed Project were not implemented, it is possible that students residing south of Pine Avenue attend Cal Aero. However, Cal Aero is operating near capacity. The next closest elementary and junior high schools are Butterfield Ranch Elementary School at 6350 Mystic Canyon, 3.25 miles southeast of the project site (as the crow flies), and Townsend Junior High at 15359 Ilex Drive, 6.25 miles northeast of the project (as the crow flies). If the Proposed Project were not implemented, students residing south of Pine Avenue in The Preserve planning area would be required to drive substantially farther and increase VMT.

Nevertheless, according to the City of Chino's VMT Impact Thresholds via Resolution No. 2020-0019—which is consistent with the criteria identified by the San Bernardino County Transportation Authority (SBCTA)—the Proposed Project is exempt from VMT analysis. The City's adopted thresholds include project-type screening for local-serving K-12 schools, which are presumed to have less than significant impacts. Therefore, the Proposed Project is consistent with CEQA Guidelines § 15064.3(b), and the Proposed Project would have less than significant impacts related to VMT.

c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Less Than Significant Impact / No Changes to the Certified EIR. Incompatible uses for schools typically include industries such as agricultural operations, where soil tilling and/or pesticide use creates air pollution; logistic distribution centers that have large tractors, semi-trailer trucks, and oversized equipment that may create a hazard to cars or pedestrians on local roadways; or hazardous industrial uses. Circulation design that would result in vehicular and/or pedestrian safety hazards would be sharp curves or dangerous intersections. These typically consist of new roads or driveways on busy roadways with left or right turns that force cross-traffic and create conflicts between cars and people.

The project site is not currently or planned to be surrounded by land uses that would be incompatible with school operations. The closest agricultural uses to the project site are farmland about one-quarter mile southwest of the project site and a dairy at the northwest corner of Pine Avenue at East Preserve Loop. The farm will likely cease operations after the fourth quarter of 2021—before the proposed school opens—to start construction of the planned residential uses. Any potentially oversized vehicles operated by the dairy would use Pine Avenue, away from the project site. Therefore, transportation hazards cause by nearby agricultural uses are less than significant.

Moreover, the project site is rectangular and does not present geometric design hazards. The school driveways in the northern and eastern parking lots have been adequately distanced from the intersections of East Preserve Loop/Market Avenue and East Preserve Loop/Academy Avenue to give motorists leaving the site enough time to make necessary lane changes for traveling through the downstream intersection or maneuvering into the intersections' left or right-turn lane. A site distance evaluation completed as a part of the traffic assessment recommends that the height of future landscaping and/or hardscapes along the perimeters of the parking lots on Market Street and East Preserve Loop to be less than 3.5 feet above the pavement. This height would ensure that a clear line of sight is given to motorists accessing the driveways, and the landscaping and/or hardscapes do not threaten vehicular or pedestrian safety. An internal circulation evaluation completed as a part of the traffic assessment also recommends that the width of the driveways be widened to accommodate the turning movements of long school buses, in the event they are used at the school. These recommendations have been included as project design features of the Proposed Project (see Section 3.2 and Figure 5).

The traffic assessment also evaluated safe routes to school. Based on an opening year of 2024, there would be adequate sidewalk facilities and crosswalks along the recommended safe routes to school paths in The Preserve. Prior to the opening of the proposed school, the District would coordinate with the City to ensure that adequate school signage is installed to notify motorist of the proposed school and of the maximum speed limit near the campus. Therefore, impacts related to onsite traffic hazards are less than significant, and the project's impacts on traffic hazards are not greater than those identified in the Certified EIR.

d) Result in inadequate emergency access?

Less Than Significant Impact / No Changes to the Certified EIR. As shown in Figure 5, the site plan includes a fire access lane behind the school buildings. Access would be provided from the parking lots, specifically the western driveway on Market Street and southern driveway on East Preserve Loop. An internal access circulation evaluation—included in the traffic assessment—determined that fire trucks, SU-30 delivery trucks, and passenger vehicles would be able to easily circulate the internal road network. However, a 40-foot school bus would not be able to readily maneuver through the driveways on Market Street. Accordingly, as a project design feature, all four driveways have been expanded to provide a minimum 30-foot width to accommodate the turning maneuvers of a long school bus. Therefore, the Proposed Project would not result in inadequate emergency access. Impacts on emergency access are less than significant and not greater than those identified in the Certified EIR.

5.17.3 Adopted Mitigation Measures Applicable to the Proposed Project

The following mitigation measures were identified in the Certified EIR. Applicability of each mitigation measure has been evaluated. The mitigation measures have been modified where appropriate to reflect the Proposed Project. The revisions are identified in ~~strikethrough~~ for deletion and underline for addition.

~~T-1. **Notification:** Since the project contributes significant traffic to a State Highway (I-15 Freeway, SR-71 Freeway, SR-60 Freeway, and SR-91 Freeway), and it also contributes significant traffic to roadway segments serving CMP intersections within the jurisdictions of the City of Chino Hills, City of Ontario, County of San Bernardino, City of Norco, City of Corona, and the County of Riverside, the City of Chino shall notify the Congestion Management Agency (SANBAG), the California Department of Transportation (Caltrans), the City of Chino Hills, City of Ontario, County of San Bernardino, City of Norco, City of Corona, and the County of Riverside in accordance with CMP requirements. Each of these agencies must be provided with a copy of the CMP traffic study, once the document is accepted by the City of Chino.~~

T-2. **Internal Roadway Improvements.** The proposed project shall construct or otherwise provide for all internal roadway improvements. The provision of such improvements shall be phased to address the incremental impacts of individual development projects.

~~T-3. **Regional/Subregional Project Participation.** The City of Chino shall work cooperatively through SCAG and SANBAG to develop regional/subregional projects and identify regional transportation funding needed to minimize future freeway deficiencies. The City will actively participate in other future regional and/or subregional efforts to reduce freeway congestion.~~

~~T-4. **Regional/Subregional Transportation Planning.** The City of Chino shall participate in planning efforts to develop subregional and/or regional transportation facilities based on equitable cost sharing programs among cities and counties.~~

~~T-5. **Traffic Operations and System Management.** The City of Chino shall provide traffic operations and traffic systems management (TSM) improvements, including signal system coordination, automated traffic control, Smart Corridors, intelligent transportation systems, and other measures.~~

~~T-6. **Project Review for Trip Reduction and Travel Demand Management.** Individual development projects shall be reviewed by the City for integration of trip reduction measures, travel demand management (TDM) strategies and alternative transportation modes, consistent with the Specific Plan.~~

~~T-7. **Transit Feasibility Study.** In the initial phases of development, the City of Chino shall require that a Transit Feasibility Study be prepared of the proposed project transit system. The feasibility study should address the timing of transit development vis-a-vis development~~

~~phasing, and the interface with future regional transit works. To respond to potential issues related to the development of such a system, the following actions must be undertaken:~~

- ~~Identify the various funding mechanisms associated with the construction and operation of the system.~~
- ~~Require each proposed project to provide adequate right of way for such a system and construct the required infrastructure.~~
- ~~Establish design criteria and an evaluation process for determining transit stop locations that ensure pedestrian access prior to tentative map approval.~~
- ~~Operational issues, such as the future management of the system, may be deferred until the appropriate time, based upon discussions with current regional transit providers.~~

~~T-8.~~ ~~**Transit Service Extensions.** The City of Chino shall contact appropriate transit agencies to encourage an expansion of transit services up to and within the project area.~~

T-9. **Project Traffic Studies.** Traffic studies shall be required as deemed necessary by the City Engineer. Each study will identify the timing, and extent of required improvements to adequately evaluate future traffic impacts of individual projects needed to mitigate the impacts of such development.

5.17.4 Level of Significance After Mitigation

Implementation of Mitigation Measures T-2 and T-9 would reduce impacts to less than significant and would not be greater than those found in the Certified EIR. The traffic assessment was submitted to the City Engineer who has reviewed and approved it. The Proposed Project will not require additional mitigation substantially greater than those of the Certified EIR.

5.18 TRIBAL CULTURAL RESOURCES

5.18.1 Findings of the Certified EIR

Tribal Cultural Resources were not analyzed in the Certified EIR. Assembly Bill 52 (AB 52) added Public Resources Code §§ 21073 et seq., known as the Native American Historic Resource Protection Act, which incorporates tribal consultation and analysis of impacts to tribal cultural resources into the CEQA process. It requires tribal cultural resources to be analyzed like any other CEQA topic and established a consultation process for lead agencies and California tribes. Projects that require a Notice of Preparation of an EIR or Notice of Intent to adopt a Negative Declaration or Mitigated Negative Declaration on or after July 1, 2015, are subject to AB 52. Since this CEQA document is an addendum, AB 52 does not apply to the Proposed Project.

5.18.2 Impacts Associated with the Proposed Project

Environmental Issues	Change in Project Requiring EIR Revisions	Change in Circum-stances Requiring EIR Revisions	New Information Showing Potentially New or Increased Significant Effects	Less Than Significant Impact and No Changes to Certified EIR	No Impact and No Changes to Certified EIR
a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:					
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or				X	
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code § 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.				X	

a) **Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:**

  i) **Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code § 5020.1(k), or**

Less Than Significant Impact / No Changes to the Certified EIR. The project site is not listed in the California Register of Historical Resources or the City of Chino Register of Historical Resources. Additionally, the Proposed Project is not subject to the AB 52 process, which allows tribes to submit a written request to a lead agency to be notified of projects within their traditionally and culturally affiliated area. Nevertheless, as discussed in Section 5.5.2(b), because there is potential for discovery of subsurface resources on the site and the District will implement Certified EIR Mitigation Measure CR-2—i.e., archaeological monitoring—potential impacts to subsurface resources, including any tribal cultural resources would be less than significant. In the unlikely event that human remains are uncovered, excavation and earth-disturbing activities shall halt until the San Bernardino County Coroner determines appropriate action. If the coroner has reason to believe that the remains are those of a Native American, he or she shall contact the Native American Heritage Commission by telephone within 24 hours. Impacts would be less than significant and are not greater than that assumed in the Certified EIR.

  ii) **A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code § 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.**

Less Than Significant Impact / No Changes to the Certified EIR. PRC § 5024.1(c) includes criteria to be used for listing a resource in the California Register. The project site is rough graded and contains no structural improvements that can be considered for listing. In accordance with Certified EIR Mitigation Measures CR-2, the District will retain a qualified archaeologist during earth-moving construction activities. In the event unique archaeological resources are identified, including tribal cultural resources, the archaeologist will take appropriate actions to comply with state law, including applying the criteria set forth in PRC § 5024.1(c). Therefore, potential impacts related to undiscovered tribal cultural resources would be less than significant.

5.18.3 Adopted Mitigation Measures Applicable to the Proposed Project

As the Certified EIR was not required to study Tribal Cultural Resources, no mitigation measures were identified or were adopted to mitigate potentially significant impacts to tribal cultural resources. Notwithstanding, the Proposed Project will implement Certified EIR Mitigation Measure CR-2, which requires archaeological monitoring. In the event the monitoring archaeologist identifies any prehistoric or historic tribal cultural resources, the archaeologist will report such findings to the District and/or City. If the resources are found to be significant, the archaeologist shall determine, in consultation with the District and/or City, appropriate actions for further exploration and/or salvage recovery.

5.18.4 Level of Significance After Mitigation

With the implementation of Certified DEIR Mitigation Measures CR-2, potential impacts to tribal cultural resources would be less than significant, and Proposed Project impacts are not greater than cultural impacts disclosed in the Certified EIR.

5.19 UTILITIES AND SERVICE SYSTEMS

5.19.1 Findings of the Certified EIR

Water

Based on land uses proposed in the Approved Project, the Certified EIR estimated that buildout of the Approved Project—inclusive of the proposed school—would generate a need for 4,267.5 gallons per minute (gpm) or 6.2 million gallons per day (mgd) of potable water and 2,776.5 gpm (4.0 mgd) of recycled water. The Certified EIR concluded that there would be sufficient water supplies for the next 35 years for the Approved Project through the consumption of potable, desalted, local groundwater, and recycled water sources.

Wastewater

The City of Chino Sewer Master Plan outlines planned sewer infrastructure additions based on flow rates and growth projections. The Certified EIR estimated that the buildout of the Approved Project, inclusive of the Proposed Project, would increase wastewater generation by 4,816,9290 gallons per day and determined that the Inland Empire Utility Agency (IEUA), which provides wastewater services for the Approved Project, would be able to provide wastewater infrastructure, including wastewater lines and treatment facilities to accommodate the demand. The Certified EIR concluded that with implementation of planned improvements; Mitigation Measures U-WW-1 and U-WW-2, which require City assurance that required sewer improvements are implemented and developer payment of fees for construction; and increased reliance on the beneficial reuse of water resources, there would be sufficient capacity.

Solid Waste

The El Sobrante Landfill can accommodate waste generated by the Approved Project. The Certified EIR states that there are also other landfills in the region that would be able to accommodate waste from the Approved Project. With recycling and solid waste reduction procedures, impacts related to solid waste was determined to be less than significant.

Electricity

The Certified EIR concluded that the (then) current electrical energy shortfall in California would create uncertainty in meeting future growth demand in electrical supplies. Therefore, the Approved Project may contribute to significant and unavoidable long-term impacts on electrical energy supplies.

Natural Gas

The Certified EIR indicates that limited gas service is available to The Preserve planning area. The Southern California Gas Company (SCGC) is under the regulation of the California Public Utilities Commission (CPUC) and can also be affected by the actions of federal regulatory agencies. If any of these agencies were to take any action affecting the gas supply or the conditions under which service is available, gas service would be provided in accordance with revised conditions.

5.19.2 Impacts Associated with the Proposed Project

Would the project:

	Environmental Issues	Change in Project Requiring EIR Revisions	Change in Circum-stances Requiring EIR Revisions	New Information Showing Potentially New or Increased Significant Effects	Less Than Significant Impact and No Changes to Certified EIR	No Impact and No Changes to Certified EIR
a)	Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?				X	
b)	Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?				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's projected demand in addition to the provider's existing commitments?				X	
d)	Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?				X	
e)	Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?				X	

a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

Less Than Significant Impact / No Changes to the Certified EIR. The areas east of the project site have been developed with residential uses. Roadways and utilities—including water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities—have been constructed and installed to accommodate the planned uses south of Pine Avenue, including the Proposed Project. Currently, a 12-inch-diameter water line; 8-inch recycled water line; 12-inch sewer line; 66-inch storm drain; and electrical, natural gas, and telecommunications facilities exist under East Preserve Loop. Backbone infrastructure has been installed and appropriately sized to accommodate the Approved Project, including the proposed school, and the Proposed Project would not be required to construct new or expand existing utility infrastructure. Impacts to utility facilities would be less than significant and not greater than those identified in the Certified EIR.

b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

Less Than Significant Impact / No Changes to the Certified EIR. The Proposed Project would result in water consumption consistent with the land use plan analyzed in the Certified EIR. The Project would connect to the available potable and recycled water lines under East Preserve Loop. The proposed school would include water-efficient plumbing fixtures for toilets and sinks and would include drought-tolerant landscape to conserve water. According to the Inland Empire Utilities Agency (IEUA), which provides potable and recycled water to The Preserve planning area, there is sufficient water supply to accommodate the Approved Project, including the proposed school, until 2035. Project impacts would be less than significant and would not be greater than those identified in the Certified EIR.

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's projected demand in addition to the provider's existing commitments?

Less Than Significant Impact / No Changes to the Certified EIR. The Approved Project would be served by IEUA's sewer system. According to the Certified EIR, sewer system improvements that would be implemented as a part of the Approved Project in conjunction with IEUA and the City of Chino would provide adequate wastewater treatment capacity for the entire Approved Project, including the proposed school. Therefore, impacts to wastewater treatment facilities would be less than significant and not greater than those of the Certified EIR.

d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

Less Than Significant Impact / No Changes to the Certified EIR. The proposed school's waste was accounted for in the impact analysis of the Certified EIR. Solid waste would be brought to the El Sobrante Landfill, which is operated by USA Waste Services of California and is the closest landfill to The Preserve planning area. It currently accepts a maximum of 16,054 tons/day with a remaining capacity of 143,977,170 cubic yards as of 2018. Closure of the landfill is anticipated by January 2051 (CalRecycle, 2019).

Because the project site is vacant, construction waste would be minimal and disposed of at local landfills. Section 5.408 (Construction Waste Reduction, Disposal, and Recycling) of the CALGreen Building Standards Code (24 CCR, Part 11, § 5.408.1.1) requires that at least 65 percent of the nonhazardous construction and demolition waste from nonresidential construction operations be recycled and/or salvaged for reuse. Construction of the proposed school would adhere to these established standards. Therefore, construction of the Proposed Project would not adversely impact landfills. Impacts would be less than significant and would not be greater than those identified in the Certified EIR.

e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

Less Than Significant Impact / No Changes to the Certified EIR. The District currently complies with federal, state, and local statutes and regulations related to solid waste and would continue this practice for the Proposed Project. The proposed school would include storage areas for recyclable materials per AB 341, including areas for storing organic matter per AB 1826. At least 65 percent of construction debris would be recycled and/or salvaged for reuse per CALGreen § 5.408.1. The District would comply with regulations governing solid waste disposal and diversion, and impacts would be less than significant and not greater than those identified in the Certified EIR.

5.19.3 Adopted Mitigation Measures Applicable to the Proposed Project

The following mitigation measures were identified in the Certified EIR. Applicability of each mitigation measure has been evaluated. The mitigation measures have been modified where appropriate to reflect the Proposed Project. The revisions are identified in ~~strikethrough~~ for deletion and underline for addition.

~~U-W-1.~~ ~~**Water Supply Availability.** Consistent with SB 221, subsequent development projects within the plan area shall be reviewed by the City to confirm the availability of sufficient water supplies to meet project water needs.~~

~~U-W-2.~~ ~~**Urban Water Management Plan.** Consistent with requirements of AB 2838, the City shall periodically review and update its urban water management plan to ensure that adequate water supplies and facilities are available to meet future growth.~~

~~U-W-3.~~ ~~**Groundwater Replenishment.** Subsequent development projects should be designed to incorporate features that encourage and promote groundwater replenishment.~~

~~U-W-4.~~ ~~**Onsite Retention.** Retention of precipitation and runoff on-site should be encouraged in development designs where appropriate.~~

~~U-W-5.~~ ~~**Water Conservation Techniques.** The City shall continue to support efforts to develop the water supply and to encourage water conservation. Water conservation techniques appropriate for new and existing development include:~~

- ~~Installing flow restrictors in showers.~~
- ~~Repairing leaky water fixtures.~~
- ~~Promoting drought resistant low maintenance vegetation.~~

~~U-W-6.~~ ~~**Wastewater Re-use.** The City shall coordinate its efforts with the IEUA to expand the re-use of wastewater for such uses as the irrigation of parkways, golf courses, landscaped areas, and parks, and, if feasible, for industrial processes.~~

~~U-W-7.~~ ~~**Water Conservation Programs.** The City shall engage in water conservation programs and activities, including but not limited to, participation in the following water conservation practices:~~

- ~~Water Survey Programs for Single-Family Residential and Multi-Family Residential Customers~~
- ~~Residential Plumbing Retrofits~~
- ~~System Water Audits, Leak Detectors and Repair~~
- ~~Large Landscape Conservation Programs and Incentives~~
- ~~High Efficiency Washing Machine Programs~~
- ~~Public Information and School Education Programs~~
- ~~Conservation Programs for Commercial, Industrial and Institutional Accounts~~
- ~~Wholesale Agency Technical Assistance Program~~
- ~~Conservation Pricing~~

~~U-W-8.~~ ~~**On-site Water Recharge.** Where erosion or water runoff is not a problem, encourage use of on-site water recharge, such as dry wells.~~

~~U-WW-1.~~ ~~**Compliance with Sewer Master Plan.** The City shall assure that required backbone sewer lines, or an equivalent system recommended by the City Engineer are implemented pursuant to the Sewer Master Plan.~~

~~U-WW-2.~~ ~~**Sewer Impact Fees.** Developers shall pay required sewage facilities development fees and system collection fees to cover City costs to construct master planned sewer mains.~~

~~U-E-1.~~ ~~**Energy Efficient Lighting.** Energy efficient lighting and natural lighting should be encouraged and utilized where practical.~~

~~U-SW-1.~~ ~~**Waste Container Storage Space.** Future developments should be reviewed by the City for the provision of outside building space to accommodate the storage of large waste containers (e.g. 3 containers of 96-gallons). This system reduces waste production by encouraging recycling of material.~~

5.19.4 Level of Significance After Mitigation

The Proposed Project's impacts on utilities are less than significant and would not be greater than those identified in the Certified EIR.

5.20 WILDFIRE

5.20.1 Findings of the Certified EIR

Impacts related to wildfire were not analyzed in the Certified EIR because the requirement to analyze wildfire in environmental documents did not become effective until January 1, 2019, after the EIR was certified. Therefore, the analysis of wildfire impacts is new in this Addendum.

5.20.2 Impacts Associated with the Proposed Project

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:

Environmental Issues	Change in Project Requiring EIR Revisions	Change in Circum-stances Requiring EIR Revisions	New Information Showing Potentially New or Increased Significant Effects	Less Than Significant Impact and No Changes to Certified EIR	No Impact and No Changes to Certified EIR
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?				X	
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?					X
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?				X	
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?				X	

a) Substantially impair an adopted emergency response plan or emergency evacuation plan?

Less Than Significant Impact / No Changes to the Certified EIR. The Proposed Project includes an internal fire access lane that would be accessed from both parking lots. Currently, the site is surrounded by undeveloped properties to the north, west, and south, and residential development to the east. At buildout, the site would be surrounded by a community park on the west, community commercial on the northeast, and residential uses elsewhere. Project implementation would not impair emergency access on the surrounding roadways or affect adopted emergency evacuation plans. Moreover, in the event of a catastrophic situation, it is possible the campus is used as emergency shelter for the community. Therefore, impacts to emergency response and evacuation are less than significant.

b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

No Impact / No Changes to the Certified EIR. According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if it were in or near a State Responsibility Area (SRA)[4] or lands classified as very high fire hazard severity zones (VHFHSZ) by the California Department of Forestry and Fire Protection (Cal FIRE). According to Cal FIRE, the project site is within an area classified as Non-VHFHSZ. Figure SAF-4 (Wildland Interface Threat to Community) of the City of Chino General Plan also shows the project site in an area designated with little to no wildfire threat. There is currently no wildland at or surrounding the project site, and the Proposed Project would not place people or buildings at risk from wildfires. No impact related to wildfire risks would occur.

c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

Less Than Significant Impact / No Changes to the Certified EIR. The Proposed Project would require connection to utilities such as electricity, water, sewer, natural gas, and telecommunications. However, the connections and installations would not directly increase fire risk, and impacts would be less than significant.

d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

Less Than Significant Impact / No Changes to the Certified EIR. The project site is relatively flat. The risk of a landslide hazard is low, and the site is outside of a 100-year flood zone. Therefore, it is unlikely that the site would be susceptible to downslope or downstream flooding or landslides as a result of post-fire slope instability. Moreover, construction activities related to the Proposed Project would be subject to compliance with the CBC and would include best management practices (BMPs). Operationally, the project site's drainage would be similar to existing conditions and biofiltration basins would be included onsite. Therefore, with the implementation of BMPs and drainage improvements, impacts would be less than significant.

5.20.3 Adopted Mitigation Measures Applicable to the Proposed Project

The wildfire section is new in this Addendum; therefore, no mitigation measures were identified in the Certified EIR. The Proposed Project would not require any mitigation measures.

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[4] An SRA is an area where the state is financially responsible for the prevention and suppression of wildfires. It does not include lands within city boundaries or in federal ownership.

5.20.4 Level of Significance After Mitigation

Project impacts would be less than significant.

5.21 MANDATORY FINDINGS OF SIGNIFICANCE

Environmental Issues	Change in Project Requiring EIR Revisions	Change in Circum-stances Requiring EIR Revisions	New Information Showing Potentially New or Increased Significant Effects	Less Than Significant Impact and No Changes to Certified EIR	No Impact and No Changes to Certified EIR
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, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?				X	
b) Does the project have the potential to achieve short-term environmental goals to the disadvantage of long-term environmental goals?				X	
c) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)				X	
d) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?				X	

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, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

Less Than Significant Impact / No Changes to the Certified EIR. The project site is vacant and rough graded by the current owner in accordance with to City-approved plans. No biological resources are onsite. However, consistent with the Approved Project's mitigation measures, the District will implement Certified

EIR Mitigation Measures B-3.3, which requires preconstruction surveying for burrowing owls (and nesting birds) in accordance with CDFW's Staff Report on Burrowing Owls (CDFW 2012). The District will also implement Certified EIR Mitigation Measure CR-2, which requires the District to retain an archaeologist during earthmoving activities. Implementation of the mitigation measures will ensure that impacts are less than significant. Therefore, the preparation of a subsequent EIR is not required.

b) Does the project have the potential to achieve short-term environmental goals to the disadvantage of long-term environmental goals?

Less Than Significant Impact / No Changes to the Certified EIR. The purpose of the Proposed Project is to provide the second of three schools identified for the Approved Project. The Proposed Project would serve students generated from areas south of Pine Avenue in the Approved Project and would relieve overcrowding conditions at Cal Aero Preserve Academy, the first school that has been constructed for the Approved Project. The Proposed Project will implement applicable development-specific mitigation provided in the Certified EIR and would not achieve short-term environmental goals to the disadvantage of long-term environmental goals. With the implementation of mitigation measures identified in the Certified EIR (included in the Mitigation Monitoring and Reporting Program), the Proposed Project's impacts would be less than significant, and not greater than those identified in the Certified EIR. The preparation of a subsequent EIR is not required.

c) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)

Less Than Significant Impact / No Changes to the Certified EIR. The Proposed Project would continue to contribute to the acceleration of the conversion of prime farmland to urban uses, and cumulative impacts would remain significant as that disclosed in the Certified EIR. However, the Proposed Project would not contribute to new significant cumulatively considerable impacts. The Proposed Project would require implementation of the below mitigation measures adopted for the Approved Project. With their implementation as well as compliance with existing regulations, the Proposed Project would not contribute to a cumulatively considerable impacts greater than those identified in the Certified EIR. Therefore, the preparation of a subsequent EIR is not required.

d) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Less Than Significant Impact / No Changes to the Certified EIR. With the implementation of mitigation previously adopted as a part of the Approved Project, the Proposed Project would not increase environmental effects that would directly or indirectly affect human beings beyond what was analyzed in the Certified EIR. Direct and indirect impacts on human beings would be less than significant, and the preparation of a subsequent EIR is not required.

6. List of Preparers

PLACEWORKS

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Izzy Garcia, Project Planner

Danielle Clendening, Assistant Planner

CLIENT

Gregory Stachura, Assistant Superintendent, Facilities, Planning and Construction

6. List of Preparers

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Appendix A Air Quality and Greenhouse Gas Emissions Modeling

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Air Quality and Greenhouse Gas Appendix

Construction and Operational Model Input Assumptions

CalEEMod Inputs - The Preserve K-8

Name: The Preserve K-8 Development
Project Number: CVUS-07
Project Location: Chino Valley
County: San Bernardino
Source Receptor Area (SRA): 33-Southwest San Bernardino Valley
Climate Zone: 10
Land Use Setting: Urban
Operational Year: 2024
Utility Company: Southern California Edison
Air Basin: South Coast Air Basin
Air District: South Coast Air Quality Management District (SCAQMD)

Project Site Acreage 12
Disturbed Site Acreage 12.00 Includes roadway improvements

Project Components	SQFT	Acres
School Buildings	82,000	1.882
TOTAL BUILDING	82,000	1.882
Parking Lot	74,929	1.72
Total Other Asphalt Surfaces	81,868	1.88
Total Hardscape	100,288	2.30
Total Landscape	183,768	4.22
Subtotal		12.00

CalEEMod Land Use Inputs

Land Use Type	Land Use Subtype	Unit Amount	Size Metric	Lot Acreage	Land Use Square Feet
Educational	Elementary	82	1000 sqft	1.88	82,000
Parking	Parking Lot	74.9	1000 sqft	1.72	74,929
Parking	Other Asphalt Surfaces	182.156	1000 sqft	4.18	182,156
Parking	Other Non-asphalt Surfaces	183.768	1000 sqft	4.22	183,768
				12.00	

Note: Other Asphalt surfaces combined Total Other Asphalt Surfaces and Total Hardscape SQFT's

Soil Haul [1]

Construction Activities	Haul Volume (CY)	Haul Truck Capacity (cy) (CaleeMod Default)	Haul Distance (CalEEMod Default)	No. of total one-way export haul (trip ends)	Total Days	No. of total one-way haul (trip ends/day)
Grading Export	1700	16	20	213	44	5

[1] Total Cut = 118,121, Total Fill = 116,420. Srouce: Grading Plan · 1700 CY export based on grading plan provided by WLC Architects

Architectural Coating

Percentage of Proposed Buildings' Interior Painted: 100%
Percentage of Proposed Buildings' Exterior Painted: 100%

Rule 1113

Interior Paint VOC content: 50 grams per liter
Exterior Paing VOC content: 50 grams per liter

School Buildings	Land Use Square Feet	CalEEMod Factor[2]	Total Paintable Surface Area	Paintable Interior Area[1]	Paintable Exterior Area[1]
School Buildings	82,000	2	164,000	123,000	41,000
Subtotal			**164,000**	**123,000**	**41,000**
Parking Lot	257,085	6%	15,425	-	15,425
Subtotal			**15,425**		**15,425**

[1] CalEEMod methodology calculates the paintable interior and exterior areas by multiplying the total paintable surface area by 75 and 25 percent, respectively.

[2] The program assumes the total surface for painting equals 2.7 times the floor square footage for residential and 2 times that for nonresidential square footage defined by the user. Architectural coatings for the parking lot is based on CalEEMod methodology applied to a surface parking lot (i.e., striping), in which 6% of surface area is painted.

[3] 100% of the interior and exterior of buildings to be modernized will be painted

Construction Mitigation

SCAQMD Rule 403

Replace Ground Cover	PM10:	5	% Reduction
Replace Ground Cover	PM2.5:	5	% Reduction
Water Exposed Area	Frequency:	2	per day
	PM10:	55	% Reduction
	PM25:	55	% Reduction
Unpaved Roads	Vehicle Speed:	15	mph

SCAQMD Rule 1186

	Clean Paved Road	9	% PM Reduction

Construction Activities and Schedule Assumptions: The Preserve K-8

* CalEEMod defaults based on info provided by applicant, normalized to fit duration provided by applicant

CalEEMod Defaults

One Phase Only

		Construction Schedule		
Construction Activities	**Phase Type**	**Start Date**	**End Date**	**CalEEMod Duration (Workday)**
Demolition	Demolition	6/1/2022	6/28/2022	20
Site Preperation	Site Preparation	6/29/2022	7/12/2022	10
Grading	Grading	7/13/2022	8/23/2022	30
Building Construction	Building Construction	8/24/2022	10/17/2023	300
Paving	Paving	10/18/2023	11/14/2023	20
Architectural Coating	Architectural Coating	11/15/2023	12/12/2023	20

Normalized Schedule

		Construction Schedule		
Construction Activities	**Phase Type**	**Start Date**	**End Date**	**CalEEMod Duration (Workday)**
Site Preperation/Soil Haul	Site Preparation	6/1/2022	6/24/2022	18
Grading	Grading	6/27/2022	8/25/2022	44
Soil Haul	Grading	6/27/2022	8/25/2022	44
Building Construction	Building Construction	8/26/2022	5/31/2024	461
Paving	Paving	4/1/2024	5/13/2024	31
Architectural Coating	Architectural Coating	4/18/2024	6/1/2024	32

Changes to the CalEEMod Defaults - Fleet Mix 2024

Trips 378

Default	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH	
FleetMix (Model Default)	0.558745	0.035303	0.1818	0.111169	0.014289	0.004794	0.018611	0.065078	0.001365	0.001491	0.005725	0.000799	0.00083	100%
Trips	211	13	69	42	5	2	7	25	1	1	2	0	0	378
Percent	78%			11%	11%									100%
without buses/MH	0.558745	0.035303	0.181800	0.111169	0.014289	0.004794	0.018611	0.065078	0	0	0.005725	0	0	100%
Percent	78%			11%	10%									100%
Adjusted without buses/MH	0.558745	0.035303	0.181800	0.111169	0.014913	0.005003	0.019423	0.067918	0.000000	0.000000	0.005975	0.000000	0.000000	
Percent adjusted	78%			11%	11%									100%
Assumed Mix	97.0%			2.00%	1.00%									100%
adjusted with Assumed	**0.693229**	**0.043800**	**0.225557**	**0.020000**	**0.001390**	**0.000466**	**0.001811**	**0.006332**	**0.000000**	**0.000000**	**0.007413**	**0.000000**	**0.000000**	**100%**
Percent Check:	97.00%			2.00%	1%									
Trips	262	17	85	8	1	0	1	2	0	0	3	0	0	378
	367			*8*	*4*									

Fleet mix for the project is modified to reflect a higher proportion of passenger vehicles that the regional VMT. Assumes a mix of approximately 97% passenger vehicles, 2% medium duty trucks, and 1% heavy duty trucks and buses.

CalEEMod Inputs - The Preserve K-8

Name:	The Preserve K-8 Development
Project Number:	CVUS-07
Project Location:	Chino Valley
County:	San Bernardino
Source Receptor Area (SRA):	33-Southwest San Bernardino Valley
Climate Zone:	10
Land Use Setting:	Urban
Operational Year:	2024
Utility Company:	Southern California Edison
Air Basin:	South Coast Air Basin
Air District:	South Coast Air Quality Management District (SCAQMD)

CalEEMod Land Use Inputs

Land Use Type	Land Use Subtype	Unit Amount	Size Metric	Lot Acreage	Land Use Square Feet	Portables SQFT*
Educational	Elementary	91.60	1000 sqft	1.88	91,600	9600
Parking	Parking Lot	74.93	1000 sqft	1.72	74,929	
Parking	Other Asphalt Surfaces	182.16	1000 sqft	4.18	182,156	
Parking	Other Non-asphalt Surfaces	183.77	1000 sqft	4.22	183,768	
				12.00		

**Portables Assumption: 960 SF/ portable building x 10 portables = 9600 SF*

Land Use Type	Approved Project (1,000 Students) Average Daily Trips	Proposed Project (1,200 Students) Average Daily Trips	Net Increase in Average Daily Trips	CalEEMod Weekday Trip Rate
Educational	1,890	2,268	378	4.13

Source: LLG Engineers. January 27,2021. CVUSD Preserve School Foucused Traffic Assessment.

Trip Length (Miles) - CalEEMod Default		
Commercial-to-Commercial	Commercial-to-Work	Commercial-to-NonWork
8.4	16.6	6.9

Trip Length (Miles) - Adjusted		
Staff Trips (CC)	Student Trips (CW)	Vendor Trips (CNW)
8.4	16.6	6.9

*Adjusted trip CW trip length based on school enrollment boundary distance.

	Trip Percentages - CalEEMod Default	
Commercial-to-Commercial	30%	Reflects Faculty/Staff Trips
Commercial-to-Work	65%	Reflects Student Drop-off/Pick-up Trips
Commercial-to-NonWork	5%	Reflects Vendor Trips

Trip Types - CalEEMod Default		
Primary	Diverted	Passby
63	25	*12*

~~Trip Types - Adjusted~~		
~~Primary~~	~~Diverted~~	~~Passby~~
~~100~~	~~0~~	~~0~~

Water Use

Land Use	Indoor[1]	Outdoor[2]	Total (gal/yr)
Elementary School	1,717,746	2,687,431	4,405,176

[1] Based on The Preserve Certified EIR wastewater generation factor of 2,500 gallons/day/acre

[2] California Department of Water Resources (DWR). June 13, 2017. Water Budget Workbook for New and Rehabilitated Non-Residential Landscapes, Beta Version 1.30.

**Assumes 100% aerobic treatment.*

Solid Waste CalEEMod Defaults

Land Use	Total Solid Waste (tons/yr)
Elementary School	119.08

Architectural Coating *see Construction Assumptions*

Electricity (Buildings)

Additional Electricity Reductions[2]	**10.7%**	more efficient than 2019 Title 24 electricity rates
Additional Natural Gas Reductions[2]	**1%**	more efficient than 2019 Title 24 natural gas rates

Sources:

[1] California Energy Commission (CEC). 2018. 2019 Building Energy and Efficiency Standards Frequently Asked Questions. Accessed on April 3, 2019. http://www.energy.ca.gov/title24/2019standards/documents/2018_Title_24_2019_Building_Standards_FAQ.pdf

[2] NORESCO. 2020. 2019 Update to the California Energy Efficiency Standards for Residential and Non-Residential Buildings

Default CalEEMod Energy Use

Land Use Subtype	Title-24 Electricity Energy Intensity (kWhr/size/year)*	Nontitle-24 Electricity Energy Intensity (kWhr/size/year)	Lighting Energy Intensity (KWhr/size/year)	Title-24 Natural Gas Energy Intensity (KBTU/size/year)*	Nontitle-24 Natural Gas Energy Intensity (KBTU/size/year)
Elementary School	**2.78**	1.49	3.03	**6.97**	1.79
Other Asphalt Surfaces	**0.00**	0.00	0.00	**0.00**	0.00
Other Non-Asphalt Surfaces	**0.00**	0.00	0.35	**0.00**	0.00
Parking Lot	**0.00**	0.00	0.35	**0.00**	0.00

Adjusted CalEEMod Energy Use

Land Use Subtype	Title-24 Electricity Energy Intensity (kWhr/size/year)*	Nontitle-24 Electricity Energy Intensity (kWhr/size/year)	Lighting Energy Intensity (KWhr/size/year)	Title-24 Natural Gas Energy Intensity (KBTU/size/year)*	Nontitle-24 Natural Gas Energy Intensity (KBTU/size/year)
Elementary School	**2.48**	1.49	3.03	**6.90**	1.79
Other Asphalt Surfaces	**0.00**	0.00	0.00	**0.00**	0.00
Other Non-Asphalt Surfaces	**0.00**	0.00	0.35	**0.00**	0.00
Parking Lot	**0.00**	0.00	0.35	**0.00**	0.00

**Based on methodology above, only Title-24 energy for Elementary School has been adjusted.*

Southern California Edison Carbon Intensity Factors

	lbs/MWh
CO2:[1,2]	531.44
CH4:[3]	0.029
N2O:[3]	0.00617

[1] Based on CO_2e intensity factor of 534 pounds per megawatt hour; Southern California Edison. 2020. 2019 Sustainability Report. https://www.edison.com/content/dam/eix/documents/sustainability/eix-2019-sustainability-report.pdf.

[2] Based on Intergovernmental Panel on Climate Change Fourth Assessment Report global warming potentials for CH4 and N2O; Intergovernmental Panel on Climate Change (IPCC). 2007. Fourth Assessment Report: Climate Change 2007.

[3] CalEEMod default values.

Global Warming Potentials (GWP)		
	AR4	**AR5**
CO_2	1	1
CH_4	25	28
N_2O	298	265

Based on Intergovernmental Panel on Climate Change Fourth Assessment Report global warming potentials for CH4 and N2O; Intergovernmental Panel on Climate Change (IPCC).

CalEEMod Construction Model Outputs

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Elementary School	82.00	1000sqft	1.88	82,000.00	0
Other Asphalt Surfaces	182.16	1000sqft	4.18	182,160.00	0
Other Non-Asphalt Surfaces	183.77	1000sqft	4.22	183,770.00	0
Parking Lot	74.93	1000sqft	1.72	74,930.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	32
Climate Zone	10			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	531.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - SCE 2019 Sustainability Report, CO2 IF

Land Use -

Construction Phase - See Assumptions

Off-road Equipment -

Off-road Equipment - Haul Trucks Only

Trips and VMT - 2 trips/water truck

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

Grading - See Assumptions

Architectural Coating - South Coast AQMD Rule 1113, See Assumptions

Energy Use -

Construction Off-road Equipment Mitigation - South Coast AQMD Rulle 403 and Rule 1186 (cleaned paved road).

Vehicle Trips -

Vehicle Emission Factors -

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Parking	26,452.00	15,425.00
tblArchitecturalCoating	EF_Nonresidential_Exterior	100.00	50.00
tblArchitecturalCoating	EF_Nonresidential_Interior	100.00	50.00
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	9
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	10.00	18.00
tblConstructionPhase	NumDays	30.00	44.00
tblConstructionPhase	NumDays	30.00	44.00
tblConstructionPhase	NumDays	300.00	461.00
tblConstructionPhase	NumDays	20.00	31.00
tblConstructionPhase	NumDays	20.00	32.00
tblConstructionPhase	PhaseEndDate	6/14/2022	6/24/2022
tblConstructionPhase	PhaseEndDate	7/26/2022	8/25/2022
tblConstructionPhase	PhaseEndDate	9/6/2022	8/25/2022
tblConstructionPhase	PhaseEndDate	10/31/2023	5/31/2024
tblConstructionPhase	PhaseEndDate	11/28/2023	5/13/2024
tblConstructionPhase	PhaseEndDate	12/26/2023	5/31/2024

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

tblConstructionPhase	PhaseStartDate	6/15/2022	6/27/2022
tblConstructionPhase	PhaseStartDate	7/27/2022	6/27/2022
tblConstructionPhase	PhaseStartDate	9/7/2022	8/26/2022
tblConstructionPhase	PhaseStartDate	11/1/2023	4/1/2024
tblConstructionPhase	PhaseStartDate	11/29/2023	4/18/2024
tblGrading	MaterialExported	0.00	1,700.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblProjectCharacteristics	CO2IntensityFactor	702.44	531.44
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00

2.0 Emissions Summary

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

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					
2022	3.7589	40.2789	29.9322	0.0699	18.2931	1.6395	19.9075	9.9914	1.5084	11.4767	0.0000	6,968.6585	6,968.6585	1.9795	0.0000	6,989.4496
2023	2.7229	20.9806	23.9667	0.0685	3.0099	0.7207	3.7306	0.8108	0.6779	1.4887	0.0000	6,828.1292	6,828.1292	0.7890	0.0000	6,847.8542
2024	18.5918	30.9011	41.4073	0.0989	3.6693	1.1675	4.8368	0.9857	1.0918	2.0775	0.0000	9,770.5218	9,770.5218	1.5230	0.0000	9,808.5957
Maximum	**18.5918**	**40.2789**	**41.4073**	**0.0989**	**18.2931**	**1.6395**	**19.9075**	**9.9914**	**1.5084**	**11.4767**	**0.0000**	**9,770.5218**	**9,770.5218**	**1.9795**	**0.0000**	**9,808.5957**

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					
2022	3.7589	40.2789	29.9322	0.0699	7.9328	1.6395	9.5472	4.3018	1.5084	5.7871	0.0000	6,968.6585	6,968.6585	1.9795	0.0000	6,989.4496
2023	2.7229	20.9806	23.9667	0.0685	2.7822	0.7207	3.5028	0.7549	0.6779	1.4328	0.0000	6,828.1292	6,828.1292	0.7890	0.0000	6,847.8542
2024	18.5918	30.9011	41.4073	0.0989	3.3900	1.1675	4.5575	0.9171	1.0918	2.0089	0.0000	9,770.5218	9,770.5218	1.5230	0.0000	9,808.5957

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

Maximum	**18.5918**	**40.2789**	**41.4073**	**0.0989**	**7.9328**	**1.6395**	**9.5472**	**4.3018**	**1.5084**	**5.7871**	**0.0000**	**9,770.5218**	**9,770.5218**	**1.9795**	**0.0000**	**9,808.5957**

	ROG	**NOx**	**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**	**43.52**	**0.00**	**38.16**	**49.32**	**0.00**	**38.65**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	6/1/2022	6/24/2022	5	18	
2	Grading	Grading	6/27/2022	8/25/2022	5	44	
3	Soil Haul	Grading	6/27/2022	8/25/2022	5	44	
4	Building Construction	Building Construction	8/26/2022	5/31/2024	5	461	
5	Paving	Paving	4/1/2024	5/13/2024	5	31	
6	Architectural Coating	Architectural Coating	4/18/2024	5/31/2024	5	32	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 110

Acres of Paving: 10.12

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 123,000; Non-Residential Outdoor: 41,000; Striped Parking Area:

OffRoad Equipment

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Soil Haul	Excavators	0	8.00	158	0.38
Soil Haul	Graders	0	8.00	187	0.41
Soil Haul	Rubber Tired Dozers	0	8.00	247	0.40
Soil Haul	Scrapers	0	8.00	367	0.48
Soil Haul	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

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
Site Preparation	7	18.00	4.00	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	44.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	4.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Soil Haul	0	0.00	0.00	213.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	220.00	86.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Site Preparation - 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					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	3.1701	33.0835	19.6978	0.0380		1.6126	1.6126		1.4836	1.4836		3,686.0619	3,686.0619	1.1922		3,715.8655

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

Total	**3.1701**	**33.0835**	**19.6978**	**0.0380**	**18.0663**	**1.6126**	**19.6788**	**9.9307**	**1.4836**	**11.4143**		**3,686.0619**	**3,686.0619**	**1.1922**		**3,715.8655**

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	0.0102	0.3616	0.0788	1.0300e-003	0.0256	5.7000e-004	0.0262	7.3800e-003	5.5000e-004	7.9200e-003		108.5025	108.5025	7.7100e-003		108.6952
Worker	0.0858	0.0534	0.5606	1.7100e-003	0.2012	1.2500e-003	0.2025	0.0534	1.1500e-003	0.0545		170.3063	170.3063	4.4100e-003		170.4166
Total	**0.0961**	**0.4150**	**0.6394**	**2.7400e-003**	**0.2268**	**1.8200e-003**	**0.2286**	**0.0607**	**1.7000e-003**	**0.0624**		**278.8088**	**278.8088**	**0.0121**		**279.1119**

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

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					7.7233	0.0000	7.7233	4.2454	0.0000	4.2454			0.0000			0.0000
Off-Road	3.1701	33.0835	19.6978	0.0380		1.6126	1.6126		1.4836	1.4836	0.0000	3,686.0619	3,686.0619	1.1922		3,715.8655
Total	**3.1701**	**33.0835**	**19.6978**	**0.0380**	**7.7233**	**1.6126**	**9.3359**	**4.2454**	**1.4836**	**5.7289**	**0.0000**	**3,686.0619**	**3,686.0619**	**1.1922**		**3,715.8655**

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	0.0102	0.3616	0.0788	1.0300e-003	0.0240	5.7000e-004	0.0246	6.9700e-003	5.5000e-004	7.5200e-003		108.5025	108.5025	7.7100e-003		108.6952
Worker	0.0858	0.0534	0.5606	1.7100e-003	0.1855	1.2500e-003	0.1867	0.0495	1.1500e-003	0.0506		170.3063	170.3063	4.4100e-003		170.4166
Total	**0.0961**	**0.4150**	**0.6394**	**2.7400e-003**	**0.2094**	**1.8200e-003**	**0.2113**	**0.0565**	**1.7000e-003**	**0.0582**		**278.8088**	**278.8088**	**0.0121**		**279.1119**

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

3.3 Grading - 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					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	3.6248	38.8435	29.0415	0.0621		1.6349	1.6349		1.5041	1.5041		6,011.4105	6,011.4105	1.9442		6,060.0158
Total	**3.6248**	**38.8435**	**29.0415**	**0.0621**	**8.6733**	**1.6349**	**10.3082**	**3.5965**	**1.5041**	**5.1006**		**6,011.4105**	**6,011.4105**	**1.9442**		**6,060.0158**

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	0.0102	0.3616	0.0788	1.0300e-003	0.0256	5.7000e-004	0.0262	7.3800e-003	5.5000e-004	7.9200e-003		108.5025	108.5025	7.7100e-003		108.6952
Worker	0.0954	0.0594	0.6228	1.9000e-003	0.2236	1.3900e-003	0.2249	0.0593	1.2800e-003	0.0606		189.2292	189.2292	4.9000e-003		189.3518
Total	**0.1056**	**0.4209**	**0.7017**	**2.9300e-003**	**0.2492**	**1.9600e-003**	**0.2511**	**0.0667**	**1.8300e-003**	**0.0685**		**297.7317**	**297.7317**	**0.0126**		**298.0470**

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

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					3.7079	0.0000	3.7079	1.5375	0.0000	1.5375			0.0000			0.0000
Off-Road	3.6248	38.8435	29.0415	0.0621		1.6349	1.6349		1.5041	1.5041	0.0000	6,011.4105	6,011.4105	1.9442		6,060.0158
Total	**3.6248**	**38.8435**	**29.0415**	**0.0621**	**3.7079**	**1.6349**	**5.3427**	**1.5375**	**1.5041**	**3.0416**	**0.0000**	**6,011.4105**	**6,011.4105**	**1.9442**		**6,060.0158**

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	0.0102	0.3616	0.0788	1.0300e-003	0.0240	5.7000e-004	0.0246	6.9700e-003	5.5000e-004	7.5200e-003		108.5025	108.5025	7.7100e-003		108.6952
Worker	0.0954	0.0594	0.6228	1.9000e-003	0.2061	1.3900e-003	0.2075	0.0550	1.2800e-003	0.0563		189.2292	189.2292	4.9000e-003		189.3518
Total	**0.1056**	**0.4209**	**0.7017**	**2.9300e-003**	**0.2300**	**1.9600e-003**	**0.2320**	**0.0620**	**1.8300e-003**	**0.0638**		**297.7317**	**297.7317**	**0.0126**		**298.0470**

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

3.4 Soil Haul - 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					
Fugitive Dust					4.3700e-003	0.0000	4.3700e-003	6.6000e-004	0.0000	6.6000e-004			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**4.3700e-003**	**0.0000**	**4.3700e-003**	**6.6000e-004**	**0.0000**	**6.6000e-004**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

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	0.0284	1.0145	0.1890	3.6200e-003	0.0847	2.6300e-003	0.0873	0.0232	2.5100e-003	0.0257		384.5650	384.5650	0.0227		385.1327
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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0284**	**1.0145**	**0.1890**	**3.6200e-003**	**0.0847**	**2.6300e-003**	**0.0873**	**0.0232**	**2.5100e-003**	**0.0257**		**384.5650**	**384.5650**	**0.0227**		**385.1327**

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

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					1.8700e-003	0.0000	1.8700e-003	2.8000e-004	0.0000	2.8000e-004			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.8700e-003**	**0.0000**	**1.8700e-003**	**2.8000e-004**	**0.0000**	**2.8000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

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	0.0284	1.0145	0.1890	3.6200e-003	0.0790	2.6300e-003	0.0816	0.0218	2.5100e-003	0.0243		384.5650	384.5650	0.0227		385.1327
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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0284**	**1.0145**	**0.1890**	**3.6200e-003**	**0.0790**	**2.6300e-003**	**0.0816**	**0.0218**	**2.5100e-003**	**0.0243**		**384.5650**	**384.5650**	**0.0227**		**385.1327**

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

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	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612		2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**		**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

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	0.2202	7.7732	1.6947	0.0221	0.5508	0.0123	0.5631	0.1586	0.0118	0.1704		2,332.8038	2,332.8038	0.1658		2,336.9476
Worker	1.0489	0.6531	6.8512	0.0209	2.4591	0.0153	2.4744	0.6522	0.0141	0.6662		2,081.5212	2,081.5212	0.0539		2,082.8698
Total	**1.2691**	**8.4264**	**8.5459**	**0.0430**	**3.0099**	**0.0276**	**3.0374**	**0.8108**	**0.0258**	**0.8366**		**4,414.3249**	**4,414.3249**	**0.2197**		**4,419.8174**

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

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	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612	0.0000	2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**	**0.0000**	**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

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	0.2202	7.7732	1.6947	0.0221	0.5155	0.0123	0.5278	0.1499	0.0118	0.1617		2,332.8038	2,332.8038	0.1658		2,336.9476
Worker	1.0489	0.6531	6.8512	0.0209	2.2667	0.0153	2.2819	0.6049	0.0141	0.6190		2,081.5212	2,081.5212	0.0539		2,082.8698
Total	**1.2691**	**8.4264**	**8.5459**	**0.0430**	**2.7822**	**0.0276**	**2.8097**	**0.7549**	**0.0258**	**0.7807**		**4,414.3249**	**4,414.3249**	**0.2197**		**4,419.8174**

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

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	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584		2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**		**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

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	0.1661	6.0079	1.4415	0.0215	0.5508	6.0900e-003	0.5569	0.1586	5.8200e-003	0.1644		2,269.5258	2,269.5258	0.1328		2,272.8459
Worker	0.9841	0.5878	6.2811	0.0201	2.4591	0.0149	2.4739	0.6522	0.0137	0.6658		2,003.3935	2,003.3935	0.0484		2,004.6022
Total	**1.1502**	**6.5957**	**7.7227**	**0.0416**	**3.0099**	**0.0210**	**3.0308**	**0.8108**	**0.0195**	**0.8303**		**4,272.9193**	**4,272.9193**	**0.1812**		**4,277.4482**

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

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	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584	0.0000	2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**	**0.0000**	**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

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	0.1661	6.0079	1.4415	0.0215	0.5155	6.0900e-003	0.5216	0.1499	5.8200e-003	0.1558		2,269.5258	2,269.5258	0.1328		2,272.8459
Worker	0.9841	0.5878	6.2811	0.0201	2.2667	0.0149	2.2815	0.6049	0.0137	0.6186		2,003.3935	2,003.3935	0.0484		2,004.6022
Total	**1.1502**	**6.5957**	**7.7227**	**0.0416**	**2.7822**	**0.0210**	**2.8031**	**0.7549**	**0.0195**	**0.7744**		**4,272.9193**	**4,272.9193**	**0.1812**		**4,277.4482**

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

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	1.4716	13.4438	16.1668	0.0270		0.6133	0.6133		0.5769	0.5769		2,555.6989	2,555.6989	0.6044		2,570.8077
Total	**1.4716**	**13.4438**	**16.1668**	**0.0270**		**0.6133**	**0.6133**		**0.5769**	**0.5769**		**2,555.6989**	**2,555.6989**	**0.6044**		**2,570.8077**

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	0.1636	6.0388	1.3896	0.0215	0.5508	6.0500e-003	0.5568	0.1586	5.7900e-003	0.1644		2,267.5238	2,267.5238	0.1328		2,270.8436
Worker	0.9286	0.5323	5.8469	0.0194	2.4591	0.0147	2.4738	0.6522	0.0136	0.6657		1,938.4475	1,938.4475	0.0442		1,939.5514
Total	**1.0922**	**6.5711**	**7.2365**	**0.0409**	**3.0099**	**0.0208**	**3.0306**	**0.8108**	**0.0193**	**0.8301**		**4,205.9713**	**4,205.9713**	**0.1770**		**4,210.3950**

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

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	1.4716	13.4438	16.1668	0.0270		0.6133	0.6133		0.5769	0.5769	0.0000	2,555.6989	2,555.6989	0.6044		2,570.8077
Total	**1.4716**	**13.4438**	**16.1668**	**0.0270**		**0.6133**	**0.6133**		**0.5769**	**0.5769**	**0.0000**	**2,555.6989**	**2,555.6989**	**0.6044**		**2,570.8077**

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	0.1636	6.0388	1.3896	0.0215	0.5155	6.0500e-003	0.5215	0.1499	5.7900e-003	0.1557		2,267.5238	2,267.5238	0.1328		2,270.8436
Worker	0.9286	0.5323	5.8469	0.0194	2.2667	0.0147	2.2814	0.6049	0.0136	0.6185		1,938.4475	1,938.4475	0.0442		1,939.5514
Total	**1.0922**	**6.5711**	**7.2365**	**0.0409**	**2.7822**	**0.0208**	**2.8029**	**0.7549**	**0.0193**	**0.7742**		**4,205.9713**	**4,205.9713**	**0.1770**		**4,210.3950**

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

3.6 Paving - 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	0.9882	9.5246	14.6258	0.0228		0.4685	0.4685		0.4310	0.4310		2,207.5472	2,207.5472	0.7140		2,225.3963
Paving	0.4987					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4868**	**9.5246**	**14.6258**	**0.0228**		**0.4685**	**0.4685**		**0.4310**	**0.4310**		**2,207.5472**	**2,207.5472**	**0.7140**		**2,225.3963**

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	0.0633	0.0363	0.3987	1.3300e-003	0.1677	1.0000e-003	0.1687	0.0445	9.2000e-004	0.0454		132.1669	132.1669	3.0100e-003		132.2421
Total	**0.0633**	**0.0363**	**0.3987**	**1.3300e-003**	**0.1677**	**1.0000e-003**	**0.1687**	**0.0445**	**9.2000e-004**	**0.0454**		**132.1669**	**132.1669**	**3.0100e-003**		**132.2421**

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

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	0.9882	9.5246	14.6258	0.0228		0.4685	0.4685		0.4310	0.4310	0.0000	2,207.5472	2,207.5472	0.7140		2,225.3963
Paving	0.4987					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4868**	**9.5246**	**14.6258**	**0.0228**		**0.4685**	**0.4685**		**0.4310**	**0.4310**	**0.0000**	**2,207.5472**	**2,207.5472**	**0.7140**		**2,225.3963**

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	0.0633	0.0363	0.3987	1.3300e-003	0.1546	1.0000e-003	0.1556	0.0413	9.2000e-004	0.0422		132.1669	132.1669	3.0100e-003		132.2421
Total	**0.0633**	**0.0363**	**0.3987**	**1.3300e-003**	**0.1546**	**1.0000e-003**	**0.1556**	**0.0413**	**9.2000e-004**	**0.0422**		**132.1669**	**132.1669**	**3.0100e-003**		**132.2421**

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

3.7 Architectural Coating - 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					
Archit. Coating	14.1114					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1808	1.2188	1.8101	2.9700e-003		0.0609	0.0609		0.0609	0.0609		281.4481	281.4481	0.0159		281.8443
Total	**14.2922**	**1.2188**	**1.8101**	**2.9700e-003**		**0.0609**	**0.0609**		**0.0609**	**0.0609**		**281.4481**	**281.4481**	**0.0159**		**281.8443**

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	0.1857	0.1065	1.1694	3.8900e-003	0.4918	2.9400e-003	0.4948	0.1304	2.7100e-003	0.1331		387.6895	387.6895	8.8300e-003		387.9103
Total	**0.1857**	**0.1065**	**1.1694**	**3.8900e-003**	**0.4918**	**2.9400e-003**	**0.4948**	**0.1304**	**2.7100e-003**	**0.1331**		**387.6895**	**387.6895**	**8.8300e-003**		**387.9103**

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

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	14.1114					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1808	1.2188	1.8101	2.9700e-003		0.0609	0.0609		0.0609	0.0609	0.0000	281.4481	281.4481	0.0159		281.8443
Total	**14.2922**	**1.2188**	**1.8101**	**2.9700e-003**		**0.0609**	**0.0609**		**0.0609**	**0.0609**	**0.0000**	**281.4481**	**281.4481**	**0.0159**		**281.8443**

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	0.1857	0.1065	1.1694	3.8900e-003	0.4533	2.9400e-003	0.4563	0.1210	2.7100e-003	0.1237		387.6895	387.6895	8.8300e-003		387.9103
Total	**0.1857**	**0.1065**	**1.1694**	**3.8900e-003**	**0.4533**	**2.9400e-003**	**0.4563**	**0.1210**	**2.7100e-003**	**0.1237**		**387.6895**	**387.6895**	**8.8300e-003**		**387.9103**

CalEEMod Operational Model Outputs

CVUS-07 Project Run

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1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Elementary School	91.60	1000sqft	1.88	91,600.00	0
Other Asphalt Surfaces	182.16	1000sqft	4.18	182,160.00	0
Other Non-Asphalt Surfaces	183.77	1000sqft	4.22	183,770.00	0
Parking Lot	74.93	1000sqft	1.72	74,930.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	32
Climate Zone	10			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	531.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - SCE 2019 Sustainability Report, CO2 IF

Land Use - See Assumptions

Construction Phase - See Assumptions

Off-road Equipment -

Off-road Equipment - Haul Trucks Only

Trips and VMT - 2 water trucks for grading

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Grading -

Architectural Coating - South Coast AQMD Rule 1113

Vehicle Trips - Adjusted to 100 Primary.

Vehicle Emission Factors - EMFAC2017 Web Database. See Assumptions

Vehicle Emission Factors - EMFAC2017 Web Database. See Assumptions.

Vehicle Emission Factors - EMFAC2017 Web Database. See Assumptions.

Energy Use - See Assumptions

Water And Wastewater - See Assumptions

Solid Waste - See Assumptions

Construction Off-road Equipment Mitigation - South Coast AQMD Rule 403 and Rule 1186 (cleaned paved road).

Energy Mitigation - See Assumptions

Fleet Mix - See Assumptions

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	9
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblEnergyUse	T24E	2.78	2.48
tblEnergyUse	T24NG	6.97	6.90
tblFleetMix	HHD	0.07	6.3320e-003
tblFleetMix	LDA	0.56	0.69
tblFleetMix	LDT1	0.04	0.04
tblFleetMix	LDT2	0.18	0.23
tblFleetMix	LHD1	0.01	1.3900e-003
tblFleetMix	LHD2	4.7940e-003	4.6600e-004
tblFleetMix	MCY	5.7250e-003	7.4130e-003

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tblFleetMix	MDV	0.11	0.02
tblFleetMix	MH	8.3000e-004	0.00
tblFleetMix	MHD	0.02	1.8110e-003
tblFleetMix	OBUS	1.3650e-003	0.00
tblFleetMix	SBUS	7.9900e-004	0.00
tblFleetMix	UBUS	1.4910e-003	0.00
tblLandUse	LotAcreage	2.10	1.88
tblProjectCharacteristics	CO2IntensityFactor	702.44	531.44
tblVehicleEF	HHD	0.92	0.03
tblVehicleEF	HHD	0.04	0.13
tblVehicleEF	HHD	0.08	1.8032e-007
tblVehicleEF	HHD	2.21	6.39
tblVehicleEF	HHD	0.53	0.55
tblVehicleEF	HHD	1.68	3.3279e-003
tblVehicleEF	HHD	6,548.54	1,061.49
tblVehicleEF	HHD	1,428.49	1,386.62
tblVehicleEF	HHD	5.31	0.03
tblVehicleEF	HHD	18.65	5.46
tblVehicleEF	HHD	1.28	2.58
tblVehicleEF	HHD	20.21	2.40
tblVehicleEF	HHD	5.3430e-003	2.7891e-003
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	5.3010e-003	0.02
tblVehicleEF	HHD	4.7000e-005	6.8203e-007

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tblVehicleEF	HHD	5.1120e-003	2.6685e-003
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8790e-003	8.8287e-003
tblVehicleEF	HHD	5.0720e-003	0.02
tblVehicleEF	HHD	4.3000e-005	6.2710e-007
tblVehicleEF	HHD	7.3000e-005	3.4870e-006
tblVehicleEF	HHD	2.7400e-003	1.1175e-004
tblVehicleEF	HHD	0.59	0.43
tblVehicleEF	HHD	4.5000e-005	2.0719e-006
tblVehicleEF	HHD	0.06	0.03
tblVehicleEF	HHD	1.7500e-004	5.5521e-004
tblVehicleEF	HHD	0.04	9.4709e-007
tblVehicleEF	HHD	0.06	9.7453e-003
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	8.1000e-005	2.8961e-007
tblVehicleEF	HHD	7.3000e-005	3.4870e-006
tblVehicleEF	HHD	2.7400e-003	1.1175e-004
tblVehicleEF	HHD	0.67	0.50
tblVehicleEF	HHD	4.5000e-005	2.0719e-006
tblVehicleEF	HHD	0.10	0.16
tblVehicleEF	HHD	1.7500e-004	5.5521e-004
tblVehicleEF	HHD	0.05	1.0369e-006
tblVehicleEF	HHD	0.87	0.03
tblVehicleEF	HHD	0.04	0.13
tblVehicleEF	HHD	0.08	1.7203e-007

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tblVehicleEF	HHD	1.61	6.30
tblVehicleEF	HHD	0.53	0.55
tblVehicleEF	HHD	1.58	3.1419e-003
tblVehicleEF	HHD	6,937.59	1,049.59
tblVehicleEF	HHD	1,428.49	1,386.62
tblVehicleEF	HHD	5.31	0.03
tblVehicleEF	HHD	19.25	5.22
tblVehicleEF	HHD	1.20	2.44
tblVehicleEF	HHD	20.20	2.40
tblVehicleEF	HHD	4.5050e-003	2.4353e-003
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	5.3010e-003	0.02
tblVehicleEF	HHD	4.7000e-005	6.8203e-007
tblVehicleEF	HHD	4.3100e-003	2.3300e-003
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8790e-003	8.8287e-003
tblVehicleEF	HHD	5.0720e-003	0.02
tblVehicleEF	HHD	4.3000e-005	6.2710e-007
tblVehicleEF	HHD	1.4200e-004	6.8246e-006
tblVehicleEF	HHD	3.0590e-003	1.2683e-004
tblVehicleEF	HHD	0.55	0.45
tblVehicleEF	HHD	9.8000e-005	4.5555e-006
tblVehicleEF	HHD	0.06	0.03
tblVehicleEF	HHD	1.7700e-004	5.6915e-004

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tblVehicleEF	HHD	0.04	9.0624e-007
tblVehicleEF	HHD	0.07	9.6317e-003
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	7.9000e-005	2.8669e-007
tblVehicleEF	HHD	1.4200e-004	6.8246e-006
tblVehicleEF	HHD	3.0590e-003	1.2683e-004
tblVehicleEF	HHD	0.64	0.52
tblVehicleEF	HHD	9.8000e-005	4.5555e-006
tblVehicleEF	HHD	0.10	0.16
tblVehicleEF	HHD	1.7700e-004	5.6915e-004
tblVehicleEF	HHD	0.04	9.9222e-007
tblVehicleEF	HHD	0.99	0.02
tblVehicleEF	HHD	0.04	9.0333e-004
tblVehicleEF	HHD	0.08	1.7930e-007
tblVehicleEF	HHD	3.05	6.37
tblVehicleEF	HHD	0.53	0.21
tblVehicleEF	HHD	1.66	3.3019e-003
tblVehicleEF	HHD	6,011.27	1,048.13
tblVehicleEF	HHD	1,428.49	1,299.09
tblVehicleEF	HHD	5.31	0.03
tblVehicleEF	HHD	17.82	5.62
tblVehicleEF	HHD	1.26	2.47
tblVehicleEF	HHD	20.21	2.40
tblVehicleEF	HHD	6.5010e-003	2.9592e-003
tblVehicleEF	HHD	0.06	0.06

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tblVehicleEF	HHD	0.04	0.03
tblVehicleEF	HHD	5.3010e-003	0.02
tblVehicleEF	HHD	4.7000e-005	6.8203e-007
tblVehicleEF	HHD	6.2190e-003	2.8312e-003
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8790e-003	8.6012e-003
tblVehicleEF	HHD	5.0720e-003	0.02
tblVehicleEF	HHD	4.3000e-005	6.2710e-007
tblVehicleEF	HHD	7.1000e-005	3.6809e-006
tblVehicleEF	HHD	2.9460e-003	1.2966e-004
tblVehicleEF	HHD	0.63	0.39
tblVehicleEF	HHD	4.4000e-005	2.1988e-006
tblVehicleEF	HHD	0.06	0.02
tblVehicleEF	HHD	1.8900e-004	5.8280e-004
tblVehicleEF	HHD	0.04	9.4183e-007
tblVehicleEF	HHD	0.06	9.9022e-003
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	8.0000e-005	2.8920e-007
tblVehicleEF	HHD	7.1000e-005	3.6809e-006
tblVehicleEF	HHD	2.9460e-003	1.2966e-004
tblVehicleEF	HHD	0.73	0.45
tblVehicleEF	HHD	4.4000e-005	2.1988e-006
tblVehicleEF	HHD	0.10	0.02
tblVehicleEF	HHD	1.8900e-004	5.8280e-004
tblVehicleEF	HHD	0.05	1.0312e-006

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tblVehicleEF	LDA	3.4870e-003	2.0138e-003
tblVehicleEF	LDA	4.3060e-003	0.04
tblVehicleEF	LDA	0.51	0.59
tblVehicleEF	LDA	0.99	1.98
tblVehicleEF	LDA	232.23	254.16
tblVehicleEF	LDA	52.85	51.55
tblVehicleEF	LDA	0.04	0.03
tblVehicleEF	LDA	0.06	0.16
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	8.0000e-003	8.0000e-003
tblVehicleEF	LDA	1.6390e-003	1.4255e-003
tblVehicleEF	LDA	2.2390e-003	1.7107e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	2.0000e-003	2.0000e-003
tblVehicleEF	LDA	1.5090e-003	1.3122e-003
tblVehicleEF	LDA	2.0590e-003	1.5729e-003
tblVehicleEF	LDA	0.04	0.05
tblVehicleEF	LDA	0.09	0.09
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	8.7420e-003	7.3557e-003
tblVehicleEF	LDA	0.03	0.20
tblVehicleEF	LDA	0.06	0.18
tblVehicleEF	LDA	2.3250e-003	2.4637e-003
tblVehicleEF	LDA	5.4500e-004	4.9981e-004
tblVehicleEF	LDA	0.04	0.05

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tblVehicleEF	LDA	0.09	0.09
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	0.01	0.01
tblVehicleEF	LDA	0.03	0.20
tblVehicleEF	LDA	0.06	0.20
tblVehicleEF	LDA	3.9680e-003	2.2761e-003
tblVehicleEF	LDA	3.5930e-003	0.04
tblVehicleEF	LDA	0.62	0.72
tblVehicleEF	LDA	0.82	1.67
tblVehicleEF	LDA	254.04	275.18
tblVehicleEF	LDA	52.85	50.96
tblVehicleEF	LDA	0.04	0.03
tblVehicleEF	LDA	0.06	0.15
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	8.0000e-003	8.0000e-003
tblVehicleEF	LDA	1.6390e-003	1.4255e-003
tblVehicleEF	LDA	2.2390e-003	1.7107e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	2.0000e-003	2.0000e-003
tblVehicleEF	LDA	1.5090e-003	1.3122e-003
tblVehicleEF	LDA	2.0590e-003	1.5729e-003
tblVehicleEF	LDA	0.08	0.10
tblVehicleEF	LDA	0.10	0.10
tblVehicleEF	LDA	0.06	0.08
tblVehicleEF	LDA	9.9310e-003	8.2294e-003

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tblVehicleEF	LDA	0.03	0.19
tblVehicleEF	LDA	0.05	0.16
tblVehicleEF	LDA	2.5450e-003	2.6674e-003
tblVehicleEF	LDA	5.4200e-004	4.9409e-004
tblVehicleEF	LDA	0.08	0.10
tblVehicleEF	LDA	0.10	0.10
tblVehicleEF	LDA	0.06	0.08
tblVehicleEF	LDA	0.01	0.01
tblVehicleEF	LDA	0.03	0.19
tblVehicleEF	LDA	0.05	0.17
tblVehicleEF	LDA	3.3950e-003	1.9725e-003
tblVehicleEF	LDA	4.2830e-003	0.04
tblVehicleEF	LDA	0.48	0.57
tblVehicleEF	LDA	0.97	1.98
tblVehicleEF	LDA	227.08	250.24
tblVehicleEF	LDA	52.85	51.56
tblVehicleEF	LDA	0.04	0.03
tblVehicleEF	LDA	0.06	0.16
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	8.0000e-003	8.0000e-003
tblVehicleEF	LDA	1.6390e-003	1.4255e-003
tblVehicleEF	LDA	2.2390e-003	1.7107e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	2.0000e-003	2.0000e-003
tblVehicleEF	LDA	1.5090e-003	1.3122e-003

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tblVehicleEF	LDA	2.0590e-003	1.5729e-003
tblVehicleEF	LDA	0.04	0.05
tblVehicleEF	LDA	0.10	0.10
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	8.5140e-003	7.2053e-003
tblVehicleEF	LDA	0.04	0.22
tblVehicleEF	LDA	0.06	0.19
tblVehicleEF	LDA	2.2730e-003	2.4257e-003
tblVehicleEF	LDA	5.4500e-004	4.9989e-004
tblVehicleEF	LDA	0.04	0.05
tblVehicleEF	LDA	0.10	0.10
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	0.01	0.01
tblVehicleEF	LDA	0.04	0.22
tblVehicleEF	LDA	0.06	0.20
tblVehicleEF	LDT1	0.01	5.7611e-003
tblVehicleEF	LDT1	0.01	0.07
tblVehicleEF	LDT1	1.27	1.22
tblVehicleEF	LDT1	2.92	2.21
tblVehicleEF	LDT1	294.54	302.30
tblVehicleEF	LDT1	66.91	62.67
tblVehicleEF	LDT1	0.13	0.10
tblVehicleEF	LDT1	0.17	0.25
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003

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tblVehicleEF	LDT1	2.4790e-003	2.0331e-003
tblVehicleEF	LDT1	3.3490e-003	2.4484e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	2.2820e-003	1.8706e-003
tblVehicleEF	LDT1	3.0800e-003	2.2513e-003
tblVehicleEF	LDT1	0.16	0.16
tblVehicleEF	LDT1	0.29	0.22
tblVehicleEF	LDT1	0.11	0.12
tblVehicleEF	LDT1	0.03	0.03
tblVehicleEF	LDT1	0.18	0.73
tblVehicleEF	LDT1	0.20	0.34
tblVehicleEF	LDT1	2.9610e-003	2.9308e-003
tblVehicleEF	LDT1	7.2000e-004	6.0757e-004
tblVehicleEF	LDT1	0.16	0.16
tblVehicleEF	LDT1	0.29	0.22
tblVehicleEF	LDT1	0.11	0.12
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	0.18	0.73
tblVehicleEF	LDT1	0.22	0.37
tblVehicleEF	LDT1	0.01	6.4446e-003
tblVehicleEF	LDT1	0.01	0.06
tblVehicleEF	LDT1	1.52	1.45
tblVehicleEF	LDT1	2.41	1.86
tblVehicleEF	LDT1	320.99	324.09

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tblVehicleEF	LDT1	66.91	61.93
tblVehicleEF	LDT1	0.12	0.09
tblVehicleEF	LDT1	0.16	0.23
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003
tblVehicleEF	LDT1	2.4790e-003	2.0331e-003
tblVehicleEF	LDT1	3.3490e-003	2.4484e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	2.2820e-003	1.8706e-003
tblVehicleEF	LDT1	3.0800e-003	2.2513e-003
tblVehicleEF	LDT1	0.33	0.30
tblVehicleEF	LDT1	0.36	0.26
tblVehicleEF	LDT1	0.24	0.22
tblVehicleEF	LDT1	0.03	0.03
tblVehicleEF	LDT1	0.18	0.72
tblVehicleEF	LDT1	0.17	0.29
tblVehicleEF	LDT1	3.2290e-003	3.1421e-003
tblVehicleEF	LDT1	7.1100e-004	6.0043e-004
tblVehicleEF	LDT1	0.33	0.30
tblVehicleEF	LDT1	0.36	0.26
tblVehicleEF	LDT1	0.24	0.22
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	0.18	0.72
tblVehicleEF	LDT1	0.18	0.32

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tblVehicleEF	LDT1	0.01	5.6507e-003
tblVehicleEF	LDT1	0.01	0.07
tblVehicleEF	LDT1	1.21	1.18
tblVehicleEF	LDT1	2.88	2.22
tblVehicleEF	LDT1	288.31	298.24
tblVehicleEF	LDT1	66.91	62.68
tblVehicleEF	LDT1	0.12	0.09
tblVehicleEF	LDT1	0.17	0.25
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003
tblVehicleEF	LDT1	2.4790e-003	2.0331e-003
tblVehicleEF	LDT1	3.3490e-003	2.4484e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	2.2820e-003	1.8706e-003
tblVehicleEF	LDT1	3.0800e-003	2.2513e-003
tblVehicleEF	LDT1	0.17	0.16
tblVehicleEF	LDT1	0.34	0.25
tblVehicleEF	LDT1	0.10	0.11
tblVehicleEF	LDT1	0.03	0.02
tblVehicleEF	LDT1	0.21	0.85
tblVehicleEF	LDT1	0.20	0.34
tblVehicleEF	LDT1	2.8980e-003	2.8914e-003
tblVehicleEF	LDT1	7.2000e-004	6.0770e-004
tblVehicleEF	LDT1	0.17	0.16

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tblVehicleEF	LDT1	0.34	0.25
tblVehicleEF	LDT1	0.10	0.11
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	0.21	0.85
tblVehicleEF	LDT1	0.22	0.38
tblVehicleEF	LDT2	5.3570e-003	3.5834e-003
tblVehicleEF	LDT2	6.4770e-003	0.06
tblVehicleEF	LDT2	0.71	0.86
tblVehicleEF	LDT2	1.39	2.53
tblVehicleEF	LDT2	328.11	317.70
tblVehicleEF	LDT2	74.12	66.03
tblVehicleEF	LDT2	0.07	0.07
tblVehicleEF	LDT2	0.11	0.25
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003
tblVehicleEF	LDT2	1.7520e-003	1.5111e-003
tblVehicleEF	LDT2	2.4320e-003	1.7807e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.6110e-003	1.3906e-003
tblVehicleEF	LDT2	2.2360e-003	1.6373e-003
tblVehicleEF	LDT2	0.06	0.09
tblVehicleEF	LDT2	0.11	0.13
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.01	0.01

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tblVehicleEF	LDT2	0.06	0.42
tblVehicleEF	LDT2	0.09	0.28
tblVehicleEF	LDT2	3.2870e-003	3.0797e-003
tblVehicleEF	LDT2	7.6500e-004	6.4016e-004
tblVehicleEF	LDT2	0.06	0.09
tblVehicleEF	LDT2	0.11	0.13
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.06	0.42
tblVehicleEF	LDT2	0.10	0.31
tblVehicleEF	LDT2	6.0780e-003	4.0305e-003
tblVehicleEF	LDT2	5.3990e-003	0.05
tblVehicleEF	LDT2	0.87	1.03
tblVehicleEF	LDT2	1.15	2.12
tblVehicleEF	LDT2	358.16	338.46
tblVehicleEF	LDT2	74.12	65.24
tblVehicleEF	LDT2	0.06	0.06
tblVehicleEF	LDT2	0.10	0.23
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003
tblVehicleEF	LDT2	1.7520e-003	1.5111e-003
tblVehicleEF	LDT2	2.4320e-003	1.7807e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.6110e-003	1.3906e-003

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tblVehicleEF	LDT2	2.2360e-003	1.6373e-003
tblVehicleEF	LDT2	0.12	0.17
tblVehicleEF	LDT2	0.13	0.14
tblVehicleEF	LDT2	0.10	0.14
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.06	0.41
tblVehicleEF	LDT2	0.07	0.24
tblVehicleEF	LDT2	3.5890e-003	3.2809e-003
tblVehicleEF	LDT2	7.6000e-004	6.3253e-004
tblVehicleEF	LDT2	0.12	0.17
tblVehicleEF	LDT2	0.13	0.14
tblVehicleEF	LDT2	0.10	0.14
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.06	0.41
tblVehicleEF	LDT2	0.08	0.26
tblVehicleEF	LDT2	5.2180e-003	3.5124e-003
tblVehicleEF	LDT2	6.4370e-003	0.06
tblVehicleEF	LDT2	0.67	0.83
tblVehicleEF	LDT2	1.37	2.54
tblVehicleEF	LDT2	321.03	313.84
tblVehicleEF	LDT2	74.12	66.05
tblVehicleEF	LDT2	0.07	0.06
tblVehicleEF	LDT2	0.11	0.25
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003

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tblVehicleEF	LDT2	1.7520e-003	1.5111e-003
tblVehicleEF	LDT2	2.4320e-003	1.7807e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.6110e-003	1.3906e-003
tblVehicleEF	LDT2	2.2360e-003	1.6373e-003
tblVehicleEF	LDT2	0.06	0.08
tblVehicleEF	LDT2	0.12	0.14
tblVehicleEF	LDT2	0.05	0.07
tblVehicleEF	LDT2	0.01	0.01
tblVehicleEF	LDT2	0.07	0.49
tblVehicleEF	LDT2	0.09	0.28
tblVehicleEF	LDT2	3.2150e-003	3.0422e-003
tblVehicleEF	LDT2	7.6400e-004	6.4032e-004
tblVehicleEF	LDT2	0.06	0.08
tblVehicleEF	LDT2	0.12	0.14
tblVehicleEF	LDT2	0.05	0.07
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.07	0.49
tblVehicleEF	LDT2	0.10	0.31
tblVehicleEF	LHD1	4.8470e-003	4.7968e-003
tblVehicleEF	LHD1	0.01	5.1176e-003
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	0.14	0.18
tblVehicleEF	LHD1	0.89	0.61

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tblVehicleEF	LHD1	2.31	0.96
tblVehicleEF	LHD1	9.22	9.11
tblVehicleEF	LHD1	599.78	638.53
tblVehicleEF	LHD1	29.30	10.76
tblVehicleEF	LHD1	0.09	0.07
tblVehicleEF	LHD1	1.82	1.01
tblVehicleEF	LHD1	0.92	0.29
tblVehicleEF	LHD1	9.6000e-004	9.1827e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	0.01	9.9199e-003
tblVehicleEF	LHD1	0.01	8.9361e-003
tblVehicleEF	LHD1	8.6900e-004	2.3700e-004
tblVehicleEF	LHD1	9.1800e-004	8.7855e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.5600e-003	2.4800e-003
tblVehicleEF	LHD1	0.01	8.5244e-003
tblVehicleEF	LHD1	7.9900e-004	2.1791e-004
tblVehicleEF	LHD1	3.4980e-003	2.7033e-003
tblVehicleEF	LHD1	0.11	0.08
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.7520e-003	1.4326e-003
tblVehicleEF	LHD1	0.08	0.05
tblVehicleEF	LHD1	0.35	0.51
tblVehicleEF	LHD1	0.24	0.07
tblVehicleEF	LHD1	9.2000e-005	8.8148e-005

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tblVehicleEF	LHD1	5.8770e-003	6.2189e-003
tblVehicleEF	LHD1	3.3600e-004	1.0650e-004
tblVehicleEF	LHD1	3.4980e-003	2.7033e-003
tblVehicleEF	LHD1	0.11	0.08
tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	1.7520e-003	1.4326e-003
tblVehicleEF	LHD1	0.09	0.07
tblVehicleEF	LHD1	0.35	0.51
tblVehicleEF	LHD1	0.26	0.07
tblVehicleEF	LHD1	4.8470e-003	4.8094e-003
tblVehicleEF	LHD1	0.01	5.2120e-003
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	0.14	0.18
tblVehicleEF	LHD1	0.91	0.62
tblVehicleEF	LHD1	2.16	0.91
tblVehicleEF	LHD1	9.22	9.11
tblVehicleEF	LHD1	599.78	638.54
tblVehicleEF	LHD1	29.30	10.67
tblVehicleEF	LHD1	0.09	0.07
tblVehicleEF	LHD1	1.71	0.95
tblVehicleEF	LHD1	0.88	0.28
tblVehicleEF	LHD1	9.6000e-004	9.1827e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	0.01	9.9199e-003
tblVehicleEF	LHD1	0.01	8.9361e-003

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tblVehicleEF	LHD1	8.6900e-004	2.3700e-004
tblVehicleEF	LHD1	9.1800e-004	8.7855e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.5600e-003	2.4800e-003
tblVehicleEF	LHD1	0.01	8.5244e-003
tblVehicleEF	LHD1	7.9900e-004	2.1791e-004
tblVehicleEF	LHD1	6.8610e-003	4.8470e-003
tblVehicleEF	LHD1	0.13	0.09
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	3.9020e-003	2.7205e-003
tblVehicleEF	LHD1	0.08	0.06
tblVehicleEF	LHD1	0.35	0.51
tblVehicleEF	LHD1	0.22	0.07
tblVehicleEF	LHD1	9.2000e-005	8.8148e-005
tblVehicleEF	LHD1	5.8770e-003	6.2191e-003
tblVehicleEF	LHD1	3.3400e-004	1.0563e-004
tblVehicleEF	LHD1	6.8610e-003	4.8470e-003
tblVehicleEF	LHD1	0.13	0.09
tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	3.9020e-003	2.7205e-003
tblVehicleEF	LHD1	0.09	0.07
tblVehicleEF	LHD1	0.35	0.51
tblVehicleEF	LHD1	0.24	0.07
tblVehicleEF	LHD1	4.8470e-003	4.7983e-003
tblVehicleEF	LHD1	0.01	5.1241e-003

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tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	0.14	0.18
tblVehicleEF	LHD1	0.89	0.61
tblVehicleEF	LHD1	2.27	0.96
tblVehicleEF	LHD1	9.22	9.11
tblVehicleEF	LHD1	599.78	638.53
tblVehicleEF	LHD1	29.30	10.75
tblVehicleEF	LHD1	0.09	0.07
tblVehicleEF	LHD1	1.79	0.99
tblVehicleEF	LHD1	0.91	0.29
tblVehicleEF	LHD1	9.6000e-004	9.1827e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	0.01	9.9199e-003
tblVehicleEF	LHD1	0.01	8.9361e-003
tblVehicleEF	LHD1	8.6900e-004	2.3700e-004
tblVehicleEF	LHD1	9.1800e-004	8.7855e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.5600e-003	2.4800e-003
tblVehicleEF	LHD1	0.01	8.5244e-003
tblVehicleEF	LHD1	7.9900e-004	2.1791e-004
tblVehicleEF	LHD1	3.7620e-003	2.7673e-003
tblVehicleEF	LHD1	0.12	0.09
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.7190e-003	1.4516e-003
tblVehicleEF	LHD1	0.08	0.06

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tblVehicleEF	LHD1	0.38	0.54
tblVehicleEF	LHD1	0.23	0.07
tblVehicleEF	LHD1	9.2000e-005	8.8148e-005
tblVehicleEF	LHD1	5.8770e-003	6.2189e-003
tblVehicleEF	LHD1	3.3600e-004	1.0639e-004
tblVehicleEF	LHD1	3.7620e-003	2.7673e-003
tblVehicleEF	LHD1	0.12	0.09
tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	1.7190e-003	1.4516e-003
tblVehicleEF	LHD1	0.09	0.07
tblVehicleEF	LHD1	0.38	0.54
tblVehicleEF	LHD1	0.26	0.07
tblVehicleEF	LHD2	3.2790e-003	3.4455e-003
tblVehicleEF	LHD2	3.7300e-003	3.6376e-003
tblVehicleEF	LHD2	6.5990e-003	9.0640e-003
tblVehicleEF	LHD2	0.12	0.14
tblVehicleEF	LHD2	0.40	0.42
tblVehicleEF	LHD2	1.07	0.61
tblVehicleEF	LHD2	14.16	13.98
tblVehicleEF	LHD2	600.81	649.79
tblVehicleEF	LHD2	23.70	8.28
tblVehicleEF	LHD2	0.10	0.10
tblVehicleEF	LHD2	1.10	1.10
tblVehicleEF	LHD2	0.46	0.20
tblVehicleEF	LHD2	1.2350e-003	1.3465e-003

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tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.01	0.01
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tblVehicleEF	LHD2	1.1820e-003	1.2883e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.6940e-003	2.6692e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	3.3900e-004	1.1415e-004
tblVehicleEF	LHD2	1.1430e-003	1.5266e-003
tblVehicleEF	LHD2	0.03	0.05
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	6.3600e-004	8.5545e-004
tblVehicleEF	LHD2	0.05	0.06
tblVehicleEF	LHD2	0.07	0.27
tblVehicleEF	LHD2	0.09	0.04
tblVehicleEF	LHD2	1.3800e-004	1.3377e-004
tblVehicleEF	LHD2	5.8420e-003	6.2769e-003
tblVehicleEF	LHD2	2.5600e-004	8.1904e-005
tblVehicleEF	LHD2	1.1430e-003	1.5266e-003
tblVehicleEF	LHD2	0.03	0.05
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	6.3600e-004	8.5545e-004
tblVehicleEF	LHD2	0.06	0.06
tblVehicleEF	LHD2	0.07	0.27

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tblVehicleEF	LHD2	0.10	0.05
tblVehicleEF	LHD2	3.2790e-003	3.4545e-003
tblVehicleEF	LHD2	3.7760e-003	3.6701e-003
tblVehicleEF	LHD2	6.3100e-003	8.7155e-003
tblVehicleEF	LHD2	0.12	0.14
tblVehicleEF	LHD2	0.40	0.43
tblVehicleEF	LHD2	1.01	0.58
tblVehicleEF	LHD2	14.16	13.98
tblVehicleEF	LHD2	600.81	649.80
tblVehicleEF	LHD2	23.70	8.22
tblVehicleEF	LHD2	0.10	0.10
tblVehicleEF	LHD2	1.04	1.03
tblVehicleEF	LHD2	0.44	0.20
tblVehicleEF	LHD2	1.2350e-003	1.3465e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	3.6900e-004	1.2415e-004
tblVehicleEF	LHD2	1.1820e-003	1.2883e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.6940e-003	2.6692e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	3.3900e-004	1.1415e-004
tblVehicleEF	LHD2	2.1960e-003	2.7469e-003
tblVehicleEF	LHD2	0.04	0.05

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tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	1.3570e-003	1.6184e-003
tblVehicleEF	LHD2	0.05	0.06
tblVehicleEF	LHD2	0.07	0.27
tblVehicleEF	LHD2	0.09	0.04
tblVehicleEF	LHD2	1.3800e-004	1.3377e-004
tblVehicleEF	LHD2	5.8420e-003	6.2770e-003
tblVehicleEF	LHD2	2.5500e-004	8.1352e-005
tblVehicleEF	LHD2	2.1960e-003	2.7469e-003
tblVehicleEF	LHD2	0.04	0.05
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	1.3570e-003	1.6184e-003
tblVehicleEF	LHD2	0.06	0.06
tblVehicleEF	LHD2	0.07	0.27
tblVehicleEF	LHD2	0.09	0.05
tblVehicleEF	LHD2	3.2790e-003	3.4465e-003
tblVehicleEF	LHD2	3.7350e-003	3.6405e-003
tblVehicleEF	LHD2	6.5440e-003	9.0209e-003
tblVehicleEF	LHD2	0.12	0.14
tblVehicleEF	LHD2	0.40	0.43
tblVehicleEF	LHD2	1.06	0.61
tblVehicleEF	LHD2	14.16	13.98
tblVehicleEF	LHD2	600.81	649.80
tblVehicleEF	LHD2	23.70	8.27
tblVehicleEF	LHD2	0.10	0.10

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tblVehicleEF	LHD2	1.09	1.08
tblVehicleEF	LHD2	0.45	0.20
tblVehicleEF	LHD2	1.2350e-003	1.3465e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	3.6900e-004	1.2415e-004
tblVehicleEF	LHD2	1.1820e-003	1.2883e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.6940e-003	2.6692e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	3.3900e-004	1.1415e-004
tblVehicleEF	LHD2	1.1520e-003	1.5019e-003
tblVehicleEF	LHD2	0.04	0.05
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	6.2000e-004	8.5367e-004
tblVehicleEF	LHD2	0.05	0.06
tblVehicleEF	LHD2	0.08	0.29
tblVehicleEF	LHD2	0.09	0.04
tblVehicleEF	LHD2	1.3800e-004	1.3377e-004
tblVehicleEF	LHD2	5.8420e-003	6.2769e-003
tblVehicleEF	LHD2	2.5600e-004	8.1841e-005
tblVehicleEF	LHD2	1.1520e-003	1.5019e-003
tblVehicleEF	LHD2	0.04	0.05
tblVehicleEF	LHD2	0.02	0.02

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tblVehicleEF	LHD2	6.2000e-004	8.5367e-004
tblVehicleEF	LHD2	0.06	0.06
tblVehicleEF	LHD2	0.08	0.29
tblVehicleEF	LHD2	0.10	0.05
tblVehicleEF	MCY	0.44	0.34
tblVehicleEF	MCY	0.16	0.24
tblVehicleEF	MCY	19.74	18.80
tblVehicleEF	MCY	9.96	8.64
tblVehicleEF	MCY	169.37	213.49
tblVehicleEF	MCY	45.59	60.09
tblVehicleEF	MCY	1.15	1.13
tblVehicleEF	MCY	0.31	0.26
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003
tblVehicleEF	MCY	1.9350e-003	2.0823e-003
tblVehicleEF	MCY	3.3460e-003	2.7595e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003
tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	1.8090e-003	1.9452e-003
tblVehicleEF	MCY	3.1480e-003	2.5918e-003
tblVehicleEF	MCY	1.44	1.42
tblVehicleEF	MCY	0.81	0.78
tblVehicleEF	MCY	0.79	0.77
tblVehicleEF	MCY	2.20	2.34
tblVehicleEF	MCY	0.47	1.77

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tblVehicleEF	MCY	2.13	1.82
tblVehicleEF	MCY	2.0800e-003	2.1126e-003
tblVehicleEF	MCY	6.8100e-004	5.9462e-004
tblVehicleEF	MCY	1.44	1.42
tblVehicleEF	MCY	0.81	0.78
tblVehicleEF	MCY	0.79	0.77
tblVehicleEF	MCY	2.72	2.90
tblVehicleEF	MCY	0.47	1.77
tblVehicleEF	MCY	2.32	1.99
tblVehicleEF	MCY	0.43	0.34
tblVehicleEF	MCY	0.13	0.21
tblVehicleEF	MCY	19.87	18.83
tblVehicleEF	MCY	9.04	7.91
tblVehicleEF	MCY	169.37	213.40
tblVehicleEF	MCY	45.59	58.20
tblVehicleEF	MCY	0.98	0.97
tblVehicleEF	MCY	0.29	0.25
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003
tblVehicleEF	MCY	1.9350e-003	2.0823e-003
tblVehicleEF	MCY	3.3460e-003	2.7595e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003
tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	1.8090e-003	1.9452e-003
tblVehicleEF	MCY	3.1480e-003	2.5918e-003

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tblVehicleEF	MCY	3.11	2.77
tblVehicleEF	MCY	1.24	1.10
tblVehicleEF	MCY	2.09	1.75
tblVehicleEF	MCY	2.15	2.30
tblVehicleEF	MCY	0.47	1.74
tblVehicleEF	MCY	1.84	1.60
tblVehicleEF	MCY	2.0800e-003	2.1118e-003
tblVehicleEF	MCY	6.5700e-004	5.7593e-004
tblVehicleEF	MCY	3.11	2.77
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tblVehicleEF	MCY	2.09	1.75
tblVehicleEF	MCY	2.66	2.85
tblVehicleEF	MCY	0.47	1.74
tblVehicleEF	MCY	2.00	1.75
tblVehicleEF	MCY	0.43	0.34
tblVehicleEF	MCY	0.15	0.24
tblVehicleEF	MCY	18.88	18.32
tblVehicleEF	MCY	9.60	8.48
tblVehicleEF	MCY	169.37	212.66
tblVehicleEF	MCY	45.59	59.76
tblVehicleEF	MCY	1.11	1.09
tblVehicleEF	MCY	0.31	0.26
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003
tblVehicleEF	MCY	1.9350e-003	2.0823e-003

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tblVehicleEF	MCY	3.3460e-003	2.7595e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003
tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	1.8090e-003	1.9452e-003
tblVehicleEF	MCY	3.1480e-003	2.5918e-003
tblVehicleEF	MCY	1.69	1.57
tblVehicleEF	MCY	1.09	1.04
tblVehicleEF	MCY	0.70	0.73
tblVehicleEF	MCY	2.17	2.32
tblVehicleEF	MCY	0.53	2.02
tblVehicleEF	MCY	2.06	1.80
tblVehicleEF	MCY	2.0660e-003	2.1044e-003
tblVehicleEF	MCY	6.7300e-004	5.9133e-004
tblVehicleEF	MCY	1.69	1.57
tblVehicleEF	MCY	1.09	1.04
tblVehicleEF	MCY	0.70	0.73
tblVehicleEF	MCY	2.68	2.88
tblVehicleEF	MCY	0.53	2.02
tblVehicleEF	MCY	2.24	1.96
tblVehicleEF	MDV	0.01	4.3912e-003
tblVehicleEF	MDV	0.02	0.07
tblVehicleEF	MDV	1.13	0.95
tblVehicleEF	MDV	2.68	2.91
tblVehicleEF	MDV	455.56	394.71
tblVehicleEF	MDV	101.88	82.36

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tblVehicleEF	MDV	0.14	0.08
tblVehicleEF	MDV	0.26	0.32
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	1.7950e-003	1.5664e-003
tblVehicleEF	MDV	2.4230e-003	1.8283e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	1.6540e-003	1.4442e-003
tblVehicleEF	MDV	2.2280e-003	1.6811e-003
tblVehicleEF	MDV	0.09	0.11
tblVehicleEF	MDV	0.19	0.16
tblVehicleEF	MDV	0.08	0.10
tblVehicleEF	MDV	0.03	0.02
tblVehicleEF	MDV	0.11	0.47
tblVehicleEF	MDV	0.20	0.36
tblVehicleEF	MDV	4.5620e-003	3.8247e-003
tblVehicleEF	MDV	1.0660e-003	7.9846e-004
tblVehicleEF	MDV	0.09	0.11
tblVehicleEF	MDV	0.19	0.16
tblVehicleEF	MDV	0.08	0.10
tblVehicleEF	MDV	0.04	0.03
tblVehicleEF	MDV	0.11	0.47
tblVehicleEF	MDV	0.22	0.40
tblVehicleEF	MDV	0.01	4.9455e-003

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tblVehicleEF	MDV	0.01	0.06
tblVehicleEF	MDV	1.38	1.14
tblVehicleEF	MDV	2.22	2.44
tblVehicleEF	MDV	495.92	416.48
tblVehicleEF	MDV	101.88	81.42
tblVehicleEF	MDV	0.13	0.07
tblVehicleEF	MDV	0.24	0.29
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	1.7950e-003	1.5664e-003
tblVehicleEF	MDV	2.4230e-003	1.8283e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	1.6540e-003	1.4442e-003
tblVehicleEF	MDV	2.2280e-003	1.6811e-003
tblVehicleEF	MDV	0.19	0.20
tblVehicleEF	MDV	0.22	0.17
tblVehicleEF	MDV	0.17	0.18
tblVehicleEF	MDV	0.03	0.02
tblVehicleEF	MDV	0.11	0.46
tblVehicleEF	MDV	0.17	0.31
tblVehicleEF	MDV	4.9690e-003	4.0358e-003
tblVehicleEF	MDV	1.0570e-003	7.8939e-004
tblVehicleEF	MDV	0.19	0.20
tblVehicleEF	MDV	0.22	0.17

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tblVehicleEF	MDV	0.17	0.18
tblVehicleEF	MDV	0.04	0.03
tblVehicleEF	MDV	0.11	0.46
tblVehicleEF	MDV	0.19	0.34
tblVehicleEF	MDV	0.01	4.3013e-003
tblVehicleEF	MDV	0.01	0.07
tblVehicleEF	MDV	1.07	0.91
tblVehicleEF	MDV	2.64	2.92
tblVehicleEF	MDV	446.15	390.65
tblVehicleEF	MDV	101.88	82.38
tblVehicleEF	MDV	0.13	0.08
tblVehicleEF	MDV	0.26	0.31
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	1.7950e-003	1.5664e-003
tblVehicleEF	MDV	2.4230e-003	1.8283e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	1.6540e-003	1.4442e-003
tblVehicleEF	MDV	2.2280e-003	1.6811e-003
tblVehicleEF	MDV	0.09	0.10
tblVehicleEF	MDV	0.21	0.17
tblVehicleEF	MDV	0.08	0.09
tblVehicleEF	MDV	0.03	0.02
tblVehicleEF	MDV	0.12	0.54

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tblVehicleEF	MDV	0.20	0.36
tblVehicleEF	MDV	4.4680e-003	3.7853e-003
tblVehicleEF	MDV	1.0650e-003	7.9866e-004
tblVehicleEF	MDV	0.09	0.10
tblVehicleEF	MDV	0.21	0.17
tblVehicleEF	MDV	0.08	0.09
tblVehicleEF	MDV	0.04	0.03
tblVehicleEF	MDV	0.12	0.54
tblVehicleEF	MDV	0.22	0.40
tblVehicleEF	MH	0.03	9.0576e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	2.16	1.00
tblVehicleEF	MH	5.58	1.96
tblVehicleEF	MH	1,051.62	1,459.21
tblVehicleEF	MH	58.77	18.16
tblVehicleEF	MH	1.36	1.41
tblVehicleEF	MH	0.83	0.24
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	1.0410e-003	2.3041e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.2250e-003	3.2868e-003
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	9.5800e-004	2.1186e-004

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tblVehicleEF	MH	1.28	0.98
tblVehicleEF	MH	0.08	0.06
tblVehicleEF	MH	0.45	0.38
tblVehicleEF	MH	0.08	0.06
tblVehicleEF	MH	0.03	1.31
tblVehicleEF	MH	0.32	0.09
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	6.8500e-004	1.7973e-004
tblVehicleEF	MH	1.28	0.98
tblVehicleEF	MH	0.08	0.06
tblVehicleEF	MH	0.45	0.38
tblVehicleEF	MH	0.11	0.08
tblVehicleEF	MH	0.03	1.31
tblVehicleEF	MH	0.35	0.10
tblVehicleEF	MH	0.03	9.2608e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	2.24	1.02
tblVehicleEF	MH	5.08	1.82
tblVehicleEF	MH	1,051.62	1,459.25
tblVehicleEF	MH	58.77	17.93
tblVehicleEF	MH	1.24	1.31
tblVehicleEF	MH	0.79	0.23
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.03	0.03

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tblVehicleEF	MH	1.0410e-003	2.3041e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.2250e-003	3.2868e-003
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	9.5800e-004	2.1186e-004
tblVehicleEF	MH	2.51	1.74
tblVehicleEF	MH	0.09	0.07
tblVehicleEF	MH	1.05	0.73
tblVehicleEF	MH	0.08	0.06
tblVehicleEF	MH	0.03	1.30
tblVehicleEF	MH	0.30	0.09
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	6.7600e-004	1.7744e-004
tblVehicleEF	MH	2.51	1.74
tblVehicleEF	MH	0.09	0.07
tblVehicleEF	MH	1.05	0.73
tblVehicleEF	MH	0.12	0.08
tblVehicleEF	MH	0.03	1.30
tblVehicleEF	MH	0.33	0.09
tblVehicleEF	MH	0.03	9.0626e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	2.17	1.00
tblVehicleEF	MH	5.52	1.96
tblVehicleEF	MH	1,051.62	1,459.21
tblVehicleEF	MH	58.77	18.17

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tblVehicleEF	MH	1.33	1.38
tblVehicleEF	MH	0.82	0.24
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	1.0410e-003	2.3041e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.2250e-003	3.2868e-003
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	9.5800e-004	2.1186e-004
tblVehicleEF	MH	1.50	1.06
tblVehicleEF	MH	0.10	0.07
tblVehicleEF	MH	0.46	0.39
tblVehicleEF	MH	0.08	0.06
tblVehicleEF	MH	0.03	1.38
tblVehicleEF	MH	0.32	0.09
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	6.8400e-004	1.7980e-004
tblVehicleEF	MH	1.50	1.06
tblVehicleEF	MH	0.10	0.07
tblVehicleEF	MH	0.46	0.39
tblVehicleEF	MH	0.11	0.08
tblVehicleEF	MH	0.03	1.38
tblVehicleEF	MH	0.35	0.10
tblVehicleEF	MHD	0.02	2.3961e-003

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tblVehicleEF	MHD	2.6000e-003	9.5913e-004
tblVehicleEF	MHD	0.04	5.9112e-003
tblVehicleEF	MHD	0.30	0.31
tblVehicleEF	MHD	0.23	0.14
tblVehicleEF	MHD	4.34	0.65
tblVehicleEF	MHD	155.87	63.89
tblVehicleEF	MHD	1,101.40	932.72
tblVehicleEF	MHD	50.42	5.97
tblVehicleEF	MHD	0.42	0.35
tblVehicleEF	MHD	0.64	1.08
tblVehicleEF	MHD	12.05	1.86
tblVehicleEF	MHD	1.0400e-004	2.8538e-004
tblVehicleEF	MHD	0.13	0.13
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	2.7700e-003	6.8459e-003
tblVehicleEF	MHD	6.8900e-004	6.8489e-005
tblVehicleEF	MHD	9.9000e-005	2.7304e-004
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.0000e-003	3.0000e-003
tblVehicleEF	MHD	2.6470e-003	6.5468e-003
tblVehicleEF	MHD	6.3400e-004	6.2973e-005
tblVehicleEF	MHD	1.0590e-003	3.7575e-004
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.02	0.01
tblVehicleEF	MHD	5.6000e-004	2.0705e-004

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tblVehicleEF	MHD	0.03	0.01
tblVehicleEF	MHD	0.01	0.07
tblVehicleEF	MHD	0.27	0.03
tblVehicleEF	MHD	1.4970e-003	6.0553e-004
tblVehicleEF	MHD	0.01	8.8645e-003
tblVehicleEF	MHD	5.8000e-004	5.9031e-005
tblVehicleEF	MHD	1.0590e-003	3.7575e-004
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	5.6000e-004	2.0705e-004
tblVehicleEF	MHD	0.03	0.01
tblVehicleEF	MHD	0.01	0.07
tblVehicleEF	MHD	0.29	0.03
tblVehicleEF	MHD	0.01	2.2875e-003
tblVehicleEF	MHD	2.6390e-003	9.7539e-004
tblVehicleEF	MHD	0.04	5.6788e-003
tblVehicleEF	MHD	0.22	0.27
tblVehicleEF	MHD	0.23	0.14
tblVehicleEF	MHD	4.06	0.62
tblVehicleEF	MHD	165.10	63.62
tblVehicleEF	MHD	1,101.40	932.72
tblVehicleEF	MHD	50.42	5.90
tblVehicleEF	MHD	0.44	0.35
tblVehicleEF	MHD	0.60	1.01
tblVehicleEF	MHD	12.02	1.86

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tblVehicleEF	MHD	8.7000e-005	2.4356e-004
tblVehicleEF	MHD	0.13	0.13
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	2.7700e-003	6.8459e-003
tblVehicleEF	MHD	6.8900e-004	6.8489e-005
tblVehicleEF	MHD	8.4000e-005	2.3302e-004
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.0000e-003	3.0000e-003
tblVehicleEF	MHD	2.6470e-003	6.5468e-003
tblVehicleEF	MHD	6.3400e-004	6.2973e-005
tblVehicleEF	MHD	2.0770e-003	6.8378e-004
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.02	0.01
tblVehicleEF	MHD	1.2630e-003	4.0503e-004
tblVehicleEF	MHD	0.03	0.01
tblVehicleEF	MHD	0.01	0.07
tblVehicleEF	MHD	0.25	0.03
tblVehicleEF	MHD	1.5840e-003	6.0307e-004
tblVehicleEF	MHD	0.01	8.8645e-003
tblVehicleEF	MHD	5.7500e-004	5.8413e-005
tblVehicleEF	MHD	2.0770e-003	6.8378e-004
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	1.2630e-003	4.0503e-004
tblVehicleEF	MHD	0.03	0.01

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tblVehicleEF	MHD	0.01	0.07
tblVehicleEF	MHD	0.28	0.03
tblVehicleEF	MHD	0.02	2.5564e-003
tblVehicleEF	MHD	2.6040e-003	9.5905e-004
tblVehicleEF	MHD	0.04	5.8670e-003
tblVehicleEF	MHD	0.41	0.36
tblVehicleEF	MHD	0.23	0.14
tblVehicleEF	MHD	4.27	0.65
tblVehicleEF	MHD	143.11	64.26
tblVehicleEF	MHD	1,101.40	932.72
tblVehicleEF	MHD	50.42	5.96
tblVehicleEF	MHD	0.40	0.37
tblVehicleEF	MHD	0.63	1.06
tblVehicleEF	MHD	12.04	1.86
tblVehicleEF	MHD	1.2600e-004	3.4313e-004
tblVehicleEF	MHD	0.13	0.13
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	2.7700e-003	6.8459e-003
tblVehicleEF	MHD	6.8900e-004	6.8489e-005
tblVehicleEF	MHD	1.2100e-004	3.2829e-004
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.0000e-003	3.0000e-003
tblVehicleEF	MHD	2.6470e-003	6.5468e-003
tblVehicleEF	MHD	6.3400e-004	6.2973e-005
tblVehicleEF	MHD	1.1160e-003	3.8027e-004

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tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.02	0.01
tblVehicleEF	MHD	5.4700e-004	2.0877e-004
tblVehicleEF	MHD	0.03	0.01
tblVehicleEF	MHD	0.02	0.08
tblVehicleEF	MHD	0.26	0.03
tblVehicleEF	MHD	1.3770e-003	6.0888e-004
tblVehicleEF	MHD	0.01	8.8645e-003
tblVehicleEF	MHD	5.7900e-004	5.8945e-005
tblVehicleEF	MHD	1.1160e-003	3.8027e-004
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	5.4700e-004	2.0877e-004
tblVehicleEF	MHD	0.03	0.01
tblVehicleEF	MHD	0.02	0.08
tblVehicleEF	MHD	0.29	0.03
tblVehicleEF	OBUS	0.01	8.6570e-003
tblVehicleEF	OBUS	7.2410e-003	4.7733e-003
tblVehicleEF	OBUS	0.03	0.02
tblVehicleEF	OBUS	0.24	0.54
tblVehicleEF	OBUS	0.47	0.58
tblVehicleEF	OBUS	5.59	2.33
tblVehicleEF	OBUS	65.08	74.10
tblVehicleEF	OBUS	1,122.26	1,367.42
tblVehicleEF	OBUS	70.20	19.84

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tblVehicleEF	OBUS	0.12	0.27
tblVehicleEF	OBUS	0.45	1.00
tblVehicleEF	OBUS	1.81	0.74
tblVehicleEF	OBUS	1.1000e-005	9.2233e-005
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	1.9630e-003	6.6254e-003
tblVehicleEF	OBUS	9.4500e-004	2.2194e-004
tblVehicleEF	OBUS	1.1000e-005	8.8243e-005
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	3.0000e-003	3.0000e-003
tblVehicleEF	OBUS	1.8550e-003	6.3206e-003
tblVehicleEF	OBUS	8.6900e-004	2.0406e-004
tblVehicleEF	OBUS	1.9890e-003	2.5726e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.03	0.05
tblVehicleEF	OBUS	8.6300e-004	1.1214e-003
tblVehicleEF	OBUS	0.03	0.03
tblVehicleEF	OBUS	0.05	0.29
tblVehicleEF	OBUS	0.34	0.11
tblVehicleEF	OBUS	6.3300e-004	7.0653e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	8.0000e-004	1.9629e-004
tblVehicleEF	OBUS	1.9890e-003	2.5726e-003
tblVehicleEF	OBUS	0.02	0.02

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tblVehicleEF	OBUS	0.04	0.06
tblVehicleEF	OBUS	8.6300e-004	1.1214e-003
tblVehicleEF	OBUS	0.04	0.04
tblVehicleEF	OBUS	0.05	0.29
tblVehicleEF	OBUS	0.38	0.12
tblVehicleEF	OBUS	0.01	8.7351e-003
tblVehicleEF	OBUS	7.4380e-003	4.8889e-003
tblVehicleEF	OBUS	0.03	0.02
tblVehicleEF	OBUS	0.24	0.53
tblVehicleEF	OBUS	0.49	0.59
tblVehicleEF	OBUS	5.12	2.17
tblVehicleEF	OBUS	67.92	73.30
tblVehicleEF	OBUS	1,122.26	1,367.44
tblVehicleEF	OBUS	70.20	19.56
tblVehicleEF	OBUS	0.13	0.26
tblVehicleEF	OBUS	0.41	0.93
tblVehicleEF	OBUS	1.76	0.73
tblVehicleEF	OBUS	9.0000e-006	8.1955e-005
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	1.9630e-003	6.6254e-003
tblVehicleEF	OBUS	9.4500e-004	2.2194e-004
tblVehicleEF	OBUS	9.0000e-006	7.8410e-005
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	3.0000e-003	3.0000e-003

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tblVehicleEF	OBUS	1.8550e-003	6.3206e-003
tblVehicleEF	OBUS	8.6900e-004	2.0406e-004
tblVehicleEF	OBUS	3.8500e-003	4.6205e-003
tblVehicleEF	OBUS	0.02	0.03
tblVehicleEF	OBUS	0.03	0.05
tblVehicleEF	OBUS	1.9610e-003	2.1940e-003
tblVehicleEF	OBUS	0.03	0.03
tblVehicleEF	OBUS	0.05	0.29
tblVehicleEF	OBUS	0.32	0.11
tblVehicleEF	OBUS	6.6000e-004	6.9892e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	7.9200e-004	1.9358e-004
tblVehicleEF	OBUS	3.8500e-003	4.6205e-003
tblVehicleEF	OBUS	0.02	0.03
tblVehicleEF	OBUS	0.04	0.07
tblVehicleEF	OBUS	1.9610e-003	2.1940e-003
tblVehicleEF	OBUS	0.04	0.04
tblVehicleEF	OBUS	0.05	0.29
tblVehicleEF	OBUS	0.36	0.12
tblVehicleEF	OBUS	0.01	8.5819e-003
tblVehicleEF	OBUS	7.2610e-003	4.7769e-003
tblVehicleEF	OBUS	0.03	0.02
tblVehicleEF	OBUS	0.25	0.54
tblVehicleEF	OBUS	0.48	0.58
tblVehicleEF	OBUS	5.55	2.33

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tblVehicleEF	OBUS	61.15	75.21
tblVehicleEF	OBUS	1,122.26	1,367.42
tblVehicleEF	OBUS	70.20	19.84
tblVehicleEF	OBUS	0.12	0.29
tblVehicleEF	OBUS	0.44	0.98
tblVehicleEF	OBUS	1.79	0.74
tblVehicleEF	OBUS	1.4000e-005	1.0643e-004
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	1.9630e-003	6.6254e-003
tblVehicleEF	OBUS	9.4500e-004	2.2194e-004
tblVehicleEF	OBUS	1.3000e-005	1.0182e-004
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	3.0000e-003	3.0000e-003
tblVehicleEF	OBUS	1.8550e-003	6.3206e-003
tblVehicleEF	OBUS	8.6900e-004	2.0406e-004
tblVehicleEF	OBUS	2.0720e-003	2.6685e-003
tblVehicleEF	OBUS	0.02	0.03
tblVehicleEF	OBUS	0.03	0.05
tblVehicleEF	OBUS	8.6200e-004	1.1635e-003
tblVehicleEF	OBUS	0.03	0.03
tblVehicleEF	OBUS	0.05	0.31
tblVehicleEF	OBUS	0.34	0.11
tblVehicleEF	OBUS	5.9600e-004	7.1703e-004
tblVehicleEF	OBUS	0.01	0.01

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tblVehicleEF	OBUS	7.9900e-004	1.9638e-004
tblVehicleEF	OBUS	2.0720e-003	2.6685e-003
tblVehicleEF	OBUS	0.02	0.03
tblVehicleEF	OBUS	0.04	0.06
tblVehicleEF	OBUS	8.6200e-004	1.1635e-003
tblVehicleEF	OBUS	0.04	0.04
tblVehicleEF	OBUS	0.05	0.31
tblVehicleEF	OBUS	0.38	0.12
tblVehicleEF	SBUS	0.83	0.06
tblVehicleEF	SBUS	9.2120e-003	7.3441e-003
tblVehicleEF	SBUS	0.06	6.3239e-003
tblVehicleEF	SBUS	5.90	2.63
tblVehicleEF	SBUS	0.56	0.68
tblVehicleEF	SBUS	5.13	0.82
tblVehicleEF	SBUS	1,231.15	341.25
tblVehicleEF	SBUS	1,120.79	1,083.10
tblVehicleEF	SBUS	39.22	4.88
tblVehicleEF	SBUS	10.14	3.05
tblVehicleEF	SBUS	3.99	4.60
tblVehicleEF	SBUS	14.61	1.04
tblVehicleEF	SBUS	9.1600e-003	3.4684e-003
tblVehicleEF	SBUS	0.74	0.74
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	5.6800e-004	4.0441e-005

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tblVehicleEF	SBUS	8.7640e-003	3.3184e-003
tblVehicleEF	SBUS	0.32	0.32
tblVehicleEF	SBUS	2.7400e-003	2.6958e-003
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	5.2200e-004	3.7184e-005
tblVehicleEF	SBUS	2.9390e-003	1.1929e-003
tblVehicleEF	SBUS	0.02	9.3021e-003
tblVehicleEF	SBUS	0.70	0.29
tblVehicleEF	SBUS	1.3780e-003	6.0617e-004
tblVehicleEF	SBUS	0.10	0.09
tblVehicleEF	SBUS	9.1030e-003	0.05
tblVehicleEF	SBUS	0.27	0.04
tblVehicleEF	SBUS	0.01	3.2535e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	4.8100e-004	4.8273e-005
tblVehicleEF	SBUS	2.9390e-003	1.1929e-003
tblVehicleEF	SBUS	0.02	9.3021e-003
tblVehicleEF	SBUS	1.00	0.42
tblVehicleEF	SBUS	1.3780e-003	6.0617e-004
tblVehicleEF	SBUS	0.12	0.11
tblVehicleEF	SBUS	9.1030e-003	0.05
tblVehicleEF	SBUS	0.29	0.04
tblVehicleEF	SBUS	0.83	0.06
tblVehicleEF	SBUS	9.3730e-003	7.4544e-003
tblVehicleEF	SBUS	0.05	5.2953e-003

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tblVehicleEF	SBUS	5.77	2.60
tblVehicleEF	SBUS	0.57	0.69
tblVehicleEF	SBUS	3.51	0.59
tblVehicleEF	SBUS	1,292.80	347.80
tblVehicleEF	SBUS	1,120.79	1,083.12
tblVehicleEF	SBUS	39.22	4.50
tblVehicleEF	SBUS	10.46	3.11
tblVehicleEF	SBUS	3.74	4.32
tblVehicleEF	SBUS	14.58	1.04
tblVehicleEF	SBUS	7.7220e-003	2.9321e-003
tblVehicleEF	SBUS	0.74	0.74
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	5.6800e-004	4.0441e-005
tblVehicleEF	SBUS	7.3880e-003	2.8053e-003
tblVehicleEF	SBUS	0.32	0.32
tblVehicleEF	SBUS	2.7400e-003	2.6958e-003
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	5.2200e-004	3.7184e-005
tblVehicleEF	SBUS	5.5960e-003	2.1200e-003
tblVehicleEF	SBUS	0.02	9.6252e-003
tblVehicleEF	SBUS	0.70	0.29
tblVehicleEF	SBUS	2.9710e-003	1.1273e-003
tblVehicleEF	SBUS	0.10	0.09
tblVehicleEF	SBUS	8.3110e-003	0.05

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tblVehicleEF	SBUS	0.22	0.03
tblVehicleEF	SBUS	0.01	3.3153e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	4.5400e-004	4.4524e-005
tblVehicleEF	SBUS	5.5960e-003	2.1200e-003
tblVehicleEF	SBUS	0.02	9.6252e-003
tblVehicleEF	SBUS	1.00	0.42
tblVehicleEF	SBUS	2.9710e-003	1.1273e-003
tblVehicleEF	SBUS	0.12	0.11
tblVehicleEF	SBUS	8.3110e-003	0.05
tblVehicleEF	SBUS	0.24	0.03
tblVehicleEF	SBUS	0.83	0.06
tblVehicleEF	SBUS	9.2160e-003	7.3373e-003
tblVehicleEF	SBUS	0.06	6.5157e-003
tblVehicleEF	SBUS	6.08	2.68
tblVehicleEF	SBUS	0.56	0.67
tblVehicleEF	SBUS	5.17	0.86
tblVehicleEF	SBUS	1,146.01	332.21
tblVehicleEF	SBUS	1,120.79	1,083.10
tblVehicleEF	SBUS	39.22	4.94
tblVehicleEF	SBUS	9.69	2.98
tblVehicleEF	SBUS	3.93	4.53
tblVehicleEF	SBUS	14.61	1.04
tblVehicleEF	SBUS	0.01	4.2090e-003
tblVehicleEF	SBUS	0.74	0.74

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tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	5.6800e-004	4.0441e-005
tblVehicleEF	SBUS	0.01	4.0269e-003
tblVehicleEF	SBUS	0.32	0.32
tblVehicleEF	SBUS	2.7400e-003	2.6958e-003
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	5.2200e-004	3.7184e-005
tblVehicleEF	SBUS	2.8670e-003	1.0983e-003
tblVehicleEF	SBUS	0.02	9.4928e-003
tblVehicleEF	SBUS	0.70	0.29
tblVehicleEF	SBUS	1.3540e-003	6.0998e-004
tblVehicleEF	SBUS	0.10	0.09
tblVehicleEF	SBUS	0.01	0.06
tblVehicleEF	SBUS	0.27	0.04
tblVehicleEF	SBUS	0.01	3.1681e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	4.8200e-004	4.8891e-005
tblVehicleEF	SBUS	2.8670e-003	1.0983e-003
tblVehicleEF	SBUS	0.02	9.4928e-003
tblVehicleEF	SBUS	1.01	0.42
tblVehicleEF	SBUS	1.3540e-003	6.0998e-004
tblVehicleEF	SBUS	0.12	0.11
tblVehicleEF	SBUS	0.01	0.06
tblVehicleEF	SBUS	0.30	0.04

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tblVehicleEF	UBUS	1.62	4.47
tblVehicleEF	UBUS	0.08	8.1159e-003
tblVehicleEF	UBUS	8.33	34.91
tblVehicleEF	UBUS	13.39	0.88
tblVehicleEF	UBUS	1,818.42	1,682.81
tblVehicleEF	UBUS	138.62	11.11
tblVehicleEF	UBUS	4.85	0.36
tblVehicleEF	UBUS	13.25	0.11
tblVehicleEF	UBUS	0.51	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.05	2.6981e-003
tblVehicleEF	UBUS	1.4450e-003	1.7436e-004
tblVehicleEF	UBUS	0.22	0.03
tblVehicleEF	UBUS	3.0000e-003	6.6215e-003
tblVehicleEF	UBUS	0.05	2.5669e-003
tblVehicleEF	UBUS	1.3280e-003	1.6032e-004
tblVehicleEF	UBUS	7.4710e-003	1.3306e-003
tblVehicleEF	UBUS	0.10	6.4588e-003
tblVehicleEF	UBUS	3.6930e-003	5.6077e-004
tblVehicleEF	UBUS	0.49	0.07
tblVehicleEF	UBUS	0.02	0.02
tblVehicleEF	UBUS	1.10	0.03
tblVehicleEF	UBUS	9.7450e-003	2.8420e-003
tblVehicleEF	UBUS	1.6300e-003	1.0991e-004
tblVehicleEF	UBUS	7.4710e-003	1.3306e-003

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tblVehicleEF	UBUS	0.10	6.4588e-003
tblVehicleEF	UBUS	3.6930e-003	5.6077e-004
tblVehicleEF	UBUS	2.17	4.57
tblVehicleEF	UBUS	0.02	0.02
tblVehicleEF	UBUS	1.20	0.03
tblVehicleEF	UBUS	1.63	4.47
tblVehicleEF	UBUS	0.07	7.3605e-003
tblVehicleEF	UBUS	8.41	34.91
tblVehicleEF	UBUS	11.00	0.75
tblVehicleEF	UBUS	1,818.42	1,682.82
tblVehicleEF	UBUS	138.62	10.89
tblVehicleEF	UBUS	4.50	0.35
tblVehicleEF	UBUS	13.14	0.11
tblVehicleEF	UBUS	0.51	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.05	2.6981e-003
tblVehicleEF	UBUS	1.4450e-003	1.7436e-004
tblVehicleEF	UBUS	0.22	0.03
tblVehicleEF	UBUS	3.0000e-003	6.6215e-003
tblVehicleEF	UBUS	0.05	2.5669e-003
tblVehicleEF	UBUS	1.3280e-003	1.6032e-004
tblVehicleEF	UBUS	0.01	2.4604e-003
tblVehicleEF	UBUS	0.13	8.0066e-003
tblVehicleEF	UBUS	8.6540e-003	1.1780e-003
tblVehicleEF	UBUS	0.50	0.07

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tblVehicleEF	UBUS	0.02	0.02
tblVehicleEF	UBUS	0.98	0.03
tblVehicleEF	UBUS	9.7470e-003	2.8420e-003
tblVehicleEF	UBUS	1.5890e-003	1.0780e-004
tblVehicleEF	UBUS	0.01	2.4604e-003
tblVehicleEF	UBUS	0.13	8.0066e-003
tblVehicleEF	UBUS	8.6540e-003	1.1780e-003
tblVehicleEF	UBUS	2.18	4.57
tblVehicleEF	UBUS	0.02	0.02
tblVehicleEF	UBUS	1.07	0.03
tblVehicleEF	UBUS	1.62	4.47
tblVehicleEF	UBUS	0.08	8.1886e-003
tblVehicleEF	UBUS	8.34	34.91
tblVehicleEF	UBUS	12.95	0.89
tblVehicleEF	UBUS	1,818.42	1,682.81
tblVehicleEF	UBUS	138.62	11.13
tblVehicleEF	UBUS	4.76	0.36
tblVehicleEF	UBUS	13.23	0.11
tblVehicleEF	UBUS	0.51	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.05	2.6981e-003
tblVehicleEF	UBUS	1.4450e-003	1.7436e-004
tblVehicleEF	UBUS	0.22	0.03
tblVehicleEF	UBUS	3.0000e-003	6.6215e-003
tblVehicleEF	UBUS	0.05	2.5669e-003

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tblVehicleEF	UBUS	1.3280e-003	1.6032e-004
tblVehicleEF	UBUS	8.4070e-003	1.3979e-003
tblVehicleEF	UBUS	0.13	7.4722e-003
tblVehicleEF	UBUS	3.8160e-003	5.7194e-004
tblVehicleEF	UBUS	0.49	0.07
tblVehicleEF	UBUS	0.03	0.02
tblVehicleEF	UBUS	1.08	0.03
tblVehicleEF	UBUS	9.7460e-003	2.8420e-003
tblVehicleEF	UBUS	1.6230e-003	1.1012e-004
tblVehicleEF	UBUS	8.4070e-003	1.3979e-003
tblVehicleEF	UBUS	0.13	7.4722e-003
tblVehicleEF	UBUS	3.8160e-003	5.7194e-004
tblVehicleEF	UBUS	2.17	4.57
tblVehicleEF	UBUS	0.03	0.02
tblVehicleEF	UBUS	1.18	0.03
tblVehicleTrips	WD_TR	15.43	4.13
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	IndoorWaterUseRate	2,656,117.62	1,717,745.64
tblWater	OutdoorWaterUseRate	6,830,016.73	2,687,430.73
tblWater	SepticTankPercent	10.33	0.00

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2.0 Emissions Summary

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	0.4087	6.0000e-005	6.7800e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.0132	0.0132	3.0000e-005	0.0000	0.0141
Energy	4.2900e-003	0.0390	0.0328	2.3000e-004		2.9700e-003	2.9700e-003		2.9700e-003	2.9700e-003	0.0000	203.3655	203.3655	9.5900e-003	2.6000e-003	204.3787
Mobile	0.1108	0.0978	1.0833	2.8600e-003	0.3474	1.8500e-003	0.3492	0.0923	1.7000e-003	0.0940	0.0000	268.6470	268.6470	0.0104	0.0000	268.9070
Waste						0.0000	0.0000		0.0000	0.0000	24.1722	0.0000	24.1722	1.4285	0.0000	59.8855
Water						0.0000	0.0000		0.0000	0.0000	0.6077	12.5890	13.1967	2.7800e-003	1.4600e-003	13.7024
Total	**0.5238**	**0.1369**	**1.1228**	**3.0900e-003**	**0.3474**	**4.8400e-003**	**0.3522**	**0.0923**	**4.6900e-003**	**0.0970**	**24.7799**	**484.6147**	**509.3946**	**1.4513**	**4.0600e-003**	**546.8877**

	ROG	**NOx**	**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**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

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4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive 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	0.1108	0.0978	1.0833	2.8600e-003	0.3474	1.8500e-003	0.3492	0.0923	1.7000e-003	0.0940	0.0000	268.6470	268.6470	0.0104	0.0000	268.9070
Unmitigated	0.1108	0.0978	1.0833	2.8600e-003	0.3474	1.8500e-003	0.3492	0.0923	1.7000e-003	0.0940	0.0000	268.6470	268.6470	0.0104	0.0000	268.9070

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Elementary School	378.31	0.00	0.00	931,282	931,282
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Total	378.31	0.00	0.00	931,282	931,282

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
Elementary School	16.60	8.40	6.90	65.00	30.00	5.00	63	25	12
Other Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Other Non-Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

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Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Elementary School	0.693229	0.043800	0.225557	0.020000	0.001390	0.000466	0.001811	0.006332	0.000000	0.000000	0.007413	0.000000	0.000000
Other Asphalt Surfaces	0.558745	0.035303	0.181800	0.111169	0.014289	0.004794	0.018611	0.065078	0.001365	0.001491	0.005725	0.000799	0.000830
Other Non-Asphalt Surfaces	0.558745	0.035303	0.181800	0.111169	0.014289	0.004794	0.018611	0.065078	0.001365	0.001491	0.005725	0.000799	0.000830
Parking Lot	0.558745	0.035303	0.181800	0.111169	0.014289	0.004794	0.018611	0.065078	0.001365	0.001491	0.005725	0.000799	0.000830

5.0 Energy Detail

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	160.8877	160.8877	8.7800e-003	1.8200e-003	161.6485
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	160.8877	160.8877	8.7800e-003	1.8200e-003	161.6485
NaturalGas Mitigated	4.2900e-003	0.0390	0.0328	2.3000e-004		2.9700e-003	2.9700e-003		2.9700e-003	2.9700e-003	0.0000	42.4778	42.4778	8.1000e-004	7.8000e-004	42.7302

NaturalGas Unmitigated	4.2900e-003	0.0390	0.0328	2.3000e-004		2.9700e-003	2.9700e-003		2.9700e-003	2.9700e-003	0.0000	42.4778	42.4778	8.1000e-004	7.8000e-004	42.7302

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					
Elementary School	796004	4.2900e-003	0.0390	0.0328	2.3000e-004		2.9700e-003	2.9700e-003		2.9700e-003	2.9700e-003	0.0000	42.4778	42.4778	8.1000e-004	7.8000e-004	42.7302
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**4.2900e-003**	**0.0390**	**0.0328**	**2.3000e-004**		**2.9700e-003**	**2.9700e-003**		**2.9700e-003**	**2.9700e-003**	**0.0000**	**42.4778**	**42.4778**	**8.1000e-004**	**7.8000e-004**	**42.7302**

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					
Elementary School	796004	4.2900e-003	0.0390	0.0328	2.3000e-004		2.9700e-003	2.9700e-003		2.9700e-003	2.9700e-003	0.0000	42.4778	42.4778	8.1000e-004	7.8000e-004	42.7302

Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**4.2900e-003**	**0.0390**	**0.0328**	**2.3000e-004**		**2.9700e-003**	**2.9700e-003**		**2.9700e-003**	**2.9700e-003**	**0.0000**	**42.4778**	**42.4778**	**8.1000e-004**	**7.8000e-004**	**42.7302**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Elementary School	641200	154.5658	8.4300e-003	1.7500e-003	155.2967
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	26225.5	6.3218	3.4000e-004	7.0000e-005	6.3517
Total		**160.8877**	**8.7700e-003**	**1.8200e-003**	**161.6485**

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	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Elementary School	641200	154.5658	8.4300e-003	1.7500e-003	155.2967
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	26225.5	6.3218	3.4000e-004	7.0000e-005	6.3517
Total		**160.8877**	**8.7700e-003**	**1.8200e-003**	**161.6485**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive 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	0.4087	6.0000e-005	6.7800e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.0132	0.0132	3.0000e-005	0.0000	0.0141
Unmitigated	0.4087	6.0000e-005	6.7800e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.0132	0.0132	3.0000e-005	0.0000	0.0141

6.2 Area by SubCategory

Unmitigated

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	ROG	NOx	CO	SO2	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	0.0486					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3595					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	6.3000e-004	6.0000e-005	6.7800e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.0132	0.0132	3.0000e-005	0.0000	0.0141
Total	**0.4087**	**6.0000e-005**	**6.7800e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0132**	**0.0132**	**3.0000e-005**	**0.0000**	**0.0141**

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	0.0486					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3595					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	6.3000e-004	6.0000e-005	6.7800e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.0132	0.0132	3.0000e-005	0.0000	0.0141
Total	**0.4087**	**6.0000e-005**	**6.7800e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0132**	**0.0132**	**3.0000e-005**	**0.0000**	**0.0141**

7.0 Water Detail

7.1 Mitigation Measures Water

CVUS-07 Project Run

San Bernardino-South Coast County, Annual

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	13.1967	2.7800e-003	1.4600e-003	13.7024
Unmitigated	13.1967	2.7800e-003	1.4600e-003	13.7024

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Elementary School	1.71775 / 2.68743	13.1967	2.7800e-003	1.4600e-003	13.7024
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**13.1967**	**2.7800e-003**	**1.4600e-003**	**13.7024**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e

CVUS-07 Project Run

San Bernardino-South Coast County, Annual

Land Use	Mgal	MT/yr			
Elementary School	1.71775 / 2.68743	13.1967	2.7800e-003	1.4600e-003	13.7024
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**13.1967**	**2.7800e-003**	**1.4600e-003**	**13.7024**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	24.1722	1.4285	0.0000	59.8855
Unmitigated	24.1722	1.4285	0.0000	59.8855

8.2 Waste by Land Use

Unmitigated

CVUS-07 Project Run

San Bernardino-South Coast County, Annual

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Elementary School	119.08	24.1722	1.4285	0.0000	59.8855
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**24.1722**	**1.4285**	**0.0000**	**59.8855**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Elementary School	119.08	24.1722	1.4285	0.0000	59.8855
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**24.1722**	**1.4285**	**0.0000**	**59.8855**

CVUS-07 Project Run

San Bernardino-South Coast County, Annual

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Elementary School	91.60	1000sqft	1.88	91,600.00	0
Other Asphalt Surfaces	182.16	1000sqft	4.18	182,160.00	0
Other Non-Asphalt Surfaces	183.77	1000sqft	4.22	183,770.00	0
Parking Lot	74.93	1000sqft	1.72	74,930.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	32
Climate Zone	10			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	531.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - SCE 2019 Sustainability Report, CO2 IF

Land Use - See Assumptions

Construction Phase - See Assumptions

Off-road Equipment -

Off-road Equipment - Haul Trucks Only

Trips and VMT - 2 water trucks for grading

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

Grading -

Architectural Coating - South Coast AQMD Rule 1113

Vehicle Trips - Adjusted to 100 Primary.

Vehicle Emission Factors - EMFAC2017 Web Database. See Assumptions

Vehicle Emission Factors - EMFAC2017 Web Database. See Assumptions.

Vehicle Emission Factors - EMFAC2017 Web Database. See Assumptions.

Energy Use - See Assumptions

Water And Wastewater - See Assumptions

Solid Waste - See Assumptions

Construction Off-road Equipment Mitigation - South Coast AQMD Rule 403 and Rule 1186 (cleaned paved road).

Energy Mitigation - See Assumptions

Fleet Mix - See Assumptions

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	9
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblEnergyUse	T24E	2.78	2.48
tblEnergyUse	T24NG	6.97	6.90
tblFleetMix	HHD	0.07	6.3320e-003
tblFleetMix	LDA	0.56	0.69
tblFleetMix	LDT1	0.04	0.04
tblFleetMix	LDT2	0.18	0.23
tblFleetMix	LHD1	0.01	1.3900e-003
tblFleetMix	LHD2	4.7940e-003	4.6600e-004
tblFleetMix	MCY	5.7250e-003	7.4130e-003

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

tblFleetMix	MDV	0.11	0.02
tblFleetMix	MH	8.3000e-004	0.00
tblFleetMix	MHD	0.02	1.8110e-003
tblFleetMix	OBUS	1.3650e-003	0.00
tblFleetMix	SBUS	7.9900e-004	0.00
tblFleetMix	UBUS	1.4910e-003	0.00
tblLandUse	LotAcreage	2.10	1.88
tblProjectCharacteristics	CO2IntensityFactor	702.44	531.44
tblVehicleEF	HHD	0.92	0.03
tblVehicleEF	HHD	0.04	0.13
tblVehicleEF	HHD	0.08	1.8032e-007
tblVehicleEF	HHD	2.21	6.39
tblVehicleEF	HHD	0.53	0.55
tblVehicleEF	HHD	1.68	3.3279e-003
tblVehicleEF	HHD	6,548.54	1,061.49
tblVehicleEF	HHD	1,428.49	1,386.62
tblVehicleEF	HHD	5.31	0.03
tblVehicleEF	HHD	18.65	5.46
tblVehicleEF	HHD	1.28	2.58
tblVehicleEF	HHD	20.21	2.40
tblVehicleEF	HHD	5.3430e-003	2.7891e-003
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	5.3010e-003	0.02
tblVehicleEF	HHD	4.7000e-005	6.8203e-007

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

tblVehicleEF	HHD	5.1120e-003	2.6685e-003
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8790e-003	8.8287e-003
tblVehicleEF	HHD	5.0720e-003	0.02
tblVehicleEF	HHD	4.3000e-005	6.2710e-007
tblVehicleEF	HHD	7.3000e-005	3.4870e-006
tblVehicleEF	HHD	2.7400e-003	1.1175e-004
tblVehicleEF	HHD	0.59	0.43
tblVehicleEF	HHD	4.5000e-005	2.0719e-006
tblVehicleEF	HHD	0.06	0.03
tblVehicleEF	HHD	1.7500e-004	5.5521e-004
tblVehicleEF	HHD	0.04	9.4709e-007
tblVehicleEF	HHD	0.06	9.7453e-003
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	8.1000e-005	2.8961e-007
tblVehicleEF	HHD	7.3000e-005	3.4870e-006
tblVehicleEF	HHD	2.7400e-003	1.1175e-004
tblVehicleEF	HHD	0.67	0.50
tblVehicleEF	HHD	4.5000e-005	2.0719e-006
tblVehicleEF	HHD	0.10	0.16
tblVehicleEF	HHD	1.7500e-004	5.5521e-004
tblVehicleEF	HHD	0.05	1.0369e-006
tblVehicleEF	HHD	0.87	0.03
tblVehicleEF	HHD	0.04	0.13
tblVehicleEF	HHD	0.08	1.7203e-007

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

tblVehicleEF	HHD	1.61	6.30
tblVehicleEF	HHD	0.53	0.55
tblVehicleEF	HHD	1.58	3.1419e-003
tblVehicleEF	HHD	6,937.59	1,049.59
tblVehicleEF	HHD	1,428.49	1,386.62
tblVehicleEF	HHD	5.31	0.03
tblVehicleEF	HHD	19.25	5.22
tblVehicleEF	HHD	1.20	2.44
tblVehicleEF	HHD	20.20	2.40
tblVehicleEF	HHD	4.5050e-003	2.4353e-003
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	5.3010e-003	0.02
tblVehicleEF	HHD	4.7000e-005	6.8203e-007
tblVehicleEF	HHD	4.3100e-003	2.3300e-003
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8790e-003	8.8287e-003
tblVehicleEF	HHD	5.0720e-003	0.02
tblVehicleEF	HHD	4.3000e-005	6.2710e-007
tblVehicleEF	HHD	1.4200e-004	6.8246e-006
tblVehicleEF	HHD	3.0590e-003	1.2683e-004
tblVehicleEF	HHD	0.55	0.45
tblVehicleEF	HHD	9.8000e-005	4.5555e-006
tblVehicleEF	HHD	0.06	0.03
tblVehicleEF	HHD	1.7700e-004	5.6915e-004

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

tblVehicleEF	HHD	0.04	9.0624e-007
tblVehicleEF	HHD	0.07	9.6317e-003
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	7.9000e-005	2.8669e-007
tblVehicleEF	HHD	1.4200e-004	6.8246e-006
tblVehicleEF	HHD	3.0590e-003	1.2683e-004
tblVehicleEF	HHD	0.64	0.52
tblVehicleEF	HHD	9.8000e-005	4.5555e-006
tblVehicleEF	HHD	0.10	0.16
tblVehicleEF	HHD	1.7700e-004	5.6915e-004
tblVehicleEF	HHD	0.04	9.9222e-007
tblVehicleEF	HHD	0.99	0.02
tblVehicleEF	HHD	0.04	9.0333e-004
tblVehicleEF	HHD	0.08	1.7930e-007
tblVehicleEF	HHD	3.05	6.37
tblVehicleEF	HHD	0.53	0.21
tblVehicleEF	HHD	1.66	3.3019e-003
tblVehicleEF	HHD	6,011.27	1,048.13
tblVehicleEF	HHD	1,428.49	1,299.09
tblVehicleEF	HHD	5.31	0.03
tblVehicleEF	HHD	17.82	5.62
tblVehicleEF	HHD	1.26	2.47
tblVehicleEF	HHD	20.21	2.40
tblVehicleEF	HHD	6.5010e-003	2.9592e-003
tblVehicleEF	HHD	0.06	0.06

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

tblVehicleEF	HHD	0.04	0.03
tblVehicleEF	HHD	5.3010e-003	0.02
tblVehicleEF	HHD	4.7000e-005	6.8203e-007
tblVehicleEF	HHD	6.2190e-003	2.8312e-003
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8790e-003	8.6012e-003
tblVehicleEF	HHD	5.0720e-003	0.02
tblVehicleEF	HHD	4.3000e-005	6.2710e-007
tblVehicleEF	HHD	7.1000e-005	3.6809e-006
tblVehicleEF	HHD	2.9460e-003	1.2966e-004
tblVehicleEF	HHD	0.63	0.39
tblVehicleEF	HHD	4.4000e-005	2.1988e-006
tblVehicleEF	HHD	0.06	0.02
tblVehicleEF	HHD	1.8900e-004	5.8280e-004
tblVehicleEF	HHD	0.04	9.4183e-007
tblVehicleEF	HHD	0.06	9.9022e-003
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	8.0000e-005	2.8920e-007
tblVehicleEF	HHD	7.1000e-005	3.6809e-006
tblVehicleEF	HHD	2.9460e-003	1.2966e-004
tblVehicleEF	HHD	0.73	0.45
tblVehicleEF	HHD	4.4000e-005	2.1988e-006
tblVehicleEF	HHD	0.10	0.02
tblVehicleEF	HHD	1.8900e-004	5.8280e-004
tblVehicleEF	HHD	0.05	1.0312e-006

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

tblVehicleEF	LDA	3.4870e-003	2.0138e-003
tblVehicleEF	LDA	4.3060e-003	0.04
tblVehicleEF	LDA	0.51	0.59
tblVehicleEF	LDA	0.99	1.98
tblVehicleEF	LDA	232.23	254.16
tblVehicleEF	LDA	52.85	51.55
tblVehicleEF	LDA	0.04	0.03
tblVehicleEF	LDA	0.06	0.16
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	8.0000e-003	8.0000e-003
tblVehicleEF	LDA	1.6390e-003	1.4255e-003
tblVehicleEF	LDA	2.2390e-003	1.7107e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	2.0000e-003	2.0000e-003
tblVehicleEF	LDA	1.5090e-003	1.3122e-003
tblVehicleEF	LDA	2.0590e-003	1.5729e-003
tblVehicleEF	LDA	0.04	0.05
tblVehicleEF	LDA	0.09	0.09
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	8.7420e-003	7.3557e-003
tblVehicleEF	LDA	0.03	0.20
tblVehicleEF	LDA	0.06	0.18
tblVehicleEF	LDA	2.3250e-003	2.4637e-003
tblVehicleEF	LDA	5.4500e-004	4.9981e-004
tblVehicleEF	LDA	0.04	0.05

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

tblVehicleEF	LDA	0.09	0.09
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	0.01	0.01
tblVehicleEF	LDA	0.03	0.20
tblVehicleEF	LDA	0.06	0.20
tblVehicleEF	LDA	3.9680e-003	2.2761e-003
tblVehicleEF	LDA	3.5930e-003	0.04
tblVehicleEF	LDA	0.62	0.72
tblVehicleEF	LDA	0.82	1.67
tblVehicleEF	LDA	254.04	275.18
tblVehicleEF	LDA	52.85	50.96
tblVehicleEF	LDA	0.04	0.03
tblVehicleEF	LDA	0.06	0.15
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	8.0000e-003	8.0000e-003
tblVehicleEF	LDA	1.6390e-003	1.4255e-003
tblVehicleEF	LDA	2.2390e-003	1.7107e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	2.0000e-003	2.0000e-003
tblVehicleEF	LDA	1.5090e-003	1.3122e-003
tblVehicleEF	LDA	2.0590e-003	1.5729e-003
tblVehicleEF	LDA	0.08	0.10
tblVehicleEF	LDA	0.10	0.10
tblVehicleEF	LDA	0.06	0.08
tblVehicleEF	LDA	9.9310e-003	8.2294e-003

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San Bernardino-South Coast County, Summer

tblVehicleEF	LDA	0.03	0.19
tblVehicleEF	LDA	0.05	0.16
tblVehicleEF	LDA	2.5450e-003	2.6674e-003
tblVehicleEF	LDA	5.4200e-004	4.9409e-004
tblVehicleEF	LDA	0.08	0.10
tblVehicleEF	LDA	0.10	0.10
tblVehicleEF	LDA	0.06	0.08
tblVehicleEF	LDA	0.01	0.01
tblVehicleEF	LDA	0.03	0.19
tblVehicleEF	LDA	0.05	0.17
tblVehicleEF	LDA	3.3950e-003	1.9725e-003
tblVehicleEF	LDA	4.2830e-003	0.04
tblVehicleEF	LDA	0.48	0.57
tblVehicleEF	LDA	0.97	1.98
tblVehicleEF	LDA	227.08	250.24
tblVehicleEF	LDA	52.85	51.56
tblVehicleEF	LDA	0.04	0.03
tblVehicleEF	LDA	0.06	0.16
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	8.0000e-003	8.0000e-003
tblVehicleEF	LDA	1.6390e-003	1.4255e-003
tblVehicleEF	LDA	2.2390e-003	1.7107e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	2.0000e-003	2.0000e-003
tblVehicleEF	LDA	1.5090e-003	1.3122e-003

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

tblVehicleEF	LDA	2.0590e-003	1.5729e-003
tblVehicleEF	LDA	0.04	0.05
tblVehicleEF	LDA	0.10	0.10
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	8.5140e-003	7.2053e-003
tblVehicleEF	LDA	0.04	0.22
tblVehicleEF	LDA	0.06	0.19
tblVehicleEF	LDA	2.2730e-003	2.4257e-003
tblVehicleEF	LDA	5.4500e-004	4.9989e-004
tblVehicleEF	LDA	0.04	0.05
tblVehicleEF	LDA	0.10	0.10
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	0.01	0.01
tblVehicleEF	LDA	0.04	0.22
tblVehicleEF	LDA	0.06	0.20
tblVehicleEF	LDT1	0.01	5.7611e-003
tblVehicleEF	LDT1	0.01	0.07
tblVehicleEF	LDT1	1.27	1.22
tblVehicleEF	LDT1	2.92	2.21
tblVehicleEF	LDT1	294.54	302.30
tblVehicleEF	LDT1	66.91	62.67
tblVehicleEF	LDT1	0.13	0.10
tblVehicleEF	LDT1	0.17	0.25
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003

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San Bernardino-South Coast County, Summer

tblVehicleEF	LDT1	2.4790e-003	2.0331e-003
tblVehicleEF	LDT1	3.3490e-003	2.4484e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	2.2820e-003	1.8706e-003
tblVehicleEF	LDT1	3.0800e-003	2.2513e-003
tblVehicleEF	LDT1	0.16	0.16
tblVehicleEF	LDT1	0.29	0.22
tblVehicleEF	LDT1	0.11	0.12
tblVehicleEF	LDT1	0.03	0.03
tblVehicleEF	LDT1	0.18	0.73
tblVehicleEF	LDT1	0.20	0.34
tblVehicleEF	LDT1	2.9610e-003	2.9308e-003
tblVehicleEF	LDT1	7.2000e-004	6.0757e-004
tblVehicleEF	LDT1	0.16	0.16
tblVehicleEF	LDT1	0.29	0.22
tblVehicleEF	LDT1	0.11	0.12
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	0.18	0.73
tblVehicleEF	LDT1	0.22	0.37
tblVehicleEF	LDT1	0.01	6.4446e-003
tblVehicleEF	LDT1	0.01	0.06
tblVehicleEF	LDT1	1.52	1.45
tblVehicleEF	LDT1	2.41	1.86
tblVehicleEF	LDT1	320.99	324.09

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

tblVehicleEF	LDT1	66.91	61.93
tblVehicleEF	LDT1	0.12	0.09
tblVehicleEF	LDT1	0.16	0.23
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003
tblVehicleEF	LDT1	2.4790e-003	2.0331e-003
tblVehicleEF	LDT1	3.3490e-003	2.4484e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	2.2820e-003	1.8706e-003
tblVehicleEF	LDT1	3.0800e-003	2.2513e-003
tblVehicleEF	LDT1	0.33	0.30
tblVehicleEF	LDT1	0.36	0.26
tblVehicleEF	LDT1	0.24	0.22
tblVehicleEF	LDT1	0.03	0.03
tblVehicleEF	LDT1	0.18	0.72
tblVehicleEF	LDT1	0.17	0.29
tblVehicleEF	LDT1	3.2290e-003	3.1421e-003
tblVehicleEF	LDT1	7.1100e-004	6.0043e-004
tblVehicleEF	LDT1	0.33	0.30
tblVehicleEF	LDT1	0.36	0.26
tblVehicleEF	LDT1	0.24	0.22
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	0.18	0.72
tblVehicleEF	LDT1	0.18	0.32

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

tblVehicleEF	LDT1	0.01	5.6507e-003
tblVehicleEF	LDT1	0.01	0.07
tblVehicleEF	LDT1	1.21	1.18
tblVehicleEF	LDT1	2.88	2.22
tblVehicleEF	LDT1	288.31	298.24
tblVehicleEF	LDT1	66.91	62.68
tblVehicleEF	LDT1	0.12	0.09
tblVehicleEF	LDT1	0.17	0.25
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003
tblVehicleEF	LDT1	2.4790e-003	2.0331e-003
tblVehicleEF	LDT1	3.3490e-003	2.4484e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	2.2820e-003	1.8706e-003
tblVehicleEF	LDT1	3.0800e-003	2.2513e-003
tblVehicleEF	LDT1	0.17	0.16
tblVehicleEF	LDT1	0.34	0.25
tblVehicleEF	LDT1	0.10	0.11
tblVehicleEF	LDT1	0.03	0.02
tblVehicleEF	LDT1	0.21	0.85
tblVehicleEF	LDT1	0.20	0.34
tblVehicleEF	LDT1	2.8980e-003	2.8914e-003
tblVehicleEF	LDT1	7.2000e-004	6.0770e-004
tblVehicleEF	LDT1	0.17	0.16

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

tblVehicleEF	LDT1	0.34	0.25
tblVehicleEF	LDT1	0.10	0.11
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	0.21	0.85
tblVehicleEF	LDT1	0.22	0.38
tblVehicleEF	LDT2	5.3570e-003	3.5834e-003
tblVehicleEF	LDT2	6.4770e-003	0.06
tblVehicleEF	LDT2	0.71	0.86
tblVehicleEF	LDT2	1.39	2.53
tblVehicleEF	LDT2	328.11	317.70
tblVehicleEF	LDT2	74.12	66.03
tblVehicleEF	LDT2	0.07	0.07
tblVehicleEF	LDT2	0.11	0.25
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003
tblVehicleEF	LDT2	1.7520e-003	1.5111e-003
tblVehicleEF	LDT2	2.4320e-003	1.7807e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.6110e-003	1.3906e-003
tblVehicleEF	LDT2	2.2360e-003	1.6373e-003
tblVehicleEF	LDT2	0.06	0.09
tblVehicleEF	LDT2	0.11	0.13
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.01	0.01

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

tblVehicleEF	LDT2	0.06	0.42
tblVehicleEF	LDT2	0.09	0.28
tblVehicleEF	LDT2	3.2870e-003	3.0797e-003
tblVehicleEF	LDT2	7.6500e-004	6.4016e-004
tblVehicleEF	LDT2	0.06	0.09
tblVehicleEF	LDT2	0.11	0.13
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.06	0.42
tblVehicleEF	LDT2	0.10	0.31
tblVehicleEF	LDT2	6.0780e-003	4.0305e-003
tblVehicleEF	LDT2	5.3990e-003	0.05
tblVehicleEF	LDT2	0.87	1.03
tblVehicleEF	LDT2	1.15	2.12
tblVehicleEF	LDT2	358.16	338.46
tblVehicleEF	LDT2	74.12	65.24
tblVehicleEF	LDT2	0.06	0.06
tblVehicleEF	LDT2	0.10	0.23
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003
tblVehicleEF	LDT2	1.7520e-003	1.5111e-003
tblVehicleEF	LDT2	2.4320e-003	1.7807e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.6110e-003	1.3906e-003

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

tblVehicleEF	LDT2	2.2360e-003	1.6373e-003
tblVehicleEF	LDT2	0.12	0.17
tblVehicleEF	LDT2	0.13	0.14
tblVehicleEF	LDT2	0.10	0.14
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.06	0.41
tblVehicleEF	LDT2	0.07	0.24
tblVehicleEF	LDT2	3.5890e-003	3.2809e-003
tblVehicleEF	LDT2	7.6000e-004	6.3253e-004
tblVehicleEF	LDT2	0.12	0.17
tblVehicleEF	LDT2	0.13	0.14
tblVehicleEF	LDT2	0.10	0.14
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.06	0.41
tblVehicleEF	LDT2	0.08	0.26
tblVehicleEF	LDT2	5.2180e-003	3.5124e-003
tblVehicleEF	LDT2	6.4370e-003	0.06
tblVehicleEF	LDT2	0.67	0.83
tblVehicleEF	LDT2	1.37	2.54
tblVehicleEF	LDT2	321.03	313.84
tblVehicleEF	LDT2	74.12	66.05
tblVehicleEF	LDT2	0.07	0.06
tblVehicleEF	LDT2	0.11	0.25
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

tblVehicleEF	LDT2	1.7520e-003	1.5111e-003
tblVehicleEF	LDT2	2.4320e-003	1.7807e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.6110e-003	1.3906e-003
tblVehicleEF	LDT2	2.2360e-003	1.6373e-003
tblVehicleEF	LDT2	0.06	0.08
tblVehicleEF	LDT2	0.12	0.14
tblVehicleEF	LDT2	0.05	0.07
tblVehicleEF	LDT2	0.01	0.01
tblVehicleEF	LDT2	0.07	0.49
tblVehicleEF	LDT2	0.09	0.28
tblVehicleEF	LDT2	3.2150e-003	3.0422e-003
tblVehicleEF	LDT2	7.6400e-004	6.4032e-004
tblVehicleEF	LDT2	0.06	0.08
tblVehicleEF	LDT2	0.12	0.14
tblVehicleEF	LDT2	0.05	0.07
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.07	0.49
tblVehicleEF	LDT2	0.10	0.31
tblVehicleEF	LHD1	4.8470e-003	4.7968e-003
tblVehicleEF	LHD1	0.01	5.1176e-003
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	0.14	0.18
tblVehicleEF	LHD1	0.89	0.61

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

tblVehicleEF	LHD1	2.31	0.96
tblVehicleEF	LHD1	9.22	9.11
tblVehicleEF	LHD1	599.78	638.53
tblVehicleEF	LHD1	29.30	10.76
tblVehicleEF	LHD1	0.09	0.07
tblVehicleEF	LHD1	1.82	1.01
tblVehicleEF	LHD1	0.92	0.29
tblVehicleEF	LHD1	9.6000e-004	9.1827e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	0.01	9.9199e-003
tblVehicleEF	LHD1	0.01	8.9361e-003
tblVehicleEF	LHD1	8.6900e-004	2.3700e-004
tblVehicleEF	LHD1	9.1800e-004	8.7855e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.5600e-003	2.4800e-003
tblVehicleEF	LHD1	0.01	8.5244e-003
tblVehicleEF	LHD1	7.9900e-004	2.1791e-004
tblVehicleEF	LHD1	3.4980e-003	2.7033e-003
tblVehicleEF	LHD1	0.11	0.08
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.7520e-003	1.4326e-003
tblVehicleEF	LHD1	0.08	0.05
tblVehicleEF	LHD1	0.35	0.51
tblVehicleEF	LHD1	0.24	0.07
tblVehicleEF	LHD1	9.2000e-005	8.8148e-005

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San Bernardino-South Coast County, Summer

tblVehicleEF	LHD1	5.8770e-003	6.2189e-003
tblVehicleEF	LHD1	3.3600e-004	1.0650e-004
tblVehicleEF	LHD1	3.4980e-003	2.7033e-003
tblVehicleEF	LHD1	0.11	0.08
tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	1.7520e-003	1.4326e-003
tblVehicleEF	LHD1	0.09	0.07
tblVehicleEF	LHD1	0.35	0.51
tblVehicleEF	LHD1	0.26	0.07
tblVehicleEF	LHD1	4.8470e-003	4.8094e-003
tblVehicleEF	LHD1	0.01	5.2120e-003
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	0.14	0.18
tblVehicleEF	LHD1	0.91	0.62
tblVehicleEF	LHD1	2.16	0.91
tblVehicleEF	LHD1	9.22	9.11
tblVehicleEF	LHD1	599.78	638.54
tblVehicleEF	LHD1	29.30	10.67
tblVehicleEF	LHD1	0.09	0.07
tblVehicleEF	LHD1	1.71	0.95
tblVehicleEF	LHD1	0.88	0.28
tblVehicleEF	LHD1	9.6000e-004	9.1827e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	0.01	9.9199e-003
tblVehicleEF	LHD1	0.01	8.9361e-003

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

tblVehicleEF	LHD1	8.6900e-004	2.3700e-004
tblVehicleEF	LHD1	9.1800e-004	8.7855e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.5600e-003	2.4800e-003
tblVehicleEF	LHD1	0.01	8.5244e-003
tblVehicleEF	LHD1	7.9900e-004	2.1791e-004
tblVehicleEF	LHD1	6.8610e-003	4.8470e-003
tblVehicleEF	LHD1	0.13	0.09
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	3.9020e-003	2.7205e-003
tblVehicleEF	LHD1	0.08	0.06
tblVehicleEF	LHD1	0.35	0.51
tblVehicleEF	LHD1	0.22	0.07
tblVehicleEF	LHD1	9.2000e-005	8.8148e-005
tblVehicleEF	LHD1	5.8770e-003	6.2191e-003
tblVehicleEF	LHD1	3.3400e-004	1.0563e-004
tblVehicleEF	LHD1	6.8610e-003	4.8470e-003
tblVehicleEF	LHD1	0.13	0.09
tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	3.9020e-003	2.7205e-003
tblVehicleEF	LHD1	0.09	0.07
tblVehicleEF	LHD1	0.35	0.51
tblVehicleEF	LHD1	0.24	0.07
tblVehicleEF	LHD1	4.8470e-003	4.7983e-003
tblVehicleEF	LHD1	0.01	5.1241e-003

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	0.14	0.18
tblVehicleEF	LHD1	0.89	0.61
tblVehicleEF	LHD1	2.27	0.96
tblVehicleEF	LHD1	9.22	9.11
tblVehicleEF	LHD1	599.78	638.53
tblVehicleEF	LHD1	29.30	10.75
tblVehicleEF	LHD1	0.09	0.07
tblVehicleEF	LHD1	1.79	0.99
tblVehicleEF	LHD1	0.91	0.29
tblVehicleEF	LHD1	9.6000e-004	9.1827e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	0.01	9.9199e-003
tblVehicleEF	LHD1	0.01	8.9361e-003
tblVehicleEF	LHD1	8.6900e-004	2.3700e-004
tblVehicleEF	LHD1	9.1800e-004	8.7855e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.5600e-003	2.4800e-003
tblVehicleEF	LHD1	0.01	8.5244e-003
tblVehicleEF	LHD1	7.9900e-004	2.1791e-004
tblVehicleEF	LHD1	3.7620e-003	2.7673e-003
tblVehicleEF	LHD1	0.12	0.09
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.7190e-003	1.4516e-003
tblVehicleEF	LHD1	0.08	0.06

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

tblVehicleEF	LHD1	0.38	0.54
tblVehicleEF	LHD1	0.23	0.07
tblVehicleEF	LHD1	9.2000e-005	8.8148e-005
tblVehicleEF	LHD1	5.8770e-003	6.2189e-003
tblVehicleEF	LHD1	3.3600e-004	1.0639e-004
tblVehicleEF	LHD1	3.7620e-003	2.7673e-003
tblVehicleEF	LHD1	0.12	0.09
tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	1.7190e-003	1.4516e-003
tblVehicleEF	LHD1	0.09	0.07
tblVehicleEF	LHD1	0.38	0.54
tblVehicleEF	LHD1	0.26	0.07
tblVehicleEF	LHD2	3.2790e-003	3.4455e-003
tblVehicleEF	LHD2	3.7300e-003	3.6376e-003
tblVehicleEF	LHD2	6.5990e-003	9.0640e-003
tblVehicleEF	LHD2	0.12	0.14
tblVehicleEF	LHD2	0.40	0.42
tblVehicleEF	LHD2	1.07	0.61
tblVehicleEF	LHD2	14.16	13.98
tblVehicleEF	LHD2	600.81	649.79
tblVehicleEF	LHD2	23.70	8.28
tblVehicleEF	LHD2	0.10	0.10
tblVehicleEF	LHD2	1.10	1.10
tblVehicleEF	LHD2	0.46	0.20
tblVehicleEF	LHD2	1.2350e-003	1.3465e-003

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San Bernardino-South Coast County, Summer

tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	3.6900e-004	1.2415e-004
tblVehicleEF	LHD2	1.1820e-003	1.2883e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.6940e-003	2.6692e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	3.3900e-004	1.1415e-004
tblVehicleEF	LHD2	1.1430e-003	1.5266e-003
tblVehicleEF	LHD2	0.03	0.05
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	6.3600e-004	8.5545e-004
tblVehicleEF	LHD2	0.05	0.06
tblVehicleEF	LHD2	0.07	0.27
tblVehicleEF	LHD2	0.09	0.04
tblVehicleEF	LHD2	1.3800e-004	1.3377e-004
tblVehicleEF	LHD2	5.8420e-003	6.2769e-003
tblVehicleEF	LHD2	2.5600e-004	8.1904e-005
tblVehicleEF	LHD2	1.1430e-003	1.5266e-003
tblVehicleEF	LHD2	0.03	0.05
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	6.3600e-004	8.5545e-004
tblVehicleEF	LHD2	0.06	0.06
tblVehicleEF	LHD2	0.07	0.27

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San Bernardino-South Coast County, Summer

tblVehicleEF	LHD2	0.10	0.05
tblVehicleEF	LHD2	3.2790e-003	3.4545e-003
tblVehicleEF	LHD2	3.7760e-003	3.6701e-003
tblVehicleEF	LHD2	6.3100e-003	8.7155e-003
tblVehicleEF	LHD2	0.12	0.14
tblVehicleEF	LHD2	0.40	0.43
tblVehicleEF	LHD2	1.01	0.58
tblVehicleEF	LHD2	14.16	13.98
tblVehicleEF	LHD2	600.81	649.80
tblVehicleEF	LHD2	23.70	8.22
tblVehicleEF	LHD2	0.10	0.10
tblVehicleEF	LHD2	1.04	1.03
tblVehicleEF	LHD2	0.44	0.20
tblVehicleEF	LHD2	1.2350e-003	1.3465e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	3.6900e-004	1.2415e-004
tblVehicleEF	LHD2	1.1820e-003	1.2883e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.6940e-003	2.6692e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	3.3900e-004	1.1415e-004
tblVehicleEF	LHD2	2.1960e-003	2.7469e-003
tblVehicleEF	LHD2	0.04	0.05

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San Bernardino-South Coast County, Summer

tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	1.3570e-003	1.6184e-003
tblVehicleEF	LHD2	0.05	0.06
tblVehicleEF	LHD2	0.07	0.27
tblVehicleEF	LHD2	0.09	0.04
tblVehicleEF	LHD2	1.3800e-004	1.3377e-004
tblVehicleEF	LHD2	5.8420e-003	6.2770e-003
tblVehicleEF	LHD2	2.5500e-004	8.1352e-005
tblVehicleEF	LHD2	2.1960e-003	2.7469e-003
tblVehicleEF	LHD2	0.04	0.05
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	1.3570e-003	1.6184e-003
tblVehicleEF	LHD2	0.06	0.06
tblVehicleEF	LHD2	0.07	0.27
tblVehicleEF	LHD2	0.09	0.05
tblVehicleEF	LHD2	3.2790e-003	3.4465e-003
tblVehicleEF	LHD2	3.7350e-003	3.6405e-003
tblVehicleEF	LHD2	6.5440e-003	9.0209e-003
tblVehicleEF	LHD2	0.12	0.14
tblVehicleEF	LHD2	0.40	0.43
tblVehicleEF	LHD2	1.06	0.61
tblVehicleEF	LHD2	14.16	13.98
tblVehicleEF	LHD2	600.81	649.80
tblVehicleEF	LHD2	23.70	8.27
tblVehicleEF	LHD2	0.10	0.10

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San Bernardino-South Coast County, Summer

tblVehicleEF	LHD2	1.09	1.08
tblVehicleEF	LHD2	0.45	0.20
tblVehicleEF	LHD2	1.2350e-003	1.3465e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	3.6900e-004	1.2415e-004
tblVehicleEF	LHD2	1.1820e-003	1.2883e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.6940e-003	2.6692e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	3.3900e-004	1.1415e-004
tblVehicleEF	LHD2	1.1520e-003	1.5019e-003
tblVehicleEF	LHD2	0.04	0.05
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	6.2000e-004	8.5367e-004
tblVehicleEF	LHD2	0.05	0.06
tblVehicleEF	LHD2	0.08	0.29
tblVehicleEF	LHD2	0.09	0.04
tblVehicleEF	LHD2	1.3800e-004	1.3377e-004
tblVehicleEF	LHD2	5.8420e-003	6.2769e-003
tblVehicleEF	LHD2	2.5600e-004	8.1841e-005
tblVehicleEF	LHD2	1.1520e-003	1.5019e-003
tblVehicleEF	LHD2	0.04	0.05
tblVehicleEF	LHD2	0.02	0.02

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tblVehicleEF	LHD2	6.2000e-004	8.5367e-004
tblVehicleEF	LHD2	0.06	0.06
tblVehicleEF	LHD2	0.08	0.29
tblVehicleEF	LHD2	0.10	0.05
tblVehicleEF	MCY	0.44	0.34
tblVehicleEF	MCY	0.16	0.24
tblVehicleEF	MCY	19.74	18.80
tblVehicleEF	MCY	9.96	8.64
tblVehicleEF	MCY	169.37	213.49
tblVehicleEF	MCY	45.59	60.09
tblVehicleEF	MCY	1.15	1.13
tblVehicleEF	MCY	0.31	0.26
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003
tblVehicleEF	MCY	1.9350e-003	2.0823e-003
tblVehicleEF	MCY	3.3460e-003	2.7595e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003
tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	1.8090e-003	1.9452e-003
tblVehicleEF	MCY	3.1480e-003	2.5918e-003
tblVehicleEF	MCY	1.44	1.42
tblVehicleEF	MCY	0.81	0.78
tblVehicleEF	MCY	0.79	0.77
tblVehicleEF	MCY	2.20	2.34
tblVehicleEF	MCY	0.47	1.77

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tblVehicleEF	MCY	2.13	1.82
tblVehicleEF	MCY	2.0800e-003	2.1126e-003
tblVehicleEF	MCY	6.8100e-004	5.9462e-004
tblVehicleEF	MCY	1.44	1.42
tblVehicleEF	MCY	0.81	0.78
tblVehicleEF	MCY	0.79	0.77
tblVehicleEF	MCY	2.72	2.90
tblVehicleEF	MCY	0.47	1.77
tblVehicleEF	MCY	2.32	1.99
tblVehicleEF	MCY	0.43	0.34
tblVehicleEF	MCY	0.13	0.21
tblVehicleEF	MCY	19.87	18.83
tblVehicleEF	MCY	9.04	7.91
tblVehicleEF	MCY	169.37	213.40
tblVehicleEF	MCY	45.59	58.20
tblVehicleEF	MCY	0.98	0.97
tblVehicleEF	MCY	0.29	0.25
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003
tblVehicleEF	MCY	1.9350e-003	2.0823e-003
tblVehicleEF	MCY	3.3460e-003	2.7595e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003
tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	1.8090e-003	1.9452e-003
tblVehicleEF	MCY	3.1480e-003	2.5918e-003

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San Bernardino-South Coast County, Summer

tblVehicleEF	MCY	3.11	2.77
tblVehicleEF	MCY	1.24	1.10
tblVehicleEF	MCY	2.09	1.75
tblVehicleEF	MCY	2.15	2.30
tblVehicleEF	MCY	0.47	1.74
tblVehicleEF	MCY	1.84	1.60
tblVehicleEF	MCY	2.0800e-003	2.1118e-003
tblVehicleEF	MCY	6.5700e-004	5.7593e-004
tblVehicleEF	MCY	3.11	2.77
tblVehicleEF	MCY	1.24	1.10
tblVehicleEF	MCY	2.09	1.75
tblVehicleEF	MCY	2.66	2.85
tblVehicleEF	MCY	0.47	1.74
tblVehicleEF	MCY	2.00	1.75
tblVehicleEF	MCY	0.43	0.34
tblVehicleEF	MCY	0.15	0.24
tblVehicleEF	MCY	18.88	18.32
tblVehicleEF	MCY	9.60	8.48
tblVehicleEF	MCY	169.37	212.66
tblVehicleEF	MCY	45.59	59.76
tblVehicleEF	MCY	1.11	1.09
tblVehicleEF	MCY	0.31	0.26
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003
tblVehicleEF	MCY	1.9350e-003	2.0823e-003

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San Bernardino-South Coast County, Summer

tblVehicleEF	MCY	3.3460e-003	2.7595e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003
tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	1.8090e-003	1.9452e-003
tblVehicleEF	MCY	3.1480e-003	2.5918e-003
tblVehicleEF	MCY	1.69	1.57
tblVehicleEF	MCY	1.09	1.04
tblVehicleEF	MCY	0.70	0.73
tblVehicleEF	MCY	2.17	2.32
tblVehicleEF	MCY	0.53	2.02
tblVehicleEF	MCY	2.06	1.80
tblVehicleEF	MCY	2.0660e-003	2.1044e-003
tblVehicleEF	MCY	6.7300e-004	5.9133e-004
tblVehicleEF	MCY	1.69	1.57
tblVehicleEF	MCY	1.09	1.04
tblVehicleEF	MCY	0.70	0.73
tblVehicleEF	MCY	2.68	2.88
tblVehicleEF	MCY	0.53	2.02
tblVehicleEF	MCY	2.24	1.96
tblVehicleEF	MDV	0.01	4.3912e-003
tblVehicleEF	MDV	0.02	0.07
tblVehicleEF	MDV	1.13	0.95
tblVehicleEF	MDV	2.68	2.91
tblVehicleEF	MDV	455.56	394.71
tblVehicleEF	MDV	101.88	82.36

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tblVehicleEF	MDV	0.14	0.08
tblVehicleEF	MDV	0.26	0.32
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	1.7950e-003	1.5664e-003
tblVehicleEF	MDV	2.4230e-003	1.8283e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	1.6540e-003	1.4442e-003
tblVehicleEF	MDV	2.2280e-003	1.6811e-003
tblVehicleEF	MDV	0.09	0.11
tblVehicleEF	MDV	0.19	0.16
tblVehicleEF	MDV	0.08	0.10
tblVehicleEF	MDV	0.03	0.02
tblVehicleEF	MDV	0.11	0.47
tblVehicleEF	MDV	0.20	0.36
tblVehicleEF	MDV	4.5620e-003	3.8247e-003
tblVehicleEF	MDV	1.0660e-003	7.9846e-004
tblVehicleEF	MDV	0.09	0.11
tblVehicleEF	MDV	0.19	0.16
tblVehicleEF	MDV	0.08	0.10
tblVehicleEF	MDV	0.04	0.03
tblVehicleEF	MDV	0.11	0.47
tblVehicleEF	MDV	0.22	0.40
tblVehicleEF	MDV	0.01	4.9455e-003

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San Bernardino-South Coast County, Summer

tblVehicleEF	MDV	0.01	0.06
tblVehicleEF	MDV	1.38	1.14
tblVehicleEF	MDV	2.22	2.44
tblVehicleEF	MDV	495.92	416.48
tblVehicleEF	MDV	101.88	81.42
tblVehicleEF	MDV	0.13	0.07
tblVehicleEF	MDV	0.24	0.29
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	1.7950e-003	1.5664e-003
tblVehicleEF	MDV	2.4230e-003	1.8283e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	1.6540e-003	1.4442e-003
tblVehicleEF	MDV	2.2280e-003	1.6811e-003
tblVehicleEF	MDV	0.19	0.20
tblVehicleEF	MDV	0.22	0.17
tblVehicleEF	MDV	0.17	0.18
tblVehicleEF	MDV	0.03	0.02
tblVehicleEF	MDV	0.11	0.46
tblVehicleEF	MDV	0.17	0.31
tblVehicleEF	MDV	4.9690e-003	4.0358e-003
tblVehicleEF	MDV	1.0570e-003	7.8939e-004
tblVehicleEF	MDV	0.19	0.20
tblVehicleEF	MDV	0.22	0.17

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San Bernardino-South Coast County, Summer

tblVehicleEF	MDV	0.17	0.18
tblVehicleEF	MDV	0.04	0.03
tblVehicleEF	MDV	0.11	0.46
tblVehicleEF	MDV	0.19	0.34
tblVehicleEF	MDV	0.01	4.3013e-003
tblVehicleEF	MDV	0.01	0.07
tblVehicleEF	MDV	1.07	0.91
tblVehicleEF	MDV	2.64	2.92
tblVehicleEF	MDV	446.15	390.65
tblVehicleEF	MDV	101.88	82.38
tblVehicleEF	MDV	0.13	0.08
tblVehicleEF	MDV	0.26	0.31
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	1.7950e-003	1.5664e-003
tblVehicleEF	MDV	2.4230e-003	1.8283e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	1.6540e-003	1.4442e-003
tblVehicleEF	MDV	2.2280e-003	1.6811e-003
tblVehicleEF	MDV	0.09	0.10
tblVehicleEF	MDV	0.21	0.17
tblVehicleEF	MDV	0.08	0.09
tblVehicleEF	MDV	0.03	0.02
tblVehicleEF	MDV	0.12	0.54

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San Bernardino-South Coast County, Summer

tblVehicleEF	MDV	0.20	0.36
tblVehicleEF	MDV	4.4680e-003	3.7853e-003
tblVehicleEF	MDV	1.0650e-003	7.9866e-004
tblVehicleEF	MDV	0.09	0.10
tblVehicleEF	MDV	0.21	0.17
tblVehicleEF	MDV	0.08	0.09
tblVehicleEF	MDV	0.04	0.03
tblVehicleEF	MDV	0.12	0.54
tblVehicleEF	MDV	0.22	0.40
tblVehicleEF	MH	0.03	9.0576e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	2.16	1.00
tblVehicleEF	MH	5.58	1.96
tblVehicleEF	MH	1,051.62	1,459.21
tblVehicleEF	MH	58.77	18.16
tblVehicleEF	MH	1.36	1.41
tblVehicleEF	MH	0.83	0.24
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	1.0410e-003	2.3041e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.2250e-003	3.2868e-003
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	9.5800e-004	2.1186e-004

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San Bernardino-South Coast County, Summer

tblVehicleEF	MH	1.28	0.98
tblVehicleEF	MH	0.08	0.06
tblVehicleEF	MH	0.45	0.38
tblVehicleEF	MH	0.08	0.06
tblVehicleEF	MH	0.03	1.31
tblVehicleEF	MH	0.32	0.09
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	6.8500e-004	1.7973e-004
tblVehicleEF	MH	1.28	0.98
tblVehicleEF	MH	0.08	0.06
tblVehicleEF	MH	0.45	0.38
tblVehicleEF	MH	0.11	0.08
tblVehicleEF	MH	0.03	1.31
tblVehicleEF	MH	0.35	0.10
tblVehicleEF	MH	0.03	9.2608e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	2.24	1.02
tblVehicleEF	MH	5.08	1.82
tblVehicleEF	MH	1,051.62	1,459.25
tblVehicleEF	MH	58.77	17.93
tblVehicleEF	MH	1.24	1.31
tblVehicleEF	MH	0.79	0.23
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.03	0.03

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San Bernardino-South Coast County, Summer

tblVehicleEF	MH	1.0410e-003	2.3041e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.2250e-003	3.2868e-003
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	9.5800e-004	2.1186e-004
tblVehicleEF	MH	2.51	1.74
tblVehicleEF	MH	0.09	0.07
tblVehicleEF	MH	1.05	0.73
tblVehicleEF	MH	0.08	0.06
tblVehicleEF	MH	0.03	1.30
tblVehicleEF	MH	0.30	0.09
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	6.7600e-004	1.7744e-004
tblVehicleEF	MH	2.51	1.74
tblVehicleEF	MH	0.09	0.07
tblVehicleEF	MH	1.05	0.73
tblVehicleEF	MH	0.12	0.08
tblVehicleEF	MH	0.03	1.30
tblVehicleEF	MH	0.33	0.09
tblVehicleEF	MH	0.03	9.0626e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	2.17	1.00
tblVehicleEF	MH	5.52	1.96
tblVehicleEF	MH	1,051.62	1,459.21
tblVehicleEF	MH	58.77	18.17

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San Bernardino-South Coast County, Summer

tblVehicleEF	MH	1.33	1.38
tblVehicleEF	MH	0.82	0.24
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	1.0410e-003	2.3041e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.2250e-003	3.2868e-003
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	9.5800e-004	2.1186e-004
tblVehicleEF	MH	1.50	1.06
tblVehicleEF	MH	0.10	0.07
tblVehicleEF	MH	0.46	0.39
tblVehicleEF	MH	0.08	0.06
tblVehicleEF	MH	0.03	1.38
tblVehicleEF	MH	0.32	0.09
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	6.8400e-004	1.7980e-004
tblVehicleEF	MH	1.50	1.06
tblVehicleEF	MH	0.10	0.07
tblVehicleEF	MH	0.46	0.39
tblVehicleEF	MH	0.11	0.08
tblVehicleEF	MH	0.03	1.38
tblVehicleEF	MH	0.35	0.10
tblVehicleEF	MHD	0.02	2.3961e-003

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tblVehicleEF	MHD	2.6000e-003	9.5913e-004
tblVehicleEF	MHD	0.04	5.9112e-003
tblVehicleEF	MHD	0.30	0.31
tblVehicleEF	MHD	0.23	0.14
tblVehicleEF	MHD	4.34	0.65
tblVehicleEF	MHD	155.87	63.89
tblVehicleEF	MHD	1,101.40	932.72
tblVehicleEF	MHD	50.42	5.97
tblVehicleEF	MHD	0.42	0.35
tblVehicleEF	MHD	0.64	1.08
tblVehicleEF	MHD	12.05	1.86
tblVehicleEF	MHD	1.0400e-004	2.8538e-004
tblVehicleEF	MHD	0.13	0.13
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	2.7700e-003	6.8459e-003
tblVehicleEF	MHD	6.8900e-004	6.8489e-005
tblVehicleEF	MHD	9.9000e-005	2.7304e-004
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.0000e-003	3.0000e-003
tblVehicleEF	MHD	2.6470e-003	6.5468e-003
tblVehicleEF	MHD	6.3400e-004	6.2973e-005
tblVehicleEF	MHD	1.0590e-003	3.7575e-004
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.02	0.01
tblVehicleEF	MHD	5.6000e-004	2.0705e-004

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San Bernardino-South Coast County, Summer

tblVehicleEF	MHD	0.03	0.01
tblVehicleEF	MHD	0.01	0.07
tblVehicleEF	MHD	0.27	0.03
tblVehicleEF	MHD	1.4970e-003	6.0553e-004
tblVehicleEF	MHD	0.01	8.8645e-003
tblVehicleEF	MHD	5.8000e-004	5.9031e-005
tblVehicleEF	MHD	1.0590e-003	3.7575e-004
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	5.6000e-004	2.0705e-004
tblVehicleEF	MHD	0.03	0.01
tblVehicleEF	MHD	0.01	0.07
tblVehicleEF	MHD	0.29	0.03
tblVehicleEF	MHD	0.01	2.2875e-003
tblVehicleEF	MHD	2.6390e-003	9.7539e-004
tblVehicleEF	MHD	0.04	5.6788e-003
tblVehicleEF	MHD	0.22	0.27
tblVehicleEF	MHD	0.23	0.14
tblVehicleEF	MHD	4.06	0.62
tblVehicleEF	MHD	165.10	63.62
tblVehicleEF	MHD	1,101.40	932.72
tblVehicleEF	MHD	50.42	5.90
tblVehicleEF	MHD	0.44	0.35
tblVehicleEF	MHD	0.60	1.01
tblVehicleEF	MHD	12.02	1.86

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San Bernardino-South Coast County, Summer

tblVehicleEF	MHD	8.7000e-005	2.4356e-004
tblVehicleEF	MHD	0.13	0.13
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	2.7700e-003	6.8459e-003
tblVehicleEF	MHD	6.8900e-004	6.8489e-005
tblVehicleEF	MHD	8.4000e-005	2.3302e-004
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.0000e-003	3.0000e-003
tblVehicleEF	MHD	2.6470e-003	6.5468e-003
tblVehicleEF	MHD	6.3400e-004	6.2973e-005
tblVehicleEF	MHD	2.0770e-003	6.8378e-004
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.02	0.01
tblVehicleEF	MHD	1.2630e-003	4.0503e-004
tblVehicleEF	MHD	0.03	0.01
tblVehicleEF	MHD	0.01	0.07
tblVehicleEF	MHD	0.25	0.03
tblVehicleEF	MHD	1.5840e-003	6.0307e-004
tblVehicleEF	MHD	0.01	8.8645e-003
tblVehicleEF	MHD	5.7500e-004	5.8413e-005
tblVehicleEF	MHD	2.0770e-003	6.8378e-004
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	1.2630e-003	4.0503e-004
tblVehicleEF	MHD	0.03	0.01

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San Bernardino-South Coast County, Summer

tblVehicleEF	MHD	0.01	0.07
tblVehicleEF	MHD	0.28	0.03
tblVehicleEF	MHD	0.02	2.5564e-003
tblVehicleEF	MHD	2.6040e-003	9.5905e-004
tblVehicleEF	MHD	0.04	5.8670e-003
tblVehicleEF	MHD	0.41	0.36
tblVehicleEF	MHD	0.23	0.14
tblVehicleEF	MHD	4.27	0.65
tblVehicleEF	MHD	143.11	64.26
tblVehicleEF	MHD	1,101.40	932.72
tblVehicleEF	MHD	50.42	5.96
tblVehicleEF	MHD	0.40	0.37
tblVehicleEF	MHD	0.63	1.06
tblVehicleEF	MHD	12.04	1.86
tblVehicleEF	MHD	1.2600e-004	3.4313e-004
tblVehicleEF	MHD	0.13	0.13
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	2.7700e-003	6.8459e-003
tblVehicleEF	MHD	6.8900e-004	6.8489e-005
tblVehicleEF	MHD	1.2100e-004	3.2829e-004
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.0000e-003	3.0000e-003
tblVehicleEF	MHD	2.6470e-003	6.5468e-003
tblVehicleEF	MHD	6.3400e-004	6.2973e-005
tblVehicleEF	MHD	1.1160e-003	3.8027e-004

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San Bernardino-South Coast County, Summer

tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.02	0.01
tblVehicleEF	MHD	5.4700e-004	2.0877e-004
tblVehicleEF	MHD	0.03	0.01
tblVehicleEF	MHD	0.02	0.08
tblVehicleEF	MHD	0.26	0.03
tblVehicleEF	MHD	1.3770e-003	6.0888e-004
tblVehicleEF	MHD	0.01	8.8645e-003
tblVehicleEF	MHD	5.7900e-004	5.8945e-005
tblVehicleEF	MHD	1.1160e-003	3.8027e-004
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	5.4700e-004	2.0877e-004
tblVehicleEF	MHD	0.03	0.01
tblVehicleEF	MHD	0.02	0.08
tblVehicleEF	MHD	0.29	0.03
tblVehicleEF	OBUS	0.01	8.6570e-003
tblVehicleEF	OBUS	7.2410e-003	4.7733e-003
tblVehicleEF	OBUS	0.03	0.02
tblVehicleEF	OBUS	0.24	0.54
tblVehicleEF	OBUS	0.47	0.58
tblVehicleEF	OBUS	5.59	2.33
tblVehicleEF	OBUS	65.08	74.10
tblVehicleEF	OBUS	1,122.26	1,367.42
tblVehicleEF	OBUS	70.20	19.84

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

tblVehicleEF	OBUS	0.12	0.27
tblVehicleEF	OBUS	0.45	1.00
tblVehicleEF	OBUS	1.81	0.74
tblVehicleEF	OBUS	1.1000e-005	9.2233e-005
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	1.9630e-003	6.6254e-003
tblVehicleEF	OBUS	9.4500e-004	2.2194e-004
tblVehicleEF	OBUS	1.1000e-005	8.8243e-005
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	3.0000e-003	3.0000e-003
tblVehicleEF	OBUS	1.8550e-003	6.3206e-003
tblVehicleEF	OBUS	8.6900e-004	2.0406e-004
tblVehicleEF	OBUS	1.9890e-003	2.5726e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.03	0.05
tblVehicleEF	OBUS	8.6300e-004	1.1214e-003
tblVehicleEF	OBUS	0.03	0.03
tblVehicleEF	OBUS	0.05	0.29
tblVehicleEF	OBUS	0.34	0.11
tblVehicleEF	OBUS	6.3300e-004	7.0653e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	8.0000e-004	1.9629e-004
tblVehicleEF	OBUS	1.9890e-003	2.5726e-003
tblVehicleEF	OBUS	0.02	0.02

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

tblVehicleEF	OBUS	0.04	0.06
tblVehicleEF	OBUS	8.6300e-004	1.1214e-003
tblVehicleEF	OBUS	0.04	0.04
tblVehicleEF	OBUS	0.05	0.29
tblVehicleEF	OBUS	0.38	0.12
tblVehicleEF	OBUS	0.01	8.7351e-003
tblVehicleEF	OBUS	7.4380e-003	4.8889e-003
tblVehicleEF	OBUS	0.03	0.02
tblVehicleEF	OBUS	0.24	0.53
tblVehicleEF	OBUS	0.49	0.59
tblVehicleEF	OBUS	5.12	2.17
tblVehicleEF	OBUS	67.92	73.30
tblVehicleEF	OBUS	1,122.26	1,367.44
tblVehicleEF	OBUS	70.20	19.56
tblVehicleEF	OBUS	0.13	0.26
tblVehicleEF	OBUS	0.41	0.93
tblVehicleEF	OBUS	1.76	0.73
tblVehicleEF	OBUS	9.0000e-006	8.1955e-005
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	1.9630e-003	6.6254e-003
tblVehicleEF	OBUS	9.4500e-004	2.2194e-004
tblVehicleEF	OBUS	9.0000e-006	7.8410e-005
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	3.0000e-003	3.0000e-003

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

tblVehicleEF	OBUS	1.8550e-003	6.3206e-003
tblVehicleEF	OBUS	8.6900e-004	2.0406e-004
tblVehicleEF	OBUS	3.8500e-003	4.6205e-003
tblVehicleEF	OBUS	0.02	0.03
tblVehicleEF	OBUS	0.03	0.05
tblVehicleEF	OBUS	1.9610e-003	2.1940e-003
tblVehicleEF	OBUS	0.03	0.03
tblVehicleEF	OBUS	0.05	0.29
tblVehicleEF	OBUS	0.32	0.11
tblVehicleEF	OBUS	6.6000e-004	6.9892e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	7.9200e-004	1.9358e-004
tblVehicleEF	OBUS	3.8500e-003	4.6205e-003
tblVehicleEF	OBUS	0.02	0.03
tblVehicleEF	OBUS	0.04	0.07
tblVehicleEF	OBUS	1.9610e-003	2.1940e-003
tblVehicleEF	OBUS	0.04	0.04
tblVehicleEF	OBUS	0.05	0.29
tblVehicleEF	OBUS	0.36	0.12
tblVehicleEF	OBUS	0.01	8.5819e-003
tblVehicleEF	OBUS	7.2610e-003	4.7769e-003
tblVehicleEF	OBUS	0.03	0.02
tblVehicleEF	OBUS	0.25	0.54
tblVehicleEF	OBUS	0.48	0.58
tblVehicleEF	OBUS	5.55	2.33

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

tblVehicleEF	OBUS	61.15	75.21
tblVehicleEF	OBUS	1,122.26	1,367.42
tblVehicleEF	OBUS	70.20	19.84
tblVehicleEF	OBUS	0.12	0.29
tblVehicleEF	OBUS	0.44	0.98
tblVehicleEF	OBUS	1.79	0.74
tblVehicleEF	OBUS	1.4000e-005	1.0643e-004
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	1.9630e-003	6.6254e-003
tblVehicleEF	OBUS	9.4500e-004	2.2194e-004
tblVehicleEF	OBUS	1.3000e-005	1.0182e-004
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	3.0000e-003	3.0000e-003
tblVehicleEF	OBUS	1.8550e-003	6.3206e-003
tblVehicleEF	OBUS	8.6900e-004	2.0406e-004
tblVehicleEF	OBUS	2.0720e-003	2.6685e-003
tblVehicleEF	OBUS	0.02	0.03
tblVehicleEF	OBUS	0.03	0.05
tblVehicleEF	OBUS	8.6200e-004	1.1635e-003
tblVehicleEF	OBUS	0.03	0.03
tblVehicleEF	OBUS	0.05	0.31
tblVehicleEF	OBUS	0.34	0.11
tblVehicleEF	OBUS	5.9600e-004	7.1703e-004
tblVehicleEF	OBUS	0.01	0.01

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

tblVehicleEF	OBUS	7.9900e-004	1.9638e-004
tblVehicleEF	OBUS	2.0720e-003	2.6685e-003
tblVehicleEF	OBUS	0.02	0.03
tblVehicleEF	OBUS	0.04	0.06
tblVehicleEF	OBUS	8.6200e-004	1.1635e-003
tblVehicleEF	OBUS	0.04	0.04
tblVehicleEF	OBUS	0.05	0.31
tblVehicleEF	OBUS	0.38	0.12
tblVehicleEF	SBUS	0.83	0.06
tblVehicleEF	SBUS	9.2120e-003	7.3441e-003
tblVehicleEF	SBUS	0.06	6.3239e-003
tblVehicleEF	SBUS	5.90	2.63
tblVehicleEF	SBUS	0.56	0.68
tblVehicleEF	SBUS	5.13	0.82
tblVehicleEF	SBUS	1,231.15	341.25
tblVehicleEF	SBUS	1,120.79	1,083.10
tblVehicleEF	SBUS	39.22	4.88
tblVehicleEF	SBUS	10.14	3.05
tblVehicleEF	SBUS	3.99	4.60
tblVehicleEF	SBUS	14.61	1.04
tblVehicleEF	SBUS	9.1600e-003	3.4684e-003
tblVehicleEF	SBUS	0.74	0.74
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	5.6800e-004	4.0441e-005

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

tblVehicleEF	SBUS	8.7640e-003	3.3184e-003
tblVehicleEF	SBUS	0.32	0.32
tblVehicleEF	SBUS	2.7400e-003	2.6958e-003
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	5.2200e-004	3.7184e-005
tblVehicleEF	SBUS	2.9390e-003	1.1929e-003
tblVehicleEF	SBUS	0.02	9.3021e-003
tblVehicleEF	SBUS	0.70	0.29
tblVehicleEF	SBUS	1.3780e-003	6.0617e-004
tblVehicleEF	SBUS	0.10	0.09
tblVehicleEF	SBUS	9.1030e-003	0.05
tblVehicleEF	SBUS	0.27	0.04
tblVehicleEF	SBUS	0.01	3.2535e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	4.8100e-004	4.8273e-005
tblVehicleEF	SBUS	2.9390e-003	1.1929e-003
tblVehicleEF	SBUS	0.02	9.3021e-003
tblVehicleEF	SBUS	1.00	0.42
tblVehicleEF	SBUS	1.3780e-003	6.0617e-004
tblVehicleEF	SBUS	0.12	0.11
tblVehicleEF	SBUS	9.1030e-003	0.05
tblVehicleEF	SBUS	0.29	0.04
tblVehicleEF	SBUS	0.83	0.06
tblVehicleEF	SBUS	9.3730e-003	7.4544e-003
tblVehicleEF	SBUS	0.05	5.2953e-003

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

tblVehicleEF	SBUS	5.77	2.60
tblVehicleEF	SBUS	0.57	0.69
tblVehicleEF	SBUS	3.51	0.59
tblVehicleEF	SBUS	1,292.80	347.80
tblVehicleEF	SBUS	1,120.79	1,083.12
tblVehicleEF	SBUS	39.22	4.50
tblVehicleEF	SBUS	10.46	3.11
tblVehicleEF	SBUS	3.74	4.32
tblVehicleEF	SBUS	14.58	1.04
tblVehicleEF	SBUS	7.7220e-003	2.9321e-003
tblVehicleEF	SBUS	0.74	0.74
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	5.6800e-004	4.0441e-005
tblVehicleEF	SBUS	7.3880e-003	2.8053e-003
tblVehicleEF	SBUS	0.32	0.32
tblVehicleEF	SBUS	2.7400e-003	2.6958e-003
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	5.2200e-004	3.7184e-005
tblVehicleEF	SBUS	5.5960e-003	2.1200e-003
tblVehicleEF	SBUS	0.02	9.6252e-003
tblVehicleEF	SBUS	0.70	0.29
tblVehicleEF	SBUS	2.9710e-003	1.1273e-003
tblVehicleEF	SBUS	0.10	0.09
tblVehicleEF	SBUS	8.3110e-003	0.05

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

tblVehicleEF	SBUS	0.22	0.03
tblVehicleEF	SBUS	0.01	3.3153e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	4.5400e-004	4.4524e-005
tblVehicleEF	SBUS	5.5960e-003	2.1200e-003
tblVehicleEF	SBUS	0.02	9.6252e-003
tblVehicleEF	SBUS	1.00	0.42
tblVehicleEF	SBUS	2.9710e-003	1.1273e-003
tblVehicleEF	SBUS	0.12	0.11
tblVehicleEF	SBUS	8.3110e-003	0.05
tblVehicleEF	SBUS	0.24	0.03
tblVehicleEF	SBUS	0.83	0.06
tblVehicleEF	SBUS	9.2160e-003	7.3373e-003
tblVehicleEF	SBUS	0.06	6.5157e-003
tblVehicleEF	SBUS	6.08	2.68
tblVehicleEF	SBUS	0.56	0.67
tblVehicleEF	SBUS	5.17	0.86
tblVehicleEF	SBUS	1,146.01	332.21
tblVehicleEF	SBUS	1,120.79	1,083.10
tblVehicleEF	SBUS	39.22	4.94
tblVehicleEF	SBUS	9.69	2.98
tblVehicleEF	SBUS	3.93	4.53
tblVehicleEF	SBUS	14.61	1.04
tblVehicleEF	SBUS	0.01	4.2090e-003
tblVehicleEF	SBUS	0.74	0.74

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	5.6800e-004	4.0441e-005
tblVehicleEF	SBUS	0.01	4.0269e-003
tblVehicleEF	SBUS	0.32	0.32
tblVehicleEF	SBUS	2.7400e-003	2.6958e-003
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	5.2200e-004	3.7184e-005
tblVehicleEF	SBUS	2.8670e-003	1.0983e-003
tblVehicleEF	SBUS	0.02	9.4928e-003
tblVehicleEF	SBUS	0.70	0.29
tblVehicleEF	SBUS	1.3540e-003	6.0998e-004
tblVehicleEF	SBUS	0.10	0.09
tblVehicleEF	SBUS	0.01	0.06
tblVehicleEF	SBUS	0.27	0.04
tblVehicleEF	SBUS	0.01	3.1681e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	4.8200e-004	4.8891e-005
tblVehicleEF	SBUS	2.8670e-003	1.0983e-003
tblVehicleEF	SBUS	0.02	9.4928e-003
tblVehicleEF	SBUS	1.01	0.42
tblVehicleEF	SBUS	1.3540e-003	6.0998e-004
tblVehicleEF	SBUS	0.12	0.11
tblVehicleEF	SBUS	0.01	0.06
tblVehicleEF	SBUS	0.30	0.04

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

tblVehicleEF	UBUS	1.62	4.47
tblVehicleEF	UBUS	0.08	8.1159e-003
tblVehicleEF	UBUS	8.33	34.91
tblVehicleEF	UBUS	13.39	0.88
tblVehicleEF	UBUS	1,818.42	1,682.81
tblVehicleEF	UBUS	138.62	11.11
tblVehicleEF	UBUS	4.85	0.36
tblVehicleEF	UBUS	13.25	0.11
tblVehicleEF	UBUS	0.51	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.05	2.6981e-003
tblVehicleEF	UBUS	1.4450e-003	1.7436e-004
tblVehicleEF	UBUS	0.22	0.03
tblVehicleEF	UBUS	3.0000e-003	6.6215e-003
tblVehicleEF	UBUS	0.05	2.5669e-003
tblVehicleEF	UBUS	1.3280e-003	1.6032e-004
tblVehicleEF	UBUS	7.4710e-003	1.3306e-003
tblVehicleEF	UBUS	0.10	6.4588e-003
tblVehicleEF	UBUS	3.6930e-003	5.6077e-004
tblVehicleEF	UBUS	0.49	0.07
tblVehicleEF	UBUS	0.02	0.02
tblVehicleEF	UBUS	1.10	0.03
tblVehicleEF	UBUS	9.7450e-003	2.8420e-003
tblVehicleEF	UBUS	1.6300e-003	1.0991e-004
tblVehicleEF	UBUS	7.4710e-003	1.3306e-003

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

tblVehicleEF	UBUS	0.10	6.4588e-003
tblVehicleEF	UBUS	3.6930e-003	5.6077e-004
tblVehicleEF	UBUS	2.17	4.57
tblVehicleEF	UBUS	0.02	0.02
tblVehicleEF	UBUS	1.20	0.03
tblVehicleEF	UBUS	1.63	4.47
tblVehicleEF	UBUS	0.07	7.3605e-003
tblVehicleEF	UBUS	8.41	34.91
tblVehicleEF	UBUS	11.00	0.75
tblVehicleEF	UBUS	1,818.42	1,682.82
tblVehicleEF	UBUS	138.62	10.89
tblVehicleEF	UBUS	4.50	0.35
tblVehicleEF	UBUS	13.14	0.11
tblVehicleEF	UBUS	0.51	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.05	2.6981e-003
tblVehicleEF	UBUS	1.4450e-003	1.7436e-004
tblVehicleEF	UBUS	0.22	0.03
tblVehicleEF	UBUS	3.0000e-003	6.6215e-003
tblVehicleEF	UBUS	0.05	2.5669e-003
tblVehicleEF	UBUS	1.3280e-003	1.6032e-004
tblVehicleEF	UBUS	0.01	2.4604e-003
tblVehicleEF	UBUS	0.13	8.0066e-003
tblVehicleEF	UBUS	8.6540e-003	1.1780e-003
tblVehicleEF	UBUS	0.50	0.07

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

tblVehicleEF	UBUS	0.02	0.02
tblVehicleEF	UBUS	0.98	0.03
tblVehicleEF	UBUS	9.7470e-003	2.8420e-003
tblVehicleEF	UBUS	1.5890e-003	1.0780e-004
tblVehicleEF	UBUS	0.01	2.4604e-003
tblVehicleEF	UBUS	0.13	8.0066e-003
tblVehicleEF	UBUS	8.6540e-003	1.1780e-003
tblVehicleEF	UBUS	2.18	4.57
tblVehicleEF	UBUS	0.02	0.02
tblVehicleEF	UBUS	1.07	0.03
tblVehicleEF	UBUS	1.62	4.47
tblVehicleEF	UBUS	0.08	8.1886e-003
tblVehicleEF	UBUS	8.34	34.91
tblVehicleEF	UBUS	12.95	0.89
tblVehicleEF	UBUS	1,818.42	1,682.81
tblVehicleEF	UBUS	138.62	11.13
tblVehicleEF	UBUS	4.76	0.36
tblVehicleEF	UBUS	13.23	0.11
tblVehicleEF	UBUS	0.51	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.05	2.6981e-003
tblVehicleEF	UBUS	1.4450e-003	1.7436e-004
tblVehicleEF	UBUS	0.22	0.03
tblVehicleEF	UBUS	3.0000e-003	6.6215e-003
tblVehicleEF	UBUS	0.05	2.5669e-003

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

tblVehicleEF	UBUS	1.3280e-003	1.6032e-004
tblVehicleEF	UBUS	8.4070e-003	1.3979e-003
tblVehicleEF	UBUS	0.13	7.4722e-003
tblVehicleEF	UBUS	3.8160e-003	5.7194e-004
tblVehicleEF	UBUS	0.49	0.07
tblVehicleEF	UBUS	0.03	0.02
tblVehicleEF	UBUS	1.08	0.03
tblVehicleEF	UBUS	9.7460e-003	2.8420e-003
tblVehicleEF	UBUS	1.6230e-003	1.1012e-004
tblVehicleEF	UBUS	8.4070e-003	1.3979e-003
tblVehicleEF	UBUS	0.13	7.4722e-003
tblVehicleEF	UBUS	3.8160e-003	5.7194e-004
tblVehicleEF	UBUS	2.17	4.57
tblVehicleEF	UBUS	0.03	0.02
tblVehicleEF	UBUS	1.18	0.03
tblVehicleTrips	WD_TR	15.43	4.13
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	IndoorWaterUseRate	2,656,117.62	1,717,745.64
tblWater	OutdoorWaterUseRate	6,830,016.73	2,687,430.73
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

CVUS-07 Project Run

San Bernardino-South Coast County, Summer

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	2.2411	4.9000e-004	0.0543	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1165	0.1165	3.0000e-004		0.1241
Energy	0.0235	0.2138	0.1796	1.2800e-003		0.0163	0.0163		0.0163	0.0163		256.5686	256.5686	4.9200e-003	4.7000e-003	258.0932
Mobile	0.9404	0.6924	9.1463	0.0236	2.7241	0.0142	2.7383	0.7224	0.0131	0.7355		2,443.0411	2,443.0411	0.0851		2,445.1696
Total	**3.2050**	**0.9067**	**9.3801**	**0.0249**	**2.7241**	**0.0307**	**2.7547**	**0.7224**	**0.0296**	**0.7520**		**2,699.7262**	**2,699.7262**	**0.0904**	**4.7000e-003**	**2,703.3870**

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	2.2411	4.9000e-004	0.0543	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1165	0.1165	3.0000e-004		0.1241
Energy	0.0235	0.2138	0.1796	1.2800e-003		0.0163	0.0163		0.0163	0.0163		256.5686	256.5686	4.9200e-003	4.7000e-003	258.0932
Mobile	0.9404	0.6924	9.1463	0.0236	2.7241	0.0142	2.7383	0.7224	0.0131	0.7355		2,443.0411	2,443.0411	0.0851		2,445.1696
Total	**3.2050**	**0.9067**	**9.3801**	**0.0249**	**2.7241**	**0.0307**	**2.7547**	**0.7224**	**0.0296**	**0.7520**		**2,699.7262**	**2,699.7262**	**0.0904**	**4.7000e-003**	**2,703.3870**

	ROG	**NOx**	**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**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

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San Bernardino-South Coast County, Summer

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive 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	0.9404	0.6924	9.1463	0.0236	2.7241	0.0142	2.7383	0.7224	0.0131	0.7355		2,443.0411	2,443.0411	0.0851		2,445.1696
Unmitigated	0.9404	0.6924	9.1463	0.0236	2.7241	0.0142	2.7383	0.7224	0.0131	0.7355		2,443.0411	2,443.0411	0.0851		2,445.1696

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Elementary School	378.31	0.00	0.00	931,282	931,282
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Total	378.31	0.00	0.00	931,282	931,282

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
Elementary School	16.60	8.40	6.90	65.00	30.00	5.00	63	25	12
Other Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Other Non-Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

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4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Elementary School	0.693229	0.043800	0.225557	0.020000	0.001390	0.000466	0.001811	0.006332	0.000000	0.000000	0.007413	0.000000	0.000000
Other Asphalt Surfaces	0.558745	0.035303	0.181800	0.111169	0.014289	0.004794	0.018611	0.065078	0.001365	0.001491	0.005725	0.000799	0.000830
Other Non-Asphalt Surfaces	0.558745	0.035303	0.181800	0.111169	0.014289	0.004794	0.018611	0.065078	0.001365	0.001491	0.005725	0.000799	0.000830
Parking Lot	0.558745	0.035303	0.181800	0.111169	0.014289	0.004794	0.018611	0.065078	0.001365	0.001491	0.005725	0.000799	0.000830

5.0 Energy Detail

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	0.0235	0.2138	0.1796	1.2800e-003		0.0163	0.0163		0.0163	0.0163		256.5686	256.5686	4.9200e-003	4.7000e-003	258.0932
NaturalGas Unmitigated	0.0235	0.2138	0.1796	1.2800e-003		0.0163	0.0163		0.0163	0.0163		256.5686	256.5686	4.9200e-003	4.7000e-003	258.0932

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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					
Elementary School	2180.83	0.0235	0.2138	0.1796	1.2800e-003		0.0163	0.0163		0.0163	0.0163		256.5686	256.5686	4.9200e-003	4.7000e-003	258.0932
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0235**	**0.2138**	**0.1796**	**1.2800e-003**		**0.0163**	**0.0163**		**0.0163**	**0.0163**		**256.5686**	**256.5686**	**4.9200e-003**	**4.7000e-003**	**258.0932**

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					
Elementary School	2.18083	0.0235	0.2138	0.1796	1.2800e-003		0.0163	0.0163		0.0163	0.0163		256.5686	256.5686	4.9200e-003	4.7000e-003	258.0932
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0235**	**0.2138**	**0.1796**	**1.2800e-003**		**0.0163**	**0.0163**		**0.0163**	**0.0163**		**256.5686**	**256.5686**	**4.9200e-003**	**4.7000e-003**	**258.0932**

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6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive 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	2.2411	4.9000e-004	0.0543	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1165	0.1165	3.0000e-004		0.1241
Unmitigated	2.2411	4.9000e-004	0.0543	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1165	0.1165	3.0000e-004		0.1241

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	0.2662					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.9698					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.0100e-003	4.9000e-004	0.0543	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1165	0.1165	3.0000e-004		0.1241
Total	**2.2411**	**4.9000e-004**	**0.0543**	**0.0000**		**1.9000e-004**	**1.9000e-004**		**1.9000e-004**	**1.9000e-004**		**0.1165**	**0.1165**	**3.0000e-004**		**0.1241**

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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	0.2662					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.9698					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.0100e-003	4.9000e-004	0.0543	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1165	0.1165	3.0000e-004		0.1241
Total	**2.2411**	**4.9000e-004**	**0.0543**	**0.0000**		**1.9000e-004**	**1.9000e-004**		**1.9000e-004**	**1.9000e-004**		**0.1165**	**0.1165**	**3.0000e-004**		**0.1241**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

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10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

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1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Elementary School	91.60	1000sqft	1.88	91,600.00	0
Other Asphalt Surfaces	182.16	1000sqft	4.18	182,160.00	0
Other Non-Asphalt Surfaces	183.77	1000sqft	4.22	183,770.00	0
Parking Lot	74.93	1000sqft	1.72	74,930.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	32
Climate Zone	10			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	531.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - SCE 2019 Sustainability Report, CO2 IF

Land Use - See Assumptions

Construction Phase - See Assumptions

Off-road Equipment -

Off-road Equipment - Haul Trucks Only

Trips and VMT - 2 water trucks for grading

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Grading -

Architectural Coating - South Coast AQMD Rule 1113

Vehicle Trips - Adjusted to 100 Primary.

Vehicle Emission Factors - EMFAC2017 Web Database. See Assumptions

Vehicle Emission Factors - EMFAC2017 Web Database. See Assumptions.

Vehicle Emission Factors - EMFAC2017 Web Database. See Assumptions.

Energy Use - See Assumptions

Water And Wastewater - See Assumptions

Solid Waste - See Assumptions

Construction Off-road Equipment Mitigation - South Coast AQMD Rule 403 and Rule 1186 (cleaned paved road).

Energy Mitigation - See Assumptions

Fleet Mix - See Assumptions

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	9
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblEnergyUse	T24E	2.78	2.48
tblEnergyUse	T24NG	6.97	6.90
tblFleetMix	HHD	0.07	6.3320e-003
tblFleetMix	LDA	0.56	0.69
tblFleetMix	LDT1	0.04	0.04
tblFleetMix	LDT2	0.18	0.23
tblFleetMix	LHD1	0.01	1.3900e-003
tblFleetMix	LHD2	4.7940e-003	4.6600e-004
tblFleetMix	MCY	5.7250e-003	7.4130e-003

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tblFleetMix	MDV	0.11	0.02
tblFleetMix	MH	8.3000e-004	0.00
tblFleetMix	MHD	0.02	1.8110e-003
tblFleetMix	OBUS	1.3650e-003	0.00
tblFleetMix	SBUS	7.9900e-004	0.00
tblFleetMix	UBUS	1.4910e-003	0.00
tblLandUse	LotAcreage	2.10	1.88
tblProjectCharacteristics	CO2IntensityFactor	702.44	531.44
tblVehicleEF	HHD	0.92	0.03
tblVehicleEF	HHD	0.04	0.13
tblVehicleEF	HHD	0.08	1.8032e-007
tblVehicleEF	HHD	2.21	6.39
tblVehicleEF	HHD	0.53	0.55
tblVehicleEF	HHD	1.68	3.3279e-003
tblVehicleEF	HHD	6,548.54	1,061.49
tblVehicleEF	HHD	1,428.49	1,386.62
tblVehicleEF	HHD	5.31	0.03
tblVehicleEF	HHD	18.65	5.46
tblVehicleEF	HHD	1.28	2.58
tblVehicleEF	HHD	20.21	2.40
tblVehicleEF	HHD	5.3430e-003	2.7891e-003
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	5.3010e-003	0.02
tblVehicleEF	HHD	4.7000e-005	6.8203e-007

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tblVehicleEF	HHD	5.1120e-003	2.6685e-003
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8790e-003	8.8287e-003
tblVehicleEF	HHD	5.0720e-003	0.02
tblVehicleEF	HHD	4.3000e-005	6.2710e-007
tblVehicleEF	HHD	7.3000e-005	3.4870e-006
tblVehicleEF	HHD	2.7400e-003	1.1175e-004
tblVehicleEF	HHD	0.59	0.43
tblVehicleEF	HHD	4.5000e-005	2.0719e-006
tblVehicleEF	HHD	0.06	0.03
tblVehicleEF	HHD	1.7500e-004	5.5521e-004
tblVehicleEF	HHD	0.04	9.4709e-007
tblVehicleEF	HHD	0.06	9.7453e-003
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	8.1000e-005	2.8961e-007
tblVehicleEF	HHD	7.3000e-005	3.4870e-006
tblVehicleEF	HHD	2.7400e-003	1.1175e-004
tblVehicleEF	HHD	0.67	0.50
tblVehicleEF	HHD	4.5000e-005	2.0719e-006
tblVehicleEF	HHD	0.10	0.16
tblVehicleEF	HHD	1.7500e-004	5.5521e-004
tblVehicleEF	HHD	0.05	1.0369e-006
tblVehicleEF	HHD	0.87	0.03
tblVehicleEF	HHD	0.04	0.13
tblVehicleEF	HHD	0.08	1.7203e-007

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tblVehicleEF	HHD	1.61	6.30
tblVehicleEF	HHD	0.53	0.55
tblVehicleEF	HHD	1.58	3.1419e-003
tblVehicleEF	HHD	6,937.59	1,049.59
tblVehicleEF	HHD	1,428.49	1,386.62
tblVehicleEF	HHD	5.31	0.03
tblVehicleEF	HHD	19.25	5.22
tblVehicleEF	HHD	1.20	2.44
tblVehicleEF	HHD	20.20	2.40
tblVehicleEF	HHD	4.5050e-003	2.4353e-003
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	5.3010e-003	0.02
tblVehicleEF	HHD	4.7000e-005	6.8203e-007
tblVehicleEF	HHD	4.3100e-003	2.3300e-003
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8790e-003	8.8287e-003
tblVehicleEF	HHD	5.0720e-003	0.02
tblVehicleEF	HHD	4.3000e-005	6.2710e-007
tblVehicleEF	HHD	1.4200e-004	6.8246e-006
tblVehicleEF	HHD	3.0590e-003	1.2683e-004
tblVehicleEF	HHD	0.55	0.45
tblVehicleEF	HHD	9.8000e-005	4.5555e-006
tblVehicleEF	HHD	0.06	0.03
tblVehicleEF	HHD	1.7700e-004	5.6915e-004

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tblVehicleEF	HHD	0.04	9.0624e-007
tblVehicleEF	HHD	0.07	9.6317e-003
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	7.9000e-005	2.8669e-007
tblVehicleEF	HHD	1.4200e-004	6.8246e-006
tblVehicleEF	HHD	3.0590e-003	1.2683e-004
tblVehicleEF	HHD	0.64	0.52
tblVehicleEF	HHD	9.8000e-005	4.5555e-006
tblVehicleEF	HHD	0.10	0.16
tblVehicleEF	HHD	1.7700e-004	5.6915e-004
tblVehicleEF	HHD	0.04	9.9222e-007
tblVehicleEF	HHD	0.99	0.02
tblVehicleEF	HHD	0.04	9.0333e-004
tblVehicleEF	HHD	0.08	1.7930e-007
tblVehicleEF	HHD	3.05	6.37
tblVehicleEF	HHD	0.53	0.21
tblVehicleEF	HHD	1.66	3.3019e-003
tblVehicleEF	HHD	6,011.27	1,048.13
tblVehicleEF	HHD	1,428.49	1,299.09
tblVehicleEF	HHD	5.31	0.03
tblVehicleEF	HHD	17.82	5.62
tblVehicleEF	HHD	1.26	2.47
tblVehicleEF	HHD	20.21	2.40
tblVehicleEF	HHD	6.5010e-003	2.9592e-003
tblVehicleEF	HHD	0.06	0.06

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tblVehicleEF	HHD	0.04	0.03
tblVehicleEF	HHD	5.3010e-003	0.02
tblVehicleEF	HHD	4.7000e-005	6.8203e-007
tblVehicleEF	HHD	6.2190e-003	2.8312e-003
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8790e-003	8.6012e-003
tblVehicleEF	HHD	5.0720e-003	0.02
tblVehicleEF	HHD	4.3000e-005	6.2710e-007
tblVehicleEF	HHD	7.1000e-005	3.6809e-006
tblVehicleEF	HHD	2.9460e-003	1.2966e-004
tblVehicleEF	HHD	0.63	0.39
tblVehicleEF	HHD	4.4000e-005	2.1988e-006
tblVehicleEF	HHD	0.06	0.02
tblVehicleEF	HHD	1.8900e-004	5.8280e-004
tblVehicleEF	HHD	0.04	9.4183e-007
tblVehicleEF	HHD	0.06	9.9022e-003
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	8.0000e-005	2.8920e-007
tblVehicleEF	HHD	7.1000e-005	3.6809e-006
tblVehicleEF	HHD	2.9460e-003	1.2966e-004
tblVehicleEF	HHD	0.73	0.45
tblVehicleEF	HHD	4.4000e-005	2.1988e-006
tblVehicleEF	HHD	0.10	0.02
tblVehicleEF	HHD	1.8900e-004	5.8280e-004
tblVehicleEF	HHD	0.05	1.0312e-006

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tblVehicleEF	LDA	3.4870e-003	2.0138e-003
tblVehicleEF	LDA	4.3060e-003	0.04
tblVehicleEF	LDA	0.51	0.59
tblVehicleEF	LDA	0.99	1.98
tblVehicleEF	LDA	232.23	254.16
tblVehicleEF	LDA	52.85	51.55
tblVehicleEF	LDA	0.04	0.03
tblVehicleEF	LDA	0.06	0.16
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	8.0000e-003	8.0000e-003
tblVehicleEF	LDA	1.6390e-003	1.4255e-003
tblVehicleEF	LDA	2.2390e-003	1.7107e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	2.0000e-003	2.0000e-003
tblVehicleEF	LDA	1.5090e-003	1.3122e-003
tblVehicleEF	LDA	2.0590e-003	1.5729e-003
tblVehicleEF	LDA	0.04	0.05
tblVehicleEF	LDA	0.09	0.09
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	8.7420e-003	7.3557e-003
tblVehicleEF	LDA	0.03	0.20
tblVehicleEF	LDA	0.06	0.18
tblVehicleEF	LDA	2.3250e-003	2.4637e-003
tblVehicleEF	LDA	5.4500e-004	4.9981e-004
tblVehicleEF	LDA	0.04	0.05

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

tblVehicleEF	LDA	0.09	0.09
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	0.01	0.01
tblVehicleEF	LDA	0.03	0.20
tblVehicleEF	LDA	0.06	0.20
tblVehicleEF	LDA	3.9680e-003	2.2761e-003
tblVehicleEF	LDA	3.5930e-003	0.04
tblVehicleEF	LDA	0.62	0.72
tblVehicleEF	LDA	0.82	1.67
tblVehicleEF	LDA	254.04	275.18
tblVehicleEF	LDA	52.85	50.96
tblVehicleEF	LDA	0.04	0.03
tblVehicleEF	LDA	0.06	0.15
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	8.0000e-003	8.0000e-003
tblVehicleEF	LDA	1.6390e-003	1.4255e-003
tblVehicleEF	LDA	2.2390e-003	1.7107e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	2.0000e-003	2.0000e-003
tblVehicleEF	LDA	1.5090e-003	1.3122e-003
tblVehicleEF	LDA	2.0590e-003	1.5729e-003
tblVehicleEF	LDA	0.08	0.10
tblVehicleEF	LDA	0.10	0.10
tblVehicleEF	LDA	0.06	0.08
tblVehicleEF	LDA	9.9310e-003	8.2294e-003

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

tblVehicleEF	LDA	0.03	0.19
tblVehicleEF	LDA	0.05	0.16
tblVehicleEF	LDA	2.5450e-003	2.6674e-003
tblVehicleEF	LDA	5.4200e-004	4.9409e-004
tblVehicleEF	LDA	0.08	0.10
tblVehicleEF	LDA	0.10	0.10
tblVehicleEF	LDA	0.06	0.08
tblVehicleEF	LDA	0.01	0.01
tblVehicleEF	LDA	0.03	0.19
tblVehicleEF	LDA	0.05	0.17
tblVehicleEF	LDA	3.3950e-003	1.9725e-003
tblVehicleEF	LDA	4.2830e-003	0.04
tblVehicleEF	LDA	0.48	0.57
tblVehicleEF	LDA	0.97	1.98
tblVehicleEF	LDA	227.08	250.24
tblVehicleEF	LDA	52.85	51.56
tblVehicleEF	LDA	0.04	0.03
tblVehicleEF	LDA	0.06	0.16
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	8.0000e-003	8.0000e-003
tblVehicleEF	LDA	1.6390e-003	1.4255e-003
tblVehicleEF	LDA	2.2390e-003	1.7107e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	2.0000e-003	2.0000e-003
tblVehicleEF	LDA	1.5090e-003	1.3122e-003

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

tblVehicleEF	LDA	2.0590e-003	1.5729e-003
tblVehicleEF	LDA	0.04	0.05
tblVehicleEF	LDA	0.10	0.10
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	8.5140e-003	7.2053e-003
tblVehicleEF	LDA	0.04	0.22
tblVehicleEF	LDA	0.06	0.19
tblVehicleEF	LDA	2.2730e-003	2.4257e-003
tblVehicleEF	LDA	5.4500e-004	4.9989e-004
tblVehicleEF	LDA	0.04	0.05
tblVehicleEF	LDA	0.10	0.10
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	0.01	0.01
tblVehicleEF	LDA	0.04	0.22
tblVehicleEF	LDA	0.06	0.20
tblVehicleEF	LDT1	0.01	5.7611e-003
tblVehicleEF	LDT1	0.01	0.07
tblVehicleEF	LDT1	1.27	1.22
tblVehicleEF	LDT1	2.92	2.21
tblVehicleEF	LDT1	294.54	302.30
tblVehicleEF	LDT1	66.91	62.67
tblVehicleEF	LDT1	0.13	0.10
tblVehicleEF	LDT1	0.17	0.25
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003

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San Bernardino-South Coast County, Winter

tblVehicleEF	LDT1	2.4790e-003	2.0331e-003
tblVehicleEF	LDT1	3.3490e-003	2.4484e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	2.2820e-003	1.8706e-003
tblVehicleEF	LDT1	3.0800e-003	2.2513e-003
tblVehicleEF	LDT1	0.16	0.16
tblVehicleEF	LDT1	0.29	0.22
tblVehicleEF	LDT1	0.11	0.12
tblVehicleEF	LDT1	0.03	0.03
tblVehicleEF	LDT1	0.18	0.73
tblVehicleEF	LDT1	0.20	0.34
tblVehicleEF	LDT1	2.9610e-003	2.9308e-003
tblVehicleEF	LDT1	7.2000e-004	6.0757e-004
tblVehicleEF	LDT1	0.16	0.16
tblVehicleEF	LDT1	0.29	0.22
tblVehicleEF	LDT1	0.11	0.12
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	0.18	0.73
tblVehicleEF	LDT1	0.22	0.37
tblVehicleEF	LDT1	0.01	6.4446e-003
tblVehicleEF	LDT1	0.01	0.06
tblVehicleEF	LDT1	1.52	1.45
tblVehicleEF	LDT1	2.41	1.86
tblVehicleEF	LDT1	320.99	324.09

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

tblVehicleEF	LDT1	66.91	61.93
tblVehicleEF	LDT1	0.12	0.09
tblVehicleEF	LDT1	0.16	0.23
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003
tblVehicleEF	LDT1	2.4790e-003	2.0331e-003
tblVehicleEF	LDT1	3.3490e-003	2.4484e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	2.2820e-003	1.8706e-003
tblVehicleEF	LDT1	3.0800e-003	2.2513e-003
tblVehicleEF	LDT1	0.33	0.30
tblVehicleEF	LDT1	0.36	0.26
tblVehicleEF	LDT1	0.24	0.22
tblVehicleEF	LDT1	0.03	0.03
tblVehicleEF	LDT1	0.18	0.72
tblVehicleEF	LDT1	0.17	0.29
tblVehicleEF	LDT1	3.2290e-003	3.1421e-003
tblVehicleEF	LDT1	7.1100e-004	6.0043e-004
tblVehicleEF	LDT1	0.33	0.30
tblVehicleEF	LDT1	0.36	0.26
tblVehicleEF	LDT1	0.24	0.22
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	0.18	0.72
tblVehicleEF	LDT1	0.18	0.32

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San Bernardino-South Coast County, Winter

tblVehicleEF	LDT1	0.01	5.6507e-003
tblVehicleEF	LDT1	0.01	0.07
tblVehicleEF	LDT1	1.21	1.18
tblVehicleEF	LDT1	2.88	2.22
tblVehicleEF	LDT1	288.31	298.24
tblVehicleEF	LDT1	66.91	62.68
tblVehicleEF	LDT1	0.12	0.09
tblVehicleEF	LDT1	0.17	0.25
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003
tblVehicleEF	LDT1	2.4790e-003	2.0331e-003
tblVehicleEF	LDT1	3.3490e-003	2.4484e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	2.2820e-003	1.8706e-003
tblVehicleEF	LDT1	3.0800e-003	2.2513e-003
tblVehicleEF	LDT1	0.17	0.16
tblVehicleEF	LDT1	0.34	0.25
tblVehicleEF	LDT1	0.10	0.11
tblVehicleEF	LDT1	0.03	0.02
tblVehicleEF	LDT1	0.21	0.85
tblVehicleEF	LDT1	0.20	0.34
tblVehicleEF	LDT1	2.8980e-003	2.8914e-003
tblVehicleEF	LDT1	7.2000e-004	6.0770e-004
tblVehicleEF	LDT1	0.17	0.16

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

tblVehicleEF	LDT1	0.34	0.25
tblVehicleEF	LDT1	0.10	0.11
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	0.21	0.85
tblVehicleEF	LDT1	0.22	0.38
tblVehicleEF	LDT2	5.3570e-003	3.5834e-003
tblVehicleEF	LDT2	6.4770e-003	0.06
tblVehicleEF	LDT2	0.71	0.86
tblVehicleEF	LDT2	1.39	2.53
tblVehicleEF	LDT2	328.11	317.70
tblVehicleEF	LDT2	74.12	66.03
tblVehicleEF	LDT2	0.07	0.07
tblVehicleEF	LDT2	0.11	0.25
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003
tblVehicleEF	LDT2	1.7520e-003	1.5111e-003
tblVehicleEF	LDT2	2.4320e-003	1.7807e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.6110e-003	1.3906e-003
tblVehicleEF	LDT2	2.2360e-003	1.6373e-003
tblVehicleEF	LDT2	0.06	0.09
tblVehicleEF	LDT2	0.11	0.13
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.01	0.01

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

tblVehicleEF	LDT2	0.06	0.42
tblVehicleEF	LDT2	0.09	0.28
tblVehicleEF	LDT2	3.2870e-003	3.0797e-003
tblVehicleEF	LDT2	7.6500e-004	6.4016e-004
tblVehicleEF	LDT2	0.06	0.09
tblVehicleEF	LDT2	0.11	0.13
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.06	0.42
tblVehicleEF	LDT2	0.10	0.31
tblVehicleEF	LDT2	6.0780e-003	4.0305e-003
tblVehicleEF	LDT2	5.3990e-003	0.05
tblVehicleEF	LDT2	0.87	1.03
tblVehicleEF	LDT2	1.15	2.12
tblVehicleEF	LDT2	358.16	338.46
tblVehicleEF	LDT2	74.12	65.24
tblVehicleEF	LDT2	0.06	0.06
tblVehicleEF	LDT2	0.10	0.23
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003
tblVehicleEF	LDT2	1.7520e-003	1.5111e-003
tblVehicleEF	LDT2	2.4320e-003	1.7807e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.6110e-003	1.3906e-003

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San Bernardino-South Coast County, Winter

tblVehicleEF	LDT2	2.2360e-003	1.6373e-003
tblVehicleEF	LDT2	0.12	0.17
tblVehicleEF	LDT2	0.13	0.14
tblVehicleEF	LDT2	0.10	0.14
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.06	0.41
tblVehicleEF	LDT2	0.07	0.24
tblVehicleEF	LDT2	3.5890e-003	3.2809e-003
tblVehicleEF	LDT2	7.6000e-004	6.3253e-004
tblVehicleEF	LDT2	0.12	0.17
tblVehicleEF	LDT2	0.13	0.14
tblVehicleEF	LDT2	0.10	0.14
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.06	0.41
tblVehicleEF	LDT2	0.08	0.26
tblVehicleEF	LDT2	5.2180e-003	3.5124e-003
tblVehicleEF	LDT2	6.4370e-003	0.06
tblVehicleEF	LDT2	0.67	0.83
tblVehicleEF	LDT2	1.37	2.54
tblVehicleEF	LDT2	321.03	313.84
tblVehicleEF	LDT2	74.12	66.05
tblVehicleEF	LDT2	0.07	0.06
tblVehicleEF	LDT2	0.11	0.25
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003

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San Bernardino-South Coast County, Winter

tblVehicleEF	LDT2	1.7520e-003	1.5111e-003
tblVehicleEF	LDT2	2.4320e-003	1.7807e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.6110e-003	1.3906e-003
tblVehicleEF	LDT2	2.2360e-003	1.6373e-003
tblVehicleEF	LDT2	0.06	0.08
tblVehicleEF	LDT2	0.12	0.14
tblVehicleEF	LDT2	0.05	0.07
tblVehicleEF	LDT2	0.01	0.01
tblVehicleEF	LDT2	0.07	0.49
tblVehicleEF	LDT2	0.09	0.28
tblVehicleEF	LDT2	3.2150e-003	3.0422e-003
tblVehicleEF	LDT2	7.6400e-004	6.4032e-004
tblVehicleEF	LDT2	0.06	0.08
tblVehicleEF	LDT2	0.12	0.14
tblVehicleEF	LDT2	0.05	0.07
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.07	0.49
tblVehicleEF	LDT2	0.10	0.31
tblVehicleEF	LHD1	4.8470e-003	4.7968e-003
tblVehicleEF	LHD1	0.01	5.1176e-003
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	0.14	0.18
tblVehicleEF	LHD1	0.89	0.61

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San Bernardino-South Coast County, Winter

tblVehicleEF	LHD1	2.31	0.96
tblVehicleEF	LHD1	9.22	9.11
tblVehicleEF	LHD1	599.78	638.53
tblVehicleEF	LHD1	29.30	10.76
tblVehicleEF	LHD1	0.09	0.07
tblVehicleEF	LHD1	1.82	1.01
tblVehicleEF	LHD1	0.92	0.29
tblVehicleEF	LHD1	9.6000e-004	9.1827e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	0.01	9.9199e-003
tblVehicleEF	LHD1	0.01	8.9361e-003
tblVehicleEF	LHD1	8.6900e-004	2.3700e-004
tblVehicleEF	LHD1	9.1800e-004	8.7855e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.5600e-003	2.4800e-003
tblVehicleEF	LHD1	0.01	8.5244e-003
tblVehicleEF	LHD1	7.9900e-004	2.1791e-004
tblVehicleEF	LHD1	3.4980e-003	2.7033e-003
tblVehicleEF	LHD1	0.11	0.08
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.7520e-003	1.4326e-003
tblVehicleEF	LHD1	0.08	0.05
tblVehicleEF	LHD1	0.35	0.51
tblVehicleEF	LHD1	0.24	0.07
tblVehicleEF	LHD1	9.2000e-005	8.8148e-005

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San Bernardino-South Coast County, Winter

tblVehicleEF	LHD1	5.8770e-003	6.2189e-003
tblVehicleEF	LHD1	3.3600e-004	1.0650e-004
tblVehicleEF	LHD1	3.4980e-003	2.7033e-003
tblVehicleEF	LHD1	0.11	0.08
tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	1.7520e-003	1.4326e-003
tblVehicleEF	LHD1	0.09	0.07
tblVehicleEF	LHD1	0.35	0.51
tblVehicleEF	LHD1	0.26	0.07
tblVehicleEF	LHD1	4.8470e-003	4.8094e-003
tblVehicleEF	LHD1	0.01	5.2120e-003
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	0.14	0.18
tblVehicleEF	LHD1	0.91	0.62
tblVehicleEF	LHD1	2.16	0.91
tblVehicleEF	LHD1	9.22	9.11
tblVehicleEF	LHD1	599.78	638.54
tblVehicleEF	LHD1	29.30	10.67
tblVehicleEF	LHD1	0.09	0.07
tblVehicleEF	LHD1	1.71	0.95
tblVehicleEF	LHD1	0.88	0.28
tblVehicleEF	LHD1	9.6000e-004	9.1827e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	0.01	9.9199e-003
tblVehicleEF	LHD1	0.01	8.9361e-003

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San Bernardino-South Coast County, Winter

tblVehicleEF	LHD1	8.6900e-004	2.3700e-004
tblVehicleEF	LHD1	9.1800e-004	8.7855e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.5600e-003	2.4800e-003
tblVehicleEF	LHD1	0.01	8.5244e-003
tblVehicleEF	LHD1	7.9900e-004	2.1791e-004
tblVehicleEF	LHD1	6.8610e-003	4.8470e-003
tblVehicleEF	LHD1	0.13	0.09
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	3.9020e-003	2.7205e-003
tblVehicleEF	LHD1	0.08	0.06
tblVehicleEF	LHD1	0.35	0.51
tblVehicleEF	LHD1	0.22	0.07
tblVehicleEF	LHD1	9.2000e-005	8.8148e-005
tblVehicleEF	LHD1	5.8770e-003	6.2191e-003
tblVehicleEF	LHD1	3.3400e-004	1.0563e-004
tblVehicleEF	LHD1	6.8610e-003	4.8470e-003
tblVehicleEF	LHD1	0.13	0.09
tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	3.9020e-003	2.7205e-003
tblVehicleEF	LHD1	0.09	0.07
tblVehicleEF	LHD1	0.35	0.51
tblVehicleEF	LHD1	0.24	0.07
tblVehicleEF	LHD1	4.8470e-003	4.7983e-003
tblVehicleEF	LHD1	0.01	5.1241e-003

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San Bernardino-South Coast County, Winter

tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	0.14	0.18
tblVehicleEF	LHD1	0.89	0.61
tblVehicleEF	LHD1	2.27	0.96
tblVehicleEF	LHD1	9.22	9.11
tblVehicleEF	LHD1	599.78	638.53
tblVehicleEF	LHD1	29.30	10.75
tblVehicleEF	LHD1	0.09	0.07
tblVehicleEF	LHD1	1.79	0.99
tblVehicleEF	LHD1	0.91	0.29
tblVehicleEF	LHD1	9.6000e-004	9.1827e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	0.01	9.9199e-003
tblVehicleEF	LHD1	0.01	8.9361e-003
tblVehicleEF	LHD1	8.6900e-004	2.3700e-004
tblVehicleEF	LHD1	9.1800e-004	8.7855e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.5600e-003	2.4800e-003
tblVehicleEF	LHD1	0.01	8.5244e-003
tblVehicleEF	LHD1	7.9900e-004	2.1791e-004
tblVehicleEF	LHD1	3.7620e-003	2.7673e-003
tblVehicleEF	LHD1	0.12	0.09
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.7190e-003	1.4516e-003
tblVehicleEF	LHD1	0.08	0.06

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San Bernardino-South Coast County, Winter

tblVehicleEF	LHD1	0.38	0.54
tblVehicleEF	LHD1	0.23	0.07
tblVehicleEF	LHD1	9.2000e-005	8.8148e-005
tblVehicleEF	LHD1	5.8770e-003	6.2189e-003
tblVehicleEF	LHD1	3.3600e-004	1.0639e-004
tblVehicleEF	LHD1	3.7620e-003	2.7673e-003
tblVehicleEF	LHD1	0.12	0.09
tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	1.7190e-003	1.4516e-003
tblVehicleEF	LHD1	0.09	0.07
tblVehicleEF	LHD1	0.38	0.54
tblVehicleEF	LHD1	0.26	0.07
tblVehicleEF	LHD2	3.2790e-003	3.4455e-003
tblVehicleEF	LHD2	3.7300e-003	3.6376e-003
tblVehicleEF	LHD2	6.5990e-003	9.0640e-003
tblVehicleEF	LHD2	0.12	0.14
tblVehicleEF	LHD2	0.40	0.42
tblVehicleEF	LHD2	1.07	0.61
tblVehicleEF	LHD2	14.16	13.98
tblVehicleEF	LHD2	600.81	649.79
tblVehicleEF	LHD2	23.70	8.28
tblVehicleEF	LHD2	0.10	0.10
tblVehicleEF	LHD2	1.10	1.10
tblVehicleEF	LHD2	0.46	0.20
tblVehicleEF	LHD2	1.2350e-003	1.3465e-003

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San Bernardino-South Coast County, Winter

tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	3.6900e-004	1.2415e-004
tblVehicleEF	LHD2	1.1820e-003	1.2883e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.6940e-003	2.6692e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	3.3900e-004	1.1415e-004
tblVehicleEF	LHD2	1.1430e-003	1.5266e-003
tblVehicleEF	LHD2	0.03	0.05
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	6.3600e-004	8.5545e-004
tblVehicleEF	LHD2	0.05	0.06
tblVehicleEF	LHD2	0.07	0.27
tblVehicleEF	LHD2	0.09	0.04
tblVehicleEF	LHD2	1.3800e-004	1.3377e-004
tblVehicleEF	LHD2	5.8420e-003	6.2769e-003
tblVehicleEF	LHD2	2.5600e-004	8.1904e-005
tblVehicleEF	LHD2	1.1430e-003	1.5266e-003
tblVehicleEF	LHD2	0.03	0.05
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	6.3600e-004	8.5545e-004
tblVehicleEF	LHD2	0.06	0.06
tblVehicleEF	LHD2	0.07	0.27

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

tblVehicleEF	LHD2	0.10	0.05
tblVehicleEF	LHD2	3.2790e-003	3.4545e-003
tblVehicleEF	LHD2	3.7760e-003	3.6701e-003
tblVehicleEF	LHD2	6.3100e-003	8.7155e-003
tblVehicleEF	LHD2	0.12	0.14
tblVehicleEF	LHD2	0.40	0.43
tblVehicleEF	LHD2	1.01	0.58
tblVehicleEF	LHD2	14.16	13.98
tblVehicleEF	LHD2	600.81	649.80
tblVehicleEF	LHD2	23.70	8.22
tblVehicleEF	LHD2	0.10	0.10
tblVehicleEF	LHD2	1.04	1.03
tblVehicleEF	LHD2	0.44	0.20
tblVehicleEF	LHD2	1.2350e-003	1.3465e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	3.6900e-004	1.2415e-004
tblVehicleEF	LHD2	1.1820e-003	1.2883e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.6940e-003	2.6692e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	3.3900e-004	1.1415e-004
tblVehicleEF	LHD2	2.1960e-003	2.7469e-003
tblVehicleEF	LHD2	0.04	0.05

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San Bernardino-South Coast County, Winter

tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	1.3570e-003	1.6184e-003
tblVehicleEF	LHD2	0.05	0.06
tblVehicleEF	LHD2	0.07	0.27
tblVehicleEF	LHD2	0.09	0.04
tblVehicleEF	LHD2	1.3800e-004	1.3377e-004
tblVehicleEF	LHD2	5.8420e-003	6.2770e-003
tblVehicleEF	LHD2	2.5500e-004	8.1352e-005
tblVehicleEF	LHD2	2.1960e-003	2.7469e-003
tblVehicleEF	LHD2	0.04	0.05
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	1.3570e-003	1.6184e-003
tblVehicleEF	LHD2	0.06	0.06
tblVehicleEF	LHD2	0.07	0.27
tblVehicleEF	LHD2	0.09	0.05
tblVehicleEF	LHD2	3.2790e-003	3.4465e-003
tblVehicleEF	LHD2	3.7350e-003	3.6405e-003
tblVehicleEF	LHD2	6.5440e-003	9.0209e-003
tblVehicleEF	LHD2	0.12	0.14
tblVehicleEF	LHD2	0.40	0.43
tblVehicleEF	LHD2	1.06	0.61
tblVehicleEF	LHD2	14.16	13.98
tblVehicleEF	LHD2	600.81	649.80
tblVehicleEF	LHD2	23.70	8.27
tblVehicleEF	LHD2	0.10	0.10

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San Bernardino-South Coast County, Winter

tblVehicleEF	LHD2	1.09	1.08
tblVehicleEF	LHD2	0.45	0.20
tblVehicleEF	LHD2	1.2350e-003	1.3465e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	3.6900e-004	1.2415e-004
tblVehicleEF	LHD2	1.1820e-003	1.2883e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.6940e-003	2.6692e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	3.3900e-004	1.1415e-004
tblVehicleEF	LHD2	1.1520e-003	1.5019e-003
tblVehicleEF	LHD2	0.04	0.05
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	6.2000e-004	8.5367e-004
tblVehicleEF	LHD2	0.05	0.06
tblVehicleEF	LHD2	0.08	0.29
tblVehicleEF	LHD2	0.09	0.04
tblVehicleEF	LHD2	1.3800e-004	1.3377e-004
tblVehicleEF	LHD2	5.8420e-003	6.2769e-003
tblVehicleEF	LHD2	2.5600e-004	8.1841e-005
tblVehicleEF	LHD2	1.1520e-003	1.5019e-003
tblVehicleEF	LHD2	0.04	0.05
tblVehicleEF	LHD2	0.02	0.02

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San Bernardino-South Coast County, Winter

tblVehicleEF	LHD2	6.2000e-004	8.5367e-004
tblVehicleEF	LHD2	0.06	0.06
tblVehicleEF	LHD2	0.08	0.29
tblVehicleEF	LHD2	0.10	0.05
tblVehicleEF	MCY	0.44	0.34
tblVehicleEF	MCY	0.16	0.24
tblVehicleEF	MCY	19.74	18.80
tblVehicleEF	MCY	9.96	8.64
tblVehicleEF	MCY	169.37	213.49
tblVehicleEF	MCY	45.59	60.09
tblVehicleEF	MCY	1.15	1.13
tblVehicleEF	MCY	0.31	0.26
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003
tblVehicleEF	MCY	1.9350e-003	2.0823e-003
tblVehicleEF	MCY	3.3460e-003	2.7595e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003
tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	1.8090e-003	1.9452e-003
tblVehicleEF	MCY	3.1480e-003	2.5918e-003
tblVehicleEF	MCY	1.44	1.42
tblVehicleEF	MCY	0.81	0.78
tblVehicleEF	MCY	0.79	0.77
tblVehicleEF	MCY	2.20	2.34
tblVehicleEF	MCY	0.47	1.77

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San Bernardino-South Coast County, Winter

tblVehicleEF	MCY	2.13	1.82
tblVehicleEF	MCY	2.0800e-003	2.1126e-003
tblVehicleEF	MCY	6.8100e-004	5.9462e-004
tblVehicleEF	MCY	1.44	1.42
tblVehicleEF	MCY	0.81	0.78
tblVehicleEF	MCY	0.79	0.77
tblVehicleEF	MCY	2.72	2.90
tblVehicleEF	MCY	0.47	1.77
tblVehicleEF	MCY	2.32	1.99
tblVehicleEF	MCY	0.43	0.34
tblVehicleEF	MCY	0.13	0.21
tblVehicleEF	MCY	19.87	18.83
tblVehicleEF	MCY	9.04	7.91
tblVehicleEF	MCY	169.37	213.40
tblVehicleEF	MCY	45.59	58.20
tblVehicleEF	MCY	0.98	0.97
tblVehicleEF	MCY	0.29	0.25
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003
tblVehicleEF	MCY	1.9350e-003	2.0823e-003
tblVehicleEF	MCY	3.3460e-003	2.7595e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003
tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	1.8090e-003	1.9452e-003
tblVehicleEF	MCY	3.1480e-003	2.5918e-003

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San Bernardino-South Coast County, Winter

tblVehicleEF	MCY	3.11	2.77
tblVehicleEF	MCY	1.24	1.10
tblVehicleEF	MCY	2.09	1.75
tblVehicleEF	MCY	2.15	2.30
tblVehicleEF	MCY	0.47	1.74
tblVehicleEF	MCY	1.84	1.60
tblVehicleEF	MCY	2.0800e-003	2.1118e-003
tblVehicleEF	MCY	6.5700e-004	5.7593e-004
tblVehicleEF	MCY	3.11	2.77
tblVehicleEF	MCY	1.24	1.10
tblVehicleEF	MCY	2.09	1.75
tblVehicleEF	MCY	2.66	2.85
tblVehicleEF	MCY	0.47	1.74
tblVehicleEF	MCY	2.00	1.75
tblVehicleEF	MCY	0.43	0.34
tblVehicleEF	MCY	0.15	0.24
tblVehicleEF	MCY	18.88	18.32
tblVehicleEF	MCY	9.60	8.48
tblVehicleEF	MCY	169.37	212.66
tblVehicleEF	MCY	45.59	59.76
tblVehicleEF	MCY	1.11	1.09
tblVehicleEF	MCY	0.31	0.26
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003
tblVehicleEF	MCY	1.9350e-003	2.0823e-003

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San Bernardino-South Coast County, Winter

tblVehicleEF	MCY	3.3460e-003	2.7595e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003
tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	1.8090e-003	1.9452e-003
tblVehicleEF	MCY	3.1480e-003	2.5918e-003
tblVehicleEF	MCY	1.69	1.57
tblVehicleEF	MCY	1.09	1.04
tblVehicleEF	MCY	0.70	0.73
tblVehicleEF	MCY	2.17	2.32
tblVehicleEF	MCY	0.53	2.02
tblVehicleEF	MCY	2.06	1.80
tblVehicleEF	MCY	2.0660e-003	2.1044e-003
tblVehicleEF	MCY	6.7300e-004	5.9133e-004
tblVehicleEF	MCY	1.69	1.57
tblVehicleEF	MCY	1.09	1.04
tblVehicleEF	MCY	0.70	0.73
tblVehicleEF	MCY	2.68	2.88
tblVehicleEF	MCY	0.53	2.02
tblVehicleEF	MCY	2.24	1.96
tblVehicleEF	MDV	0.01	4.3912e-003
tblVehicleEF	MDV	0.02	0.07
tblVehicleEF	MDV	1.13	0.95
tblVehicleEF	MDV	2.68	2.91
tblVehicleEF	MDV	455.56	394.71
tblVehicleEF	MDV	101.88	82.36

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San Bernardino-South Coast County, Winter

tblVehicleEF	MDV	0.14	0.08
tblVehicleEF	MDV	0.26	0.32
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	1.7950e-003	1.5664e-003
tblVehicleEF	MDV	2.4230e-003	1.8283e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	1.6540e-003	1.4442e-003
tblVehicleEF	MDV	2.2280e-003	1.6811e-003
tblVehicleEF	MDV	0.09	0.11
tblVehicleEF	MDV	0.19	0.16
tblVehicleEF	MDV	0.08	0.10
tblVehicleEF	MDV	0.03	0.02
tblVehicleEF	MDV	0.11	0.47
tblVehicleEF	MDV	0.20	0.36
tblVehicleEF	MDV	4.5620e-003	3.8247e-003
tblVehicleEF	MDV	1.0660e-003	7.9846e-004
tblVehicleEF	MDV	0.09	0.11
tblVehicleEF	MDV	0.19	0.16
tblVehicleEF	MDV	0.08	0.10
tblVehicleEF	MDV	0.04	0.03
tblVehicleEF	MDV	0.11	0.47
tblVehicleEF	MDV	0.22	0.40
tblVehicleEF	MDV	0.01	4.9455e-003

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San Bernardino-South Coast County, Winter

tblVehicleEF	MDV	0.01	0.06
tblVehicleEF	MDV	1.38	1.14
tblVehicleEF	MDV	2.22	2.44
tblVehicleEF	MDV	495.92	416.48
tblVehicleEF	MDV	101.88	81.42
tblVehicleEF	MDV	0.13	0.07
tblVehicleEF	MDV	0.24	0.29
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	1.7950e-003	1.5664e-003
tblVehicleEF	MDV	2.4230e-003	1.8283e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	1.6540e-003	1.4442e-003
tblVehicleEF	MDV	2.2280e-003	1.6811e-003
tblVehicleEF	MDV	0.19	0.20
tblVehicleEF	MDV	0.22	0.17
tblVehicleEF	MDV	0.17	0.18
tblVehicleEF	MDV	0.03	0.02
tblVehicleEF	MDV	0.11	0.46
tblVehicleEF	MDV	0.17	0.31
tblVehicleEF	MDV	4.9690e-003	4.0358e-003
tblVehicleEF	MDV	1.0570e-003	7.8939e-004
tblVehicleEF	MDV	0.19	0.20
tblVehicleEF	MDV	0.22	0.17

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San Bernardino-South Coast County, Winter

tblVehicleEF	MDV	0.17	0.18
tblVehicleEF	MDV	0.04	0.03
tblVehicleEF	MDV	0.11	0.46
tblVehicleEF	MDV	0.19	0.34
tblVehicleEF	MDV	0.01	4.3013e-003
tblVehicleEF	MDV	0.01	0.07
tblVehicleEF	MDV	1.07	0.91
tblVehicleEF	MDV	2.64	2.92
tblVehicleEF	MDV	446.15	390.65
tblVehicleEF	MDV	101.88	82.38
tblVehicleEF	MDV	0.13	0.08
tblVehicleEF	MDV	0.26	0.31
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	1.7950e-003	1.5664e-003
tblVehicleEF	MDV	2.4230e-003	1.8283e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	1.6540e-003	1.4442e-003
tblVehicleEF	MDV	2.2280e-003	1.6811e-003
tblVehicleEF	MDV	0.09	0.10
tblVehicleEF	MDV	0.21	0.17
tblVehicleEF	MDV	0.08	0.09
tblVehicleEF	MDV	0.03	0.02
tblVehicleEF	MDV	0.12	0.54

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San Bernardino-South Coast County, Winter

tblVehicleEF	MDV	0.20	0.36
tblVehicleEF	MDV	4.4680e-003	3.7853e-003
tblVehicleEF	MDV	1.0650e-003	7.9866e-004
tblVehicleEF	MDV	0.09	0.10
tblVehicleEF	MDV	0.21	0.17
tblVehicleEF	MDV	0.08	0.09
tblVehicleEF	MDV	0.04	0.03
tblVehicleEF	MDV	0.12	0.54
tblVehicleEF	MDV	0.22	0.40
tblVehicleEF	MH	0.03	9.0576e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	2.16	1.00
tblVehicleEF	MH	5.58	1.96
tblVehicleEF	MH	1,051.62	1,459.21
tblVehicleEF	MH	58.77	18.16
tblVehicleEF	MH	1.36	1.41
tblVehicleEF	MH	0.83	0.24
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	1.0410e-003	2.3041e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.2250e-003	3.2868e-003
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	9.5800e-004	2.1186e-004

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San Bernardino-South Coast County, Winter

tblVehicleEF	MH	1.28	0.98
tblVehicleEF	MH	0.08	0.06
tblVehicleEF	MH	0.45	0.38
tblVehicleEF	MH	0.08	0.06
tblVehicleEF	MH	0.03	1.31
tblVehicleEF	MH	0.32	0.09
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	6.8500e-004	1.7973e-004
tblVehicleEF	MH	1.28	0.98
tblVehicleEF	MH	0.08	0.06
tblVehicleEF	MH	0.45	0.38
tblVehicleEF	MH	0.11	0.08
tblVehicleEF	MH	0.03	1.31
tblVehicleEF	MH	0.35	0.10
tblVehicleEF	MH	0.03	9.2608e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	2.24	1.02
tblVehicleEF	MH	5.08	1.82
tblVehicleEF	MH	1,051.62	1,459.25
tblVehicleEF	MH	58.77	17.93
tblVehicleEF	MH	1.24	1.31
tblVehicleEF	MH	0.79	0.23
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.03	0.03

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San Bernardino-South Coast County, Winter

tblVehicleEF	MH	1.0410e-003	2.3041e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.2250e-003	3.2868e-003
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	9.5800e-004	2.1186e-004
tblVehicleEF	MH	2.51	1.74
tblVehicleEF	MH	0.09	0.07
tblVehicleEF	MH	1.05	0.73
tblVehicleEF	MH	0.08	0.06
tblVehicleEF	MH	0.03	1.30
tblVehicleEF	MH	0.30	0.09
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	6.7600e-004	1.7744e-004
tblVehicleEF	MH	2.51	1.74
tblVehicleEF	MH	0.09	0.07
tblVehicleEF	MH	1.05	0.73
tblVehicleEF	MH	0.12	0.08
tblVehicleEF	MH	0.03	1.30
tblVehicleEF	MH	0.33	0.09
tblVehicleEF	MH	0.03	9.0626e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	2.17	1.00
tblVehicleEF	MH	5.52	1.96
tblVehicleEF	MH	1,051.62	1,459.21
tblVehicleEF	MH	58.77	18.17

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San Bernardino-South Coast County, Winter

tblVehicleEF	MH	1.33	1.38
tblVehicleEF	MH	0.82	0.24
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	1.0410e-003	2.3041e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.2250e-003	3.2868e-003
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	9.5800e-004	2.1186e-004
tblVehicleEF	MH	1.50	1.06
tblVehicleEF	MH	0.10	0.07
tblVehicleEF	MH	0.46	0.39
tblVehicleEF	MH	0.08	0.06
tblVehicleEF	MH	0.03	1.38
tblVehicleEF	MH	0.32	0.09
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	6.8400e-004	1.7980e-004
tblVehicleEF	MH	1.50	1.06
tblVehicleEF	MH	0.10	0.07
tblVehicleEF	MH	0.46	0.39
tblVehicleEF	MH	0.11	0.08
tblVehicleEF	MH	0.03	1.38
tblVehicleEF	MH	0.35	0.10
tblVehicleEF	MHD	0.02	2.3961e-003

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

tblVehicleEF	MHD	2.6000e-003	9.5913e-004
tblVehicleEF	MHD	0.04	5.9112e-003
tblVehicleEF	MHD	0.30	0.31
tblVehicleEF	MHD	0.23	0.14
tblVehicleEF	MHD	4.34	0.65
tblVehicleEF	MHD	155.87	63.89
tblVehicleEF	MHD	1,101.40	932.72
tblVehicleEF	MHD	50.42	5.97
tblVehicleEF	MHD	0.42	0.35
tblVehicleEF	MHD	0.64	1.08
tblVehicleEF	MHD	12.05	1.86
tblVehicleEF	MHD	1.0400e-004	2.8538e-004
tblVehicleEF	MHD	0.13	0.13
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	2.7700e-003	6.8459e-003
tblVehicleEF	MHD	6.8900e-004	6.8489e-005
tblVehicleEF	MHD	9.9000e-005	2.7304e-004
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.0000e-003	3.0000e-003
tblVehicleEF	MHD	2.6470e-003	6.5468e-003
tblVehicleEF	MHD	6.3400e-004	6.2973e-005
tblVehicleEF	MHD	1.0590e-003	3.7575e-004
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.02	0.01
tblVehicleEF	MHD	5.6000e-004	2.0705e-004

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

tblVehicleEF	MHD	0.03	0.01
tblVehicleEF	MHD	0.01	0.07
tblVehicleEF	MHD	0.27	0.03
tblVehicleEF	MHD	1.4970e-003	6.0553e-004
tblVehicleEF	MHD	0.01	8.8645e-003
tblVehicleEF	MHD	5.8000e-004	5.9031e-005
tblVehicleEF	MHD	1.0590e-003	3.7575e-004
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	5.6000e-004	2.0705e-004
tblVehicleEF	MHD	0.03	0.01
tblVehicleEF	MHD	0.01	0.07
tblVehicleEF	MHD	0.29	0.03
tblVehicleEF	MHD	0.01	2.2875e-003
tblVehicleEF	MHD	2.6390e-003	9.7539e-004
tblVehicleEF	MHD	0.04	5.6788e-003
tblVehicleEF	MHD	0.22	0.27
tblVehicleEF	MHD	0.23	0.14
tblVehicleEF	MHD	4.06	0.62
tblVehicleEF	MHD	165.10	63.62
tblVehicleEF	MHD	1,101.40	932.72
tblVehicleEF	MHD	50.42	5.90
tblVehicleEF	MHD	0.44	0.35
tblVehicleEF	MHD	0.60	1.01
tblVehicleEF	MHD	12.02	1.86

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

tblVehicleEF	MHD	8.7000e-005	2.4356e-004
tblVehicleEF	MHD	0.13	0.13
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	2.7700e-003	6.8459e-003
tblVehicleEF	MHD	6.8900e-004	6.8489e-005
tblVehicleEF	MHD	8.4000e-005	2.3302e-004
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.0000e-003	3.0000e-003
tblVehicleEF	MHD	2.6470e-003	6.5468e-003
tblVehicleEF	MHD	6.3400e-004	6.2973e-005
tblVehicleEF	MHD	2.0770e-003	6.8378e-004
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.02	0.01
tblVehicleEF	MHD	1.2630e-003	4.0503e-004
tblVehicleEF	MHD	0.03	0.01
tblVehicleEF	MHD	0.01	0.07
tblVehicleEF	MHD	0.25	0.03
tblVehicleEF	MHD	1.5840e-003	6.0307e-004
tblVehicleEF	MHD	0.01	8.8645e-003
tblVehicleEF	MHD	5.7500e-004	5.8413e-005
tblVehicleEF	MHD	2.0770e-003	6.8378e-004
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	1.2630e-003	4.0503e-004
tblVehicleEF	MHD	0.03	0.01

CVUS-07 Project Run - San Bernardino-South Coast County, Winter

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

tblVehicleEF	MHD	0.01	0.07
tblVehicleEF	MHD	0.28	0.03
tblVehicleEF	MHD	0.02	2.5564e-003
tblVehicleEF	MHD	2.6040e-003	9.5905e-004
tblVehicleEF	MHD	0.04	5.8670e-003
tblVehicleEF	MHD	0.41	0.36
tblVehicleEF	MHD	0.23	0.14
tblVehicleEF	MHD	4.27	0.65
tblVehicleEF	MHD	143.11	64.26
tblVehicleEF	MHD	1,101.40	932.72
tblVehicleEF	MHD	50.42	5.96
tblVehicleEF	MHD	0.40	0.37
tblVehicleEF	MHD	0.63	1.06
tblVehicleEF	MHD	12.04	1.86
tblVehicleEF	MHD	1.2600e-004	3.4313e-004
tblVehicleEF	MHD	0.13	0.13
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	2.7700e-003	6.8459e-003
tblVehicleEF	MHD	6.8900e-004	6.8489e-005
tblVehicleEF	MHD	1.2100e-004	3.2829e-004
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.0000e-003	3.0000e-003
tblVehicleEF	MHD	2.6470e-003	6.5468e-003
tblVehicleEF	MHD	6.3400e-004	6.2973e-005
tblVehicleEF	MHD	1.1160e-003	3.8027e-004

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.02	0.01
tblVehicleEF	MHD	5.4700e-004	2.0877e-004
tblVehicleEF	MHD	0.03	0.01
tblVehicleEF	MHD	0.02	0.08
tblVehicleEF	MHD	0.26	0.03
tblVehicleEF	MHD	1.3770e-003	6.0888e-004
tblVehicleEF	MHD	0.01	8.8645e-003
tblVehicleEF	MHD	5.7900e-004	5.8945e-005
tblVehicleEF	MHD	1.1160e-003	3.8027e-004
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	5.4700e-004	2.0877e-004
tblVehicleEF	MHD	0.03	0.01
tblVehicleEF	MHD	0.02	0.08
tblVehicleEF	MHD	0.29	0.03
tblVehicleEF	OBUS	0.01	8.6570e-003
tblVehicleEF	OBUS	7.2410e-003	4.7733e-003
tblVehicleEF	OBUS	0.03	0.02
tblVehicleEF	OBUS	0.24	0.54
tblVehicleEF	OBUS	0.47	0.58
tblVehicleEF	OBUS	5.59	2.33
tblVehicleEF	OBUS	65.08	74.10
tblVehicleEF	OBUS	1,122.26	1,367.42
tblVehicleEF	OBUS	70.20	19.84

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

tblVehicleEF	OBUS	0.12	0.27
tblVehicleEF	OBUS	0.45	1.00
tblVehicleEF	OBUS	1.81	0.74
tblVehicleEF	OBUS	1.1000e-005	9.2233e-005
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	1.9630e-003	6.6254e-003
tblVehicleEF	OBUS	9.4500e-004	2.2194e-004
tblVehicleEF	OBUS	1.1000e-005	8.8243e-005
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	3.0000e-003	3.0000e-003
tblVehicleEF	OBUS	1.8550e-003	6.3206e-003
tblVehicleEF	OBUS	8.6900e-004	2.0406e-004
tblVehicleEF	OBUS	1.9890e-003	2.5726e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.03	0.05
tblVehicleEF	OBUS	8.6300e-004	1.1214e-003
tblVehicleEF	OBUS	0.03	0.03
tblVehicleEF	OBUS	0.05	0.29
tblVehicleEF	OBUS	0.34	0.11
tblVehicleEF	OBUS	6.3300e-004	7.0653e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	8.0000e-004	1.9629e-004
tblVehicleEF	OBUS	1.9890e-003	2.5726e-003
tblVehicleEF	OBUS	0.02	0.02

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

tblVehicleEF	OBUS	0.04	0.06
tblVehicleEF	OBUS	8.6300e-004	1.1214e-003
tblVehicleEF	OBUS	0.04	0.04
tblVehicleEF	OBUS	0.05	0.29
tblVehicleEF	OBUS	0.38	0.12
tblVehicleEF	OBUS	0.01	8.7351e-003
tblVehicleEF	OBUS	7.4380e-003	4.8889e-003
tblVehicleEF	OBUS	0.03	0.02
tblVehicleEF	OBUS	0.24	0.53
tblVehicleEF	OBUS	0.49	0.59
tblVehicleEF	OBUS	5.12	2.17
tblVehicleEF	OBUS	67.92	73.30
tblVehicleEF	OBUS	1,122.26	1,367.44
tblVehicleEF	OBUS	70.20	19.56
tblVehicleEF	OBUS	0.13	0.26
tblVehicleEF	OBUS	0.41	0.93
tblVehicleEF	OBUS	1.76	0.73
tblVehicleEF	OBUS	9.0000e-006	8.1955e-005
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	1.9630e-003	6.6254e-003
tblVehicleEF	OBUS	9.4500e-004	2.2194e-004
tblVehicleEF	OBUS	9.0000e-006	7.8410e-005
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	3.0000e-003	3.0000e-003

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

tblVehicleEF	OBUS	1.8550e-003	6.3206e-003
tblVehicleEF	OBUS	8.6900e-004	2.0406e-004
tblVehicleEF	OBUS	3.8500e-003	4.6205e-003
tblVehicleEF	OBUS	0.02	0.03
tblVehicleEF	OBUS	0.03	0.05
tblVehicleEF	OBUS	1.9610e-003	2.1940e-003
tblVehicleEF	OBUS	0.03	0.03
tblVehicleEF	OBUS	0.05	0.29
tblVehicleEF	OBUS	0.32	0.11
tblVehicleEF	OBUS	6.6000e-004	6.9892e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	7.9200e-004	1.9358e-004
tblVehicleEF	OBUS	3.8500e-003	4.6205e-003
tblVehicleEF	OBUS	0.02	0.03
tblVehicleEF	OBUS	0.04	0.07
tblVehicleEF	OBUS	1.9610e-003	2.1940e-003
tblVehicleEF	OBUS	0.04	0.04
tblVehicleEF	OBUS	0.05	0.29
tblVehicleEF	OBUS	0.36	0.12
tblVehicleEF	OBUS	0.01	8.5819e-003
tblVehicleEF	OBUS	7.2610e-003	4.7769e-003
tblVehicleEF	OBUS	0.03	0.02
tblVehicleEF	OBUS	0.25	0.54
tblVehicleEF	OBUS	0.48	0.58
tblVehicleEF	OBUS	5.55	2.33

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

tblVehicleEF	OBUS	61.15	75.21
tblVehicleEF	OBUS	1,122.26	1,367.42
tblVehicleEF	OBUS	70.20	19.84
tblVehicleEF	OBUS	0.12	0.29
tblVehicleEF	OBUS	0.44	0.98
tblVehicleEF	OBUS	1.79	0.74
tblVehicleEF	OBUS	1.4000e-005	1.0643e-004
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	1.9630e-003	6.6254e-003
tblVehicleEF	OBUS	9.4500e-004	2.2194e-004
tblVehicleEF	OBUS	1.3000e-005	1.0182e-004
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	3.0000e-003	3.0000e-003
tblVehicleEF	OBUS	1.8550e-003	6.3206e-003
tblVehicleEF	OBUS	8.6900e-004	2.0406e-004
tblVehicleEF	OBUS	2.0720e-003	2.6685e-003
tblVehicleEF	OBUS	0.02	0.03
tblVehicleEF	OBUS	0.03	0.05
tblVehicleEF	OBUS	8.6200e-004	1.1635e-003
tblVehicleEF	OBUS	0.03	0.03
tblVehicleEF	OBUS	0.05	0.31
tblVehicleEF	OBUS	0.34	0.11
tblVehicleEF	OBUS	5.9600e-004	7.1703e-004
tblVehicleEF	OBUS	0.01	0.01

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

tblVehicleEF	OBUS	7.9900e-004	1.9638e-004
tblVehicleEF	OBUS	2.0720e-003	2.6685e-003
tblVehicleEF	OBUS	0.02	0.03
tblVehicleEF	OBUS	0.04	0.06
tblVehicleEF	OBUS	8.6200e-004	1.1635e-003
tblVehicleEF	OBUS	0.04	0.04
tblVehicleEF	OBUS	0.05	0.31
tblVehicleEF	OBUS	0.38	0.12
tblVehicleEF	SBUS	0.83	0.06
tblVehicleEF	SBUS	9.2120e-003	7.3441e-003
tblVehicleEF	SBUS	0.06	6.3239e-003
tblVehicleEF	SBUS	5.90	2.63
tblVehicleEF	SBUS	0.56	0.68
tblVehicleEF	SBUS	5.13	0.82
tblVehicleEF	SBUS	1,231.15	341.25
tblVehicleEF	SBUS	1,120.79	1,083.10
tblVehicleEF	SBUS	39.22	4.88
tblVehicleEF	SBUS	10.14	3.05
tblVehicleEF	SBUS	3.99	4.60
tblVehicleEF	SBUS	14.61	1.04
tblVehicleEF	SBUS	9.1600e-003	3.4684e-003
tblVehicleEF	SBUS	0.74	0.74
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	5.6800e-004	4.0441e-005

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

tblVehicleEF	SBUS	8.7640e-003	3.3184e-003
tblVehicleEF	SBUS	0.32	0.32
tblVehicleEF	SBUS	2.7400e-003	2.6958e-003
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	5.2200e-004	3.7184e-005
tblVehicleEF	SBUS	2.9390e-003	1.1929e-003
tblVehicleEF	SBUS	0.02	9.3021e-003
tblVehicleEF	SBUS	0.70	0.29
tblVehicleEF	SBUS	1.3780e-003	6.0617e-004
tblVehicleEF	SBUS	0.10	0.09
tblVehicleEF	SBUS	9.1030e-003	0.05
tblVehicleEF	SBUS	0.27	0.04
tblVehicleEF	SBUS	0.01	3.2535e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	4.8100e-004	4.8273e-005
tblVehicleEF	SBUS	2.9390e-003	1.1929e-003
tblVehicleEF	SBUS	0.02	9.3021e-003
tblVehicleEF	SBUS	1.00	0.42
tblVehicleEF	SBUS	1.3780e-003	6.0617e-004
tblVehicleEF	SBUS	0.12	0.11
tblVehicleEF	SBUS	9.1030e-003	0.05
tblVehicleEF	SBUS	0.29	0.04
tblVehicleEF	SBUS	0.83	0.06
tblVehicleEF	SBUS	9.3730e-003	7.4544e-003
tblVehicleEF	SBUS	0.05	5.2953e-003

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

tblVehicleEF	SBUS	5.77	2.60
tblVehicleEF	SBUS	0.57	0.69
tblVehicleEF	SBUS	3.51	0.59
tblVehicleEF	SBUS	1,292.80	347.80
tblVehicleEF	SBUS	1,120.79	1,083.12
tblVehicleEF	SBUS	39.22	4.50
tblVehicleEF	SBUS	10.46	3.11
tblVehicleEF	SBUS	3.74	4.32
tblVehicleEF	SBUS	14.58	1.04
tblVehicleEF	SBUS	7.7220e-003	2.9321e-003
tblVehicleEF	SBUS	0.74	0.74
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	5.6800e-004	4.0441e-005
tblVehicleEF	SBUS	7.3880e-003	2.8053e-003
tblVehicleEF	SBUS	0.32	0.32
tblVehicleEF	SBUS	2.7400e-003	2.6958e-003
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	5.2200e-004	3.7184e-005
tblVehicleEF	SBUS	5.5960e-003	2.1200e-003
tblVehicleEF	SBUS	0.02	9.6252e-003
tblVehicleEF	SBUS	0.70	0.29
tblVehicleEF	SBUS	2.9710e-003	1.1273e-003
tblVehicleEF	SBUS	0.10	0.09
tblVehicleEF	SBUS	8.3110e-003	0.05

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

tblVehicleEF	SBUS	0.22	0.03
tblVehicleEF	SBUS	0.01	3.3153e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	4.5400e-004	4.4524e-005
tblVehicleEF	SBUS	5.5960e-003	2.1200e-003
tblVehicleEF	SBUS	0.02	9.6252e-003
tblVehicleEF	SBUS	1.00	0.42
tblVehicleEF	SBUS	2.9710e-003	1.1273e-003
tblVehicleEF	SBUS	0.12	0.11
tblVehicleEF	SBUS	8.3110e-003	0.05
tblVehicleEF	SBUS	0.24	0.03
tblVehicleEF	SBUS	0.83	0.06
tblVehicleEF	SBUS	9.2160e-003	7.3373e-003
tblVehicleEF	SBUS	0.06	6.5157e-003
tblVehicleEF	SBUS	6.08	2.68
tblVehicleEF	SBUS	0.56	0.67
tblVehicleEF	SBUS	5.17	0.86
tblVehicleEF	SBUS	1,146.01	332.21
tblVehicleEF	SBUS	1,120.79	1,083.10
tblVehicleEF	SBUS	39.22	4.94
tblVehicleEF	SBUS	9.69	2.98
tblVehicleEF	SBUS	3.93	4.53
tblVehicleEF	SBUS	14.61	1.04
tblVehicleEF	SBUS	0.01	4.2090e-003
tblVehicleEF	SBUS	0.74	0.74

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	5.6800e-004	4.0441e-005
tblVehicleEF	SBUS	0.01	4.0269e-003
tblVehicleEF	SBUS	0.32	0.32
tblVehicleEF	SBUS	2.7400e-003	2.6958e-003
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	5.2200e-004	3.7184e-005
tblVehicleEF	SBUS	2.8670e-003	1.0983e-003
tblVehicleEF	SBUS	0.02	9.4928e-003
tblVehicleEF	SBUS	0.70	0.29
tblVehicleEF	SBUS	1.3540e-003	6.0998e-004
tblVehicleEF	SBUS	0.10	0.09
tblVehicleEF	SBUS	0.01	0.06
tblVehicleEF	SBUS	0.27	0.04
tblVehicleEF	SBUS	0.01	3.1681e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	4.8200e-004	4.8891e-005
tblVehicleEF	SBUS	2.8670e-003	1.0983e-003
tblVehicleEF	SBUS	0.02	9.4928e-003
tblVehicleEF	SBUS	1.01	0.42
tblVehicleEF	SBUS	1.3540e-003	6.0998e-004
tblVehicleEF	SBUS	0.12	0.11
tblVehicleEF	SBUS	0.01	0.06
tblVehicleEF	SBUS	0.30	0.04

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

tblVehicleEF	UBUS	1.62	4.47
tblVehicleEF	UBUS	0.08	8.1159e-003
tblVehicleEF	UBUS	8.33	34.91
tblVehicleEF	UBUS	13.39	0.88
tblVehicleEF	UBUS	1,818.42	1,682.81
tblVehicleEF	UBUS	138.62	11.11
tblVehicleEF	UBUS	4.85	0.36
tblVehicleEF	UBUS	13.25	0.11
tblVehicleEF	UBUS	0.51	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.05	2.6981e-003
tblVehicleEF	UBUS	1.4450e-003	1.7436e-004
tblVehicleEF	UBUS	0.22	0.03
tblVehicleEF	UBUS	3.0000e-003	6.6215e-003
tblVehicleEF	UBUS	0.05	2.5669e-003
tblVehicleEF	UBUS	1.3280e-003	1.6032e-004
tblVehicleEF	UBUS	7.4710e-003	1.3306e-003
tblVehicleEF	UBUS	0.10	6.4588e-003
tblVehicleEF	UBUS	3.6930e-003	5.6077e-004
tblVehicleEF	UBUS	0.49	0.07
tblVehicleEF	UBUS	0.02	0.02
tblVehicleEF	UBUS	1.10	0.03
tblVehicleEF	UBUS	9.7450e-003	2.8420e-003
tblVehicleEF	UBUS	1.6300e-003	1.0991e-004
tblVehicleEF	UBUS	7.4710e-003	1.3306e-003

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San Bernardino-South Coast County, Winter

tblVehicleEF	UBUS	0.10	6.4588e-003
tblVehicleEF	UBUS	3.6930e-003	5.6077e-004
tblVehicleEF	UBUS	2.17	4.57
tblVehicleEF	UBUS	0.02	0.02
tblVehicleEF	UBUS	1.20	0.03
tblVehicleEF	UBUS	1.63	4.47
tblVehicleEF	UBUS	0.07	7.3605e-003
tblVehicleEF	UBUS	8.41	34.91
tblVehicleEF	UBUS	11.00	0.75
tblVehicleEF	UBUS	1,818.42	1,682.82
tblVehicleEF	UBUS	138.62	10.89
tblVehicleEF	UBUS	4.50	0.35
tblVehicleEF	UBUS	13.14	0.11
tblVehicleEF	UBUS	0.51	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.05	2.6981e-003
tblVehicleEF	UBUS	1.4450e-003	1.7436e-004
tblVehicleEF	UBUS	0.22	0.03
tblVehicleEF	UBUS	3.0000e-003	6.6215e-003
tblVehicleEF	UBUS	0.05	2.5669e-003
tblVehicleEF	UBUS	1.3280e-003	1.6032e-004
tblVehicleEF	UBUS	0.01	2.4604e-003
tblVehicleEF	UBUS	0.13	8.0066e-003
tblVehicleEF	UBUS	8.6540e-003	1.1780e-003
tblVehicleEF	UBUS	0.50	0.07

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San Bernardino-South Coast County, Winter

tblVehicleEF	UBUS	0.02	0.02
tblVehicleEF	UBUS	0.98	0.03
tblVehicleEF	UBUS	9.7470e-003	2.8420e-003
tblVehicleEF	UBUS	1.5890e-003	1.0780e-004
tblVehicleEF	UBUS	0.01	2.4604e-003
tblVehicleEF	UBUS	0.13	8.0066e-003
tblVehicleEF	UBUS	8.6540e-003	1.1780e-003
tblVehicleEF	UBUS	2.18	4.57
tblVehicleEF	UBUS	0.02	0.02
tblVehicleEF	UBUS	1.07	0.03
tblVehicleEF	UBUS	1.62	4.47
tblVehicleEF	UBUS	0.08	8.1886e-003
tblVehicleEF	UBUS	8.34	34.91
tblVehicleEF	UBUS	12.95	0.89
tblVehicleEF	UBUS	1,818.42	1,682.81
tblVehicleEF	UBUS	138.62	11.13
tblVehicleEF	UBUS	4.76	0.36
tblVehicleEF	UBUS	13.23	0.11
tblVehicleEF	UBUS	0.51	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.05	2.6981e-003
tblVehicleEF	UBUS	1.4450e-003	1.7436e-004
tblVehicleEF	UBUS	0.22	0.03
tblVehicleEF	UBUS	3.0000e-003	6.6215e-003
tblVehicleEF	UBUS	0.05	2.5669e-003

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tblVehicleEF	UBUS	1.3280e-003	1.6032e-004
tblVehicleEF	UBUS	8.4070e-003	1.3979e-003
tblVehicleEF	UBUS	0.13	7.4722e-003
tblVehicleEF	UBUS	3.8160e-003	5.7194e-004
tblVehicleEF	UBUS	0.49	0.07
tblVehicleEF	UBUS	0.03	0.02
tblVehicleEF	UBUS	1.08	0.03
tblVehicleEF	UBUS	9.7460e-003	2.8420e-003
tblVehicleEF	UBUS	1.6230e-003	1.1012e-004
tblVehicleEF	UBUS	8.4070e-003	1.3979e-003
tblVehicleEF	UBUS	0.13	7.4722e-003
tblVehicleEF	UBUS	3.8160e-003	5.7194e-004
tblVehicleEF	UBUS	2.17	4.57
tblVehicleEF	UBUS	0.03	0.02
tblVehicleEF	UBUS	1.18	0.03
tblVehicleTrips	WD_TR	15.43	4.13
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	IndoorWaterUseRate	2,656,117.62	1,717,745.64
tblWater	OutdoorWaterUseRate	6,830,016.73	2,687,430.73
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

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	2.2411	4.9000e-004	0.0543	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1165	0.1165	3.0000e-004		0.1241
Energy	0.0235	0.2138	0.1796	1.2800e-003		0.0163	0.0163		0.0163	0.0163		256.5686	256.5686	4.9200e-003	4.7000e-003	258.0932
Mobile	0.8889	0.7313	8.0895	0.0218	2.7240	0.0142	2.7382	0.7223	0.0131	0.7355		2,245.7922	2,245.7922	0.0817		2,247.8347
Total	**3.1535**	**0.9456**	**8.3234**	**0.0230**	**2.7240**	**0.0307**	**2.7546**	**0.7223**	**0.0296**	**0.7519**		**2,502.4773**	**2,502.4773**	**0.0869**	**4.7000e-003**	**2,506.0521**

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	2.2411	4.9000e-004	0.0543	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1165	0.1165	3.0000e-004		0.1241
Energy	0.0235	0.2138	0.1796	1.2800e-003		0.0163	0.0163		0.0163	0.0163		256.5686	256.5686	4.9200e-003	4.7000e-003	258.0932
Mobile	0.8889	0.7313	8.0895	0.0218	2.7240	0.0142	2.7382	0.7223	0.0131	0.7355		2,245.7922	2,245.7922	0.0817		2,247.8347
Total	**3.1535**	**0.9456**	**8.3234**	**0.0230**	**2.7240**	**0.0307**	**2.7546**	**0.7223**	**0.0296**	**0.7519**		**2,502.4773**	**2,502.4773**	**0.0869**	**4.7000e-003**	**2,506.0521**

	ROG	**NOx**	**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**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Architectural Coating	Architectural Coating	6/1/2022	6/28/2022	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 10.12

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 137,400; Non-Residential Outdoor: 45,800; Striped Parking Area:

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48

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
Architectural Coating	1	45.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

3.1 Mitigation Measures Construction

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Architectural Coating - 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					
Archit. Coating	48.5869					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.9062
Total	**48.7914**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

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	0.2145	0.1336	1.4014	4.2700e-003	0.5030	3.1200e-003	0.5061	0.1334	2.8800e-003	0.1363		425.7657	425.7657	0.0110		426.0416
Total	**0.2145**	**0.1336**	**1.4014**	**4.2700e-003**	**0.5030**	**3.1200e-003**	**0.5061**	**0.1334**	**2.8800e-003**	**0.1363**		**425.7657**	**425.7657**	**0.0110**		**426.0416**

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	48.5869					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817	0.0000	281.4481	281.4481	0.0183		281.9062
Total	**48.7914**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.9062**

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

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	0.2145	0.1336	1.4014	4.2700e-003	0.4636	3.1200e-003	0.4668	0.1237	2.8800e-003	0.1266		425.7657	425.7657	0.0110		426.0416
Total	**0.2145**	**0.1336**	**1.4014**	**4.2700e-003**	**0.4636**	**3.1200e-003**	**0.4668**	**0.1237**	**2.8800e-003**	**0.1266**		**425.7657**	**425.7657**	**0.0110**		**426.0416**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive 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	0.8889	0.7313	8.0895	0.0218	2.7240	0.0142	2.7382	0.7223	0.0131	0.7355		2,245.7922	2,245.7922	0.0817		2,247.8347
Unmitigated	0.8889	0.7313	8.0895	0.0218	2.7240	0.0142	2.7382	0.7223	0.0131	0.7355		2,245.7922	2,245.7922	0.0817		2,247.8347

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Elementary School	378.31	0.00	0.00	931,282	931,282
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Total	378.31	0.00	0.00	931,282	931,282

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
Elementary School	16.60	8.40	6.90	65.00	30.00	5.00	63	25	12
Other Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Other Non-Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Elementary School	0.693229	0.043800	0.225557	0.020000	0.001390	0.000466	0.001811	0.006332	0.000000	0.000000	0.007413	0.000000	0.000000
Other Asphalt Surfaces	0.558745	0.035303	0.181800	0.111169	0.014289	0.004794	0.018611	0.065078	0.001365	0.001491	0.005725	0.000799	0.000830
Other Non-Asphalt Surfaces	0.558745	0.035303	0.181800	0.111169	0.014289	0.004794	0.018611	0.065078	0.001365	0.001491	0.005725	0.000799	0.000830
Parking Lot	0.558745	0.035303	0.181800	0.111169	0.014289	0.004794	0.018611	0.065078	0.001365	0.001491	0.005725	0.000799	0.000830

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

5.0 Energy Detail

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	0.0235	0.2138	0.1796	1.2800e-003		0.0163	0.0163		0.0163	0.0163		256.5686	256.5686	4.9200e-003	4.7000e-003	258.0932
NaturalGas Unmitigated	0.0235	0.2138	0.1796	1.2800e-003		0.0163	0.0163		0.0163	0.0163		256.5686	256.5686	4.9200e-003	4.7000e-003	258.0932

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					
Elementary School	2180.83	0.0235	0.2138	0.1796	1.2800e-003		0.0163	0.0163		0.0163	0.0163		256.5686	256.5686	4.9200e-003	4.7000e-003	258.0932
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0235**	**0.2138**	**0.1796**	**1.2800e-003**		**0.0163**	**0.0163**		**0.0163**	**0.0163**		**256.5686**	**256.5686**	**4.9200e-003**	**4.7000e-003**	**258.0932**

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					
Elementary School	2.18083	0.0235	0.2138	0.1796	1.2800e-003		0.0163	0.0163		0.0163	0.0163		256.5686	256.5686	4.9200e-003	4.7000e-003	258.0932
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0235**	**0.2138**	**0.1796**	**1.2800e-003**		**0.0163**	**0.0163**		**0.0163**	**0.0163**		**256.5686**	**256.5686**	**4.9200e-003**	**4.7000e-003**	**258.0932**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive 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	2.2411	4.9000e-004	0.0543	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1165	0.1165	3.0000e-004		0.1241
Unmitigated	2.2411	4.9000e-004	0.0543	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1165	0.1165	3.0000e-004		0.1241

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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	0.2662					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.9698					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.0100e-003	4.9000e-004	0.0543	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1165	0.1165	3.0000e-004		0.1241
Total	**2.2411**	**4.9000e-004**	**0.0543**	**0.0000**		**1.9000e-004**	**1.9000e-004**		**1.9000e-004**	**1.9000e-004**		**0.1165**	**0.1165**	**3.0000e-004**		**0.1241**

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	0.2662					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.9698					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.0100e-003	4.9000e-004	0.0543	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1165	0.1165	3.0000e-004		0.1241
Total	**2.2411**	**4.9000e-004**	**0.0543**	**0.0000**		**1.9000e-004**	**1.9000e-004**		**1.9000e-004**	**1.9000e-004**		**0.1165**	**0.1165**	**3.0000e-004**		**0.1241**

CVUS-07 Project Run

San Bernardino-South Coast County, Winter

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Construction LSTs

Construction Localized Significance Thresholds: Residential - Architectural Coating

SRA No.	Acres Disturbed	Source Receptor Distance (meters)	Source Receptor Distance (Feet)	Construction / Project Site Size (Acres)
33	0.00	34	110	12.00

Source Receptor	**Southwest San Bernardino Valley**	**Equipment**	**Acres/8-hr Day**	**Acres/1-hr**	**Equipment Used**	**Daily Hours**	**Acres**
Distance (meters)	34	Tractors	0.5	0.0625			0
NOx	**128**	Graders	0.5	0.0625			0
CO	**1,022**	Dozers	0.5	0.0625			0
PM10	**8.07**	Scrapers	1	0.125			0
PM2.5	**4.68**					**Acres**	0.00

	Acres	**25**	**50**	**100**	**200**	**500**
NOx	1	118	148	211	334	652
	1	118	148	211	334	652
		118	148	211	334	652
CO	1	863	1328	2423	5691	23065
	1	863	1328	2423	5691	23065
		863	1328	2423	5691	23065
PM10	1	5	14	44	103	280
	1	5	14	44	103	280
		5	14	44	103	280
PM2.5	1	4	6	12	32	141
	1	4	6	12	32	141
		4	6	12	32	141

Southwest San Bernardino Valley

0.00 Acres

	25	**50**	**100**	**200**	**500**
NOx	118	148	211	334	652
CO	863	1328	2423	5691	23065
PM10	5	14	44	103	280
PM2.5	4	6	12	32	141

Acre Below		**Acre Above**	
SRA No.	Acres	SRA No.	Acres
33	1	33	1
Distance Increment Below			
25			
Distance Increment Above			
50			

Updated: 10/21/2009 - Table C-1. 2006 – 2008

Construction Localized Significance Thresholds: Residential - Building Construction& Soil Haul

SRA No.	Acres Disturbed	Source Receptor Distance (meters)	Source Receptor Distance (Feet)	Construction / Project Site Size (Acres)
33	1.31	34	110	12.00

Source Receptor	**Southwest San Bernardino Valley**	**Equipment**	**Acres/8-hr Day**	**Acres/1-hr**	**Equipment Used**	**Daily Hours**	**Acres**
Distance (meters)	34	Tractors	0.5	0.0625	3	7	1.3125
NOx	**144**	Graders	0.5	0.0625			0
CO	**1,156**	Dozers	0.5	0.0625			0
PM10	**8.81**	Scrapers	1	0.125			0
PM2.5	**5.10**					**Acres**	1.31

	Acres	**25**	**50**	**100**	**200**	**500**
NOx	1	118	148	211	334	652
	2	170	200	263	378	684
		134	164	227	348	662
CO	1	863	1328	2423	5691	23065
	2	1232	1877	3218	6778	24768
		978	1500	2671	6031	23597
PM10	1	5	14	44	103	280
	2	6	19	34	66	160
		5	16	41	91	243
PM2.5	1	4	6	12	32	141
	2	5	8	14	36	150
		4	7	13	33	144

Southwest San Bernardino Valley

1.31 Acres

	25	**50**	**100**	**200**	**500**
NOx	134	164	227	348	662
CO	978	1500	2671	6031	23597
PM10	5	16	41	91	243
PM2.5	4	7	13	33	144

Acre Below		**Acre Above**	
SRA No.	Acres	SRA No.	Acres
33	1	33	2

Distance Increment Below

25

Distance Increment Above

50

Updated: 10/21/2009 - Table C-1. 2006 – 2008

Construction Localized Significance Thresholds: Residential - Building Construction, Paving, Coating

SRA No.	Acres Disturbed	Source Receptor Distance (meters)	Source Receptor Distance (Feet)	Construction / Project Site Size (Acres)
33	1.31	34	110	4.56

Source Receptor	**Southwest San Bernardino Valley**	**Equipment**	**Acres/8-hr Day**	**Acres/1-hr**	**Equipment Used**	**Daily Hours**	**Acres**
Distance (meters)	34	Tractors	0.5	0.0625	3	7	1.3125
NOx	**144**	Graders	0.5	0.0625			0
CO	**1,156**	Dozers	0.5	0.0625			0
PM10	**8.81**	Scrapers	1	0.125			0
PM2.5	**5.10**					**Acres**	1.31

	Acres	**25**	**50**	**100**	**200**	**500**
NOx	1	118	148	211	334	652
	2	170	200	263	378	684
		134	164	227	348	662
CO	1	863	1328	2423	5691	23065
	2	1232	1877	3218	6778	24768
		978	1500	2671	6031	23597
PM10	1	5	14	44	103	280
	2	6	19	34	66	160
		5	16	41	91	243
PM2.5	1	4	6	12	32	141
	2	5	8	14	36	150
		4	7	13	33	144

Southwest San Bernardino Valley

1.31 Acres

	25	**50**	**100**	**200**	**500**
NOx	134	164	227	348	662
CO	978	1500	2671	6031	23597
PM10	5	16	41	91	243
PM2.5	4	7	13	33	144

Acre Below		**Acre Above**	
SRA No.	Acres	SRA No.	Acres
33	1	33	2

Distance Increment Below

25

Distance Increment Above

50

Updated: 10/21/2009 - Table C-1. 2006 – 2008

Construction Localized Significance Thresholds: Residential - Building Construction& Soil Haul

SRA No.	Acres Disturbed	Source Receptor Distance (meters)	Source Receptor Distance (Feet)	Construction / Project Site Size (Acres)
33	1.31	34	110	12.00

Source Receptor	**Southwest San Bernardino Valley**	**Equipment**	**Acres/8-hr Day**	**Acres/1-hr**	**Equipment Used**	**Daily Hours**	**Acres**
Distance (meters)	34	Tractors	0.5	0.0625	3	7	1.3125
NOx	**144**	Graders	0.5	0.0625			0
CO	**1,156**	Dozers	0.5	0.0625			0
PM10	**8.81**	Scrapers	1	0.125			0
PM2.5	**5.10**					**Acres**	1.31

	Acres	**25**	**50**	**100**	**200**	**500**
NOx	1	118	148	211	334	652
	2	170	200	263	378	684
		134	164	227	348	662
CO	1	863	1328	2423	5691	23065
	2	1232	1877	3218	6778	24768
		978	1500	2671	6031	23597
PM10	1	5	14	44	103	280
	2	6	19	34	66	160
		5	16	41	91	243
PM2.5	1	4	6	12	32	141
	2	5	8	14	36	150
		4	7	13	33	144

Southwest San Bernardino Valley

1.31 Acres

	25	**50**	**100**	**200**	**500**
NOx	134	164	227	348	662
CO	978	1500	2671	6031	23597
PM10	5	16	41	91	243
PM2.5	4	7	13	33	144

Acre Below		**Acre Above**	
SRA No.	Acres	SRA No.	Acres
33	1	33	2
Distance Increment Below			
25			
Distance Increment Above			
50			

Updated: 10/21/2009 - Table C-1. 2006 – 2008

Construction Localized Significance Thresholds: Residential - Grading

SRA No.	Acres Disturbed	Source Receptor Distance (meters)	Source Receptor Distance (Feet)	Construction / Project Site Size (Acres)
33	4.00	34	110	12.00

Source Receptor	**Southwest San Bernardino Valley**	**Equipment**	**Acres/8-hr Day**	**Acres/1-hr**	**Equipment Used**	**Daily Hours**	**Acres**
Distance (meters)	34	Tractors	0.5	0.0625	2	8	1
NOx	**248**	Graders	0.5	0.0625	1	8	0.5
CO	**2,125**	Dozers	0.5	0.0625	1	8	0.5
PM10	**21.88**	Scrapers	1	0.125	2	8	2
PM2.5	**8.69**					**Acres**	4.00

	Acres	**25**	**50**	**100**	**200**	**500**
NOx	4	237	269	340	450	747
	4	237	269	340	450	747
		237	269	340	450	747
CO	4	1873	2611	4531	8667	27863
	4	1873	2611	4531	8667	27863
		1873	2611	4531	8667	27863
PM10	4	13	40	65	115	268
	4	13	40	65	115	268
		13	40	65	115	268
PM2.5	4	8	11	19	42	163
	4	8	11	19	42	163
		8	11	19	42	163

Southwest San Bernardino Valley

4.00 Acres

	25	**50**	**100**	**200**	**500**
NOx	237	269	340	450	747
CO	1873	2611	4531	8667	27863
PM10	13	40	65	115	268
PM2.5	8	11	19	42	163

Acre Below		**Acre Above**	
SRA No.	Acres	SRA No.	Acres
33	4	33	4
Distance Increment Below			
25			
Distance Increment Above			
50			

Updated: 10/21/2009 - Table C-1. 2006 – 2008

Construction Localized Significance Thresholds: Residential - Paving

SRA No.	Acres Disturbed	Source Receptor Distance (meters)	Source Receptor Distance (Feet)	Construction / Project Site Size (Acres)
33	0.00	34	110	12.00

Source Receptor	**Southwest San Bernardino Valley**	**Equipment**	**Acres/8-hr Day**	**Acres/1-hr**	**Equipment Used**	**Daily Hours**	**Acres**
Distance (meters)	34	Tractors	0.5	0.0625			0
NOx	**128**	Graders	0.5	0.0625			0
CO	**1,022**	Dozers	0.5	0.0625			0
PM10	**8.07**	Scrapers	1	0.125			0
PM2.5	**4.68**					**Acres**	0.00

	Acres	**25**	**50**	**100**	**200**	**500**
NOx	1	118	148	211	334	652
	1	118	148	211	334	652
		118	148	211	334	652
CO	1	863	1328	2423	5691	23065
	1	863	1328	2423	5691	23065
		863	1328	2423	5691	23065
PM10	1	5	14	44	103	280
	1	5	14	44	103	280
		5	14	44	103	280
PM2.5	1	4	6	12	32	141
	1	4	6	12	32	141
		4	6	12	32	141

Southwest San Bernardino Valley

0.00 Acres

	25	**50**	**100**	**200**	**500**
NOx	118	148	211	334	652
CO	863	1328	2423	5691	23065
PM10	5	14	44	103	280
PM2.5	4	6	12	32	141

Acre Below		**Acre Above**	
SRA No.	Acres	SRA No.	Acres
33	1	33	1
Distance Increment Below			
25			
Distance Increment Above			
50			

Updated: 10/21/2009 - Table C-1. 2006 – 2008

Construction Localized Significance Thresholds: Residential - Site Prep

SRA No.	Acres Disturbed	Source Receptor Distance (meters)	Source Receptor Distance (Feet)	Construction / Project Site Size (Acres)
33	3.50	34	110	12.00

Source Receptor	**Southwest San Bernardino Valley**	**Equipment**	**Acres/8-hr Day**	**Acres/1-hr**	**Equipment Used**	**Daily Hours**	**Acres**
Distance (meters)	34	Tractors	0.5	0.0625	4	8	2
NOx	**231**	Graders	0.5	0.0625			0
CO	**1,956**	Dozers	0.5	0.0625	3	8	1.5
PM10	**19.02**	Scrapers	1	0.125			0
PM2.5	**8.02**					**Acres**	3.50

	Acres	**25**	**50**	**100**	**200**	**500**
NOx	3	203	234	301	414	715
	4	237	269	340	450	747
		220	252	321	432	731
CO	3	1552	2244	3875	7722	26315
	4	1873	2611	4531	8667	27863
		1713	2428	4203	8195	27089
PM10	3	9	29	49	91	214
	4	13	40	65	115	268
		11	35	57	103	241
PM2.5	3	6	9	16	39	157
	4	8	11	19	42	163
		7	10	18	41	160

Southwest San Bernardino Valley

3.50 Acres

	25	**50**	**100**	**200**	**500**
NOx	220	252	321	432	731
CO	1713	2428	4203	8195	27089
PM10	11	35	57	103	241
PM2.5	7	10	18	41	160

Acre Below		**Acre Above**	
SRA No.	Acres	SRA No.	Acres
33	3	33	4
Distance Increment Below			
25			
Distance Increment Above			
50			

Updated: 10/21/2009 - Table C-1. 2006 – 2008

Construction Localized Significance Thresholds: Residential - Soil Haul

SRA No.	Acres Disturbed	Source Receptor Distance (meters)	Source Receptor Distance (Feet)	Construction / Project Site Size (Acres)
33	0.00	34	110	12.00

Source Receptor	**Southwest San Bernardino Valley**	**Equipment**	**Acres/8-hr Day**	**Acres/1-hr**	**Equipment Used**	**Daily Hours**	**Acres**
Distance (meters)	34	Tractors	0.5	0.0625			0
NOx	**128**	Graders	0.5	0.0625			0
CO	**1,022**	Dozers	0.5	0.0625			0
PM10	**8.07**	Scrapers	1	0.125			0
PM2.5	**4.68**					**Acres**	0.00

	Acres	**25**	**50**	**100**	**200**	**500**
NOx	1	118	148	211	334	652
	1	118	148	211	334	652
		118	148	211	334	652
CO	1	863	1328	2423	5691	23065
	1	863	1328	2423	5691	23065
		863	1328	2423	5691	23065
PM10	1	5	14	44	103	280
	1	5	14	44	103	280
		5	14	44	103	280
PM2.5	1	4	6	12	32	141
	1	4	6	12	32	141
		4	6	12	32	141

Southwest San Bernardino Valley

0.00 Acres

	25	**50**	**100**	**200**	**500**
NOx	118	148	211	334	652
CO	863	1328	2423	5691	23065
PM10	5	14	44	103	280
PM2.5	4	6	12	32	141

Acre Below		**Acre Above**	
SRA No.	Acres	SRA No.	Acres
33	1	33	1
Distance Increment Below			
25			
Distance Increment Above			
50			

Updated: 10/21/2009 - Table C-1. 2006 – 2008

EMFAC2017 Emission Rates (2024)

EMFAC2017 Derived CalEEMod Annual Emission Rates: Year 2024[1,2]

Season	Pollutant	LDA	LDT1	LDT2	MDV	LHDT1	LHDT2	MHDT	HHDT	OBUS	UBUS	MCY	SBUS	MH
Annual	CH4_IDLEX	0	0	0	0	0.0047968	0.003445466	0.002396149	0.02891219	0.008657	0	0	0.0622071	0
Annual	CH4_RUNEX	0.0020138	0.0057611	0.0035834	0.0043912	0.0051176	0.003637609	0.000959127	0.125827349	0.0047733	4.4726617	0.3438324	0.0073441	0.0090576
Annual	CH4_STREX	0.0430475	0.0680371	0.0607348	0.0743744	0.0137626	0.00906403	0.005911187	1.8032E-07	0.0220259	0.0081159	0.238194	0.0063239	0.0223494
Annual	CO_IDLEX	0	0	0	0	0.1758223	0.142416373	0.307680828	6.39159163	0.5362206	0	0	2.6334157	0
Annual	CO_RUNEX	0.5944249	1.2212875	0.8626873	0.9514839	0.6107323	0.424935296	0.14204597	0.554174968	0.5820579	34.906841	18.796776	0.6756922	0.995951
Annual	CO_STREX	1.9816116	2.2129545	2.5286806	2.9105889	0.9612436	0.614143666	0.65448963	0.003327935	2.3281339	0.8771629	8.6377223	0.8209371	1.9582895
Annual	CO2_NBIO_IDLEX	0	0	0	0	9.1076222	13.98117229	63.89220647	1061.494457	74.101531	0	0	341.2521	0
Annual	CO2_NBIO_RUNEX	254.15943	302.29957	317.70354	394.70661	638.52538	649.7946068	932.7164061	1386.622861	1367.4175	1682.814	213.48906	1083.1007	1459.2102
Annual	CO2_NBIO_STREX	51.552418	62.667836	66.028704	82.356424	10.761805	8.276631509	5.965243889	0.02926624	19.835762	11.106642	60.087799	4.8781429	18.161892
Annual	NOX_IDLEX	0	0	0	0	0.0695411	0.098571036	0.354692277	5.460060318	0.2749602	0	0	3.0541247	0
Annual	NOX_RUNEX	0.0298264	0.0951829	0.0658613	0.0817304	1.0081528	1.097715904	1.075738105	2.583507331	0.9969359	0.3556582	1.1263957	4.6003736	1.4091973
Annual	NOX_STREX[3]	0.1611431	0.2492061	0.2486043	0.3152687	0.2928599	0.203783551	1.859423208	2.404240069	0.7390221	0.1124891	0.2631279	1.0402898	0.2388779
Annual	PM10_IDLEX	0	0	0	0	0.0009183	0.001346511	0.000285382	0.002789142	9.223E-05	0	0	0.0034684	0
Annual	PM10_PMBW	0.03675	0.03675	0.03675	0.03675	0.07644	0.089180026	0.130340037	0.060572576	0.13034	0.0728339	0.01176	0.7448002	0.13034
Annual	PM10_PMTW	0.008	0.008	0.008	0.008	0.0099199	0.010676783	0.012000003	0.035314849	0.012	0.026486	0.004	0.0107833	0.0131471
Annual	PM10_RUNEX	0.0014255	0.0020331	0.0015111	0.0015664	0.0089361	0.012207552	0.006845914	0.018528563	0.0066254	0.0026981	0.0020823	0.026369	0.0306679
Annual	PM10_STREX	0.0017107	0.0024484	0.0017807	0.0018283	0.000237	0.00012415	6.84886E-05	6.82028E-07	0.0002219	0.0001744	0.0027595	4.044E-05	0.0002304
Annual	PM25_IDLEX	0	0	0	0	0.0008785	0.001288261	0.000273036	0.002668485	8.824E-05	0	0	0.0033184	0
Annual	PM25_PMBW	0.01575	0.01575	0.01575	0.01575	0.03276	0.038220011	0.055860016	0.025959675	0.05586	0.0312145	0.00504	0.3192001	0.05586
Annual	PM25_PMTW	0.002	0.002	0.002	0.002	0.00248	0.002669196	0.003000001	0.008828712	0.003	0.0066215	0.001	0.0026958	0.0032868
Annual	PM25_RUNEX	0.0013122	0.0018706	0.0013906	0.0014442	0.0085244	0.011666015	0.006546769	0.017727009	0.0063206	0.0025669	0.0019452	0.0252178	0.0293065
Annual	PM25_STREX	0.0015729	0.0022513	0.0016373	0.0016811	0.0002179	0.000114151	6.29727E-05	6.271E-07	0.0002041	0.0001603	0.0025918	3.718E-05	0.0002119
Annual	ROG_DIURN	0.0519091	0.1588576	0.0889816	0.1072441	0.0027033	0.001526597	0.000375755	3.48704E-06	0.0025726	0.0013306	1.4235486	0.0011929	0.9780283
Annual	ROG_HTSK	0.0900433	0.2209546	0.1268402	0.1554945	0.0764522	0.045803997	0.012981192	0.000111748	0.0244303	0.0064588	0.7835986	0.0093021	0.0598166
Annual	ROG_IDLEX	0	0	0	0	0.0201449	0.016649308	0.013195648	0.427479232	0.0482882	0	0	0.2905489	0
Annual	ROG_RESTL	0.0427374	0.1157057	0.0767332	0.0980722	0.0014326	0.00085545	0.000207053	2.07191E-06	0.0011214	0.0005608	0.7729333	0.0006062	0.3758452
Annual	ROG_RUNEX	0.0073557	0.0251523	0.0144388	0.0181546	0.0549992	0.055182935	0.010009025	0.027086689	0.0269774	0.0654984	2.3406756	0.0910152	0.0565439
Annual	ROG_RUNLS	0.1970128	0.730414	0.421508	0.4708538	0.5068941	0.273078486	0.070156463	0.000555206	0.2898052	0.0196652	1.7664827	0.0538249	1.3068909
Annual	ROG_STREX	0.1840432	0.340842	0.27896	0.3623889	0.0683269	0.044353423	0.030635878	9.47092E-07	0.113124	0.0277054	1.8241703	0.0366605	0.0903074
Annual	SO2_IDLEX	0	0	0	0	8.815E-05	0.000133773	0.000605526	0.009745345	0.0007065	0	0	0.0032535	0
Annual	SO2_RUNEX	0.0024637	0.0029308	0.0030797	0.0038247	0.0062189	0.006276919	0.008864458	0.012273431	0.0132775	0.002842	0.0021126	0.0103515	0.014318
Annual	SO2_STREX	0.0004998	0.0006076	0.0006402	0.0007985	0.0001065	8.1904E-05	5.90309E-05	2.89613E-07	0.0001963	0.0001099	0.0005946	4.827E-05	0.0001797
Annual	TOG_DIURN	0.0519091	0.1588576	0.0889816	0.1072441	0.0027033	0.001526597	0.000375755	3.48704E-06	0.0025726	0.0013306	1.4235486	0.0011929	0.9780283
Annual	TOG_HTSK	0.0900433	0.2209546	0.1268402	0.1554945	0.0764522	0.045803997	0.012981192	0.000111748	0.0244303	0.0064588	0.7835986	0.0093021	0.0598166
Annual	TOG_IDLEX	0	0	0	0	0.0282087	0.022583155	0.017601056	0.495769342	0.064217	0	0	0.4171332	0
Annual	TOG_RESTL	0.0427374	0.1157057	0.0767332	0.0980722	0.0014326	0.00085545	0.000207053	2.07191E-06	0.0011214	0.0005608	0.7729333	0.0006062	0.3758452
Annual	TOG_RUNEX	0.0106986	0.0366855	0.0210278	0.0263817	0.0676599	0.064673409	0.012349087	0.156353004	0.0375594	4.5663985	2.9006895	0.110076	0.0751226
Annual	TOG_RUNLS	0.1970128	0.730414	0.421508	0.4708538	0.5068941	0.273078486	0.070156463	0.000555206	0.2898052	0.0196652	1.7664827	0.0538249	1.3068909
Annual	TOG_STREX	0.2015041	0.3731788	0.3054259	0.3967687	0.0748094	0.048561415	0.033542431	1.03695E-06	0.1238565	0.0303339	1.9854352	0.0401387	0.0988753
Summer	CH4_IDLEX	0	0	0	0	0.0048094	0.003454461	0.002287478	0.030322427	0.0087351	0	0	0.0622938	0
Summer	CH4_RUNEX	0.0022761	0.0064446	0.0040305	0.0049455	0.005212	0.00367014	0.000975385	0.125828102	0.0048889	4.4726767	0.3396957	0.0074544	0.0092608
Summer	CH4_STREX	0.0373764	0.0586838	0.0526423	0.0644368	0.0132315	0.008715487	0.005678766	1.72026E-07	0.0210203	0.0073605	0.2107889	0.0052953	0.0212197
Summer	CO_IDLEX	0	0	0	0	0.1758223	0.142416373	0.272327387	6.298976906	0.532146	0	0	2.600287	0

Summer	CO_RUNEX	0.7168465	1.4515894	1.0332837	1.1381617	0.6208315	0.428272695	0.143798186	0.554418905	0.5945442	34.907685	18.83482	0.6883511	1.021064
Summer	CO_STREX	1.6706145	1.8598258	2.1239635	2.4390606	0.9118308	0.582859013	0.617895076	0.003141899	2.166747	0.7481511	7.9086861	0.5945952	1.8216679
Summer	CO2_NBIO_IDLEX	0	0	0	0	9.1076222	13.98117229	63.62435951	1049.589904	73.296339	0	0	347.79879	0
Summer	CO2_NBIO_RUNEX	275.17673	324.09457	338.45743	416.48437	638.54351	649.800485	932.7194925	1386.623268	1367.4397	1682.8155	213.40392	1083.1231	1459.2545
Summer	CO2_NBIO_STREX	50.963115	61.930707	65.241581	81.421139	10.673955	8.220864632	5.902803096	0.028971221	19.561642	10.893356	58.199046	4.4992461	17.930658
Summer	NOX_IDLEX	0	0	0	0	0.0695411	0.098571036	0.345025254	5.220639935	0.2613133	0	0	3.1080259	0
Summer	NOX_RUNEX	0.0270558	0.0855377	0.0594564	0.0738376	0.9473885	1.034749874	1.012604838	2.4387158	0.9281664	0.3535904	0.9728527	4.3192936	1.3107936
Summer	NOX_STREX[3]	0.1503522	0.2323961	0.2319178	0.2940665	0.2812256	0.195701615	1.857041807	2.404225821	0.7287295	0.1069595	0.2478778	1.036572	0.2288184
Summer	PM10_IDLEX	0	0	0	0	0.0009183	0.001346511	0.000243561	0.002435345	8.196E-05	0	0	0.0029321	0
Summer	PM10_PMBW	0.03675	0.03675	0.03675	0.03675	0.07644	0.089180026	0.130340037	0.060572576	0.13034	0.0728339	0.01176	0.7448002	0.13034
Summer	PM10_PMTW	0.008	0.008	0.008	0.008	0.0099199	0.010676783	0.012000003	0.035314849	0.012	0.026486	0.004	0.0107833	0.0131471
Summer	PM10_RUNEX	0.0014255	0.0020331	0.0015111	0.0015664	0.0089361	0.012207552	0.006845914	0.018528563	0.0066254	0.0026981	0.0020823	0.026369	0.0306679
Summer	PM10_STREX	0.0017107	0.0024484	0.0017807	0.0018283	0.000237	0.00012415	6.84886E-05	6.82028E-07	0.0002219	0.0001744	0.0027595	4.044E-05	0.0002304
Summer	PM25_IDLEX	0	0	0	0	0.0008785	0.001288261	0.000233025	0.002329993	7.841E-05	0	0	0.0028053	0
Summer	PM25_PMBW	0.01575	0.01575	0.01575	0.01575	0.03276	0.038220011	0.055860016	0.025959675	0.05586	0.0312145	0.00504	0.3192001	0.05586
Summer	PM25_PMTW	0.002	0.002	0.002	0.002	0.00248	0.002669196	0.003000001	0.008828712	0.003	0.0066215	0.001	0.0026958	0.0032868
Summer	PM25_RUNEX	0.0013122	0.0018706	0.0013906	0.0014442	0.0085244	0.011666015	0.006546769	0.017727009	0.0063206	0.0025669	0.0019452	0.0252178	0.0293065
Summer	PM25_STREX	0.0015729	0.0022513	0.0016373	0.0016811	0.0002179	0.000114151	6.29727E-05	6.271E-07	0.0002041	0.0001603	0.0025918	3.718E-05	0.0002119
Summer	ROG_DIURN	0.0972533	0.2987691	0.1661065	0.1993176	0.004847	0.002746942	0.000683779	6.82464E-06	0.0046205	0.0024604	2.7715517	0.00212	1.7385007
Summer	ROG_HTSK	0.100925	0.2589818	0.1434717	0.1725685	0.08683	0.052017596	0.014826765	0.000126826	0.0269251	0.0080066	1.1029845	0.0096252	0.0675282
Summer	ROG_IDLEX	0	0	0	0	0.0201449	0.016649308	0.012953473	0.452302872	0.049456	0	0	0.290598	0
Summer	ROG_RESTL	0.0788706	0.2162294	0.1398032	0.1767532	0.0027205	0.001618406	0.000405027	4.5555E-06	0.002194	0.001178	1.7520709	0.0011273	0.7306618
Summer	ROG_RUNEX	0.0082294	0.0279907	0.016107	0.0202647	0.0554912	0.055319323	0.010080674	0.027091503	0.0275207	0.0655355	2.2997755	0.0915696	0.0575869
Summer	ROG_RUNLS	0.1939622	0.7196509	0.4147464	0.4639567	0.508403	0.274181808	0.070504165	0.000569146	0.2900619	0.0191744	1.7402547	0.0494016	1.3035252
Summer	ROG_STREX	0.1582272	0.2916611	0.2394527	0.3110343	0.0654884	0.04251275	0.029314399	9.0624E-07	0.1076692	0.0250861	1.6036217	0.0306641	0.0859345
Summer	SO2_IDLEX	0	0	0	0	8.815E-05	0.000133773	0.000603075	0.009631733	0.0006989	0	0	0.0033153	0
Summer	SO2_RUNEX	0.0026674	0.0031421	0.0032809	0.0040358	0.0062191	0.006276977	0.008864488	0.012273435	0.0132778	0.002842	0.0021118	0.0103517	0.0143184
Summer	SO2_STREX	0.0004941	0.0006004	0.0006325	0.0007894	0.0001056	8.13521E-05	5.8413E-05	2.86694E-07	0.0001936	0.0001078	0.0005759	4.452E-05	0.0001774
Summer	TOG_DIURN	0.0972533	0.2987691	0.1661065	0.1993176	0.004847	0.002746942	0.000683779	6.82464E-06	0.0046205	0.0024604	2.7715517	0.00212	1.7385007
Summer	TOG_HTSK	0.100925	0.2589818	0.1434717	0.1725685	0.08683	0.052017596	0.014826765	0.000126826	0.0269251	0.0080066	1.1029845	0.0096252	0.0675282
Summer	TOG_IDLEX	0	0	0	0	0.0282087	0.022583155	0.017170639	0.524286793	0.0655465	0	0	0.417189	0
Summer	TOG_RESTL	0.0788706	0.2162294	0.1398032	0.1767532	0.0027205	0.001618406	0.000405027	4.5555E-06	0.002194	0.001178	1.7520709	0.0011273	0.7306618
Summer	TOG_RUNEX	0.0119736	0.0408269	0.0234619	0.0294584	0.0683779	0.064872426	0.012453637	0.156360029	0.0383521	4.5664526	2.8517915	0.1108851	0.0766445
Summer	TOG_RUNLS	0.1939622	0.7196509	0.4147464	0.4639567	0.508403	0.274181808	0.070504165	0.000569146	0.2900619	0.0191744	1.7402547	0.0494016	1.3035252
Summer	TOG_STREX	0.1732389	0.3193319	0.2621705	0.3405422	0.0717015	0.04654611	0.032095577	9.92218E-07	0.1178842	0.0274661	1.7454436	0.0335733	0.0940874

Winter	CH4_IDLEX	0	0	0	0	0.0047983	0.003446503	0.002556389	0.018241611	0.0085819	0	0	0.0621855	0
Winter	CH4_RUNEX	0.0019725	0.0056507	0.0035124	0.0043013	0.0051241	0.003640498	0.000959049	0.000903327	0.0047769	4.4726621	0.3415442	0.0073373	0.0090626
Winter	CH4_STREX	0.0433261	0.0684846	0.061135	0.0748716	0.0136953	0.009020896	0.005866959	1.79296E-07	0.0220239	0.0081886	0.2350848	0.0065157	0.0223461
Winter	CO_IDLEX	0	0	0	0	0.1758223	0.142416373	0.357100085	6.368099425	0.5418476	0	0	2.6791649	0
Winter	CO_RUNEX	0.5707566	1.1761401	0.8295211	0.9149563	0.6113209	0.425174917	0.142109316	0.214083951	0.5824827	34.906883	18.316367	0.6748672	0.9965625
Winter	CO_STREX	1.9842558	2.2167796	2.5351169	2.9190534	0.955495	0.610644533	0.649358773	0.003301869	2.3335429	0.889855	8.4844467	0.8579725	1.9629309
Winter	CO2_NBIO_IDLEX	0	0	0	0	9.1076222	13.98117229	64.25870389	1048.132714	75.213462	0	0	332.21144	0
Winter	CO2_NBIO_RUNEX	250.24297	298.2361	313.83535	390.64707	638.52644	649.7950351	932.7165179	1299.093499	1367.4183	1682.814	212.65954	1083.0992	1459.2113
Winter	CO2_NBIO_STREX	51.560648	62.681062	66.045133	82.378001	10.751449	8.270297839	5.956539261	0.029224906	19.844312	11.127618	59.755983	4.9406159	18.169245
Winter	NOX_IDLEX	0	0	0	0	0.0695411	0.098571036	0.368041494	5.618197948	0.293806	0	0	2.9796898	0
Winter	NOX_RUNEX	0.0285419	0.0912243	0.0630683	0.0782714	0.9918697	1.080689175	1.057697707	2.473067094	0.9787503	0.3551613	1.0922891	4.5324923	1.3823368
Winter	NOX_STREX[3]	0.1600814	0.2476687	0.2469983	0.3132572	0.2890942	0.20115541	1.858826555	2.404236581	0.7363908	0.1116986	0.2611539	1.040689	0.2363063
Winter	PM10_IDLEX	0	0	0	0	0.0009183	0.001346511	0.000343133	0.002959238	0.0001064	0	0	0.004209	0
Winter	PM10_PMBW	0.03675	0.03675	0.03675	0.03675	0.07644	0.089180026	0.130340037	0.059012018	0.13034	0.0728339	0.01176	0.7448002	0.13034
Winter	PM10_PMTW	0.008	0.008	0.008	0.008	0.0099199	0.010676783	0.012000003	0.034404903	0.012	0.026486	0.004	0.0107833	0.0131471
Winter	PM10_RUNEX	0.0014255	0.0020331	0.0015111	0.0015664	0.0089361	0.012207552	0.006845914	0.018390493	0.0066254	0.0026981	0.0020823	0.026369	0.0306679
Winter	PM10_STREX	0.0017107	0.0024484	0.0017807	0.0018283	0.000237	0.00012415	6.84886E-05	6.82028E-07	0.0002219	0.0001744	0.0027595	4.044E-05	0.0002304
Winter	PM25_IDLEX	0	0	0	0	0.0008785	0.001288261	0.00032829	0.002831223	0.0001018	0	0	0.0040269	0
Winter	PM25_PMBW	0.01575	0.01575	0.01575	0.01575	0.03276	0.038220011	0.055860016	0.025290865	0.05586	0.0312145	0.00504	0.3192001	0.05586
Winter	PM25_PMTW	0.002	0.002	0.002	0.002	0.00248	0.002669196	0.003000001	0.008601226	0.003	0.0066215	0.001	0.0026958	0.0032868
Winter	PM25_RUNEX	0.0013122	0.0018706	0.0013906	0.0014442	0.0085244	0.011666015	0.006546769	0.017594912	0.0063206	0.0025669	0.0019452	0.0252178	0.0293065
Winter	PM25_STREX	0.0015729	0.0022513	0.0016373	0.0016811	0.0002179	0.000114151	6.29727E-05	6.271E-07	0.0002041	0.0001603	0.0025918	3.718E-05	0.0002119
Winter	ROG_DIURN	0.0491059	0.1551168	0.0827879	0.0976575	0.0027673	0.00150194	0.000380268	3.68093E-06	0.0026685	0.0013979	1.5717148	0.0010983	1.0617499
Winter	ROG_HTSK	0.0980162	0.2510705	0.138994	0.1674235	0.0887487	0.051821219	0.014319038	0.000129656	0.0263998	0.0074722	1.0356907	0.0094928	0.0713324
Winter	ROG_IDLEX	0	0	0	0	0.0201449	0.016649308	0.013539267	0.392736875	0.0466755	0	0	0.2904811	0
Winter	ROG_RESTL	0.0407942	0.110048	0.0733566	0.0939477	0.0014516	0.000853668	0.000208772	2.19883E-06	0.0011635	0.0005719	0.7349118	0.00061	0.3911138
Winter	ROG_RUNEX	0.0072053	0.0246537	0.0141494	0.0177751	0.0550286	0.055194162	0.010011657	0.018969394	0.0269953	0.0655004	2.3218999	0.0909857	0.0565657
Winter	ROG_RUNLS	0.2228991	0.8518975	0.4880041	0.5410126	0.5448182	0.294917696	0.076567976	0.000582805	0.308769	0.0220758	2.0217987	0.0648552	1.3772498
Winter	ROG_STREX	0.1852036	0.3429063	0.2807313	0.3647098	0.0679561	0.044118874	0.030465517	9.41826E-07	0.1131169	0.0279612	1.7974173	0.0377834	0.0903063
Winter	SO2_IDLEX	0	0	0	0	8.815E-05	0.000133773	0.000608876	0.009902238	0.000717	0	0	0.0031681	0
Winter	SO2_RUNEX	0.0024257	0.0028914	0.0030422	0.0037853	0.0062189	0.006276923	0.008864459	0.012273431	0.0132775	0.002842	0.0021044	0.0103515	0.014318
Winter	SO2_STREX	0.0004999	0.0006077	0.0006403	0.0007987	0.0001064	8.18413E-05	5.89448E-05	2.89204E-07	0.0001964	0.0001101	0.0005913	4.889E-05	0.0001798
Winter	TOG_DIURN	0.0491059	0.1551168	0.0827879	0.0976575	0.0027673	0.00150194	0.000380268	3.68093E-06	0.0026685	0.0013979	1.5717148	0.0010983	1.0617499
Winter	TOG_HTSK	0.0980162	0.2510705	0.138994	0.1674235	0.0887487	0.051821219	0.014319038	0.000129656	0.0263998	0.0074722	1.0356907	0.0094928	0.0713324
Winter	TOG_IDLEX	0	0	0	0	0.0282087	0.022583155	0.018208847	0.447101037	0.0623811	0	0	0.417056	0
Winter	TOG_RESTL	0.0407942	0.110048	0.0733566	0.0939477	0.0014516	0.000853668	0.000208772	2.19883E-06	0.0011635	0.0005719	0.7349118	0.00061	0.3911138
Winter	TOG_RUNEX	0.0104792	0.0359582	0.0206057	0.0258288	0.0677028	0.064689791	0.012352927	0.021643901	0.0375855	4.5664014	2.8778006	0.110033	0.0751545
Winter	TOG_RUNLS	0.2228991	0.8518975	0.4880041	0.5410126	0.5448182	0.294917696	0.076567976	0.000582805	0.308769	0.0220758	2.0217987	0.0648552	1.3772498
Winter	TOG_STREX	0.2027747	0.375439	0.3073653	0.3993099	0.0744034	0.048304613	0.033355907	1.03118E-06	0.1238487	0.030614	1.9563389	0.0413681	0.098874

1 Source: California Air Resources Board. EMFAC2017 Web Database. https://www.arb.ca.gov/emfac/2017/; California Air Pollution Control Officers Association (CAPCOA). 2017, November. California Emissions Estimator Model User's Guide, Version 2016.3.2, Appendix A.

2 Unless otherwise noted, per CalEEMod methodology, the calculated CalEEMod emission rates are derived from the emission rates obtained from EMFAC2017 Version 1.0.3 for the San Bernardino County (SC) region .

3 Because EMFAC2017 provides vehicle trips data for MHDT and HHDT diesel trucks, the formula provided in Appendix A of the CalEEMod User's Guide in calculating the NO $_X$ STREX emission rates are utilized.

Air Quality and Greenhouse Gas Emissions Worksheets

Localized Construction Criteria Air Pollutants

3.2 Site Preparation - 2022

Mitigated Construction On-Site

	NOx	CO	PM10 Total	PM2.5 Total
Category lb/day				
Fugitive Dust			8	4.2
Off-Road	33	20	2	1.5
Total	33	20	9	5.7
3.5 acres LSTs	231	1,956	19	8.0
Exceeds	No	No	No	No

3.3 Grading - 2022

Mitigated Construction On-Site

	NOx	CO	PM10 Total	PM2.5 Total
Category lb/day				
Fugitive Dust			4	1.5
Off-Road	39	29	2	1.5
Total	39	29	5	3.0
4.0 acres LSTs	248	2,125	22	9.0
Exceeds	No	No	No	No

3.4 Soil Haul - 2022

Mitigated Construction On-Site

	NOx	CO	PM10 Total	PM2.5 Total
Category lb/day				
Fugitive Dust			0	0.0
Off-Road	0	0	0	0.0
Total	0	0	0	0.0
<1 acres LSTs	128	1,022	8	5.0
Exceeds	No	No	No	No

3.5 Building Construction - 2022

Mitigated Construction On-Site

	NOx	CO	PM10 Total	PM2.5 Total
Category lb/day				
Off-Road	16	16	1	0.8
Total	16	16	1	0.8
1.31 acres LSTs	144	1,156	9	5.0
Exceeds	No	No	No	No

Localized Construction Criteria Air Pollutants

3.5 Building Construction - 2023

Mitigated Construction On-Site

	NOx	CO	PM10 Total	PM2.5 Total
Category lb/day				
Off-Road	14	16	1	0.7
Total	14	16	1	0.7
1.31 acres LSTs	144	1,156	9	5.0
Exceeds	No	No	No	No

3.5 Building Construction - 2024

Mitigated Construction On-Site

	NOx	CO	PM10 Total	PM2.5 Total
Category lb/day				
Off-Road	13	16	1	0.6
Total	13	16	1	0.6
1.31 acres LSTs	144	1,156	9	5.0
Exceeds	No	No	No	No

3.6 Paving - 2024

Mitigated Construction On-Site

	NOx	CO	PM10 Total	PM2.5 Total
Category lb/day				
Off-Road	10	15	0	0.4
Paving			0	0.0
Total	10	15	0	0.4
<1 acres LSTs	128	1,022	8	5.0
Exceeds	**No**	**No**	**No**	**No**

3.7 Architectural Coating - 2024

Mitigated Construction On-Site

	NOx	CO	PM10 Total	PM2.5 Total
Category lb/day				
Archit. Coating			0	0.0
Off-Road	1	2	0	0.1
Total	1	2	0	0.1
<1 acres LSTs	128	1,022	8	5.0
Exceeds	No	No	No	No

Localized Construction Criteria Air Pollutants

Overlapping Soil Haul and Grading

Mitigated Construction On-Site

Category lb/day	NOx	CO	PM10 Total	PM2.5 Total
Fugitive Dust	0	0	4	1.5
Off-Road	39	29	2	1.5
Total	39	29	5	3.0
4.0 acres LSTs	248	2,125	22	9.0
Exceeds	No	No	No	No

Overlapping Building Construction 2024, Paving, Architectural Coating

Mitigated Construction On-Site

Category lb/day	NOx	CO	PM10 Total	PM2.5 Total
Archit. Coating			0	0.0
Off-Road	24	33	1	1.1
Total	24	33	1	1.1
1.31 acres LSTs	144	1,156	9	5.0
Exceeds	No	No	No	No

GHG Emissions Worksheet

Mitigated Operational

	Metric Tons (MT) Per Year			
	CO2	CH4	N2O	CO2e
Area	0	0	0	0
Energy	203	0	0	204
Mobile	269	0	0	269
Waste	24	1	0	60
Water	13	0	0	14
Construction[1]				788
Total	**509**	**1**	**0**	**1,335**
Threshold (MTCO_2/Yr)[2]				**3,000**
Exceeds?				**No**

Notes:

1 *Construction amortized by dividing by 30 years per SCAQMD methodology

2 Source: SCAQMD. 2009, November 19. Greenhouse Gases (GHG) CEQA Significance Thresholds Working Group Meeting 14. http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/year-2008-2009/ghg-meeting-14/ghg-meeting-14-main-presentation.pdf?sfvrsn=2.

Operational Criteria Air Pollutants

Summer

Mitigated Operational

	ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
Category lb/day						
Area	2.2	0.0	0.1	0.0	0.0	0.0
Energy	0.0	0.2	0.2	0.0	0.0	0.0
Mobile	0.9	0.7	9.1	0.0	2.7	0.7
Total	3.2	0.9	9.4	0.0	2.8	0.8

Winter

Mitigated Operational

	ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
Category lb/day						
Area	2.2	0.0	0.1	0.0	0.0	0.0
Energy	0.0	0.2	0.2	0.0	0.0	0.0
Mobile	0.9	0.7	8.1	0.0	2.7	0.7
Total	3.2	0.9	8.3	0.0	2.8	0.8

Maximum

Mitigated Operational

	ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
Category lb/day						
Area	2.2	0.0	0.1	0.0	0.0	0.0
Energy	0.0	0.2	0.2	0.0	0.0	0.0
Mobile	0.9	0.7	9.1	0.0	2.7	0.7
Max Daily	3.2	0.9	9.4	0.0	2.8	0.8
2003 CEIR Max Buidout	305.0	240.0	4016.0	29.0	1613.0	NA
Regional Thresholds	**55**	**55**	**550**	**150**	**150**	**55**
Exceeds Thresholds?	**No**	**No**	**No**	**No**	**No**	**No**

Regional Construction Criteria Air Pollutants

3.2 Site Preparation - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
Category lb/day						
Fugitive Dust					8	4
Off-Road	3	33	20	0	2	1
Hauling	0	0	0	0	0	0
Vendor	0	0	0	0	0	0
Worker	0	0	1	0	0	0
Total	3	33	20	0	10	6

3.3 Grading - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
Category lb/day						
Fugitive Dust					4	2
Off-Road	4	39	29	0	2	2
Hauling	0	0	0	0	0	0
Vendor	0	0	0	0	0	0
Worker	0	0	1	0	0	0
Total	4	39	30	0	6	3

3.4 Soil Haul - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
Category lb/day						
Fugitive Dust					0	0
Off-Road	0	0	0	0	0	0
Hauling	0	1	0	0	0	0
Vendor	0	0	0	0	0	0
Worker	0	0	0	0	0	0
Total	0	1	0	0	0	0

Regional Construction Criteria Air Pollutants

3.5 Building Construction - 2022

Mitigated Construction On-Site

Category lb/day	ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
Off-Road	2	16	16	0	1	1
Hauling	0	0	0	0	0	0
Vendor	0	8	2	0	1	0
Worker	1	1	7	0	2	1
Total	3	24	25	0	4	2

3.5 Building Construction - 2023

Mitigated Construction On-Site

Category lb/day	ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
Off-Road	2	14	16	0	1	1
Hauling	0	0	0	0	0	0
Vendor	0	6	1	0	1	0
Worker	1	1	6	0	2	1
Total	3	21	24	0	4	1

3.5 Building Construction - 2024

Mitigated Construction On-Site

Category lb/day	ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
Off-Road	1	13	16	0	1	1
Hauling	0	0	0	0	0	0
Vendor	0	6	1	0	1	0
Worker	1	1	6	0	2	1
Total	3	20	23	0	3	1

Regional Construction Criteria Air Pollutants

3.6 Paving - 2024

Mitigated Construction On-Site

Category	lb/day	ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
Off-Road		1	10	15	0	0	0
Paving		0				0	0
Hauling		0	0	0	0	0	0
Vendor		0	0	0	0	0	0
Worker		0	0	0	0	0	0
Total		2	10	15	0	1	0

3.7 Architectural Coating - 2024

Mitigated Construction On-Site

Category	lb/day	ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
Archit. Coating		14				0	0
Off-Road		0	1	2	0	0	0
Hauling		0	0	0	0	0	0
Vendor		0	0	0	0	0	0
Worker		0	0	1	0	0	0
Total		14	1	3	0	1	0

	ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
Max Daily	**14**	**39**	**30**	**8**	**10**	**6**
2003 CEIR Max Buidout	**55**	**769**	**258**	**92**	**3,305**	**NA**
Regional Thresholds	**75**	**100**	**550**	**150**	**150**	**55**
Exceeds Thresholds?	**No**	**No**	**No**	**No**	**No**	**No**

Appendix B Geotechnical Investigation

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John R. Byerly
INCORPORATED

GEOTECHNICAL INVESTIGATION

PRESERVE II: K-8 SCHOOL

WEST SIDE OF EAST PRESERVE LOOP,
BETWEEN MARKET STREET AND ACADEMY STREET

CHINO, CALIFORNIA

WLC ARCHITECTS, INC.

GEOTECHNICAL ENGINEERS • TESTING AND INSPECTION
2257 South Lilac Ave., Bloomington, CA 92316-2903
Bloomington (909) 877-1324 Riverside (909) 783-1910 Fax (909) 877-5210

John R. Byerly
INCORPORATED

GEOTECHNICAL INVESTIGATION

DECEMBER 27, 2019

PRESERVE II: K-8 SCHOOL

WEST SIDE OF EAST PRESERVE LOOP,
BETWEEN MARKET STREET AND ACADEMY STREET

CHINO, CALIFORNIA

CLIENT:

WLC ARCHITECTS, INC.

8163 ROCHESTER AVENUE, SUITE 100

RANCHO CUCAMONGA, CALIFORNIA 91730-0729

ATTENTION: JIM DICAMILLO, PRESIDENT

RPT. NO.: 6230
FILE NO.: S-14223

DISTRIBUTION:
(4) CLIENT

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INTRODUCTION

During November and December of 2019, an investigation of the soil conditions underlying the site of the proposed elementary school was conducted by this firm. The purpose of our investigation was to evaluate the surface and subsurface conditions at the site with respect to safe and economical foundation types, vertical and lateral bearing values, liquefaction and seismic settlement potential, support of concrete slabs-on-grade, and site preparation. Included in the recommendations are the seismic design parameters as required by the California Building Code and ASCE Standard 7-10. Recommendations are also provided for the design of asphalt concrete pavement for parking and driveway areas. Our consulting engineering geologist, Terra Geosciences, has evaluated the geologic conditions attendant to the site as required by the California Geological Survey. The geologic hazards report is presented as Enclosure 11. An analysis of the site seismicity indicates that the seismic design parameter S_1 will not exceed 0.75g. Therefore, a site-specific ground motion analysis was not conducted for this site. Our geotechnical investigation, together with our conclusions and recommendations, is discussed in detail in the following report.

This report has been prepared for the exclusive use of the Chino Valley Unified School District and their design consultants for specific application to the project described herein. Should the project be modified, the conclusions and recommendations presented in this report should be reviewed by the geotechnical engineer. Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted engineering principles and practices. This warranty is in lieu of all other warranties, express or implied.

PROJECT DESCRIPTION

For the preparation of this report, we reviewed the following items:

a) Topography and Offsite Infrastructure Exhibit, The Preserve at Chino, 12 Acre School Site, prepared by L.D. King, Inc., Project No. TR 16420-3, plot date of July 24, 2019,

b) Overall New Site Plan, Preserve II: New K-8 School, prepared by WLC Architects, Project Number 19158.00, Drawing Number A1.1, July 30, 2019,

c) Overall Site Exhibit, Preserve II: New K-8 School, prepared by WLC Architects, Project Number 743-002, December 5, 2019, and

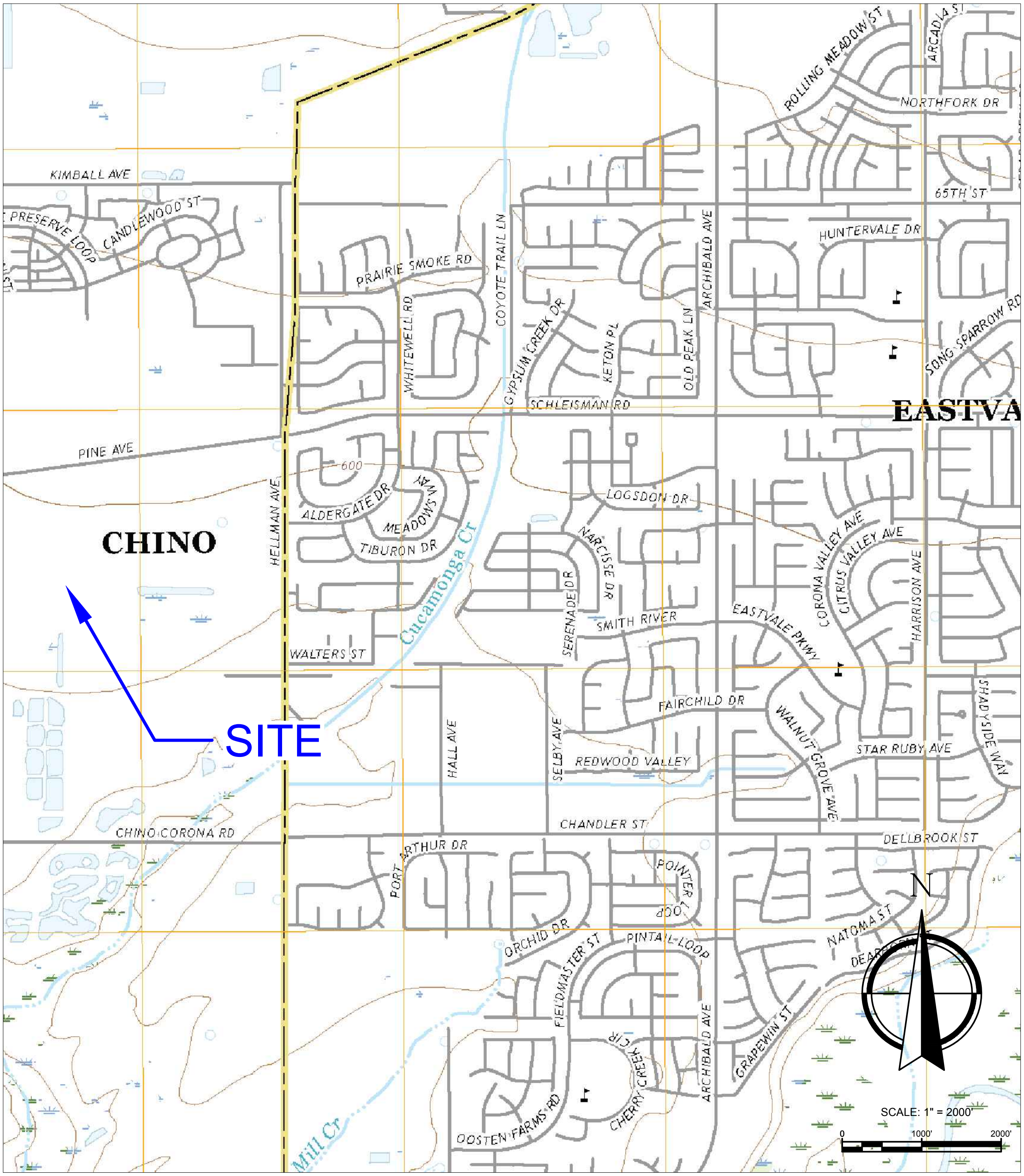
d) Google Earth Images.

We understand the proposed construction will consist of a new elementary school that will contain six single-story wood-frame buildings that will have a total footprint area of approximately 82,000 square feet. The buildings will be located generally towards the central and northern portions of the property. The buildings will implement concrete slab-on-grade floors and will be supported on conventional shallow isolated and continuous footings. The project is in the conceptual design stage at this time; for the purpose of this report we have assumed maximum column and wall loads of 80 kips and 3.0 kips per linear foot, respectively. Parking facilities paved with asphalt concrete are proposed along a portion of the eastern site perimeter and in the northwest quadrant of the site. Basketball courts, a soccer field and two baseball diamonds are planned in the southern part of the property. Underground storm water retention areas are proposed for the east-central and extreme southeast corner of the site. Future portable buildings are planned for the west-central part of the property. A play area will be located in the northeast corner of the site. It is anticipated that the maximum depth of fill will be approximately 6 feet in the southeast corner of the site. The majority of the site will be cut to the desired final elevation. It is anticipated that cuts ranging from approximately 7 feet to 11 feet below existing grade will be required below the footprints of the buildings. Major slope construction is not expected, however retaining walls up to 3 feet in height are planned as part of an amphitheater area in the central portion of the property. The site configuration and proposed development are illustrated on Enclosure 1.

SITE CONDITIONS

The approximately 12-acre site is located on the west side of East Preserve Loop, between Market Street and Academy Street in the city of Chino. An Index Map showing the general vicinity of the site is presented on the following page. The coordinates of the site are latitude 33.9550° N and longitude 117.6202° W (WGS 1984 coordinates). The majority of the property is undeveloped and is covered with a moderate growth of weeds. Based on a review of historic Google Earth aerial photographs, the site was used as a dairy farm in the past. Photographs show a drainage channel was graded along the east property line sometime between 2011 and 2013. On the site,

INDEX MAP



SOURCE DOCUMENTS: USGS CORONA NORTH QUADRANGLE, CALIFORNIA, 7.5 MINUTE SERIES, 2018

TOWNSHIP AND RANGE: SECTION 33, T2S, R7w

LATITUDE: 33.9550° N

LONGITUDE: 117.6202° W

John R. Byerly
INCORPORATED

Rpt. No.: 6230
File No.: S-14223

undocumented fill up to a maximum depth of 10 feet was encountered in our test borings. It is our understanding that soil derived from a residential development to the east was placed on the site. In addition, it is logical to conclude that soil originating from the former drainage channel also may have been placed on the school property. Based on the results of our explorations and testing, it appears that some compactive effort may have been applied to this imported material as it was placed. A portland cement concrete paved road traverses the western portion of the site in a north-south direction. Stockpiles of dirt up to 3 feet in height have been graded along the eastern perimeter of the road. Unpaved roads are interspersed throughout the property. Evidence of ground-burrowing rodents was observed during our site reconnaissance. A gravel-covered area used for storage of construction equipment and materials is situated in the east-central portion of the site. An unpaved road extends upward in a northwest direction into the property off of East Preserve Loop in the southeast corner of the site. The property to the north, west and south is undeveloped. A construction trailer and elevated water tank for earthwork operations is present on the property to the north. The majority of the site is relatively planar, and slopes downward to the south and southeast at an average gradient of less than 2 percent. Along the eastern property line a slope up to 12 feet in height descends to East Preserve Loop at a gradient of 2:1 (H:V). An unpaved road runs along the top of this slope. Three utility vaults are located adjacent to or coincident with the property line near the north portion of the site at the bottom of the slope next to East Preserve Loop. In the southeast corner of the site a slope up to 17 feet in height descends into a depressed area that contains two storm drain risers. Total relief across the site is approximately 28 feet.

FIELD AND LABORATORY INVESTIGATION

The soils underlying or adjacent to the new buildings were explored by means of 13 test borings drilled with a truck-mounted flight-auger to a maximum depth of 71.5 feet below the existing ground surface. The California Geologic Survey allows test borings to be shared between buildings if the structures are relatively close together. Some of the test borings were shared between buildings since most of the new structures are separated by a distance ranging from 15 feet to 48 feet. Additional borings were drilled in proposed hardscape, landscape and parking areas. The approximate locations of the test borings are indicated on Enclosure 1. The soils encountered were examined and visually classified by one of our field engineers. A summary of the soil classifications appears as Enclosure 2. The exploration logs show subsurface conditions at the dates and locations indicated, and may not be representative of other locations and times.

The stratification lines presented on the logs represent the approximate boundaries between soil types, and the transitions may be gradual. A hollow-stem auger with an outside diameter of 7.9 inches was utilized. The inside diameter of the auger was 4.3 inches.

Bulk and relatively undisturbed samples were obtained at selected levels within the explorations and returned to our laboratory for testing and evaluation. The driving energy or blow counts required to advance the sampler at each sample interval were noted. Relatively undisturbed soil samples were recovered at various intervals in the borings with a California sampler. The California sampler was a 2.9-inch outside diameter, 2.5-inch inside diameter, split-barrel sampler lined with brass tubes. The sampler was 18 inches long. The sampler conformed to the requirements of ASTM D 3550. A 140-pound automatic trip hammer was lifted hydraulically and was dropped 30 inches for each blow. Standard penetration tests were performed as Borings 1 and 15 were advanced. The standard penetration test blow counts are shown on the logs for these borings. Standard penetration testing was performed with a 2.0-inch outside diameter, 1.5-inch inside diameter, split-barrel sampler. The sampler was 18 inches long and is machined to fit liners. The sampler was unlined and conformed to the requirements of ASTM D 1586. A 140-pound automatic trip hammer was lifted hydraulically and was dropped 30 inches for each blow. An efficiency value of 1.0 was assumed for the automatic trip hammer.

Included in our laboratory testing were moisture/density determinations on all undisturbed samples. Optimum moisture content/maximum dry density relationships were established for typical soil types so that the relative compaction of the subsoils could be determined. Consolidation testing was conducted on selected samples to evaluate the compressibility characteristics of the soil. The moisture/density data are presented on the boring logs presented in Enclosure 2. The maximum density and consolidation test results appear on Enclosures 3 and 4, respectively. Expansion index testing was performed on selected samples to determine the expansion potential of the soil. Plasticity index testing was also conducted on selected samples. The percent passing the No. 200 sieve was determined to help classify the soils encountered in our explorations. A composite sample of potential subgrade soil was tested for gradation, sand equivalent, and “R” value for pavement design purposes. The expansion index and plasticity index test results appear on Enclosures 5 and 6, respectively. The percent passing the No. 200 sieve and subgrade test results appear on Enclosures 7 and 8, respectively. Chemical testing, comprised of pH, soluble sulfate, chloride, redox potential, and resistivity testing was also performed. These test results are presented in the “Chemical Test Results” section of this report.

SOIL CONDITIONS

Crushed miscellaneous base was encountered from the ground surface to a depth of 3 inches in Borings 6, 7 and 13. Artificial fill consisting of loose to medium dense silty sands with varying amounts of gravel and clay, and stiff to very stiff sandy silts with varying amounts of clay and clayey silts with sand was noted in the test borings to the depths shown on the following table:

Boring No.	**Depth of Undocumented Fill (Ft.)**
1	8.0
2	6.5*
3	9.0
4	9.0
5	8.0
6	9.0
7	10.0
8	9.0
9	10.0
10	9.0
11	9.5
12	8.0
13	9.0
14	10.0
15	9.0
16	4.5+*
17	4.5+*
18	4.5+*
19	3.5

* Natural ground not encountered at the termination depth of the boring

The natural soils encountered in our test borings consisted of loose to very dense sands to clayey sands with the occasional trace of gravel, and soft to very stiff clayey silts to sandy silts with varying amounts of clay. The clayey and sandy silts exhibited a relatively high moisture content. Free ground water was encountered in Borings 1 and 15 at depths of 57 feet and 53.5 feet, respectively. The soils encountered in our test borings have an expansion potential that ranges from very low to medium in accordance with ASTM D 4829. The results of the expansion index tests are presented on Enclosure 5.

LIQUEFACTION AND DYNAMIC SETTLEMENT

Liquefaction is a phenomenon that occurs when a soil undergoes a transformation from a solid state to a liquefied condition due to the effects of increased pore-water pressure. Loose saturated soils with particle sizes in the medium sand to silt range are particularly susceptible to liquefaction when subjected to seismic ground shaking. Affected soils lose all strength during liquefaction, and foundation failure can occur.

Free ground water was encountered in Borings 1 and 15 at depths of 57 feet and 53.5 feet, respectively. Based on ground water data, our consulting engineering geologist estimates that the shallowest depth to ground water in the future may be at approximately 5 feet below the original ground surface for short periods of time. A ground water depth of 5 feet below the final grade has been assumed in our liquefaction analysis.

It is anticipated that major earthquake ground shaking will occur during the lifetime of the proposed development from the Elsinore fault zone, located approximately 6 miles to the southwest of the site. This fault would create the most significant earthshaking event. Based on an earthquake magnitude of 7.8, a peak horizontal ground acceleration of 0.588g is assigned to the site. To evaluate the potential for seismically induced settlement of the subsoils, the soils were analyzed for relative density. The most effective measurement of relative density of sands with respect to seismic settlement potential is standard penetration resistance. Standard penetration tests were performed as Borings 1 and 15 were advanced.

The SPT sampler is machined to fit liners, therefore a correction factor of 1.0 may not be appropriate. Using the information presented in Table 3 of Page 73 of the publication by Idriss and Boulanger (Soil Liquefaction During Earthquakes, Idriss and Boulanger, MNO-12, 2008) a Cs value of 1.1 was used in our analysis. Based on some of the $(N_1)_{60}$ values, a Cs value of 1.1 is a conservative number.

The standard penetration data provided input for the LiquefyPro Version 4.3 program for liquefaction and seismically induced settlement potential. As indicated in Special Publication 117A (Revised), “Guidelines for Evaluating and Mitigating Seismic Hazards in California, March 2009,” a safety factor of 1.3 was used in this analysis. The results of this evaluation indicate a potential for liquefaction in the depth range of 40 feet to 44 feet and 55 feet to 57 feet in Boring 1.

The potential seismically induced settlements for Boring 1 and Boring 15 are shown on the table below and on Enclosure 10.

Boring No.	Seismic Settlement (In.)
1	1.53
15	0.00

Plasticity index tests were conducted on representative soils in Borings 1 and 15. The test results are presented on Enclosure 6. The test results show that the soils have a plasticity index ranging from 16.2 to 38.2, and can be described as clay-like in their response to ground shaking. It is our judgement that the soils tested are not susceptible to significant strength loss should a large, local earthquake occur.

Using a minimum building width of 58 feet and based on the potential for differential seismic settlement value of 1/2 the total dynamic settlement tabulated above, the maximum angular distortion is calculated to be 1/910, which is within allowable limits for seismically induced settlement.

The layers of soils that are potentially liquefiable are thin and relatively deep. The potential for disruption of the foundation bearing soils is considered low. Since the site will be graded to a relatively flat pad and the surrounding topography is relatively flat, lateral spread need not be a consideration in development of the site. In addition, it is our opinion that seismic settlement will be within tolerable limits.

CONCLUSIONS

The artificial fill encountered in our test borings is undocumented and inconsistent in density, and should be overexcavated and compacted below all proposed improvements. We note that planned cuts will remove much of the existing artificial fill within the building areas. In addition, the site is underlain by relatively compressible natural soils to depths ranging from 20 feet to 25 feet below the presently existing ground surface. In order to provide uniform soil conditions for structural support, overexcavation and recompaction of portions of the near-surface soils is recommended. Compressible soil will likely remain below the bottom of the recommended overexcavation. Based on the recommended depths of removals and a review of Boussinesq's stress distribution curves, the stress imposed by the footing loads will dissipate within the mat of compacted fill. It is anticipated that the proposed overexcavation will encounter clayey and sandy silts that exhibit a relatively high moisture content. During earthwork operations some of the soils may need to be allowed to dry back to acceptable moisture contents, or be mixed with dryer soil prior to replacement as engineered fill. The bottoms of the overexcavated areas below the buildings and other site improvements may require stabilization in the form of geogrid and aggregate base. Recommendations for foundation design and slabs-on-grade are provided below for a medium (Expansion Index of 51 to 90) expansion potential. Subsequent to remedial grading, the new structures may be safely founded on conventional continuous and/or isolated footings. Detailed recommendations are provided below.

RECOMMENDATIONS

FOUNDATION DESIGN

Where the site is prepared as recommended, the proposed buildings may be founded on conventional continuous and isolated footings. Footings should be at least 18 inches deep and should be designed for a maximum safe soil bearing pressure of 2,000 pounds per square foot for dead plus live loads. This value may be increased by one-third for wind and seismic loading.

Continuous footings should be reinforced with at least four No. 4 bars, two placed near the top and two near the bottom of the footings. This recommendation for foundation reinforcement is based on geotechnical considerations. Structural design may require additional foundation reinforcement.

SEISMIC DESIGN PARAMETERS

The development of the seismic ground motion parameters is described in detail in the geologic hazards report prepared on our behalf by Terra Geosciences. In summary, the California Building Code and the ASCE Standard 7-10 coefficients and factors are provided in the following table:

Factor or Coefficient	***Value***
Latitude	33.9550° N
Longitude	117.6202° W
Mapped S_S	1.552g
Mapped S_1	0.600g
F_a	1.0
F_v	1.5
Final S_{MS}	1.552g
Final S_{M1}	0.900g
Final S_{DS}	1.035g
Final S_{D1}	0.600g
PGA	0.588g
T_L	8 seconds
Site Class	D

LATERAL LOADING

Retaining wall backfill within 6 feet of the walls should consist of granular soil exhibiting a very low (expansion potential between 0 and 21) expansion potential. For a level backfill surface and cantilever retaining wall conditions, we recommend an active earth pressure of 35 pounds per square foot per foot of depth, exclusive of surcharge loads. For braced walls with level backfill surface conditions, we recommend an at-rest earth pressure of 60 pounds per square foot per foot of depth, exclusive of surcharge loads. For shallow footings, resistance to lateral loads will be provided by passive earth pressure and basal friction. For footings bearing against compacted fill, passive earth pressure may be considered to develop at a rate of 300 pounds per square foot per foot of depth. Basal friction may be computed at 0.35 times the normal dead load. The resistance from basal friction and passive earth pressure may be combined directly without reduction. The allowable lateral resistance may be increased by one-third for wind and seismic loading. A backdrain system or weep holes should be provided to prevent buildup of hydrostatic pressure behind retaining walls.

SLABS-ON-GRADE

Concrete slab-on-grade design recommendations are presented below. The slab-on-grade recommendations assume underlying utility trench backfills and pad subgrade soils have been densified to a relative compaction of at least 90 percent (ASTM D1557).

1. Slab-on-grade floors that will not receive vehicular traffic should be at least 5 inches thick – structural considerations may require a thicker slab. The concrete slabs-on-grade may be designed using a modulus of subgrade reaction of 200 pounds per cubic inch.

2. It is recommended that concrete slabs-on-grade be reinforced with No. 3 bars at 16-inch centers each way in the middle third of the slab. All slab reinforcement should be supported by chairs or precast concrete blocks to ensure positioning of reinforcement in the slab. Lifting of unsupported reinforcement during concrete placement should not be allowed.

3. Slabs to receive moisture-sensitive floor coverings should be underlain with a moisture vapor retardant membrane, such as 10-mil Stego Wrap or equivalent. The moisture vapor retardant membrane should conform to ASTM E 1745-11 (Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs). The moisture vapor retardant membrane should be lapped into the footing excavation to provide full coverage of the subgrade soils. Punctures and/or holes cut for plumbing should be taped to minimize moisture emissions through the membrane. The project inspector and/or a representative of the geotechnical engineer should inspect the placement of the moisture vapor retardant membrane prior to covering. Installation of the moisture vapor retardant membrane should be performed in accordance with ASTM E 1643-11 (Standard Practice for Selection, Design, Installation and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill under Concrete Slabs).

4. A 2-inch layer of clean sand (SE>30, no more than 7 percent passing the No. 200 sieve) should be placed over the moisture vapor retardant membrane to promote uniform setting of the concrete. Concrete should be placed on the sand blanket when the sand is damp. Excess moisture should not be allowed to accumulate within the sand blanket prior to concrete placement. At the time of concrete placement, the moisture content of the sand blanket above the moisture vapor retardant membrane should not exceed 2 percent below the optimum moisture content.

5. In lieu of placing the sand blanket described above and to further minimize future moisture vapor emissions through the slabs-on-grade, the slab concrete may be placed directly on the moisture vapor retardant membrane. Placing concrete directly on the moisture vapor retardant membrane will increase shrinkage and curling forces and make finishing more difficult. To accommodate these concerns, the structural engineer should provide appropriate mix design criteria for concrete placed directly on the moisture vapor retardant membrane.

6. We recommend a maximum water-cement ratio of 0.50 for all building slab concrete. Architectural or structural considerations may require the utilization of a lower water-cement ratio. Where slab concrete is placed directly on the moisture vapor retardant membrane without the presence of an intervening layer of absorptive sand, a lower maximum water-cement ratio may be needed.

7. Preparation of the concrete floor slabs should conform to ASTM F 710-11 (Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring) and the manufacturer's recommendations. Moisture vapor emission tests should be performed to verify acceptable moisture emission rates prior to flooring installation.

SITE PREPARATION

We assume that the site will be prepared in accordance with the California Building Code or the current City of Chino Grading Ordinance. The recommendations presented below are to establish additional grading criteria. These recommendations should be considered preliminary and are subject to modification or expansion based on a geotechnical review of the project foundation and grading plans.

- The existing concrete road in the western portion of the site should be removed. All areas to be graded should be stripped of organic matter, man-made obstructions, and other deleterious materials. Underground utilities should be removed and relocated or abandoned. All cavities created during site clearing should be cleaned of loose and disturbed soil, shaped to provide access for construction equipment, and backfilled with fill placed and compacted as described below.

- Existing artificial fill should be removed from building, retaining wall, baseball dugout and pavement and hardscape areas. Up to 10 feet of fill was encountered in our explorations. Deeper deposits of undocumented fill may be encountered in areas that were not explored. It is anticipated that much of the existing fill will be removed during earthwork operations as the site is brought to the desired finished grade elevation. Some of the excavated soils may need to be dried back prior to replacement as engineered fill. Deleterious material should be separated from the removed fill and hauled from the site. The excavated fill should be stockpiled pending replacement or be placed in previously prepared areas.

- Overexcavation

    - <u>Building area and retaining wall footings</u> – Subsequent to removal of existing artificial fill, the natural soils below the bottom of the floor-slabs should be overexcavated to a depth of at least 3 feet below proposed finished grade or at least 2 feet below the bottom of the slabs, whichever depth is greater. The soils below isolated building footings should be overexcavated to a depth of at least 5 feet below the bottom of the footings, and the soils below continuous building footings and retaining wall footings should be overexcavated to a depth of at least 3 feet below the bottom of the footings. The soils exposed in the bottom of the excavations should be evaluated by a representative of the geotechnical engineer.

    - <u>Baseball Dugouts</u> – Subsequent to removal of undocumented fill, the natural soils below the bottom of the floor-slabs and footings should be overexcavated to a depth of at least 2 feet below the bottom of these structural elements.

    - <u>Limits of overexcavation</u> – The overexcavation should extend beyond the building, dugout, and retaining wall footing areas a horizontal distance at least equal to the depth of overexcavation below the bottom of the foundation elements or 5 feet, whichever is greater.

    - <u>Asphalt parking and driveway areas</u> –Undocumented fill should be removed below parking and driveway areas. The natural soils below these areas should be overexcavated to a depth of 12 inches below existing grade or 12 inches below proposed finished grade, whichever depth is greater. Finished grade is defined as the top of the subgrade.

  - <u>Hardscape areas</u> – Undocumented fill should be removed below proposed hardscape areas. The natural soils below these areas should be scarified to a depth of at least 8 inches, moisture conditioned or dried to at least 2 percent above the optimum moisture content, and densified to a relative compaction of at least 90 percent (ASTM D1557).

- Approved subexcavated surfaces and all other surfaces to receive fill should be scarified to a minimum depth of 8 inches, moisture conditioned or dried to at least 2 percent above the optimum moisture content, and densified to a relative compaction of at least 90 percent (ASTM D1557).

- The on-site soils should provide adequate quality fill material provided they are free from significant organic matter and other deleterious materials and are at acceptable moisture contents. Portland cement concrete removed during site clearing may be pulverized into fragments not exceeding 3 inches in greatest dimension and incorporated into the fill at all levels. Import fill should be inorganic, granular, non-expansive soil free from rocks or lumps greater than 8 inches in maximum dimension, and should exhibit a very low expansion potential (expansion index less than 21), negligible sulfate content (less than 1,000 ppm soluble sulfate by weight), and low corrosion potential. Prior to bringing import fill to the site, the contractor should obtain certification to verify that the proposed import meets the State of California Department of Toxic Substance Control (DTSC) environmental standards. Proposed import should be sampled at the source and tested by this firm for expansion index, soluble sulfate content, and corrosion potential.

- It is anticipated that the on-site soils exposed during the earthwork operations will be at elevated moisture contents. Soils to be used as engineered fill may have to be spread out and dried prior to replacement.

- The soils exposed in the bottom of the overexcavated areas may be relatively wet and may require either drying or stabilization prior to processing. If stabilization is required, a layer of geogrid, such as BX 1200 by Tensar, should be placed in the bottom of the excavation. At least 12 inches of Class 2 aggregate base (Caltrans Standard Specifications) or crushed miscellaneous base (Greenbook Standard Specifications) should be placed over the geogrid and densified to at least 90 percent relative compaction.

Once 12 inches of aggregate base is placed and compacted on the geogrid, the area should be proof-rolled to verify that a competent surface has been constructed. If objectionable pumping is observed during the proof-rolling process, an additional layer of geogrid should be placed on top of the aggregate base, and another 6 inches of base placed and compacted on the second layer of geogrid. Once a competent surface has been created, the on-site soils may be used as engineered fill.

- Some of the on-site soils have a low to medium expansion potential. These soils should not be used as backfill within 6 feet of the back of retaining walls. Engineered fill within 6 feet of retaining walls should exhibit a very low expansion potential (expansion index less than 21).

- All fill should be placed in 8-inch or less lifts, moisture conditioned or dried to a moisture content of at least 2 percent above the optimum moisture content, and densified to a minimum relative compaction of 90 percent (ASTM D 1557).

- The surface of the site should be graded to provide positive drainage away from the structures. Drainage should be directed to established swales and then to appropriate drainage structures to minimize the possibility of erosion. Water should not be allowed to pond adjacent to footings.

SHRINKAGE AND SUBSIDENCE

Volume change in going from cut to fill conditions is anticipated. Assuming the fill will be compacted to an average relative compaction of 93 percent, an average cut-fill shrinkage of 10 to 15 percent is estimated. Further volume loss will occur through subsidence during preparation of the natural ground surface. Although the contractor's methods and equipment utilized in preparing the natural ground will have a significant effect on the amount of natural ground subsidence that will occur, our experience indicates as much as 0.10 to 0.15 foot of subsidence in areas prepared to receive fill should be anticipated. These values are exclusive of losses due to stripping or removal of subsurface obstructions.

ASPHALT CONCRETE AND PORTLAND CEMENT CONCRETE PAVEMENT

A representative sample of near-surface soil at the site has been tested for relevant subgrade properties. A Traffic Index of 5.0 was assumed for the new parking lots and drive areas for conventional vehicular traffic, and a Traffic Index of 6.0 was assumed for areas accommodating heavier truck or bus traffic. Recommendations for portland cement concrete (PCC) for hardscape areas are also presented below. In conjunction with the test data shown on Enclosure 8, we believe the sections presented on the following tables should provide durable pavement.

Location	TI	"R" Value	Thickness (Inches) Asphalt Concrete	Thickness (Inches) Aggregate Base
Pavement areas for conventional passenger cars and light trucks	5.0	31	2.5	6.5
Pavement areas for the fire lane and heavier trucks and buses	6.0	31	3.0	8.5

Location	Thickness (Inches) Portland Cement Concrete
Pavement areas for pedestrian traffic	3.5

Due to the amount of cuts proposed on the site, we recommend additional "R" value testing be performed once the grading contractor is close to proposed finished grades in the parking and driveway areas.

Based on an R-Value of 31, aggregate base is not geotechnically required for the PCC pavement sections; however, if aggregate base is to be utilized for the PCC pavement, we recommend a minimum of 4 inches of aggregate base placed over 12 inches of compacted subgrade soil. The design engineer may wish to provide some level of reinforcement to minimize the width of shrinkage cracks.

Aggregate base may be recommended below PCC pavement sections if confirmatory "R" value testing of the subgrade soils reveals a value of 10 or less.

For hardscape areas to receive only pedestrian traffic, we recommend the PCC pavement be at least 3.5 inches in thickness and be placed directly on the compacted subgrade soil. Prior to the placement of hardscape concrete, we recommend that the final subgrade surface be scarified to a depth of at least 12 inches, moisture conditioned to at least 2 percent above the optimum moisture content, and densified to a minimum relative compaction of 90 percent (ASTM D1557).

Due to the presence of low to medium expansive soils, concrete hardscape areas should be reinforced with a 6” x 6” W2.9 welded wire mesh or equivalent. The mesh should be placed in the middle of the slabs. The design engineer may wish to provide an additional level of reinforcement to minimize the width of shrinkage cracks. All slab reinforcement should be supported by chairs or precast concrete blocks to ensure positioning of reinforcement in the slab. Lifting of unsupported reinforcement during concrete placement should not be allowed.

Portland cement concrete for pavement should be proportioned for a maximum slump of 4 inches and to achieve a minimum compressive strength of 3,000 psi at 28 days. If additional workability is desired, a plasticizing or water-reducing admixture should be utilized in lieu of increasing the water content. Control joints for the 3.5-inch-thick pavement should be spaced no more than 10.5 feet on-center each way. Control joints should be established either by hand groovers, plastic inserts, or saw-cutting as soon as the concrete can be cut without dislodging aggregate. Cutting the control joints the day after the concrete pour will likely result in uncontrolled shrinkage cracks. Concrete should not be placed in hot and windy weather. Water curing should commence immediately after the final finishing and should continue for at least 7 days.

The above designs are preliminary and for estimating purposes only. We recommend that during the process of rough grading, observation and additional testing of the actual subgrade soils should be performed. Final pavement design sections can then be determined. The foregoing pavement sections assume that utility trench backfill below all proposed pavement areas will be compacted to at least 90 percent relative compaction. Prior to the placement of aggregate base, we recommend that the final subgrade surface be scarified to a depth of at least 12 inches, moisture conditioned or dried to within 2 percent of the optimum moisture content, and compacted to a minimum relative compaction of at least 90 percent (ASTM D1557). Due to the presence of relatively wet soils, stabilization of the subgrade soils may be required. Aggregate base should be densified to at least 95 percent relative compaction. Suggested specifications for aggregate base material are presented on Enclosure 9. The preparation of the subgrade and compaction of the aggregate base should be monitored by a representative of the geotechnical engineer.

CHEMICAL TEST RESULTS

The chemical test results from a sample taken from Boring 1 between the ground surface and a depth of 5 feet and a sample taken from Boring 13 between 1 foot and 5 feet are shown on the following tables:

Boring 1 at 0 to 5 feet

Analysis	**Result**	**Units**
Saturated Resistivity	950	ohm-cm
Chloride	150	ppm
Sulfate	180	ppm
pH	8.2	pH units
Redox Potential	233	mV

Boring 13 at 1 foot to 5 feet

Analysis	**Result**	**Units**
Saturated Resistivity	1400	ohm-cm
Chloride	80	ppm
Sulfate	280	ppm
pH	8.9	pH units
Redox Potential	206	mV

The soil tested exhibited negligible soluble sulfate content; therefore, sulfate-resistant concrete will not be required for this project. In Boring 1 the results of the corrosivity testing indicate that the soils tested are very corrosive to ferrous-metal pipes. In Boring 13 the results of the corrosivity testing indicate that the soils tested are corrosive to ferrous-metal pipes. In addition, the soils tested in Boring 13 have a relatively high pH value. Recommendations for protection of buried ferrous metal should be provided by a corrosion engineer.

FOUNDATION AND GRADING PLAN REVIEW

The project foundation and grading plans should be reviewed by the geotechnical engineer. Additional recommendations may be required at that time.

CONSTRUCTION OBSERVATIONS

All grading operations, including the preparation of the natural ground surface, should be observed and compaction tests performed by this firm. No fill should be placed on any prepared surface until that surface has been evaluated by the representative of the geotechnical engineer. The footing excavations for the building and retaining walls should be evaluated by a representative of the geotechnical engineer. All footing excavations should be observed by the geotechnical engineer prior to placement of forms or reinforcing steel.

The conclusions and recommendations presented in this report are based upon the field and laboratory investigation described herein and represent our best engineering judgment. Should conditions be encountered in the field that appear different from those described in this report, we should be contacted immediately in order that appropriate recommendations might be prepared.

Respectfully submitted,

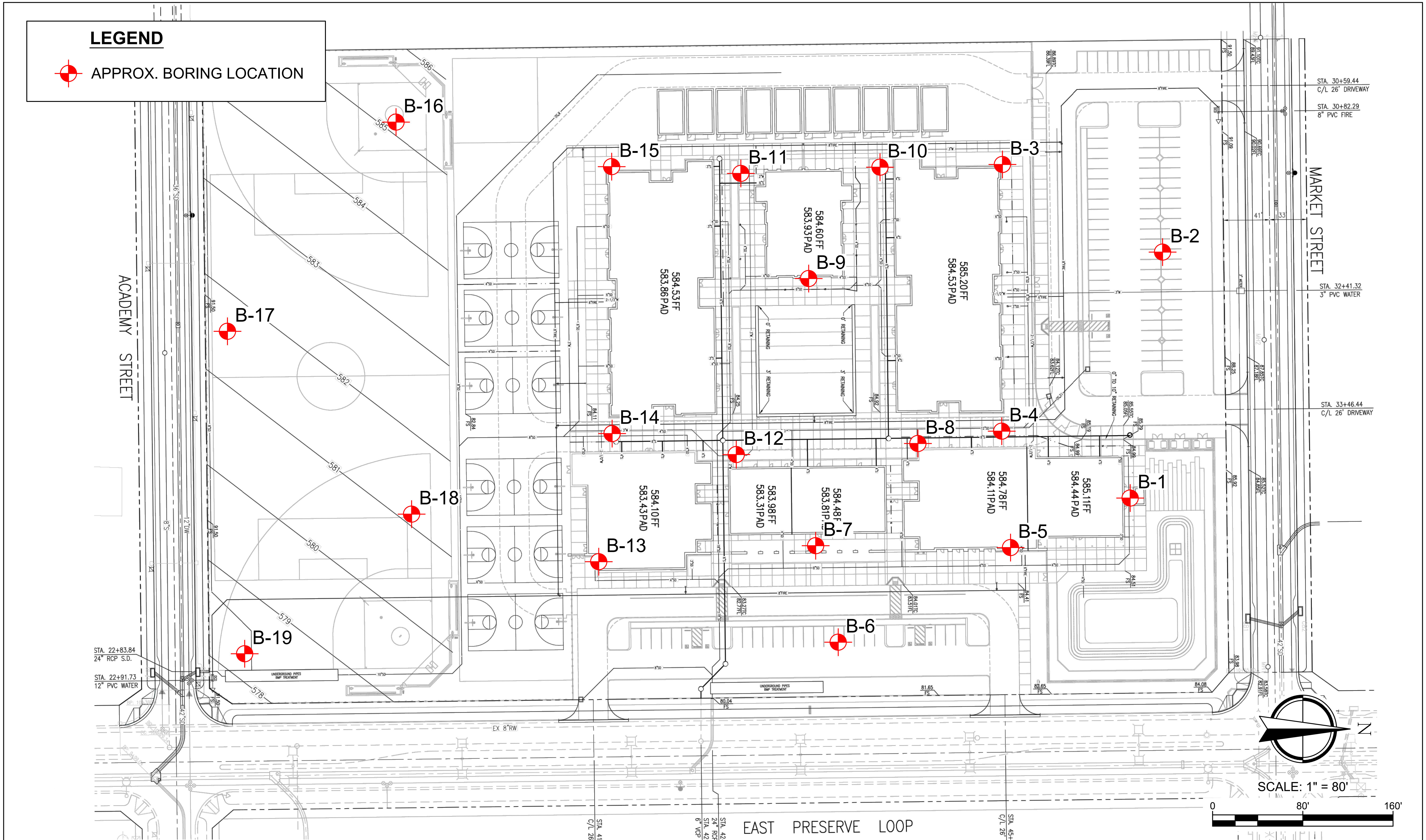
JOHN R. BYERLY, INC.

John R. Byerly, Geotechnical Engineer
President

REGISTERED PROFESSIONAL ENGINEER
JOHN R. BYERLY
GE 000179
EXP. 06/30/21
GEOTECHNICAL
STATE OF CALIFORNIA

JRB:GSF:jet

Enclosures: (1) Plot Plan
(2) Test Boring Logs
(3) Maximum Density Determinations
(4) Consolidation Test Results
(5) Expansion Index Test Results
(6) Plasticity Index Test Data
(7) Percent Passing No. 200 Sieve
(8) Subgrade Test Results
(9) Specifications for Aggregate Base
(10) Liquefaction Analysis
(11) Geologic Hazards Report



SOURCE DOCUMENT: GRADING AND UTILITY EXHIBIT, LD KING, INC.

John R. Byerly
INCORPORATED

GEOTECHNICAL INVESTIGATION

PRESERVE II K-8 SCHOOL
CHINO, CALIFORNIA

Enclosure 1
Rpt. No.: 6230
File No.: S-14223

Boring 1

Boring Date: 11/06/19
Surface Elevation:
Drilling Method: Truck-Mounted Flight-Auger

Depth	Std. Pen. "N" Value	Blows/Ft.	Dry Density (PCF)	Moisture Content (%)	Rel. Compaction (%)	Water Table		
0							SM	Light gray silty fine sand, damp and loose (FILL)
		36	95	17.7	85			
							SM	Gray silty fine sand with a trace of clay, wet and medium dense (FILL)
		50	101	18.9	91			
								- becoming dense at 3.5 feet
5								
		40	99	16.1	89		SM	Olive-gray silty fine sand with seams of clayey silt, wet and medium dense (FILL)
	19							
							SC	Light gray silty fine sand with clay, wet and loose (ORIGINAL GROUND)
10								
		11	98	20.8	84			
	5							
15								
		11	81	24.7	---		ML	Olive-gray sandy silt with clay, wet and medium stiff
	9							
20								
		14	87	24.1	---			
	13							
25								
		19	100	23.5	86		SC	Gray-brown silty fine sand with clay, wet and medium dense
	16							
30								
		15	95	27.2	---			
	13			28.4			ML	Gray-brown clayey silt with sand, wet and stiff
							ML	Brown sandy silt with clay, wet and very stiff
35								

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LOG OF BORING

John R. Byerly, Inc.

Preserve II: K-8 School
Chino, California

Enclosure 2, Page 1
Rpt. No.: 6230
File No.: S-14223

Boring 1

Boring Date: 11/06/19
Surface Elevation:
Drilling Method: Truck-Mounted Flight-Auger

Depth	Std. Pen. "N" Value	Blows/Ft.	Dry Density (PCF)	Moisture Content (%)	Rel. Compaction (%)	Water Table		
35	21			19.9			ML	Brown sandy silt with clay, wet and very stiff
40	15			20.3			SM	Gray-brown silty fine to medium sand with a trace of clay, wet and medium dense
45	18			24.2			SC	Brown clayey fine to medium sand, wet and medium dense
50	21			22.7			ML	Gray-brown clayey silt with sand, wet and very stiff
55	25			20.1		▼	SM	Olive-gray silty fine to medium sand with a trace of clay, wet and medium dense - free ground water at 57.0 feet
60	51						SM	Gray-brown silty fine to medium sand, saturated and very dense
65	58						SP	Gray fine to medium sand with silt seams, saturated and very dense
70								

LOG OF BORING

John R. Byerly, Inc.

Preserve II: K-8 School
Chino, California

Enclosure 2, Page 2
Rpt. No.: 6230
File No.: S-14223

Boring 1

Boring Date: 11/06/19
Surface Elevation:
Drilling Method: Truck-Mounted Flight-Auger

Depth	Std. Pen. "N" Value	Blows/Ft.	Dry Density (PCF)	Moisture Content (%)	Rel. Compaction (%)	Water Table			
70	120						▨	SP	Gray fine to medium sand with silt seams, saturated and very dense Total Depth at 70.5 Feet Free Ground Water Encountered at 57.0 Feet
75									
80									
85									
90									
95									
100									
105									

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LOG OF BORING

John R. Byerly, Inc.

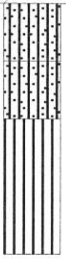
Preserve II: K-8 School
Chino, California

Enclosure 2, Page 3
Rpt. No.: 6230
File No.: S-14223

Boring 2

Boring Date: 11/06/19
Surface Elevation:
Drilling Method: Truck-Mounted Flight-Auger

Depth	Std. Pen. "N" Value	Blows/Ft.	Dry Density (PCF)	Moisture Content (%)	Rel. Compaction (%)	Water Table
0						GWT not encountered
		26	109	7.0	---	
		17	97	22.2	---	
5		21	95	24.0	---	
10						
15						
20						
25						
30						
35						



SM	Light gray silty fine to medium sand with gravel, damp and loose (FILL)
SM	Gray silty fine to coarse sand with a trace of gravel, moist and medium dense (FILL)
ML	Gray-brown sandy silt with a trace of clay, wet and stiff (FILL)

Total Depth at 6.5 Feet
No Free Ground Water Encountered

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LOG OF BORING

John R. Byerly, Inc.

Preserve II: K-8 School
Chino, California

Enclosure 2, Page 4
Rpt. No.: 6230
File No.: S-14223

Boring 3

Boring Date: 11/06/19
Surface Elevation:
Drilling Method: Truck-Mounted Flight-Auger

Depth	Std. Pen. "N" Value	Blows/Ft.	Dry Density (PCF)	Moisture Content (%)	Rel. Compaction (%)	Water Table		
0							SM	Light gray silty fine to coarse sand, damp and medium dense (FILL)
		45	114	7.0	87	GWT not encountered		
								- becoming moist at 1.5 feet
		18	85	18.9	---			
							ML	Gray-brown sandy silt with clay, wet and stiff (FILL)
5		20	107	10.0	85		SM	Gray silty fine sand, moist and medium dense (FILL)
		50	99	19.1	89		SM	Gray silty fine sand with a trace of clay, wet and medium dense (FILL)
							ML	Light gray sandy silt with a trace of clay, wet and stiff (ORIGINAL GROUND)
10		14	82	20.1	---			
15		7	94	26.6	---		ML	Gray-brown clayey silt with sand, wet and medium stiff
20		10	106	21.5	---			
25		13	82	26.4	---			- becoming stiff at 25.0 feet
30		20	95	20.9	---			
								Total Depth at 31.5 Feet No Free Ground Water Encountered
35								

LOG OF BORING

John R. Byerly, Inc.

Preserve II: K-8 School
Chino, California

Enclosure 2, Page 5
Rpt. No.: 6230
File No.: S-14223

Boring 4

Boring Date: 11/06/19
Surface Elevation:
Drilling Method: Truck-Mounted Flight-Auger

Depth	Std. Pen. "N" Value	Blows/Ft.	Dry Density (PCF)	Moisture Content (%)	Rel. Compaction (%)	Water Table		
0						GWT not encountered	SM	Light gray silty sand, damp and loose (FILL)
							SM	Gray-brown silty fine sand with a trace of gravel, moist and loose (FILL)
5								
							ML	Gray clayey silt with sand, wet and stiff (FILL)
							ML	Gray clayey silt with sand, wet and stiff (ORIGINAL GROUND)
10								
15								
20								
25								
30								
35								

Total Depth at 15.0 Feet
No Free Ground Water Encountered

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LOG OF BORING

John R. Byerly, Inc.

Preserve II: K-8 School
Chino, California

Enclosure 2, Page 6
Rpt. No.: 6230
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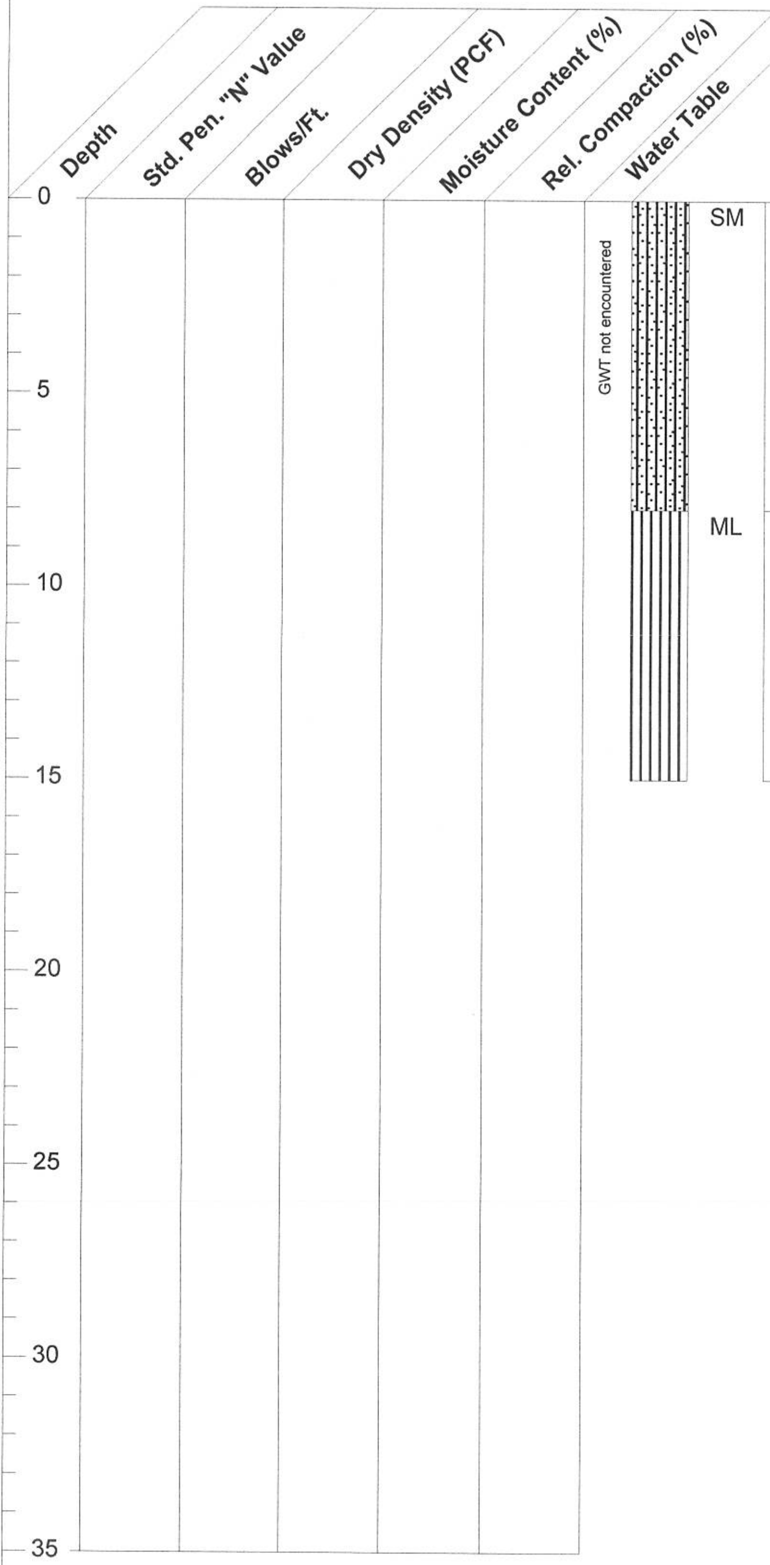
Boring 5

Boring Date: 11/06/19
Surface Elevation:
Drilling Method: Truck-Mounted Flight-Auger



Light gray silty fine sand, damp and loose (FILL)

- becoming medium dense at 4.0 feet

Gray clayey silt with sand, wet and stiff (ORIGINAL GROUND)

Total Depth at 15.0 Feet
No Free Ground Water Encountered

LOG OF BORING

Boring 6

Boring Date: 11/06/19
Surface Elevation:
Drilling Method: Truck-Mounted Flight-Auger

Depth	Std. Pen. "N" Value	Blows/Ft.	Dry Density (PCF)	Moisture Content (%)	Rel. Compaction (%)	Water Table
0						GWT not encountered
		40	111	16.4	88	
		30	97	24.4	87	
5		14	106	22.4	84	
		40	105	21.8	---	
10		7	79	17.8	---	
15						
20						
25						
30						
35						

SM	3.0 inches of crushed miscellaneous base Dark gray silty fine sand, wet and medium dense (FILL)
SM	Gray-brown silty fine to coarse sand, wet and dense (FILL)
SM ML	Dark gray silty fine sand to sandy silt with a trace of clay, wet and medium dense to very stiff (FILL)
SM	Dark gray silty fine sand, wet and loose to medium dense (FILL)
ML	Light gray sandy silt with clay, wet and very stiff (FILL)
ML	Light gray clayey silt, wet and medium stiff (ORIGINAL GROUND)

Total Depth at 11.5 Feet
No Free Ground Water Encountered

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LOG OF BORING

John R. Byerly, Inc.	Preserve II: K-8 School Chino, California	Enclosure 2, Page 8 Rpt. No.: 6230 File No.: S-14223

Boring 7

Boring Date: 11/06/19
Surface Elevation:
Drilling Method: Truck-Mounted Flight-Auger

Depth	Std. Pen. "N" Value	Blows/Ft.	Dry Density (PCF)	Moisture Content (%)	Rel. Compaction (%)	Water Table		
0						GWT not encountered	SM	3.0 inches of crushed miscellaneous base Dark gray silty fine sand, moist and loose (FILL)
5							ML	Gray sandy silt with clay, wet and stiff (FILL)
10							ML	Gray clayey silt with sand, wet and stiff (ORIGINAL GROUND)
15								Total Depth at 15.0 Feet No Free Ground Water Encountered
20								
25								
30								
35								

LOG OF BORING

Boring 8

Boring Date: 11/06/19
Surface Elevation:
Drilling Method: Truck-Mounted Flight-Auger

Depth	Std. Pen. "N" Value	Blows/Ft.	Dry Density (PCF)	Moisture Content (%)	Rel. Compaction (%)	Water Table		
0						GWT not encountered	SM	Light gray silty fine sand, damp and loose (FILL)
		43	98	19.0	88		SM	Gray-brown silty fine sand with a trace of clay, wet and medium dense (FILL)
		45	99	17.7	89			
5		21	---	21.5	---			
10		9	89	20.5	---		ML	Gray-brown clayey silt with a trace of sand, wet and soft to medium stiff (ORIGINAL GROUND)
15		10	92	20.2	---		ML	Olive-gray clayey silt, wet and medium stiff
20		11	83	17.8	---		ML	Light gray clayey silt with a trace of sand, wet and stiff
25		30	115	18.0	---		ML SC	Red-brown sandy silt to silty fine sand with clay, wet and very stiff to medium dense
30		24	90	22.1	---		ML	Olive-gray clayey silt with sand, wet and very stiff
35								

Total Depth at 31.5 Feet
No Free Ground Water Encountered

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LOG OF BORING

John R. Byerly, Inc.

Preserve II: K-8 School
Chino, California

Enclosure 2, Page 10
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Boring 9

Boring Date: 11/07/19
Surface Elevation:
Drilling Method: Truck-Mounted Flight-Auger

Depth	Std. Pen. "N" Value	Blows/Ft.	Dry Density (PCF)	Moisture Content (%)	Rel. Compaction (%)	Water Table
0						GWT not encountered
5						
10						
15						
20						
25						
30						
35						

SM	Light gray silty fine sand, moist and loose (FILL)
SM	Gray-brown silty fine sand with a trace of gravel, moist and loose (FILL)
ML	Gray clayey silt with sand, wet and stiff (FILL)
ML	Gray silt with sand and clay, wet and stiff (ORIGINAL GROUND)

Total Depth at 15.0 Feet
No Free Ground Water Encountered

LOG OF BORING

Boring 10

Boring Date: 11/06/19
Surface Elevation:
Drilling Method: Truck-Mounted Flight-Auger

Depth	Std. Pen. "N" Value	Blows/Ft.	Dry Density (PCF)	Moisture Content (%)	Rel. Compaction (%)	Water Table		
0						GWT not encountered	SM	Light gray silty fine sand with a trace of gravel, moist and loose (FILL) - becoming medium dense at 3.0 feet
5								- becoming wet at 5.0 feet
							ML	Gray clayey silt, wet and stiff (ORIGINAL GROUND)
10								
15								Total Depth at 15.0 Feet No Free Ground Water Encountered
20								
25								
30								
35								

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LOG OF BORING

John R. Byerly, Inc.

Preserve II: K-8 School
Chino, California

Enclosure 2, Page 12
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File No.: S-14223

Boring 11

Boring Date: 11/07/19
Surface Elevation:
Drilling Method: Truck-Mounted Flight-Auger

Depth	Std. Pen. "N" Value	Blows/Ft.	Dry Density (PCF)	Moisture Content (%)	Rel. Compaction (%)	Water Table		
0						GWT not encountered	SM	Light gray silty fine sand, damp and loose (FILL) - becoming moist at 1.0 foot - becoming medium dense at 4.0 feet
5								
							ML	Gray sandy silt with clay, wet and stiff (FILL)
							ML	Gray clayey silt with sand, wet and stiff (ORIGINAL GROUND)
10								
15								
20								
25								
30								
35								

Total Depth at 15.0 Feet
No Free Ground Water Encountered

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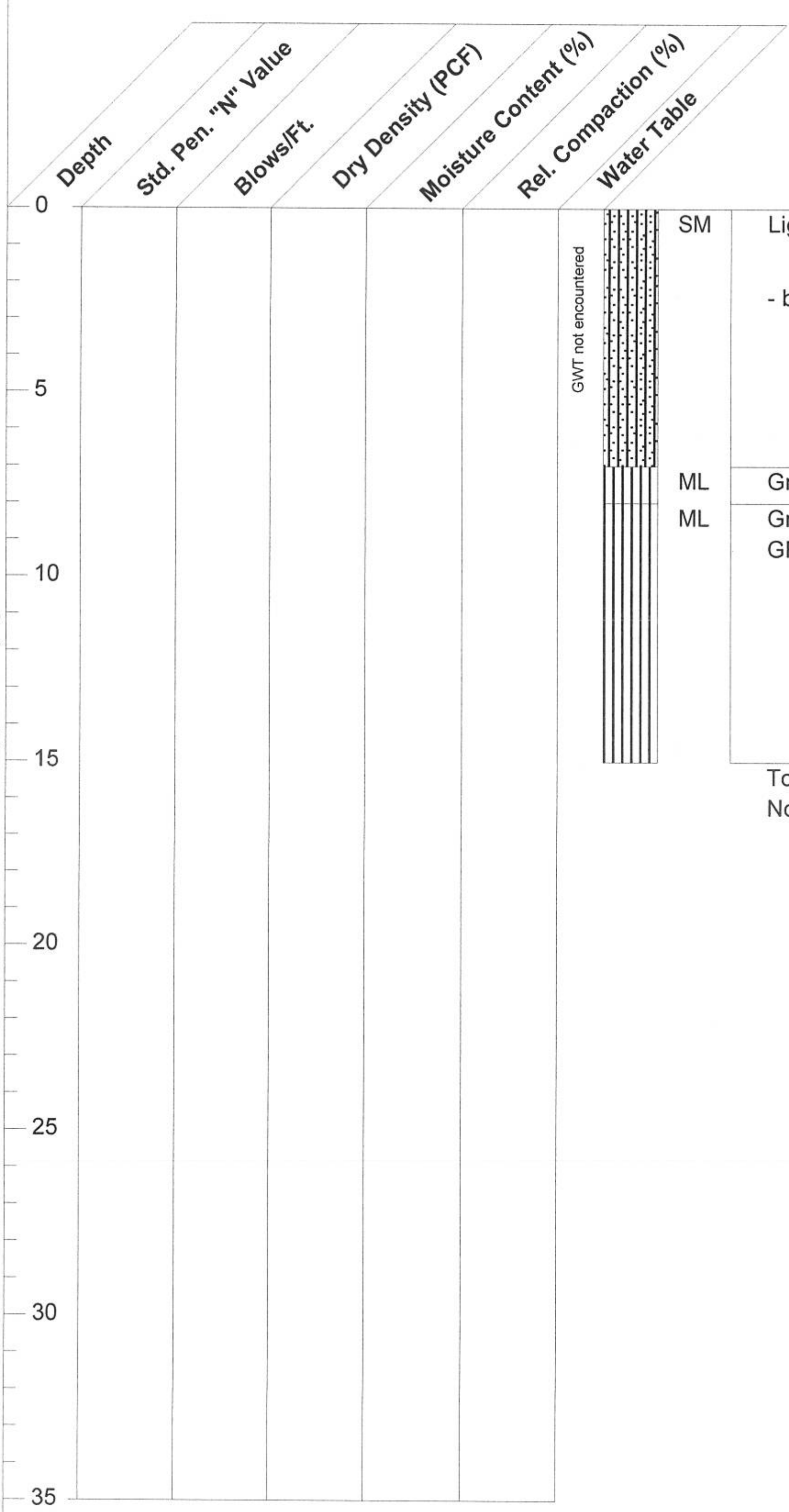
LOG OF BORING

John R. Byerly, Inc.	Preserve II: K-8 School Chino, California	Enclosure 2, Page 13 Rpt. No.: 6230 File No.: S-14223

Boring 12

Boring Date: 11/07/19
Surface Elevation:
Drilling Method: Truck-Mounted Flight-Auger



SM	Light gray silty fine sand, damp and loose (FILL) - becoming moist and medium dense at 2.0 feet
ML	Gray clayey silt with sand, wet and stiff (FILL)
ML	Gray clayey and sandy silt, wet and stiff (ORIGINAL GROUND)

Total Depth at 15.0 Feet
No Free Ground Water Encountered

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LOG OF BORING

John R. Byerly, Inc.

Preserve II: K-8 School
Chino, California

Enclosure 2, Page 14
Rpt. No.: 6230
File No.: S-14223

Boring 13

Boring Date: 11/07/19
Surface Elevation:
Drilling Method: Truck-Mounted Flight-Auger

Depth	Std. Pen. "N" Value	Blows/Ft.	Dry Density (PCF)	Moisture Content (%)	Rel. Compaction (%)	Water Table		
0							SC	3.0 inches of crushed miscellaneous base Gray clayey fine sand, wet and medium dense (FILL)
		27	81	18.0	86	GWT not encountered		
		25	83	16.5	88			
5		30	111	18.7	88		SM	Gray-brown silty fine sand, wet and medium dense (FILL)
		30	94	16.8	---			
							ML	Light gray clayey silt with calcareous nodules, moist and stiff (FILL)
							ML	Light gray clayey silt, wet and medium stiff (ORIGINAL GROUND)
10		9	85	25.6	---			
							ML	Olive-brown clayey silt with a trace of sand, wet and medium stiff
15		10	90	24.6	---			
20		12	91	21.6	---			
25		25	110	20.4	---		ML	Red-brown sandy silt with clay, wet and very stiff
							ML	Olive-gray clayey silt, wet and stiff
30		16	91	24.4	---			
								Total Depth at 31.5 Feet No Free Ground Water Encountered
35								

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LOG OF BORING

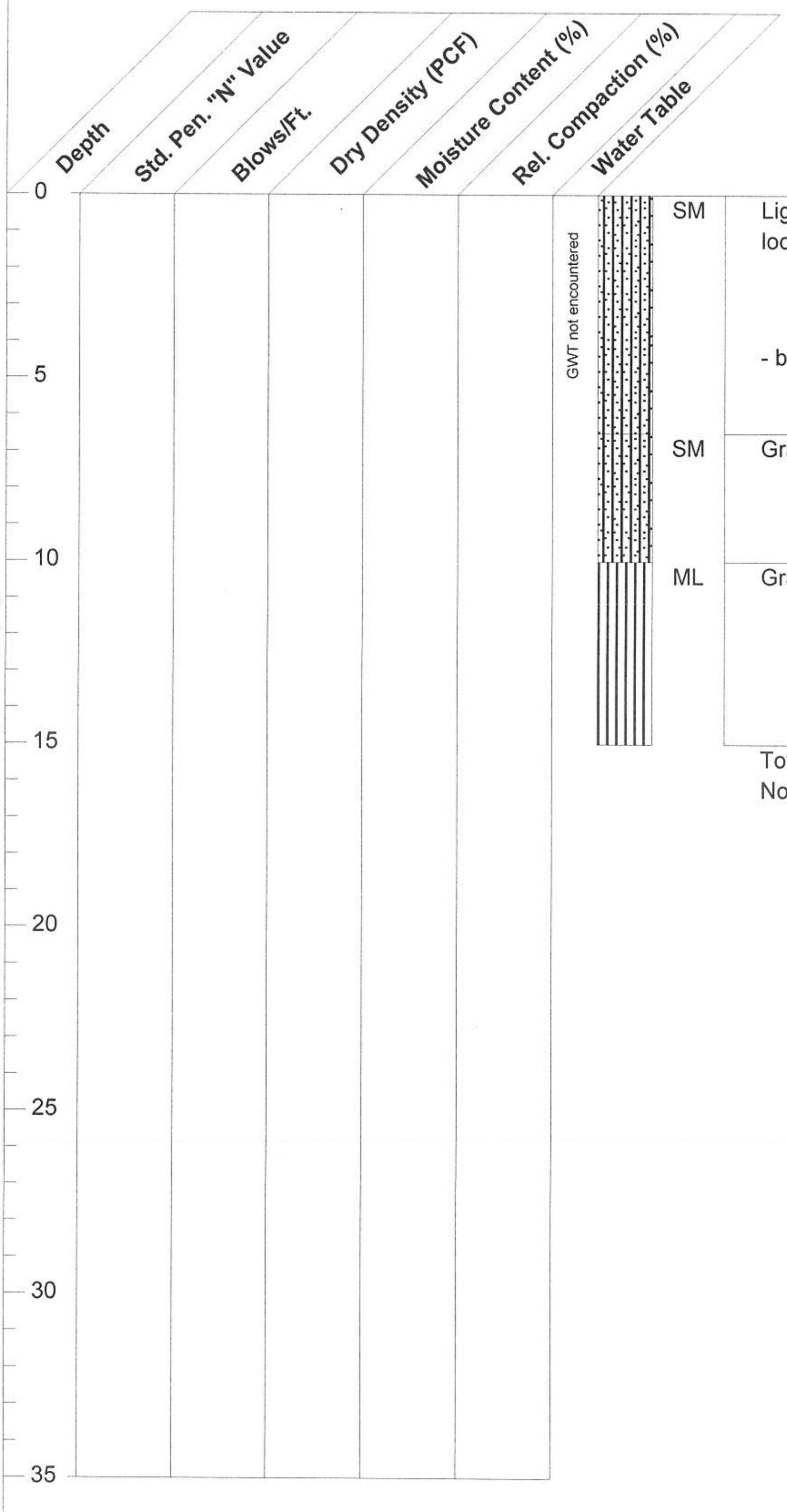
John R. Byerly, Inc.

Preserve II: K-8 School
Chino, California

Enclosure 2, Page 15
Rpt. No.: 6230
File No.: S-14223

Boring 14

Boring Date: 11/07/19
Surface Elevation:
Drilling Method: Truck-Mounted Flight-Auger



SM	Light gray silty fine sand with a trace of gravel, damp and loose (FILL) - becoming wet at 4.0 feet
SM	Gray silty fine sand, wet and medium dense (FILL)
ML	Gray clayey silt, wet and stiff (ORIGINAL GROUND)

Total Depth at 15.0 Feet
No Free Ground Water Encountered

LOG OF BORING

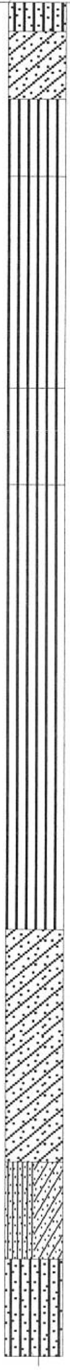
John R. Byerly, Inc.

Preserve II: K-8 School
Chino, California

Enclosure 2, Page 16
Rpt. No.: 6230
File No.: S-14223

Boring 15

Boring Date: 11/07/19
Surface Elevation:
Drilling Method: Truck-Mounted Flight-Auger



Depth	Std. Pen. "N" Value	Blows/Ft.	Dry Density (PCF)	Moisture Content (%)	Rel. Compaction (%)	Water Table		
0		20	110	10.1	85		SM	Light gray silty fine sand with a trace of gravel, damp and loose (FILL)
		13	115	13.9	89		SC	Gray-brown clayey fine to medium sand, moist and medium dense (FILL)
	25	25	105	17.2	---		ML	Dark gray sandy silt, wet and very stiff (FILL)
10	7	10	94	26.2	---		ML	Light gray sandy silt with clay, wet and medium stiff (ORIGINAL GROUND)
	7	10	84	25.2	---			
20	10	13	89	24.4	---		ML	Light gray-brown clayey silt with calcareous nodules, wet and stiff
	12	26	107	22.5	---		ML	Red-brown sandy silt with clay, wet and stiff
30	12	19	98	21.5	---			
	23			19.6				- becoming very stiff at 35.0 feet
40	16			24.8				
	22			24.9				
50	21			15.7			SC	Gray clayey fine sand, wet and medium dense
	20			19.9		▼		- ground water encountered at 53.5 feet
60	50			19.3			SM SC	Gray-brown silty fine to medium sand with clay and clay seams, saturated and very dense
	63			---			SM	Gray-brown silty fine to medium sand, saturated and very dense
70								

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LOG OF BORING

John R. Byerly, Inc.

Preserve II: K-8 School
Chino, California

Enclosure 2, Page 17
Rpt. No.: 6230
File No.: S-14223

Boring 15

Boring Date: 11/07/19
Surface Elevation:
Drilling Method: Truck-Mounted Flight-Auger

Depth	Std. Pen. "N" Value	Blows/Ft.	Dry Density (PCF)	Moisture Content (%)	Rel. Compaction (%)	Water Table			
70	80			---			▦	SM	Gray-brown silty fine to medium sand, saturated and very dense
									Total Depth at 71.5 Feet No Free Ground Water Encountered
80									
90									
100									
110									
120									
130									
140									

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LOG OF BORING

John R. Byerly, Inc.

Preserve II: K-8 School
Chino, California

Enclosure 2, Page 18
Rpt. No.: 6230
File No.: S-14223

Boring 16

Boring Date: 11/07/19
Surface Elevation:
Drilling Method: Truck-Mounted Flight-Auger

Depth	Std. Pen. "N" Value	Blows/Ft.	Dry Density (PCF)	Moisture Content (%)	Rel. Compaction (%)	Water Table
0						GWT not encountered
		27	109	7.1	86	
		23	107	9.6	85	
5						
10						
15						
20						
25						
30						
35						

SM Light gray silty fine sand, damp and loose (FILL)

- becoming moist and medium dense at 1.5 feet

Total Depth at 4.5 Feet
No Free Ground Water Encountered

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LOG OF BORING

John R. Byerly, Inc.

Preserve II: K-8 School
Chino, California

Enclosure 2, Page 19
Rpt. No.: 6230
File No.: S-14223

Boring 17

Boring Date: 11/07/19
Surface Elevation:
Drilling Method: Truck-Mounted Flight-Auger

Depth	Std. Pen. "N" Value	Blows/Ft.	Dry Density (PCF)	Moisture Content (%)	Rel. Compaction (%)	Water Table		
0						GWT not encountered	SM	Light gray silty fine sand, damp and loose (FILL)
		36	97	9.5	87			
							SM ML	Light gray-brown silty fine sand to sandy silt with a trace of clay, medium dense to very stiff and moist (FILL)
		35	108	11.6	85		SM	Gray-brown silty fine sand, moist and medium dense (FILL)
5								Total Depth at 4.5 Feet No Free Ground Water Encountered
10								
15								
20								
25								
30								
35								

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LOG OF BORING

John R. Byerly, Inc.

Preserve II: K-8 School
Chino, California

Enclosure 2, Page 20
Rpt. No.: 6230
File No.: S-14223

Boring 18

Boring Date: 11/07/19
Surface Elevation:
Drilling Method: Truck-Mounted Flight-Auger

Depth	Std. Pen. "N" Value	Blows/Ft.	Dry Density (PCF)	Moisture Content (%)	Rel. Compaction (%)	Water Table		
0						GWT not encountered	SM	Light gray silty fine sand with gravel, damp and loose (FILL)
		50	108	17.5	85		SM	Gray to dark gray silty fine sand, wet and medium dense (FILL)
		46	108	21.0	85			
5								Total Depth at 4.5 Feet No Free Ground Water Encountered
10								
15								
20								
25								
30								
35								

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LOG OF BORING

John R. Byerly, Inc.	**Preserve II: K-8 School** **Chino, California**	**Enclosure 2, Page 21** **Rpt. No.: 6230** **File No.: S-14223**

Boring 19

Boring Date: 11/07/19
Surface Elevation:
Drilling Method: Truck-Mounted Flight-Auger

Depth	Std. Pen. "N" Value	Blows/Ft.	Dry Density (PCF)	Moisture Content (%)	Rel. Compaction (%)	Water Table		
0						GWT not encountered	SM	Light gray silty fine sand with gravel, damp and loose (FILL)
		24	106	18.3	84		SM	Light gray-brown silty fine sand, wet and medium dense (FILL)
		13	77	22.9	---			
							ML	Gray-brown sandy silt with a trace of clay, wet and stiff (ORIGINAL GROUND)
5								Total Depth at 4.5 Feet No Free Ground Water Encountered
10								
15								
20								
25								
30								
35								

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECTS-14223 (Rpt. No. 6230).log Date: 12/26/2019

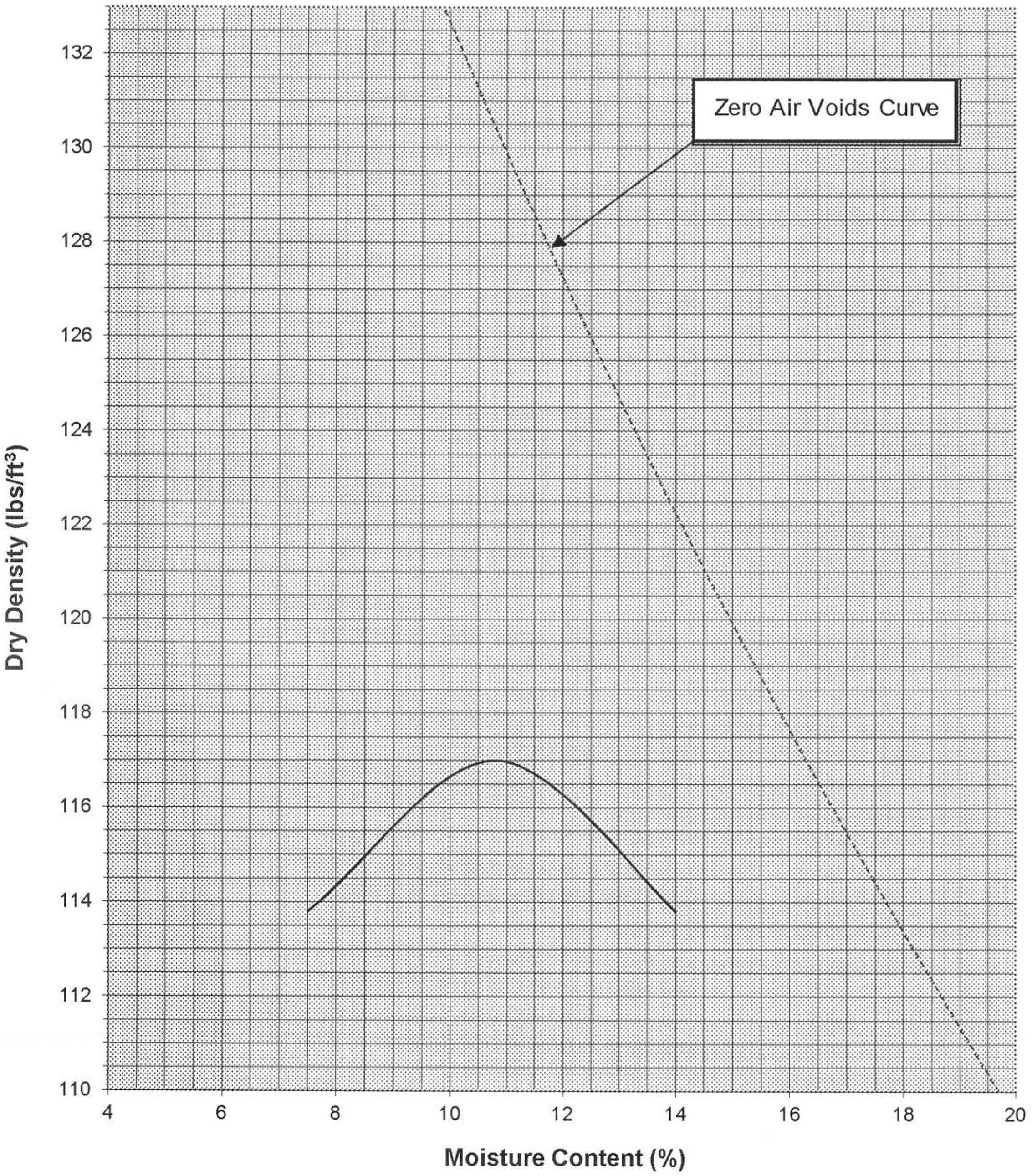
LOG OF BORING

John R. Byerly, Inc.

Preserve II: K-8 School
Chino, California

Enclosure 2, Page 22
Rpt. No.: 6230
File No.: S-14223

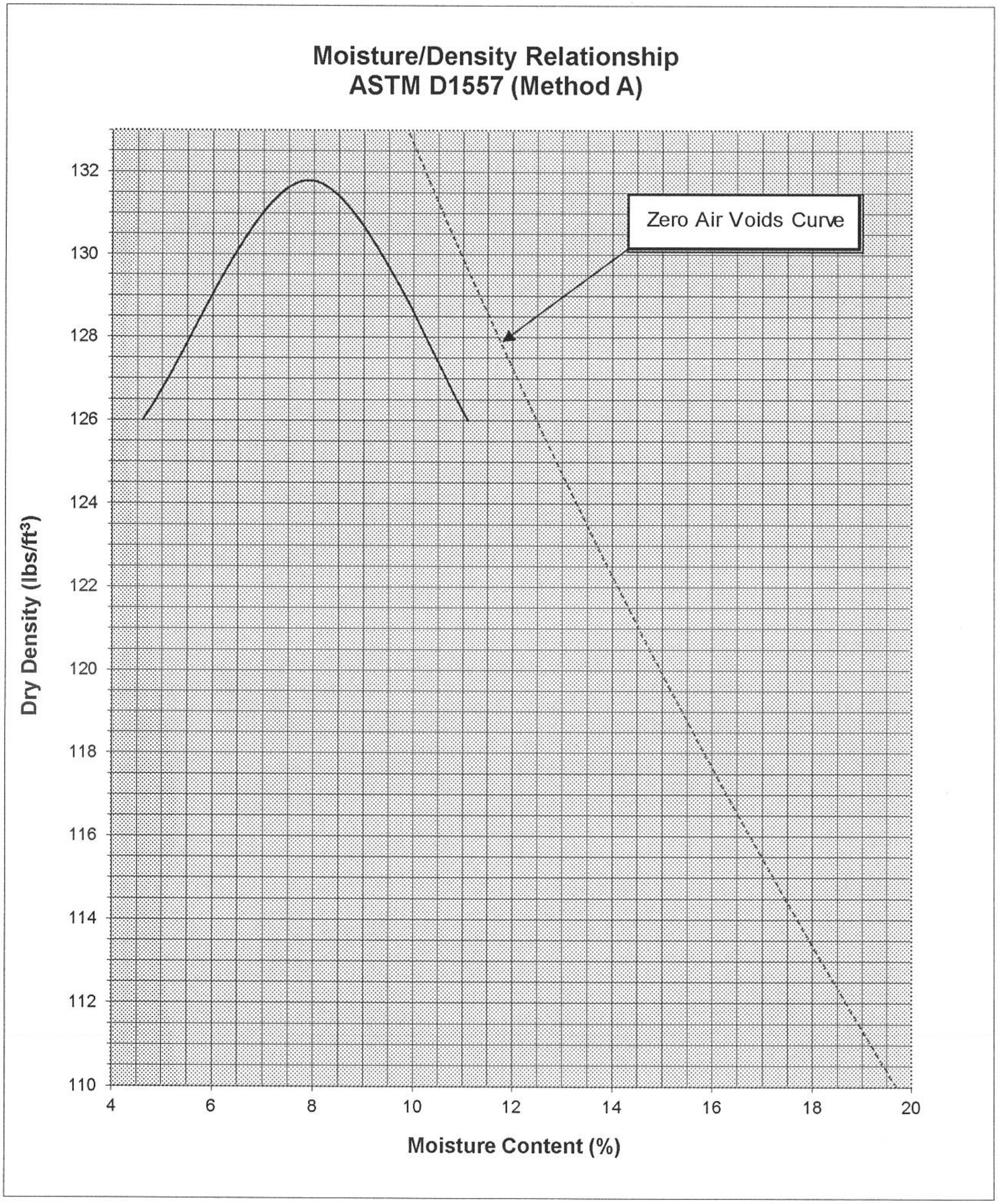
Moisture/Density Relationship
ASTM D1557 (Method A)



Boring No.	B-1
Depth (ft.)	10.5
Optimum Moisture (%)	10.8
Maximum Dry Density (pcf)	117.0
Soil Classification	Light gray silty fine sand with clay (SC)

Preserve II: K-8 School
Chino, California

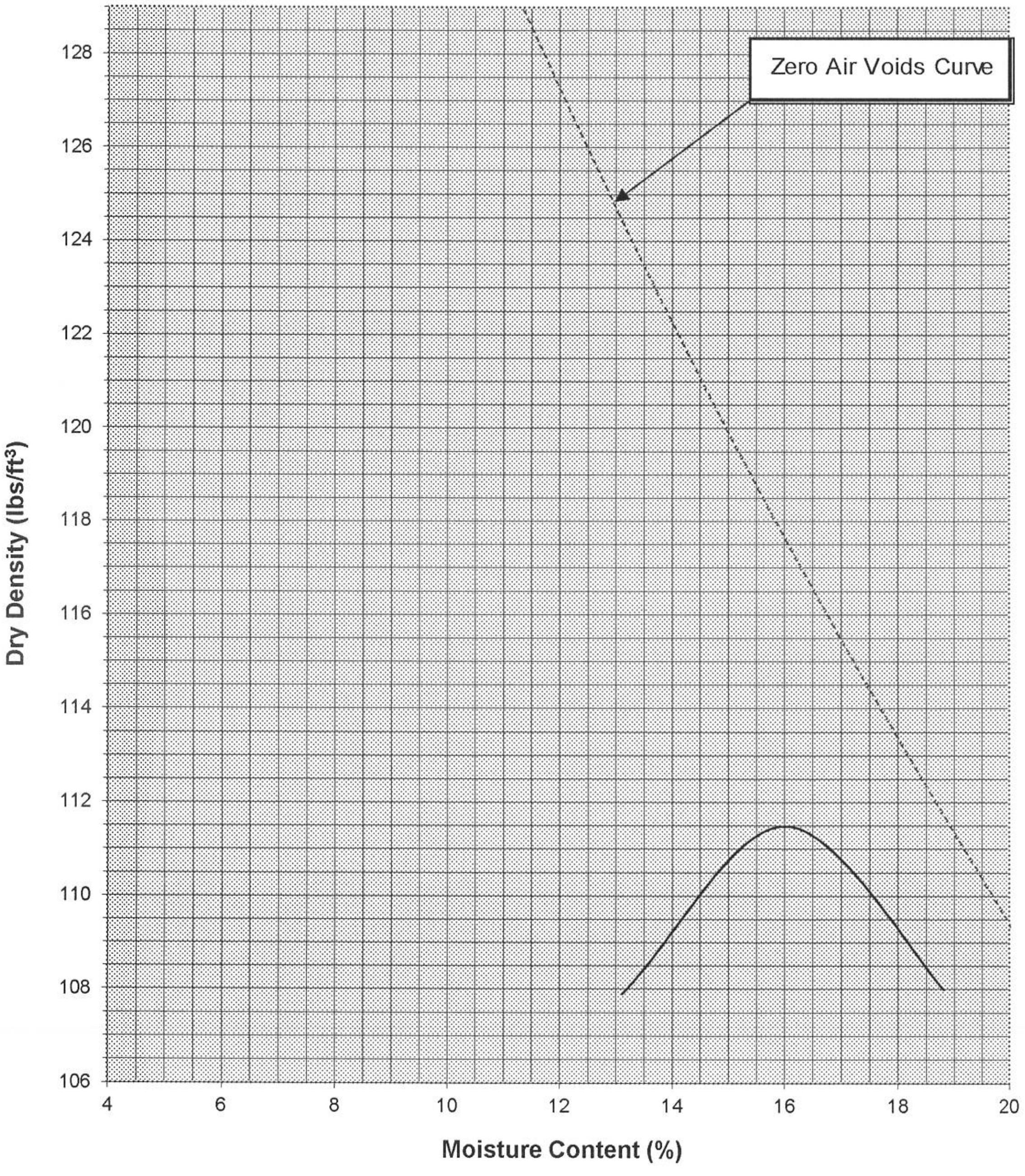
Enclosure 3, Page 1
Rpt. No.: 6230
File No.: S-14223



Boring No.	B-3
Depth (ft.)	1.5
Optimum Moisture (%)	7.9
Maximum Dry Density (pcf)	131.8
Soil Classification	Light gray silty fine to coarse sand (SM)

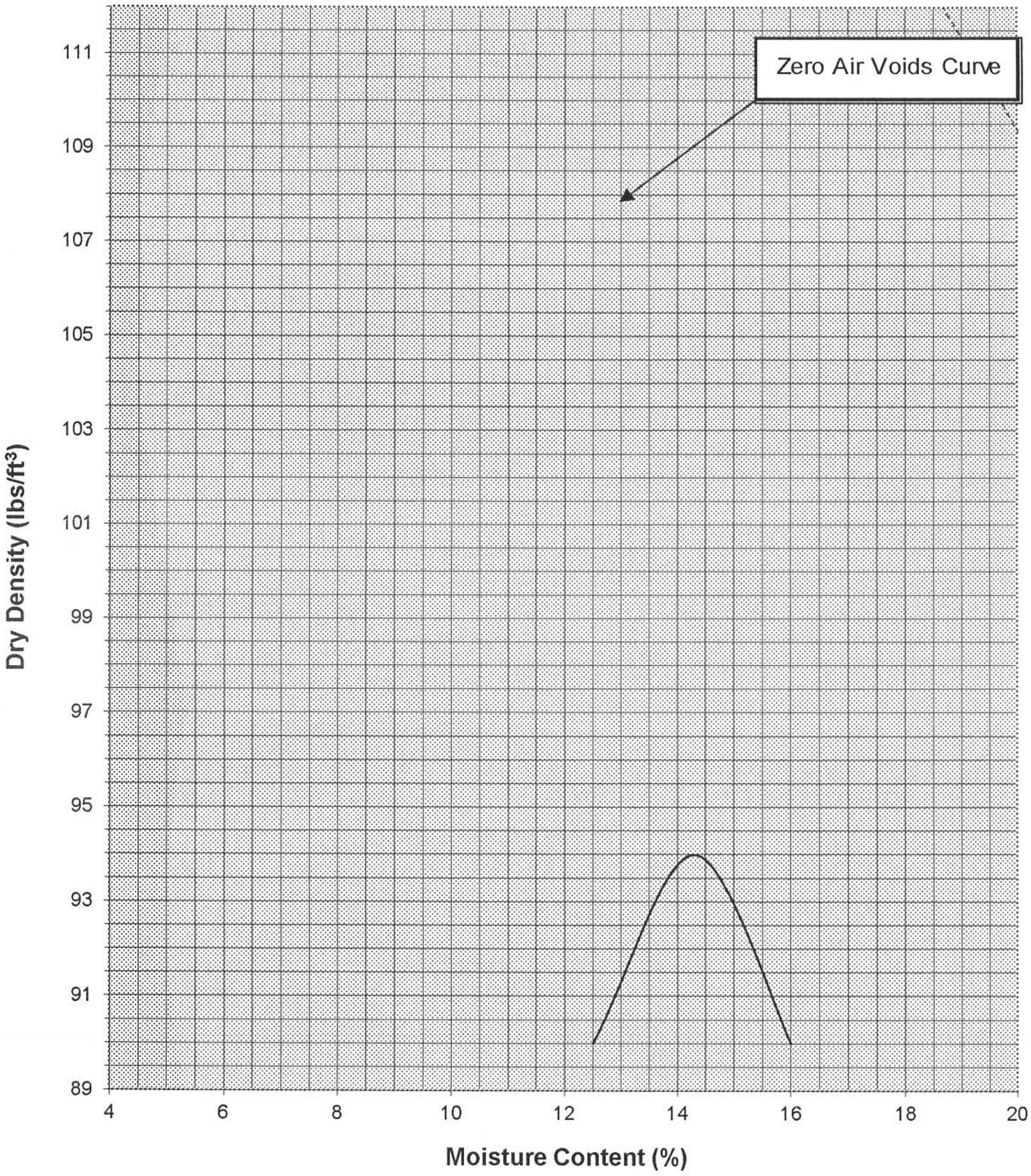
Preserve II: K-8 School Chino, California	Enclosure 3, Page 2 Rpt. No.: 6230 File No.: S-14223

Moisture/Density Relationship
ASTM D1557 (Method A)

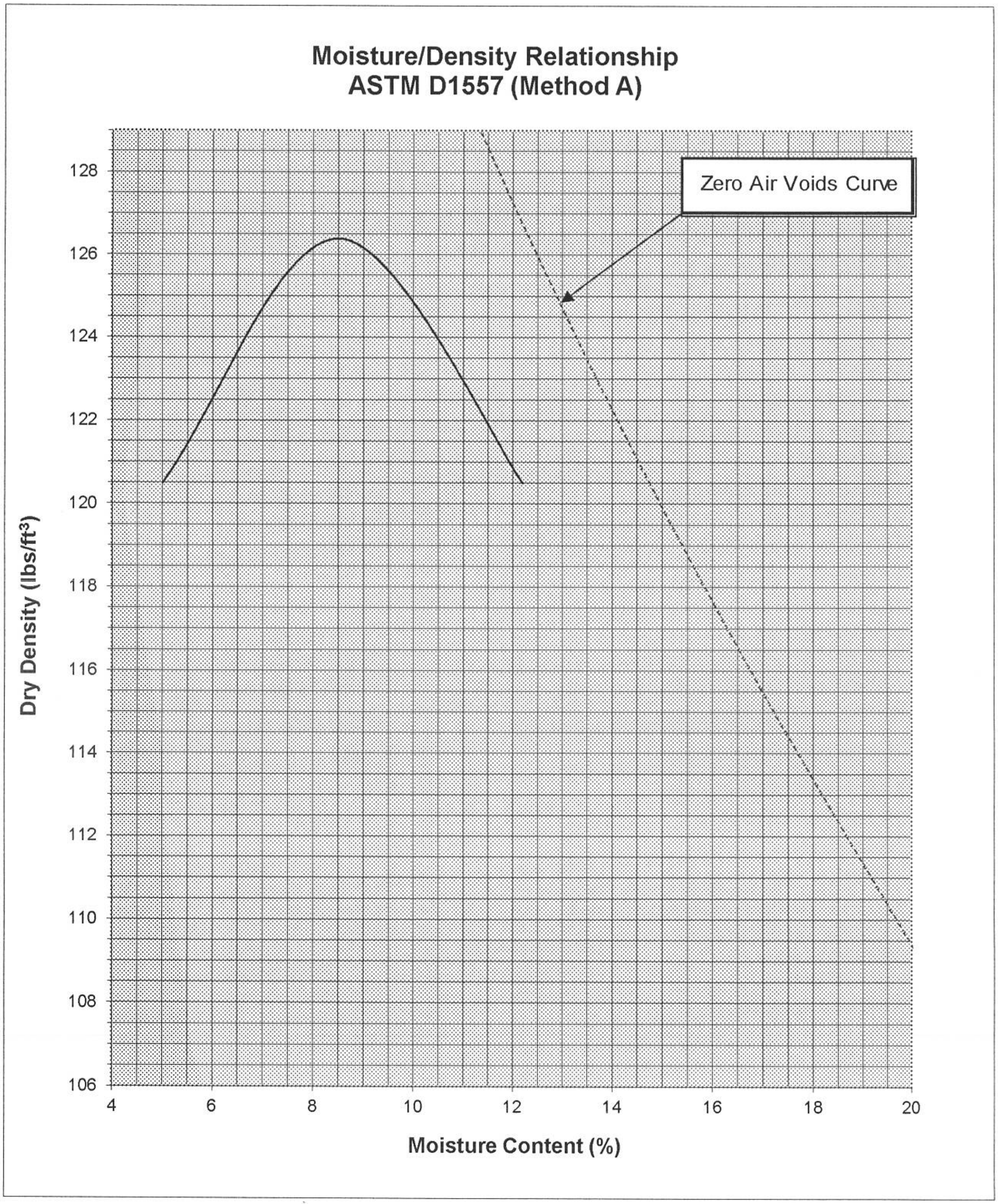


Boring No.	B-3
Depth (ft.)	7.5
Optimum Moisture (%)	16.0
Maximum Dry Density (pcf)	111.5
Soil Classification	Gray silty fine sand with a trace of clay (SM)

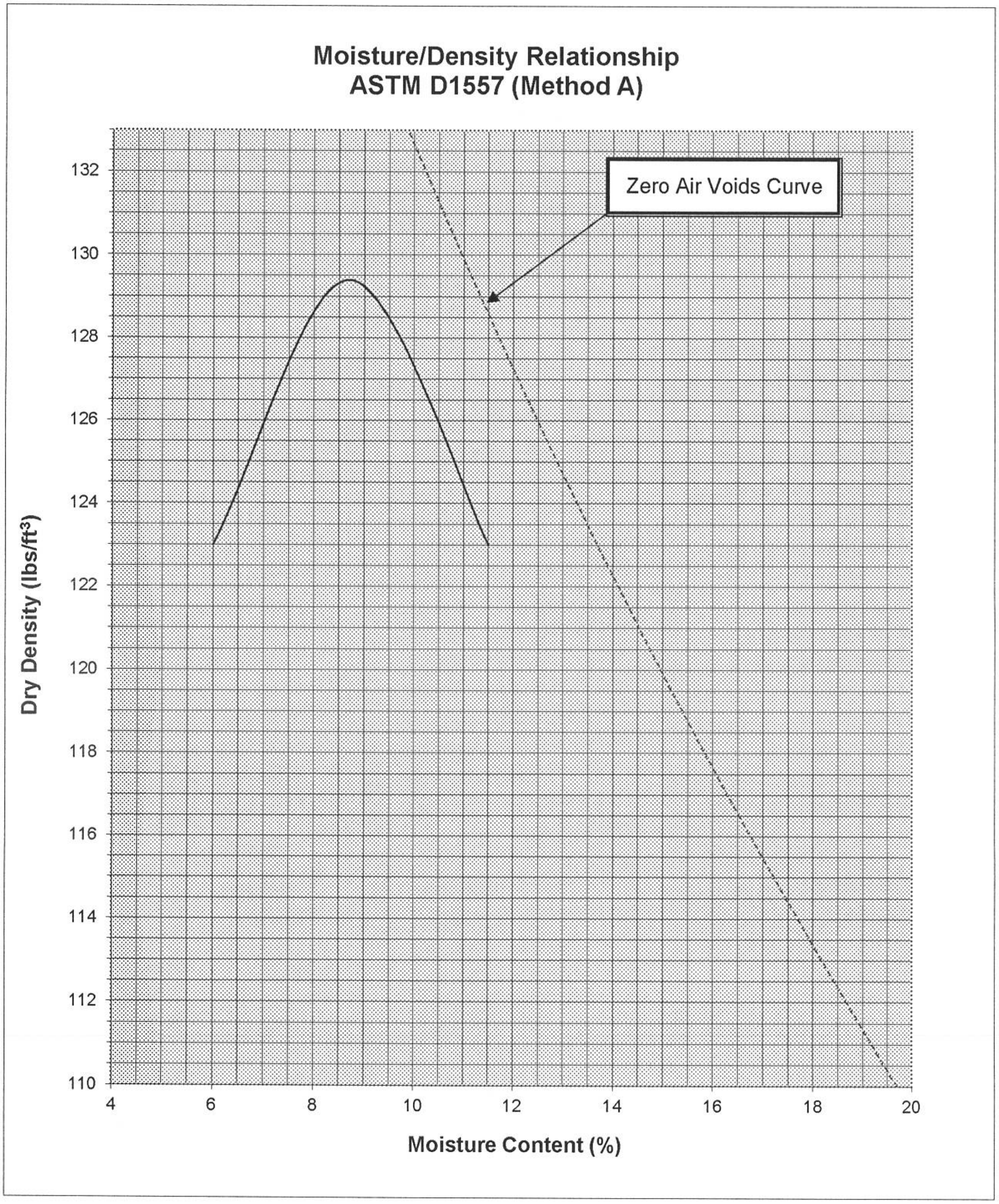
Moisture/Density Relationship
ASTM D1557 (Method A)



Boring No.	B-13
Depth (ft.)	3.5
Optimum Moisture (%)	14.3
Maximum Dry Density (pcf)	94.0
Soil Classification	Gray clayey fine sand (SC)



Boring No.	B-13
Depth (ft.)	5.5
Optimum Moisture (%)	8.5
Maximum Dry Density (pcf)	126.4
Soil Classification	Gray-brown silty fine sand (SM)

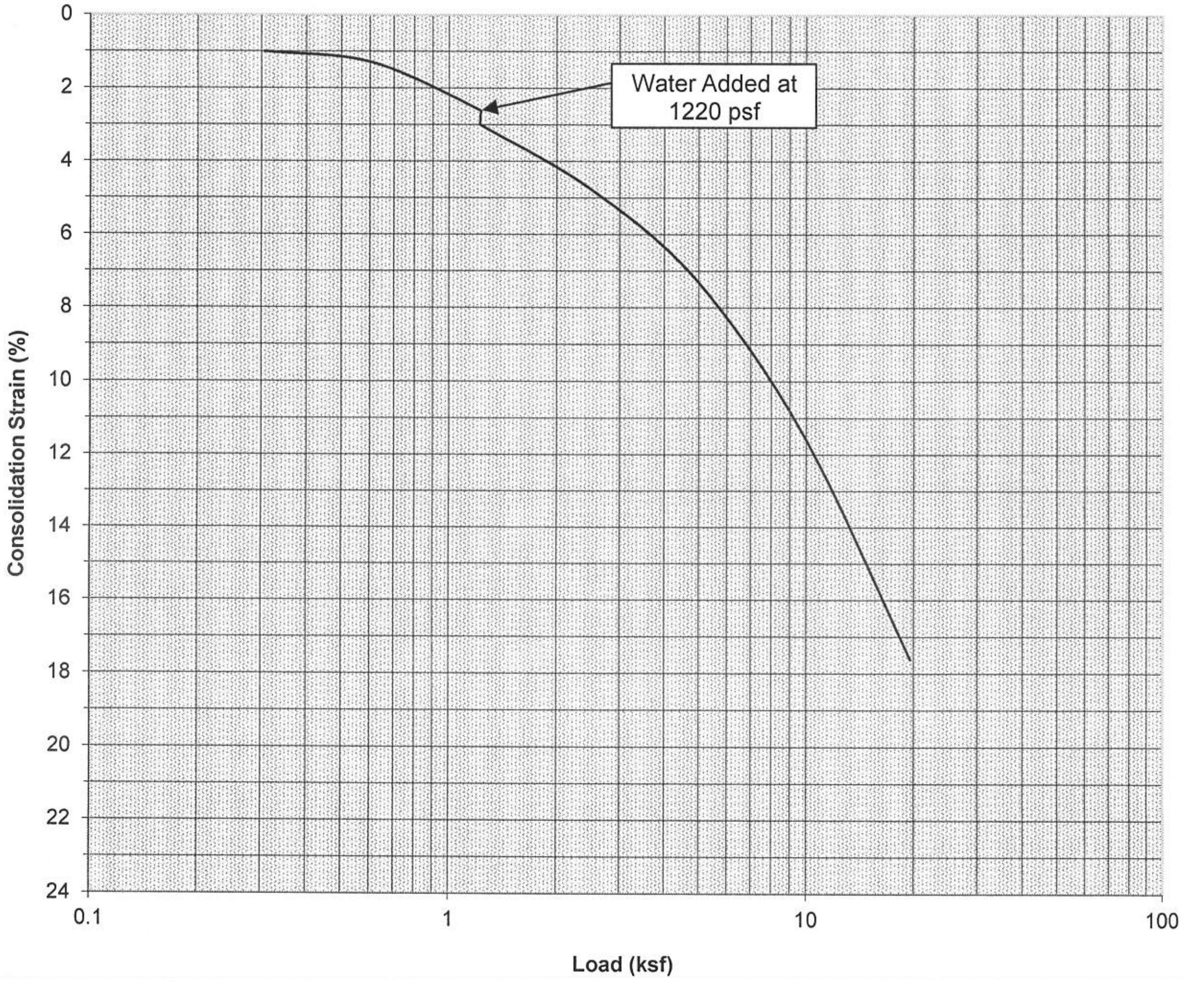


Boring No.	B-15
Depth (ft.)	3.5
Optimum Moisture (%)	8.7
Maximum Dry Density (pcf)	129.4
Soil Classification	Gray-brown clayey fine to medium sand (SC)

Preserve II: K-8 School
Chino, California

Enclosure 3, Page 6
Rpt. No.: 6230
File No.: S-14223

Consolidation Test Results

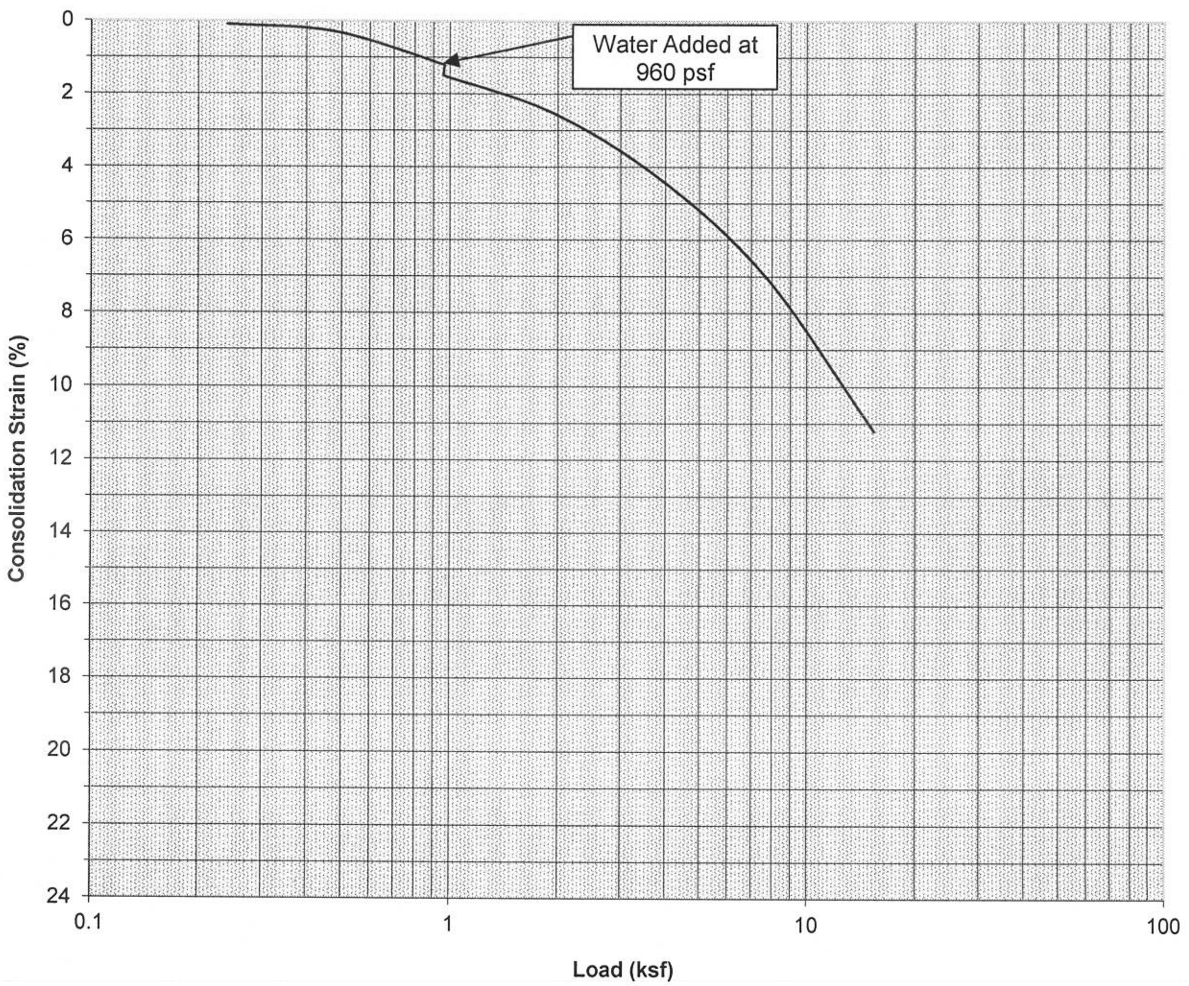


Classification: ML

Boring Number:	B-1	Initial Moisture Content (%)	24.7
Depth (ft)	15.5	Final Moisture Content (%)	30.2
Specimen Diameter (in)	2.4	Initial Dry Density (pcf)	81
Specimen Thickness (in)	1.0		

Enclosure 4, Page 1
Rpt. No.: 6230
File No.: S-14223

Consolidation Test Results



Classification: ML

Boring Number:	B-8
Depth (ft)	10.5
Specimen Diameter (in)	2.4
Specimen Thickness (in)	1.0

Initial Moisture Content (%)	20.5
Final Moisture Content (%)	33.4
Initial Dry Density (pcf)	79

Enclosure 4, Page 2
Rpt. No.: 6230
File No.: S-14223

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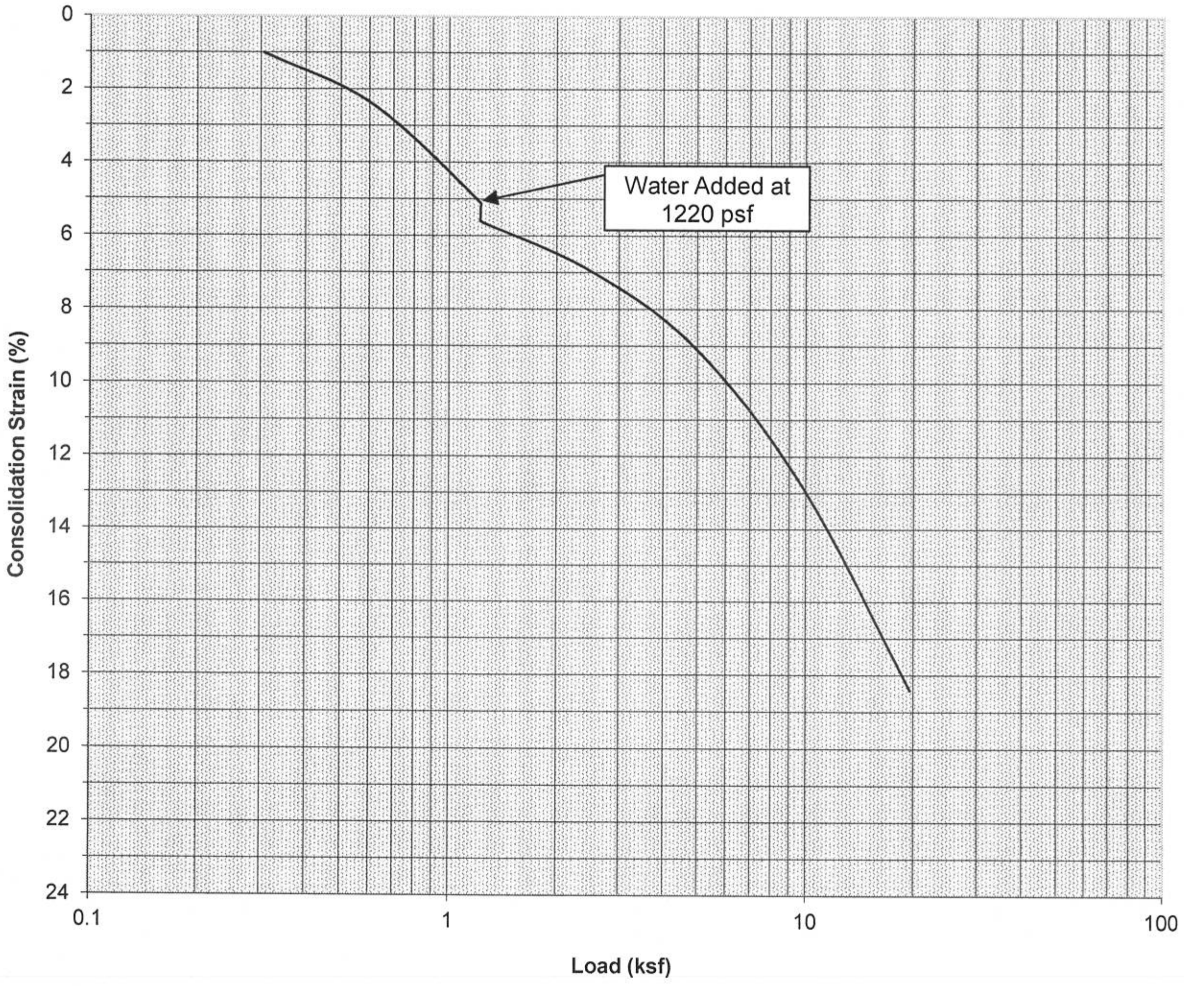
Consolidation Test Results



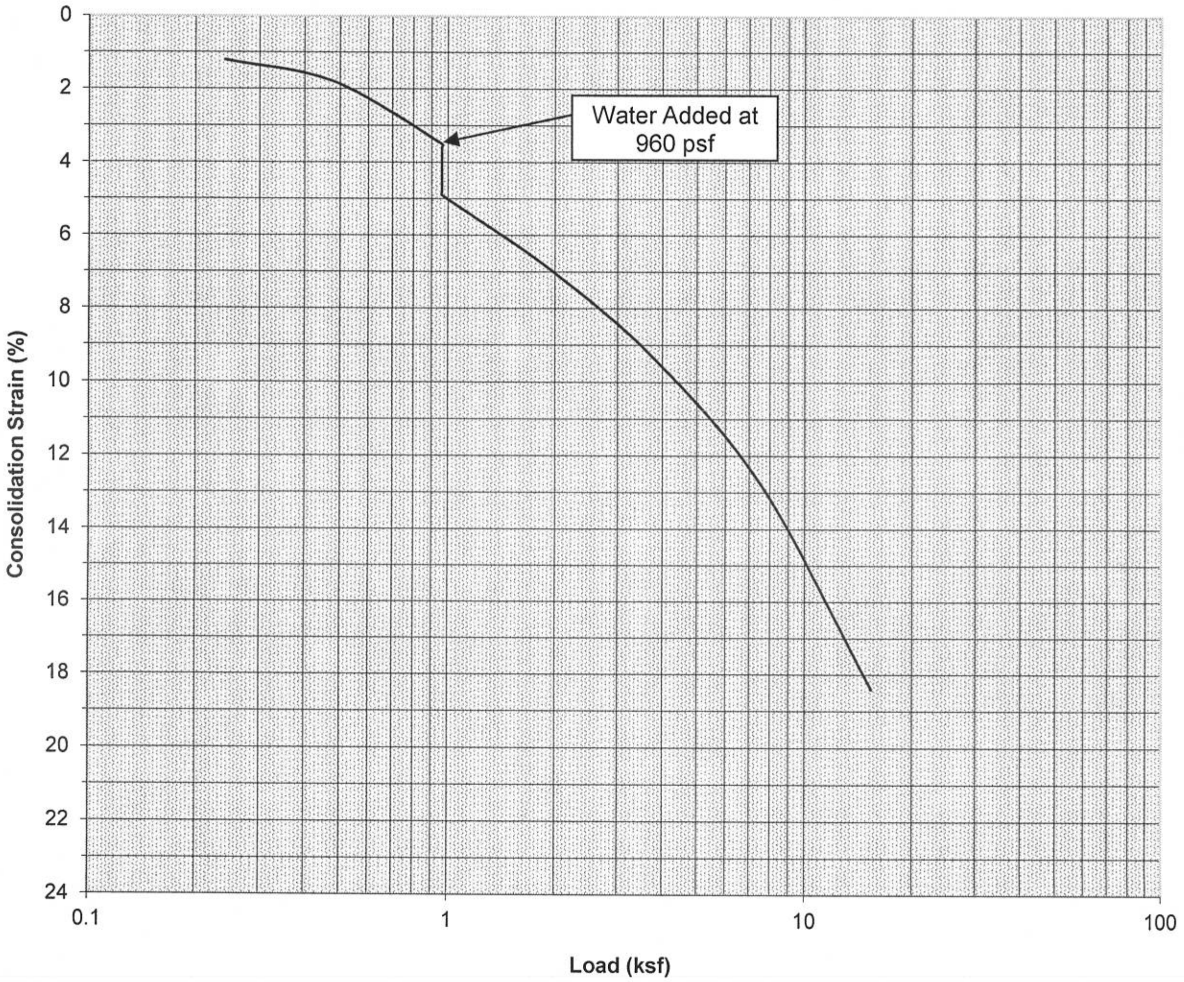
Classification:

Boring Number:	B-13
Depth (ft)	10.5
Specimen Diameter (in)	2.4
Specimen Thickness (in)	1.0

Initial Moisture Content (%)	25.6
Final Moisture Content (%)	37.8
Initial Dry Density (pcf)	65

Enclosure 4, Page 3
Rpt. No.: 6230
File No.: S-14223

Consolidation Test Results



Classification: ML

Boring Number:	B-13	Initial Moisture Content (%)	24.6
Depth (ft)	15.5	Final Moisture Content (%)	26.9
Specimen Diameter (in)	2.4	Initial Dry Density (pcf)	90
Specimen Thickness (in)	1.0		

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Rpt. No.: 6230
File No.: S-14223

EXPANSION INDEX TEST DATA

Test Description

The sample was moistened so that the as-compacted moisture content was between 49 and 51 percent saturation. The moistened sample was compacted into a 4-inch-diameter mold in two layers; each layer was compacted by 15 blows of a 5.5-pound hammer falling 12 inches. The sample was trimmed to a thickness of 1 inch and placed in a consolidometer loaded with 12.63 pounds. The sample was then submerged in distilled water, and the expansion to constant volume was noted.

Test Boring No.	Depth (ft.)	Compaction Moisture Content (%)	Dry Density (pcf)	Expansion Index	Expansion Potential
B-1	0-5.0	20.2	82.3	23	Low
B-1	7.0-15.0	12.5	98.9	45	Low
B-3	5.0-10.0	15.0	94.7	53	Medium

Enclosure 5
Rpt. No.: 6230
File No.: S-14223

PLASTIC INDEX TESTS

Test Boring No.	Depth of Sample (Feet)	Liquid Limit (%)	Plastic Limit (%)	Plastic Index
B-1	11.5	41.2	24.9	16.3
B-1	21.5	52.3	31.7	20.6
B-1	45.0	38.0	21.8	16.2
B-15	31.5	48.5	26.3	22.2
B-15	50.0	68.3	30.1	38.2
B-15	55.0	47.6	19.5	28.1

Enclosure 6
Rpt. No.: 6230
File No.: S-14223

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PERCENT PASSING NO. 200 SIEVE

Tested in accordance with ASTM C117.

Test Boring No.	Depth (ft.)	Percent Passing No. 200 Sieve
B-1	11.5	52.1
B-1	21.5	64.2
B-1	26.5	46.2
B-1	40.0	48.0
B-1	45.0	47.1
B-1	55.0	28.7
B-2	0 - 5.0	34.9
B-15	6.5	60.2
B-15	11.5	56.9
B-15	31.5	74.8
B-15	50.0	54.3

Enclosure 7
Rpt. No.: 6230
File No.: S-14223

RESULTS OF SUBGRADE SOIL TESTS

California Department of Transportation Test Methods 202, 217, & 301
ASTM Designations C136 and D2419

PROJECT: Preserve II: K-8 School

Sample No.	Location	3"	2½"	2"	1½"	1"	3/4"	1/2"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200	Sand Equiv.
						Percent Passing Sieve Size:											
1	B-2 at 0-5'					100	99	97	96	92	90	88	81	77	68	52	7

STABILOMETER "R" VALUE

Sample No.		1	
Moisture Content (%)	17.9	18.8	19.7
Dry Density (lbs./cu. ft.)	108.6	104.7	103.5
Exudation Pressure (psi)	503	314	188
Expansion Pressure (psf)	368.050	264.130	129.900
"R" Value	39	32	24
"R" Value at 300 PSI Exudation		31	

Enclosure 8
Rpt. No.: 6230
File No.: S-14223

SUGGESTED SPECIFICATIONS FOR CLASS II BASE

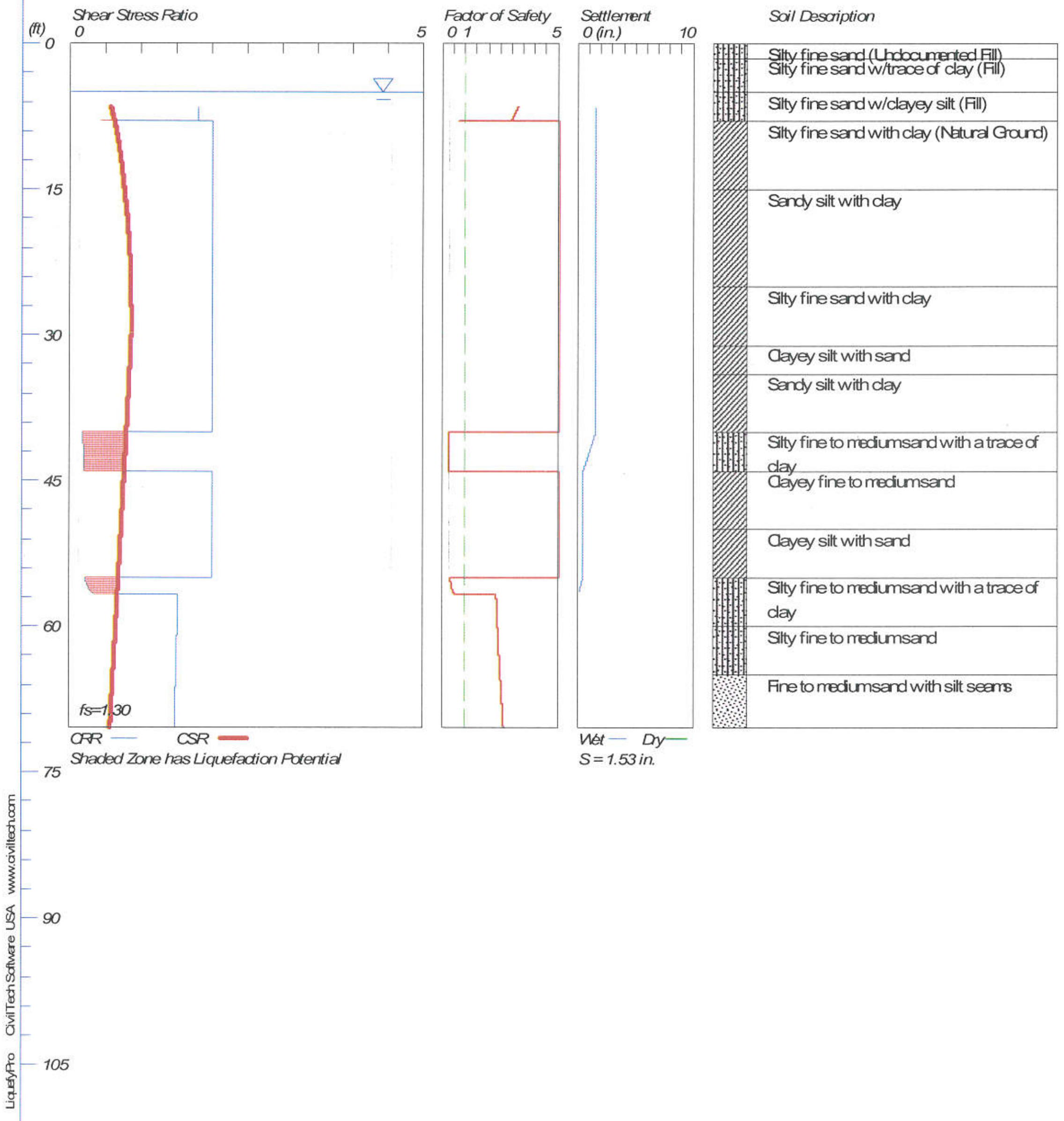
Sieve Size	**Percent Finer Than**
1 Inch	100
3/4 Inch	90 - 100
No. 4	35 - 60
No. 30	10 - 30
No. 200	2 - 9
Sand Equivalent (Minimum)	25
“R” Value (minimum) at 300 psi Exudation	78

LIQUEFACTION ANALYSIS

PRESERVE II: K-8 SCHOOL

Hole No.=B-1 Water Depth=5 ft

Magnitude=7.8
Acceleration=0.588g



John R. Byerly, Inc. S-14223

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*************************************************************************************
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                                        LIQUEFACTION ANALYSIS CALCULATION SHEET

                                                     Version 4.3
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                                             (425) 453-6488  Fax (425) 453-5848

*************************************************************************************
*******************
        Licensed to John R Byerly, John R. Byerly, Inc. 12/26/2019      12:52:22 PM

        Input File Name: P:\TerraServer\Liquefy4\S-14223 1.liq
        Title:  PRESERVE II: K-8 SCHOOL
        Subtitle:  S-14223

        Surface Elev.=
        Hole No.=B-1
        Depth of Hole= 70.5 ft
        Water Table during Earthquake= 5.0 ft
        Water Table during In-Situ Testing= 57.0 ft
        Max. Acceleration= 0.59 g
        Earthquake Magnitude= 7.8
        User defined factor of safty (applied to CSR)        User fs=1.3
        fs=user,  Plot one CSR (fs=user)

        Hammer Energy Ratio, Ce=1.25
        Borehole Diameter, Cb=1
        Sampeling Method, Cs=1.1
        SPT Fines Correction Method: Stark/Olson et al.*
        Settlement Analysis Method: Ishihara / Yoshimine*
        Fines Correction for Liquefaction: Stark/Olson et al.*
        Fine Correction for Settlement: Post-Liq. Correction *
        Average Input Data: Smooth*
        * Recommended Options

Input Data:
        Depth   SPT     Gamma   Fines
        ft              pcf     %
        ____________________________________
        6.5     19.0    115.0   35.0
        11.5    5.0     118.0   NoLiq
        16.5    9.0     101.0   NoLiq
        21.5    13.0    108.0   NoLiq
        26.5    16.0    124.0   NoLiq
        31.5    13.0    130.0   NoLiq
        35.0    21.0    130.0   NoLiq
        40.0    15.0    130.0   48.0
        45.0    18.0    130.0   NoLiq
        50.0    21.0    130.0   NoLiq
        55.0    25.0    130.0   28.7
        60.0    51.0    130.0   20.0
        65.0    58.0    130.0   4.0
        70.0    120.0   130.0   4.0
        ____________________________________

Output Results:
        Settlement of saturated sands=1.53 in.
        Settlement of dry sands=0.00 in.
        Total settlement of saturated and dry sands=1.53 in.
```

```
Differential Settlement=0.764 to 1.009 in.

Depth    CRRm     CSRfs    F.S.     S_sat.   S_dry    S_all
ft                w/fs              in.      in.      in.
_______________________________________________________________
6.50     1.81     0.56     3.22     1.53     0.00     1.53
7.50     1.81     0.60     3.02     1.53     0.00     1.53
8.50     2.00     0.63     5.00     1.52     0.00     1.52
9.50     2.00     0.66     5.00     1.52     0.00     1.52
10.50    2.00     0.68     5.00     1.52     0.00     1.52
11.50    2.00     0.70     5.00     1.52     0.00     1.52
12.50    2.00     0.72     5.00     1.52     0.00     1.52
13.50    2.00     0.73     5.00     1.52     0.00     1.52
14.50    2.00     0.75     5.00     1.52     0.00     1.52
15.50    2.00     0.76     5.00     1.52     0.00     1.52
16.50    2.00     0.78     5.00     1.52     0.00     1.52
17.50    2.00     0.79     5.00     1.52     0.00     1.52
18.50    2.00     0.80     5.00     1.52     0.00     1.52
19.50    2.00     0.81     5.00     1.52     0.00     1.52
20.50    2.00     0.82     5.00     1.52     0.00     1.52
21.50    2.00     0.83     5.00     1.52     0.00     1.52
22.50    2.00     0.84     5.00     1.52     0.00     1.52
23.50    2.00     0.84     5.00     1.52     0.00     1.52
24.50    2.00     0.85     5.00     1.52     0.00     1.52
25.50    2.00     0.85     5.00     1.52     0.00     1.52
26.50    2.00     0.85     5.00     1.52     0.00     1.52
27.50    2.00     0.85     5.00     1.52     0.00     1.52
28.50    2.00     0.85     5.00     1.52     0.00     1.52
29.50    2.00     0.85     5.00     1.52     0.00     1.52
30.50    2.00     0.85     5.00     1.52     0.00     1.52
31.50    2.00     0.84     5.00     1.52     0.00     1.52
32.50    2.00     0.84     5.00     1.52     0.00     1.52
33.50    2.00     0.83     5.00     1.52     0.00     1.52
34.50    2.00     0.82     5.00     1.52     0.00     1.52
35.50    2.00     0.82     5.00     1.52     0.00     1.52
36.50    2.00     0.81     5.00     1.52     0.00     1.52
37.50    2.00     0.80     5.00     1.52     0.00     1.52
38.50    2.00     0.80     5.00     1.52     0.00     1.52
39.50    2.00     0.79     5.00     1.52     0.00     1.52
40.50    0.19     0.78     0.24*    1.36     0.00     1.36
41.50    0.19     0.78     0.25*    1.07     0.00     1.07
42.50    0.19     0.77     0.25*    0.80     0.00     0.80
43.50    0.20     0.76     0.26*    0.54     0.00     0.54
44.50    2.00     0.76     5.00     0.39     0.00     0.39
45.50    2.00     0.75     5.00     0.39     0.00     0.39
46.50    2.00     0.74     5.00     0.39     0.00     0.39
47.50    2.00     0.73     5.00     0.39     0.00     0.39
48.50    2.00     0.73     5.00     0.39     0.00     0.39
49.50    2.00     0.72     5.00     0.39     0.00     0.39
50.50    2.00     0.71     5.00     0.39     0.00     0.39
51.50    2.00     0.71     5.00     0.39     0.00     0.39
52.50    2.00     0.70     5.00     0.39     0.00     0.39
53.50    2.00     0.69     5.00     0.39     0.00     0.39
54.50    2.00     0.68     5.00     0.39     0.00     0.39
55.50    0.23     0.68     0.34*    0.26     0.00     0.26
56.50    0.30     0.67     0.45*    0.05     0.00     0.05
57.50    1.53     0.66     2.30     0.00     0.00     0.00
58.50    1.52     0.65     2.32     0.00     0.00     0.00
59.50    1.52     0.65     2.34     0.00     0.00     0.00
60.50    1.51     0.64     2.37     0.00     0.00     0.00
61.50    1.51     0.63     2.39     0.00     0.00     0.00
62.50    1.51     0.63     2.41     0.00     0.00     0.00
63.50    1.50     0.62     2.43     0.00     0.00     0.00
```

```
        64.50   1.50    0.61    2.46    0.00    0.00    0.00
        65.50   1.50    0.60    2.48    0.00    0.00    0.00
        66.50   1.49    0.60    2.51    0.00    0.00    0.00
        67.50   1.49    0.59    2.53    0.00    0.00    0.00
        68.50   1.48    0.58    2.56    0.00    0.00    0.00
        69.50   1.48    0.57    2.58    0.00    0.00    0.00
        70.50   1.48    0.57    2.61    0.00    0.00    0.00
        _______________________________________________________
        * F.S.<1, Liquefaction Potential Zone
        (F.S. is limited to 5,  CRR is limited to 2,    CSR is limited to 2)

        Units           Depth = ft, Stress or Pressure = tsf (atm), Unit Weight =
pcf, Settlement = in.

____________________________________________________________________________________
        CRRm            Cyclic resistance ratio from soils
        CSRfs           Cyclic stress ratio induced by a given earthquake (with user
request factor of safety)
        F.S.            Factor of Safety against liquefaction, F.S.=CRRm/CSRfs
        S_sat           Settlement from saturated sands
        S_dry           Settlement from dry sands
        S_all           Total settlement from saturated and dry sands
        NoLiq           No-Liquefy Soils
```

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************************************************************************************
*******************
                                   LIQUEFACTION ANALYSIS CALCULATION SHEET

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************************************************************************************
*******************
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        Input File Name: P:\TerraServer\Liquefy4\S-14223 1.liq
        Title:  PRESERVE II: K-8 SCHOOL
        Subtitle:  S-14223

 Input Data:

        Surface Elev.=
        Hole No.=B-1
        Depth of Hole=70.5 ft
        Water Table during Earthquake= 5.0 ft
        Water Table during In-Situ Testing= 57.0 ft
        Max. Acceleration=0.59 g
        Earthquake Magnitude=7.8
        User defined factor of safty (applied to CSR)        User fs=1.3
        fs=user,  Plot one CSR (fs=user)

        Hammer Energy Ratio, Ce=1.25
        Borehole Diameter, Cb=1
        Sampeling Method, Cs=1.1
        SPT Fines Correction Method: Stark/Olson et al.*
        Settlement Analysis Method: Ishihara / Yoshimine*
        Fines Correction for Liquefaction: Stark/Olson et al.*
        Fine Correction for Settlement: Post-Liq. Correction *
        Average Input Data: Smooth*
        * Recommended Options

        Depth   SPT     Gamma   Fines
        ft              pcf     %
        ____________________________________
        6.5     19.0    115.0   35.0
        11.5    5.0     118.0   NoLiq
        16.5    9.0     101.0   NoLiq
        21.5    13.0    108.0   NoLiq
        26.5    16.0    124.0   NoLiq
        31.5    13.0    130.0   NoLiq
        35.0    21.0    130.0   NoLiq
        40.0    15.0    130.0   48.0
        45.0    18.0    130.0   NoLiq
        50.0    21.0    130.0   NoLiq
        55.0    25.0    130.0   28.7
        60.0    51.0    130.0   20.0
        65.0    58.0    130.0   4.0
        70.0    120.0   130.0   4.0
        ____________________________________

 Output Results:           (Interval = 1.00 ft)
```

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CSR Calculation:
Depth    gamma    sigma    gamma'   sigma'   rd       CSR      fs       CSRfs
ft       pcf      tsf      pcf      tsf                        (user)   w/fs
_____________________________________________________________________________
6.50     115.0    0.374    52.6     0.327    0.98     0.43     1.3      0.56
7.50     115.6    0.431    53.2     0.353    0.98     0.46     1.3      0.60
8.50     116.2    0.489    53.8     0.380    0.98     0.48     1.3      0.63
9.50     116.8    0.548    54.4     0.407    0.98     0.50     1.3      0.66
10.50    117.4    0.606    55.0     0.435    0.98     0.52     1.3      0.68
11.50    118.0    0.665    55.6     0.462    0.97     0.54     1.3      0.70
12.50    114.6    0.723    52.2     0.489    0.97     0.55     1.3      0.72
13.50    111.2    0.780    48.8     0.514    0.97     0.56     1.3      0.73
14.50    107.8    0.834    45.4     0.538    0.97     0.57     1.3      0.75
15.50    104.4    0.888    42.0     0.560    0.96     0.59     1.3      0.76
16.50    101.0    0.939    38.6     0.580    0.96     0.60     1.3      0.78
17.50    102.4    0.990    40.0     0.600    0.96     0.61     1.3      0.79
18.50    103.8    1.041    41.4     0.620    0.96     0.62     1.3      0.80
19.50    105.2    1.094    42.8     0.641    0.95     0.62     1.3      0.81
20.50    106.6    1.146    44.2     0.663    0.95     0.63     1.3      0.82
21.50    108.0    1.200    45.6     0.685    0.95     0.64     1.3      0.83
22.50    111.2    1.255    48.8     0.709    0.95     0.64     1.3      0.84
23.50    114.4    1.311    52.0     0.734    0.95     0.65     1.3      0.84
24.50    117.6    1.369    55.2     0.761    0.94     0.65     1.3      0.85
25.50    120.8    1.429    58.4     0.789    0.94     0.65     1.3      0.85
26.50    124.0    1.490    61.6     0.819    0.94     0.65     1.3      0.85
27.50    125.2    1.552    62.8     0.850    0.94     0.66     1.3      0.85
28.50    126.4    1.615    64.0     0.882    0.93     0.66     1.3      0.85
29.50    127.6    1.679    65.2     0.914    0.93     0.66     1.3      0.85
30.50    128.8    1.743    66.4     0.947    0.93     0.65     1.3      0.85
31.50    130.0    1.807    67.6     0.981    0.92     0.65     1.3      0.84
32.50    130.0    1.872    67.6     1.014    0.91     0.64     1.3      0.84
33.50    130.0    1.937    67.6     1.048    0.90     0.64     1.3      0.83
34.50    130.0    2.002    67.6     1.082    0.89     0.63     1.3      0.82
35.50    130.0    2.067    67.6     1.116    0.89     0.63     1.3      0.82
36.50    130.0    2.132    67.6     1.150    0.88     0.62     1.3      0.81
37.50    130.0    2.197    67.6     1.183    0.87     0.62     1.3      0.80
38.50    130.0    2.262    67.6     1.217    0.86     0.61     1.3      0.80
39.50    130.0    2.327    67.6     1.251    0.85     0.61     1.3      0.79
40.50    130.0    2.392    67.6     1.285    0.84     0.60     1.3      0.78
41.50    130.0    2.457    67.6     1.319    0.84     0.60     1.3      0.78
42.50    130.0    2.522    67.6     1.352    0.83     0.59     1.3      0.77
43.50    130.0    2.587    67.6     1.386    0.82     0.59     1.3      0.76
44.50    130.0    2.652    67.6     1.420    0.81     0.58     1.3      0.76
45.50    130.0    2.717    67.6     1.454    0.80     0.58     1.3      0.75
46.50    130.0    2.782    67.6     1.488    0.80     0.57     1.3      0.74
47.50    130.0    2.847    67.6     1.521    0.79     0.57     1.3      0.73
48.50    130.0    2.912    67.6     1.555    0.78     0.56     1.3      0.73
49.50    130.0    2.977    67.6     1.589    0.77     0.55     1.3      0.72
50.50    130.0    3.042    67.6     1.623    0.76     0.55     1.3      0.71
51.50    130.0    3.107    67.6     1.657    0.75     0.54     1.3      0.71
52.50    130.0    3.172    67.6     1.690    0.75     0.54     1.3      0.70
53.50    130.0    3.237    67.6     1.724    0.74     0.53     1.3      0.69
54.50    130.0    3.302    67.6     1.758    0.73     0.53     1.3      0.68
55.50    130.0    3.367    67.6     1.792    0.72     0.52     1.3      0.68
56.50    130.0    3.432    67.6     1.826    0.71     0.51     1.3      0.67
57.50    130.0    3.497    67.6     1.859    0.71     0.51     1.3      0.66
58.50    130.0    3.562    67.6     1.893    0.70     0.50     1.3      0.65
59.50    130.0    3.627    67.6     1.927    0.69     0.50     1.3      0.65
60.50    130.0    3.692    67.6     1.961    0.68     0.49     1.3      0.64
61.50    130.0    3.757    67.6     1.995    0.67     0.49     1.3      0.63
62.50    130.0    3.822    67.6     2.028    0.67     0.48     1.3      0.63
63.50    130.0    3.887    67.6     2.062    0.66     0.48     1.3      0.62
64.50    130.0    3.952    67.6     2.096    0.65     0.47     1.3      0.61
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        65.50    130.0    4.017    67.6     2.130    0.64     0.46     1.3      0.60
        66.50    130.0    4.082    67.6     2.164    0.63     0.46     1.3      0.60
        67.50    130.0    4.147    67.6     2.197    0.62     0.45     1.3      0.59
        68.50    130.0    4.212    67.6     2.231    0.62     0.45     1.3      0.58
        69.50    130.0    4.277    67.6     2.265    0.61     0.44     1.3      0.57
        70.50    130.0    4.342    67.6     2.299    0.60     0.43     1.3      0.57
        _________________________________________________________________________
        CSR is based on water table at 5.0 during earthquake

        CRR Calculation from SPT or BPT data:
        Depth    SPT      Cebs     Cr       sigma'   Cn       (N1)60   Fines    d(N1)60
(N1)60f CRR7.5
        ft                                                             %

_________________________________________________________________________________
_
        6.50     19.00    1.38     0.75     0.374    1.64     32.05    35.0     7.20
39.25   2.00
        7.50     16.20    1.38     0.75     0.431    1.52     25.44    48.2     7.20
32.64   2.00
        8.50     13.40    1.38     0.85     0.489    1.43     22.39    NoLiq    7.20
29.59   0.41
        9.50     10.60    1.38     0.85     0.548    1.35     16.74    NoLiq    7.20
23.94   0.27
        10.50    7.80     1.38     0.85     0.606    1.28     11.71    NoLiq    7.20
18.91   0.20
        11.50    5.00     1.38     0.85     0.665    1.23     7.17     NoLiq    7.20
14.37   0.16
        12.50    5.80     1.38     0.85     0.723    1.18     7.97     NoLiq    7.20
15.17   0.16
        13.50    6.60     1.38     0.85     0.780    1.13     8.74     NoLiq    7.20
15.94   0.17
        14.50    7.40     1.38     0.85     0.834    1.09     9.47     NoLiq    7.20
16.67   0.18
        15.50    8.20     1.38     0.95     0.888    1.06     11.37    NoLiq    7.20
18.57   0.20
        16.50    9.00     1.38     0.95     0.939    1.03     12.13    NoLiq    7.20
19.33   0.21
        17.50    9.80     1.38     0.95     0.990    1.01     12.87    NoLiq    7.20
20.07   0.22
        18.50    10.60    1.38     0.95     1.041    0.98     13.57    NoLiq    7.20
20.77   0.23
        19.50    11.40    1.38     0.95     1.094    0.96     14.24    NoLiq    7.20
21.44   0.23
        20.50    12.20    1.38     0.95     1.146    0.93     14.88    NoLiq    7.20
22.08   0.24
        21.50    13.00    1.38     0.95     1.200    0.91     15.50    NoLiq    7.20
22.70   0.25
        22.50    13.60    1.38     0.95     1.255    0.89     15.86    NoLiq    7.20
23.06   0.25
        23.50    14.20    1.38     0.95     1.311    0.87     16.20    NoLiq    7.20
23.40   0.26
        24.50    14.80    1.38     0.95     1.369    0.85     16.52    NoLiq    7.20
23.72   0.26
        25.50    15.40    1.38     0.95     1.429    0.84     16.83    NoLiq    7.20
24.03   0.27
        26.50    16.00    1.38     0.95     1.490    0.82     17.12    NoLiq    7.20
24.32   0.27
        27.50    15.40    1.38     0.95     1.552    0.80     16.15    NoLiq    7.20
23.35   0.26
        28.50    14.80    1.38     1.00     1.615    0.79     16.01    NoLiq    7.20
23.21   0.26
        29.50    14.20    1.38     1.00     1.679    0.77     15.07    NoLiq    7.20
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22.27   0.24
        30.50   13.60   1.38    1.00    1.743   0.76    14.17   NoLiq   7.20
21.37   0.23
        31.50   13.00   1.38    1.00    1.807   0.74    13.30   NoLiq   7.20
20.50   0.22
        32.50   15.29   1.38    1.00    1.872   0.73    15.36   NoLiq   7.20
22.56   0.25
        33.50   17.57   1.38    1.00    1.937   0.72    17.36   NoLiq   7.20
24.56   0.28
        34.50   19.86   1.38    1.00    2.002   0.71    19.29   NoLiq   7.20
26.49   0.31
        35.50   20.40   1.38    1.00    2.067   0.70    19.51   NoLiq   7.20
26.71   0.31
        36.50   19.20   1.38    1.00    2.132   0.68    18.08   NoLiq   7.20
25.28   0.29
        37.50   18.00   1.38    1.00    2.197   0.67    16.70   NoLiq   7.20
23.90   0.27
        38.50   16.80   1.38    1.00    2.262   0.66    15.36   NoLiq   7.20
22.56   0.25
        39.50   15.60   1.38    1.00    2.327   0.66    14.06   NoLiq   7.20
21.26   0.23
        40.50   15.30   1.38    1.00    2.392   0.65    13.60   53.3    7.20
20.80   0.23
        41.50   15.90   1.38    1.00    2.457   0.64    13.95   63.9    7.20
21.15   0.23
        42.50   16.50   1.38    1.00    2.522   0.63    14.29   74.5    7.20
21.49   0.23
        43.50   17.10   1.38    1.00    2.587   0.62    14.62   85.1    7.20
21.82   0.24
        44.50   17.70   1.38    1.00    2.652   0.61    14.94   NoLiq   7.20
22.14   0.24
        45.50   18.30   1.38    1.00    2.717   0.61    15.26   NoLiq   7.20
22.46   0.25
        46.50   18.90   1.38    1.00    2.782   0.60    15.58   NoLiq   7.20
22.78   0.25
        47.50   19.50   1.38    1.00    2.847   0.59    15.89   NoLiq   7.20
23.09   0.25
        48.50   20.10   1.38    1.00    2.912   0.59    16.19   NoLiq   7.20
23.39   0.26
        49.50   20.70   1.38    1.00    2.977   0.58    16.50   NoLiq   7.20
23.70   0.26
        50.50   21.40   1.38    1.00    3.042   0.57    16.87   NoLiq   7.20
24.07   0.27
        51.50   22.20   1.38    1.00    3.107   0.57    17.32   NoLiq   7.20
24.52   0.27
        52.50   23.00   1.38    1.00    3.172   0.56    17.76   NoLiq   7.20
24.96   0.28
        53.50   23.80   1.38    1.00    3.237   0.56    18.19   NoLiq   7.20
25.39   0.29
        54.50   24.60   1.38    1.00    3.302   0.55    18.61   NoLiq   7.20
25.81   0.30
        55.50   27.60   1.38    1.00    3.367   0.54    20.68   27.8    5.48
26.16   0.30
        56.50   32.80   1.38    1.00    3.432   0.54    24.34   26.1    5.06
29.40   0.39
        57.50   38.00   1.38    1.00    3.483   0.54    27.99   24.4    4.64
32.64   2.00
        58.50   43.20   1.38    1.00    3.517   0.53    31.67   22.6    4.23
35.90   2.00
        59.50   48.40   1.38    1.00    3.551   0.53    35.31   20.9    3.81
39.12   2.00
        60.50   51.70   1.38    1.00    3.585   0.53    37.55   18.4    3.22
40.76   2.00
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         61.50    53.10    1.38     1.00     3.618    0.53     38.38    15.2     2.45
40.83    2.00
         62.50    54.50    1.38     1.00     3.652    0.52     39.21    12.0     1.68
40.89    2.00
         63.50    55.90    1.38     1.00     3.686    0.52     40.03    8.8      0.91
40.95    2.00
         64.50    57.30    1.38     1.00     3.720    0.52     40.85    5.6      0.14
40.99    2.00
         65.50    64.19    1.38     1.00     3.754    0.52     45.56    4.0      0.00
45.56    2.00
         66.50    76.59    1.38     1.00     3.787    0.51     54.12    4.0      0.00
54.12    2.00
         67.50    88.99    1.38     1.00     3.821    0.51     62.60    4.0      0.00
62.60    2.00
         68.50    101.39   1.38     1.00     3.855    0.51     71.01    4.0      0.00
71.01    2.00
         69.50    113.80   1.38     1.00     3.889    0.51     79.35    4.0      0.00
79.35    2.00
         70.50    120.00   1.38     1.00     3.923    0.50     83.31    4.0      0.00
83.31    2.00

_______________________________________________________________________________________________
_
         CRR is based on water table at 57.0 during In-Situ Testing

         Factor of Safety,  - Earthquake Magnitude= 7.8:
         Depth    sigC'    CRR7.5   Ksigma   CRRv     MSF      CRRm     CSRfs    F.S.
         ft       tsf      tsf                                          w/fs     CRRm/CSRfs
         ___________________________________________________________________________
         6.50     0.24     2.00     1.00     2.00     0.90     1.81     0.56     3.22
         7.50     0.28     2.00     1.00     2.00     0.90     1.81     0.60     3.02
         8.50     0.32     0.41     1.00     0.41     0.90     2.00     0.63     5.00
         9.50     0.36     0.27     1.00     0.27     0.90     2.00     0.66     5.00
         10.50    0.39     0.20     1.00     0.20     0.90     2.00     0.68     5.00
         11.50    0.43     0.16     1.00     0.16     0.90     2.00     0.70     5.00
         12.50    0.47     0.16     1.00     0.16     0.90     2.00     0.72     5.00
         13.50    0.51     0.17     1.00     0.17     0.90     2.00     0.73     5.00
         14.50    0.54     0.18     1.00     0.18     0.90     2.00     0.75     5.00
         15.50    0.58     0.20     1.00     0.20     0.90     2.00     0.76     5.00
         16.50    0.61     0.21     1.00     0.21     0.90     2.00     0.78     5.00
         17.50    0.64     0.22     1.00     0.22     0.90     2.00     0.79     5.00
         18.50    0.68     0.23     1.00     0.23     0.90     2.00     0.80     5.00
         19.50    0.71     0.23     1.00     0.23     0.90     2.00     0.81     5.00
         20.50    0.75     0.24     1.00     0.24     0.90     2.00     0.82     5.00
         21.50    0.78     0.25     1.00     0.25     0.90     2.00     0.83     5.00
         22.50    0.82     0.25     1.00     0.25     0.90     2.00     0.84     5.00
         23.50    0.85     0.26     1.00     0.26     0.90     2.00     0.84     5.00
         24.50    0.89     0.26     1.00     0.26     0.90     2.00     0.85     5.00
         25.50    0.93     0.27     1.00     0.27     0.90     2.00     0.85     5.00
         26.50    0.97     0.27     1.00     0.27     0.90     2.00     0.85     5.00
         27.50    1.01     0.26     1.00     0.26     0.90     2.00     0.85     5.00
         28.50    1.05     0.26     1.00     0.26     0.90     2.00     0.85     5.00
         29.50    1.09     0.24     0.99     0.24     0.90     2.00     0.85     5.00
         30.50    1.13     0.23     0.99     0.23     0.90     2.00     0.85     5.00
         31.50    1.17     0.22     0.98     0.22     0.90     2.00     0.84     5.00
         32.50    1.22     0.25     0.97     0.24     0.90     2.00     0.84     5.00
         33.50    1.26     0.28     0.97     0.27     0.90     2.00     0.83     5.00
         34.50    1.30     0.31     0.96     0.30     0.90     2.00     0.82     5.00
         35.50    1.34     0.31     0.95     0.30     0.90     2.00     0.82     5.00
         36.50    1.39     0.29     0.95     0.27     0.90     2.00     0.81     5.00
         37.50    1.43     0.27     0.94     0.25     0.90     2.00     0.80     5.00
         38.50    1.47     0.25     0.94     0.23     0.90     2.00     0.80     5.00
         39.50    1.51     0.23     0.93     0.22     0.90     2.00     0.79     5.00
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40.50    1.55     0.23     0.93     0.21     0.90     0.19     0.78     0.24 *
41.50    1.60     0.23     0.92     0.21     0.90     0.19     0.78     0.25 *
42.50    1.64     0.23     0.91     0.21     0.90     0.19     0.77     0.25 *
43.50    1.68     0.24     0.91     0.22     0.90     0.20     0.76     0.26 *
44.50    1.72     0.24     0.90     0.22     0.90     2.00     0.76     5.00
45.50    1.77     0.25     0.90     0.22     0.90     2.00     0.75     5.00
46.50    1.81     0.25     0.89     0.22     0.90     2.00     0.74     5.00
47.50    1.85     0.25     0.89     0.23     0.90     2.00     0.73     5.00
48.50    1.89     0.26     0.88     0.23     0.90     2.00     0.73     5.00
49.50    1.94     0.26     0.88     0.23     0.90     2.00     0.72     5.00
50.50    1.98     0.27     0.87     0.23     0.90     2.00     0.71     5.00
51.50    2.02     0.27     0.87     0.24     0.90     2.00     0.71     5.00
52.50    2.06     0.28     0.86     0.24     0.90     2.00     0.70     5.00
53.50    2.10     0.29     0.86     0.25     0.90     2.00     0.69     5.00
54.50    2.15     0.30     0.86     0.25     0.90     2.00     0.68     5.00
55.50    2.19     0.30     0.85     0.26     0.90     0.23     0.68     0.34 *
56.50    2.23     0.39     0.85     0.33     0.90     0.30     0.67     0.45 *
57.50    2.26     2.00     0.84     1.69     0.90     1.53     0.66     2.30
58.50    2.29     2.00     0.84     1.68     0.90     1.52     0.65     2.32
59.50    2.31     2.00     0.84     1.68     0.90     1.52     0.65     2.34
60.50    2.33     2.00     0.84     1.67     0.90     1.51     0.64     2.37
61.50    2.35     2.00     0.84     1.67     0.90     1.51     0.63     2.39
62.50    2.37     2.00     0.83     1.67     0.90     1.51     0.63     2.41
63.50    2.40     2.00     0.83     1.66     0.90     1.50     0.62     2.43
64.50    2.42     2.00     0.83     1.66     0.90     1.50     0.61     2.46
65.50    2.44     2.00     0.83     1.65     0.90     1.50     0.60     2.48
66.50    2.46     2.00     0.82     1.65     0.90     1.49     0.60     2.51
67.50    2.48     2.00     0.82     1.65     0.90     1.49     0.59     2.53
68.50    2.51     2.00     0.82     1.64     0.90     1.48     0.58     2.56
69.50    2.53     2.00     0.82     1.64     0.90     1.48     0.57     2.58
70.50    2.55     2.00     0.82     1.63     0.90     1.48     0.57     2.61
_______________________________________________________________________________
* F.S.<1: Liquefaction Potential Zone.  (If above water table: F.S.=5)
(F.S. is limited to 5,  CRR is limited to 2,    CSR is limited to 2)


CPT convert to SPT for Settlement Analysis:
Fines Correction for Settlement Analysis:
Depth    Ic       qc/N60   qc1      (N1)60   Fines    d(N1)60 (N1)60s
ft                         tsf               %
_________________________________________________________________________
6.50     -        -        -        32.05    35.0     2.92     34.97
7.50     -        -        -        25.44    48.2     3.76     29.20
8.50     -        -        -        22.39    NoLiq    0.00     22.39
9.50     -        -        -        16.74    NoLiq    0.00     16.74
10.50    -        -        -        11.71    NoLiq    0.00     11.71
11.50    -        -        -        7.17     NoLiq    0.00     7.17
12.50    -        -        -        7.97     NoLiq    0.00     7.97
13.50    -        -        -        8.74     NoLiq    0.00     8.74
14.50    -        -        -        9.47     NoLiq    0.00     9.47
15.50    -        -        -        11.37    NoLiq    0.00     11.37
16.50    -        -        -        12.13    NoLiq    0.00     12.13
17.50    -        -        -        12.87    NoLiq    0.00     12.87
18.50    -        -        -        13.57    NoLiq    0.00     13.57
19.50    -        -        -        14.24    NoLiq    0.00     14.24
20.50    -        -        -        14.88    NoLiq    0.00     14.88
21.50    -        -        -        15.50    NoLiq    0.00     15.50
22.50    -        -        -        15.86    NoLiq    0.00     15.86
23.50    -        -        -        16.20    NoLiq    0.00     16.20
24.50    -        -        -        16.52    NoLiq    0.00     16.52
25.50    -        -        -        16.83    NoLiq    0.00     16.83
26.50    -        -        -        17.12    NoLiq    0.00     17.12
27.50    -        -        -        16.15    NoLiq    0.00     16.15
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28.50    -      -      -      16.01   NoLiq   0.00    16.01
29.50    -      -      -      15.07   NoLiq   0.00    15.07
30.50    -      -      -      14.17   NoLiq   0.00    14.17
31.50    -      -      -      13.30   NoLiq   0.00    13.30
32.50    -      -      -      15.36   NoLiq   0.00    15.36
33.50    -      -      -      17.36   NoLiq   0.00    17.36
34.50    -      -      -      19.29   NoLiq   0.00    19.29
35.50    -      -      -      19.51   NoLiq   0.00    19.51
36.50    -      -      -      18.08   NoLiq   0.00    18.08
37.50    -      -      -      16.70   NoLiq   0.00    16.70
38.50    -      -      -      15.36   NoLiq   0.00    15.36
39.50    -      -      -      14.06   NoLiq   0.00    14.06
40.50    -      -      -      13.60   53.3    4.05    17.65
41.50    -      -      -      13.95   63.9    4.59    18.53
42.50    -      -      -      14.29   74.5    5.03    19.32
43.50    -      -      -      14.62   85.1    5.39    20.00
44.50    -      -      -      14.94   NoLiq   0.00    14.94
45.50    -      -      -      15.26   NoLiq   0.00    15.26
46.50    -      -      -      15.58   NoLiq   0.00    15.58
47.50    -      -      -      15.89   NoLiq   0.00    15.89
48.50    -      -      -      16.19   NoLiq   0.00    16.19
49.50    -      -      -      16.50   NoLiq   0.00    16.50
50.50    -      -      -      16.87   NoLiq   0.00    16.87
51.50    -      -      -      17.32   NoLiq   0.00    17.32
52.50    -      -      -      17.76   NoLiq   0.00    17.76
53.50    -      -      -      18.19   NoLiq   0.00    18.19
54.50    -      -      -      18.61   NoLiq   0.00    18.61
55.50    -      -      -      20.68   27.8    2.40    23.08
56.50    -      -      -      24.34   26.1    2.27    26.61
57.50    -      -      -      27.99   24.4    2.13    30.13
58.50    -      -      -      31.67   22.6    2.00    33.67
59.50    -      -      -      35.31   20.9    1.86    37.17
60.50    -      -      -      37.55   18.4    1.66    39.20
61.50    -      -      -      38.38   15.2    1.39    39.77
62.50    -      -      -      39.21   12.0    1.11    40.32
63.50    -      -      -      40.03   8.8     0.83    40.86
64.50    -      -      -      40.85   5.6     0.53    41.38
65.50    -      -      -      45.56   4.0     0.38    45.94
66.50    -      -      -      54.12   4.0     0.38    54.50
67.50    -      -      -      62.60   4.0     0.38    62.98
68.50    -      -      -      71.01   4.0     0.38    71.39
69.50    -      -      -      79.35   4.0     0.38    79.73
70.50    -      -      -      83.31   4.0     0.38    83.69
_______________________________________________________________

         Settlement of Saturated Sands:
         Settlement Analysis Method: Ishihara / Yoshimine*
         Depth   CSRfs   F.S.    Fines   (N1)60s Dr      ec      dsz     dsv     S
         ft      w/fs            %               %       %       in.     in.     in.

_______________________________________________________________________________
         70.45   0.57    2.61    4.0     83.71   100.00  0.000   0.000   0.000
0.000
         69.50   0.57    2.58    4.0     79.73   100.00  0.000   0.000   0.000
0.000
         68.50   0.58    2.56    4.0     71.39   100.00  0.000   0.000   0.000
0.000
         67.50   0.59    2.53    4.0     62.98   100.00  0.000   0.000   0.000
0.000
         66.50   0.60    2.51    4.0     54.50   100.00  0.000   0.000   0.000
0.000
         65.50   0.60    2.48    4.0     45.94   100.00  0.000   0.000   0.000
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0.000
        64.50    0.61    2.46    5.6      41.38   100.00  0.000   0.000   0.000
0.000
        63.50    0.62    2.43    8.8      40.86   100.00  0.000   0.000   0.000
0.000
        62.50    0.63    2.41    12.0     40.32   100.00  0.000   0.000   0.000
0.000
        61.50    0.63    2.39    15.2     39.77   100.00  0.000   0.000   0.000
0.000
        60.50    0.64    2.37    18.4     39.20   100.00  0.000   0.000   0.000
0.000
        59.50    0.65    2.34    20.9     37.17   100.00  0.000   0.000   0.000
0.000
        58.50    0.65    2.32    22.6     33.67   99.01   0.000   0.000   0.000
0.000
        57.50    0.66    2.30    24.4     30.13   90.35   0.000   0.000   0.000
0.000
        56.50    0.67    0.45    26.1     26.61   82.87   1.621   0.010   0.047
0.047
        55.50    0.68    0.34    27.8     23.08   76.12   1.921   0.012   0.213
0.261
        54.50    0.68    5.00    NoLiq    18.61   68.03   0.000   0.000   0.132
0.393
        53.50    0.69    5.00    NoLiq    18.19   67.26   0.000   0.000   0.000
0.393
        52.50    0.70    5.00    NoLiq    17.76   66.47   0.000   0.000   0.000
0.393
        51.50    0.71    5.00    NoLiq    17.32   65.66   0.000   0.000   0.000
0.393
        50.50    0.71    5.00    NoLiq    16.87   64.83   0.000   0.000   0.000
0.393
        49.50    0.72    5.00    NoLiq    16.50   64.13   0.000   0.000   0.000
0.393
        48.50    0.73    5.00    NoLiq    16.19   63.57   0.000   0.000   0.000
0.393
        47.50    0.73    5.00    NoLiq    15.89   62.99   0.000   0.000   0.000
0.393
        46.50    0.74    5.00    NoLiq    15.58   62.40   0.000   0.000   0.000
0.393
        45.50    0.75    5.00    NoLiq    15.26   61.79   0.000   0.000   0.000
0.393
        44.50    0.76    5.00    NoLiq    14.94   61.17   0.000   0.000   0.000
0.393
        43.50    0.76    0.26    85.1     20.00   70.55   2.171   0.013   0.142
0.536
        42.50    0.77    0.25    74.5     19.32   69.31   2.238   0.013   0.264
0.800
        41.50    0.78    0.25    63.9     18.53   67.89   2.324   0.014   0.274
1.074
        40.50    0.78    0.24    53.3     17.65   66.29   2.422   0.015   0.285
1.359
        39.50    0.79    5.00    NoLiq    14.06   59.42   0.000   0.000   0.162
1.521
        38.50    0.80    5.00    NoLiq    15.36   61.97   0.000   0.000   0.000
1.521
        37.50    0.80    5.00    NoLiq    16.70   64.51   0.000   0.000   0.000
1.521
        36.50    0.81    5.00    NoLiq    18.08   67.06   0.000   0.000   0.000
1.521
        35.50    0.82    5.00    NoLiq    19.51   69.65   0.000   0.000   0.000
1.521
        34.50    0.82    5.00    NoLiq    19.29   69.27   0.000   0.000   0.000
1.521
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          33.50    0.83     5.00    NoLiq    17.36    65.74    0.000    0.000    0.000
1.521
          32.50    0.84     5.00    NoLiq    15.36    61.98    0.000    0.000    0.000
1.521
          31.50    0.84     5.00    NoLiq    13.30    57.86    0.000    0.000    0.000
1.521
          30.50    0.85     5.00    NoLiq    14.17    59.63    0.000    0.000    0.000
1.521
          29.50    0.85     5.00    NoLiq    15.07    61.41    0.000    0.000    0.000
1.521
          28.50    0.85     5.00    NoLiq    16.01    63.23    0.000    0.000    0.000
1.521
          27.50    0.85     5.00    NoLiq    16.15    63.48    0.000    0.000    0.000
1.521
          26.50    0.85     5.00    NoLiq    17.12    65.30    0.000    0.000    0.000
1.521
          25.50    0.85     5.00    NoLiq    16.83    64.76    0.000    0.000    0.000
1.521
          24.50    0.85     5.00    NoLiq    16.52    64.18    0.000    0.000    0.000
1.521
          23.50    0.84     5.00    NoLiq    16.20    63.58    0.000    0.000    0.000
1.521
          22.50    0.84     5.00    NoLiq    15.86    62.93    0.000    0.000    0.000
1.521
          21.50    0.83     5.00    NoLiq    15.50    62.25    0.000    0.000    0.000
1.521
          20.50    0.82     5.00    NoLiq    14.88    61.05    0.000    0.000    0.000
1.521
          19.50    0.81     5.00    NoLiq    14.24    59.78    0.000    0.000    0.000
1.521
          18.50    0.80     5.00    NoLiq    13.57    58.42    0.000    0.000    0.000
1.521
          17.50    0.79     5.00    NoLiq    12.87    56.96    0.000    0.000    0.000
1.521
          16.50    0.78     5.00    NoLiq    12.13    55.40    0.000    0.000    0.000
1.521
          15.50    0.76     5.00    NoLiq    11.37    53.71    0.000    0.000    0.000
1.521
          14.50    0.75     5.00    NoLiq    9.47     49.24    0.000    0.000    0.000
1.521
          13.50    0.73     5.00    NoLiq    8.74     47.41    0.000    0.000    0.000
1.521
          12.50    0.72     5.00    NoLiq    7.97     45.41    0.000    0.000    0.000
1.521
          11.50    0.70     5.00    NoLiq    7.17     43.21    0.000    0.000    0.000
1.521
          10.50    0.68     5.00    NoLiq    11.71    54.47    0.000    0.000    0.000
1.521
          9.50     0.66     5.00    NoLiq    16.74    64.60    0.000    0.000    0.000
1.521
          8.50     0.63     5.00    NoLiq    22.39    74.85    0.000    0.000    0.000
1.521
          7.50     0.60     3.02    48.2     29.20    88.28    0.000    0.000    0.008
1.529
          6.50     0.56     3.22    35.0     34.97    100.00   0.000    0.000    0.000
1.529
_______________________________________________________________________________________
          Settlement of Saturated Sands=1.529 in.
          dsz is per each segment: dz=0.05 ft
          dsv is per each print interval: dv=1 ft
          S is cumulated settlement at this depth
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        Settlement of Dry Sands:
        Depth   sigma'  sigC'   (N1)60s CSRfs   Gmax    g*Ge/Gm g_eff   ec7.5   Cec
ec      dsz     dsv     S
        ft      tsf     tsf             w/fs    tsf                     %
%       in.     in.     in.

____________________________________________________________________________________
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____________________________________________________________________________________
____________________________
        Settlement of Dry Sands=0.000 in.
        dsz is per each segment: dz=0.05 ft
        dsv is per each print interval: dv=1 ft
        S is cumulated settlement at this depth

        Total Settlement of Saturated and Dry Sands=1.529 in.
        Differential Settlement=0.764 to 1.009 in.

        Units           Depth = ft, Stress or Pressure = tsf (atm), Unit Weight =
pcf, Settlement = in.

____________________________________________________________________________________
_____________
        SPT             Field data from Standard Penetration Test (SPT)
        BPT             Field data from Becker Penetration Test (BPT)
        qc              Field data from Cone Penetration Test (CPT)
        fc              Friction from CPT testing
        Gamma           Total unit weight of soil
        Gamma'          Effective unit weight of soil
        Fines           Fines content [%]
        D50             Mean grain size
        Dr              Relative Density
        sigma           Total vertical stress [tsf]
        sigma'          Effective vertical stress [tsf]
        sigC'           Effective confining pressure [tsf]
        rd              Stress reduction coefficient
        CSR             Cyclic stress ratio induced by earthquake
        fs              User request factor of safety, apply to CSR
        w/fs            With user request factor of safety inside
        CSRfs           CSR with User request factor of safety
        CRR7.5          Cyclic resistance ratio (M=7.5)
        Ksigma          Overburden stress correction factor for CRR7.5
        CRRv            CRR after overburden stress correction, CRRv=CRR7.5 * Ksigma
        MSF             Magnitude scaling factor for CRR (M=7.5)
        CRRm            After magnitude scaling correction CRRm=CRRv * MSF
        F.S.            Factor of Safety against liquefaction F.S.=CRRm/CSRfs
        Cebs            Energy Ratio, Borehole Dia., and Sample Method Corrections
        Cr              Rod Length Corrections
        Cn              Overburden Pressure Correction
        (N1)60          SPT after corrections, (N1)60=SPT * Cr * Cn * Cebs
        d(N1)60         Fines correction of SPT
        (N1)60f         (N1)60 after fines corrections, (N1)60f=(N1)60 + d(N1)60
        Cq              Overburden stress correction factor
        qc1             CPT after Overburden stress correction
        dqc1            Fines correction of CPT
        qc1f            CPT after Fines and Overburden correction, qc1f=qc1 + dqc1
        qc1n            CPT after normalization in Robertson's method
        Kc              Fine correction factor in Robertson's Method
        qc1f            CPT after Fines correction in Robertson's Method
        Ic              Soil type index in Suzuki's and Robertson's Methods
        (N1)60s         (N1)60 after seattlement fines corrections
        ec              Volumetric strain for saturated sands
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```
ds              Settlement in each Segment dz
dz              Segment for calculation, dz=0.050 ft
Gmax            Shear Modulus at low strain
g_eff           gamma_eff, Effective shear Strain
g*Ge/Gm         gamma_eff * G_eff/G_max,      Strain-modulus ratio
ec7.5           Volumetric Strain for magnitude=7.5
Cec             Magnitude correction factor for any magnitude
ec              Volumetric strain for dry sands, ec=Cec * ec7.5
NoLiq           No-Liquefy Soils
```

References:

NCEER Workshop on Evaluation of Liquefaction Resistance of Soils. Youd, T.L., and Idriss, I.M., eds., Technical Report NCEER 97-0022.

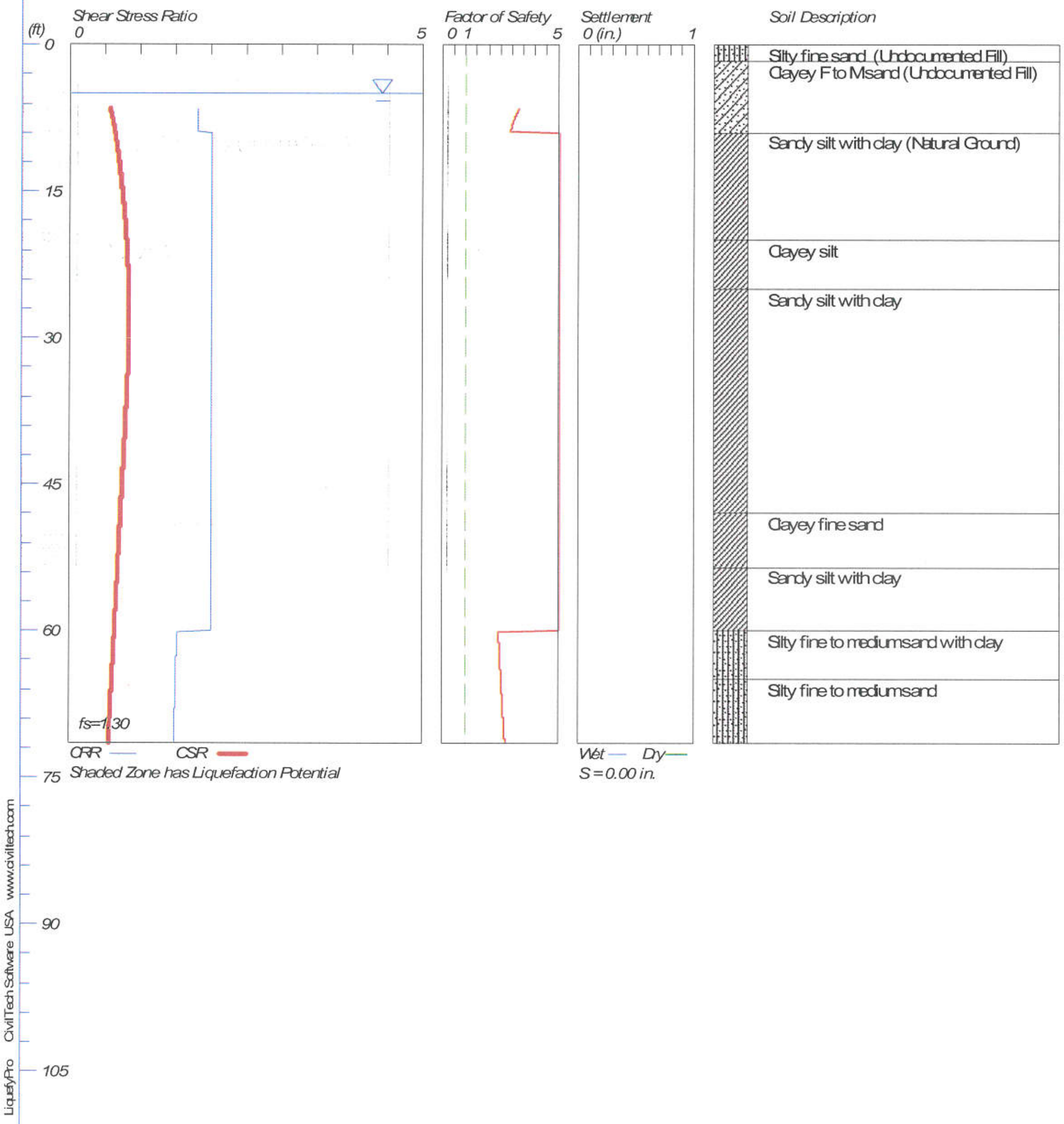
SP117. Southern California Earthquake Center. Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California. University of Southern California. March 1999.

LIQUEFACTION ANALYSIS

PRESERVE II: K-8 SCHOOL

Hole No.=B-15   Water Depth=5 ft

Magnitude=7.8
Acceleration=0.588g



John R. Byerly, Inc.

S-14223

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************************************************************************************
*******************
                                    LIQUEFACTION ANALYSIS CALCULATION SHEET

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************************************************************************************
*******************
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        Input File Name: P:\TerraServer\Liquefy4\S-14223 15.liq
        Title:  PRESERVE II: K-8 SCHOOL
        Subtitle:  S-14223

        Surface Elev.=
        Hole No.=B-15
        Depth of Hole= 71.5 ft
        Water Table during Earthquake= 5.0 ft
        Water Table during In-Situ Testing= 53.5 ft
        Max. Acceleration= 0.59 g
        Earthquake Magnitude= 7.8
        User defined factor of safty (applied to CSR)       User fs=1.3
        fs=user,  Plot one CSR (fs=user)

        Hammer Energy Ratio, Ce=1.25
        Borehole Diameter, Cb=1
        Sampeling Method, Cs=1.1
        SPT Fines Correction Method: Stark/Olson et al.*
        Settlement Analysis Method: Ishihara / Yoshimine*
        Fines Correction for Liquefaction: Stark/Olson et al.*
        Fine Correction for Settlement: Post-Liq. Correction *
        Average Input Data: Smooth*
        * Recommended Options

Input Data:
        Depth   SPT     Gamma   Fines
        ft              pcf     %
        ____________________________________
        6.5     25.0    123.0   60.2
        11.5    7.0     119.0   NoLiq
        16.5    7.0     105.0   NoLiq
        21.5    10.0    111.0   NoLiq
        26.5    12.0    131.0   NoLiq
        31.5    12.0    119.0   NoLiq
        35.0    23.0    130.0   NoLiq
        40.0    16.0    130.0   NoLiq
        45.0    22.0    130.0   NoLiq
        50.0    21.0    130.0   NoLiq
        55.0    20.0    130.0   NoLiq
        60.0    50.0    130.0   NoLiq
        65.0    63.0    130.0   30.0
        70.0    80.0    130.0   25.0
        ____________________________________

Output Results:
        Settlement of saturated sands=0.00 in.
        Settlement of dry sands=0.00 in.
        Total settlement of saturated and dry sands=0.00 in.
```

```
Differential Settlement=0.000 to 0.000 in.

Depth    CRRm      CSRfs     F.S.     S_sat.   S_dry    S_all
ft                 w/fs               in.      in.      in.
_______________________________________________________________
6.50     1.81      0.56      3.25     0.00     0.00     0.00
7.50     1.81      0.59      3.07     0.00     0.00     0.00
8.50     1.81      0.62      2.93     0.00     0.00     0.00
9.50     2.00      0.64      5.00     0.00     0.00     0.00
10.50    2.00      0.66      5.00     0.00     0.00     0.00
11.50    2.00      0.68      5.00     0.00     0.00     0.00
12.50    2.00      0.70      5.00     0.00     0.00     0.00
13.50    2.00      0.71      5.00     0.00     0.00     0.00
14.50    2.00      0.73      5.00     0.00     0.00     0.00
15.50    2.00      0.74      5.00     0.00     0.00     0.00
16.50    2.00      0.76      5.00     0.00     0.00     0.00
17.50    2.00      0.77      5.00     0.00     0.00     0.00
18.50    2.00      0.78      5.00     0.00     0.00     0.00
19.50    2.00      0.79      5.00     0.00     0.00     0.00
20.50    2.00      0.80      5.00     0.00     0.00     0.00
21.50    2.00      0.80      5.00     0.00     0.00     0.00
22.50    2.00      0.81      5.00     0.00     0.00     0.00
23.50    2.00      0.82      5.00     0.00     0.00     0.00
24.50    2.00      0.82      5.00     0.00     0.00     0.00
25.50    2.00      0.82      5.00     0.00     0.00     0.00
26.50    2.00      0.82      5.00     0.00     0.00     0.00
27.50    2.00      0.82      5.00     0.00     0.00     0.00
28.50    2.00      0.82      5.00     0.00     0.00     0.00
29.50    2.00      0.83      5.00     0.00     0.00     0.00
30.50    2.00      0.82      5.00     0.00     0.00     0.00
31.50    2.00      0.82      5.00     0.00     0.00     0.00
32.50    2.00      0.82      5.00     0.00     0.00     0.00
33.50    2.00      0.81      5.00     0.00     0.00     0.00
34.50    2.00      0.81      5.00     0.00     0.00     0.00
35.50    2.00      0.80      5.00     0.00     0.00     0.00
36.50    2.00      0.80      5.00     0.00     0.00     0.00
37.50    2.00      0.79      5.00     0.00     0.00     0.00
38.50    2.00      0.78      5.00     0.00     0.00     0.00
39.50    2.00      0.78      5.00     0.00     0.00     0.00
40.50    2.00      0.77      5.00     0.00     0.00     0.00
41.50    2.00      0.76      5.00     0.00     0.00     0.00
42.50    2.00      0.76      5.00     0.00     0.00     0.00
43.50    2.00      0.75      5.00     0.00     0.00     0.00
44.50    2.00      0.74      5.00     0.00     0.00     0.00
45.50    2.00      0.74      5.00     0.00     0.00     0.00
46.50    2.00      0.73      5.00     0.00     0.00     0.00
47.50    2.00      0.72      5.00     0.00     0.00     0.00
48.50    2.00      0.72      5.00     0.00     0.00     0.00
49.50    2.00      0.71      5.00     0.00     0.00     0.00
50.50    2.00      0.70      5.00     0.00     0.00     0.00
51.50    2.00      0.70      5.00     0.00     0.00     0.00
52.50    2.00      0.69      5.00     0.00     0.00     0.00
53.50    2.00      0.68      5.00     0.00     0.00     0.00
54.50    2.00      0.68      5.00     0.00     0.00     0.00
55.50    2.00      0.67      5.00     0.00     0.00     0.00
56.50    2.00      0.66      5.00     0.00     0.00     0.00
57.50    2.00      0.65      5.00     0.00     0.00     0.00
58.50    2.00      0.65      5.00     0.00     0.00     0.00
59.50    2.00      0.64      5.00     0.00     0.00     0.00
60.50    1.52      0.63      2.40     0.00     0.00     0.00
61.50    1.52      0.63      2.43     0.00     0.00     0.00
62.50    1.51      0.62      2.45     0.00     0.00     0.00
63.50    1.51      0.61      2.47     0.00     0.00     0.00
```

```
        64.50    1.51     0.60     2.49     0.00     0.00     0.00
        65.50    1.50     0.60     2.52     0.00     0.00     0.00
        66.50    1.50     0.59     2.54     0.00     0.00     0.00
        67.50    1.49     0.58     2.57     0.00     0.00     0.00
        68.50    1.49     0.57     2.60     0.00     0.00     0.00
        69.50    1.49     0.57     2.62     0.00     0.00     0.00
        70.50    1.48     0.56     2.65     0.00     0.00     0.00
        71.50    1.48     0.55     2.68     0.00     0.00     0.00
        _______________________________________________________
        * F.S.<1, Liquefaction Potential Zone
        (F.S. is limited to 5,  CRR is limited to 2,    CSR is limited to 2)

        Units           Depth = ft, Stress or Pressure = tsf (atm), Unit Weight =
pcf, Settlement = in.

____________________________________________________________________________________
        CRRm            Cyclic resistance ratio from soils
        CSRfs           Cyclic stress ratio induced by a given earthquake (with user
request factor of safety)
        F.S.            Factor of Safety against liquefaction, F.S.=CRRm/CSRfs
        S_sat           Settlement from saturated sands
        S_dry           Settlement from dry sands
        S_all           Total settlement from saturated and dry sands
        NoLiq           No-Liquefy Soils
```

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*************************************************************************************
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*************************************************************************************
*******************
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        Input File Name: P:\TerraServer\Liquefy4\S-14223 15.liq
        Title:  PRESERVE II: K-8 SCHOOL
        Subtitle:  S-14223

 Input Data:

        Surface Elev.=
        Hole No.=B-15
        Depth of Hole=71.5 ft
        Water Table during Earthquake= 5.0 ft
        Water Table during In-Situ Testing= 53.5 ft
        Max. Acceleration=0.59 g
        Earthquake Magnitude=7.8
        User defined factor of safty (applied to CSR)        User fs=1.3
        fs=user,  Plot one CSR (fs=user)

        Hammer Energy Ratio, Ce=1.25
        Borehole Diameter, Cb=1
        Sampeling Method, Cs=1.1
        SPT Fines Correction Method: Stark/Olson et al.*
        Settlement Analysis Method: Ishihara / Yoshimine*
        Fines Correction for Liquefaction: Stark/Olson et al.*
        Fine Correction for Settlement: Post-Liq. Correction *
        Average Input Data: Smooth*
        * Recommended Options

        Depth   SPT     Gamma   Fines
        ft              pcf     %
        ____________________________________
        6.5     25.0    123.0   60.2
        11.5    7.0     119.0   NoLiq
        16.5    7.0     105.0   NoLiq
        21.5    10.0    111.0   NoLiq
        26.5    12.0    131.0   NoLiq
        31.5    12.0    119.0   NoLiq
        35.0    23.0    130.0   NoLiq
        40.0    16.0    130.0   NoLiq
        45.0    22.0    130.0   NoLiq
        50.0    21.0    130.0   NoLiq
        55.0    20.0    130.0   NoLiq
        60.0    50.0    130.0   NoLiq
        65.0    63.0    130.0   30.0
        70.0    80.0    130.0   25.0
        ____________________________________

 Output Results:          (Interval = 1.00 ft)
```

```
CSR Calculation:
Depth   gamma   sigma   gamma'  sigma'  rd      CSR     fs      CSRfs
ft      pcf     tsf     pcf     tsf                     (user)  w/fs
_________________________________________________________________________
6.50    123.0   0.400   60.6    0.353   0.98    0.43    1.3     0.56
7.50    122.2   0.461   59.8    0.383   0.98    0.45    1.3     0.59
8.50    121.4   0.522   59.0    0.413   0.98    0.48    1.3     0.62
9.50    120.6   0.582   58.2    0.442   0.98    0.49    1.3     0.64
10.50   119.8   0.643   57.4    0.471   0.98    0.51    1.3     0.66
11.50   119.0   0.702   56.6    0.499   0.97    0.52    1.3     0.68
12.50   116.2   0.761   53.8    0.527   0.97    0.54    1.3     0.70
13.50   113.4   0.819   51.0    0.553   0.97    0.55    1.3     0.71
14.50   110.6   0.875   48.2    0.578   0.97    0.56    1.3     0.73
15.50   107.8   0.929   45.4    0.602   0.96    0.57    1.3     0.74
16.50   105.0   0.982   42.6    0.624   0.96    0.58    1.3     0.76
17.50   106.2   1.035   43.8    0.645   0.96    0.59    1.3     0.77
18.50   107.4   1.089   45.0    0.667   0.96    0.60    1.3     0.78
19.50   108.6   1.143   46.2    0.690   0.95    0.61    1.3     0.79
20.50   109.8   1.197   47.4    0.714   0.95    0.61    1.3     0.80
21.50   111.0   1.252   48.6    0.738   0.95    0.62    1.3     0.80
22.50   115.0   1.309   52.6    0.763   0.95    0.62    1.3     0.81
23.50   119.0   1.367   56.6    0.790   0.95    0.63    1.3     0.82
24.50   123.0   1.428   60.6    0.819   0.94    0.63    1.3     0.82
25.50   127.0   1.490   64.6    0.851   0.94    0.63    1.3     0.82
26.50   131.0   1.555   68.6    0.884   0.94    0.63    1.3     0.82
27.50   128.6   1.620   66.2    0.918   0.94    0.63    1.3     0.82
28.50   126.2   1.683   63.8    0.950   0.93    0.63    1.3     0.82
29.50   123.8   1.746   61.4    0.981   0.93    0.64    1.3     0.83
30.50   121.4   1.807   59.0    1.012   0.93    0.63    1.3     0.82
31.50   119.0   1.867   56.6    1.040   0.92    0.63    1.3     0.82
32.50   122.1   1.928   59.7    1.070   0.91    0.63    1.3     0.82
33.50   125.3   1.989   62.9    1.100   0.90    0.63    1.3     0.81
34.50   128.4   2.053   66.0    1.132   0.89    0.62    1.3     0.81
35.50   130.0   2.118   67.6    1.166   0.89    0.62    1.3     0.80
36.50   130.0   2.183   67.6    1.200   0.88    0.61    1.3     0.80
37.50   130.0   2.248   67.6    1.234   0.87    0.61    1.3     0.79
38.50   130.0   2.313   67.6    1.267   0.86    0.60    1.3     0.78
39.50   130.0   2.378   67.6    1.301   0.85    0.60    1.3     0.78
40.50   130.0   2.443   67.6    1.335   0.84    0.59    1.3     0.77
41.50   130.0   2.508   67.6    1.369   0.84    0.59    1.3     0.76
42.50   130.0   2.573   67.6    1.403   0.83    0.58    1.3     0.76
43.50   130.0   2.638   67.6    1.436   0.82    0.58    1.3     0.75
44.50   130.0   2.703   67.6    1.470   0.81    0.57    1.3     0.74
45.50   130.0   2.768   67.6    1.504   0.80    0.57    1.3     0.74
46.50   130.0   2.833   67.6    1.538   0.80    0.56    1.3     0.73
47.50   130.0   2.898   67.6    1.572   0.79    0.56    1.3     0.72
48.50   130.0   2.963   67.6    1.605   0.78    0.55    1.3     0.72
49.50   130.0   3.028   67.6    1.639   0.77    0.55    1.3     0.71
50.50   130.0   3.092   67.6    1.673   0.76    0.54    1.3     0.70
51.50   130.0   3.157   67.6    1.707   0.75    0.54    1.3     0.70
52.50   130.0   3.222   67.6    1.741   0.75    0.53    1.3     0.69
53.50   130.0   3.287   67.6    1.774   0.74    0.52    1.3     0.68
54.50   130.0   3.352   67.6    1.808   0.73    0.52    1.3     0.68
55.50   130.0   3.417   67.6    1.842   0.72    0.51    1.3     0.67
56.50   130.0   3.482   67.6    1.876   0.71    0.51    1.3     0.66
57.50   130.0   3.547   67.6    1.910   0.71    0.50    1.3     0.65
58.50   130.0   3.612   67.6    1.943   0.70    0.50    1.3     0.65
59.50   130.0   3.677   67.6    1.977   0.69    0.49    1.3     0.64
60.50   130.0   3.742   67.6    2.011   0.68    0.49    1.3     0.63
61.50   130.0   3.807   67.6    2.045   0.67    0.48    1.3     0.63
62.50   130.0   3.872   67.6    2.079   0.67    0.48    1.3     0.62
63.50   130.0   3.937   67.6    2.112   0.66    0.47    1.3     0.61
64.50   130.0   4.002   67.6    2.146   0.65    0.46    1.3     0.60
```

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          65.50    130.0    4.067    67.6     2.180   0.64     0.46     1.3      0.60
          66.50    130.0    4.132    67.6     2.214   0.63     0.45     1.3      0.59
          67.50    130.0    4.197    67.6     2.248   0.62     0.45     1.3      0.58
          68.50    130.0    4.262    67.6     2.281   0.62     0.44     1.3      0.57
          69.50    130.0    4.327    67.6     2.315   0.61     0.44     1.3      0.57
          70.50    130.0    4.392    67.6     2.349   0.60     0.43     1.3      0.56
          71.50    130.0    4.457    67.6     2.383   0.59     0.42     1.3      0.55
          ______________________________________________________________________________
          CSR is based on water table at 5.0 during earthquake

          CRR Calculation from SPT or BPT data:
          Depth    SPT      Cebs     Cr       sigma'  Cn       (N1)60   Fines    d(N1)60
(N1)60f   CRR7.5
          ft                                                            %

__________________________________________________________________________________________
_
          6.50     25.00    1.38     0.75     0.400   1.58     40.78    60.2     7.20
47.98     2.00
          7.50     21.40    1.38     0.75     0.461   1.47     32.50    68.4     7.20
39.70     2.00
          8.50     17.80    1.38     0.85     0.522   1.38     28.80    76.5     7.20
36.00     2.00
          9.50     14.20    1.38     0.85     0.582   1.31     21.75    NoLiq    7.20
28.95     0.37
          10.50    10.60    1.38     0.85     0.643   1.25     15.45    NoLiq    7.20
22.65     0.25
          11.50    7.00     1.38     0.85     0.702   1.19     9.76     NoLiq    7.20
16.96     0.18
          12.50    7.00     1.38     0.85     0.761   1.15     9.38     NoLiq    7.20
16.58     0.18
          13.50    7.00     1.38     0.85     0.819   1.11     9.04     NoLiq    7.20
16.24     0.18
          14.50    7.00     1.38     0.85     0.875   1.07     8.75     NoLiq    7.20
15.95     0.17
          15.50    7.00     1.38     0.95     0.929   1.04     9.49     NoLiq    7.20
16.69     0.18
          16.50    7.00     1.38     0.95     0.982   1.01     9.22     NoLiq    7.20
16.42     0.18
          17.50    7.60     1.38     0.95     1.035   0.98     9.76     NoLiq    7.20
16.96     0.18
          18.50    8.20     1.38     0.95     1.089   0.96     10.27    NoLiq    7.20
17.47     0.19
          19.50    8.80     1.38     0.95     1.143   0.94     10.75    NoLiq    7.20
17.95     0.19
          20.50    9.40     1.38     0.95     1.197   0.91     11.22    NoLiq    7.20
18.42     0.20
          21.50    10.00    1.38     0.95     1.252   0.89     11.67    NoLiq    7.20
18.87     0.20
          22.50    10.40    1.38     0.95     1.309   0.87     11.87    NoLiq    7.20
19.07     0.21
          23.50    10.80    1.38     0.95     1.367   0.86     12.06    NoLiq    7.20
19.26     0.21
          24.50    11.20    1.38     0.95     1.428   0.84     12.24    NoLiq    7.20
19.44     0.21
          25.50    11.60    1.38     0.95     1.490   0.82     12.41    NoLiq    7.20
19.61     0.21
          26.50    12.00    1.38     0.95     1.555   0.80     12.57    NoLiq    7.20
19.77     0.21
          27.50    12.00    1.38     0.95     1.620   0.79     12.32    NoLiq    7.20
19.52     0.21
          28.50    12.00    1.38     1.00     1.683   0.77     12.72    NoLiq    7.20
19.92     0.22
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```
         29.50    12.00    1.38     1.00     1.746    0.76     12.49    NoLiq    7.20
19.69    0.21
         30.50    12.00    1.38     1.00     1.807    0.74     12.27    NoLiq    7.20
19.47    0.21
         31.50    12.00    1.38     1.00     1.867    0.73     12.07    NoLiq    7.20
19.27    0.21
         32.50    15.14    1.38     1.00     1.928    0.72     15.00    NoLiq    7.20
22.20    0.24
         33.50    18.28    1.38     1.00     1.989    0.71     17.83    NoLiq    7.20
25.03    0.28
         34.50    21.43    1.38     1.00     2.053    0.70     20.56    NoLiq    7.20
27.76    0.34
         35.50    22.30    1.38     1.00     2.118    0.69     21.07    NoLiq    7.20
28.27    0.35
         36.50    20.90    1.38     1.00     2.183    0.68     19.45    NoLiq    7.20
26.65    0.31
         37.50    19.50    1.38     1.00     2.248    0.67     17.89    NoLiq    7.20
25.09    0.28
         38.50    18.10    1.38     1.00     2.313    0.66     16.37    NoLiq    7.20
23.57    0.26
         39.50    16.70    1.38     1.00     2.378    0.65     14.89    NoLiq    7.20
22.09    0.24
         40.50    16.60    1.38     1.00     2.443    0.64     14.60    NoLiq    7.20
21.80    0.24
         41.50    17.80    1.38     1.00     2.508    0.63     15.46    NoLiq    7.20
22.66    0.25
         42.50    19.00    1.38     1.00     2.573    0.62     16.29    NoLiq    7.20
23.49    0.26
         43.50    20.20    1.38     1.00     2.638    0.62     17.10    NoLiq    7.20
24.30    0.27
         44.50    21.40    1.38     1.00     2.703    0.61     17.90    NoLiq    7.20
25.10    0.28
         45.50    21.90    1.38     1.00     2.768    0.60     18.10    NoLiq    7.20
25.30    0.29
         46.50    21.70    1.38     1.00     2.833    0.59     17.73    NoLiq    7.20
24.93    0.28
         47.50    21.50    1.38     1.00     2.898    0.59     17.37    NoLiq    7.20
24.57    0.28
         48.50    21.30    1.38     1.00     2.963    0.58     17.02    NoLiq    7.20
24.22    0.27
         49.50    21.10    1.38     1.00     3.028    0.57     16.67    NoLiq    7.20
23.87    0.27
         50.50    20.90    1.38     1.00     3.092    0.57     16.34    NoLiq    7.20
23.54    0.26
         51.50    20.70    1.38     1.00     3.157    0.56     16.02    NoLiq    7.20
23.22    0.26
         52.50    20.50    1.38     1.00     3.222    0.56     15.70    NoLiq    7.20
22.90    0.25
         53.50    20.30    1.38     1.00     3.287    0.55     15.39    NoLiq    7.20
22.59    0.25
         54.50    20.10    1.38     1.00     3.323    0.55     15.16    NoLiq    7.20
22.36    0.24
         55.50    23.00    1.38     1.00     3.357    0.55     17.26    NoLiq    7.20
24.46    0.27
         56.50    29.00    1.38     1.00     3.390    0.54     21.65    NoLiq    7.20
28.85    0.37
         57.50    35.00    1.38     1.00     3.424    0.54     26.00    NoLiq    7.20
33.20    2.00
         58.50    41.00    1.38     1.00     3.458    0.54     30.31    NoLiq    7.20
37.51    2.00
         59.50    47.00    1.38     1.00     3.492    0.54     34.58    NoLiq    7.20
41.78    2.00
         60.50    51.30    1.38     1.00     3.526    0.53     37.57    34.5     7.08
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44.65   2.00
        61.50   53.90   1.38    1.00    3.559   0.53    39.28   33.5    6.84
46.12   2.00
        62.50   56.50   1.38    1.00    3.593   0.53    40.98   32.5    6.60
47.58   2.00
        63.50   59.10   1.38    1.00    3.627   0.53    42.67   31.5    6.36
49.03   2.00
        64.50   61.70   1.38    1.00    3.661   0.52    44.34   30.5    6.12
50.46   2.00
        65.50   64.70   1.38    1.00    3.695   0.52    46.28   29.5    5.88
52.16   2.00
        66.50   68.10   1.38    1.00    3.728   0.52    48.49   28.5    5.64
54.13   2.00
        67.50   71.50   1.38    1.00    3.762   0.52    50.68   27.5    5.40
56.08   2.00
        68.50   74.90   1.38    1.00    3.796   0.51    52.86   26.5    5.16
58.02   2.00
        69.50   78.30   1.38    1.00    3.830   0.51    55.01   25.5    4.92
59.93   2.00
        70.50   80.00   1.38    1.00    3.864   0.51    55.96   25.0    4.80
60.76   2.00
        71.50   80.00   1.38    1.00    3.897   0.51    55.72   25.0    4.80
60.52   2.00
_______________________________________________________________________________________
_
        CRR is based on water table at 53.5 during In-Situ Testing

        Factor of Safety,  - Earthquake Magnitude= 7.8:
        Depth   sigC'   CRR7.5  Ksigma  CRRv    MSF     CRRm    CSRfs   F.S.
        ft      tsf     tsf                                     w/fs    CRRm/CSRfs
        ____________________________________________________________________________
        6.50    0.26    2.00    1.00    2.00    0.90    1.81    0.56    3.25
        7.50    0.30    2.00    1.00    2.00    0.90    1.81    0.59    3.07
        8.50    0.34    2.00    1.00    2.00    0.90    1.81    0.62    2.93
        9.50    0.38    0.37    1.00    0.37    0.90    2.00    0.64    5.00
        10.50   0.42    0.25    1.00    0.25    0.90    2.00    0.66    5.00
        11.50   0.46    0.18    1.00    0.18    0.90    2.00    0.68    5.00
        12.50   0.49    0.18    1.00    0.18    0.90    2.00    0.70    5.00
        13.50   0.53    0.18    1.00    0.18    0.90    2.00    0.71    5.00
        14.50   0.57    0.17    1.00    0.17    0.90    2.00    0.73    5.00
        15.50   0.60    0.18    1.00    0.18    0.90    2.00    0.74    5.00
        16.50   0.64    0.18    1.00    0.18    0.90    2.00    0.76    5.00
        17.50   0.67    0.18    1.00    0.18    0.90    2.00    0.77    5.00
        18.50   0.71    0.19    1.00    0.19    0.90    2.00    0.78    5.00
        19.50   0.74    0.19    1.00    0.19    0.90    2.00    0.79    5.00
        20.50   0.78    0.20    1.00    0.20    0.90    2.00    0.80    5.00
        21.50   0.81    0.20    1.00    0.20    0.90    2.00    0.80    5.00
        22.50   0.85    0.21    1.00    0.21    0.90    2.00    0.81    5.00
        23.50   0.89    0.21    1.00    0.21    0.90    2.00    0.82    5.00
        24.50   0.93    0.21    1.00    0.21    0.90    2.00    0.82    5.00
        25.50   0.97    0.21    1.00    0.21    0.90    2.00    0.82    5.00
        26.50   1.01    0.21    1.00    0.21    0.90    2.00    0.82    5.00
        27.50   1.05    0.21    1.00    0.21    0.90    2.00    0.82    5.00
        28.50   1.09    0.22    0.99    0.21    0.90    2.00    0.82    5.00
        29.50   1.13    0.21    0.99    0.21    0.90    2.00    0.83    5.00
        30.50   1.17    0.21    0.98    0.21    0.90    2.00    0.82    5.00
        31.50   1.21    0.21    0.97    0.20    0.90    2.00    0.82    5.00
        32.50   1.25    0.24    0.97    0.23    0.90    2.00    0.82    5.00
        33.50   1.29    0.28    0.96    0.27    0.90    2.00    0.81    5.00
        34.50   1.33    0.34    0.96    0.32    0.90    2.00    0.81    5.00
        35.50   1.38    0.35    0.95    0.33    0.90    2.00    0.80    5.00
        36.50   1.42    0.31    0.94    0.29    0.90    2.00    0.80    5.00
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37.50   1.46   0.28   0.94   0.27   0.90   2.00   0.79   5.00
38.50   1.50   0.26   0.93   0.24   0.90   2.00   0.78   5.00
39.50   1.55   0.24   0.93   0.22   0.90   2.00   0.78   5.00
40.50   1.59   0.24   0.92   0.22   0.90   2.00   0.77   5.00
41.50   1.63   0.25   0.92   0.23   0.90   2.00   0.76   5.00
42.50   1.67   0.26   0.91   0.24   0.90   2.00   0.76   5.00
43.50   1.71   0.27   0.91   0.25   0.90   2.00   0.75   5.00
44.50   1.76   0.28   0.90   0.26   0.90   2.00   0.74   5.00
45.50   1.80   0.29   0.89   0.26   0.90   2.00   0.74   5.00
46.50   1.84   0.28   0.89   0.25   0.90   2.00   0.73   5.00
47.50   1.88   0.28   0.88   0.24   0.90   2.00   0.72   5.00
48.50   1.93   0.27   0.88   0.24   0.90   2.00   0.72   5.00
49.50   1.97   0.27   0.88   0.23   0.90   2.00   0.71   5.00
50.50   2.01   0.26   0.87   0.23   0.90   2.00   0.70   5.00
51.50   2.05   0.26   0.87   0.22   0.90   2.00   0.70   5.00
52.50   2.09   0.25   0.86   0.22   0.90   2.00   0.69   5.00
53.50   2.14   0.25   0.86   0.21   0.90   2.00   0.68   5.00
54.50   2.16   0.24   0.85   0.21   0.90   2.00   0.68   5.00
55.50   2.18   0.27   0.85   0.23   0.90   2.00   0.67   5.00
56.50   2.20   0.37   0.85   0.31   0.90   2.00   0.66   5.00
57.50   2.23   2.00   0.85   1.70   0.90   2.00   0.65   5.00
58.50   2.25   2.00   0.85   1.69   0.90   2.00   0.65   5.00
59.50   2.27   2.00   0.84   1.69   0.90   2.00   0.64   5.00
60.50   2.29   2.00   0.84   1.68   0.90   1.52   0.63   2.40
61.50   2.31   2.00   0.84   1.68   0.90   1.52   0.63   2.43
62.50   2.34   2.00   0.84   1.67   0.90   1.51   0.62   2.45
63.50   2.36   2.00   0.83   1.67   0.90   1.51   0.61   2.47
64.50   2.38   2.00   0.83   1.67   0.90   1.51   0.60   2.49
65.50   2.40   2.00   0.83   1.66   0.90   1.50   0.60   2.52
66.50   2.42   2.00   0.83   1.66   0.90   1.50   0.59   2.54
67.50   2.45   2.00   0.83   1.65   0.90   1.49   0.58   2.57
68.50   2.47   2.00   0.82   1.65   0.90   1.49   0.57   2.60
69.50   2.49   2.00   0.82   1.64   0.90   1.49   0.57   2.62
70.50   2.51   2.00   0.82   1.64   0.90   1.48   0.56   2.65
71.50   2.53   2.00   0.82   1.64   0.90   1.48   0.55   2.68
_________________________________________________________________________
* F.S.<1: Liquefaction Potential Zone.  (If above water table: F.S.=5)
(F.S. is limited to 5,  CRR is limited to 2,    CSR is limited to 2)


CPT convert to SPT for Settlement Analysis:
Fines Correction for Settlement Analysis:
Depth   Ic      qc/N60  qc1     (N1)60  Fines   d(N1)60 (N1)60s
ft                      tsf             %
________________________________________________________________
6.50    -       -       -       40.78   60.2    4.41    45.19
7.50    -       -       -       32.50   68.4    4.79    37.29
8.50    -       -       -       28.80   76.5    5.11    33.90
9.50    -       -       -       21.75   NoLiq   0.00    21.75
10.50   -       -       -       15.45   NoLiq   0.00    15.45
11.50   -       -       -       9.76    NoLiq   0.00    9.76
12.50   -       -       -       9.38    NoLiq   0.00    9.38
13.50   -       -       -       9.04    NoLiq   0.00    9.04
14.50   -       -       -       8.75    NoLiq   0.00    8.75
15.50   -       -       -       9.49    NoLiq   0.00    9.49
16.50   -       -       -       9.22    NoLiq   0.00    9.22
17.50   -       -       -       9.76    NoLiq   0.00    9.76
18.50   -       -       -       10.27   NoLiq   0.00    10.27
19.50   -       -       -       10.75   NoLiq   0.00    10.75
20.50   -       -       -       11.22   NoLiq   0.00    11.22
21.50   -       -       -       11.67   NoLiq   0.00    11.67
22.50   -       -       -       11.87   NoLiq   0.00    11.87
23.50   -       -       -       12.06   NoLiq   0.00    12.06
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24.50   -     -     -     12.24   NoLiq   0.00    12.24
25.50   -     -     -     12.41   NoLiq   0.00    12.41
26.50   -     -     -     12.57   NoLiq   0.00    12.57
27.50   -     -     -     12.32   NoLiq   0.00    12.32
28.50   -     -     -     12.72   NoLiq   0.00    12.72
29.50   -     -     -     12.49   NoLiq   0.00    12.49
30.50   -     -     -     12.27   NoLiq   0.00    12.27
31.50   -     -     -     12.07   NoLiq   0.00    12.07
32.50   -     -     -     15.00   NoLiq   0.00    15.00
33.50   -     -     -     17.83   NoLiq   0.00    17.83
34.50   -     -     -     20.56   NoLiq   0.00    20.56
35.50   -     -     -     21.07   NoLiq   0.00    21.07
36.50   -     -     -     19.45   NoLiq   0.00    19.45
37.50   -     -     -     17.89   NoLiq   0.00    17.89
38.50   -     -     -     16.37   NoLiq   0.00    16.37
39.50   -     -     -     14.89   NoLiq   0.00    14.89
40.50   -     -     -     14.60   NoLiq   0.00    14.60
41.50   -     -     -     15.46   NoLiq   0.00    15.46
42.50   -     -     -     16.29   NoLiq   0.00    16.29
43.50   -     -     -     17.10   NoLiq   0.00    17.10
44.50   -     -     -     17.90   NoLiq   0.00    17.90
45.50   -     -     -     18.10   NoLiq   0.00    18.10
46.50   -     -     -     17.73   NoLiq   0.00    17.73
47.50   -     -     -     17.37   NoLiq   0.00    17.37
48.50   -     -     -     17.02   NoLiq   0.00    17.02
49.50   -     -     -     16.67   NoLiq   0.00    16.67
50.50   -     -     -     16.34   NoLiq   0.00    16.34
51.50   -     -     -     16.02   NoLiq   0.00    16.02
52.50   -     -     -     15.70   NoLiq   0.00    15.70
53.50   -     -     -     15.39   NoLiq   0.00    15.39
54.50   -     -     -     15.16   NoLiq   0.00    15.16
55.50   -     -     -     17.26   NoLiq   0.00    17.26
56.50   -     -     -     21.65   NoLiq   0.00    21.65
57.50   -     -     -     26.00   NoLiq   0.00    26.00
58.50   -     -     -     30.31   NoLiq   0.00    30.31
59.50   -     -     -     34.58   NoLiq   0.00    34.58
60.50   -     -     -     37.57   34.5    2.88    40.45
61.50   -     -     -     39.28   33.5    2.81    42.10
62.50   -     -     -     40.98   32.5    2.74    43.73
63.50   -     -     -     42.67   31.5    2.67    45.34
64.50   -     -     -     44.34   30.5    2.60    46.94
65.50   -     -     -     46.28   29.5    2.53    48.81
66.50   -     -     -     48.49   28.5    2.45    50.94
67.50   -     -     -     50.68   27.5    2.38    53.06
68.50   -     -     -     52.86   26.5    2.30    55.16
69.50   -     -     -     55.01   25.5    2.22    57.24
70.50   -     -     -     55.96   25.0    2.19    58.15
71.50   -     -     -     55.72   25.0    2.19    57.90
_______________________________________________________________

Settlement of Saturated Sands:
Settlement Analysis Method: Ishihara / Yoshimine*
Depth   CSRfs   F.S.    Fines   (N1)60s Dr      ec      dsz     dsv     S
ft      w/fs            %               %       %       in.     in.     in.

_______________________________________________________________________________
        71.45   0.55    2.68    25.0    57.92   100.00  0.000   0.000   0.000
0.000
        70.50   0.56    2.65    25.0    58.15   100.00  0.000   0.000   0.000
0.000
        69.50   0.57    2.62    25.5    57.24   100.00  0.000   0.000   0.000
0.000
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         68.50    0.57     2.60     26.5     55.16    100.00   0.000    0.000    0.000
0.000
         67.50    0.58     2.57     27.5     53.06    100.00   0.000    0.000    0.000
0.000
         66.50    0.59     2.54     28.5     50.94    100.00   0.000    0.000    0.000
0.000
         65.50    0.60     2.52     29.5     48.81    100.00   0.000    0.000    0.000
0.000
         64.50    0.60     2.49     30.5     46.94    100.00   0.000    0.000    0.000
0.000
         63.50    0.61     2.47     31.5     45.34    100.00   0.000    0.000    0.000
0.000
         62.50    0.62     2.45     32.5     43.73    100.00   0.000    0.000    0.000
0.000
         61.50    0.63     2.43     33.5     42.10    100.00   0.000    0.000    0.000
0.000
         60.50    0.63     2.40     34.5     40.45    100.00   0.000    0.000    0.000
0.000
         59.50    0.64     5.00     NoLiq    34.58    100.00   0.000    0.000    0.000
0.000
         58.50    0.65     5.00     NoLiq    30.31    90.77    0.000    0.000    0.000
0.000
         57.50    0.65     5.00     NoLiq    26.00    81.66    0.000    0.000    0.000
0.000
         56.50    0.66     5.00     NoLiq    21.65    73.52    0.000    0.000    0.000
0.000
         55.50    0.67     5.00     NoLiq    17.26    65.56    0.000    0.000    0.000
0.000
         54.50    0.68     5.00     NoLiq    15.16    61.59    0.000    0.000    0.000
0.000
         53.50    0.68     5.00     NoLiq    15.39    62.04    0.000    0.000    0.000
0.000
         52.50    0.69     5.00     NoLiq    15.70    62.63    0.000    0.000    0.000
0.000
         51.50    0.70     5.00     NoLiq    16.02    63.23    0.000    0.000    0.000
0.000
         50.50    0.70     5.00     NoLiq    16.34    63.85    0.000    0.000    0.000
0.000
         49.50    0.71     5.00     NoLiq    16.67    64.47    0.000    0.000    0.000
0.000
         48.50    0.72     5.00     NoLiq    17.02    65.11    0.000    0.000    0.000
0.000
         47.50    0.72     5.00     NoLiq    17.37    65.76    0.000    0.000    0.000
0.000
         46.50    0.73     5.00     NoLiq    17.73    66.42    0.000    0.000    0.000
0.000
         45.50    0.74     5.00     NoLiq    18.10    67.10    0.000    0.000    0.000
0.000
         44.50    0.74     5.00     NoLiq    17.90    66.73    0.000    0.000    0.000
0.000
         43.50    0.75     5.00     NoLiq    17.10    65.27    0.000    0.000    0.000
0.000
         42.50    0.76     5.00     NoLiq    16.29    63.75    0.000    0.000    0.000
0.000
         41.50    0.76     5.00     NoLiq    15.46    62.16    0.000    0.000    0.000
0.000
         40.50    0.77     5.00     NoLiq    14.60    60.50    0.000    0.000    0.000
0.000
         39.50    0.78     5.00     NoLiq    14.89    61.07    0.000    0.000    0.000
0.000
         38.50    0.78     5.00     NoLiq    16.37    63.89    0.000    0.000    0.000
0.000
         37.50    0.79     5.00     NoLiq    17.89    66.71    0.000    0.000    0.000
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0.000
        36.50   0.80    5.00    NoLiq   19.45   69.55   0.000   0.000   0.000
0.000
        35.50   0.80    5.00    NoLiq   21.07   72.47   0.000   0.000   0.000
0.000
        34.50   0.81    5.00    NoLiq   20.56   71.55   0.000   0.000   0.000
0.000
        33.50   0.81    5.00    NoLiq   17.83   66.60   0.000   0.000   0.000
0.000
        32.50   0.82    5.00    NoLiq   15.00   61.27   0.000   0.000   0.000
0.000
        31.50   0.82    5.00    NoLiq   12.07   55.27   0.000   0.000   0.000
0.000
        30.50   0.82    5.00    NoLiq   12.27   55.70   0.000   0.000   0.000
0.000
        29.50   0.83    5.00    NoLiq   12.49   56.16   0.000   0.000   0.000
0.000
        28.50   0.82    5.00    NoLiq   12.72   56.65   0.000   0.000   0.000
0.000
        27.50   0.82    5.00    NoLiq   12.32   55.79   0.000   0.000   0.000
0.000
        26.50   0.82    5.00    NoLiq   12.57   56.34   0.000   0.000   0.000
0.000
        25.50   0.82    5.00    NoLiq   12.41   56.00   0.000   0.000   0.000
0.000
        24.50   0.82    5.00    NoLiq   12.24   55.64   0.000   0.000   0.000
0.000
        23.50   0.82    5.00    NoLiq   12.06   55.25   0.000   0.000   0.000
0.000
        22.50   0.81    5.00    NoLiq   11.87   54.83   0.000   0.000   0.000
0.000
        21.50   0.80    5.00    NoLiq   11.67   54.39   0.000   0.000   0.000
0.000
        20.50   0.80    5.00    NoLiq   11.22   53.38   0.000   0.000   0.000
0.000
        19.50   0.79    5.00    NoLiq   10.75   52.31   0.000   0.000   0.000
0.000
        18.50   0.78    5.00    NoLiq   10.27   51.17   0.000   0.000   0.000
0.000
        17.50   0.77    5.00    NoLiq   9.76    49.95   0.000   0.000   0.000
0.000
        16.50   0.76    5.00    NoLiq   9.22    48.64   0.000   0.000   0.000
0.000
        15.50   0.74    5.00    NoLiq   9.49    49.29   0.000   0.000   0.000
0.000
        14.50   0.73    5.00    NoLiq   8.75    47.44   0.000   0.000   0.000
0.000
        13.50   0.71    5.00    NoLiq   9.04    48.19   0.000   0.000   0.000
0.000
        12.50   0.70    5.00    NoLiq   9.38    49.02   0.000   0.000   0.000
0.000
        11.50   0.68    5.00    NoLiq   9.76    49.96   0.000   0.000   0.000
0.000
        10.50   0.66    5.00    NoLiq   15.45   62.16   0.000   0.000   0.000
0.000
        9.50    0.64    5.00    NoLiq   21.75   73.69   0.000   0.000   0.000
0.000
        8.50    0.62    2.93    76.5    33.90   99.63   0.000   0.000   0.000
0.000
        7.50    0.59    3.07    68.4    37.29   100.00  0.000   0.000   0.000
0.000
        6.50    0.56    3.25    60.2    45.19   100.00  0.000   0.000   0.000
0.000
```

```
_______________________________________________________________________________
        Settlement of Saturated Sands=0.000 in.
        dsz is per each segment: dz=0.05 ft
        dsv is per each print interval: dv=1 ft
        S is cumulated settlement at this depth

        Settlement of Dry Sands:
        Depth   sigma'  sigC'   (N1)60s CSRfs   Gmax    g*Ge/Gm  g_eff   ec7.5   Cec
ec      dsz     dsv     S
        ft      tsf     tsf             w/fs    tsf                      %
%       in.     in.     in.

___________________________________________________________________________________
____________________________

___________________________________________________________________________________
____________________________
        Settlement of Dry Sands=0.000 in.
        dsz is per each segment: dz=0.05 ft
        dsv is per each print interval: dv=1 ft
        S is cumulated settlement at this depth

        Total Settlement of Saturated and Dry Sands=0.000 in.
        Differential Settlement=0.000 to 0.000 in.

        Units           Depth = ft, Stress or Pressure = tsf (atm), Unit Weight =
pcf, Settlement = in.

___________________________________________________________________________________
_____________
        SPT             Field data from Standard Penetration Test (SPT)
        BPT             Field data from Becker Penetration Test (BPT)
        qc              Field data from Cone Penetration Test (CPT)
        fc              Friction from CPT testing
        Gamma           Total unit weight of soil
        Gamma'          Effective unit weight of soil
        Fines           Fines content [%]
        D50             Mean grain size
        Dr              Relative Density
        sigma           Total vertical stress [tsf]
        sigma'          Effective vertical stress [tsf]
        sigC'           Effective confining pressure [tsf]
        rd              Stress reduction coefficient
        CSR             Cyclic stress ratio induced by earthquake
        fs              User request factor of safety, apply to CSR
        w/fs            With user request factor of safety inside
        CSRfs           CSR with User request factor of safety
        CRR7.5          Cyclic resistance ratio (M=7.5)
        Ksigma          Overburden stress correction factor for CRR7.5
        CRRv            CRR after overburden stress correction, CRRv=CRR7.5 * Ksigma
        MSF             Magnitude scaling factor for CRR (M=7.5)
        CRRm            After magnitude scaling correction CRRm=CRRv * MSF
        F.S.            Factor of Safety against liquefaction F.S.=CRRm/CSRfs
        Cebs            Energy Ratio, Borehole Dia., and Sample Method Corrections
        Cr              Rod Length Corrections
        Cn              Overburden Pressure Correction
        (N1)60          SPT after corrections, (N1)60=SPT * Cr * Cn * Cebs
        d(N1)60         Fines correction of SPT
        (N1)60f         (N1)60 after fines corrections, (N1)60f=(N1)60 + d(N1)60
        Cq              Overburden stress correction factor
        qc1             CPT after Overburden stress correction
        dqc1            Fines correction of CPT
```

```
qc1f          CPT after Fines and Overburden correction, qc1f=qc1 + dqc1
qc1n          CPT after normalization in Robertson's method
Kc            Fine correction factor in Robertson's Method
qc1f          CPT after Fines correction in Robertson's Method
Ic            Soil type index in Suzuki's and Robertson's Methods
(N1)60s       (N1)60 after seattlement fines corrections
ec            Volumetric strain for saturated sands
ds            Settlement in each Segment dz
dz            Segment for calculation, dz=0.050 ft
Gmax          Shear Modulus at low strain
g_eff         gamma_eff, Effective shear Strain
g*Ge/Gm       gamma_eff * G_eff/G_max,        Strain-modulus ratio
ec7.5         Volumetric Strain for magnitude=7.5
Cec           Magnitude correction factor for any magnitude
ec            Volumetric strain for dry sands, ec=Cec * ec7.5
NoLiq         No-Liquefy Soils
```

References:

NCEER Workshop on Evaluation of Liquefaction Resistance of Soils. Youd, T.L., and Idriss, I.M., eds., Technical Report NCEER 97-0022.

SP117. Southern California Earthquake Center. Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California. University of Southern California. March 1999.

TERRA
GEOSCIENCES

GEOLOGIC HAZARDS REPORT

PRESERVE II K8 SCHOOL CAMPUS

MARKET STREET AND EAST PRESERVE LOOP

CITY OF CHINO, CALIFORNIA

Project No. 193319-1

November 25, 2019

Prepared for:

John R. Byerly, Inc.
2257 South Lilac Avenue
Bloomington, CA 92316

John R. Byerly, Inc.
2257 South Lilac Avenue
Bloomington, CA 92316

Attention: Mr. John R. Byerly

Regarding: Geologic Hazards Report
Preserve II K8 School Campus
Market Street and East Preserve Loop
City of Chino, California
JRB File No. S-14223

INTRODUCTION

At your request, this firm has prepared a Geologic Hazards Report for the proposed Preserve II K8 School Campus, as referenced above. The purpose for this study was to evaluate the local geologic conditions and seismic hazards, and to develop generalized conclusions and recommendations, if warranted, with respect to the proposed development.

This geologic hazards report has been prepared utilizing the suggested "Checklist for the Review of Engineering Geology and Seismology Reports for California Public Schools, Hospitals, and Essential Services Buildings" (CGS Note 48, 2013), along with the Geologic portion of the "*Factors to Be Included in the Geological and Environmental Hazards Report*," which is included as Appendix H of the "School Site Selection and Approval Guide," prepared by the School Facility Planning Division, California Department of Education, and the Geohazard Reports requirements outlined by the DSA (2016). The scope of services provided for this evaluation included the following:

- **Review of available published and unpublished geologic/seismic data in our files pertinent to the site, including the provided boring logs.**
- **Field geologic reconnaissance and a review of stereoscopic aerial photographs.**
- **Evaluation of the local and regional tectonic setting and historical seismic activity, including a CBC ground motion summary.**
- **Preparation of this report presenting our findings, conclusions, and recommendations from a geologic standpoint.**

Accompanying Map and Appendices

Plate 1 - Regional Geologic Map
Appendix A - Ground Motion Analysis
Appendix B - References

PROJECT SUMMARY

We understand that a geologic hazards report has been requested to be performed for the proposed new Preserve II K8 School Campus. No grading plans were available for this evaluation, and no field or subsurface exploration was performed by this firm. Only a review of available geologic and geotechnical data in our files was undertake, along with a field reconnaissance, observation of exploratory borings preformed by your firm, and a review of stereoscopic pairs of aerial photographs.

GEOLOGIC SETTING

The proposed school site is situated within a natural geomorphic province in southwestern California known as the Peninsular Ranges, which is characterized by steep, elongated ranges and valleys that trend northwesterly. This province is believed to have begun as a thick accumulation of predominantly marine sedimentary and volcanic rocks during the late Paleozoic and early Mesozoic (pre-batholithic rocks). Following this accumulation, in mid-Cretaceous time, the province underwent a pronounced episode of mountain building. These rocks were then complexly metamorphosed and intruded by igneous rocks, known as the Southern California Batholith.

Regionally, the site is situated within a sub-structural block of the Peninsular Ranges, locally referred to as the Perris Block, which is an eroded mass of Cretaceous and older crystalline rock. The Perris Block, approximately 20 miles by 50 miles in extent, is generally bounded by the San Jacinto Fault Zone to the northeast, the Elsinore Fault Zone to the southwest, the Cucamonga Fault Zone to the northwest, and to the southeast by the fringes of the Temecula basin, where the boundary is ill-defined. Thin sedimentary and volcanic units mantle the bedrock in a few places, with alluvial deposits filling in the lower valley areas of which the site is included.

More specifically, the site lies upon the southern portion of the Chino Basin, which is a broad smooth alluvial plain, that slopes southerly from the San Gabriel Mountains on the north to the Sana Ana River on the south. This basin is bounded to the east by low-lying hills and along the west by the Puente Hills. Locally, the subject site is estimated to be covered by up to 700± feet of alluvium and sedimentary rocks (Fife and Morton, 1976), which in turn are underlain by pre-tertiary basement rocks comprised of granodiorite and plutonic rocks of the Southern California Batholith. These sediments have been deposited as alluvial outwash predominantly from the San Gabriel Mountains to the north and from the Santa Ana River to the east.

Locally, geologic mapping by Morton and Gray (2002) indicates the site to be underlain by early Pleistocene age older alluvial fan deposits (see Plate 1, map symbol Qvof). These deposits are generally described as being comprised of mostly well-dissected, well-indurated, reddish-brown sand deposits, and commonly contains duripans and locally silcretes.

EARTH MATERIALS

Although no subsurface exploration was performed by this firm for this investigation, we have reviewed the Exploratory Boring Logs prepared by John R. Byerly, Inc., (JRB), dated November 6 and 7, 2019, performed within the proposed development area. These boring logs indicate the site to be predominantly underlain by a wide range and thicknesses of interbedded silty fine- to medium-grained sand, clayey fine- to medium-grained sand, silty fine sand, clayey silt, sandy silt with clay, sandy silt with clay, and fine- to medium-grained sand, to a depth of at least 71½ feet. These deposits were noted to be have a wide range of consistency, generally from a loose/soft to dense/stiff condition.

GROUNDWATER

The site is located within the Chino Basin, which is a subunit of the greater Upper Santa Ana Valley Groundwater Basin in southern California. This basin is recharged predominantly by infiltration of surface runoff from the surrounding highlands and by deep penetration of rain on the valley floor and locally flows towards the south. Based on groundwater data obtained from the United States Geological Survey (2019b), the nearest measured well is located approximately 0.5 miles to the east (Site Code 339534N1176112W001). The groundwater levels in this well were measured to range from 35 to 41 feet in depth (below ground surface) between the years 2011 and 2019. In addition, groundwater contours prepared by Carson and Matti (1985) show the water level to be approximately 60± feet below the subject site in the general vicinity. Based on the exploratory borings performed by JRB (2019), groundwater was encountered locally as shallow as 54± feet. No shallow or surface indications of groundwater was locally observed within the aerial photographs reviewed (see Appendix B).

According to mapping by Fife and Morton (1976), the subject site is shown to be historically located within an area of “Artesian area or rising water”. They indicate that these high-water levels conditions will not return as long as the region remains populous, but there could be short periods of time when this area will be subjected to shallow-water tables. Therefore, historic groundwater levels should be considered to be at a depth of at least 5± feet below the original ground surface.

FLOODING

According to the Federal Emergency Management Agency (FEMA, 2015), the site is not shown to be located within the boundaries of a 100-year flood zone (Community Panel No. 06071C9375H, August 28, 2008). The proposed school campus is shown to be located within "Zone X" which is defined as “Areas of Minimal Flood Hazard.” In addition, according to the City of Chino (2010) Safety Element (FEMA Floodplains Map, Figure SAF-2), the site is shown to be located outside of the 500-year flood zone.

FAULTING

There are at least forty-three major late Quaternary active/potentially active faults that are located within a 100-kilometer (62-mile) radius of the site (Blake, 1989-2000a) as generally shown in Figure 1 below (C.G.S. 2002 Fault Model). Of these, there are no known active faults that traverse the site based on available published literature or was observed during our photogeologic analysis (see Appendix B for a listing of aerial photographs).

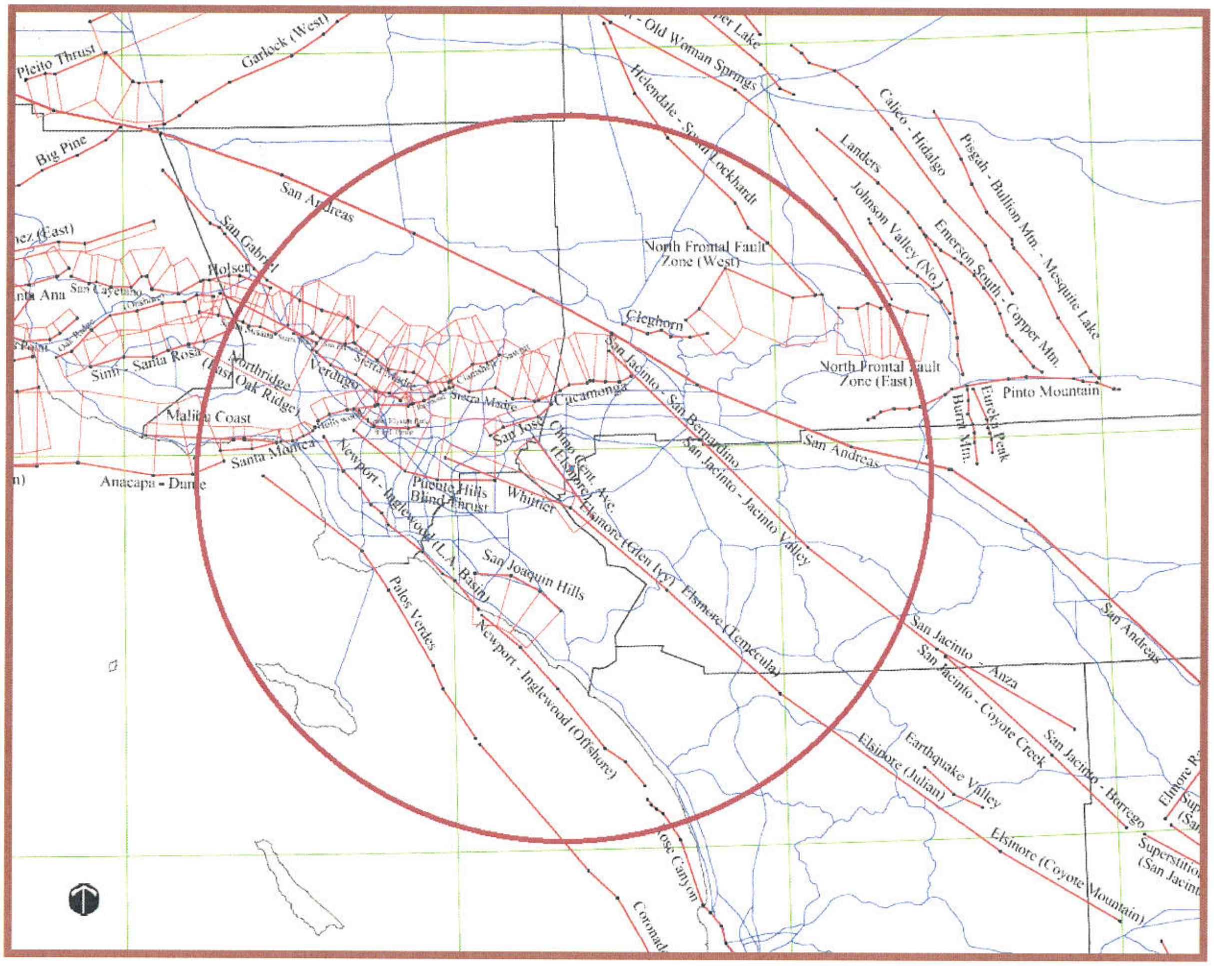


FIGURE 1- Fault Map; Faults shown within a 100-km radius (circle); Site in center (blue square).

Additionally, the subject site is not located within a State of California "Alquist-Priolo Earthquake Fault Zone" for fault rupture hazard (CGS, 2018). The nearest mapped "active" fault zoned by the State of California is for the Chino Fault, which is located approximately 3¼± miles to the southwest (C.G.S., 2003b). In addition, according to the Chino General Plan (City of Chino, 2010), the site is not shown to be traversed by faulting as indicated on Figure SAF-1 ("Active Faults") of their General Plan (see Figure 2 below).

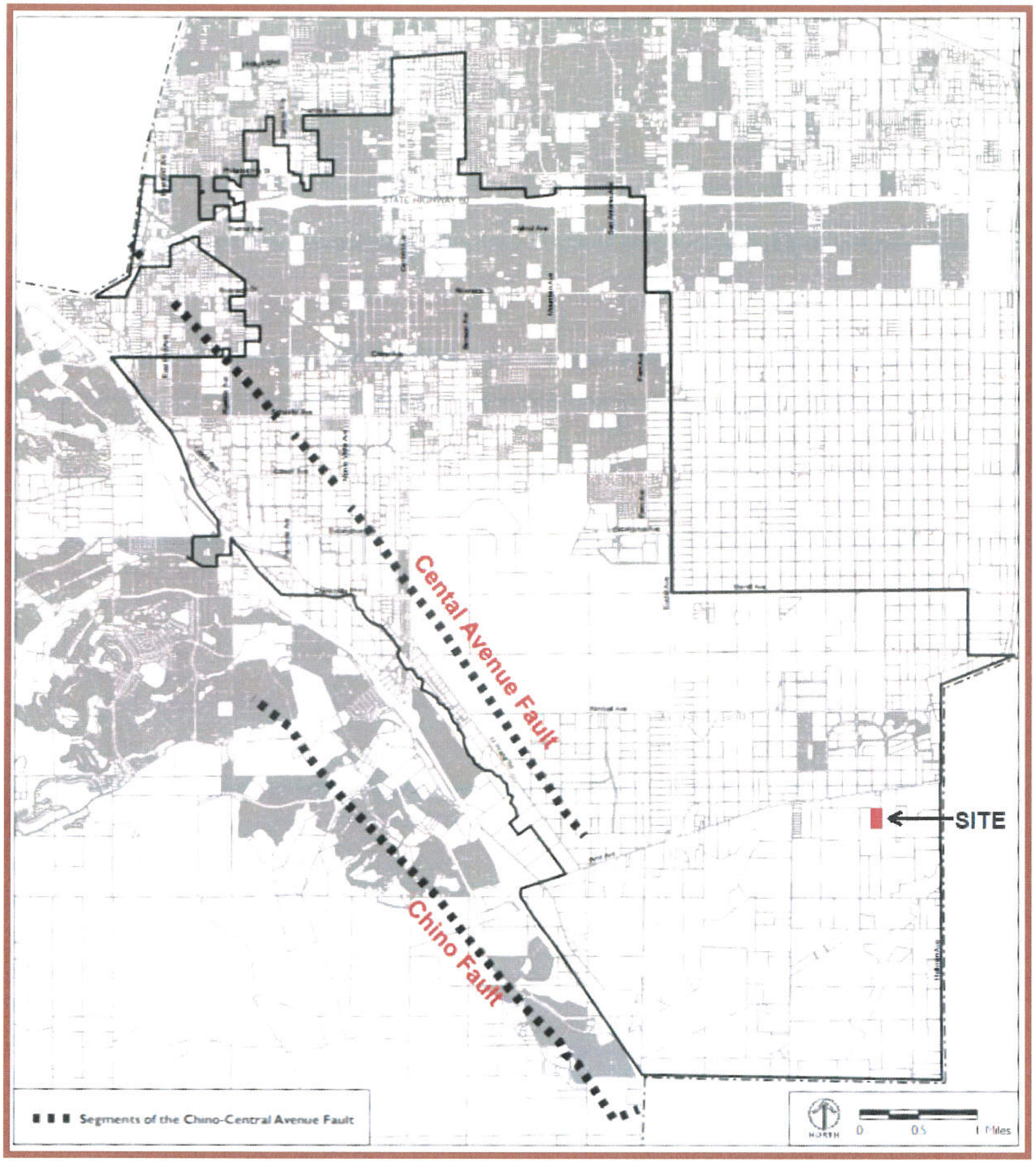


FIGURE 2- Active Fault Map (City of Chino, 2010, Figure SAF-1).

The Chino Fault has a dominant right-lateral sense of displacement, associated with some reverse-oblique motion based on precious studies as discussed by Treiman (2002). This fault locally is 28±-kilometers in length, with a dip of 50 to 67° to the west, having a maximum moment magnitude of M_w6.7 (Cao et.al., 2003). The associated slip-rate has been estimated between 1.0 to 5.0 mm/yr.

The nearest mapped fault not zoned as active, but is zoned as a fault study zone by the City of Chino (2010), is for an unnamed fault that lies approximates 1½ miles to the southwest. This fault is shown as the queried red-dashed line encompassed by red-hachures that denote the zone boundaries, as depicted on Figure 3 below (Exhibit 5.5-2, Geologic Hazards, Chino Subarea 2). This fault parallels the Central Avenue and Chino Faults and is reported to offset late Pleistocene age alluvium. This fault is not known to be active at this time and is not included within an Alquist-Priolo Earthquake Fault Zone.

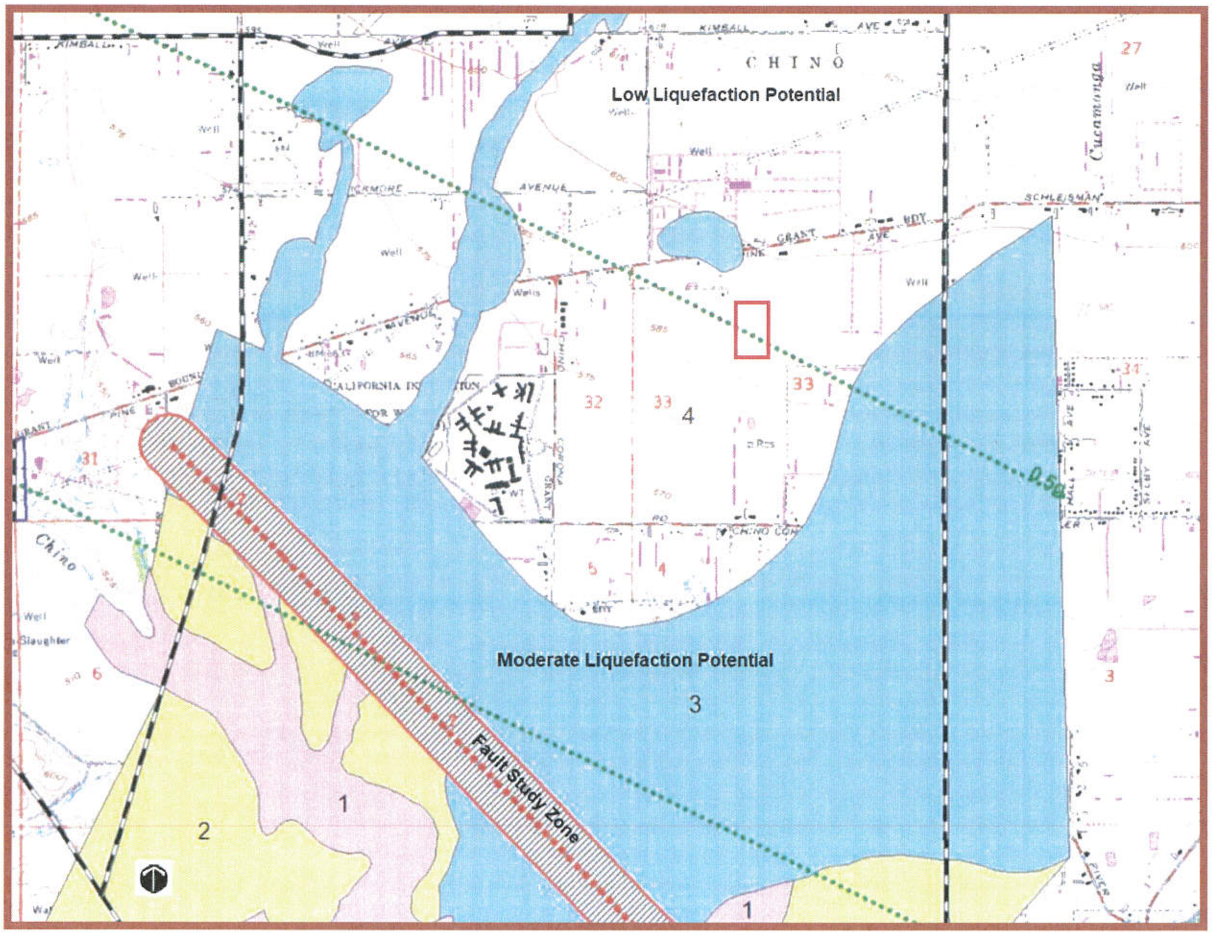


FIGURE 3- Geologic Hazards Map (City of Chino, 2010, Exhibit 5.5-2); Site outlined in red.

Another nearby fault that is mapped by the City of Chino (2010) is associated with the Central Avenue Fault, where a segment traverses approximately 2½ miles west of the site, as shown on Figure 2 above. This fault is considered to be associated with the northern Elsinore Fault Zone, which generally forms the barrier between the Puente Hills to the west and the Chino basin to the east. There is no evidence in available literature that this fault is currently active and has been based on inference from groundwater and as also suggested by several linear tonal and vegetational features (Treiman, 2002).

Although farther in distance, the Elsinore Fault Zone is located approximately 6± miles to the southwest and is capable of generating much larger seismogenic events in the region. The Elsinore Fault Zone generally includes five segments, which are the Whittier, Glen Ivy, Temecula, Julian, and Coyote Mountain Faults. When considering that a cascading effect of rupture could occur along the entire length of the Elsinore Fault Zone involving all five segments, the total rupture area of these combined faults is 3,841.7 square kilometers and has an associated Maximum Moment Magnitude (M_W) of 7.8 (Petersen et al., 2008).

HISTORIC SEISMICITY

A computerized search, based on Southern California historical earthquake catalogs, has been performed using the programs EQSEARCH (Blake, 1989-2018) and the ANSS Comprehensive Earthquake Catalog (U.S.G.S., 2019). The following table and discussion summarizes the historic seismic events (greater than or equal to M4.0) that have been estimated and/or recorded during this time period of 1800 to November 2019, within a 100-kilometer radius of the site. It should be noted that pre-instrumental seismic events (generally before 1932) have been estimated from isoseismal maps (Toppozada, et al., 1981 and 1982).

TABLE 1 - HISTORIC SEISMIC EVENTS; 1800-2019 (100-kilometer radius)

4.0 - 4.9	523
5.0 - 5.9	62
6.0 - 6.9	16
7.0 - 7.9	0
8.0+	0

These data have been compiled generally based on the reported intensities throughout the region, thus focusing in on the most likely epicentral location. Seismic instrumentation beyond 1932 has greatly increased the accuracy of locating earthquake epicenters. A summary of the historic earthquake data is as follows:

- The closest recorded historic earthquake epicenter (>M4.0) was approximately five miles west of the site (January 5, 1998, M4.3).
- The nearest estimated significant historic earthquake epicenter (pre-1932) was approximately eight miles northeast of the site (December 16, 1858, M6.5).
- The nearest recorded significant historic earthquake epicenter was the M5.4 Chino Hills event of July 29, 2008, located approximately eight miles west of the site.
- The largest estimated historical earthquake epicenter (pre-1932) within a 62-mile radius of the site is the M6.9 event of December 8, 1812 (29± miles northwest).

- The largest recorded historical earthquake was the M6.7 Big Bear event, located approximately 49 miles to the northeast (January 17, 1994).
- The largest estimated ground acceleration estimated to have been experienced at the site was 0.324g which resulted from the M6.5 earthquake of December 16, 1858, which was approximately eight miles northeast of the site (Blake, 1989-2000b), based on the attenuation relationship of Boore et al. (1997).

An Earthquake Epicenter Map which includes magnitudes 4.0 and greater for a 100-kilometer (62-mile) radius has been included below as Figure 4, for reference. This map was prepared using the ANSS Comprehensive Earthquake Catalog (U.S.G.S., 2019a) of instrumentally recorded events from the period of 1932 to November 2019, superimposed on a captured Google™ Earth image (Google™ Earth, 2019).

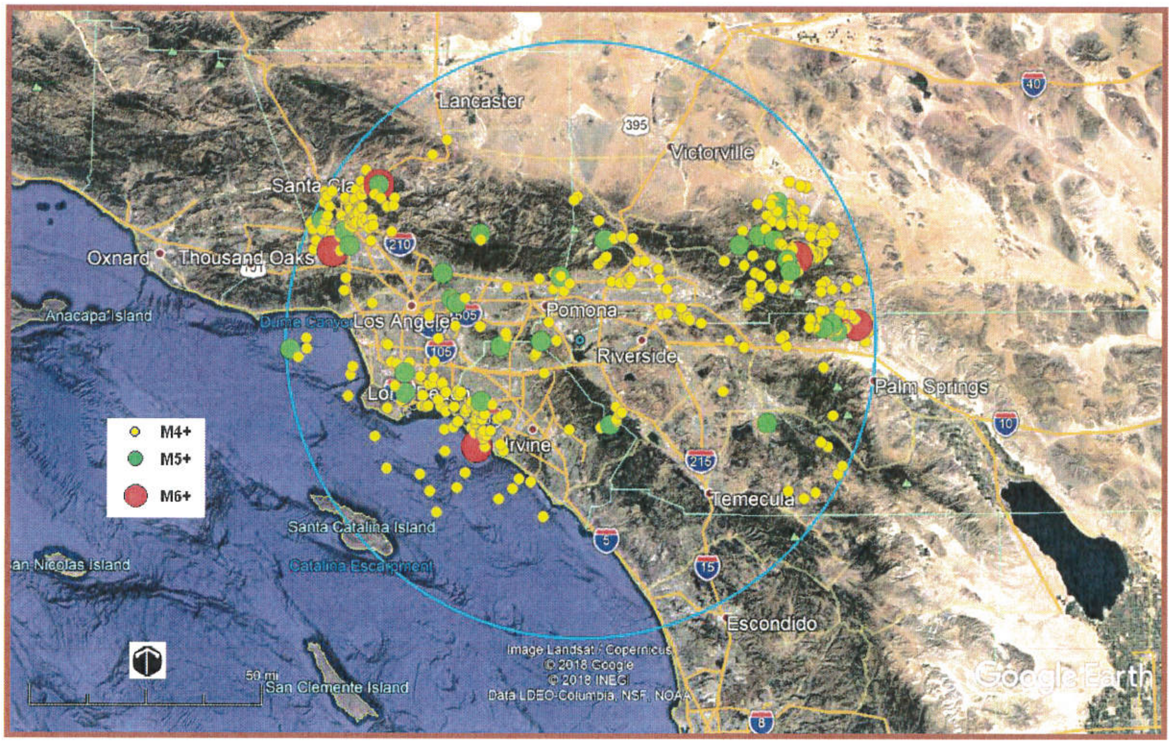


FIGURE 4- Earthquake Epicenter Map showing events of M4.0+ within a 100-kilometer radius.

CBC GROUND MOTION ANALYSIS

Included for this study was an assessment of the seismic ground motion parameters of the subject site with respect to the most recently adopted 2016 California Building Code (CBC) and ASCE Standard 7-10 (ASCE, 2010) as partially summarized and tabulated below, with the calculation data (OSHPD, 2019) presented within Appendix A, for reference. Geographically, the proposed construction area is located at Latitude 33.955 and Longitude -117.6202 (WGS 1984 coordinates).

- **Mapped Spectral Acceleration Parameters (CBC 1613A.3.1)**- Based on maps prepared by the U.S.G.S. (Risk-Adjusted Maximum Considered Earthquake (MCE_R) Ground Motion Parameter for the Conterminous United States for the 0.2 and 1-second Spectral Response Acceleration (5% of Critical Damping; Site Class B), a value of 1.552g for the 0.2 second period (S_s) and 0.600g for the 1.0 second period (S_1) was calculated (ASCE 7 Figures 22-1, 22-2, and CBC 1613A.3.1).

- **Site Classification (CBC 1613A.3.2)**- Based on the presence of mapped Quaternary age alluvial deposits underlying the site and exploratory boring test data provided by JRB (2019), the design Site Class would be "**D**." This Class is defined as having the upper 100 feet (30 meters) of the subsurface being underlain by stiff soil with average shear-wave velocities of 180 to 360 meters/second and standard penetration blow counts ranging from 15 to 50.

- **Seismic Design Category (CBC 1616A.3.5)**- Based on the proposed school site facilities (Risk Category III; CBC Table 1604A.5) and using the OSHPD Seismic Design Maps Tool web application (OSHPD, 2019), the mapped spectral response acceleration parameter at the one-second period (S_1=0.600g), was found to be less than 0.75g which classifies the site to be in Seismic Design Category "**D**."

TABLE 2 – SUMMARY OF SEISMIC DESIGN PARAMETERS

Factor or Coefficient	Value
S_S	1.552g
S_1	0.600g
F_a	1.000
F_v	1.500
S_{DS}	1.035g
S_{D1}	0.600g
S_{MS}	1.552g
S_{M1}	0.900g
T_L	8 Seconds
PGA_M	0.588
Site Class	D
Seismic Design Category	D

SECONDARY SEISMIC HAZARDS

Secondary permanent or transient seismic hazards generally associated with severe ground shaking during an earthquake are ground rupture, liquefaction, seiches or tsunamis, ground lurching/lateral spreading, flooding (water storage facility failure), landsliding, rockfalls, and seismically-induced settlement. These hazards are discussed below.

Ground Rupture:

Ground rupture is generally considered most likely to occur along pre-existing faults. Since there are no faults that are known to traverse the site, the potential for ground rupture is considered to be very low to nil.

Seiches/Tsunamis:

Based on the far distance of large open-bodies of water and the elevation of the site with respect to sea level, the possibility of seiches/tsunamis is considered nil. Additionally, mapping by the California Geological Survey (2014) does not indicate the site to be located within a tsunami inundation zone.

Ground Lurching/Lateral Spreading:

Ground lurching is the horizontal movement of soil, sediments, or fill located on relatively steep embankments or scarps as a result of seismic activity, forming irregular ground surface cracks. The potential for lateral spreading or lurching is highest in areas underlain by soft, saturated materials, especially where bordered by steep banks or adjacent hard ground. Due to the relatively flat-lying nature of the site and distance from embankments, the potential for ground lurching and/or lateral spreading is considered to be nil.

Liquefaction:

In general, liquefaction is a phenomenon that occurs where there is a loss of strength or stiffness in the soils that can result in the settlement of buildings, ground failures, or other related hazards. The main factors contributing to this phenomenon are: 1) cohesionless, granular soils having relatively low densities (usually of Holocene age); 2) shallow groundwater (generally less than 50 feet); and 3) moderate-high seismic ground shaking. The City of Chino General Plan (2010) indicates the site to be located within a zone of low liquefaction potential (no shading) as depicted on the Geologic Hazards Map, as presented on Figure 3. However, since the groundwater levels have been historically near the surface and the subsurface soils are predominantly unconsolidated and fine-grained, there may be a potential for liquefaction to occur.

Rockfalls:

Since no large rock outcrops are present at or adjacent to the site, the possibility of rockfalls during seismic shaking is nil.

Flooding (Water Storage Facility Failure):

According to the City of Chino (2010), the subject school site is not shown to be located within the boundaries of dam inundation in the event of catastrophic failure of any dams, nor are there any other water storage facilities that would inundate the site in case of failure. According to the City of Chino (2010) the nearest water-storage facility is the Prado Dam, located 4½± miles to the south-southwest. The "566 Foot Prado Dam Inundation Area Map" as prepared by the City of Chino (Figure SAF-3) indicates the site to be located outside of this zone, as shown on Figure 5 below.

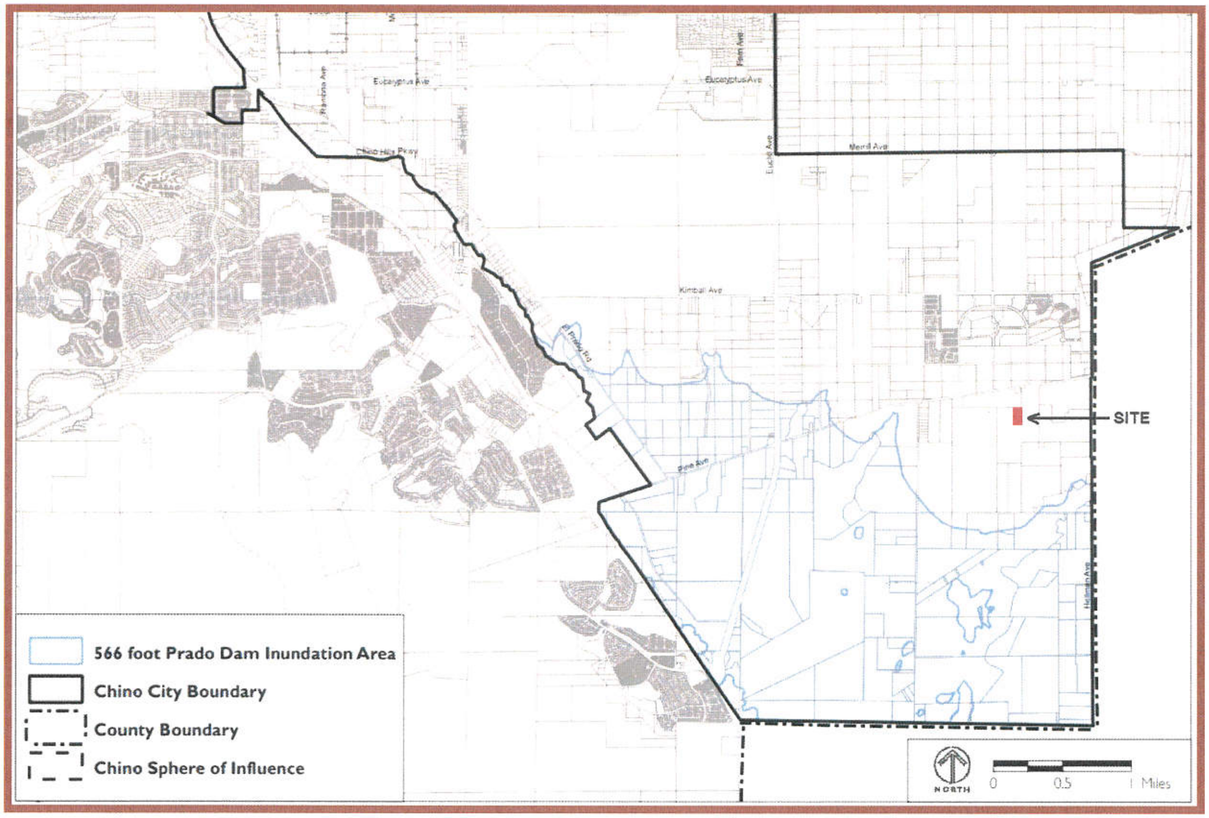


FIGURE 5- Prado Dam Inundation Area Map (City of Chino, 2010; Figure SAF-3).

Landsliding:

Due to the low-lying relief of the site and adjacent areas, landsliding due to seismic shaking is considered nil.

Seismically-Induced Settlement:

Seismically-induced settlement generally occurs within areas of loose, granular soils during periods of strong ground motion. Since the site is underlain by a wide range and thicknesses of interbedded fine- to medium-grained sediments, and were noted to have a variable range of consistency, generally from a loose/soft to dense/stiff condition, the potential for seismic settlement should be considered a possibility.

OTHER GEOLOGIC HAZARDS

There are other potential geologic hazards not necessarily associated with seismic activity that occur statewide. These hazards include; natural hazardous materials (such as methane gas, hydrogen-sulfide gas, and tar seeps); Radon-222 gas; naturally occurring asbestos; volcanic hazards; and regional subsidence. Of these hazards, there are none that appear to impact the site.

CONCLUSIONS AND RECOMMENDATIONS

General:

Based on our review of available pertinent published and unpublished geologic/seismic literature (including our previous report prepared for the site), construction of the proposed school campus appears to be feasible from a geologic standpoint, providing our recommendations are considered during planning and construction.

Conclusions:

1. Based on available published geologic data, the subject development area is underlain by early Pleistocene age older alluvial fan deposits, generally described as being comprised of mostly well-dissected, well-indurated, reddish-brown sand deposits, and commonly contains duripans and locally silcretes. Locally, subsurface exploration performed at the site encountered a wide range and thicknesses of interbedded silty fine- to medium-grained sand, clayey fine- to medium-grained sand, silty fine sand, clayey silt, sandy silt with clay, sandy silt with clay, and fine- to medium-grained sand, to a depth of at least 71½ feet. These deposits were noted to be have a variable range of consistency, generally from a loose/soft to dense/stiff condition.

2. Groundwater was encountered locally as shallow as 54± feet within the exploratory borings drilled at the site. The subject site has been shown to be historically located within an area of "Artesian area or rising water". Other groundwater sources indicate that groundwater to range from 35 to 60± feet in depth. No shallow or surface indications of groundwater was locally observed within the aerial photographs reviewed during this study. Due to past regional artesian conditions, historic groundwater levels should be considered to be at a depth of at least 5± feet below the original ground surface. No shallow groundwater conditions are anticipated to be encountered during construction.

3. There are no active faults that are known to traverse the site based on published literature. In addition, the subject school site is not located within a designated Alquist-Priolo Earthquake Fault Zone that would indicate a potential for surface-fault rupture hazards. The nearest mapped "active" fault zoned by the State of

California is for the Chino Fault, which is located approximately 3¼± miles to the southwest along with an estimated maximum moment magnitude of M_W 6.7. Other faults in the nearby area include the Central Avenue Fault, which is located approximately 2½± miles to the west and an unnamed fault located approximately 1½± miles to the southwest, neither of which are zoned as active at this time.

Possessing a larger seismogenic capability than all of these faults is the active Elsinore Fault Zone, located approximately 6±-miles to the southwest. The Elsinore Fault Zone generally includes five individual fault segments, which are the Whittier, Glen Ivy, Temecula, Julian, and Coyote Mountain Faults. When considering a combined cascading seismic rupture event, the associated Maximum Moment Magnitude (M_W) is considered to be 7.8

4. The primary geologic hazard that exists at the site is that of ground shaking. Moderate to severe ground shaking could be anticipated during the life of the proposed buildings. Ground shaking from earthquakes accounts for nearly all earthquake losses.

5. Other than the potential for liquefaction and seismically-induced settlement, there do not appear to be any potential permanent or transient secondary seismic hazards, as previously discussed, that would be expected to affect the proposed development.

Recommendations:

1. It is recommended that all structures be designed to at least meet the current California Building Code provisions in the latest CBC edition (2016) and the ASCE Standard 7-10, where applicable; however, it should be noted that the building code is described as a minimum design condition and is often the maximum level to which structures are designed. Structures that are built to minimum code are designed to remain standing after an earthquake in order for occupants to safely evacuate, but then may have to ultimately be demolished (Larson and Slosson, 1992). It is the responsibility of both the property owner and project structural engineer to determine the risk factors with respect to using CBC minimum design values for the proposed school facilities. This information should be carefully reviewed prior to construction.

2. The potential for liquefaction and secondary seismic settlement should be properly addressed and/or evaluated by the project Civil Engineer. Appropriate site-specific mitigation measures, with respect to these secondary seismic hazards, should be implemented as recommended, if warranted.

CLOSURE

Our conclusions and recommendations are based on a review of available existing geologic/seismic data and the provided site-specific provided subsurface exploratory boring logs. No subsurface exploration was performed by this firm for this evaluation. The results of the seismic parameter values were based on the OSHPD Seismic Design Maps Tool web application. We make no warranty, either express or implied.

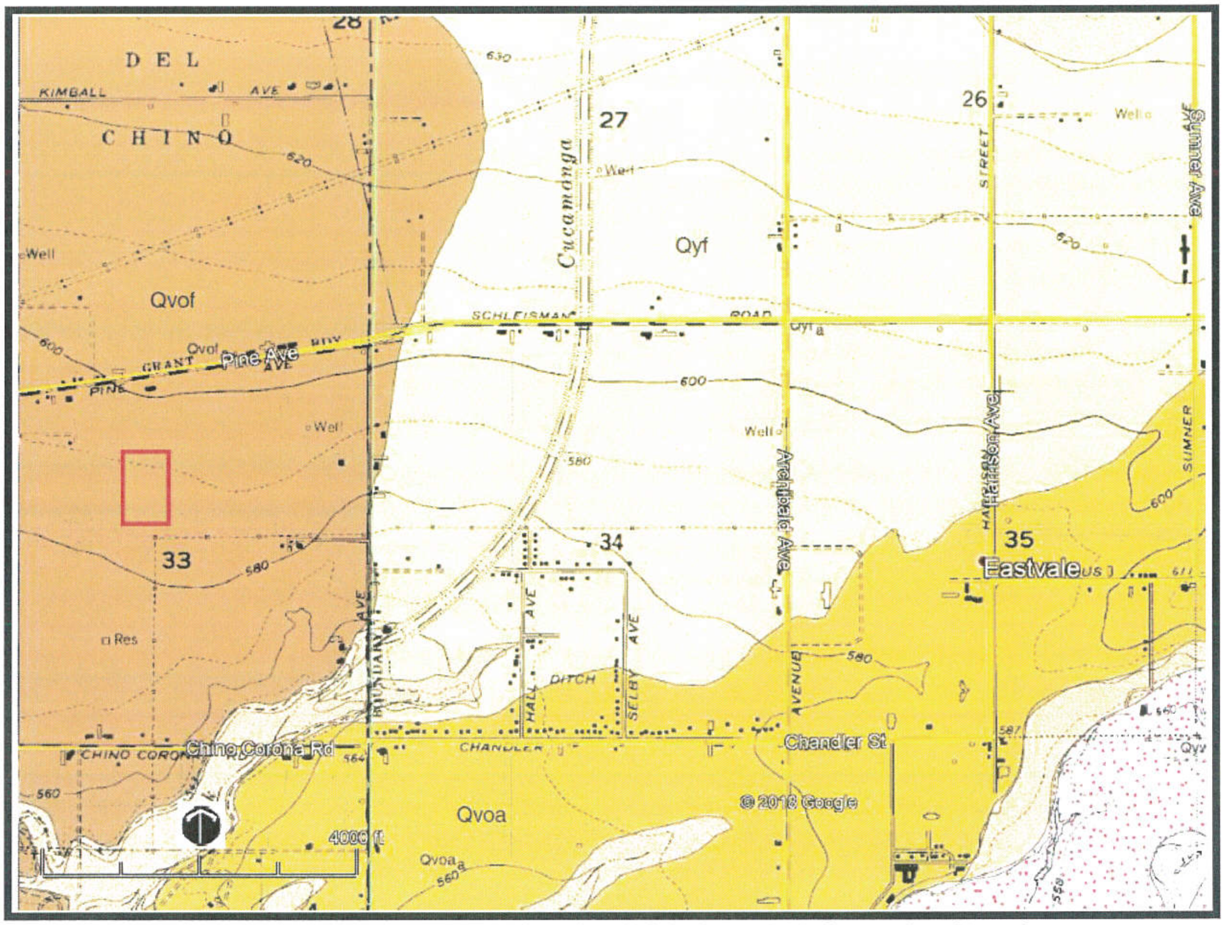
Should conditions be encountered at a later date or more information becomes available that appear to be different than those indicated in this report, we reserve the right to reevaluate our conclusions and recommendations and provide appropriate mitigation measures, if warranted. It is assumed that all the conclusions and recommendations outlined in this report are understood and followed. If any portion of this report is not understood, it is the responsibility of the owner, contractor, engineer, and/or governmental agency, etc., to contact this office for further clarification.

Respectfully submitted,
TERRA GEOSCIENCES

Donn C. Schwartzkopf
Certified Engineering Geologist
CEG 1459

PROFESSIONAL GEOLOGIST
DONN C. SCHWARTZKOPF
CERTIFIED ENGINEERING GEOLOGIST
No. 1459
STATE OF CALIFORNIA

REGIONAL GEOLOGIC MAP



BASE MAP: Morton and Gray (2002), U.S.G.S. OFR 02-22, Site outlined in red.

PARTIAL LEGEND

Qyf	**YOUNG ALLUVIAL FAN DEPOSITS**	Unconsolidated sand and cobble, and gravel-sand (Holocene and late Pleistocene).
Qvoa	**OLD ALLUVIAL CHANNEL DEPOSITS**	Well-indurated gravel, sand and silt deposits (early Pleistocene).
Qvof	**OLD ALLUVIAL FAN DEPOSITS**	Well-indurated reddish-brown sand deposits (early Pleistocene).
—	**GEOLOGIC CONTACT**	Contact generally located within 15± meters.

PROJECT NO. 193319-1

PLATE 1

APPENDIX A

GROUND MOTION ANALYSIS

OSHPD

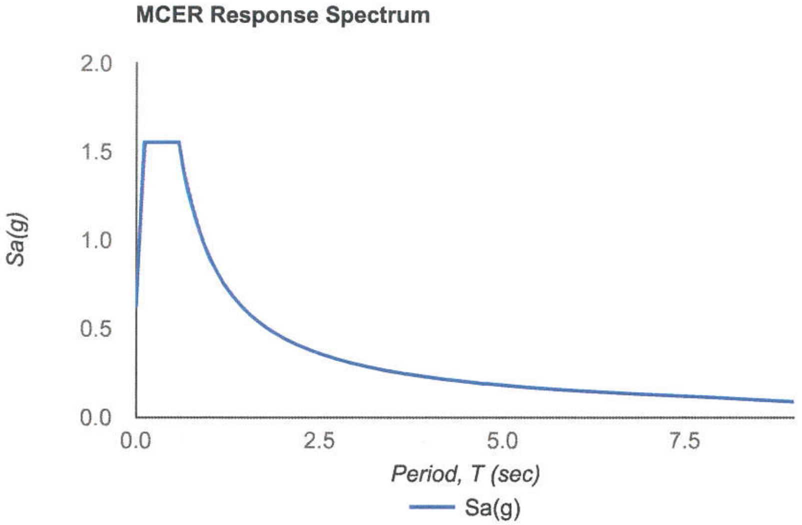
Preserve II K8 School Campus

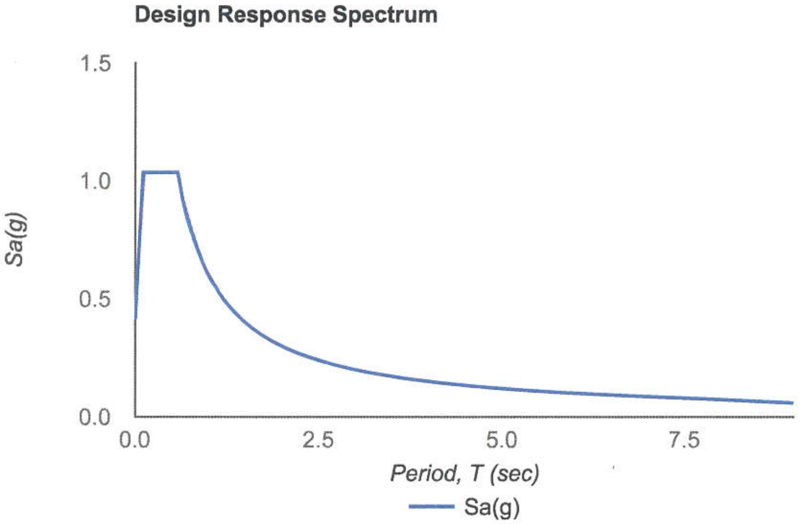
Latitude, Longitude: 33.955, -117.6202

Date	11/12/2019, 1:14:28 PM
Design Code Reference Document	ASCE7-10
Risk Category	III
Site Class	D - Stiff Soil

Type	Value	Description
S_S	1.552	MCE_R ground motion. (for 0.2 second period)
S_1	0.6	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.552	Site-modified spectral acceleration value
S_{M1}	0.9	Site-modified spectral acceleration value
S_{DS}	1.035	Numeric seismic design value at 0.2 second SA
S_{D1}	0.6	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	D	Seismic design category
F_a	1	Site amplification factor at 0.2 second
F_v	1.5	Site amplification factor at 1.0 second
PGA	0.588	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.588	Site modified peak ground acceleration
T_L	8	Long-period transition period in seconds
SsRT	1.883	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	1.777	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.552	Factored deterministic acceleration value. (0.2 second)
S1RT	0.697	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.66	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.6	Factored deterministic acceleration value. (1.0 second)
PGAd	0.588	Factored deterministic acceleration value. (Peak Ground Acceleration)
C_{RS}	1.06	Mapped value of the risk coefficient at short periods
C_{R1}	1.056	Mapped value of the risk coefficient at a period of 1 s


MCER Response Spectrum
2.0
1.5
1.0
0.5
0.0
Sa(g)
0.0
2.5
5.0
7.5
Period, T (sec)
Sa(g)


Design Response Spectrum
1.5
1.0
0.5
0.0
Sa(g)
0.0
2.5
5.0
7.5
Period, T (sec)
Sa(g)

APPENDIX B

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Appendix C Geological and Environmental Hazards Assessment Report

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April 2021 | Geological and Environmental Hazards Assessment Report

PRESERVE #2 SCHOOL

Chino Valley Unified School District

Prepared for:

Chino Valley Unified School District
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Facilities, Planning & Operations Division
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Chino, California 91710

Prepared by:

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PLACEWORKS

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LIST OF FIGURES

Figure **Page**

1. Introduction

This report evaluates whether Chino Valley Unified School District's (District) proposed school site for New Preserve #2 School conforms to California school facility standards, pursuant to Section 14010 of Title 5, California Code of Regulations (CCR).

1.1 PROJECT LOCATION

The proposed school site encompasses a 12-acre, rectangular parcel at the southwest corner of East Preserve Loop and Market Street in the City of Chino, San Bernardino County, California (Assessor's Parcel Number 1057-181-35-0000). Regional access is via State Route 71 to the west, State Route 91 to the south, Interstate 15 to the east, and State Route 60 to the north. The project site is approximately 0.4 mile south and west of Pine Avenue and Hellman Avenue, respectively, and 1.5 miles east of Euclid Avenue (or State Route 83) (Figure 1, *Regional Location*, and Figure 2, *Project Location*).

The site is in the southern half of The Preserve Specific Plan. It is rough graded, vacant, and surrounded by residential uses on the east and northeast, and vacant land to the north, west, and south. As shown in Figure 3, *The Preserve Specific Plan,* these areas will be developed with residential uses, community commercial uses, and a park. Two agricultural operations are within one-quarter mile of the site: a dairy operates at the northeast corner of Pine Avenue at East Preserve Loop, and a farm growing hay and alfalfa is southwest of the site. Both agricultural operations will be developed with residential uses at the buildout of The Preserve Specific Plan.

1.2 PROJECT DESCRIPTION

The District proposes acquisition of the site for development and operation of a public K-8 school. As shown in Figure 4, *Proposed Site Plan,* school buildings are planned near the center of the project site, outdoor recreational facilities in the southern portion, and surface parking in the northern and mideastern portions of the site. The parking lots and vehicle loading areas would be accessed from East Preserve Loop and Market Street. The proposed school would accommodate a maximum of 900 students in kindergarten through eighth grade on a standard school calendar or a maximum of 1,200 students on a four-track, year-round schedule. The District will acquire the site soon after it receives site approval from the California Department of Education. Construction is anticipated to start mid-2022, for a projected school opening in fall 2024.

1.3 CONCLUSIONS/RECOMMENDATIONS

As documented in this report, the proposed school site conforms to the environmental health and safety hazards standards provided in 5 CCR Section 14010, and no further evaluation is necessary.

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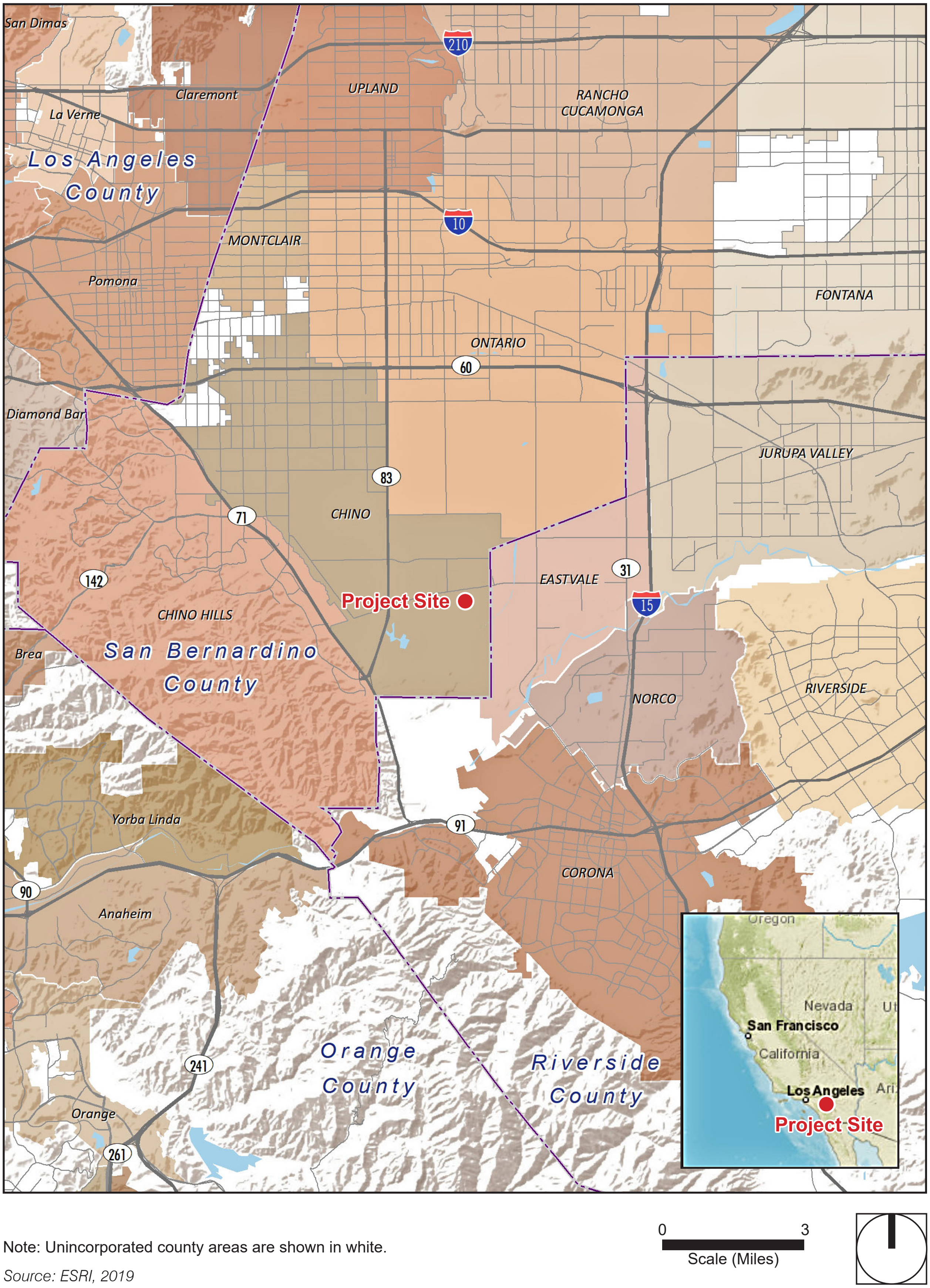
Figure 1 - Regional Location



Note: Unincorporated county areas are shown in white.

Source: ESRI, 2019

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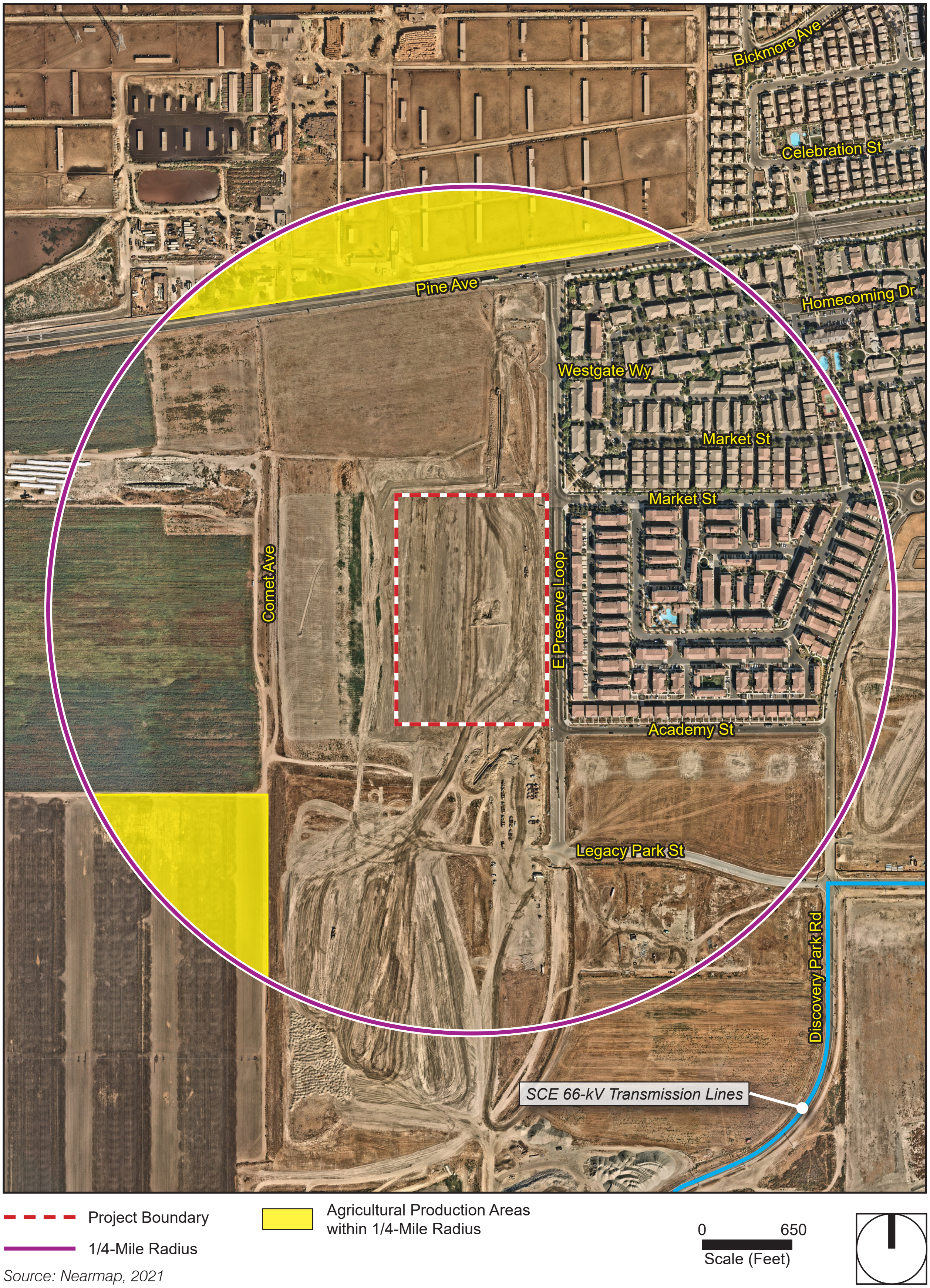
Figure 2 - Project Location



Source: Nearmap, 2021

1. Introduction

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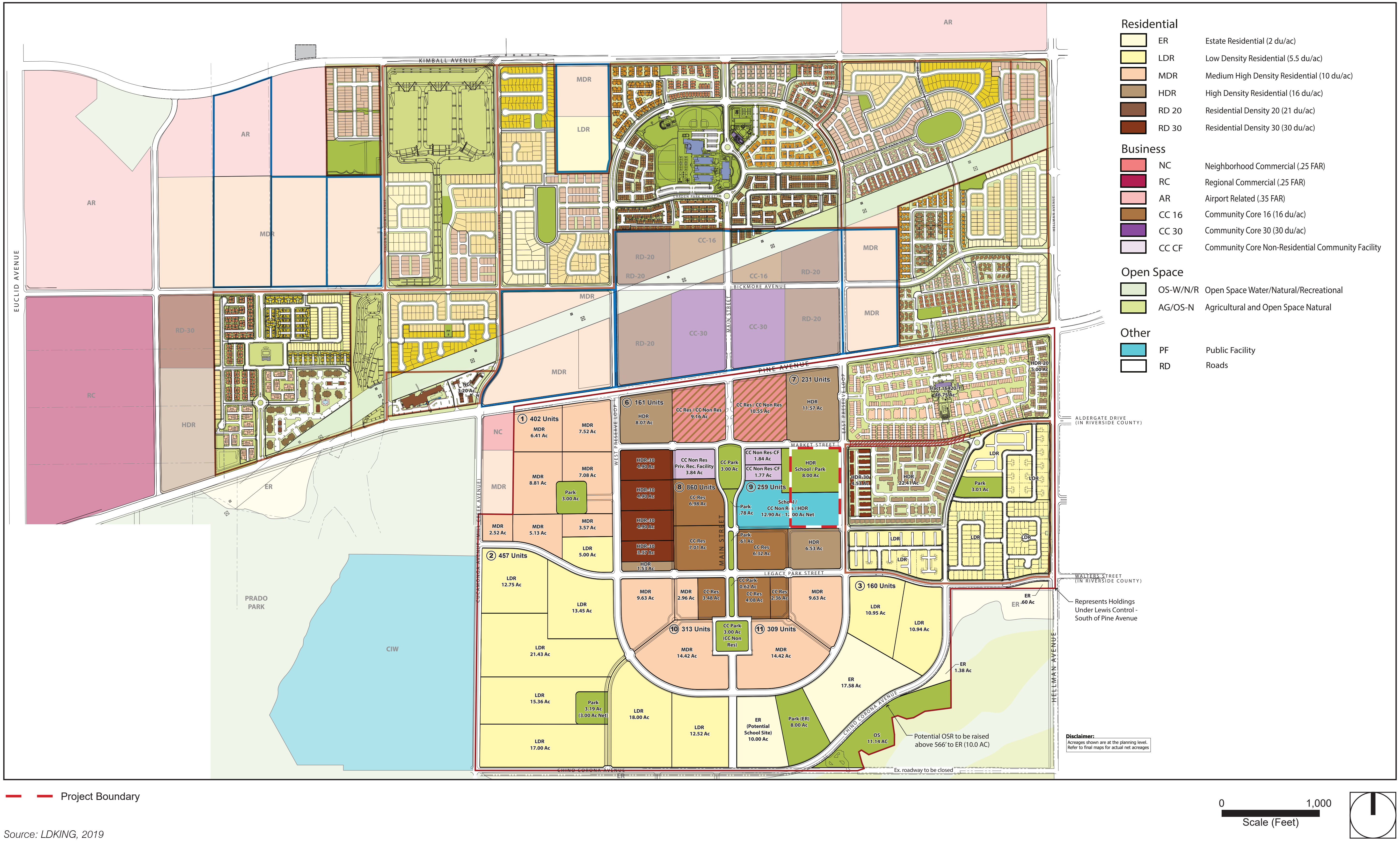
Figure 3 - The Preserve Specific Plan



Source: LDKING, 2019

1. Introduction

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Figure 4 - Proposed Site Plan

Source: WLC Architects, 2020

1. Introduction

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2. State Standards for New School Construction

The State of California's standards for school site selection are found in Title 5 CCR Section 14010. Additional codes and regulations applicable to school facilities are also provided in the California Education, Government, and Public Resources Codes. The following checklist provides a list of questions and code citations related to State-funded new school facilities.

STATE STANDARDS CHECKLIST FOR STATE-FUNDED SCHOOL FACILITIES—
SCHOOL SITE APPROVAL
(Documentation for SFPD 4.0, 4.01-4.03, School Site Approval)

Topic	Code References
Air Quality	
Is the boundary of the proposed school site within 500 feet of the edge of the closest traffic lane of a freeway or busy traffic corridor? If yes, would the project create an air quality health risk due to the placement of the school?	Ed. Code § 17213(c)(2)(C) CCR Title 5 § 14010(q)
Would the project create an air quality hazard due to the placement of a school within one-quarter mile of: (a) permitted and non-permitted facilities identified by the jurisdictional air quality control board or air pollution control district; (b) freeways and other busy traffic corridors; (c) large agricultural operations; and/or (d) a rail yard, which might reasonably be anticipated to emit hazardous air emissions, or handle hazardous or acutely hazardous material, substances, or waste?	Ed. Code § 17213(b) CCR Title 5 § 14010(q)
Geology and Soils	
Does the site contain an active earthquake fault or fault trace, or is the site located within the boundaries of any special studies zone or within an area designated as geologically hazardous in the safety element of the local general plan?	Ed. Code, § 17212 and § 17212.5 CCR Title 5 § 14010(f)
Would the project involve the construction, reconstruction, or relocation of any school building on the trace of a geological fault along which surface rupture can reasonably be expected to occur within the life of the school building?	Ed. Code § 17212.5
Would the project involve the construction, reconstruction, or relocation of any school building on a site subject to moderate-to-high liquefaction, landslides, or expansive soils?	CCR, Title 5 § 14010(i) School Site Selection and Approval Guide, Appendix H
Are naturally occurring asbestos minerals located at the site?	School Site Selection and Approval Guide, Appendix H
Hazards and Hazardous Materials	
Does the proposed school site contain one or more pipelines, situated underground or aboveground, which carry hazardous substances, acutely hazardous materials, or hazardous wastes, unless the pipeline is a natural gas line that is used only to supply natural gas to that school or neighborhood?	Ed. Code § 17213(a)(3)
Is the proposed school site located near an aboveground water or fuel storage tank or within 1,500 feet of an easement of an aboveground or underground pipeline that can pose a safety hazard to the site?	CCR, Title 5 § 14010 (h)
Is the school site in an area designated in a city, county, or city and county general plan for agricultural use and zoned for agricultural production, and if so, do neighboring agricultural uses have the potential to result in any public health and safety issues that may affect the pupils and employees at the school site? *(Does not apply to school sites approved by CDE prior to January 1, 1997.)*	Ed. Code § 17215.5

2. Environmental Checklist

Is the property line of the proposed school site less than the following distances from the edge of respective power line easements: (1) 100 feet of a 50–133 kV line; (2) 150 feet of a 220–230 kV line; or (3) 350 feet of a 500–550 kV line?	CCR, Title 5 § 14010 (c)
Does the project site contain a current or former hazardous waste disposal site or solid waste disposal site and, if so, have the wastes been removed?	Ed. Code § 17213(a)(1)
Is the project site a hazardous substance release site identified by the state Department of Health Services in a current list adopted pursuant to §25356 for removal or remedial action pursuant to Chapter 6.8 of Division 20 of the Health and Safety Code?	PRC § 21151.8 (a)(1)(B) Ed. Code § 17213(a)(2)
If prepared, has the risk assessment been performed with a focus on children's health posed by a hazardous materials release or threatened release, or the presence of naturally occurring hazardous materials on the school site?	Ed. Code § 17210.1(a)(3)
If a response action is necessary and proposed as part of this project, has it been developed to be protective of children's health, with an ample margin of safety?	Ed. Code § 17210.1(a)(4)
Is the proposed school site situated within 2,000 feet of a significant disposal of hazardous waste?	CCR, Title 5 § 14010 (t)
Is the site within 300 feet of an active oil or natural gas well?	Fire Code § 3406.3.1
Hydrology and Flooding	
Is the project site subject to flooding or tank/dam inundation or street flooding?	Ed. Code §§ 17212 and 17212.5 CCR, Title 5 § 14010 (g) School Site Selection and Approval Guide, Appendix H
Land Use and Planning	
Would the proposed school conflict with any existing or proposed land uses, such that a potential health or safety risk to students would be created?	Ed. Code § 17213 Gov't. Code § 65402 CCR, Title 5 § 14010 (m)
Are there easements on or adjacent to the site that would restrict access or building placement?	CCR, Title 5 § 14010(r)
Is the school site proportionate in its length to width ratio to accommodate the building layout, parking and playfields that can be safely supervised and does not exceed the allowed passing time to classes for the district?	CCR, Title 5 § 14010(j)
Is the site located within the proposed attendance area to encourage student walking and avoid extensive bussing unless bussing for ethnic diversity?	CCR, Title 5 § 14010(n)
Has the district considered environmental factors of light, wind, noise, aesthetics, and air pollution in its site selection process?	CCR, Title 5 § 14010(q)
Is the site within a designated Farmland Security Zone?	Government Code § 51296.5
Noise	
Is the proposed school site located adjacent to or near a major arterial roadway or freeway whose noise generation may adversely affect the educational program?	CCR, Title 5 § 14010 (e)
Public Services	
Does the site promote joint use of parks, libraries, museums, and other public services?	CCR, Title 5, § 14010 (o)
Is the site conveniently located for public services, including but not limited to fire protection, police protection, public transit and trash disposal wherever feasible?	CCR, Title 5, § 14010 (p)
Transportation/Traffic	
Are traffic and pedestrian hazards mitigated per Caltrans' School Area Pedestrian Safety manual?	CCR, Title 5 § 14010 (l)
Is the site easily accessible from arterials and is the minimum peripheral visibility maintained for driveways per Caltrans' Highway Design Manual?	CCR, Title 5 § 14010 (k)
Is the proposed school site within 1,500 feet of a railroad track easement?	CCR, Title 5 § 14010 (d)
Is the proposed school site within two nautical miles, measured by air line, of that point on an airport runway or potential runway included in an airport master plan that is nearest to the site? *(Does not apply to school sites acquired prior to January 1, 1966.)*	Ed. Code § 17215 (a)&(b)

Notes: School building "means and includes any building used, or designed to be used, for elementary or secondary school purposes and constructed, reconstructed, altered, or added to…." (Ed. Code § 17283).
Any documentation related to the California Environmental Quality Act is provided under separate cover.

3. Environmental Analysis

Section 2 provided a checklist of the State of California's safety standards for school site selection. This section evaluates the standards and recommends mitigation measures where appropriate.

3.1 AIR QUALITY

3.1.1 Is the boundary of the proposed school site within 500 feet of the edge of the closest traffic lane of a freeway or busy traffic corridor? If yes, would the project create an air quality health risk due to the placement of the school?

No Significant Hazard. Public Resources Code Section 21151.8(b)(9) and Education Code Section 17213(d)(9) define a "freeway or other busy traffic corridors" as roadways that on an average day have traffic in excess of 50,000 vehicles in a rural area or 100,000 vehicles in an urban area or 100,000 average daily trips (ADT). Streets within 500 feet of the site include East Preserve Loop, Market Street, and Academy Street. They are designated as urban residential collector streets and are projected to have less than the threshold of 50,000 ADT (Exhibit 5.7-5, The Preserve Certified EIR, 2003). Therefore, no freeways or busy traffic corridors are within 500 feet of the site.

3.1.2 Would the project create an air quality hazard due to the placement of a school within one-quarter mile of: (a) permitted and non-permitted facilities identified by the jurisdictional air quality control board or air pollution control district; (b) freeways and other busy traffic corridors; (c) large agricultural operations; and/or (d) a rail yard, which might reasonably be anticipated to emit hazardous air emissions, or handle hazardous or acutely hazardous material, substances, or waste?

No Significant Hazard. Residential uses are currently developed to the east and northeast of the site, and vacant land adjoins the site on the north, west, and south. At buildout of The Preserve Specific Plan (see Figure 3), these vacant areas would be developed with residential, community commercial, and park uses. According to the South Coast Air Quality Management District (AQMD), there are currently no permitted facilities within a quarter mile of the site (Appendix A). There are also no rail yards within one-quarter mile. Pine Avenue—the largest corridor within one-quarter mile of the site—has an existing ADT count of approximately 8,000 vehicles and is projected to accommodate 29,000 ADT at buildout, which is less than the threshold of a busy traffic corridor (see Section 3.1.1). There are two agricultural operations within one-quarter mile of the site: a dairy operates at the northeast corner of Pine Avenue at East Preserve Loop, and a farm growing hay and alfalfa is southwest of the site. The operations are temporary; as shown in Figure 3, both sites will be developed with residential uses. Although the surrounding buildout land uses—community commercial, residential, and park—would use hazardous materials, they are anticipated to be standard cleaning and maintenance supplies and small amounts of fuels, which are not considered substantially hazardous when used in accordance with established federal, state, and local guidance. Future developments and businesses that will operate with large amounts of chemicals and/or emit air emissions (e.g., gas stations, dry cleaning, and restaurants) would be required to obtain permits and licensing from the AQMD, City of Chino Planning Department, Chino Valley

Independent Fire District, San Bernardino County Environmental Health Services Department, and/or San Bernardino County Fire Department Hazardous Materials Division. Therefore, any potentially hazardous materials and emissions caused by future developments within one-quarter mile of the site would be mitigated, and potential air quality hazard impacts would be less than significant.

3.2 GEOLOGY AND SOILS

According to the United States Geological Survey (USGS) 7.5-minute Topographic Series, Corona North, California, Quadrangle Map (USGS 2018), the property is in the Chino Basin of the Upper Santa Ana Valley within the northern part of the Peninsular Ranges Geomorphic Province. The Peninsular Ranges Province extends approximately 900 miles from the Los Angeles-Pomona-San Bernardino Basins to Baja California, Mexico, and is characterized by elongated, northwest-trending mountain ranges separated by sediment-floored valleys (Yerkes et al. 1965). The most dominant structural features of the province are the northwest-trending fault zones, most of which die out, merge with, or are terminated by the steep reverse faults at the southern margin of the San Gabriel-San Bernardino Mountains within the Transverse Ranges Geomorphic Province far to the north of the site. The site sits atop early Pleistocene alluvial fan deposits (Morton and Gray 2002).

The geographic coordinates for the subject site are 33.9550 north latitude and 117.6200 west longitude. The subject site lies at an approximate elevation of 590 feet above sea level (USGS 2018). The topography of the site and surrounding areas drains southward.

3.2.1 Does the site contain an active earthquake fault or fault trace, or is the site located within the boundaries of any special studies zone or within an area designated as geologically hazardous in the safety element of the local general plan?

No Significant Hazard. Based on a review of Morton (2004), Jennings and Bryant (2010), and the City of Chino (2010), the project site is not on a known fault and is not within an earthquake fault zone or an area designated as geologically hazardous.

3.2.2 Would the project involve the construction, reconstruction, or relocation of any school building on the trace of a geological fault along which surface rupture can reasonably be expected to occur within the life of the school building?

No Significant Hazard. The site is not within or immediately adjacent (i.e., within a few hundred feet) to a fault zone (Morton 2004; Jennings and Bryant 2010; City of Chino 2010). The nearest active fault is the Chino-Central Avenue Fault, approximately 2.5 miles west of the site. Based on a review of geologic literature, the site is not on a pressure ridge, and there are no known active faults on or immediately adjacent to the site. On this basis, the potential for tectonic fault rupture at the site is considered negligible.

3.2.3 Would the project involve the construction, reconstruction, or relocation of any school building on a site subject to moderate-to-high liquefaction, landslides, or expansive soils?

No Significant Hazard.

Liquefaction

Based on the reported depth to groundwater of 75 feet below the ground surface in the site vicinity (Wildermuth Environmental 2017), the site has a low liquefaction potential. In addition, since the site would be developed as a public school, the California Geological Survey and Division of the State Architect will ensure that the buildings are evaluated for liquefaction potential and, if necessary, improved in accordance with the California Building Code standards. Therefore, project implementation would not result in a significant impact from liquefaction.

Landslides

The project site is relatively flat. No landslides were mapped on the site by Morton (2004). Therefore, landslides are not a potential hazard at the project site.

Expansive Soils

Expansive soils swell when they become wet and shrink when they dry out, resulting in the potential for cracked building foundations and, in some cases, structural distress of the buildings. In each case, minor to severe damage to overlying structures is possible. Based on the older alluvial soil, expansive soils are not expected to be a significant hazard at the site. Therefore, the project will not expose people or the new school buildings to adverse effects associated with expansive soils.

3.2.4 Are naturally occurring asbestos minerals located at the site?

No Significant Hazard. Based on a review of *A General Location Guide for Ultramafic Rocks in California: Areas More Likely to Contain Naturally Occurring Asbestos* (CGS 2000) and Van Gosen and Clinkenbeard (2011), no known naturally occurring serpentine rock or rock formations—which may contain significant quantities of asbestos—are within 10 miles of the project site. Therefore, project implementation would not result in the exposure of hazardous materials or naturally occurring hazardous materials on the school site.

3.3 HAZARDS AND HAZARDOUS MATERIALS

3.3.1 Does the proposed school site contain one or more pipelines, situated underground or aboveground, which carry hazardous substances, acutely hazardous materials, or hazardous wastes, unless the pipeline is a natural gas line that is used only to supply natural gas to that school or neighborhood? Does the proposed school site contain pressurized sewer lines and high-pressure water pipelines within 1,500 feet of the proposed site?

No Significant Hazard.

Hazardous Substance Pipelines

There are no petroleum or chemical pipelines on or within a 1,500-foot radius of the site (National Pipeline Mapping System online mapping database, 2019). According to an online map by the Southern California Gas Company, there are no high-pressure natural gas pipelines within 1,500 feet of the project site (Appendix A).

Sewer Pipelines

There are no pressurized sewer lines within 1,500 feet of the site.

Water Pipelines

Two 30-inch diameter water mains, operated by the Inland Empire Utilities Agency (IEUA), previously cut through the central portion of the site. In May 2020, the landowner removed the water mains during mass grading activities at the site (Appendix A).

The City of Chino Public Works Department identified several 12-inch water mains and one 12-inch recycled water pipeline within 1,500 feet of the site. The identified pipelines are summarized in Table 1.

TABLE 1 WATER PIPELINES

Pipeline Diameter	Pipeline Location	Distance from Site
12-Inch	East Preserve Loop	Approximately 72 feet east
12-Inch (recycled water)	East Preserve Loop	Approximately 25 feet east
12-Inch	Market Street	Approximately 30 feet south
12-Inch	Academy Street	Approximately 30 feet north
12-Inch	Legacy Park Street	525 feet south
12-Inch	Pine Avenue	Approximately 940 feet north

The CDE requires risk evaluation of releases from large volume (≥12 inches) water pipelines (CDE, 2007). The CDE Guidance Protocol for School Pipeline Risk Analysis provides a methodology for evaluating the potential for flooding. A probability analysis is not required. All of the water pipelines listed in Table 1 are located beneath streets with full or partial curbing. A pipeline flooding analysis was conducted for these pipelines to determine the depth and location of water flow within the street in the event of a pipeline leak or rupture. For this worst-case analysis, it was conservatively assumed that all the water flowing through the pipelines at their maximum capacity would reach the surface. In addition, no credit was taken for the presence of storm drains along these streets. Release impacts were calculated based on the procedures specified in the CDE manual. The release rate was determined by multiplying the pipe area by an assumed velocity of 5 feet per second (fps). Then the release rate was compared to the carrying capacity of the street, accounting for longitudinal slope, to determine if the water would be contained within the confines of the street curbing (Jeffers & Associates, 2006). The results are provided in Table 2.

TABLE 2 STREET FLOW

Pipeline Diameter	Location	Release Rate (cubic feet per second, cfs)	Street Width (ft)	Depth of Flow in Street (in)	Exceeds Street Carrying Capacity?[1]
12-Inch (potable water and recycled water)	East Preserve Loop	3.93	60	3.1	No
12-Inch	Market Street	3.93	38	3.0	No
12-Inch	Academy Street	3.93	36	3.5	No
12-Inch	Legacy Park Street	3.93	36	3.6	No
12-Inch	Pine Avenue	3.93	60	3.5	No

1 Assuming 6-inch curbing for residential/collector streets.

Assuming a standard 6-inch curb for residential or collector roadways, the water released from a full-flow rupture of the 12-inch water mains or 12-inch recycled water pipeline would be entirely contained within the confines of the curbing. Therefore, a potential break in any of the water pipelines within 1,500 feet of the site would not result in significant flooding at the project site.

3.3.2 Is the proposed school site located near an aboveground water or fuel storage tank or within 1,500 feet of an easement of an aboveground or underground pipeline that can pose a safety hazard to the site?

No Significant Hazard. Based on reviews of Google Earth Pro and the GeoTracker website (2019), there are no aboveground water or fuel storage tanks within a 1,500-foot radius of the site.

3.3.3 Is the school site in an area designated in a city, county, or city and county general plan for agricultural use and zoned for agricultural production, and if so, do neighboring agricultural uses have the potential to result in any public health and safety issues that may affect the pupils and employees at the school site? (Does not apply to school sites approved by CDE prior to January 1, 1997.)

No Significant Hazard. The project site is rough graded and vacant. It has been in agricultural production and used as a dairy in the past. As approved in The Preserve Specific Plan, the site can be developed for school use. Additionally, the site is surrounded by vacant land on the north, west, and south; residential uses are on the east and northeast. An active dairy is north of Pine Avenue, approximately 1,000 feet north of the site, and a farm is approximately 600 feet southwest of the site. As shown in Figure 3, the surrounding vacant land and nearby dairy and farmland would be urbanized with community commercial, residential, and park uses. At buildout of The Preserve Specific Plan, there would be no agricultural uses near the proposed school site; these existing facilities are considered temporary. Furthermore, as discussed in Section 3.3.7, due to the site's historical agricultural uses, site soil sampling was conducted to determine if historical or surrounding uses have contaminated the site's soil. As documented in the Preliminary Environmental Assessment (PEA), chemical concentrations of soils at the project site are below screening thresholds established by the US Environmental

Protection Agency (EPA) and would not be a risk to human health or the environment. Therefore, any potential public health and safety issues caused by agricultural operations would be less than significant.

3.3.4 Is the property line of the proposed school site less than the following distances from the edge of respective power line easements: (1) 100 feet of a 50–133 kV line; (2) 150 feet of a 220–230 kV line; or (3) 350 feet of a 500–550 kV line?

No Significant Hazard. During the summer of 2020, Southern California Edison Company (SCE) relocated two 66 kilovolt (kV) subtransmission lines that existed along the southern perimeter of the project site to the Legacy Park Street right-of-way, which is approximately 500 feet south of the site. According to SCE, there are no longer power lines of 50 kV or more within 350 feet of the project site. A copy of the response from SCE is included in Appendix A.

3.3.5 Does the project site contain a current or former hazardous waste disposal site or solid waste disposal site and, if so, have the wastes been removed?

No Significant Hazard. Based on a review of the EnviroStor and GeoTracker databases, the project site does not contain a current or former hazardous waste disposal site or solid waste disposal site (DTSC 2019; SWRCB 2019).

3.3.6 Is the project site a hazardous substance release site identified by the state Department of Health Services in a current list adopted pursuant to § 25356 for removal or remedial action pursuant to Chapter 6.8 of Division 20 of the Health and Safety Code?

No Significant Hazard. Searches compiled pursuant to Government Code Section 65962.5 by Environmental Database Report concluded that the project site is not on a list of hazardous materials sites and is not a hazardous substance release site.

3.3.7 If prepared, has the risk assessment been performed with a focus on children's health posed by a hazardous materials release or threatened release, or the presence of naturally occurring hazardous materials on the school site?

No Significant Hazard. As mentioned in Section 3.3.3, a PEA was prepared for the project site. Based on a review of historical information, the project site never contained structures. However, the site was used for agriculture, potentially row crops, from at least 1966 to 1985. From 1985 to around 2009, it was part of a dairy. Since 2009, the site has been vacant and undeveloped. As part of the PEA, 44 soil samples and 16 soil gas samples were collected. Analysis of the samples and screening for human health risk revealed that chemical concentrations at the project site would not be a risk to human health or the environment under an unrestricted residential land use scenario. The results of the PEA show that the site is clean. The PEA concludes that no further action is recommended.

3.3.8 If a response action is necessary and proposed as part of this project, has it been developed to be protective of children's health, with an ample margin of safety?

No Significant Hazard. Based on the findings of the PEA, no further removal or action is recommended at the project site.

3.3.9 Is the proposed school site situated within 2,000 feet of a significant disposal of hazardous waste?

No Significant Hazard. Based on review of the SWIS, EnviroStor, and GeoTracker websites, the project site is not within 2,000 feet of a significant disposal of hazardous waste (CalRecycle 2019; DTSC 2019; SWRCB 2019).

3.3.10 Is the site within 300 feet of an active oil or natural gas well?

No Significant Hazard. According to the Department of Conservation Division of Oil, Gas, and Geothermal Resources Well Finder, the project site is not within 300 feet of an active oil or natural gas well (DOGGR 2019). The closest oil well is approximately 2,400 feet to the southwest of the site. The well is identified as a plugged dry hole that was drilled in 1969 by Ebert and Brandt and was abandoned in 1980.

3.4 HYDROLOGY AND FLOODING

Based on an analysis of the topography in the site vicinity, sheet flow runoff from the site during periods of intense or prolonged precipitation would flow to the south. The site is in the Chino subbasin of the Upper Santa Ana Valley Groundwater Basin. Local groundwater flow in the Chino subbasin is predominantly to the south, toward Prado Dam. According to Wildermuth Environmental (2017), groundwater is about 75 feet below ground surface in the site vicinity. Hydrogeologic investigations were not performed on the site for this investigation; therefore, the extent of localized variations in groundwater presence and flow on the site are unknown.

3.4.1 Is the project site subject to flooding or tank/dam inundation or street flooding?

No Significant Hazard. According to the FEMA Map Service Center website (2019), the project site and the surrounding area are outside of 100-year and 500-year flood zones and are considered in an area of reduced flood risk due to a levee. Based on maps from the Office of Emergency Services (2015), the site is within a dam inundation zone for the San Antonio Dam. The arrival time of floodwaters from a dam inundation from San Antonio Dam would be more than 10 hours and 30 minutes from the time of failure, thus providing ample time for students and personnel to evacuate. The closest high ground outside of the dam inundation zone is to the southwest near the Euclid Avenue overpass of State Route 71, but the intersection of Schleisman Road and Hamner Avenue about 3.5 miles to the east of the site is also outside of the dam inundation zone. The maximum depth of floodwaters is estimated to be two feet in depth, arriving an additional 9 hours and 30 minutes after the arrival of the first floodwaters. As stated in Section 3.3.2, there are no water tanks within 1,500 feet of the site.

3.5 LAND USE AND PLANNING

3.5.1 Would the proposed school conflict with any existing or proposed land uses, such that a potential health or safety risk to students would be created?

No Significant Hazard. As shown in Figure 3, the project site is part of The Preserve Specific Plan, a master planned community characterized by suburban residential development. The areas to the north, west, and south are currently vacant; residential uses exist to the east and northeast. At buildout of the planning area, the vacant properties adjoining the site would be developed with residential, community commercial, and park uses. The existing and projected uses adjacent to the site are compatible with school operations. No agricultural or industrial uses are proposed nearby. It should be further noted that the Chino Planning Commission adopted Resolution PC2020-008 on March 16, 2020, indicating that the proposed school site is consistent with the city's General Plan and The Preserve Specific Plan. Therefore, no land use conflicts between the proposed school site and surrounding land uses are anticipated to affect the health or safety of site occupants.

3.5.2 Are there easements on or adjacent to the site that would restrict access or building placement?

No Significant Hazard. The site contained two easements: a north-south easement in the middle of the site with two high-pressure water mains, and a west-south easement along the southern perimeter with 66-kV subtransmission power lines. As provided in Sections 3.3.2 and 3.3.4, the water mains and power lines within these easements have been removed and/or relocated away from the site. There are no other easements on or near the site that would restrict site access or building placement.

3.5.3 Is the school site proportionate in its length to width ratio to accommodate the building layout, parking and playfields that can be safely supervised and does not exceed the allowed passing time to classes for the district?

No Significant Hazard. As shown in Figure 4, the site is rectangular, and outdoor recreational facilities are in the southern portion of the site, school buildings are clustered in the mideastern portion, and two parking lots are in the northern and midwestern perimeters. The proposed school has been designed so that all parts of the campus can be easily supervised by school employees and law enforcement for security from the outside.

3.5.4 Has the district considered environmental factors of light, wind, noise, aesthetics, and air pollution in its site selection process?

No Significant Hazard.

Light and Wind

The project site would be exposed to standard climate conditions experienced by southwestern San Bernardino County, which is generally characterized by Mediterranean conditions (Western Regional Climate Center 2019). Based on a review of a wind rose for southwestern San Bernardino County, the predominant wind direction is from the west-southwest, and wind speeds rarely exceed 24 miles per hour (AQMD 2003). As applicable, operation of the proposed school would consider these environmental conditions.

Aesthetics

The project site is in a planned suburban community. The site is currently vacant and rough graded. Residential uses are to the east and northeast of the site, and areas north, west, and south of the site are currently vacant. These areas will be developed with residential, community commercial, and park uses as a part of the community in the near future. The design of the proposed campus would be consistent with the District's design guidelines and compatible with the design standards of the community. The character and quality of the site would not compromise the surrounding development, and the surrounding development would not negatively affect the aesthetics of the site.

Air Pollution

Based on a response from AQMD, there are no permitted facilities or mobile sources within one-quarter mile of the site that have the potential to generate hazardous air emissions (Appendix A). No freeways or busy traffic corridors, large agricultural operations, or rail yards are within a quarter mile of the site.

The site, however, is in an area that has historically operated with dairies, which operations can create odors. The closest facility is approximately 1,000 feet north of the site. This facility as with others in the planning area would be phased out as the community continues to develop from farmland to urban. As identified in the certified EIR for The Preserve Specific Plan, odor impacts from dairy operations on new receptors (e.g., residences, schools) are a nuisance. The District operates other schools near dairies. According to the District, HVAC filters are changed more often at schools close to dairies. Additionally, doors are kept closed as much as possible, and windows are never opened. If there are odors at the site, the District will continue to mitigate through implementation of these established best management practices.

3.6 NOISE

3.6.1 Is the proposed school site located adjacent to or near a major arterial roadway or freeway whose noise generation may adversely affect the educational program?

No Significant Hazard. The site is adjacent to East Preserve Loop, Academy Street, and Market Street, which are classified as local collector streets; they are not major arterial roadways or freeways. Traffic noise generated on these streets would not be substantial, because they would mainly accommodate vehicle from the site and residential uses near the school site. Pine Avenue, approximately 870 feet north of the site's northern boundary, is a major arterial. At build out of the planning area, Pine Avenue would accommodate 29,000 ADT. Though still not a freeway or busy traffic corridor (see section 3.1.1), Pine Avenue could generate traffic noise audible at the site. Accordingly, at build out, the site's surrounding uses would also be developed, and residential structures would be constructed between Pine Avenue and the proposed school site. The structures would block line-of-sight between Pine Avenue and the site and attenuate vehicle noise from Pine Avenue. The school's parking lot would also provide additional distance to the closest classrooms and further attenuate potential noise. Therefore, vehicle noise from Pine Avenue would not adversely affect the school's indoor and outdoor educational program.

3.7 PUBLIC SERVICES

3.7.1 Does the site promote joint use of parks, libraries, museums, and other public services?

No Significant Hazard. The proposed 12-acre school site would include indoor and outdoor recreational facilities as well as its own library and media center. Daily school operating and programming needs would be accommodated on-site, and the school would not need to share use of the proposed adjacent park to the west of the site. The proposed school facilities would also be available for public use as the scheduling of scholastic purposes allows, following District policies and the Civic Center Act.

3.7.2 Is the site conveniently located for public services, including but not limited to fire protection, police protection, public transit and trash disposal wherever feasible?

No Significant Hazard. The project site is in a planned community with access to public services. It will have regularly scheduled trash collection. Chino Valley Independent Fire District Station No. 63 is about 1.4 miles northwest of the site. The Chino Spectrum Marketplace Police Substation is about 6.2 miles to the northwest of the site. The closest bus stop is the Euclid Avenue/Eucalyptus Avenue bus stop about 2.9 miles northwest of the site. However, as the surrounding area grows in population, public transit routes will likely be extended into the site vicinity.

3.8 TRANSPORTATION/TRAFFIC

3.8.1 Are traffic and pedestrian hazards mitigated per Caltrans' School Area Pedestrian Safety manual?

No Significant Hazard. The proposed school is in a planned community. Nearby roads and streets will be designed to meet City of Chino standards, and the school driveways will be designed to meet the requirements of the Caltrans Highway Design Manual. As warranted, the city will coordinate with the District to implement the below control devices (Caltrans 1996), and potential traffic and pedestrian hazards will be reduced to acceptable standards.

1. Warning signs and markings.
2. Variable speed limits.
3. Intersection stop signs.
4. Flashing yellow beacons.
5. Traffic signals.
6. Visibility obstructions removed.
7. School safety patrol.
8. Adult crossing guard.
9. Pedestrian separation structures.
10. Pedestrian walkways along the roadway.
11. Pedestrian walkways separated from the roadway.
12. Parking controls and curb-use zones.

3.8.2 Is the site easily accessible from arterials and is the minimum peripheral visibility maintained for driveways per Caltrans' Highway Design Manual?

No Significant Hazard. The site is in a planned development with relatively flat streets for open viewing of oncoming traffic. Driveways at the site have been designed to meet the requirements of the Caltrans Highway Design Manual. Future transportation facilities are subject to review and approval by the City of Chino.

3.8.3 Is the proposed school site within 1,500 feet of a railroad track easement?

No Significant Hazard. Based on a review of Google Earth and a site visit, the site is not within 1,500 feet of a railroad track easement.

3.8.4 Is the proposed school site within two nautical miles, measured by air line, of that point on an airport runway or potential runway included in an airport master plan that is nearest to the site? (Does not apply to school sites acquired prior to January 1, 1966.)

No Significant Hazard. Based on a review of area maps and recent aerial photographs, the site is approximately 6,000 feet south of the Chino Airport's approach runway (Runway 26L). The site has been reviewed by the California Department of Transportation Division of Aeronautics (Caltrans). Caltrans determined that the site is outside of all safety compatibility zones and concluded that it can be used as a school (Appendix A).

3.9 EXEMPTIONS TO SITING STANDARDS

3.9.1 Is the district seeking any exemptions to the standards found in CCR, Title 5, § 14010(c-i), (l), (m), (q), (c), (t)?

No Significant Hazard. The site meets the school site requirements of Section 14010 of the CCR, Title 5. Therefore, the District will not be seeking any exemptions to any of its standards.

3.9.2 If so, has mitigation been identified that demonstrates that the standard may be overridden without compromising a safe and supportive school environment?

No Significant Hazard. The proposed project would comply with all CCR Title 5 standards.

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Appendix A Agency Information

Appendix

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Appendix D Preliminary Environmental Assessment

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December 2020 | Preliminary Environmental Assessment Report

Proposed Preserve #2 Elementary School

for Chino Valley Unified School District

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Department of Toxic Substances Control

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Secretary for
Environmental Protection

Meredith Williams, Ph.D., Director
5796 Corporate Avenue
Cypress, California 90630

Gavin Newsom
Governor

March 24, 2021 **SENT VIA ELECTRONIC MAIL**

Mr. Gregory J. Stachura
Assistant Superintendent
Facilities, Planning, and Operations Division
Chino Valley Unified School District
5130 Riverside Drive
Chino, California 91710
greg_stachura@chino.k12.ca.us

APPROVAL OF PRELIMINARY ENVIRONMENTAL ASSESSMENT REPORT, CHINO VALLEY USD PRESERVE 2 SCHOOL, SOUTHWEST OF PRESERVE LOOP AND MARKET STREET, CHINO (SITE CODE: 404965)

Dear Mr. Stachura:

The Department of Toxic Substances Control (DTSC) reviewed the “Preliminary Environmental Assessment Report” (PEA) (PlaceWorks, December 22, 2020) received on January 10, 2020 for the Proposed Preserve #2 Elementary School site (Site). The PEA presents investigation results and conclusions based on a health risk screening evaluation for the Site.

The Chino Valley Unified School District (District) notified DTSC on March 19, 2021 that it has complied with all public review and comment requirements for the PEA pursuant to Option A (Ed. Code § 17213.1, subd. (a)(6)(A)). The District made the PEA available for public review and comment from February 13, 2021 through March 18, 2021 and a public hearing was held on March 18, 2021. No public comments were received regarding the PEA.

According to the PEA, the Site consists of approximately 12 acres of vacant undeveloped land. The Site is located at the southwest corner of Preserve Loop and Market Street, in the City of Chino. Surrounding land uses consists of residential areas immediately to the east and open undeveloped land on the remaining sides. Past uses include row crop agriculture from at least 1966 to 1985 and a dairy farm from 1985 to 2009. After 2009, the Site was left vacant and undeveloped and has most recently been used for staging construction equipment for developments in the surrounding area. To evaluate potential impacts from historical agriculture use, former dairy operations and former fill materials, the Site was investigated for organochlorine pesticides, total petroleum hydrocarbons, arsenic and methane. The PEA concludes that chemical concentrations on-site would not be a risk to human health or the environment under an unrestricted residential land use scenario and recommends no further environmental investigation of the Site.

Based on review of the PEA, neither a release of hazardous material nor the presence of a naturally occurring hazardous material which would pose a threat to public health or the environment under unrestricted land use, was indicated at the Site. Therefore, DTSC concurs with the conclusion of the PEA that further environmental investigation of the Site is not required and hereby approves the PEA.

Pursuant to Education Code section 17213.2, subdivision (e), if a previously unidentified release or threatened release of a hazardous material or the presence of a naturally occurring hazardous material is discovered anytime during construction at the Site, the district shall cease all construction activities at the Site and notify DTSC. Additional assessment, investigation or cleanup may be required.

If you have any questions regarding this project, please contact Mr. Johnson Abraham, Project Manager, at (714) 484-5380 or at Johnson.Abraham@dtsc.ca.gov, or Mr. Shahir Haddad, Unit Chief at (714) 484-5368 or at Shahir.Haddad@dtsc.ca.gov.

Sincerely,

Javier Hinojosa

Javier Hinojosa, Chief
Brownfields Restoration and School Evaluation Branch
Site Mitigation and Restoration Program

mv/ja/sh

cc: See next page

cc: (via e-mail)

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Mr. Johnson P. Abraham
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Brownfields Restoration and School Evaluation Branch Reading File - Cypress

PLACEWORKS

December 22, 2020

Johnson Abraham
Project Manager
Department of Toxic Substances Control (DTSC)
5796 Cypress Avenue
Cypress, CA 90630

Subject: Preliminary Environmental Assessment Chino Valley USD Preserve #2 School

Dear Mr. Johnson:

Enclosed please find the draft Preliminary Environmental Assessment for the proposed 12-acre elementary school site for Chino Valley Unified School District. PlaceWorks is submitting the draft Preliminary Environmental Assessment on behalf of Chino Valley Unified School District to the Department of Toxic Substances Control as part of the ongoing assessment of the proposed new school site. The school site is identified with DTSC EnviroStor Number 60002886.

Sincerely,

PLACEWORKS

Denise Clendening
Denise Clendening, Ph.D.
Associate Principal

Michael Watson
Michael Watson, PG 8177
Project Geologist

PROFESSIONAL GEOLOGIST
Michael James Watson
NO. 8177
Exp. 6-30-21
STATE OF CALIFORNIA

Enclosures

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Executive Summary

This Preliminary Environmental Assessment (PEA) Report for the proposed construction of an elementary school in the city of Chino, San Bernardino County, California, was prepared by PlaceWorks on behalf of the Chino Valley Unified School District (District) pursuant to the California Education Code which requires that all new school sites or existing school sites with new construction obtain a "No Further Action" (NFA) determination from the California Environmental Protection Agency Department of Toxic Substances Control (DTSC) prior to proceeding with acquisition and/or construction of a school. The District proposes to build a new elementary school within the Preserve Residential Development in Chino, California.

A PEA Workplan was submitted to the DTSC in January 2020 and comments were received on March 23, 2020. The revised PEA Workplan included the revisions based on the DTSC comments and was also revised based on the rough grading plans that the developer planned on implementing prior to turning the site over to the District. Lewis Management Group removed 144,722 cubic yards of soil from the site prior to the implementation of the sampling. The stockpiled soil was removed in September and October 2020. Lewis Management Group had been using the site to stockpile soil and temporary park heavy equipment used in grading activities for the surrounding new community. The heavy equipment was parked on top of the fill material that had been located on the site.

The project site is approximately 12-acres and is associated with the assessor parcel number (APN) 1057-181-350000. The project site is currently vacant undeveloped property within the Preserve Residential Development. The project site is bounded by vacant land to the north, west, and south and to the east is East Preserve Loop and across the street is a residential development (Figure 1). Figure 2 shows the local vicinity of the proposed school site. Figure 3 is an aerial photograph showing site conditions prior to grading.

The project site was historically occupied by row crops from at least 1966 until 1985 and after 1985 the project site was part of an Alta Dena Dairy Farm (associated with the address 8545 Pine Avenue) until around 2009. The project site was then left vacant and undeveloped after 2009 and was then used by Lewis Management Group to stockpile soil and park heavy equipment. Prior to sampling, the fill material was removed by Lewis Management Group.

The District has decided to complete a PEA for the following reasons:

- The possibility of residual pesticides in the soil due to historical agricultural use of the site from approximately 1931 to 1985.
- Evaluate if there are any impacts to the project site from its historically being part of a dairy farm from approximately 1985 until at least 2009.
- Evaluate if there are any impacts from the former fill material.

Executive Summary

Based on information developed during the PEA using the DTSC's PEA Guidance Manual, the DTSC will then make an informed decision regarding potential risks posed by the site.

The field sampling program implemented for the investigation is summarized below:

- Soil sampling and soil vapor probes were installed at the site on November 5, 2020 for the PEA. Soil gas samples were collected on November 6, 2020.
- Forty-four (44) discrete soil samples plus 3 duplicates were collected.
- Sixteen (16) discrete soil gas samples were collected.
- Two 3:1 composite samples, four 4:1 composite samples, and one 3:1 composite sample duplicate were collected from two depths and analyzed for organochlorine pesticides (OCPs) by EPA Method 8081A to assess for potential residual OCPs from historic agricultural operations. Half of the samples collected for OCP analysis were from 0 to 0.5 feet bgs and the other half were collected from 2 to 2.5 feet bgs.
- Four soil samples plus one duplicate sample from 0 to 0.5 feet bgs were analyzed for Total Petroleum Hydrocarbons (TPH) by EPA Method 8015 to assess the historic agriculture.
- Six soil samples plus one duplicate from 0 to 0.5 feet bgs were analyzed for arsenic by EPA Method 6010B to assess the historic agriculture.
- Sixteen soil gas samples were analyzed from eight locations at two depths, 5 and 15 feet bgs. All soil gas samples were analyzed in the field with a FID and two soil gas samples were submitted to a laboratory for methane analysis by ASTM D1946.

The results of the field program are summarized below:

- Fill material was not encountered in any of the borings at the site.
- Two OCPs (4,4'-DDE and dieldrin) were detected in the composite soil samples. All OCP concentrations were below residential screening levels adjusted for the number of samples that comprised the composite.
- TPH were not detected above the laboratory detection limits in the four soil samples and one duplicate soil sample analyzed.
- Arsenic was not detected above the laboratory detection limits in the six soil samples and one duplicate soil sample analyzed.

- Methane was detected in one soil gas sample in the field collected from 5.0 feet bgs at a low concentration of 22.0 parts per million volume (ppmv).
- The human health risk screening showed that chemical concentrations would not be a risk to human health or the environment under an unrestricted residential land use scenario.
- Laboratory data obtained were validated to assure that Data Quality Objectives (DQOs) were met, and the data were suitable for use in a human health and ecological screening evaluation.

Recommendations

The results of the PEA support the following conclusions and recommendations:

Based on the PEA objectives, the environmental quality goals of the District, and the results of the PEA investigation, PlaceWorks has determined that no further assessment is required for the site. Therefore, PlaceWorks recommends that the PEA be finalized. Per California Education Code Section 17213.1, Section 3, PlaceWorks concludes that further assessment of the site is not necessary and is requesting an approval of the PEA.

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1. Introduction

This Preliminary Environmental Assessment (PEA) Report for the proposed construction of an elementary school in the city of Chino, San Bernardino County, California, was prepared by PlaceWorks on behalf of the Chino Valley Unified School District (District) pursuant to the California Education Code which requires that all new school sites or existing school sites with new construction obtain a "No Further Action" (NFA) determination from the California Environmental Protection Agency Department of Toxic Substances Control (DTSC) prior to proceeding with acquisition and/or construction of a school. The District proposes to build a new elementary school within the Preserve Residential Development in Chino, California.

The 12-acre project site is located on assessor parcel number (APN) 1057-181-350000. The project site is currently vacant undeveloped property within the Preserve Residential Development. The project site is bounded by vacant land to the north, west, and south and to the east is East Preserve Loop and across the street is a new residential development (Figure 1). Figure 2 shows the local vicinity of the proposed school site. Figure 3 is an aerial photograph showing site conditions prior to grading and project site boundaries.

Based on a review of historical aerial photographs and topographic maps, the project site had been utilized for row crop agriculture from at least 1931 until 1985 and after 1985 the project site was a portion of an Alta Dena Dairy Farm at 8545 Pine Avenue until around 2009. The project site was then left vacant and undeveloped after 2009 and was then used by Lewis Management Group to stockpile soil and park heavy equipment used for grading in the new Preserve residential development. This PEA was prepared in accordance with the guidelines of the California Environmental Protection Agency Department of Toxic Substances Control (DTSC), as detailed in the PEA Guidance Manual.

1.1 PEA OBJECTIVES

The District has prepared this PEA pursuant to the California Education Code that requires the completion of a Phase I Environmental Site Assessment (Phase I) or PEA, for all new school sites that will receive state funding prior to proceeding with construction of a school.

The overall objectives of this PEA are to:

- Evaluate historical information for indications of the past use, storage, disposal, or release of hazardous waste/substances at the site;
- Evaluate available information for indications of naturally occurring hazardous materials at the site.
- Establish through a field sampling and analysis program the nature of hazardous wastes/substances that may be present in soil at the site, their concentration and general extent; and

- Estimate the potential threat to public health and/or the environment posed by hazardous constituents, if any, at the site using a residential land-use scenario.

Based on information developed during the PEA and the conservative human and ecological risk evaluation set forth in the DTSC's Preliminary Endangerment Assessment Guidance Manual, the DTSC will then make an informed decision regarding potential risks posed by the site.

Possible outcomes of the PEA decision include, but are not limited to, the requirement for further investigation through the Supplemental Site Investigation process if the site is found to be significantly impacted by hazardous substances release(s); the need to perform a Removal Action if localized impacts by hazardous substances release(s) are found; implementation of mitigation actions to address any potential risks; and an issuance of a "No Further Action" (NFA) finding if the site is found not to be significantly impacted and risks to human health and the environment are found to be within acceptable levels based on the conservative screening-level risk assessment.

1.2 SCOPE OF WORK

The scope of work implemented to prepare this PEA included:

- Researching available site background information regarding former and current land use;
- Implementing field and laboratory data collection and evaluation to further assess environmental conditions at the site; and
- Preparing this PEA report.

Several information sources were reviewed as part of the background research for development of this PEA report. These sources were reviewed to develop an understanding of current and past land uses and practices that may have involved the handling, use, storage, and/or disposal of hazardous substances or wastes. Information was obtained and used to develop a general site history in an attempt to identify potential sources of chemical impact, if any.

The approach utilized to perform the background research is very similar to that used in completing a Phase I under the American Society for Testing and Materials (ASTM) Practice for Environmental Site Assessments (ESAs): Phase I Assessments Process (ASTM Standard E 1527-13). Specific sources of information reviewed, and activities performed by PlaceWorks in conducting the background research included:

- Site inspections and observations of the site and surrounding area within ¼-mile (site photographs are included in Appendix A);
- Review of available aerial photographs (included in Appendix B);
- Review of current U.S. Geological Survey (USGS) 7.5-minute topographic maps (included in Appendix B);

- Evaluation of environmental database list searches (included in Appendix C);
- Review of agency files at federal, state and local regulatory agencies and offices for the site;
- Review of agency files for listed facilities within ¼-mile of the site that were identified as having a potential to have impacted the site (included in Appendix C);
- Interviews with persons knowledgeable of site history and operations; and
- Collection and review of available applicable information from the District's files.

The scope for the field and laboratory investigation is discussed in Section 6. The field sampling program implemented for the investigation is summarized below:

- Soil sampling and soil vapor probes were installed at the site on November 5, 2020 for the PEA. Soil gas samples were collected on November 6, 2020.
- Forty-four (44) discrete soil samples plus 3 duplicates were collected.
- Sixteen (16) discrete soil gas samples were collected.
- Two 3:1 composite samples, four 4:1 composite samples, and one 3:1 composite sample duplicate were collected from two depths and analyzed for organochlorine pesticides (OCPs) by EPA Method 8081A to assess for potential residual OCPs from historic agricultural operations. Half of the samples collected for OCP analysis were from 0 to 0.5 feet bgs and the other half were collected from 2 to 2.5 feet bgs.
- Four soil samples plus one duplicate sample from 0 to 0.5 feet bgs were analyzed for TPH by EPA Method 8015 to assess the historic agriculture.
- Six soil samples plus one duplicate from 0 to 0.5 feet bgs were analyzed for arsenic by EPA Method 6010B to assess the historic agriculture.
- Sixteen soil gas samples were analyzed from eight locations at two depths, 5 and 15 feet bgs. All soil gas samples were analyzed in the field with a FID and two soil gas samples were submitted to a laboratory for methane analysis by ASTM D1946.

The results of the field program are summarized below:

- Two OCPs were detected in the composite soil samples (4,4'-DDE and dieldrin). All concentrations detected of the two OCPs were below residential screening levels adjusted for the number of samples that comprised the composite.

- Total Petroleum Hydrocarbons (TPH) were not detected above the laboratory detection limits in the four soil samples and one duplicate soil sample analyzed.
- Arsenic was not detected above the laboratory detection limits in the six soil samples and one duplicate soil sample analyzed.
- Methane was detected in one sample at 5.0 feet bgs at 22.0 ppmv, below the level of concern of 5,000 ppmv.
- The human health risk screening showed that chemical concentrations would not be a risk to human health or the environment under an unrestricted residential land use scenario.
- Laboratory data obtained were validated to assure that Data Quality Objectives (DQOs) were met, and the data were suitable for use in a human health and ecological screening evaluation.

1.3 PEA REPORT FORMAT

This PEA Report is organized in general accordance with the format presented in Chapter 3 of the DTSC's PEA Guidance Manual. This PEA Report contains the following sections:

- Section 1 presents an Introduction and Summary of PEA Objectives and PEA Report Format;
- Section 2 presents a Site Description of the proposed site;
- Section 3 includes Site History and Background Information;
- Section 4 defines the Apparent Problem;
- Section 5 contains a description of the Site Environmental Setting;
- Section 6 presents a discussion of Sampling Activities and Results;
- Section 7 includes the Human Health Screening Evaluation Statement;
- Section 8 presents the Ecological Screening Evaluation Statement;
- Section 9 includes a summary of Quality Assurance Project Plan (QAPP) measures;
- Section 10 describes Health and Safety Plan (HASP) implementation;
- Section 11 summarizes variances from the proposed sampling plan;

- Section 12 presents a discussion of Applicable or Relevant Laws and Regulation Pertaining to School Sites;
- Section 13 presents Conclusions and Recommendations of the PEA; and
- Section 14 lists References cited in the document.

The appendices to this PEA Report include:

Appendix A – Site Photographs;

Appendix B – Research Documentation;

Appendix C – Environmental Database Search Report;

Appendix D – Health and Safety Plan;

Appendix E – Laboratory Reports;

Appendix F – QAPP

Appendix G – Boring Log

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2. Site Description

This section describes the location and ownership of the site as well as other pertinent details required by DTSC regarding the specifics of the site description. The project site is approximately 12-acre area of vacant undeveloped land within the Preserve Residential Development located in south Chino. The site has recently been graded by Lewis Management Group removing 144,722 cubic yards of stockpile soil temporarily placed on the site during grading activities of the surrounding master planned community. The project site is located within Section 33 of Township 2 South, Range 7 West of the San Bernardino Base Line and Meridian.

To the north of the project site is a dairy. Residential developments are to the northeast and east. Southeast, south, southwest, and west of the project site is more undeveloped vacant land. Additionally, the project site is approximately 2.36-miles northeast of the 71 Freeway. Figure 1, *Regional Location*, provides a map depicting the regional location of the project site. Figure 2, Local Vicinity, is a map of the surrounding area. Figure 3 is an aerial photograph of the proposed project site showing the school site and proposed project site boundaries.

2.1 DESCRIPTION AND LOCATION

2.1.1 Site Name

The project site has been identified by the District as the proposed Preserve Elementary School. The project site had been used for row crops from approximately 1966 to about 1985. After 1985, the project site was used for a dairy until at least 2009. The proposed project site currently consists of vacant land next to new Lewis Homes.

2.1.2 Site Address

The project site does not have a reported address. The project site is located at the southwest corner of the intersection of E. Preserve Loop and Market Street in the Preserve Residential Development in Chino, San Bernardino County, California (Figure 1). Figure 2, *Local Vicinity*, provides a map depicting the general location of the project, which is identified with the Assessor's Parcel Number [APN] 1057-181-350000.

2.1.3 Designated Contact Person

Gregory J. Stachura is the Contact Person designated by the District.

2.1.4 Mailing Address

The mailing address for the project designated by the District is:

Chino Valley Unified School District
5130 Riverside Drive

Chino, CA 91710

2.1.5 Other Site Names

No other site names were identified for the proposed school site.

2.1.6 U.S. Environmental Protection Agency (USEPA) Identification Number

The project site does not have a USEPA identification number.

2.1.7 EnviroStor Database Number

The project site EnviroStor database number is 60002886.

2.1.8 Assessor's Parcel Number(s)

The school site is located within the Assessor Parcel Number [APN] 1057-181-350000.

2.1.9 Site Maps and Photographs

A vicinity map depicting the project site and surrounding area is included as Figures 1 and 2, respectively. Project boundaries are shown in Figures 3 and 4. Site photographs are included in Appendix A.

3. Site History and Background Information

3.1 CURRENT AND HISTORICAL LAND USES

3.1.1 Facility Ownership/Operators

Chino Holding Company, LLC owns the project site.

3.1.2 Business Type

The project site had been utilized for agricultural purposes from at least 1931 to around 1985. From 1985 to the 2009, the project site was part of a dairy farm.

3.1.3 Years of Operation

Based on a review of historical aerial photographs, the project site was used for agricultural purposes from at least 1966 to around 1985. From 1985 until at least 2009 the project site is a portion of the Alta Dena Dairy Farm at 8545 Pine Avenue. The proposed project site currently consists of vacant land that was recently rough graded to remove soil stockpiled that was temporarily placed on the site by Lewis Development Group from grading of the surrounding area for residential tracks.

3.1.4 Business/Manufacturing Activities

Based on a review of historical documents, no manufacturing activities have occurred on the project site. The proposed project site currently consists of vacant land.

3.2 SURROUNDING PROPERTY LAND USES

The surrounding property is in a rural area with expanding multifamily residential. The adjoining land uses are as follows:

North: Vacant land followed by Pine Avenue then a dairy.

South: Vacant land.

East: New residential development.

West: Vacant land.

Section 17213 of the California Education Code and Section 21151.8 of the California Public Resources Code prohibit construction of a school upon a current or former hazardous waste disposal site or solid waste disposal site. Based on information reviewed for preparation of this PEA Report, the proposed school site is not located on a current or former disposal site.

3.3 PAST USAGE OF THE SITE

Past usage of the site was assessed through a review of aerial photographs and topographic maps. Copies of the aerial photographs and topographic maps are included in Appendix B. Based on a review of aerial photographs and historical topographic maps the project site was used for row crops from approximately 1966 to about 1985. The project site was part of a dairy from approximately 1985 until at least 2009. The proposed project site currently consists of vacant land that was recently graded to remove all stockpiled soil from the site. Lewis Management Group temporarily placed fill at the site while grading the surrounding master planned community. Six to nine feet of fill were placed on the eastern side of the site where Lewis Management Group parked heavy equipment used for grading activities. At the time of the site visit all fill material had been removed from the site and the site was vacant and fenced with no structures or vehicles parked on the site.

3.3.1 Aerial Photographs

Aerial photographs, obtained from EDR, dated 1931, 1938, 1946, 1948, 1953, 1966, 1975, 1985, 1989, 1990, 1994, 2006, 2009, 2012, and 2016 were reviewed for the project site. Copies of the aerial photographs are included in Appendix B.

- 1931 – The project site appears to have irrigated row crop agriculture on the north eastern side of the project site. Pastureland is on the western side of the project site. There appears to be a fence running in a north south direction through the middle of the site. Surrounding the project site is rural residential and agriculture.
- 1938 – The project site appears to be all pastureland.
- 1946 – The project site and surrounding areas appear relatively unchanged in comparison to the 1938 aerial photograph.
- 1948 – The project site appears to have crops on the northwest corner of the site and pastureland on the eastern area of the site.
- 1953 – The project site appears to be used for grain crops. There is more development to the northwest.
- 1966 – The project site appears to have irrigated row crop agriculture on the eastern side of the project site. Pastureland is on the western side of the project site. Surrounding the project site is rural residential and agriculture.

- 1975 – The project site appears relatively unchanged in comparison to the 1966 aerial photograph. Development appears to be going in north of the project site. The surrounding area is still predominately rural residential and agriculture.

- 1985 – The project area is now part of a dairy. Dairies are north and east of the project site.

- 1989 – The project site and surrounding area appears relatively unchanged in comparison to the 1985 aerial photograph.

- 1990 – The project site and surrounding area appears relatively unchanged in comparison to the 1989 aerial photograph.

- 1994 – The project site and surrounding area appears relatively unchanged in comparison to the 1990 aerial photograph.

- 2006 – The project site and surrounding area appears relatively unchanged in comparison to the 1994 aerial photograph.

- 2009 – The project site and surrounding area appears relatively unchanged in comparison to the 2006 aerial photograph.

- 2012 – The project site and the immediate surrounding area appears to now be vacant land.

- 2016 – The project site appears relatively unchanged in comparison to the 2012 aerial photograph. Residential developments are located to the northeast of the project site.

3.3.2 Historical Topographic Maps

Historical topographic maps, obtained from EDR dated 1902, 1933, 1941, 1942, 1947, 1949, 1967, 1973, 1981, and 2012 were reviewed for the project site. Copies of the topographic maps are included in Appendix B.

- 1902 – The project site appears to be vacant undeveloped property. There are sparse structures in the surrounding area.

- 1933 – The project site is on an unmapped portion of the topographic map.

- 1941 – The project site is on an unmapped portion of the topographic map.

- 1942 – The project site appears to be vacant undeveloped property. There are more structures marked in the surrounding area.

- 1947 – The project site and surrounding area appears relatively unchanged in comparison to the 1942 topographic map.

- 1949 – The project site is on an unmapped portion of the topographic map.
- 1967 – The project site appears to be vacant undeveloped property. The California Institution for Women is marked southwest of the project site.
- 1973 – The project site appears relatively unchanged in comparison to the 1967 topographic map. There are more structures and developments marked in the surrounding area.
- 1981 – The project site and surrounding area appears relatively unchanged in comparison to the 1973 topographic map.
- 2012 – No structures are depicted in current topographic maps, only streets are labeled, and the topography shown.

3.3.3 Sanborn Maps

Sanborn maps were searched for the property, but it is an unmapped property. A copy of the Certified Sanborn Map Report is included in Appendix B.

3.3.4 City Directory

EDR provided an EDR-City Directory of the project site and surrounding area. A copy of the EDR-City Directory is in Appendix B. City Directory data was searched for the years spanning from 1922 to 2014. The project site and surrounding area were not identified in the city directory database search.

3.4 PAST USAGE OF ADJOINING PROPERTIES

Past usage of the adjoining properties was assessed through a review of aerial photographs and historical topographic maps. Copies of historical references reviewed are included in Appendix B. Based on a review of aerial photographs and historical topographic maps, adjoining properties have been utilized for agricultural dairy purposes.

The project site is in the Preserve development and construction in the surrounding areas started in the last few years. The area to the east and northeast have been recently developed with new single-family residential homes. After the area is development the proposed school site will be surrounded by residential uses to the north, east, and south; a community park to the west; and community commercial uses to the northwest

3.5 HAZARDOUS SUBSTANCE/WASTE MANAGEMENT INFORMATION

3.5.1 Records Review

3.5.1.1 SITE OWNER/OPERATOR RECORDS

Site owner/operator records were not reviewed.

3.6 STATE OF CALIFORNIA DIVISION OF OIL AND GAS RECORDS

Based on a review of the California Department of Conservation Geologic Energy Management Division (CalGEM) Well Finder website, there are no oil or gas wells within the project site. The nearest oil well is approximately 2,678-feet to the southwest of the project site. The well is identified as an abandoned dry hole advanced by Ebert and Brandt in March 1969. The well was reported abandoned in January of 1981.

3.6.1 Site Inspection Results

A site visit to observe site conditions was conducted by PlaceWorks on November 5, 2020. No weather-related conditions or other conditions that would limit our ability to observe the site occurred during our site reconnaissance. The site was vacant land that had been recently graded. No vehicles or structures were on the site that was surrounded by a chain-link fence. The site was at the same grade as the surrounding land to the east and west.

Summarized below are observations relative to specific physical features identified in the PEA Guidance Manual and site photographs are included as Appendix A.

Physical Feature	***Observations***
Site boundaries:	The project site consists of approximately 12-acres of vacant recently graded land bordered by East Preserve Loop on the east and the future extension of Market Street on the north and Academy Street on the south. Vacant land is located to the west.
Locations and boundaries of all onsite operations (present and past):	Based on a review of aerial photographs the project site has been used as an agricultural field from at least 1931 to 1985 and from 1985 to around 2009, the project site was part of a dairy.
Foundations of former structures:	None noted by PlaceWorks.
Storage tanks and storage areas:	None noted by PlaceWorks
Odors:	None noted by PlaceWorks.
Pools of liquid:	None noted by PlaceWorks.
Electrical or hydraulic equipment known or likely to contain PCBs:	None noted by PlaceWorks.
Unidentified substance containers (including empty drum storage):	None noted by PlaceWorks
Stained soil and pavement, corrosion, and degradation of floors and walls:	None noted by PlaceWorks.
Drains and Sumps:	None noted by PlaceWorks.
Pits, ponds, and lagoons:	None noted by PlaceWorks.
Surface drainage pathways:	None noted by PlaceWorks.
Stressed vegetation (from other than insufficient water):	None noted by PlaceWorks.
Solid waste and wastewater:	None noted by PlaceWorks.
Wells (including dry wells, irrigation wells, injection wells):	None noted by PlaceWorks.
Septic systems:	None noted by PlaceWorks.
Overhead electrical lines:	None noted by PlaceWorks.
High-pressure gas or fuel transmission lines:	No high-pressure gas pipelines were identified as being located on the site.
Railroad tracks:	Railroad tracks were not identified within 1,500 feet of the site.

3.6.2 Prior Assessments/Remediation

No prior assessments or remediation exist for this site and were not reviewed by PlaceWorks.

3.7 REGULATORY STATUS

PlaceWorks utilized the electronic database service EDR to complete an environmental records review for the project site. The database search was used to identify properties that may be listed in the referenced Agency records, located within the American Society for Testing and Materials (ASTM)-specified search radii indicated below:

Database	Approximate Search Distance	Project Site Listed?	Number of Sites within Search Area
Federal NPL Sites	1 mile	No	0
Federal Delisted NPL Sites	0.5 mile	No	0
CERCLIS Sites	0.5 mile	No	0
CERCLIS-NFRAP Sites	0.5 mile	No	0
Federal ERNS	Site only	No	0
RCRA non-CORRACTS TSD Facilities	0.5 mile	No	0
RCRA CORRACTS Facilities	1 mile	No	0
RCRA Generators	Site and Adjoining	No	0
Federal Institutional/Engineering Control Registry	0.5 mile	No	0
State and Tribal Equivalent NPL Sites	1 mile	No	0
State and Tribal Equivalent CERCLIS Sites	1 mile	No	6
State and Tribal Registered Storage Tanks	Site and Adjoining	No	0
State and Tribal Landfills and Solid Waste Disposal Sites	0.5 mile	No	1
State and Tribal Leaking Storage Tanks	0.5 mile	No	2
State and Tribal Institutional Controls/Engineering Control	Site only	No	0
State and Tribal Voluntary Cleanup Sites	0.5 mile	No	0
State and Tribal Brownfield Sites	0.5 mile	No	0
Orphan Site List	Site and Adjoining	No	0
HAZNET	Site only	No	0

A review of selected regulatory agency databases for documented environmental concerns on the project site, or in close proximity to the project site, was conducted by EDR. A copy of the radius report, dated September 6, 2019 is included in Appendix C. The project site was not identified on any of the regulatory databases searched in the EDR..

3.7.1 NPL Sites

The National Priorities List (NPL) is a list of contaminated sites that are considered the highest priority for clean-up by the EPA.

- The project site is not listed on the NPL database.

- The database search did not identify any NPL facilities within one mile of the project site.

3.7.2 CERCLIS Sites

The Comprehensive Environmental Response, Compensation, and Liability Act Information System (CERCLIS) list identifies sites which are suspected to have contamination and require additional investigation to assess if they should be considered for inclusion on the NPL.

- The project site is not listed on the CERCLIS database.
- The database search did not identify any CERCLIS Sites within a half mile of the project site.

3.7.3 CERCLIS-NFRAP Sites

CERCLIS-NFRAP status indicates that a site was once on the CERCLIS List but has No Further Response Actions Planned (NFRAP). Sites on the CERCLIS-NFRAP List were removed from the CERCLIS List in February 1995 because, after an initial investigation was performed, no contamination was found, contamination was removed quickly, or the contamination was not significant enough to warrant NPL status.

- The project site is not listed on the CERCLIS-NFRAP database.
- The database search did not identify any CERCLIS-NFRAP sites within a half mile of the project site.

3.7.4 Federal ERNS List

The Federal Emergency Response Notification System (ERNS) list tracks information on reported releases of oil and hazardous materials.

- The project site is not listed on the ERNS database.

3.7.5 RCRA CORRACTS Facilities

The Resource and Conservation Recovery Act (RCRA) CORRACTS Facilities list catalogues facilities that treat, store, or dispose of hazardous waste and have been associated with corrective action activity.

- The project site is not listed on the RCRA CORRACTS Facilities list.
- The database search did not identify any RCRA CORRACTS Facilities within one mile of the project site.

3.7.6 RCRA non-CORRACTS TSD Facilities

The RCRA non-CORRACTS TSD Facilities list tracks facilities which treat, store, or dispose of hazardous waste and are not associated with corrective action activity.

- The project site is not listed on the RCRA non-CORRACTS TSD Facilities list.
- The database search did not identify any RCRA non-CORRACTS TSD facilities within a half mile radius of the project site.

3.7.7 RCRA Generators

The RCRA Generators list is maintained by the USEPA to track facilities that generate hazardous waste.

- The project site is not listed on the RCRA Generators Facilities list.
- The database search did not identify any RCRA Generators within a half mile radius of the project site.

3.7.8 State-and-tribal equivalent CERCLIS List

The State-and-tribal equivalent CERCLIS List database identifies hazardous waste sites selected for remedial action and underground storage tank (UST) properties having a reportable release and is maintained by the DTSC.

- The project site is not listed on the State-and-tribal equivalent CERCLIS List.
- The database search identified six facilities on the State-and-tribal equivalent CERCLIS List within a half mile radius of the project site.
    - Rando Elementary School at the southeast corner of Hellman Avenue and Walters Street, approximately 0.475-miles southeast of the project site, underwent a PEA due to contamination related to livestock and vehicle maintenance. Currently, the clean-up status of the project site is listed as No Further Action as of April 14, 2017.
    - Rodriguez Dairy at 8340 and 8342 Chino Corona Road, approximately 0.533-miles south southwest of the project site, is listed as being referred to a local agency as of June 7, 2004.
    - Legend Dairy Farms – Schleisman at 14955 Schleisman, approximately 0.724-miles northeast of the project site, was a site that was going to be developed but was stalled due to the 2008 economic downturn, but currently the cleanup status is listed as certified as of June 30, 2010.
    - Dump – Hall Avenue at 7675 Hall Avenue, approximately 0.878-miles southeast of the project site, is a historical site that is listed because the property owners complained of illegal dumping and the case is listed as having been referred to County Health Department as of June 10, 1991.
    - W.F. Durrington Dairy at 8107 Kimball Avenue, approximately 0.907-miles northwest of the project site, underwent a PEA due to contamination related to former dairy and row crop

operations. Currently, the clean-up status of the project site is listed as No Further Action as of May 5, 2005.

  - Engelsma Dairy at 8011 Kimball Avenue, approximately 0.977-miles northwest of the project site, is listed as being referred to a local agency as of October 7, 2004.

3.7.9 State and Tribal Registered Underground Storage Tanks (USTs)

The State Water Resources Control Board's Hazardous Substance Storage Container Database maintains a list of USTs regulated by the RCRA.

- The project site is not listed on the registered UST database.
- The database search did not identify any registered UST facilities within a quarter mile radius of the project site.

3.7.10 State Landfills and Solid Waste Disposal Sites

The Solid Waste Facilities/Landfill Sites records typically contain an inventory of solid waste disposal facilities or landfills. The data comes from the Integrated Waste Management Board's Solid Waste Information System database.

- The project site is not listed on the Solid Waste Facilities/Landfill Sites database.
- The database search identified one Solid Waste Facilities/Landfill Sites within a half mile of the project site.
  - Bemus Landscape, INC at 8005 Pine Avenue, approximately 0.499-miles northwest of the project site, is listed as an active green waster composting operation. No violations were noted for the facility on CalRecycle.

3.7.11 State and Tribal Leaking Underground Storage Tanks (LUSTs)

The State Water Resources Control Board's Leaking Underground Storage Tank Information System contains an inventory of LUST Incident Reports.

- The database search identified two LUST facilities within a half mile radius of the project site.
  - The project site was a portion of the Stueve Bros. Farms at 8300 Pine Avenue, which is listed because of a leak of gasoline reported on October 2, 1998. Currently the cleanup status of the case is completed case closed as of June 19, 2013. Reviewing the Phase I Environmental Site Assessment (1999) of the Stueve Bros. Farm, the area of the farm that had the former USTs is over 1200 fee to the north of the project site on the far side of Pine Avenue. The most recent groundwater monitoring report from 2012 indicate the USTs were located to the

north of the residential building located on the north side of Pine Avenue and that the groundwater gradient was toward the southwest, cross gradient of the project site. The USTs were removed under the oversight of the San Bernardino County Fire Department 1998. In 2008 the County Fire Department transferred oversight of the case to the Santa Ana Regional Water Quality Control Board. Quarterly monitoring was implemented at the site from 2006 to 2009 then semiannual monitoring until 2011. In 2000 Soil Vapor Extraction was implemented. Regional Water Quality Control Board determined that the groundwater plume was shrinking in size and concentration and that the impacted shallow groundwater was not used as a source of water supply nor was it likely to be used as a source of water supply in the foreseeable future and the limited residual petroleum hydrocarbons that remained in soil and groundwater posed a low risk to human health, safety and the environment. A copy of the closure letter and closure summary are included in Appendix B. Based on the current regulatory status and distance from the site it is not expected to have had an impact on the project site.

- R.T. Lee Construction at 7200 Hellman Avenue, approximately 0.484-miles east of the project site, is listed because of a leak of gasoline reported on July 1, 1991. Currently the cleanup status of the case is completed case closed as of August 26, 1992. Based on the current regulatory status it is not expected to have had an impact on the project site.

3.7.12 Local Lists of Hazardous Waste Contaminated Sites

A record search was done on the following databases: Clandestine Drug Labs, HIST Cal-Sites Historical CalSites Database, and Toxic Pits Cleanup Act Sites.

- The subject site is not listed on the Local List of Hazardous Waste Contaminated Sites.
- The database search did not identify any Local List of Hazardous Waste Contaminated Sites within the designated search radius.

3.7.13 High Risk Historical Records

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, and dry cleaners. There were no high-risk historical records identified within a half-mile of the project site.

3.7.14 HAZNET

HAZNET contains the data obtained from hazardous waste manifests received by the DTSC for lawful disposal of hazardous materials. A listing on the HAZNET database does not indicate that an environmental concern exists, only that a lawful disposal of materials has occurred.

- The project site is not listed on the HAZNET database.
- The database search did not identify any properties on the HAZNET database within a quarter mile radius of the project site.

3.7.15 Orphan Sites

The EDR database identified one site that is indicated as being potentially in the area and was not mapped due to incomplete address information. There were no orphan sites identified in the database search.

3.7.16 Other Databases

The project site was not listed on any of the other additional environmental records reviewed in the EDR report.

3.7.17 Vapor Migration

The ASTM 1527-13 standard states that "for the purposes of this practice, “migrate” and “migration” refers to the movement of hazardous substances or petroleum products in any form, including, for example, solid and liquid at the surface or subsurface, and vapor in the subsurface". Thus, this section specifies whether or not we perceive a risk of vapor migration to the project site.

To assess vapor migration risk, a review and analysis of the site-specific environmental database report and other reasonably ascertainable records was implemented to assess whether:

1. Off-site properties have documented chlorinated volatile organic compound (VOC) contamination located within 100 feet of the project property, or
2. Off-site properties have documented volatile petroleum hydrocarbon contamination within 30 feet of the project property.

Based on the records review, it is unlikely that a potential source of vapor migration currently exists beneath the site from off-site properties. No chlorinated VOC contamination was identified, and underground storage tanks were not identified adjacent or within 100 feet of the project site.

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4. Apparent Problem

There is no physical or historic evidence of any site activity that might have caused any environmental impact to the site. However, there are potential environmental issues evaluated in this PEA. The PEA identified the following potential issues at the site:

- The possibility of residual pesticides in the soil due to historical agricultural use of the site from approximately 1931 to 1985.
- The possibility of residual methane resulting from dairy operations on the project site from around 1985 until around 2009.
- Potential for fill material to be present at the site from the surrounding area due to adjacent residential development.

Because the site is for a proposed school, there is a potential for children who will attend the school and adult employees of the school to be exposed to chemicals that may be present in soil. Potential exposure may occur from soil ingestion, dermal exposure to soil, and inhalation of particles. The sampling that was conducted as part of this PEA was directed at addressing these potential chemicals of concern and these potential exposure pathways.

Because of the presence of the above-mentioned concerns, a PEA was initiated for the site.

4. Apparent Problem

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5. Environmental Setting

This section describes potential exposure pathways and the site geology and hydrogeology.

5.1 FACTORS RELATED TO SOIL EXPOSURE PATHWAYS

5.1.1 Site Topography

The topographic gradient of the project site is to the south. Based on a review of the United States Geological Survey (USGS) 7.5-minute Topographic Series, Corona North, California Quadrangle Map (USGS 2012), surface elevation of the site is approximately 590 feet above mean sea level (msl). Topographic maps are included in Appendix B.

5.1.2 Site Geology and Soil Types

Based on a review of the United States Geological Survey (USGS) 7.5-minute Topographic Series, Corona North, California Quadrangle Map (USGS 2012), the project site is in the northern part of the Peninsular Ranged Geomorphic Province. The Peninsular Ranges Geomorphic Province extends approximately 900 miles southward from the Los Angeles Basin to Baja California, Mexico and is characterized by elongated northwest-trending mountain ranges separated by sediment-floored valleys (Yerkes et al. 1965). The most dominant structural features of the province are the northwest-trending fault zones, most of which die out, merge with, or are terminated by the steep reverse faults at the southern margin of the San Gabriel Mountains within the Transverse Ranges Geomorphic Province. The site itself sits atop early Pleistocene very old alluvial fan deposits (Morton and Gray 2002). Topographically, the site general slopes to the southeast.

Based on a review of the Fault Activity Map of California (California Department of Conservation 2010), no active faults are known to have been mapped within the boundaries of the project site. The nearest known active fault to the project site is the Chino-Central Avenue Fault, located approximately 2.5 miles west of the site.

The United States Department of Agriculture Natural Resources Conservation Services mapped the soil beneath the project site and is reported in the EDR radius report included in Appendix C. The soil component is Chino, which has surface texture classified as silt loam. This soil has moderate infiltration rated and is considered a moderately well to well-draining soil.

Fill material was placed at the site by Lewis Management Group for temporary storage during grading activities for the new master planned community. Six to nine feet of fill were placed at the site in the area that heavy equipment was parked.

5.1.3 Naturally Occurring Asbestos and Radon

Based on a review of A General Location Guide for Ultramafic Rocks in California – Areas More Likely to Contain Naturally Occurring Asbestos (Department of Conservation, Division of Mines and Geology 2000) and Reported Historic Asbestos Mines, Historic Asbestos Prospects, and Other Natural Occurrences of Asbestos in California (Van Gosen and Clinkenbeard 2011), the site is not located within a ten-mile radius from an area thought to contain naturally occurring asbestos (NOA).

The EPA Radon Zone for San Bernardino County is Zone 2 with indoor average levels greater than 2 pCi/L and less than 4 pCi/l/ Based on the project site being within Zone 2 and below 4pi/CL in the area, radon is not considered an issue for the proposed school site (EPA, 2019).

5.1.4 Site Accessibility

The site is accessible off of Preserve Loop to the northeast and Market Street to the east.

5.1.5 Proximity to Nearby Receptors

New residential properties are located to the northeast and east of the project site. There is vacant land north of the project site followed by Pine Avenue then a dairy. Fallow land surrounds the rest of the project site.

5.2 FACTORS RELATED TO WATER PATHWAYS

The following sections describe factors related to potential water pathways.

5.2.1 Groundwater Pathway and Surface Water Information

The project site lies within the Chino subbasin of the Upper Santa Ana Valley Groundwater Basin. Local groundwater flow in the Chino subbasin is predominately to the south, toward Prado Dam. According to Wildermuth Environmental (2017), groundwater is about 75 feet below ground surface in the site vicinity. Hydrogeologic investigations were not performed on the site for this investigation; therefore, it is unknown to what extent localized variations in groundwater presence and flow occur on the site.

Cucamonga Creek, located approximately a half mile southeast of the site, is the principal surface water drainage feature in the area.

The City of Chino provides water service to the site and surrounding area, which is supplied from two sources: State Water Project (SWP), and local groundwater (City of Chino 2019). In 2015, 85% of water demands have been met by local supplies, and 15% from the State Water Project (City of Chino 2016). Water service within the City of Chino is provided by the City of Chino Water Utility, Monte Vista Water District and City of Chino Hills. Approximately one-half of the City's water supply is from groundwater from the Chino Basin. In addition to the groundwater wells, the City operates four water treatment facilities. The city of Chino is building a $12 million expansion of its Eastside Water Treatment Facility (EWTF), located in Ontario, increasing capacity from 3,500 gallons per minute, or about 5 million gallons per day, to 7,000 gallons per minute, or about 10 million gallons per day. The expanded plant removes traces of 1,2,3 trichloropropane (TCP). The system also treats nitrates that leaked into groundwater from cow manure and fertilizers from above-ground activities. The plant removes nitrates through ionic exchange. The nitrates are sent to the Inland Empire Utilities Agency's pipeline for treatment.

According to the FEMA Map Service Center website (2008), the project site and the surrounding area are outside of 100-year and 500-year flood zones and is in an area of reduced flood risk due to a levee.

5.2.2 Impacted Aquifers from Site Releases

There are no known site releases.

5.3 FACTORS RELATED TO AIR PATHWAYS

The site is classified as being in climate zone 10 by the California Energy Commission. It is an area that is semi-arid with hot, dry summers and mild winters. The Western Regional Climate Center collected data from Corona from 1981 to 2010. The mean temperature in the area ranges from a low of 50° Fahrenheit (°F) in the winter to a high of 79.5°F in the summer. The average annual precipitation is 12.56 inches per year.

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6. Sampling Activities and Results

This section describes methods and results of the soil sampling activities conducted at the site on November 5, 2020. Figure 4 shows the sampling locations for the project area. Table 1 provides a summary of the sampling and analysis program for the PEA. The Health and Safety Plan used for the site is included in Appendix D.

- Soil sampling and soil vapor probes were installed at the site on November 5, 2020 for the PEA. Soil gas samples were collected on November 6, 2020.
- Forty-four (44) discrete soil samples plus 3 duplicates were collected.
- Sixteen (16) discrete soil gas samples were collected.
- Two 3:1 composite samples, four 4:1 composite samples, and one 3:1 composite sample duplicate were collected from two depths and analyzed for organochlorine pesticides (OCPs) by EPA Method 8081A to assess for potential residual OCPs from historic agricultural operations. Half of the samples analyzed for OCPs were from 0 to 0.5 feet bgs and the other half were collected from 2 to 2.5 feet bgs.
- Four soil samples plus one duplicate sample from 0 to 0.5 feet bgs were analyzed for TPH by EPA Method 8015 to assess potential impacts from the historic agriculture.
- Six soil samples plus one duplicate from 0 to 0.5 feet bgs were analyzed for arsenic by EPA Method 6010B to assess potential impacts from the historic agriculture.
- Sixteen (16) soil gas samples were analyzed from 5.0 to 15.0 feet bgs were analyzed for methane by a Photovac MicroFID on November 6, 2020 and two soil gas samples were submitted to the laboratory for methane analysis by ASTM D1946 to assess potential impacts from the former dairy.

6.1 UTILITY CLEARANCE

Prior to commencement of field activities, Dig Alert was notified of our intent to conduct subsurface investigations at least 48 hours prior to initiation of intrusive field tasks. Dig Alert contacted all utility owners of record within the site vicinity and notified them of our intention to conduct subsurface investigations in proximity to buried utilities. All utility owners of record, or their designated agents, were expected to clearly mark the position of their utilities on the ground surface throughout the area designated for investigation.

6.2 SAMPLING PROCEDURES

Soil samples were collected following protocols described in DTSC's PEA Guidance Manual (DTSC 2015), DTSC's Interim Guidance for Sampling Agricultural Properties (Third Revision) (DTSC 2008), and guidelines provided by the DTSC in Advisory – Active Soil Gas Investigations (DTSC/LARWQCB 2015. The sampling program that was implemented is included in Table 1 and all sampling locations are shown on Figure 4, Sampling Locations. A Professional Geologist was on-site to direct and observe all field activities. DTSC was notified prior to sampling and observed sampling events on November 5 and 6, 2020.

6.2.1 Soil Sampling Methods and Procedures

Soil sampling was conducted by using a truck-mounted direct push drill rig (Geoprobe™). The Geoprobe™ rig advanced acetate lined sample core barrels sleeves to desired depths using a hydraulic ram or pneumatic hammer system. The inside diameter of the core barrel are typically 1.5 to 2.0 inches. The sample barrel was retrieved, and the sample interval was observed, logged and preserved. Soil samples were preserved by placing Teflon™ sheeting and polyethylene caps leaving no headspace and placing them in sealable plastic bags.

Observations pertaining to the soil type were described by the field geologist. Each soil sample was labeled with the sample number, sample depth, and the date and time the sample was collected. Samples were immediately placed in an ice-filled cooler and listed on a chain-of-custody form. Any observation pertaining to potential soil contamination or soil source were recorded. Soil samples will be collected from 0.5 feet and to 2.5 feet below ground surface. Figure 4 shows the sampling locations and Appendix E contains the chain-of-custody form.

6.2.2 Soil Gas Sampling Methods and Procedures

Soil gas samples were collected and analyzed for methane from eight locations. Soil gas sampling and analysis followed the *Advisory - Active Soil Gas Investigations* (DTSC and RWQCB 2015). Sixteen soil gas probes were installed at approximately 5 feet bgs and 15 feet bgs at eight locations and analyzed by a handheld FID for methane. One continuous core was collected and logged by a Professional Geologist. Groundwater was not encountered in any of the soil gas probes.

Soil gas probes were installed using standard Geoprobe™ rods. After the rod was driven to the desired depth using a direct push installation rig, the rod was retracted. The implant was attached to a ¼-inch outer diameter sample line and lowered into the boring. Use of the implant, attached to relatively small diameter Teflon tubing, allows for the soil gas to be sampled with a minimum volume of line purging. A sand pack was poured into the boring, followed by one foot of dry granular bentonite and hydrated bentonite slurry and the probe was allowed to equilibrate for a minimum of two hours prior to sampling

Prior to sampling, a shut-in test was conducted to check for leaks in the above-ground sampling system. The shut-in test was performed on the above ground apparatus by evacuating the line to a vacuum of 100 inches of water, sealing the entire system and watching the vacuum for at least one minute. A Dwyer Magnehelic vacuum gauge attached in parallel to the apparatus measured the vacuum. If there was any observable loss of vacuum, the fittings were adjusted as needed until the vacuum did not change noticeably. The soil gas sample was then collected.

The soil gas probes were allowed to equilibrate a minimum of 17 hours before conducting sampling for methane. Prior to collecting soil gas samples, a magnehelic gauge was connected to the probe sampling port to observe naturally existing soil gas pressures or vacuums beneath the site.

A properly calibrated FID was connected to the probe to collect measurements of methane. At probe locations with the highest methane concentrations, duplicate soil gas samples were collected in Tedlar bags for off-site confirmation analysis.

Field testing was conducted using the following field instruments:

- Photovac MicroFID® Flame Ionization Detector – Calibrated to methane and used to measure low-level methane concentrations (<500 parts per million by volume; ppmv).
- Dwyer Instruments Magnehelic Gauges (0-2, 0-10, and 0-100 in. H2O ranges) – Used to collect pressure/vacuum measurements.

6.3 QUALITY CONTROL SAMPLING PROCEDURES

Field quality control samples associated with the sampling program included duplicate soil samples, equipment blanks, and soil matrix spike/matrix spike duplicate (MS/MSD) samples, in accordance with the DTSC PEA Guidance Manual (DTSC 2015). Duplicate soil samples were collected and analyzed and are listed on Table 1 for soil samples.

Field duplicate samples were collected and analyzed to evaluate sampling and analytical precision. Field duplicates for soil samples were collected at a rate of approximately 10% of the samples collected. The Quality Assurance Project Plan (QAPP) is included in Appendix F.

6.4 DECONTAMINATION PROCEDURES

All equipment that came into contact with the soil was decontaminated consistently to assure the quality of samples collected. Decontamination was conducted prior to and after each use of a piece of equipment. All sampling devices used were decontaminated using the following procedures:

- Non-phosphate detergent and distilled water wash, using a brush; and
- A double deionized/distilled water rinse.

6.5 INVESTIGATIVE-DERIVED WASTE MANAGEMENT

In the process of collecting environmental samples during the field-sampling program, different types of potentially contaminated investigation-derived wastes (IDW) were generated that include the following:

- Used personal protective equipment (PPE);

- Disposable sampling equipment;
- Soil cuttings; and
- Decontamination fluids.

The EPA's National Contingency Plan requires that management of IDW comply with all applicable or relevant and appropriate requirements to the extent practicable. The sampling plan followed the Office of Emergency and Remedial Response Directive 9345.3-02 dated May 1991, which provides the guidance for the management of IDW. In addition, other legal and practical considerations that may affect the handling of IDW will be considered.

Listed below are the procedures that were followed for handling the IDW:

- Used PPE and disposable equipment were double bagged and placed in a municipal refuse dumpster. These wastes are not considered hazardous and can be sent to a municipal landfill.
- Soil cuttings were returned to their original borehole.

6.6 ANALYTICAL RESULTS

Organochlorine pesticide results in soil are summarized in Table 2. Total Petroleum Hydrocarbons (TPH) results in soil are summarized in Table 3. Table 4 is a summary of arsenic results. Methane in soil gas results are summarized in Table 5. Laboratory summary reports for analytes are included in Appendix E.

6.7 DISCUSSION OF RESULTS

6.7.1 Soil Description

Descriptions of the soils encountered and collected during the investigation were recorded by a field geologist. The native soils encountered and collected during the investigation consisted of medium stiff to stiff pale red (2.5YR 6/2) to reddish brown (2.5YR 5/3) to yellowish brown (10YR 5/4) clay. No odors or staining were observed by the field geologist. A soil boring log is included in Appendix G. Groundwater was not encountered. Fill material was not observed in any of the soil borings.

6.7.2 Soil Results

6.7.2.1 ORGANOCHLORINE PESTICIDES

Two OCPs, 4,4,'-DDE and dieldrin, were detected in some of the composite samples. The OCPs were compared to both DTSC SLs and EPA Region 9 RSLs which were identical for the OCPs detected at the site.

4,4'-DDE was detected above the laboratory detection limits in three of the 4:1 composite samples. The lowest concentration of 4,4'-DDE was detected in the 4:1 composite B-4, B-5, B-6, B-10 at 0.5' bgs at 0.0.0025 mg/kg. The maximum concentration of 4,4'-DDE was detected in the 4:1 composite B-7, B-9, B-12, B-14 at 0.5' bgs at 0.005 mg/kg. The EPA RSL and DTSC SL for 4,4'-DDE adjusted for a 4:1 composite is 0.50 mg/kg. All the concentrations of 4,4'-DDE detected are below the screening levels for residential exposure adjusted for the number of samples in the composite.

Dieldrin was detected above the laboratory detection limit in one of the 4:1 composite samples and one of the 3:1 composite samples. The lowest concentration of dieldrin was detected in the 4:1 composite B-7, B-9, B-12, B-14 at 0.5' bgs at 0.0.0025 mg/kg. The maximum concentration of dieldrin was detected in the 3:1 composite B-20, B-21, B-22 at 0.5' bgs at 0.0076 mg/kg. The EPA RSL and DTSC SL for dieldrin adjusted for a 3:1 composite is 0.011 mg/kg and for a 4:1 composite is 0.0085 mg/kg. All the concentrations of dieldrin detected are below the EPA and DTSC screening levels for residential exposure adjusted for the number of samples in the composite.

Table 2 is a summary of the organochlorine pesticides detected at the site and their EPA and DTSC screening levels. Appendix E contains the laboratory reports.

6.7.2.2 **TPH**

TPH was not detected above the laboratory detection limits in the four soil samples and one duplicate soil sample collected at 0 to 0.5 feet bgs. TPH results are summarized on Table 3. Laboratory reports for TPH analysis are included in Appendix E.

6.7.2.3 **ARSENIC**

Arsenic was not detected above the laboratory detection limits in the six soil samples and one duplicate soil sample analyzed. Arsenic results are summarized in Table 4 and laboratory reports for arsenic analysis are included in Appendix E.

6.7.3 Soil Gas Results

Soil gas probes were installed at eight (8) locations between 5' and 15' bgs. Sixteen (16) soil gas samples were analyzed in the field for methane by MicroFID and two samples were analyzed for methane by ASTM D1946.

Methane was detected in the field at 22.9 ppmv (parts per million by volume) in SG-4 at 5.0 feet bgs, below the screening level of 5,000 ppmv for methane. There were no other detects of methane in the soil gas samples. The two soil gas samples submitted to the laboratory for methane analysis by ASTM D1946 were below the laboratory reporting limit for methane. Table 5 is a summary table of methane results. Laboratory reports for methane analysis are included in Appendix E.

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7. Human Health Screening Evaluation

A human health screening assessment was conducted to evaluate the potential threat to human health at the project site. The established PEA screening process was used to determine if there are levels of contamination at the site that may cause a concern about effects on human health. The purpose of the human health risk screening evaluation was to assess whether levels of contaminants in soil at the site could pose a threat to human health under conservative (health-protective) exposure assumptions. The PEA requires a residential land use scenario regardless of current use and zoning.

7.1 CONCEPTUAL SITE MODEL

The potentially complete soil exposure pathways include soil ingestion, dermal exposure to soil, and inhalation of particulates detected in soil. Potentially exposed populations for the site include on-site school age children and employees based on future land use plans. In addition, consistent with DTSC guidance, future unrestricted/residential land use was considered as the most health-protective and conservative land use for the assessment and hypothetical future onsite residents were also evaluated. In order to estimate what the potential exposures may be under current and future land use plans; risk calculations were conducted using the data that were collected for this investigation.

Figure 5 is the conceptual site model for the site. The primary sources of chemicals of concern for the site are from the historic land uses discussed in Section 3. The exposure assumptions for the resident assumes that exposure will occur 24 hours per day for seven days a week for 350 days per year for 26 years. This exposure scenario is very health protective for a school site where teachers, students and staff may occupy the site for a maximum of 250 days per year for eight to nine hours per day.

7.2 CHEMICALS OF CONCERN SELECTION

The chemicals of concern (COCs) for the site that were evaluated in the PEA screening risk assessment have been identified based on-site history, sampling results, DTSC guidance and protocol. Some composite samples had levels of 4,4'-DDE, and dieldrin above laboratory reporting levels, but below EPA and DTSC Screening Levels (Table 2) and were carried forward into the screening level assessment. Because TPH and arsenic were non detect in all samples analyzed and methane was detected in one sample below DTSC's level of concern they were not carried forward in the risk analysis.

7.3 SOIL EVALUATION FOR ORGANOCHLORINE PESTICIDES

The concentrations of the two pesticides detected do not exceed the EPA RSLs or DTSC SLs. A summary table is provided below showing the highest reported pesticide concentration at the site and the corresponding screening level.

Carcinogenic Risk Residential Exposure Using Maximum Concentrations in Soil

Chemical	Maximum Concentration mg/kg	Number of Samples in Composite	RSL mg/kg	RSL adjusted for number of samples in composite	Conc./RSL
4,4'-DDE	0.005	4	2	0.5	0.1
Dieldrin	0.0076	3	0.034	0.011	0.69
Total Risk					**7.9-07**

The estimated cancer risk for the site using the maximum detected concentration assuming a residential land use exposure scenario is 7.9E-07, below the level of concern of 1.0E-06.

Hazard Index Residential Exposure Using Maximum Concentrations in Soil

Chemical	Maximum Concentration mg/kg	Number of Samples in Composite	RSL for Noncancer Risk mg/kg	RSL adjusted for composite	Conc./RSL
4,4'-DDE	0005	4	23	5.75	0.00087
Dieldrin	0.011	3	3.2	1.07	0.0071
Total Hazard					**0.008**

The cumulative hazard index (HI) for noncarcinogenic risk for exposure to organochlorine pesticides in soil was significantly less than 1 using the maximum concentration for a residential exposure scenario. A total HI of 1 or less indicates that there is no cause of concern for adverse noncarcinogenic health effects.

The concentrations of the pesticides at the site do not pose a significant health risk to future users of the site under the most conservative assumptions using a residential land use exposure scenario and maximum reported concentrations reported. The pesticides were reported infrequently, and the risk analysis conservatively assumes that the highest reported concentrations are located throughout the site.

7.4 UNCERTAINTY ANALYSIS

The data collected are subject to uncertainty associated with sampling and analysis. These data are presented in other parts of the PEA. In the analysis it was assumed that samples collected were representative of conditions to which various populations may be exposed. However, the collected samples may not be completely representative due to biases in sampling and to random variability of samples. In general, sampling was biased toward areas of known and suspected elevated chemical concentrations, which will lead to an overestimation of risk when these results are assumed to represent a larger area. The placement of soil borings was in part, purposely biased to detect and characterize potential hot spots of soil based on historical site use. This type of sampling approach is likely to overestimate the chemical concentrations to which a receptor would be exposed and the potential health impact to the receptors evaluated.

7. Human Health Screening Evaluation

Samples were analyzed using California State Certified Laboratory procedures and were subjected to limited review, to obtain data suitable for decision-making. However, it should be understood that sample analysis is subject to uncertainties associated with precision, accuracy and detection of chemicals at low concentrations.

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8. Ecological Screening Evaluation

8.1 SITE CHARACTERIZATION

Based on visual observations during the site visit and information provided by the District, vacant land used to stage construction equipment for the residential developed northeast of the project site. Prior to being vacant land, the site had been used for irrigated rows crops from at least 1931until 1985. From 1985 until approximately 2009 the project site was part of a dairy. The area is disturbed and does not support wildlife habitats.

8.2 BIOLOGICAL CHARACTERIZATION

The site is a disturbed area that has been developed and does not support wildlife habitats.

8.3 ECOLOGICAL PATHWAY ASSESSMENT

No assessment of potential exposures to sensitive ecological receptors is necessary based on the lack of chemicals of concern for the site.

8.4 ECOLOGICAL SCREENING EVALUATION SUMMARY

An ecological screening evaluation was not conducted for the site because of the lack of wildlife habitats and because chemicals of concern were not reported for the site.

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9. Quality Assurance/Quality Control (QA/QC) Implementation

The QA/QC Program was implemented in accordance with the DTSC PEA Guidance Manual (DTSC 2015). The primary quality control features of the QA/QC program include the collection and analysis of field quality control samples and the data validation. The Quality Assurance Project Plan is included as Appendix F.

Quality control samples collected in the field included duplicate samples and equipment rinseate blanks as described in Section 6. The data for these quality control samples were reviewed as part of the data validation process, along with results from laboratory quality control analyses. Data validation was performed in compliance with DTSC's PEA Guidance Manual, using protocols consistent with the USEPA National Functional Guidelines (DTSC 2015). Each sample was analyzed for the specified suite of analyses presented in Section 6. Data from each of the analyses were evaluated with respect to the quality control criteria listed below. Data for the project as a whole were evaluated in terms of completeness.

- Holding times;
- Field blanks;
- Laboratory method and calibration blanks;
- Initial and continuing calibrations;
- System monitoring compounds (surrogates - organic analyses only);
- Laboratory control samples (LCS) and LCS duplicate samples (LCSD) - as applicable;
- Matrix spikes (MS)/Matrix spike duplicates (MSD);
- Field replicates/confirmatory samples; and
- Compound identification and quantitation.

Data quality for the project is very good, and the data collected are of acceptable quality for use in the screening evaluation.

Results from the field duplicate samples indicate appropriate sample collection and handling procedures were implemented, and that laboratory analytical precision was also acceptable.

9. Quality Assurance/Quality Control (QA/QC) Implementation

Data validation qualifier flags have been added to those data that did not meet acceptance criteria as defined in School Quality Assurance Project Plans. Results of the validation indicate that all samples collected and analyzed are useful in characterizing the site and assessing the human health and ecological risks for the site. No detectable concentrations were qualified as rejected (R) or were considered to be unusable based on the validation evaluation. Data qualified as estimated (J/UJ) exhibited some bias during analysis and should be considered as an approximate measure of the respective analyte concentration. Qualified data are presented along with the data results in the analytical summary tables provided in this report.

Field activities were observed to be conducted in a manner consistent with the QA/QC procedures presented in the DTSC PEA Guidance Manual (DTSC 2015). No findings were identified that significantly affect the quality of the samples collected or the resulting data evaluation.

9.1 DATA VALIDATION

Data validation was performed for all samples submitted as part of PlaceWorks' evaluation of soil. A&R Laboratories, Inc. was the lead laboratory for the PEA and performed the required soil analyses.

Validation was performed in accordance with the general guidance provided in the USEPA Functional Guidelines for Evaluating Inorganic Analyses (USEPA 1994) and in accordance with the professional judgment of the validation team. Validation was performed to assess analytical performance in terms of the DQOs accuracy, precision, sensitivity, and completeness. Comparability and representativeness DQOs for the samples collected are addressed by the correct implementation of the procedures defined in the sampling and analysis plan.

A summary of the validation program, in terms of the DQOs listed above, is provided in the following sections. Data qualifiers assigned to results, if required, were as follows:

A. Result is estimated due to failure to meet one of the DQO criteria associated with the sample result or associated sample batch. Results reported at concentrations below standard laboratory reporting limits, but above method detection limits, were flagged "J" by the laboratory, or "B" in the case of metals. These data are validated as J/estimated because they are below the reliable quantitation limits determined by the laboratory.

U. Result is qualified as not detected at the reported value. This qualifier is used when results from blank analyses indicate that detections in associated samples may be biased high due to potential contaminant conditions in the field or laboratory.

UJ. Result is qualified as not detected at the reported value, and the value is determined to be estimated. This qualifier commonly results when quality control failures are associated with analytes that are not detected, or when detections are qualified "U" due to blank contamination combined with a "J" qualifier resulting from another QC problem.

R. Result is rejected due to severe QC failure, or due to multiple lessor QC problems that are determined to be additive.

9.2 ACCURACY

Accuracy was evaluated by assessing the results of holding times, field and laboratory blanks, initial and continuing calibrations, surrogate spike recoveries (organic analyses), LCS recoveries, MS analyses, and interference check samples (metals by inductively coupled plasma).

Frequency and control criteria for initial and continuing calibration verifications were met. The method blank data showed non-detectable levels for all constituents. MS and MSD were performed at the required frequencies. All recoveries were within acceptable limits. LCS analysis was performed at required frequencies and all recoveries were within acceptable limits. Surrogate recoveries for all samples were within acceptable control limits.

9.3 PRECISION

Precision was evaluated by assessing the results between MS and MSD analyses, LCS and LCSD analyses, between laboratory duplicate analyses. The precision DQO was generally satisfied for the samples collected during the project. Precision was evaluated as the relative percent difference (RPD) between control sample results. RPD criteria reported by the laboratory were used to assess precision. RPDs were within the appropriate control limits and precision is considered acceptable.

9.4 SENSITIVITY

Sensitivity was addressed by ensuring that the reporting limits provided by the laboratories met those as requested in the workplans and task orders provided to the laboratory. Data were qualified in cases where results were reported at concentrations below standard laboratory reporting limits, but above the method detection limits that may have been required to meet the sensitivity requirements for the project. Such results were flagged by the laboratory as either J or B qualified data. These data retain a J/estimated qualifier due to potential decreased reliability at low concentration levels.

9.5 COMPLETENESS

Completeness is an evaluation of the overall sampling program with respect to data generated that is usable versus data that may have been rejected. No data was rejected during the data validation process for this project. The completeness objectives (minimum 90 percent) for this project are therefore considered to be satisfied for all analyses.

9.6 DATA VALIDATION CHART

The following table is a summary of pertinent quality indicators that were verified during the data validation process.

9. Quality Assurance/Quality Control (QA/QC) Implementation

QUALITY INDICATOR	ACCEPTABILITY SOIL EPA Method 6010B Target Analyte: Arsenic	ACCEPTABILITY SOIL EPA Method 8081A Target Analyte: 4,4'-DDT
Completeness of Laboratory Reports (e.g., laboratory, client, and sample identifications; ELAP certification number, project name, sample matrix, sample collection, preservation, preparation, extraction, analysis dates; analytical methods; analytes; reporting units and limits; dilution factors; report page numbering system; designated title and signatures)	Y See discussion above	Y See discussion above
Reporting Limit (RL)	Y 1 mg/kg for ARL	Y 0.0020 mg/kg for ARL
Chain of Custody	Y	Y
Sample Containers and Conditions	Y	Y
Holding Time (<28 days)	Y	Y
Sample Preservation	Y	Y
Equipment Rinsate Blanks	Y	Y
Field Duplicates	Y	Y
Field QC Samples – Others	NA	NA
Surrogate Recoveries	NA	NA
Method Blanks	Y	Y
LCS % Recovery	Y	Y
MS/MSD % Recovery	See discussion above	See discussion above
MS/MSD % RPD	See discussion above	See discussion above
Laboratory Duplicates	See discussion above	See discussion above
Laboratory QC Samples – Others	NA	NA
Compound Identification	Y	Y
Compound Quantitation	Y	Y
Dilution Factors	Y	Y
Data Qualifiers	Y	Y
Confirmation of Positive Samples	NA	NA
Observations of Significance	NA	NA
Case Narrative	Y	Y
Instrument Tuning	NA	NA
Initial Calibration	Lab	Lab
Calibration Verification	Lab	Lab
Interference Check Standard	NA	NA
Others	NA	NA

NOTES:
Y = acceptable or in compliance
NA = not applicable
Lab = responsible by the Laboratory

10. HASP Implementation

PlaceWorks prepared a site-specific HASP pursuant to Health and Safety Code 1910.120. The plan addressed the following:

- Identification and description of potentially hazardous substances that may be encountered during field operations;
- PPE and clothing for site activities; and
- Measures that need to be implemented in the event of an emergency.

PlaceWorks field personnel reviewed the HASP prior to commencing fieldwork. Prior to initiation of field activities each day, a site safety briefing was conducted to identify potential physical and chemical hazards and measures to be taken in event of an emergency. All on-site personnel were required to sign the site safety briefing form.

During field activities, all personnel within the exclusion zone wore appropriate level D PPE. A copy of the HASP is contained in Appendix D.

10. HASP Implementation

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11. Field Variances

Soil sampling was conducted on the project area in general accordance with the approved work plan, PEA Guidance Manual (DTSC 2015), and Interim Guidance for Sampling Agricultural Properties (Third Revision) (DTSC 2008).

11. Field Variances

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12. Evaluations of Applicable or Relevant Laws and Regulations Pertaining to School Sites

State of California Department of Education Code Section 17213 and Public Resources Code 21151.8 prohibit the approval of a project involving the purchase of a school site or the construction of a new elementary or secondary school by a school district unless the district first determines whether the site is:

- The site of a current or former hazardous waste disposal site or solid waste disposal site and, if so, whether the wastes have been removed.
- A hazardous substance release site identified by the State Department of Health Services in a current list adopted pursuant to Section 25356 for removal or remedial action pursuant to Chapter 6.8 (commencing with Section 25300) of Division 20 of the Health and Safety Code.
- A site which contains one or more pipelines, situated underground or aboveground, which carries hazardous substance, acutely hazardous materials or hazardous wastes, unless the pipeline is a natural gas line which is used only to supply natural gas to that school or neighborhood.
- In addition, the school district must contact the local air pollution control district to identify any facilities located within ¼-mile of the proposed school site that might reasonably be anticipated to emit hazardous emissions or handle hazardous materials, substances or waste. If any facilities exist within the ¼-mile the district must be able to make a written finding that:

  a) The health risks from the facilities do not and will not constitute an actual or potential endangerment of public health to persons who attend or are employed at the proposed school; or

  b) If potential hazards exist and have been identified, corrective measures can be implemented that mitigate air emissions to levels that do not constitute an actual potential endangerment of public health to persons who would attend or be employed at the proposed school.

For this proposed school site, a records search of any hazardous waste/substance storage, treatment, or disposal activities at the site and within a ¼-mile of the site was conducted. No evidence of the site being used as a solid waste or hazardous waste disposal site was found. There was no indication that aboveground or underground pipelines are located on the school site.

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13. Conclusions and Recommendations

After reviewing and analyzing the analytical and human health screening evaluation results of this PEA, PlaceWorks concludes the following with respect to the site:

- Soil sampling occurred and soil vapor probes were installed at the site on November 5, 2020 for the PEA. Soil gas samples were collected on November 6, 2020.
- Forty-four (44) discrete soil samples plus 3 duplicates were collected.
- Sixteen (16) discrete soil gas samples were collected.
- Two 3:1 composite samples, four 4:1 composite samples, and one 3:1 composite sample duplicate were collected from two depths and analyzed for organochlorine pesticides (OCPs) by EPA Method 8081A to assess for potential residual OCPs from historic agricultural operations. Half of the samples collected for OCP analysis were from 0 to 0.5 feet bgs and the other half were collected from 2 to 2.5 feet bgs.
- Four soil samples plus one duplicate sample from 0 to 0.5 feet bgs were analyzed for Total Petroleum Hydrocarbons (TPH) by EPA Method 8015 to assess the historic agriculture.
- Six soil samples plus one duplicate from 0 to 0.5 feet bgs were analyzed for arsenic by EPA Method 6010B to assess the historic agriculture.
- Sixteen soil gas samples were analyzed from eight locations at two depths, 5 and 15 feet bgs on November 6, 2020. All soil gas samples were analyzed in the field with a FID and two soil gas samples were submitted to a laboratory for methane analysis by ASTM D1946.

The results of the field program are summarized below:

- Fill material was not encountered in any of the borings at the site.
- Two OCPs (4,4'-DDE and dieldrin) were detected in the composite soil samples. All OCP concentrations were below residential screening levels adjusted for the number of samples that comprised the composite.
- TPH were not detected above the laboratory detection limits in the four soil samples and one duplicate soil sample analyzed.

- Arsenic was not detected above the laboratory detection limits in the six soil samples and one duplicate soil sample analyzed.

- Methane was detected in one soil gas sample in the field collected from 5.0 feet bgs at a low concentration of 22.0 ppmv.

- The human health risk screening showed that chemical concentrations would not be a risk to human health or the environment under an unrestricted residential land use scenario.

- Laboratory data obtained were validated to assure that Data Quality Objectives (DQOs) were met, and the data were suitable for use in a human health and ecological screening evaluation.

13.1 RECOMMENDATIONS

The results of the PEA support the following conclusions and recommendations:

Based on the PEA objectives, the environmental quality goals of the District, and the results of the PEA investigation, PlaceWorks has determined that no further assessment is required for the site. Per California Education Code Section 17213.1, Section 3, PlaceWorks concludes that no further assessment of the site is necessary and is requesting an approval of the PEA.

14. References

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14. References

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Tables

Tables

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TABLE 1
PEA SAMPLING AND ANALYSIS PROGRAM
Proposed Preserve School #2
Chino Valley Unified School District
Chino, California

Sample Number	Depth (feet bgs)	Rationale	EPA 8081A OCPs	EPA 6010B Arsenic	TPH by EPA Method 8015	Methane by FID
Matrix			**Soil**			**Soil Gas**
B-1	0.5'	Former Agriculture	C (B-1, B-2, B-3)			
	2.5'		C (B-1, B-2, B-3)			
B-1 DUP	0.5'	Duplicate	C DUP (B-1 DUP, B-2 DUP, B-3 DUP)			
B-2	0.5'	Former Agriculture	C (B-1, B-2, B-3)			
	2.5'		C (B-1, B-2, B-3)			
B-2 DUP	0.5'	Duplicate	C DUP (B-1 DUP, B-2 DUP, B-3 DUP)			
B-3	0.5'	Former Agriculture	C (B-1, B-2, B-3)	D	D	
	2.5'		C (B-1, B-2, B-3)			
B-3 DUP	0.5'	Duplicate	C DUP (B-1 DUP, B-2 DUP, B-3 DUP)	D DUP	D DUP	
B-4	0.5'	Former Agriculture	C (B-4, B-5, B-6, B-10)	D		
	2.5'		C (B-4, B-5, B-6, B-10)			
B-5	0.5'	Former Agriculture	C (B-4, B-5, B-6, B-10)			
	2.5'		C (B-4, B-5, B-6, B-10)			
B-6	0.5'	Former Agriculture	C (B-4, B-5, B-6, B-10)			
	2.5'		C (B-4, B-5, B-6, B-10)			
B-7	0.5'	Former Agriculture	C (B-7, B-9, B-12, B-14)			
	2.5'		C (B-7, B-9, B-12, B-14)			
B-8	0.5'	Former Agriculture	C (B-8, B-11, B-13, B-16)			
	2.5'		C (B-8, B-11, B-13, B-16)			
B-9	0.5'	Former Agriculture	C (B-7, B-9, B-12, B-14)	D		
	2.5'		C (B-7, B-9, B-12, B-14)			
B-10	0.5'	Former Agriculture	C (B-4, B-5, B-6, B-10)			
	2.5'		C (B-4, B-5, B-6, B-10)			
B-11	0.5'	Former Agriculture	C (B-8, B-11, B-13, B-16)		D	
	2.5'		C (B-8, B-11, B-13, B-16)			
B-12	0.5'	Former Agriculture	C (B-7, B-9, B-12, B-14)			
	2.5'		C (B-7, B-9, B-12, B-14)			
B-13	0.5'	Former Agriculture	C (B-8, B-11, B-13, B-16)	D	D	
	2.5'		C (B-8, B-11, B-13, B-16)			
B-14	0.5'	Former Agriculture	C (B-7, B-9, B-12, B-14)			
	2.5'		C (B-7, B-9, B-12, B-14)			
B-15	0.5'	Former Agriculture	C (B-15, B-17, B-18, B-19)	D		
	2.5'		C (B-15, B-17, B-18, B-19)			
B-16	0.5'	Former Agriculture	C (B-8, B-11, B-13, B-16)		D	
	2.5'		C (B-8, B-11, B-13, B-16)			
B-17	0.5'	Former Agriculture	C (B-15, B-17, B-18, B-19)			
	2.5'		C (B-15, B-17, B-18, B-19)			
B-18	0.5'	Former Agriculture	C (B-15, B-17, B-18, B-19)			
	2.5'		C (B-15, B-17, B-18, B-19)			
B-19	0.5'	Former Agriculture	C (B-15, B-17, B-18, B-19)			
	2.5'		C (B-15, B-17, B-18, B-19)			
B-20	0.5'	Former Agriculture	C (B-20, B-21, B-22)			
	2.5'		C (B-20, B-21, B-22)			

TABLE 1
PEA SAMPLING AND ANALYSIS PROGRAM
Proposed Preserve School #2
Chino Valley Unified School District
Chino, California

Sample Number	Depth (feet bgs)	Rationale	EPA 8081A OCPs	EPA 6010B Arsenic	TPH by EPA Method 8015	Methane by FID
B-21	0.5'	Former Agriculture	C (B-20, B-21, B-22)			
	2.5'		C (B-20, B-21, B-22)			
B-22	0.5'	Former Agriculture	C (B-20, B-21, B-22)	D		
	2.5'		C (B-20, B-21, B-22)			
SG-1	5'	Former Dairy				D
	15'					D
SG-2	5'	Former Dairy				D
	15'					D
SG-3	5'	Former Dairy				D
	15'					D
SG-4	5'	Former Dairy				D*
	15'					D
SG-5	5	Former Dairy				D
	15'					D
SG-6	5'	Former Dairy				D
	15'					D
SG-7	5'	Former Dairy				D
	15'					D*
SG-8	5'	Former Dairy				D
	15'					D
EB	n/a		1 EB	1 EB		
Total			**12 C, 1 C DUP, 1 EB**	**6 D, 1 D DUP, 1 EB**	**4 D, 1 D DUP, 1 EB**	**16 D**

Notes:

D = Discrete; C = Composite; DUP -= Duplicate Samples; EB = Equipment Blank

Duplicates collected at a frequency of approximately 10%

*D replicate soil gas samples will analyzed for methane by fixed laboratory.

TABLE 2
SUMMARY TABLE OF ORGANOCHLORINE PESTICIDES IN SOIL
Proposed Preserve School #2
Chino Valley Unified School District
Chino, California

			Concentration (milligrams per kilogram [mg/kg])			
Sample Number	**Depth (feet bgs)**	**Sample Date**	**4,4´-DDD**	**4,4´-DDE**	**4,4´-DDT**	**Dieldrin**
B-1, B-2, B-3	0.5'	11/5/2020	<0.0020	<0.0020	<0.0020	<0.0020
	2.5'		<0.0020	<0.0020	<0.0020	<0.0020
B-1 DUP, B-2 DUP, B-3 DUP	0.5'	11/5/2020	<0.0020	<0.0020	<0.0020	<0.0020
B-4, B-5, B-6, B-10	0.5'	11/5/2020	<0.0020	<0.0020	<0.0020	<0.0020
	2.5'		<0.0020	**0.0025**	<0.0020	<0.0020
B-7, B-9, B-12, B-14	0.5'	11/5/2020	<0.0020	**0.005**	<0.0020	**0.0025**
	2.5'		<0.0020	**0.0041**	<0.0020	**0.003**
B-8, B-11, B-13, B-16	0.5'	11/5/2020	<0.0020	<0.0020	<0.0020	<0.0020
	2.5'		<0.0020	<0.0020	<0.0020	<0.0020
B-15, B-17, B-18, B-19	0.5'	11/5/2020	<0.0020	<0.0020	<0.0020	<0.0020
	2.5'		<0.0020	<0.0020	<0.0020	<0.0020
B-20, B-21, B-22	0.5'	11/5/2020	<0.0020	<0.0020	<0.0020	<0.0020
	2.5'		<0.0020	<0.0020	<0.0020	**0.0076**
Maximum Concentration Detected			ND	0.005	ND	0.0076
DTSC SL/EPA Region 9 RSLs			2.3	2	1.9	0.034
EPA Region 9 RSLs for 3:1 Composite			0.76	0.66	0.63	0.011
EPA Region 9 RSLs for 4:1 Composite			0.575	0.5	0.475	0.0085

Notes:

< - Non detect at the established method detection limit.

* Screening level for endrin aldehyde and endrin ketone was developed for endrin

A highlighted cell indicates levels are elevated above agency screening levels

EPA= Environmental Protection Agency, RSL= Regional Screening Levels

DTSC= Department of Toxic Substances Control, SLs= Screening Levels

Samples analyzed by EPA Method 8081A

EPA Region 9 Regional Screeening Level Nov 2020 Residential soil in mg/kg; DTSC SLs 2020 residential soil mg/kg

The complete laboratory analytical reports are included in Appendix E.

TABLE 3
SUMMARY TABLE OF TPH IN SOIL
Proposed Preserve School #2
Chino Valley Unified School District
Chino, California

Concentration (milligram per kilogram [mg/kg])					
Sample Number	**Sample Depth**	**Sample Date**	**C4-C12**	**C13-C22**	**C23-C40**
B-3	0.5'	11/5/2020	<0.20	<10	<20
B-3 DUP	0.5'	11/5/2020	<0.20	<10	<20
B-11	0.5'	11/5/2020	<0.20	<10	<20
B-13	0.5'	11/5/2020	<0.20	<10	<20
B-16	0.5'	11/5/2020	<0.20	<10	<20

Notes:

< - Non detect at the established method detection limit.

Samples analyzed by EPA Method 8015 B

The complete laboratory analytical reports are included in Appendix E.

TABLE 4
SUMMARY TABLE OF ARSENIC IN SOIL
Proposed Preserve School #2
Chino Valley Unified School District
Chino, California

Concentration (milligrams per kilogram [mg/kg])			
Sample Number	**Sample Depth**	**Sample Date**	**Arsenic**
B-3	0.5'	11/5/2020	<1.00
B-3 DUP	0.5'	11/5/2020	<1.00
B-4	0.5'	11/5/2020	<1.00
B-9	0.5'	11/5/2020	<1.00
B-13	0.5'	11/5/2020	<1.00
B-15	0.5'	11/5/2020	<1.00
B-22	0.5'	11/5/2020	<1.00
DTSC SL			12

Notes:

< - Non detect at the established method detection limit.

DTSC= Department of Toxic Substances Control, SL= Screening Level

The complete laboratory analytical reports are included in Appendix E.

TABLE 5
SUMMARY TABLE OF METHANE IN SOIL GAS
Proposed Preserve School #2
Chino Valley Unified School District
Chino, California

			Concentration (Parts per million by volume [PPMV])	
Sample Number	**Sample Date**	**Sample Depth**	**Methane by MicroFID**	**Methane by ASTM D1946**
SG-1	11/6/2020	5.0'	<0.5	NA
	11/6/2020	15.0'	<0.5	NA
SG-2	11/6/2020	5.0'	<0.5	NA
	11/6/2020	15.0'	<0.5	NA
SG-3	11/6/2020	5.0'	<0.5	NA
	11/6/2020	15.0'	<0.5	NA
SG-4	11/6/2020	5.0'	**22.9**	<5000
	11/6/2020	15.0'	<0.5	NA
SG-5	11/6/2020	5.0'	<0.5	NA
	11/6/2020	15.0'	<0.5	NA
SG-6	11/6/2020	5.0'	<0.5	NA
	11/6/2020	15.0'	<0.5	NA
SG-7	11/6/2020	5.0'	<0.5	NA
	11/6/2020	15.0'	<0.5	NA
SG-8	11/6/2020	5.0'	<0.5	<5000
	11/6/2020	15.0'	<0.5	NA
Maximum Concentration Detected			22.9	<5000

NA: Not applicable

< - Non detect at the established method detection limit.

The complete laboratory analytical reports are included in Appendix E.

Figures

Figures

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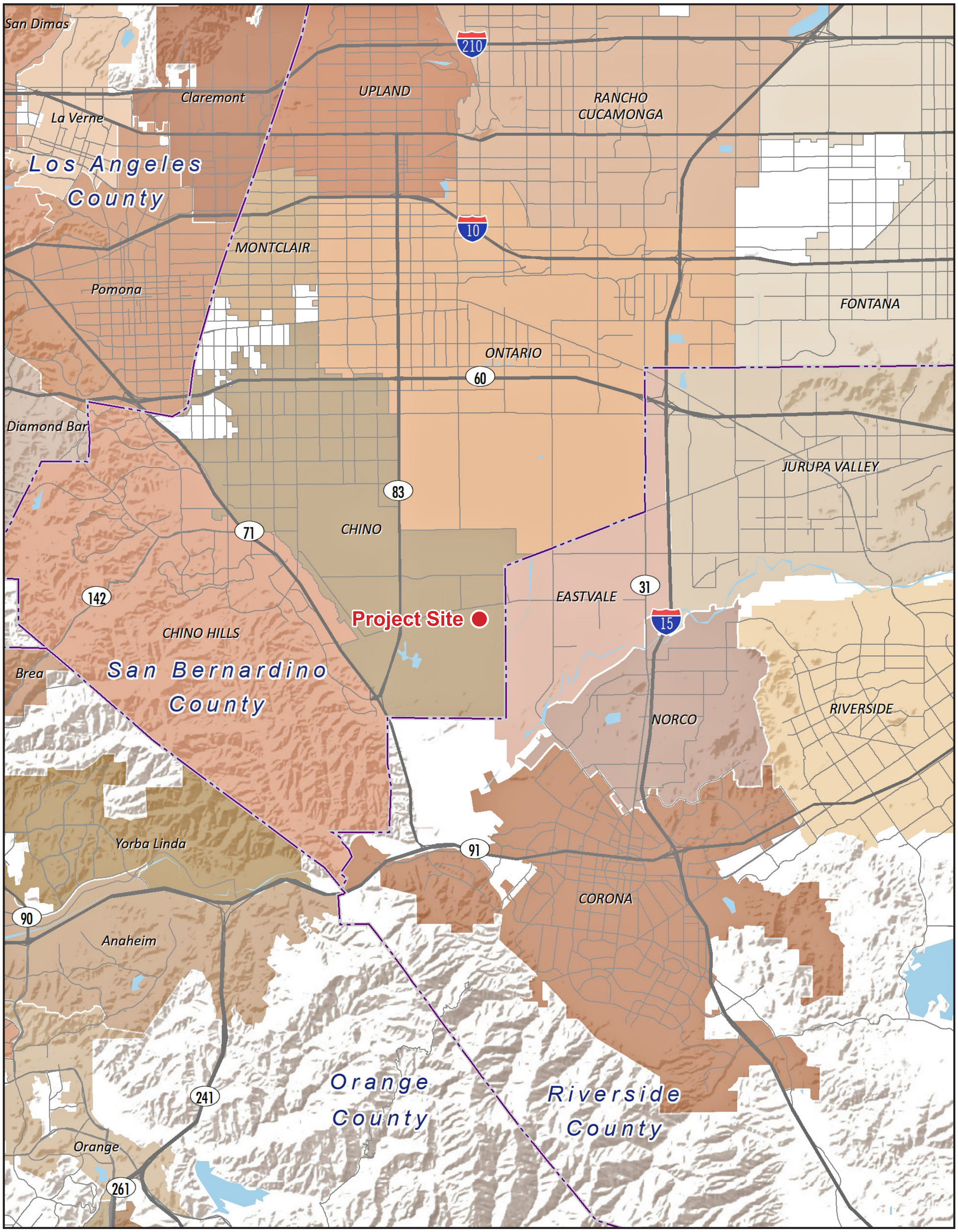
Figure 1 - Regional Location

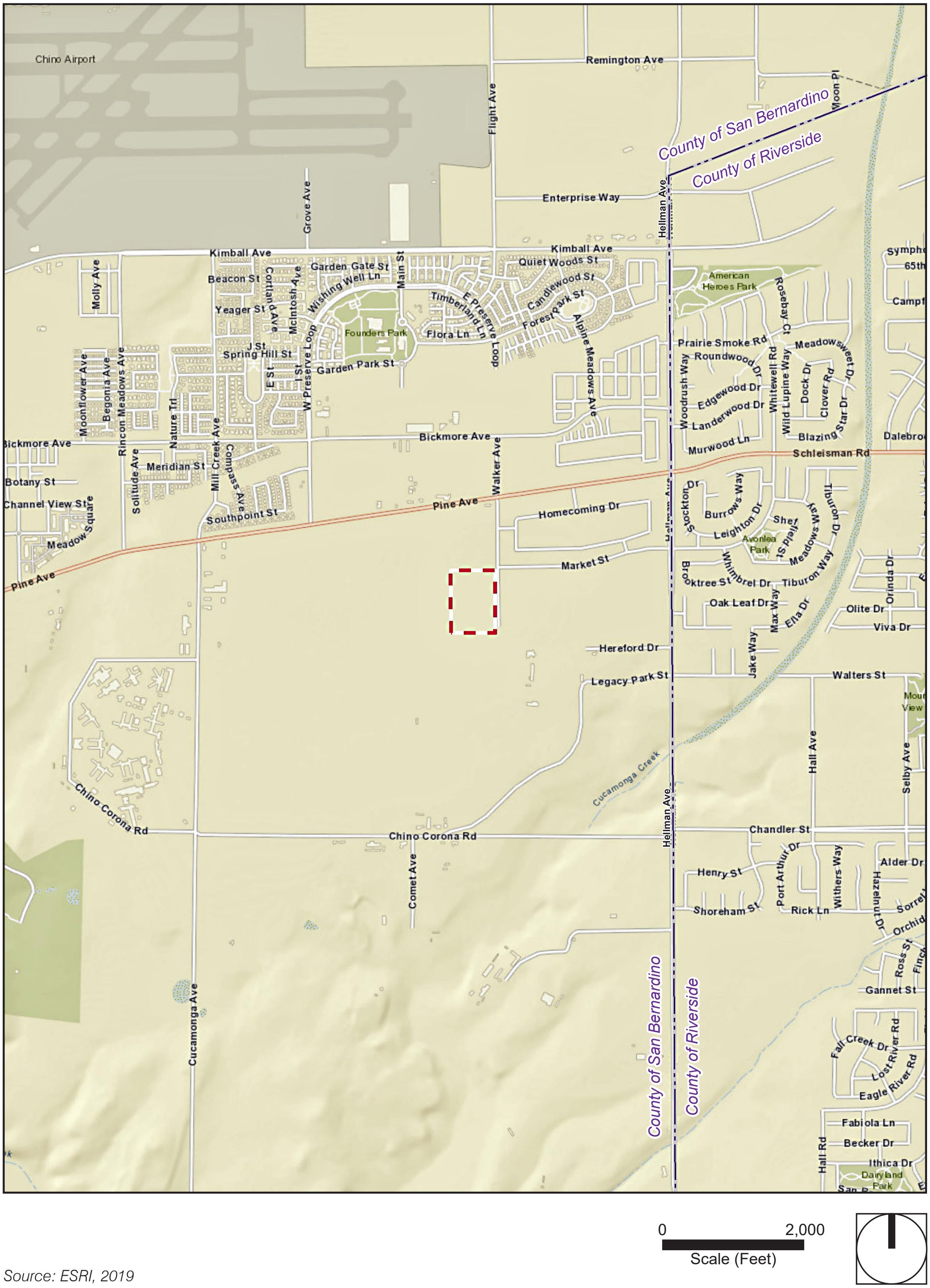


Note: Unincorporated county areas are shown in white.

Source: ESRI, 2019

PlaceWorks

Figure 2 - Local Vicinity

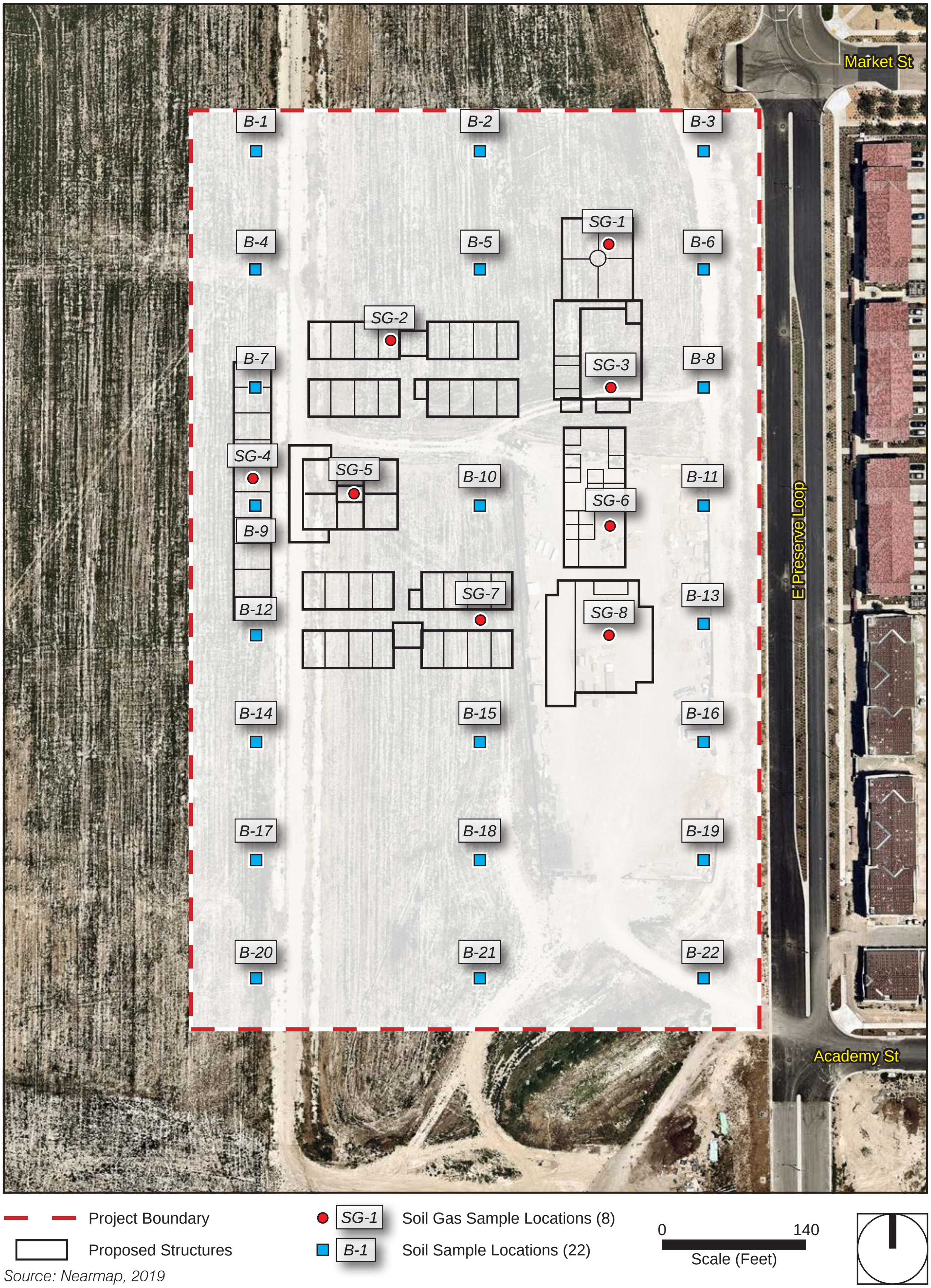


Source: ESRI, 2019

Figure 3 - Aerial Photograph

Source: Nearmap, 2019

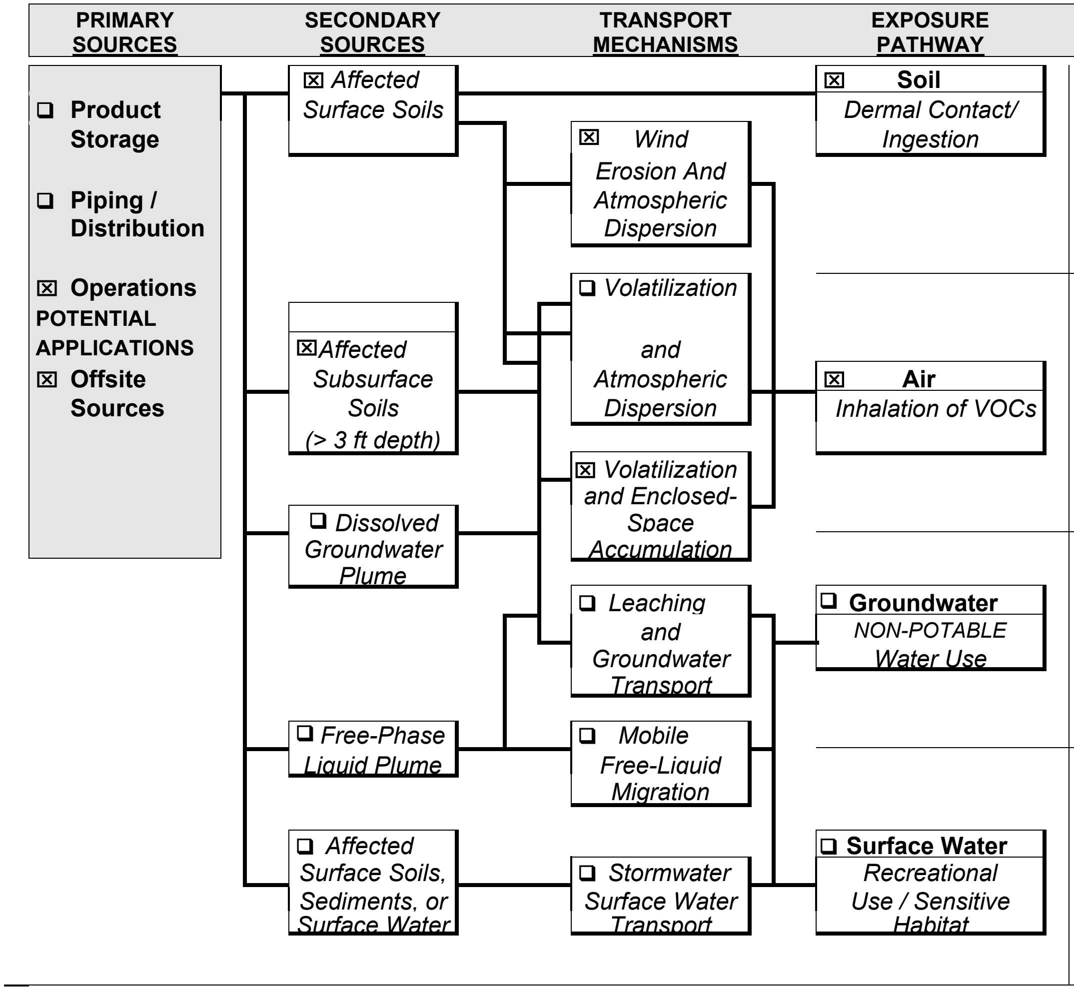
Figure 4 - Sampling Locations



Source: Nearmap, 2019

FIGURE 5 **CONCEPTUAL SITE MODEL**

Proposed Preserve #2 Elementary School
Chino Valley Unified School District
Chino, California



EXPOSURE ROUTES/POTENTIAL RECEPTORS

Exposure Route	Potential Receptor
INGESTION	+
INHALATION	0
DERMAL	+

INGESTION	0
INHALATION	+
DERMAL	0

INGESTION	0
INHALATION	0
DERMAL	0

INGESTION	0
INHALATION	0
DERMAL	0

0 INDICATES INCOMPLETE PATHWAY
+ INDICATES COMPLETE PATHWAY

Appendix A. Site Photographs

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PLACEWORKS	SITE PHOTOGRAPHS

Client Name:	Chino Valley Unified School District
Site Location:	Southwest corner of East Preserve Loop and Market Street, Chino, California
Project No.:	CVUS-06.0

Photo No:	Date:
1	11/5/2020

Description:

View of northern portion of the site, looking east.

Photo No:	Date:
2	11/5/2020

Description:

View of eastern portion of the site, looking south.

Client Name:	Chino Valley Unified School District
Site Location:	Southwest corner of East Preserve Loop and Market Street, Chino, California
Project No.:	CVUS-06.0

Photo No:	Date:
3	11/2/2020

Description:

View of the site from the south, looking north.

Photo No:	Date:
4	11/5/2020

Description:

View of the site, looking southwest.

Appendix B. Research Documentation

Appendix

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Appendix C. Environmental Database Search Report

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Appendix D. Health and Safety Plan

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Appendix E. Laboratory Reports

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Appendix F. QAPP

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Appendix G. Boring Log

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Appendix E Infiltration Rate Study

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John R. Byerly
INCORPORATED

January 13, 2020

WLC Architects, Inc.
8163 Rochester Avenue, Suite 100
Rancho Cucamonga, California 91730-0729

Rpt. No.: 6251
File No.: S-14223

Attention: Jim DiCamillo, President

Project: Preserve II: K-8 School, Market Street and East Preserve Loop, Chino, California

Subject: Infiltration Rate Study for Storm Water Disposal

References:
(a) San Bernardino County Stormwater Program, Technical Guidance Document for Water Quality Management Plans (WQMP), June 7, 2013
(b) e-mail re: Preserve II: New K-8 School – DD Package, Paul Schenck, L.D. King, Inc., December 13, 2019 with attached Overall Site Exhibit
(c) Geotechnical Investigation, Preserve II: K-8 School, John R. Byerly, Inc., Rpt. No. 6230, December 27, 2019

Ladies and Gentlemen:

We understand that further development of the new K-8 school will include the construction of infiltration systems for storm water disposal. The referenced overall site exhibit identifies two areas in which infiltration systems will be constructed. An investigation of the percolation characteristics of the subsoils underlying these areas was performed by this firm during January of 2020. The purpose of our percolation investigation was to assist in the determination of an infiltration rate for design of the proposed infiltration systems.

PROJECT DESCRIPTION

For the preparation of this report, we reviewed the referenced San Bernardino County's Technical Guidance Document for Water Quality Management Plans (Reference a), the referenced geotechnical investigation report (Reference c), and the referenced overall site exhibit. We understand that a new K-8 school is proposed and will consist of six single-story buildings with a combined footprint area of about 82,000 square feet. We also understand that the buildings will be of wood-frame construction incorporating concrete slab-on-grade floors. Parking facilities

GEOTECHNICAL ENGINEERS • TESTING AND INSPECTION
2257 South Lilac Ave., Bloomington, CA 92316-2907
Bloomington(909) 877-1324 Riverside (909) 783-1910 Fax (909) 877-5210

paved with asphalt concrete are proposed along a portion of the eastern site perimeter and in the northwest quadrant of the site. Basketball courts, a soccer field and two baseball diamonds are planned in the southern part of the property. Future portable buildings are planned for the west-central part of the property. A play area will be located in the northeast corner of the site. It is anticipated that the maximum depth of fill will be about 6 feet in the southeast corner of the site. The majority of the site will be cut to the desired final elevation. It is anticipated that cuts ranging from approximately 7 feet to 11 feet below existing grade will be required below the footprints of the buildings. Major slope construction is not expected, however; retaining walls up to 3 feet in height are planned as part of an amphitheater area in the central portion of the property. As part of the development, infiltration systems are planned for the east-central and extreme southeast corner of the site to dispose of storm water runoff. We have been informed by the project civil engineer that the bottom of the infiltration systems will range from about 10 feet to 17 feet below the presently existing ground surface. The site configuration is illustrated on Enclosure 1.

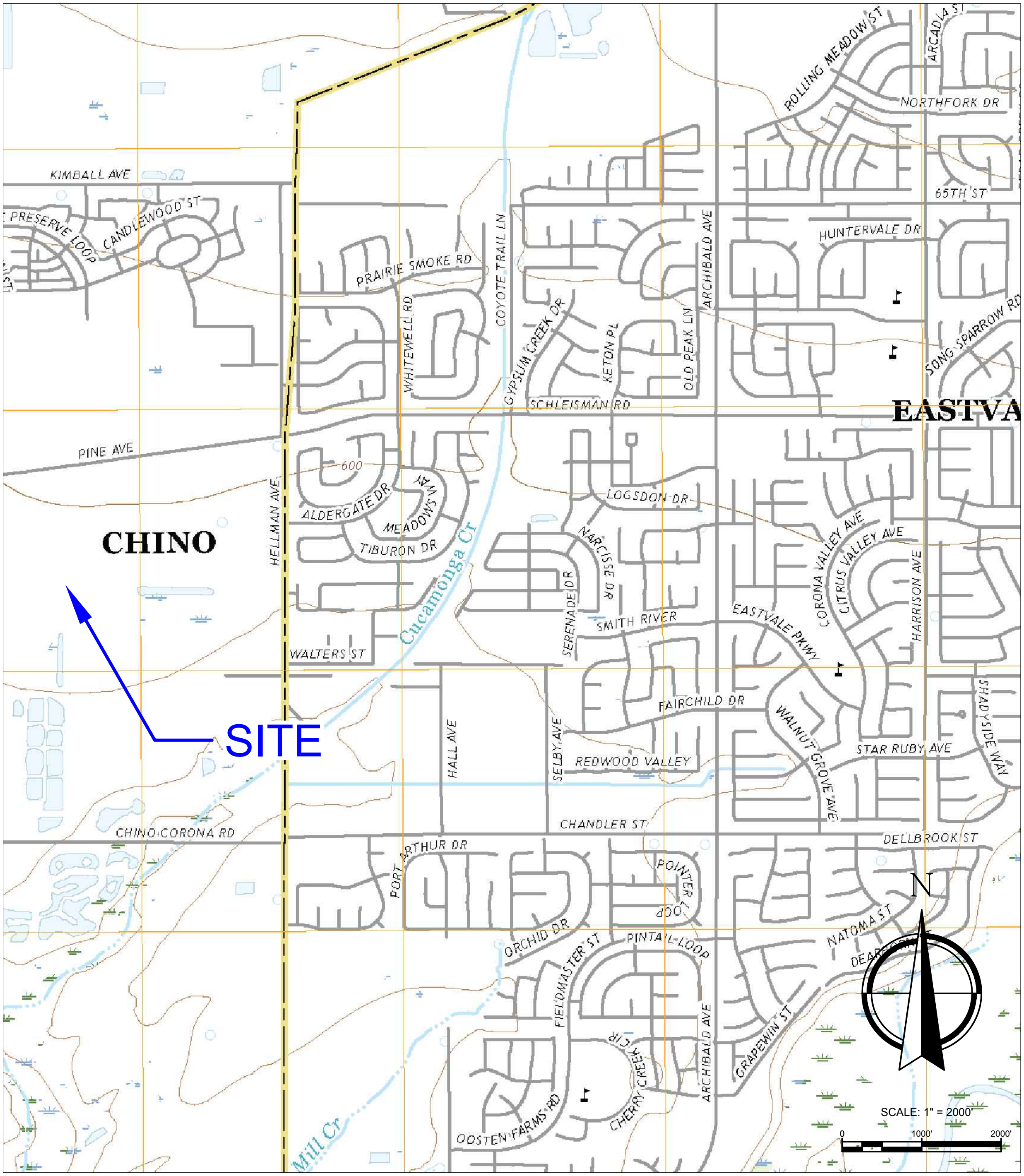
REVIEW OF GEOTECHNICAL REPORT

A geotechnical investigation was performed for the new K-8 school by our firm as described in Reference (c). The subsurface explorations consisted of 13 test borings drilled with a truck-mounted flight-auger to a maximum depth of 71.5 feet below the existing ground surface. Additional borings were drilled in proposed hardscape, landscape and parking areas. Crushed miscellaneous base was encountered from the ground surface to a depth of 3 inches in Borings 6, 7 and 13. Artificial fill consisting of loose to medium dense silty sands with varying amounts of gravel and clay, and stiff to very stiff sandy silts with varying amounts of clay, and clayey silts with sand was noted in the test borings to depths ranging from about 3.5 feet to 10 feet. The natural soils encountered in our test borings consisted of loose to very dense sands to clayey sands with the occasional trace of gravel, and soft to very stiff clayey silts to sandy silts with varying amounts of clay. The clayey and sandy silts exhibited a relatively high moisture content. Free ground water was encountered in Borings 1 and 15 at depths of 57 feet and 53.5 feet, respectively. Some of the test borings were placed in close proximity (less than 100 feet) of the areas proposed for the storm water disposal systems. Laboratory testing included maximum density, consolidation expansion index, plasticity index, gradation, sand equivalent, "R" value, and chemical tests. This report presented grading and foundation design recommendations. Recommendations are also provided for the design of asphalt concrete pavement for vehicle drive and parking areas, and for portland cement concrete pavement to receive only pedestrian traffic.

SITE CONDITIONS

The approximately 12-acre site is located on the west side of East Preserve Loop, between Market Street and Academy Street in the city of Chino. An Index Map showing the general vicinity of the site is presented on the following page. The coordinates of the site are latitude 33.9544° N and longitude 117.6192° W (WGS 1984 coordinates). The majority of the property is undeveloped and is covered with a moderate growth of weeds. Based on a review of historic Google Earth aerial photographs, the site was used as a dairy farm in the past. Photographs show a drainage channel was graded along the east property line sometime between 2011 and 2013. A portland cement concrete paved road traverses the western portion of the site in a north-south direction. Stockpiles of dirt up to 3 feet in height have been graded along the eastern perimeter of the road. Unpaved roads are interspersed throughout the property. A gravel-covered area used for storage of construction equipment and materials is situated in the east-central portion of the site. An unpaved road extends into the property off of East Preserve Loop in the southeast corner of the site. The property to the north, west and south is undeveloped. A construction trailer and elevated water tank for earthwork operations is present on the property to the north. The majority of the site is relatively planar, and slopes downward to the south and southeast at an average gradient of less than 2 percent. Along the eastern property line a slope up to 12 feet in height descends to East Preserve Loop at a gradient of 2:1 (H:V). An unpaved road runs along the top of this slope. In the southeast corner of the site a slope up to 17 feet in height descends into a depressed area that contains two storm drain risers. Total relief across the site is approximately 28 feet.

INDEX MAP



SOURCE DOCUMENTS: USGS CORONA NORTH QUADRANGLE, CALIFORNIA, 7.5 MINUTE SERIES, 2018

TOWNSHIP AND RANGE: SECTION 33, T2S, R7w

LATITUDE: 33.9544° N

LONGITUDE: 117.6192° W

FIELD INVESTIGATION

We explored the soils underlying the two areas currently proposed for infiltration systems by means of four test borings excavated with a four-wheel drive truck-mounted flight-auger to depths ranging from about 84.0 inches to 204.0 inches below the existing ground surface. The approximate locations of the field explorations are shown on Enclosure 1. The soils encountered were examined and visually classified by one of our field engineers. A summary of the soil classifications appears as Enclosure 2. The exploration logs show subsurface conditions at the dates and locations indicated, and may not be representative of subsurface conditions at other locations and times. The stratification depths presented on the logs represent the approximate soil type boundaries.

San Bernardino County's Technical Guidance Document for Water Quality Management Plans (Reference a) incorporates Low Impact Development (LID) Best Management Practices (BMPs) to the maximum extent practicable. Table VII.1, Appendix VII of Reference (a) provides required methods of establishing design infiltration rates. We investigated the percolation characteristics of the subsoils in the two areas designated for infiltration systems by a total of four percolation tests, two tests in each designated system area, using the falling-head test method. Percolation testing was performed using the borehole-type method and following test procedures required by Reference (a).

On January 3, 2020, percolation testing was performed at four locations. The weather condition was dry and warm with an average temperature of 72 degrees Fahrenheit. Two inches of clean gravel were placed in the bottoms of the test holes. Perforated plastic cans, 12 inches in height and 6 inches in diameter, were then placed in the test holes to control scour. Clear water was introduced into each test hole, and the soils were allowed to soak and condition overnight prior to determination of the percolation rate. The following day, no discernable percolation had occurred in any of our test holes. However, in order to provide an infiltration rate for design of the proposed infiltration systems a time interval of 1440 minutes was utilized in our study. Enclosure 3 presents the field test data. Percolation rates have been corrected for the contribution of the test hole sidewall.

SOIL CONDITIONS

The underlying soils consisted of medium dense silty sands, and stiff to very stiff sandy silts with clay and clayey silts. The soils encountered in this percolation investigation are generally consistent with the findings of our earlier geotechnical investigation report (Reference c). Neither bedrock nor ground water was encountered at these percolation locations. Based on ground water data, our consulting engineering geologist estimates that the shallowest depth to ground water in the future may be at approximately 5 feet below the original ground surface for short periods of time.

CONCLUSIONS AND RECOMMENDATIONS

The percolation tests yielded infiltration rates ranging from 0.02 inch per hour to 0.1 inch per hour. The infiltration rates were computed utilizing the percolation rate conversion equation (Porchet Method, aka Inverse Borehole Method) provided by the San Bernardino County's Technical Guidance Document for Water Quality Management Plans (Reference a), which accommodates the contribution of the test hole sidewall to the measured percolation rate. The percolation rate conversion equation is presented below.

$$I_t = \frac{\Delta H\ (60\ \text{min./hr.})\ r}{\Delta t\ (r + 2\ H_{avg})}$$

Where: I_t = *tested infiltration rate (in./hr.)*

Δt = *time interval (min.)*

r = *test hole radius (in.)*

ΔH = *change in height over the time interval (in.)*

H_{avg} = *average head height over the time interval (in.)*

The converted percolation rates are presented in the following table.

Percolation Number	Depth of Test (inches)	Converted Percolation Rate (inch per hour)
P-1	75.0	0.1
P-2	188.0	0.02
P-3	126.0	0.1
P-4	76.0	0.1

A safety factor has not been applied to these design values. We note that the tests conducted yielded unacceptably slow percolation rates. It is our opinion that the slow infiltration rates are attributable to the fine grain and clayey nature of the soil that will likely underlie the proposed infiltration system areas. The depth of percolation testing performed during this investigation corresponds to the depth representative of the bottom elevation of the proposed infiltration systems.

We appreciate this opportunity to be of service. Should there be questions, please feel free to contact this office.

Respectfully submitted,

JOHN R. BYERLY, INC.

John R. Byerly, Geotechnical Engineer
President

REGISTERED PROFESSIONAL ENGINEER
JOHN R. BYERLY
GE 000179
EXP. 06/30/21
GEOTECHNICAL
STATE OF CALIFORNIA

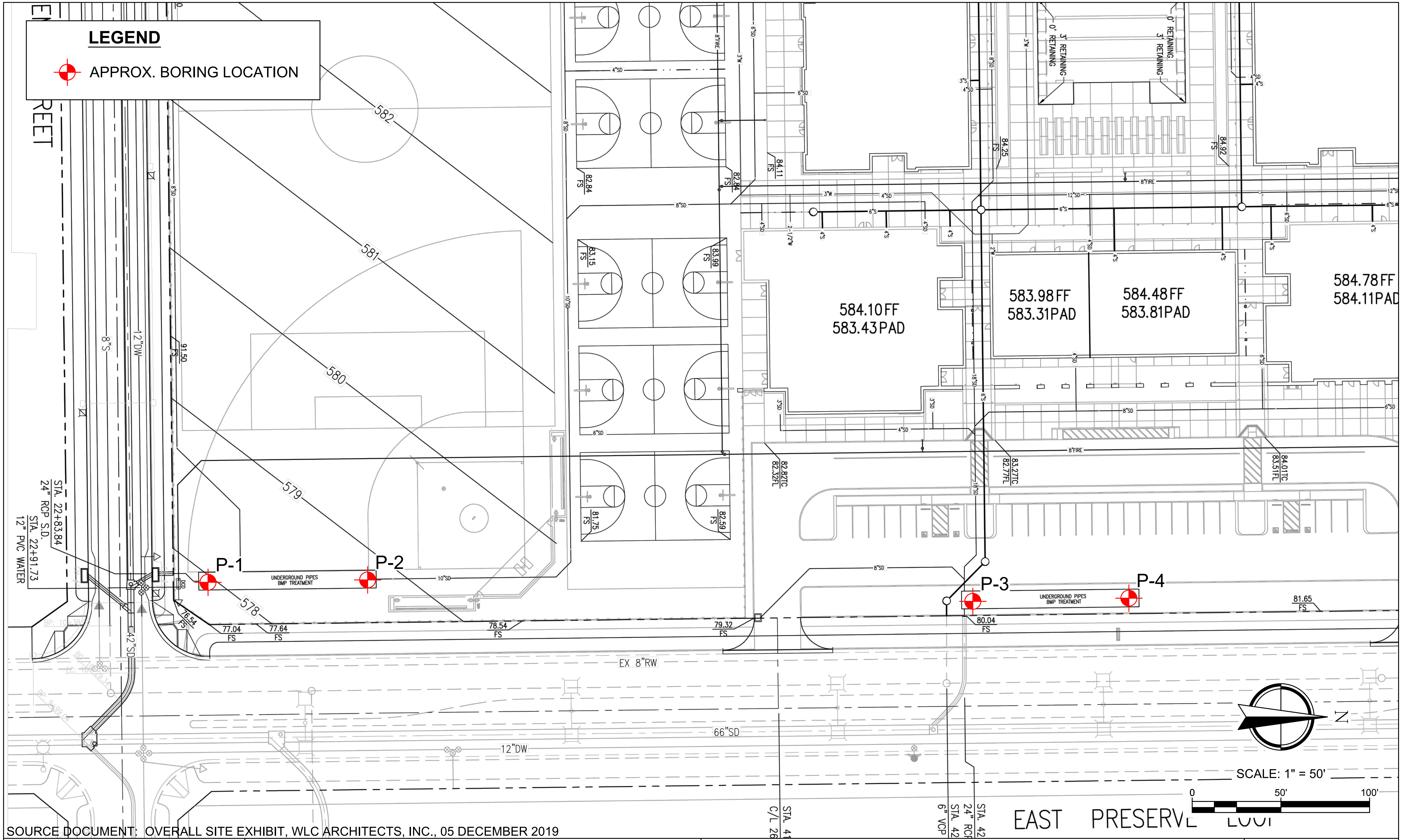
JRB:MLL:jet

Enclosures: (1) Plot Plan
(2) Exploration Logs
(3) Summary of Field Test Data

Copies: (2) Client
(2) L.D. King, Inc.

LEGEND

🔴 APPROX. BORING LOCATION



SOURCE DOCUMENT: OVERALL SITE EXHIBIT, WLC ARCHITECTS, INC., 05 DECEMBER 2019

John R. Byerly
INCORPORATED

INFILTRATION RATE STUDY

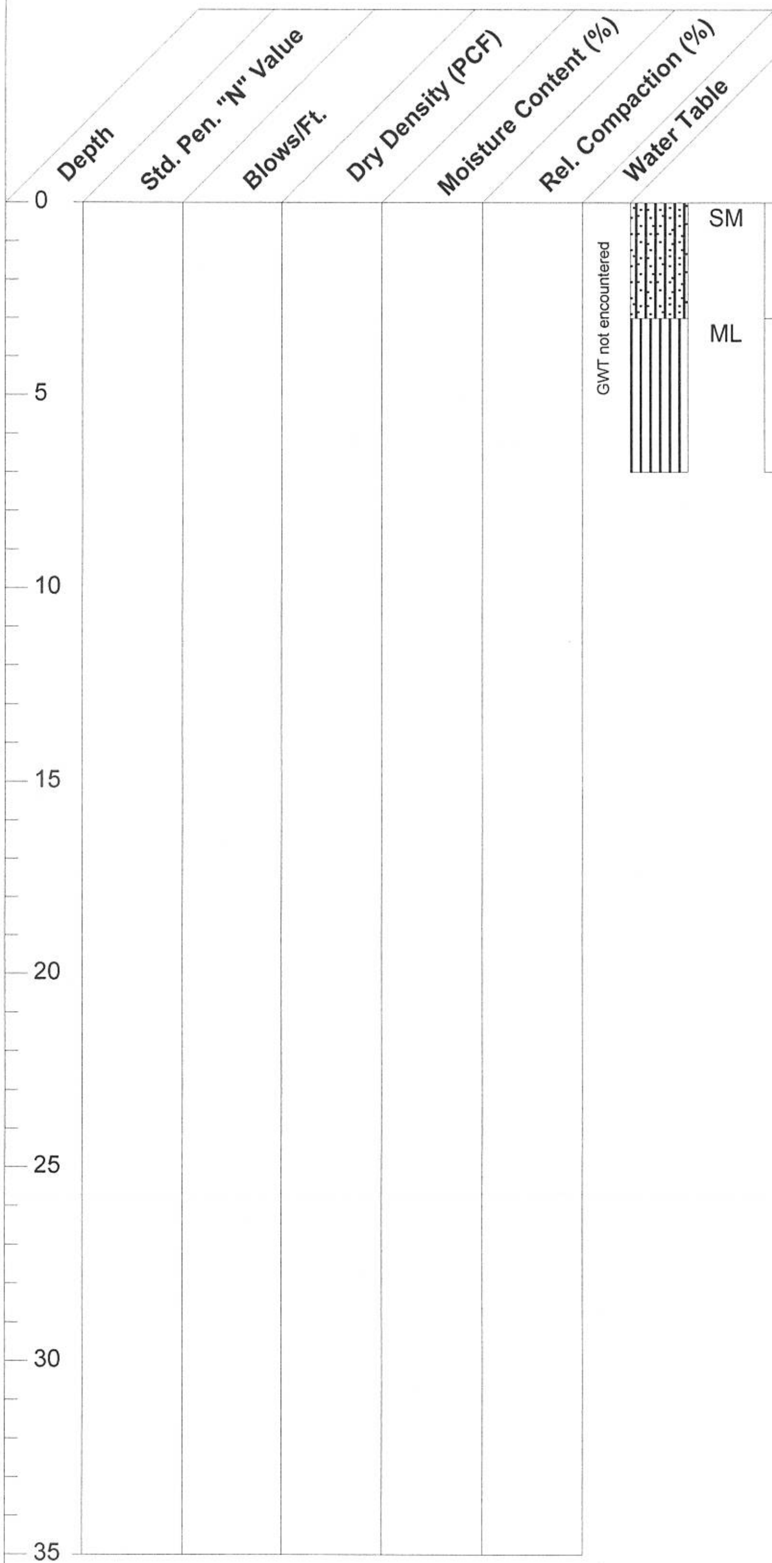
E-8

PRESERVE II: K-8 SCHOOL
MARKET STREET AND EAST PRESERVE LOOP
CHINO, CALIFORNIA

Enclosure 1
Rpt. No.: 6251
File No.: S-14223

Perc 1

Boring Date: 1/02/20
Surface Elevation:
Drilling Method: Truck-Mounted Flight-Auger



SM	Light gray-brown silty fine sand, very moist and medium dense
ML	Gray-brown sandy silt with clay, wet and stiff

Total Depth at 7.0 Feet
No Free Ground Water Encountered

LOG OF BORING

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\S-14223 (Rpt. No. 6251).log Date: 1/13/2020

John R. Byerly, Inc.	**Preserve II: K-8 School** **Chino, California**	**Enclosure 2, Page 1** **Rpt. No.: 6251** **File No.: S-14223**

Perc 2

Boring Date: 1/02/20
Surface Elevation:
Drilling Method: Truck-Mounted Flight-Auger

Depth	Std. Pen. "N" Value	Blows/Ft.	Dry Density (PCF)	Moisture Content (%)	Rel. Compaction (%)	Water Table		
0						GWT not encountered	SM	Dark brown silty fine sand, very moist and medium dense
							ML	Gray-brown sandy silt with clay, wet and stiff
5								
							ML	Light gray clayey silt, wet and stiff
10								
							ML	Gray-brown clayey silt, wet and very stiff
15								
								Total Depth at 17.0 Feet No Free Ground Water Encountered
20								
25								
30								
35								

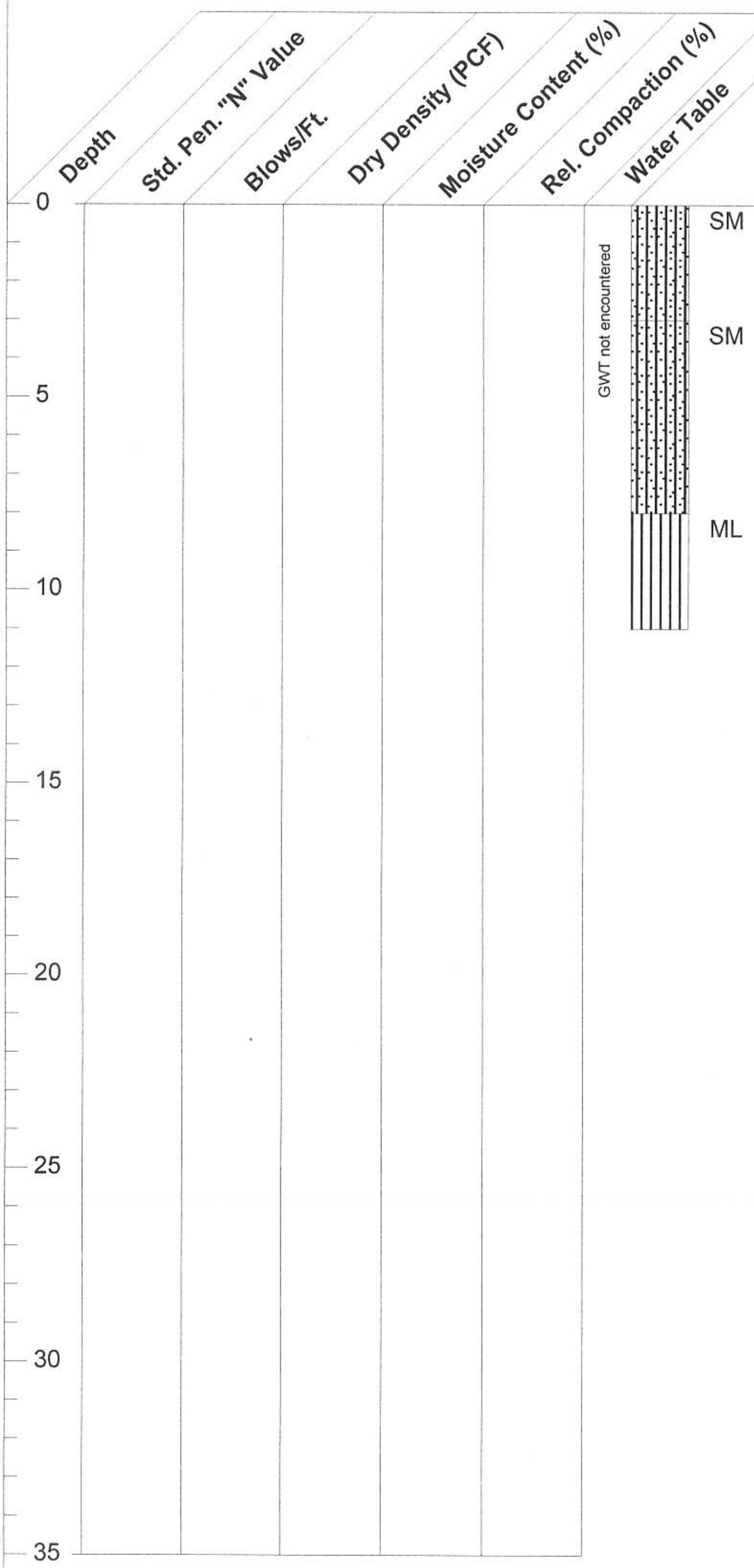
SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\S-14223 (Rpt. No. 6251).log Date: 1/10/2020

LOG OF BORING

John R. Byerly, Inc.	**Preserve II: K-8 School** **Chino, California**	**Enclosure 2, Page 2** **Rpt. No.: 6251** **File No.: S-14223**

Perc 3

Boring Date: 1/02/20
Surface Elevation:
Drilling Method: Truck-Mounted Flight-Auger



SM Gray-brown silty fine sand, very moist and medium dense

SM Dark gray silty fine sand, wet and medium dense

ML Light gray sandy silt with clay, wet and stiff

Total Depth at 11.0 Feet
No Free Ground Water Encountered

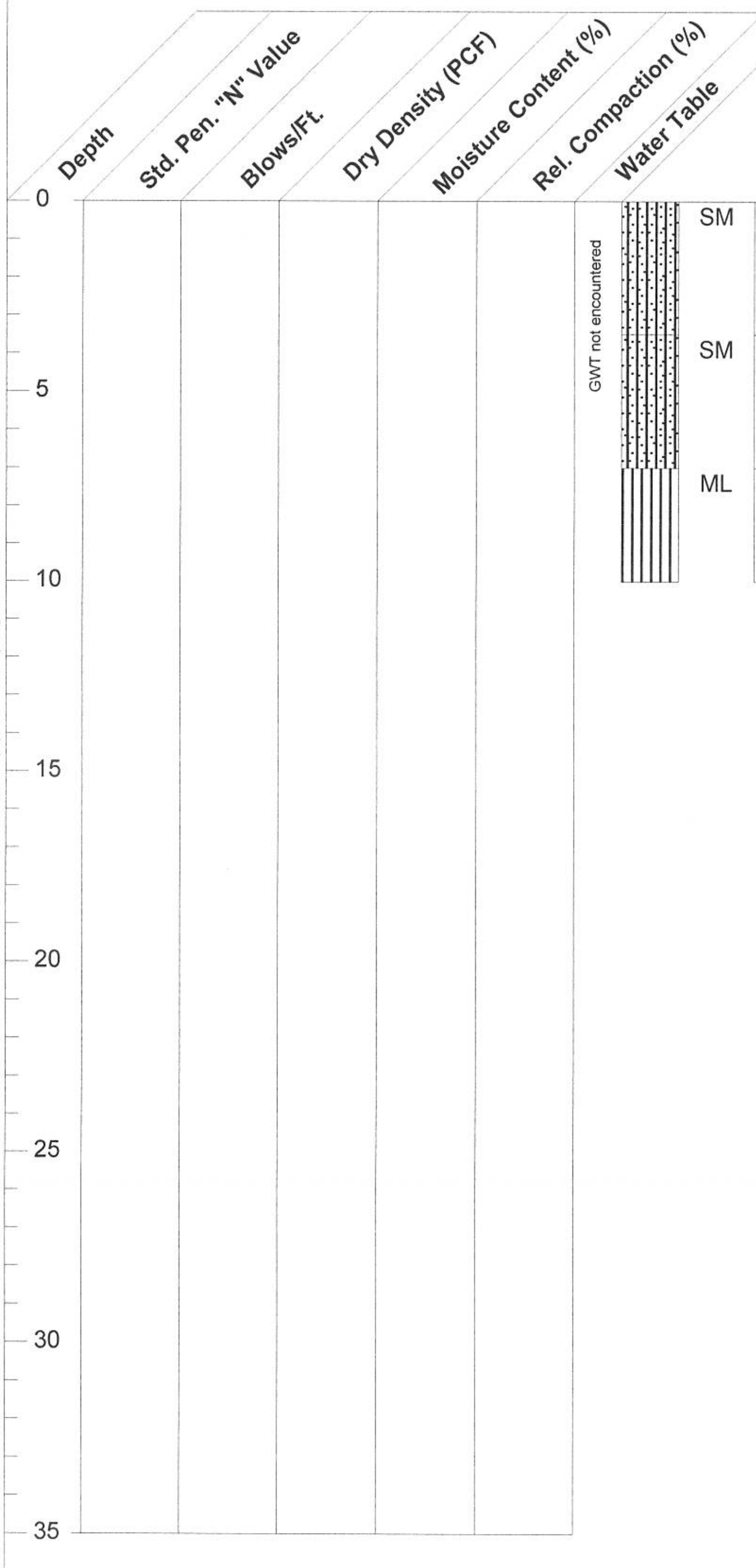
SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\S-14223 (Rpt. No. 6251).log Date: 1/10/2020

LOG OF BORING

John R. Byerly, Inc.	**Preserve II: K-8 School** **Chino, California**	**Enclosure 2, Page 3** **Rpt. No.: 6251** **File No.: S-14223**

Perc 4

Boring Date: 1/02/20
Surface Elevation:
Drilling Method: Truck-Mounted Flight-Auger



SM	Gray-brown silty fine sand, very moist and medium dense
SM	Dark gray silty fine sand, wet and medium dense
ML	Light gray sandy silty with clay, wet and stiff

Total Depth at 10.0 Feet
No Free Ground Water Encountered

LOG OF BORING

John R. Byerly, Inc.

Preserve II: K-8 School
Chino, California

Enclosure 2, Page 4
Rpt. No.: 6251
File No.: S-14223

JOHN R. BYERLY, INC.

PERCOLATION TEST DATA SHEET

Job: Chino Valley Unified School District – Preserve II: K-8 School S-14223 Date: 01-03-20 By: Michael Case Sr. Remarks: ____________

Perc. No. 1 Dia. (in.) 8.0
Depth of Test 75.0 in.

Time Read	Read. (in.)	* Rate (in/hr)
10:00 (1-2-20)	55.0	0.1
10:00 (1-3-20)	73.0	

Perc. No. 2 Dia. (in.) 8.0
Depth of Test 188.0 in.

Time Read	Read. (in.)	* Rate (in/hr)
10:05 (1-2-20)	148.0	0.02
10:05 (1-3-20)	158.0	

Perc. No. 3 Dia. (in.) 8.0
Depth of Test 126.0 in.

Time Read	Read. (in.)	* Rate (in/hr)
10:10 (1-2-20)	106.0	0.1
10:10 (1-3-20)	117.0	

Perc. No. 4 Dia. (in.) 8.0
Depth of Test 76.0 in.

Time Read	Read. (in.)	* Rate (in/hr)
10:15 (1-2-20)	56.0	0.1
10:15 (1-3-20)	69.0	

* Rate has been corrected for contribution of boring sidewall

Appendix F Preliminary Water Quality Management Plan

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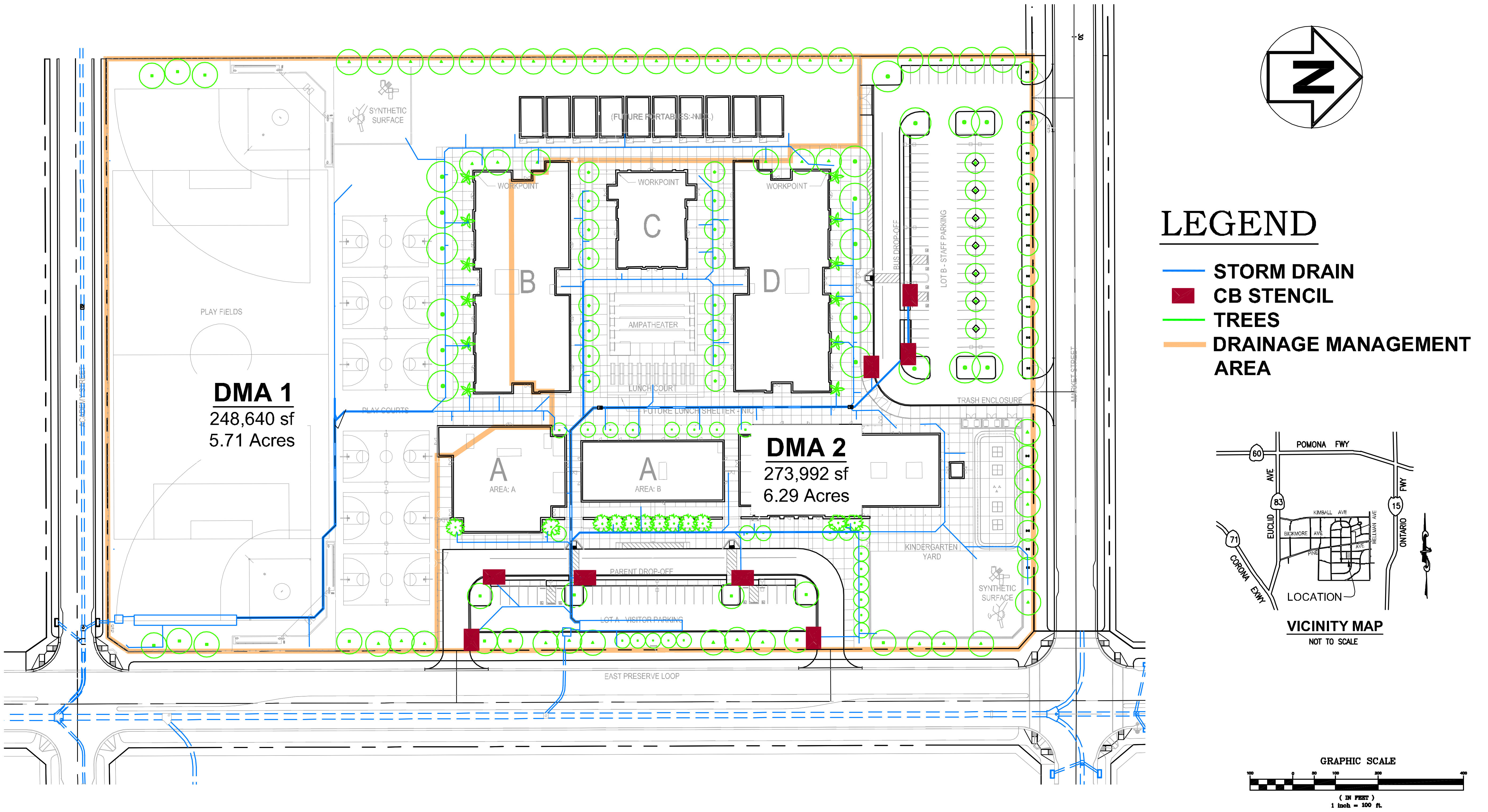


The Preserve II K-8 School

BMP Site Plan

LDKING
L.D. KING, INC.
2151 CONVENTION CENTER WAY
SUITE 100B
ONTARIO, CA 91764
(909) 937-0200

Water Quality Design Capture Volume

Project Name: The Preserve II K-8 School **Tract No.:**
City: Chino **Client: Chino Valley Unifies School District**

$P_{2\text{-yr,1hr}}$ Rainfall Depth=	0.539
a1 (climatic region)=	1.4807
a2 (drawdown time)=	1.963
P6 =	0.798

Landuse	i Range-Percent	i Recommended	Area (acres)	C	DCV (ac-ft)	DCV cu. ft.
Natural, Agriculture or Open Space	0 - 0	0.00	0.00	0.040	0.00	0
Public Park	10 - 25	0.15	0.00	0.141	0.00	0
School - DMA 1	30 - 50	0.46	5.71	0.314	0.23	10180
School - DMA 2	30 - 50	0.85	6.29	0.663	0.54	23705
1 Acre Lots	10 - 25	0.20	0.00	0.170	0.00	0
2 Dwellings/Acre	20 - 40	0.30	0.00	0.225	0.00	0
3-4 Dwellings/Acre	30 - 50	0.40	0.00	0.280	0.00	0
5-7 Dwellings/Acre	35 - 55	0.50	0.00	0.339	0.00	0
8-10 Dwellings/Acre	50- 70	0.60	0.00	0.409	0.00	0
More Than 10 Dwellings/Acre	65 - 90	0.70	0.00	0.494	0.00	0
Condominiums	45 - 70	0.65	0.00	0.449	0.00	0
Apartments	65 - 90	0.80	0.00	0.599	0.00	0
Mobile Home Park	60 - 85	0.75	0.00	0.544	0.00	0
Commercial, Downtown Business or Industrial	80 - 100	0.90	0.00	0.730	0.00	0
Total			**12.00**		**0.78**	**33886**

Average	0.7029	12.00	0.497	0.78	33886

i = Imperviousness fraction

C= Runoff Coefficient =0.858i^3-0.78i^2+0.774i+0.04

a1 = Coefficient for Climatic Region

1.4807 for Valley;1.9090 for Mountain; 1.2371 for Desert

$P_{2yr,1hr}$ = 2 year - 1hr rainfall in inches

P6 = Mean Rainfall depth (inches) = $P_{2yr,1hr}$*a1

a2 = Regression constant = 1.582 for 24-hr drawdown; 1.963 for 48-hr

DCV = Design Capture Volume in Ac-ft = Area*C*a2*p6/12

Area	cu. ft.	48hr-CFS		MWS
DMA 1	10180	0.058914	0.073	4-6-V-Flow
DMA 2	23705	0.137184	0.147	6-8-V-Flow

PRINSCO
ENGINEERED WITH INTEGRITY

HydroStor™ System Design Aid

PROJECT DESCRIPTION

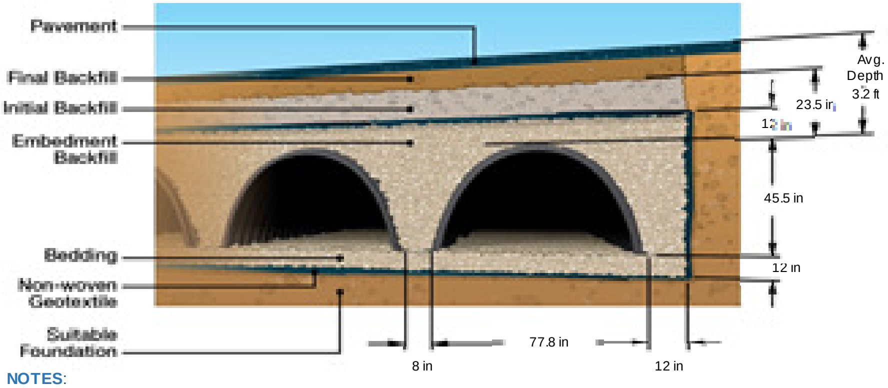
Project Name: Preserve School 2 - DMA-1
Date: 3 / 9 / 20
City / State: /
Phone #:
Engineer: L D King, Inc.
Contractor:
Designed By:
Prinsco Rep:

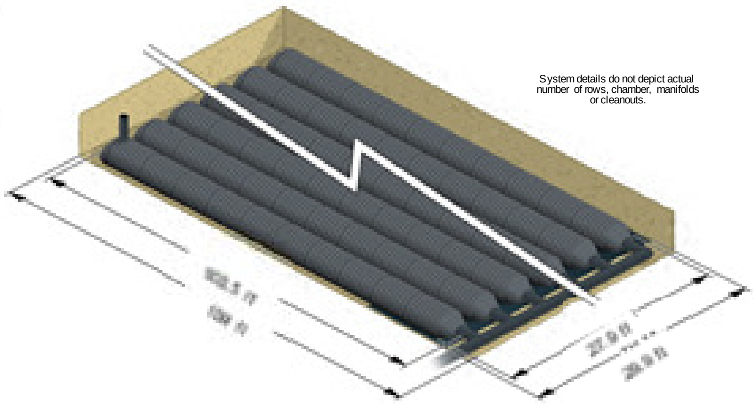
DESIGN CRITERIA - BASED ON SYSTEM DIMENSIONS

Chamber Size	HS180	Number of Manifolds	1	Manifold Diameter	24 in. (600 mm)	Include Manifold Volume	No
Number of Rows	4	Chambers Per Row	14	Stone Porosity	30 %	Bottom of Bedding Elevation	0 (ft)
Max. Pavement Elevation	8.0 (ft)	Min. Pavement Elevation	8.0 (ft)				
Additional Stone Above Chamber*	0 (in)	Additional Stone Below Chamber*	3 (in)	Additional Stone Side of Chamber*	0 (in)	Additional Stone Between Chamber*	0 (in)
Units: Metric or Standard	Standard						

* Minimum recommended values are already included in calculations

SYSTEM LAYOUT





System details do not depict actual number of rows, chamber, manifolds or cleanouts.

NOTES:

Minimum Burial Depth 23.5 (in)

Maximum Burial Depth 8 (ft)

SYSTEM STORAGE & QUANTITIES

System Footprint	Stone Storage	Manifold Storage	Chamber Storage	Total System Storage
3,262 (sq.f)	3,674 (cu.f)	0 (cu.f)	6,512 (cu.f)	10,187 (cu.f)

Number of Chambers	Number of End Caps	Required Stone (For Embedment Backfill)	Non-Woven Geotextile (Includes 20% Overlap)	Woven Geotextile - Scour	Woven Geotextile - Sediment Row
56	8	454 (cu.y)	1,084 (sq.y)	39 (sq.y)	176 (sq.y)

ASSISTANCE: For assistance with design, drawings or pricing please have your completed system design aid ready, and contact your Prinsco sales representative

Prinsco, Inc. I 1717 16th St NE I Willmar, MN 56201 I 320.222.6800 I 800.992.1725 I prinsco.com

V-4.1

PRINSCO
ENGINEERED WITH INTEGRITY

HydroStor™ System Design Aid

PROJECT DESCRIPTION

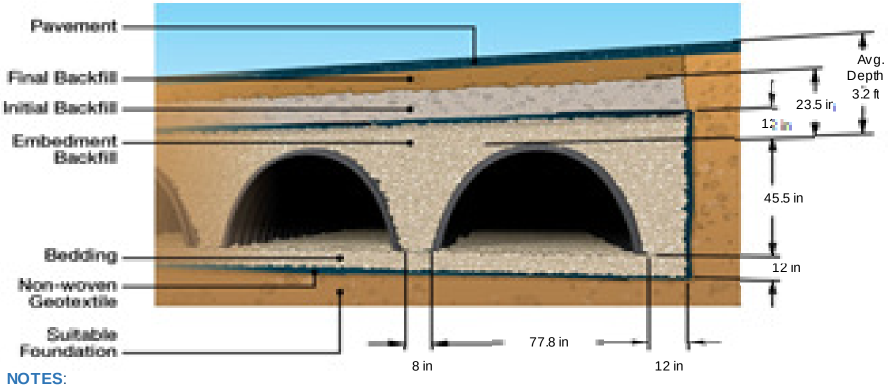
Project Name: Preserve School 2 - DMA-2
Date: 3 / 9 / 20
City / State: /
Phone #:
Engineer: L D King, Inc.
Contractor:
Designed By:
Prinsco Rep:

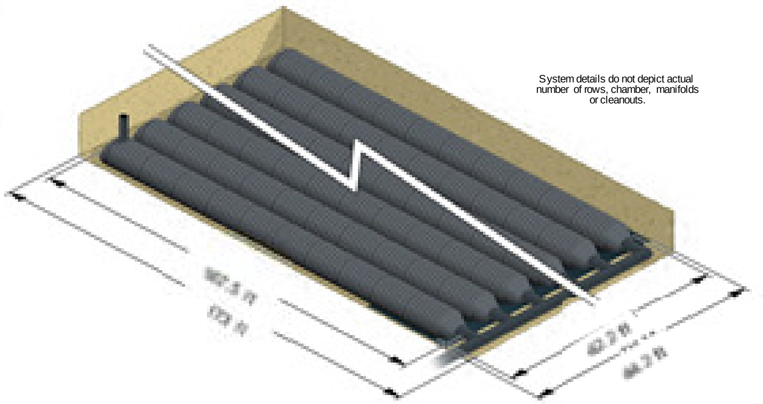
DESIGN CRITERIA - BASED ON SYSTEM DIMENSIONS

Chamber Size: HS180
Number of Manifolds: 1
Manifold Diameter: 24 in. (600 mm)
Include Manifold Volume: No
Number of Rows: 6
Chambers Per Row: 23
Stone Porosity: 30 %
Bottom of Bedding Elevation: 0 (ft)
Max. Pavement Elevation: 8.0 (ft)
Min. Pavement Elevation: 8.0 (ft)
Additional Stone Above Chamber*: 0 (in)
Additional Stone Below Chamber*: 3 (in)
Additional Stone Side of Chamber*: 0 (in)
Additional Stone Between Chamber*: 0 (in)
Units: Metric or Standard: Standard

* Minimum recommended values are already included in calculations

SYSTEM LAYOUT




System details do not depict actual number of rows, chamber, manifolds or cleanouts.

NOTES:

Minimum Burial Depth 23.5 (in)

Maximum Burial Depth 8 (ft)

SYSTEM STORAGE & QUANTITIES

System Footprint: 7,650 (sq.f)
Stone Storage: 8,461 (cu.f)
Manifold Storage: 0 (cu.f)
Chamber Storage: 15,901 (cu.f)
Total System Storage: 24,362 (cu.f)

Number of Chambers: 138
Number of End Caps: 12
Required Stone (For Embedment Backfill): 1,045 (cu.y)
Non-Woven Geotextile (Includes 20% Overlap): 2,375 (sq.y)
Woven Geotextile - Scour: 63 (sq.y)
Woven Geotextile - Sediment Row: 282 (sq.y)

ASSISTANCE: For assistance with design, drawings or pricing please have your completed system design aid ready, and contact your Prinsco sales representative

Prinsco, Inc. I 1717 16th St NE I Willmar, MN 56201 I 320.222.6800 I 800.992.1725 I prinsco.com

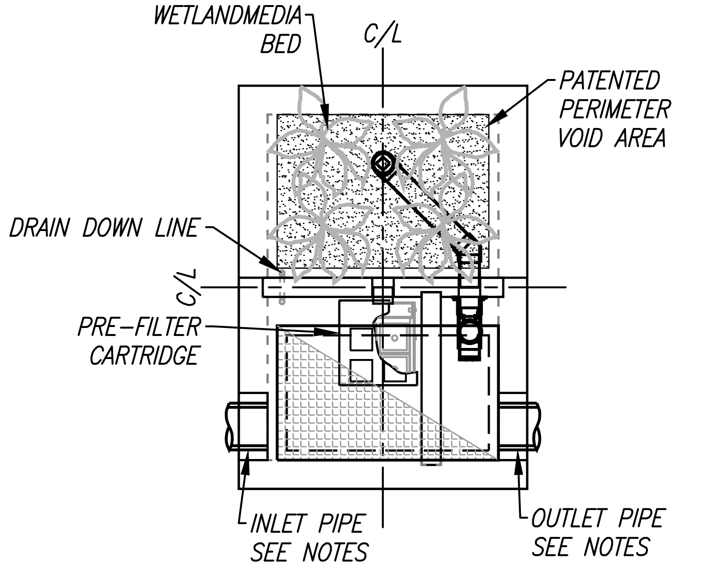
This tool is intended to assist in sizing stormwater management systems using Prinsco products. It should be used for estimating purposes only and is not intended to be a final design tool. The design engineer needs to verify all the values and ensure they meet all project design criteria.

V-4.1

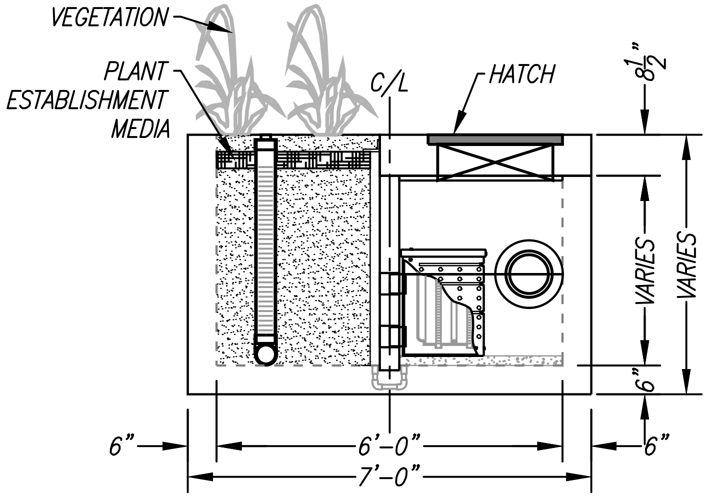
SITE SPECIFIC DATA

PROJECT NUMBER			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
N/A		0.073	
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			OFFLINE
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2	N/A	N/A	N/A
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PEDESTRIAN		
FRAME & COVER	24" X 42"	OPEN PLANTER	N/A
NOTES:			

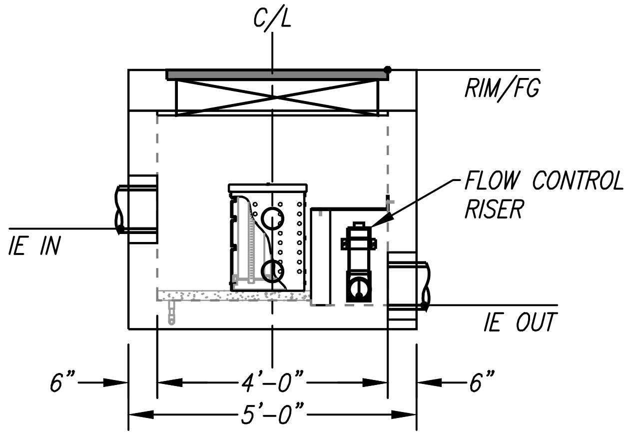
* PRELIMINARY NOT FOR CONSTRUCTION



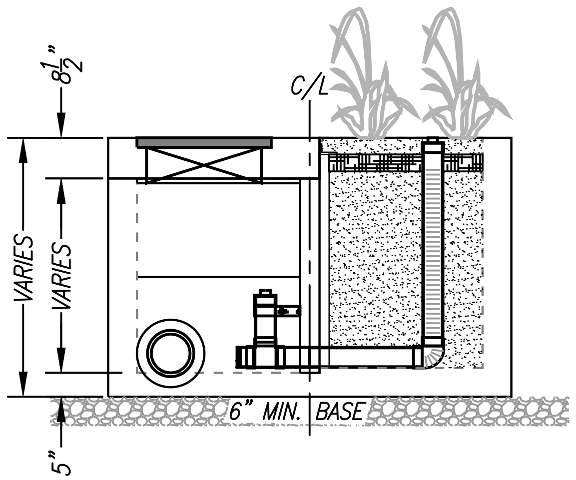
PLAN VIEW



LEFT END VIEW



ELEVATION VIEW



RIGHT END VIEW

INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURERS CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE TO VERIFY PROJECT ENGINEERS RECOMMENDED BASE SPECIFICATIONS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATER TIGHT PER MANUFACTURERS STANDARD CONNECTION DETAIL.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. VEGETATION SUPPLIED AND INSTALLED BY OTHERS. ALL UNITS WITH VEGETATION MUST HAVE DRIP OR SPRAY IRRIGATION SUPPLIED AND INSTALLED BY OTHERS.
7. CONTRACTOR RESPONSIBLE FOR CONTACTING BIO CLEAN FOR ACTIVATION OF UNIT. MANUFACTURERS WARRANTY IS VOID WITH OUT PROPER ACTIVATION BY A BIO CLEAN REPRESENTATIVE.

GENERAL NOTES

1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT BIO CLEAN.

TREATMENT FLOW (CFS)	0.073
OPERATING HEAD (FT)	3.4
PRETREATMENT LOADING RATE (GPM/SF)	1.3
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

MODULAR WETLANDS

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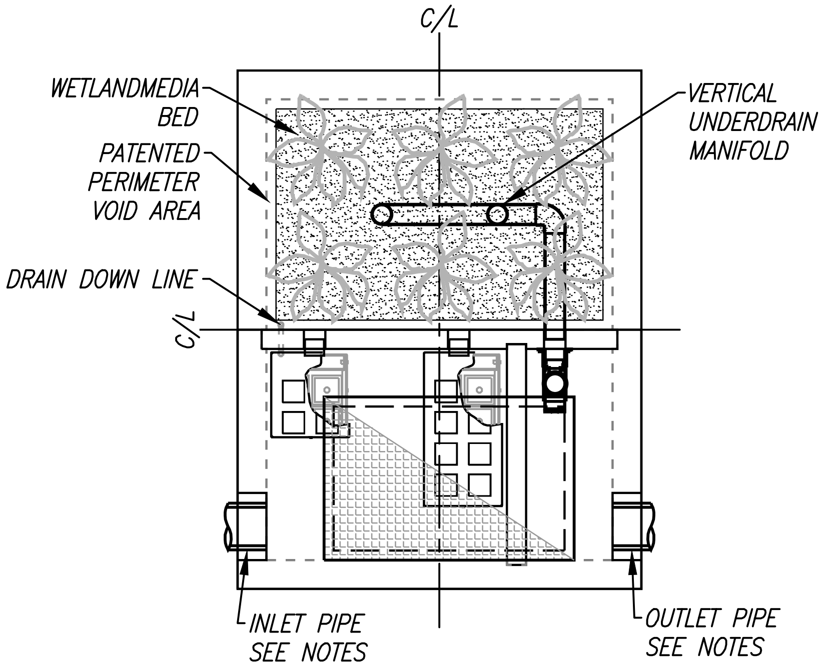
Bio Clean
A Forterra Company

MWS-L-4-6-V
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

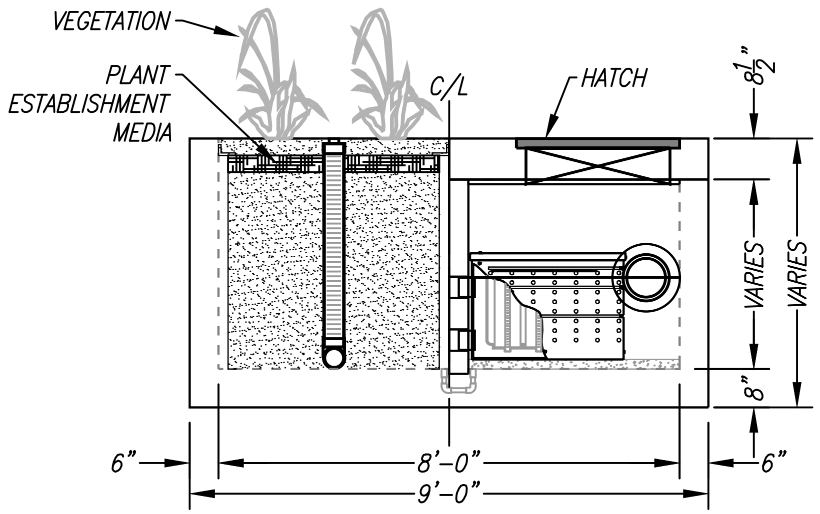
5/23/19TOLFF

SITE SPECIFIC DATA			
PROJECT NUMBER			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
N/A		0.073	
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			OFFLINE
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2	N/A	N/A	N/A
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PEDESTRIAN		
FRAME & COVER	30" X 48"	OPEN PLANTER	N/A
NOTES:			

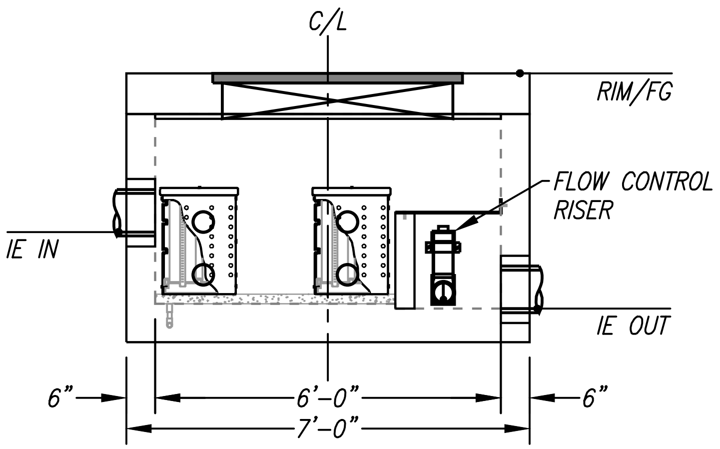
* PRELIMINARY NOT FOR CONSTRUCTION



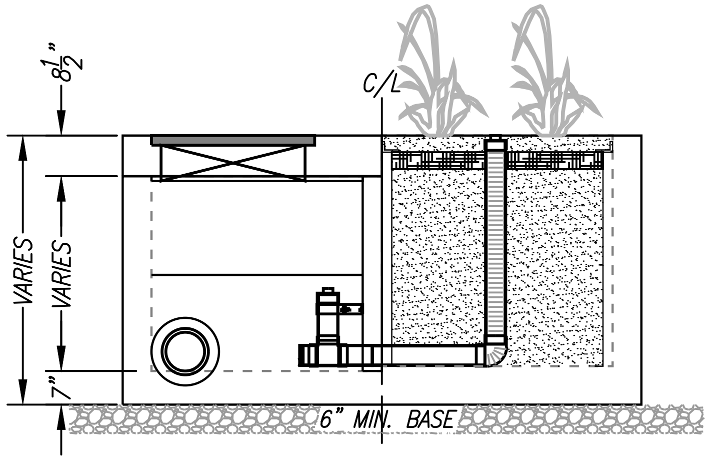
PLAN VIEW



LEFT END VIEW



ELEVATION VIEW



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5/23/19TOLFF

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OPERATING HEAD (FT)	3.4
PRETREATMENT LOADING RATE (GPM/SF)	1.3
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

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MWS-L-6-8-V
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

Appendix G Traffic Assessment

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LINSCOTT
LAW &
GREENSPAN
engineers

Engineers & Planners
Traffic
Transportation
Parking

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Pasadena
Irvine
San Diego
Woodland Hills

January 27, 2021

Ms. Barbara Heyman
Associate Principal
Placeworks
3910 Normal Street, Suite C
San Diego, CA 92103

LLG Reference: 2.19.4192.1

Subject: **Vehicle Miles Traveled (VMT) Screening Assessment for the Chino Valley Unified School District Preserve School at South of Pine Block 9**
Chino, California

Dear Ms. Heyman,

Linscott, Law & Greenspan, Engineers (LLG) is pleased to submit this Vehicle Miles Traveled (VMT) Screening Assessment for the Chino Valley Unified School District (CVUSD) Preserve School at South of Pine (SOP) located on the southwest corner of East Preserve Loop at Market Street within Block 9 of the SOP component of the Preserve Specific Plan (herein after referred to as the "Project") in the City of Chino, California.

The proposed Project entails acquisition of a 12-acre property or development and operation of a public K-8 school. The proposed school site is located in the southwest corner of the intersection of East Preserve Loop and Market Street; Academy Street forms the site's southern boundary. The site is currently vacant and has most recently been used for construction staging for developments surrounding the project site. Historically, it has been used for agricultural purposes. The property adjoining west of the Project site is also a component of Block 9 in South of Pine but is not a part of the proposed Project. ***Figure 1*** presents a vicinity map, which illustrates the general location of the project site and depicts the surrounding street system. ***Figure 2*** presents an aerial depiction of the existing site.

The proposed school would serve students in kindergarten through eighth grade and would accommodate a maximum of 900 students on a standard school calendar or a maximum of 1,200 students on a 4-track year-round schedule. It

Philip M. Linscott, PE (1924-2000)
Jack M. Greenspan, PE (Ret.)
William A. Law, PE (Ret.)
Paul W. Wilkinson, PE
John P. Keating, PE
David S. Shender, PE
John A. Boarman, PE
Clare M. Look-Jaeger, PE
Richard E. Barretto, PE
Keil D. Maberry, PE

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should be noted that though the school can accommodate 1,200 students, only 900 students will likely be accommodated at any given time. The school buildings would encompass 83,500 square feet and be constructed near the center of the property. Outdoor recreational facilities are proposed on the southern portion of the campus. CVUSD anticipates construction of the project to start in 2022 and the school to open in Fall 2024. ***Figure 3*** presents the proposed Project site plan.

The Entitled Development/Current zoning for the proposed Project includes the construction of an elementary school to accommodate a maximum of 1,000 students.

SB743 COMPLIANCE

VMT Screening Assessment

On December 28, 2018, the California Natural Resources Agency adopted revised CEQA Guidelines. Among the changes to the guidelines was the removal of vehicle delay and LOS from consideration for transportation impacts under CEQA. With the adopted guidelines, transportation impacts are to be evaluated based on a project's effect on vehicle miles traveled. Lead agencies are allowed to continue using their current impact criteria, or to opt into the revised transportation guidelines. However, the new guidelines must be used starting July 1, 2020, as required in CEQA section 15064.3.

The City of Chino has adopted VMT Impact Thresholds via Resolution No. 2020-0019 on June 16, 2020, which are consistent with the criteria identified by San Bernardino County Transportation Authority (SBCTA) in the *Recommended Traffic Impact Analysis Guidelines for Vehicle Miles Traveled and Level of Service Assessment*, prepared by Fehr & Peers in February 2020. The City's adopted thresholds include project-type screening for local-serving K-12 schools which are presumed to have less than significant impact. Therefore, based on this criteria the Project would be screened out from a VMT assessment and its VMT impacts are presumed to be less than significant.

* * * * * * * * * *

We appreciate the opportunity to be of service on this Project. Should you need further assistance, or have any questions regarding this analysis, please call us at (949) 825-6175.

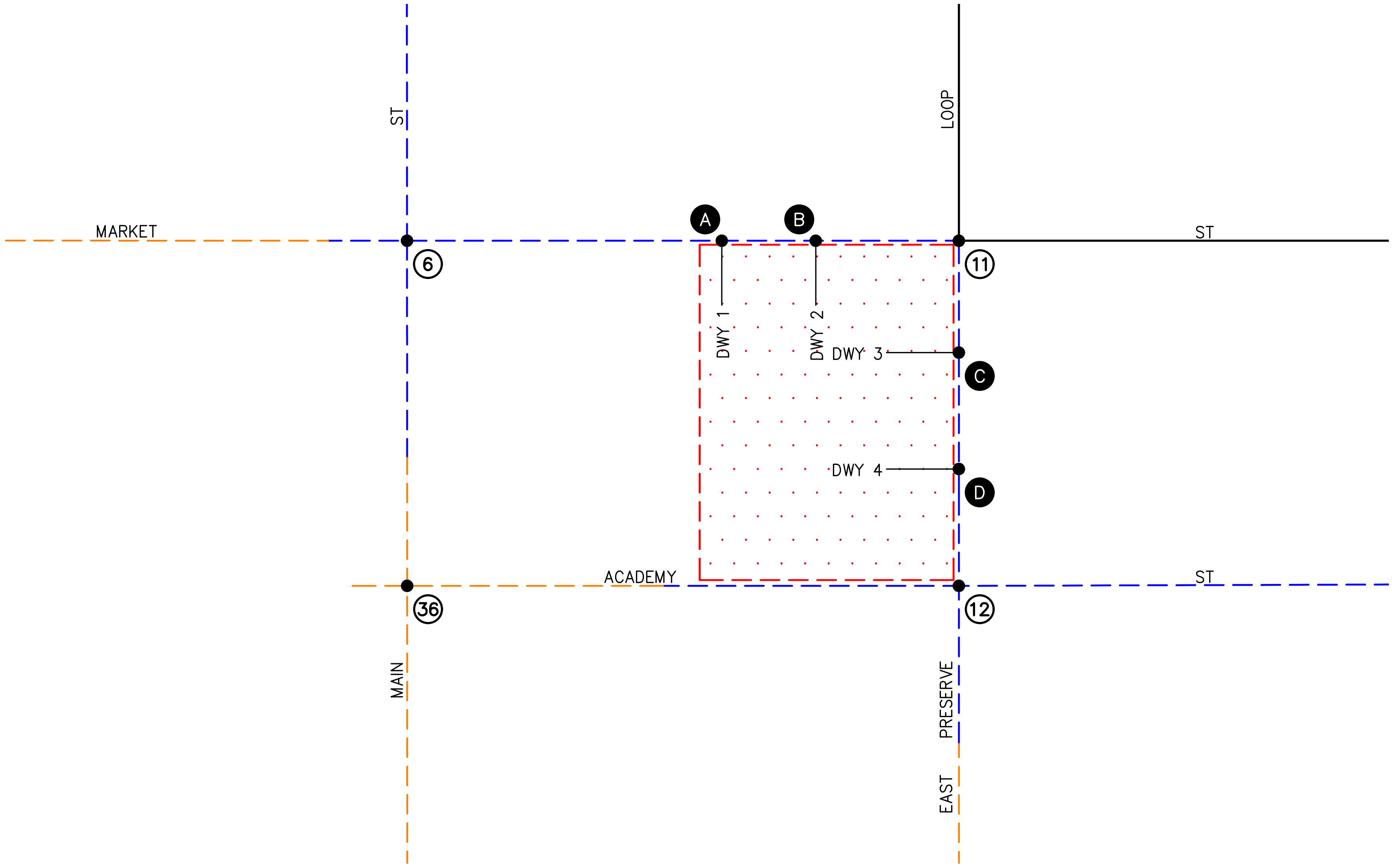
Very truly yours,
Linscott, Law & Greenspan, Engineers

Richard E. Barretto, P.E.
Principal

REGISTERED PROFESSIONAL ENGINEER
RICHARD E. BARRETTO
No. 2006
Exp. 6/30/21
TRAFFIC
STATE OF CALIFORNIA

cc: Shane S. Green, P.E. Senior Transportation Engineer

Attachments



n:\3500\2153599 – block 4 south of pine – the preserve, chino\cvusd preserve school\dwg\3599 f-1.dwg LDP 13:19:57 01-14-2021 co

LINSCOTT
LAW &
GREENSPAN
engineers

N NO SCALE

KEY

Ⓘ = STUDY INTERSECTION
– – = FUTURE YEAR 2022 ROADWAY
– – = FUTURE POST 2030 ROADWAY
▨ = PROJECT SITE

FIGURE 1

VICINITY MAP

CHINO VALLEY USD PRESERVE SCHOOL, CHINO

n:\3500\2153599 – block 4 south of pine – the preserve, chino\cvusd preserve school\dwg\3599 f-2.dwg LDP 13:20:50 01-14-2021 co

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N
NO SCALE

SOURCE: GOOGLE

KEY

▨ = PROJECT SITE

FIGURE 2

EXISTING SITE AERIAL

CHINO VALLEY USD PRESERVE SCHOOL, CHINO

n:\3500\2153599 – block 4 south of pine – the preserve, chino\cvusd preserve school\dwg\3599 f–3.dwg LDP 13:24:03 01–14–2021 co

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SOURCE: WLC ARCHITECTS

FIGURE 3

PROPOSED SITE PLAN

CHINO VALLEY USD PRESERVE SCHOOL, CHINO

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Traffic
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Parking

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Pasadena
Irvine
San Diego
Woodland Hills

April 27, 2021

Barbara Heyman
Associate Principal
Placeworks
3910 Normal Street, Suite C
San Diego, CA 92103

LLG Reference: 2.19.4192.1

Subject: **Revised Focused Traffic Assessment for the Chino Valley Unified School District Preserve School at South of Pine Block 9**
Chino, California

Dear Ms. Heyman:

As requested, Linscott, Law & Greenspan, Engineers (LLG) is pleased to submit this Revised Focused Traffic Assessment related to the development of the Chino Valley Unified School District (CVUSD) Preserve School at South of Pine (SOP) located on the southwest corner of East Preserve Loop at Market Street within Block 9 of the SOP component of the Preserve Specific Plan (herein after referred to as the "Project") in the City of Chino, California. This analysis has been updated to address the comment of the City of Chino as documented in a memorandum dated March 16, 2021.

The development of the proposed Project site was previously analyzed and approved as part of the *Traffic Impact Analysis "South of Pine" (Tentative Tract Map No. 16420) The Preserve Phase 3 and 4 Areas Internal Evaluation and External Evaluation, prepared by LLG, dated January 2008.* In addition, the subject property has been included in the cumulative traffic analysis prepared as part of the *Revised Traffic Impact Analysis for the Preserve Specific Plan Flores & South of Pine GPA-SPA-MSA project, dated August 30, 2016 (revised November 2, 2016)*, that included a long-term (buildout) traffic assessment. Further, the Project was also included as a cumulative development project in the recently approved *The Preserve town Center Revised Focused Traffic Assessment, dated October 13, 2020*, for which this study uses as a reference/resource. For reference, the January 2008 TIA and November 2016 TIA have been included in ***Appendix A***.

The focus of this analysis is to determine the potential traffic and circulation needs associated with the proposed Project under Opening Year 2024 and Year 2030/2040 traffic conditions within the SOP internal assessment and to reconfirm the adequacy of planned intersection roadway configuration and geometry. The work program provided herein is very similar to evaluations prepared for recent and current development project within SOP. Included in this focused assessment are:

- Project traffic generation/distribution/assignment,
- AM and PM peak hour capacity analyses for Year 2024 Cumulative Plus Project traffic conditions,
- AM and PM peak hour capacity analyses for Year 2030/2040 Buildout Plus Project traffic conditions,
- Traffic signal warrant analysis at all unsignalized intersections and project driveways,
- Queue length analysis for all planned left and right-turn lanes at key study intersections and project driveways,
- Site access and internal circulation evaluation,
- Traffic and Parking Management Plan (T&PMP) Measures, and
- Safe School Routes Recommendations.

STUDY AREA

The following study intersections, as referenced and numbered in Section 14.0 of the August 2016 TIA, have been selected for evaluation in this focused analysis as these intersections, along with an additional four (4) project driveways, will serve as the primary access for the Project:

6. Main Street at Market Street
11. East Preserve Loop at Market Street
12. East Preserve Loop at Academy Street
36. Main Street at Academy Street

Figure 1 presents a vicinity map, which illustrates the general location of the Project and depicts the study intersections and surrounding street system.

PROJECT INFORMATION

Project Description

The proposed Project, located within Block 9 of the SOP component of the Preserve Specific Plan, entails acquisition of a 12-acre property or development and operation of a public K-8 school. The proposed school site is located south of Market Street, east of East Preserve Loop, and north of Academy Street. The site is currently vacant and has most recently been used for construction staging for developments surrounding the project site. Historically, it has been used for agricultural purposes. The property adjoining west of the Project site is also a component of Block 9 in South of Pine and is planned as a future community center/park facility but is not a part of the proposed Project.

The proposed school would serve students in kindergarten through eighth grade and would accommodate a maximum of 900 students on a standard school calendar or a maximum of 1,200 students on a 4-track year-round schedule. It should be noted that though the school can accommodate 1,200 students, only 900 students will likely be accommodated at any given time. The school buildings would encompass 83,500 square feet and be constructed near the center of the property. Outdoor recreational facilities are proposed on the southern portion of the campus. CVUSD anticipates construction of the project to start in 2022 and the school to open in Fall 2024. ***Figure 2*** presents an aerial depiction of the project site. ***Figure 3*** presents the proposed Project site plan.

The Entitled Development/Current zoning for the proposed Project, as designated/identified in the 2016 TIA, includes the construction of an elementary school to accommodate a maximum of 1,000 students. ***Table 1*** presents a summary of the entitled and proposed land uses for a portion of Block 9.

Site Access

Access to the proposed Project site will be provided via (2) full access, unsignalized driveways on Market Street and two (2) right-turn only driveways on East Preserve Loop. The parking lot located on East Preserve Loop is intended to be the primary pick-up and drop-off location for students. It is expected that vehicles will enter the parking lot via the northern driveway (Driveway 3) and exit via the southern driveway (Driveway 4) after dropping off their student. Access to the Project site for pedestrian and bicyclists will be provided by proposed sidewalks along Market Street, East Preserve Loop and Academy Street which will connect to the project's site internal walkways, inclusive of a proposed midblock crosswalk on Market Street that will connect the Project site the planned residential/commercial uses in the Preserve Town Center. Additionally, based on information provided in *The Preserve Specific Plan*, prepared by The Planning Center in March 2003 and amended in September 2016, on-street parking will be provided adjacent to the project site on Market Street and Academy Street.

FUTURE TRAFFIC VOLUMES AND LANE GEOMETRICS

Future Lane Geometrics

Based on information provided by Lewis Management Corp. as well as information in our files, future/planned intersection lane geometrics were identified for Year 2024 and Year 2030/2040 Buildout Plus Project traffic conditions. ***Figures 4*** and ***5*** present the planned lane geometries used in Year 2024 and Year 2030/2040 traffic analyses, respectively. It should be noted that Year 2030 has always been considered the buildout year for the South of Pine (SOP) Project and as a result the volumes located within SOP area are the same for Year 2030 and Year 2040. ***Figure 6*** presents the location of the Project within the overall South of Pine Master Planned Land uses.

Year 2024 Cumulative Traffic Volumes

Based on information provided by Lewis Management Corp. as well as information in our files, cumulative projects within South of Pine were included as part of the background condition for Year 2024. ***Tables 2*** and ***3*** present a summary of the cumulative projects that were included for Year 2024 as well as the forecasted trip generation, respectively.

Year 2030/2040 Buildout Traffic Volumes

The buildout traffic volumes (Year 2030/2040) include the full buildout of the SOP residential community. Volumes are based on the traffic data contained in the *Traffic Impact Analysis "South of Pine" (Tentative Tract Map No. 16420) The Preserve Phase 3 and 4 Areas External Evaluation, LLG, dated January 2008*, as well as the *Revised Traffic Impact Analysis for the Preserve Specific Plan Flores & South of Pine GPA-SPA-MSA project, dated August 30, 2016 (revised November 2, 2016).* Based on information provided by Lewis Management Corp. as well as information in our files, changes to the land use development potential of Block 4 and the remainder of Block 9, including the Block 9 community center/park facilities located west of the Project site, were also included.

PROJECT TRAFFIC CHARACTERISTICS

Project Traffic Generation

Traffic generation is expressed in vehicle trip ends, defined as one-way vehicular movements, either entering or exiting the generating land use. Generation equations and/or rates used in the traffic forecasting procedure are found in the 10th Edition of *Trip Generation*, published by the Institute of Transportation Engineers (ITE) [Washington D.C., 2017], which is the most current version. Although the 2016 TIA was based on trip generation rates published in the 9th Edition of *Trip Generation*, subsequent studies within the Preserve Specific Plan were based on the current trip generation information available at the time, as the South of Pine “Internal/External” January 2008 TIAs and the February 2014 Falloncrest TIA used trip generation rates published in the 7th Edition and 9th of *Trip Generation*, respectively.

Table 4 summarizes the trip generation forecast of the proposed Project and entitled land use. The upper portion of *Table 4* presents the trip generation rates that were considered when forecasting the vehicular trips of the project, which includes ITE Land Use 520: Elementary School and ITE Land Use 522: Middle School/Junior High School. A comparison of these two rates show that the trip rates for Middle School/Junior High School are lower than the Elementary School rates. Therefore, the Elementary school rates were used to provide a conservative analysis. It should be noted that this analysis is also consistent with the original entitlement of Block 9 which was based on Elementary School rates.

A review of the top middle portion of *Table 4* shows the trip generation forecast for the entitled land use. As shown, the entitled land use is forecast to generate 1,890 daily trips, with 670 trips (362 inbound, 308 outbound) during the AM peak hour and 170 trips (82 inbound, 88 outbound) during the PM peak hour.

A review of the lower middle portion of *Table 4* shows the trip generation forecast for the proposed Project with 900 students. As shown, the proposed Project is forecast to generate 1,701 daily trips, with 603 trips (326 inbound, 277 outbound) during the AM peak hour and 153 trips (73 inbound, 80 outbound) during the PM peak hour. A comparison of the trip generation potential of the proposed Project with that of the entitled land use indicates that the proposed Project will result in 189 <u>fewer</u> daily trips, 67 fewer AM peak hour trips, and 17 fewer PM peak hour trips than the entitled land use. Hence, it can be concluded that the trip generation of the proposed Project falls within the trip budget for Block 9 within the South of Pine component of the Preserve Specific Plan, and originally assessed in the *Traffic Impact Analysis "South of Pine" (Tentative Tract Map No. 16420) The Preserve Phase 3 and 4 Areas External Evaluation, LLG, dated January 2008.*

A review of the bottom portion of *Table 4* shows the trip generation forecast for the proposed Project with 1,200 students, assuming year-round track. As shown, under this scenario, the proposed Project is forecast to generate 2,268 daily trips, with 804 trips (434 inbound, 370 outbound) during the AM peak hour and 204 trips (98 inbound, 106 outbound) during the PM peak hour. A comparison of the trip generation potential of the proposed Project with that of the entitled land use indicates that the proposed Project will result in 378 additional daily trips, 134 additional AM peak hour trips, and 34 additional PM peak hour trips than the entitled land use.

Although the Project is anticipated to only accommodate 900 students at any given time, to provide a conservative assessment this report will analyze the traffic impacts of 1,200 students.

Project Traffic Distribution

The traffic distribution pattern for the proposed Project is primarily based on the school's proximity to the neighboring residential communities within North of Pine and South of Pine as well as future roadway conditions.

For the school's opening year, Year 2024 traffic conditions, since South of Pine is not built out it is assumed that a portion of the proposed Projects trips will also originate from the residential parcels within North of Pine. Additionally, it is assumed that approximately 15% of the total trips will take alternative modes of transportation (i.e. walk or bicycle). ***Figure 7*** presents the project traffic distribution pattern for Year 2024.

For Year 2030/2040 traffic conditions, the origins of the trips are focused to the residential parcels of South of Pine only. It is assumed that approximately 25% of the total trips will take alternative modes of transportation (i.e. walk or bicycle). ***Figure 8*** presents the project traffic distribution pattern for Year 2030/2040.

Figures 9 and ***10*** present the Year 2024 project only traffic volumes for the AM peak hour and PM peak hour, respectively. ***Figures 11*** and ***12*** present the Year 2030/2040 Buildout project only traffic volumes for the AM peak hour and PM peak hour, respectively.

Figures 13 and ***14*** present the Year 2024 Cumulative Plus Project traffic volumes for the AM peak hour and PM peak hour, respectively. ***Figures 15*** and ***16*** present the Year 2030/2040 Buildout Plus Project only traffic volumes for the AM peak hour and PM peak hour, respectively.

INTERSECTION CAPACITY ANALYSIS

Table 5 summarizes the peak hour level of service results at the four (4) key study intersections and four (4) project driveways for Year 2024 Plus Project, and Year 2030/2040 Plus Project traffic conditions. The first column (1) of HCM//LOS values in *Table 5* lists Year 2024 Cumulative Plus Project traffic conditions and the second column (2) lists Year 2030/2040 Buildout Plus Project traffic conditions.

Review of column (1) of *Table 5* indicates that all four (4) study intersections and four (4) project driveways are forecast to operate at acceptable service levels during the AM and PM peak hours under Year 2024 cumulative traffic conditions.

Review of column (2) of *Table 5* indicates that all four (4) study intersections and four (4) project driveways are forecast to operate at acceptable service levels during the AM and PM peak hours under Year 2030/2040 Buildout traffic conditions.

Appendix B presents the HCM/LOS calculation worksheets for the key study intersections during the weekday AM peak hour and PM peak hour.

TRAFFIC SIGNAL WARRANT ANALYSIS

A traffic signal warrant analysis at all unsignalized intersections and project driveways has been completed to determine the need for signalization of any intersection. This assessment is made on the basis of signal warrant criteria adopted by Caltrans. For this study, the need for signalization is assessed on the basis of the peak-hour traffic signal warrant, Warrant #3, described in the *California Manual on Uniform Traffic Control Devices (MUTCD).*

Warrant #3 has two parts:

1. *Part A* evaluates peak hour vehicle delay for traffic on the minor street approach with the highest delay, and
2. *Part B* evaluates peak-hour traffic volumes on the major and minor streets.

This method provides an indication of whether peak-hour traffic conditions or peak-hour traffic volume levels are, or would be, sufficient to justify installation of a traffic signal. Other traffic signal warrants are available, however, they cannot be checked under future conditions because they rely on data for which forecasts are not available (such as accidents, pedestrian volume, and four- or eight-hour vehicle volumes).

The decision to install a traffic signal should not be based purely on the warrants alone. Instead, the installation of a signal should be considered and further analysis performed when one or more of the warrants are met. Additionally, engineering judgment is exercised on a case-by-case basis to evaluate the effect a traffic signal will have on certain types of accidents and traffic conditions at the subject intersection as well as at adjacent intersections.

The results of the peak-hour traffic signal warrant analysis for Year 2024 Cumulative Plus Project and Year 2030/2040 Buildout Plus Project traffic conditions are summarized in ***Table 6***. The results indicate that none of the key study intersections or project driveways satisfy the criteria for a traffic signal. Therefore, the installation of a traffic signal at any of the study intersections is not required. ***Appendix C*** presents the signal warrant worksheets.

QUEUEING EVALUATION

A queuing evaluation was prepared for the key study intersections to determine the required stacking/storage lengths for all planed left-turn and right-turn lanes. Queues were also evaluated at the project driveways to determine internal stacking.

The queuing evaluation was conducted based on Year 2024 Cumulative Plus Project and Year 2030/2040 Buildout Plus Project peak hour traffic volumes. For unsignalized locations, the 95th percentile queue length (feet) in the peak hour was used to determine the required pocket length.

Year 2024 Cumulative Plus Project Traffic Conditions

Table 7 identifies the queuing results for Year 2024 Cumulative Plus Project traffic conditions. Review of *Table 7* indicates that the anticipated queues for all the key study intersections and project driveways are considered adequate.

Year 2030/2040 Buildout Plus Project Traffic Conditions

Table 8 identifies the queuing results for Year 2030/2040 Buildout Plus Project traffic conditions. Review of *Table 8* indicates that the anticipated queues for all the key study intersections and project driveways are considered adequate.

Appendix D presents the queuing worksheets.

SIGHT DISTANCE AND INTERNAL CIRCULATION

Sight Distance Evaluation

At intersections and/or project driveways, a substantially clear line of sight should be maintained between the driver of a vehicle waiting at the crossroad and the driver of an approaching vehicle. Adequate time must be provided for the waiting vehicle to either cross all lanes of through traffic, cross the near lanes and turn left, or turn right, without requiring through traffic to radically alter their speed.

Sight distance evaluations were prepared using the City of Chino Public Works Department Standard Drawing No. 1025 – Limited Use Area (Adequate Sight Distance). Minimum stopping sight distance was utilized for this evaluation and is defined as the distance required by the driver of a vehicle, traveling at a given speed, to bring his vehicle to a stop after an object on the road becomes visible. Stopping sight distance is measured from the driver’s eyes, which are assumed to be 3.5 feet above the pavement surface, to an object 0.5-foot high on the roadway. For this analysis, a speed limit of 30 mph was used for both Market Street and East Preserve Loop. Based on the criteria set forth in Standard Drawing No. 1025 and interpolation between a 35 mph and 25 mph street, a minimum stopping sight distance of 330 feet is recommended for the project driveways.

Figures 17 and ***18*** presents a schematic of the sight distance evaluations performed at the proposed Project driveways along Market Street and East Preserve Loop, respectively. The figures illustrate the actual sight distances and corresponding limited use areas. As shown, a motorist's sight distance may be obstructed by future landscaping and/or hardscapes. Therefore, any landscaping and/or hardscapes should be designed such that a driver's clear line of sight is not obstructed and does not threaten vehicular or pedestrian safety, as determined by the City Engineer (see limited use areas on *Figures 17* and *18).*

Internal Circulation Evaluation

Evaluation of the access circulation was performed using the *Turning Vehicle Templates*, developed by Jack E. Leisch & Associates and *AutoTURN for AutoCAD* computer software that simulates turning maneuvers for various types of vehicles to ensure that fire trucks, school busses, SU-30 delivery trucks, and passenger vehicles could properly circulate the internal road network. A fire truck, school bus, and SU-30 turning template will be utilized in this evaluation.

Figures 19 through ***21*** present the turning movements required of a fire truck, school bus, and SU-30 truck to circulate throughout the project site, respectively. *Figure 19* indicates that access to the project site via a fire truck is generally considered adequate. *Figure 20* indicates that access to the project site via school bus is generally considered adequate. *Figure 21* indicates that access to the project site via SU-30 is generally considered adequate.

TRAFFIC AND PARKING MANAGEMENT PLAN MEASURES

This section describes specific measures under a Traffic and Parking Management Plan (T&PMP) recommended for implementation by the school to manage the future traffic and parking needs during the weekday drop-off and pick-up times. The following outlines the T&PMP measures recommended for weekday drop-off and pick-up times to be implemented to minimize on-site congestion and pedestrian/vehicular conflicts, as well as congestion at the site driveways:

1. As shown on ***Figure 22***, student drop-off and pick-up activities on site will take place via the designated drop-off/pick-up area within the parking lot located on East Preserve Loop, to be managed by School Staff. Review of *Figure 22* shows that a total of 20 vehicles can be stacked on-site, with 8 vehicles stacked within the "drop-off/pick-up" area and 12 vehicles stacked downstream in the waiting area.

   The Best Practice Standards for on-site queueing related to school drop-off/pick-up activities indicates that 6% of the effective student enrollment is a reasonable factor for estimating the "maximum queue" of vehicles on site[1]. Therefore, based on a total queue of 20 vehicles and the assumption that approximately 15% of students would walk to/from school, the "drop-off/pick-up" area on East Preserve Loop can accommodate a maximum of 400 students at a given time.

   It is anticipated that the school will implement operations similar to that of Cal Aero Preserve Academy, which is an existing K-8 school located north of Pine Avenue within the Preserve at Chino. However, in order to avoid potential traffic issues/congestion, the proposed Project could consider implementing staggered start and end times in order to accommodate the total anticipated student enrollment more efficiently. Staggered start and end times could ultimately double the student enrollment from 400 to 800 students that could be accommodated within the proposed drop-off/pick-up area.

   In the event additional vehicular stacking is necessary, the northern parking lot located along Market Street potentially could be utilized as a secondary staging area for drop-off and pick-up. A total of 18 vehicles can be stacked on-site within the Market Street parking lot. Currently, the parking lot is designated for

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[1] Source: *Strategies for the Greening of Student Pick-Ups at School Dismissal White Paper*, Dustin Qualls, PE, PTOE.

bus drop-off and staff parking. However, the use of busses are intended to be used during times outside of the drop-off/pick-times to facilitate field trips and other off-campus activities.

Based on the Best Practice Standards factor of 6% for estimating the “maximum queue” for vehicles on-site and the assumption that approximately 15% of students would walk to/from school, the secondary staging area on Market Street would be able to accommodate a maximum of 360 students at a given time, which is conservative given it presumes “no siblings”. Traffic control personnel would be responsible for managing the secondary drop-off area.

2. To access the drop-off/pick-up area, vehicles must enter from East Preserve Loop via the northern most driveway and exit via the southernmost driveway. Vehicles will be required to queue in the “waiting area” before being directed by traffic control personnel to proceed to the drop-off area. No one will be allowed to drop-off/pick-up within the wait line. Signage on post delineators/cones and traffic control personnel will enforce the no loading/unloading restrictions.

3. Traffic control personnel will be responsible for moving traffic forward. Every vehicle in the waiting area will be directed to move forward as close as possible to the vehicle in front of it. Once in the drop-off/pick-up area, no one is allowed to exit or enter the vehicle except for students from the right-hand side of the vehicle. Students will be assisted by traffic control personnel to help expedite the process. Traffic control personnel would be responsible for platooning vehicles. It is anticipated that all 8 vehicles will be directed to leave at the same time after dropping off/picking up to minimize conflicts.

4. During student pick-up, it is suggested that parents display placards on their windshield indicating the last name of the students being picked up before getting into the queue. Through the use of walkie-talkies, traffic control personnel will “arrange” the students in the correct order to prepare them for a quick pick-up. Essentially, traffic control personnel will need to time and synchronize the parents’ arrival with the students. For siblings, the older child will have to wait with the younger child in front of the school where there is supervision. Signage on post delineators/cones and traffic personnel will enforce the placard program during school dismissal.

5. Restrict the northernmost driveway to inbound flow only and restrict the southernmost driveway to outbound flow only.

6. Enforce the above measures through the use of traffic personnel, channelization devices (i.e., traffic cones, barriers), and signage.

7. Establish a Parking Committee (typically staff and/or volunteers) with on-going responsibility to define, implement, and refine the T&PMP including identification of operational problems. The school should develop a detailed T&PMP prior to the first day of the school opening.

8. Monitor the designated drop-off zone on site and deploy the necessary measures to minimize traffic conflicts along the main path of travel/vehicle circulation on site, and where vehicle-pedestrian conflicts may occur.

9. Produce informational pieces (handouts, mailings, emails, etc.), with maps and descriptive text, which identify responsibilities and actions under the plan. Information should include, but not be limited to, arrival and dismissal times, drop-off and pick-up circulation, where to park, what parents should do to make dropping off or picking up easier and quicker, and what parents should expect during the peak times.

SAFE ROUTES TO SCHOOL EVALUATION

Based on opening year (Year 2024) traffic conditions, pedestrian circulation for the project site will be provided via proposed sidewalks along East Preserve Loop, Market Street, and Academy Street. The proposed Project will construct the sidewalks adjacent to the project site along East Preserve Loop, Market Street, and Academy Street to connect to the other existing and/or proposed sidewalks along East Preserve Loop, Market Street, Academy Street, Legacy Park Road, Discovery Park road, and Pine Avenue. The proposed sidewalk system within the Project vicinity provides direct connectivity to the major thoroughfares of Pine Avenue and pedestrian connectivity to the existing residential, recreational, and commercial development in the surrounding area.

The proposed sidewalks facilities will be designed to satisfy the minimum widths recommended for safe routes to schools. Adjacent to the project site, East Preserve Loop will be constructed to include a 10-foot multi-use path. Market Street will be constructed to include an 8-foot sidewalk on the north side and a 13-foot multi-use path on the south side. Academy Street will be constructed to include a 5-foot sidewalk.

Crosswalks will be marked at the stop-controlled intersections of East Preserve Loop/Market Street and East Preserve Loop/Academy Street. Additionally, a midblock crosswalk along Market Street, located adjacent to the Project site between Main Street and East Preserve Loop, is proposed as part of the background traffic conditions. Although this midblock crossing is not proposed by the CVUSD it is assumed that the final design will satisfy the City of Chino design standards and appropriate pavement markings/signage per the MUTCD. It is anticipated that the midblock crosswalk will also service students as part of the safe route to school path.

Safe Routes to School Paths of Travel

Figure 23 presents the recommended safe route to school paths of travel for students walking and/or biking to/from the school based on opening year (Year 2024) traffic conditions. This exhibit assumes implementation of future infrastructure. The implementation of safe routes to school are within the purview of the City of Chino. Prior to the first day of school, refinements to the safe routes to school path of travel should be reviewed to confirm/modify the routes as needed based on the infrastructure at that time. Annual refinements are recommended as well. It is our understanding that the City of Chino will be responsible for ensuring the safe routes to school is current and up to date as infrastructure improvements are completed. Review of *Figure 23* indicates the following:

- It is recommended for students north of Pine Avenue and west of East Preserve Loop to travel along the north side of Pine Avenue and the west side of East Preserve Loop to make their way to the school. These students should cross the street within the marked crosswalks at the intersections of Mill Creek Avenue/Pine Avenue, West Preserve Loop/Pine Avenue, and East Preserve Loop/Pine Avenue during the traffic signals walk-phase, as well as at the stop-controlled intersection of East Preserve Loop/Market Street.

- It is recommended for students north of Pine Avenue and east of East Preserve Loop to travel along the south side of Pine Avenue and the east side of East Preserve Loop to make their way to the school. These students should cross the street within the marked crosswalks at the intersections of Hellman Avenue/Pine Avenue and Homecoming Drive/Pine Avenue during the traffic signals walk-phase, as well as at the stop-controlled intersection of East Preserve Loop/Market Street.

- It is recommended for students north of Market Street, south of Pine Avenue, and west of East Preserve Loop to travel along either Market Street or East Preserve Loop to make their way to the school. Students traveling on Market Street should travel on the north side of Market Street and cross the street within the marked midblock crosswalk. Students traveling on East Preserve Loop should travel on the west side of the street and cross the street within the marked crosswalk at the stop-controlled intersection of East Preserve Loop/Market Street.

- It is recommended for students north of Market Street, south of Pine Avenue, and east of East Preserve Loop to travel along the east side of East Preserve Loop to make their way to the school. These students should cross the street within the marked crosswalk at the stop-controlled intersection of East Preserve Loop/Market Street.

- It is recommended for students south of Market Street, north of Academy Street, east of East Preserve Loop and west of Discovery Park Avenue to travel along the south side of Market Street to make their way to the school. These students should cross the street within the marked crosswalk at the stop-controlled intersection of East Preserve Loop/Market Street.

- It is recommended for students south of Academy Street, north of Legacy Park Street, east of East Preserve Loop, and west of Discovery Park Road to travel along East Preserve Loop to make their way to the school. These students should cross the street within the marked crosswalks at the intersection of East Preserve Loop/Academy Street.

- It is recommended for students east of Discovery Park Road to travel along the east side of Discovery Park Avenue, the north side of Legacy Park Street, and East Preserve Loop to make their way to the school. These students should cross the street within the marked crosswalks at the stop-controlled intersections of Discovery Park Avenue/Legacy Park Road, East Preserve Loop/Legacy Park Road, and/or East Preserve Loop/Academy Street.

Recommended School Signs and Pavement Markings

Figure 24 presents the recommended school signs and pavement markings for implementation by the City of Chino, upon review and approval, based on the safe route to school pedestrian paths of travel presented previously in *Figure 23.* Review of *Figure 24* shows that it is recommended for the crosswalks at the intersections of Main Street/Market Street, East Preserve Loop/Market Street, East Preserve Loop/Academy Street, and East Preserve Loop/Legacy Park Street be painted yellow to indicate school crossings. It is also recommended that SR4-1(CA) signs (i.e. school, 25 mph speed limit when children are present), SW-24-2(CA) signs (i.e. school crosswalk warning), and SW24-3(CA) signs (i.e. school crossing ahead) be installed in the general vicinity of the project along Market Street, Main Street, East Preserve Loop, Academy Street and Legacy Park Street. Lastly, it is also recommended to install flashing pedestrian school crossing signals at the midblock crosswalk along Market Street and on the north and south legs at East Preserve Loop/Academy Street. Installation and funding of all the aforementioned improvements are the responsibility of the City of Chino and/or Lewis Management Corp.

In addition, to the above improvements it is our understanding that the City is considering the potential midblock crossing along Academy Street between Main Street and East Preserve Loop. It is recommended that the overall design, signage and pavement markings would be similar to that proposed along Market Street.

SUMMARY OF FINDINGS AND CONCLUSIONS

Based on the above, it is concluded that the proposed Project will not generate any significant impacts. Left and right-turn queues at the study intersections and project driveways are projected to be adequate. Furthermore, the sight distance and internal access circulation for fire trucks, SU-30 trucks, and school busses at the project driveways are also generally considered adequate.

It is recommended that the school develop a detailed T&PMP prior to the first day of the school opening. The student drop-off and pick-up activities will take place via the designated drop-off/pick-up area within the parking lot located on East Preserve Loop. The East Preserve Loop parking lot can accommodate a total of 20 stacked vehicles. It is recommended to restrict the northern driveway to inbound flow only and the southern driveway to outbound flow only. Traffic control personnel will be responsible for enforcing the T&PMP.

It is anticipated that the school will implement operations similar to that of Cal Aero Preserve Academy, which is an existing K-8 school located north of Pine Avenue within the Preserve at Chino. Multiple options are available for the school to ensure drop-off/pick-up stacking is adequate to accommodate the existing/future student enrollment.

Based on opening year (Year 2024) traffic conditions, the proposed sidewalk facilities and the locations of crosswalks are considered adequate along the recommended safe routes to school paths of travel for students walking and/or biking to/from the school. It is recommended to install the appropriate signage (i.e., SR4-1(CA), SW24-2(CA) and SW24-3(CA)) in the general vicinity of the project site. It is also recommended to install flashing pedestrians school crossing signals at the midblock crosswalk along Market Street, as well as the north and south legs at East Preserve Loop/Academy Street. Implementation and funding for the improvements will be the responsibility of the City of Chino and/or Lewis Management Corp.

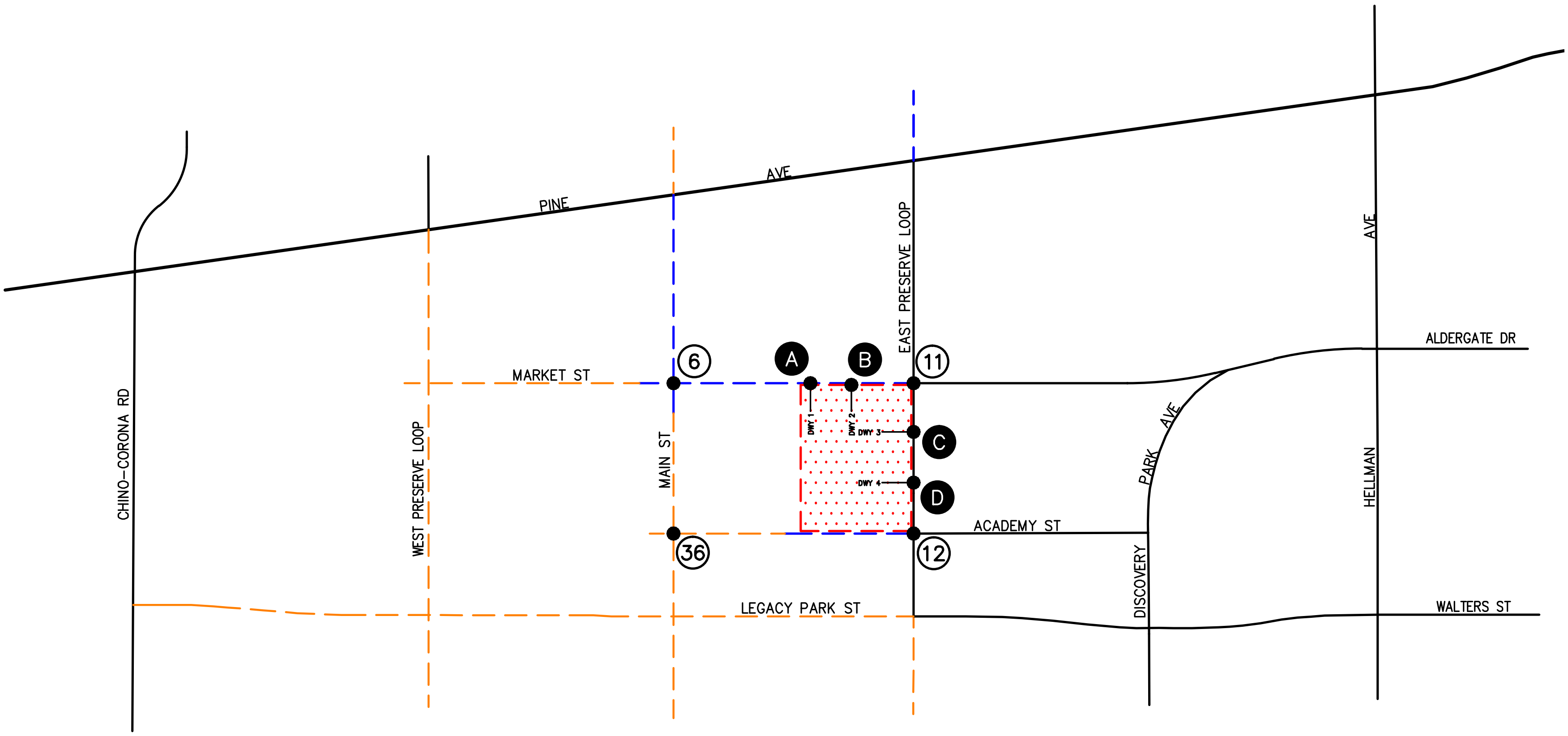
* * * * * * * * * * *

We appreciate the opportunity to provide this assessment. Should you have any questions, please call me at (949) 825-6175.

Very truly yours,
Linscott, Law & Greenspan, Engineers

Richard E. Barretto, P.E.
Principal

cc: Shane S. Green, P.E., LLG



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LINSCOTT
LAW &
GREENSPAN
engineers

NO SCALE

KEY

(#) = STUDY INTERSECTION
—— = ALREADY CONSTRUCTED ROADWAY
— — = FUTURE YEAR 2024 ROADWAY
— — = FUTURE YEAR 2030/2040 ROADWAY
▨ = PROJECT SITE

FIGURE 1

VICINITY MAP

CHINO VALLEY USD PRESERVE SCHOOL, CHINO

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LAW &
GREENSPAN
engineers

NO SCALE

SOURCE: GOOGLE

KEY

▨ = PROJECT SITE

FIGURE 2

EXISTING SITE AERIAL

CHINO VALLEY USD PRESERVE SCHOOL, CHINO

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GREENSPAN
engineers

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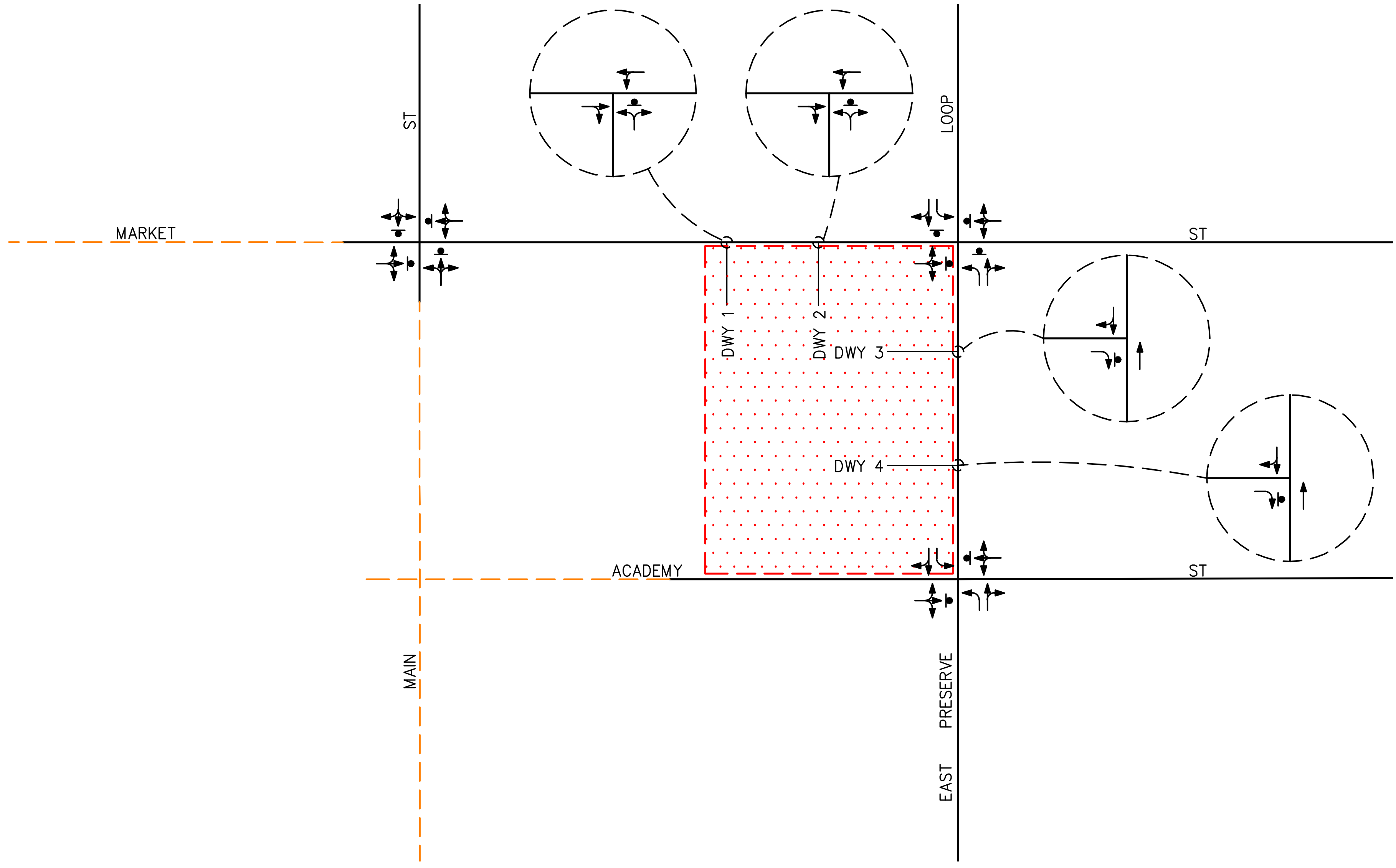
NO SCALE

SOURCE: WLC ARCHITECTS

FIGURE 3

PROPOSED SITE PLAN

CHINO VALLEY USD PRESERVE SCHOOL, CHINO



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GREENSPAN
engineers

N NO SCALE

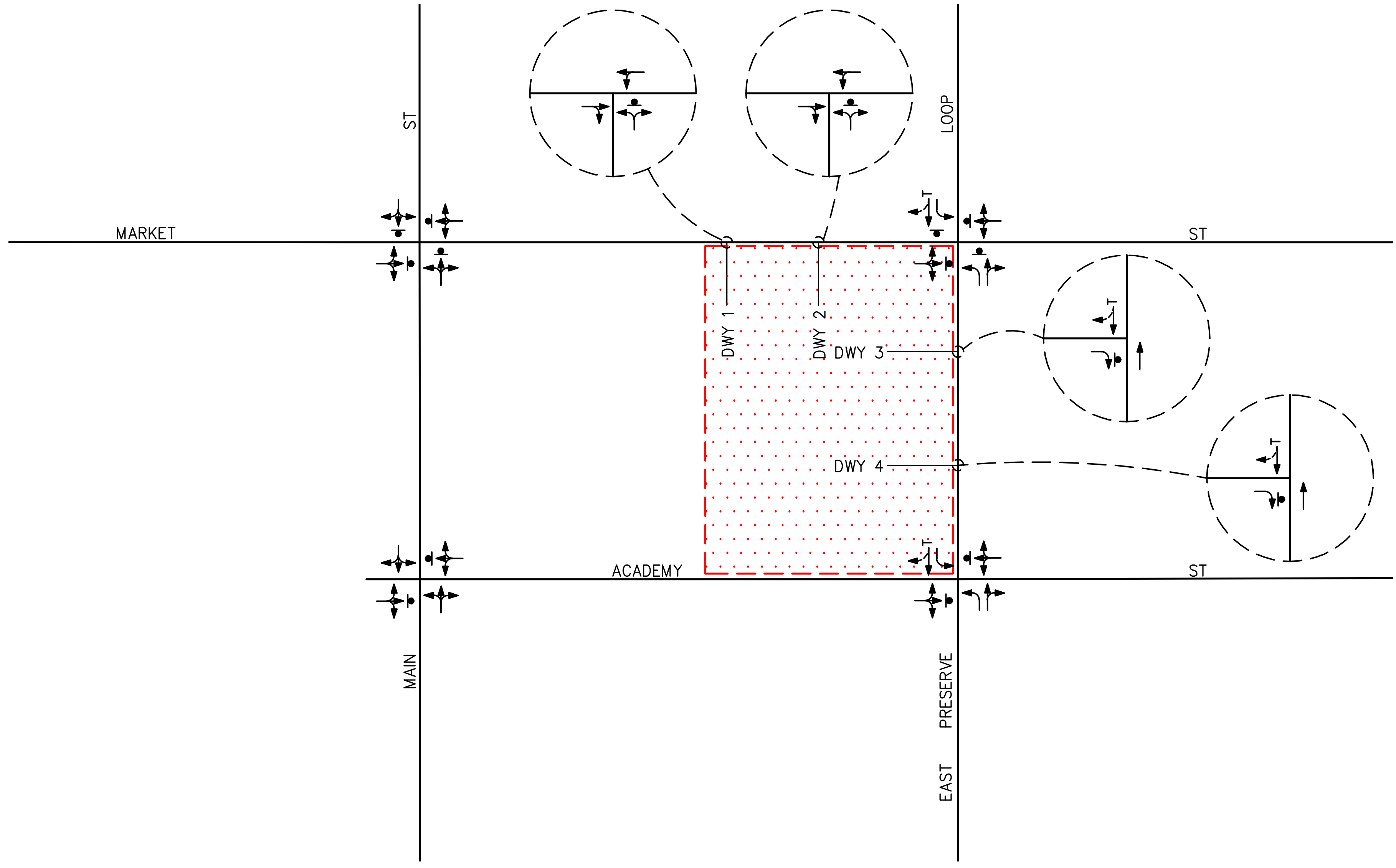
KEY

← = APPROACH LANE ASSIGNMENT
● = TRAFFIC SIGNAL, ⊥ = STOP SIGN
– – = FUTURE YEAR 2030/2040 ROADWAY
▨ = PROJECT SITE

FIGURE 4

YEAR 2024 CUMULATIVE PLUS PROJECT LANE GEOMETRICS

CHINO VALLEY USD PRESERVE SCHOOL, CHINO



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GREENSPAN
engineers

N NO SCALE

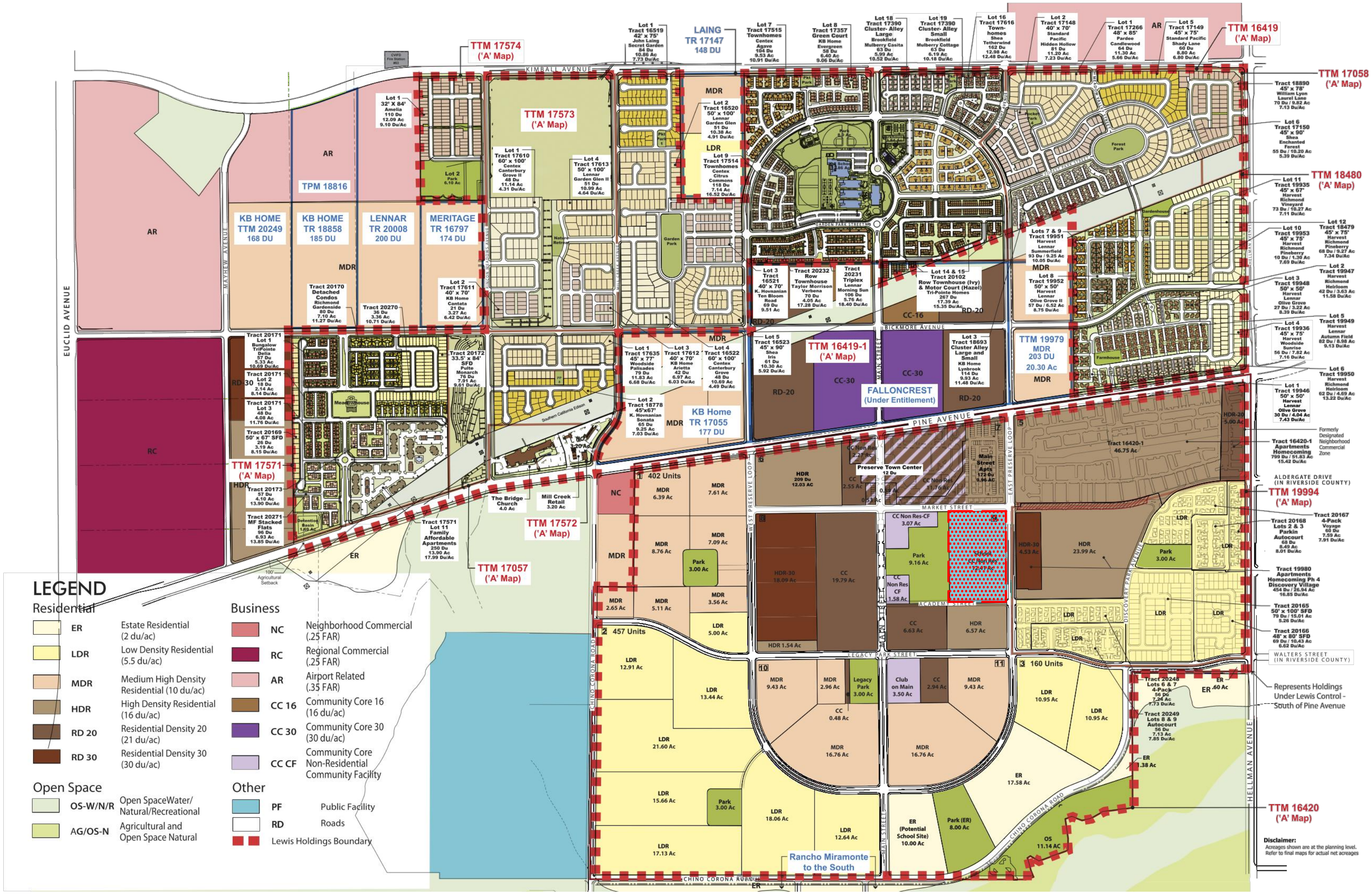
KEY

← = APPROACH LANE ASSIGNMENT
● = TRAFFIC SIGNAL, ● STOP SIGN
▨ = PROJECT SITE
T = TRANSIT LANE FUNCTIONS AS A SEPARATE RIGHT-TURN LANE AT THE INTERSECTION UNLESS OTHERWISE NOTED

FIGURE 5

YEAR 2030/2040 BUILDOUT PLUS PROJECT LANE GEOMETRICS

CHINO VALLEY USD PRESERVE SCHOOL, CHINO



SOURCE: LD KING ENGINEERING/WHA

KEY

▨ = PROJECT SITE

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

FIGURE 6

MASTER PLANNED LAND USES

CHINO VALLEY USD PRESERVE SCHOOL, CHINO

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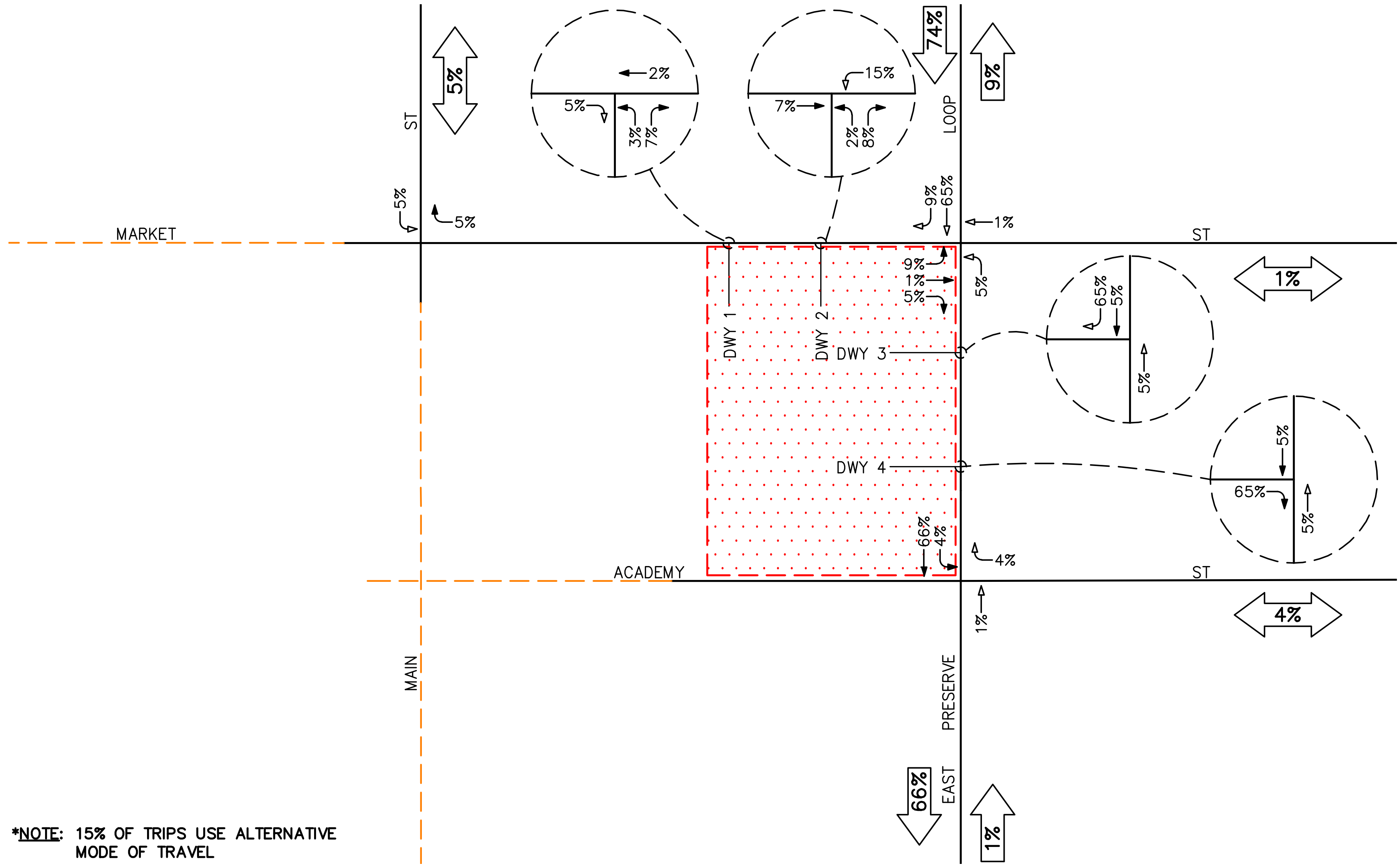

***NOTE: 15% OF TRIPS USE ALTERNATIVE MODE OF TRAVEL**

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engineers

NO SCALE

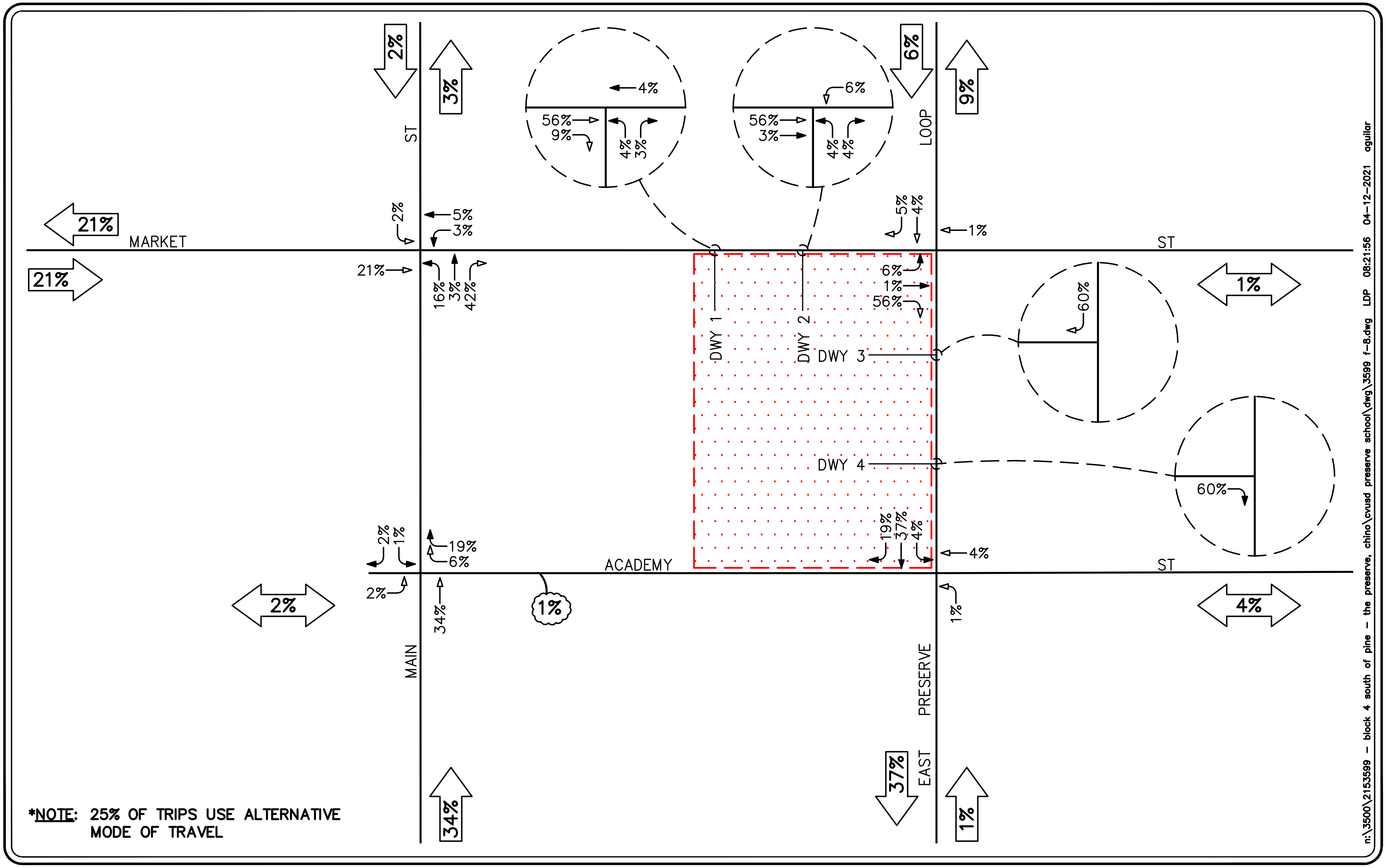
KEY

- (#) = STUDY INTERSECTION
- ◁— = INBOUND PERCENTAGE
- ◀— = OUTBOUND PERCENTAGE
- – – = FUTURE YEAR 2030/2040 ROADWAY
- ▨ = PROJECT SITE

FIGURE 7

YEAR 2024 PROJECT TRIP DISTRIBUTION PATTERN

CHINO VALLEY USD PRESERVE SCHOOL, CHINO



***NOTE:** 25% OF TRIPS USE ALTERNATIVE MODE OF TRAVEL

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NO SCALE

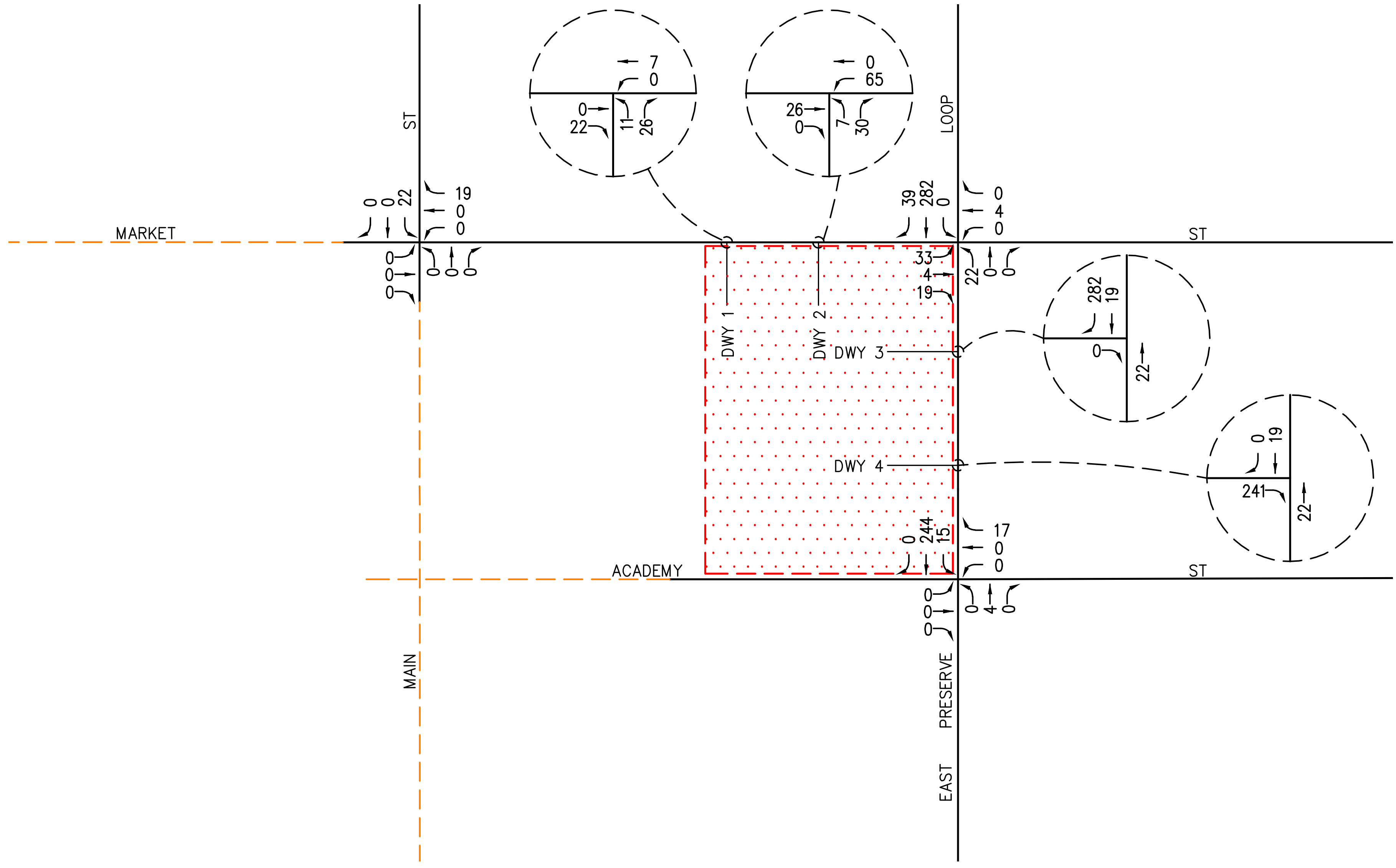
KEY

(#) = STUDY INTERSECTION
◁— = INBOUND PERCENTAGE
←— = OUTBOUND PERCENTAGE
▨ = PROJECT SITE

FIGURE 8

YEAR 2030/2040 BUILDOUT PROJECT TRIP DISTRIBUTION PATTERN

CHINO VALLEY USD PRESERVE SCHOOL, CHINO



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GREENSPAN
engineers

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NO SCALE

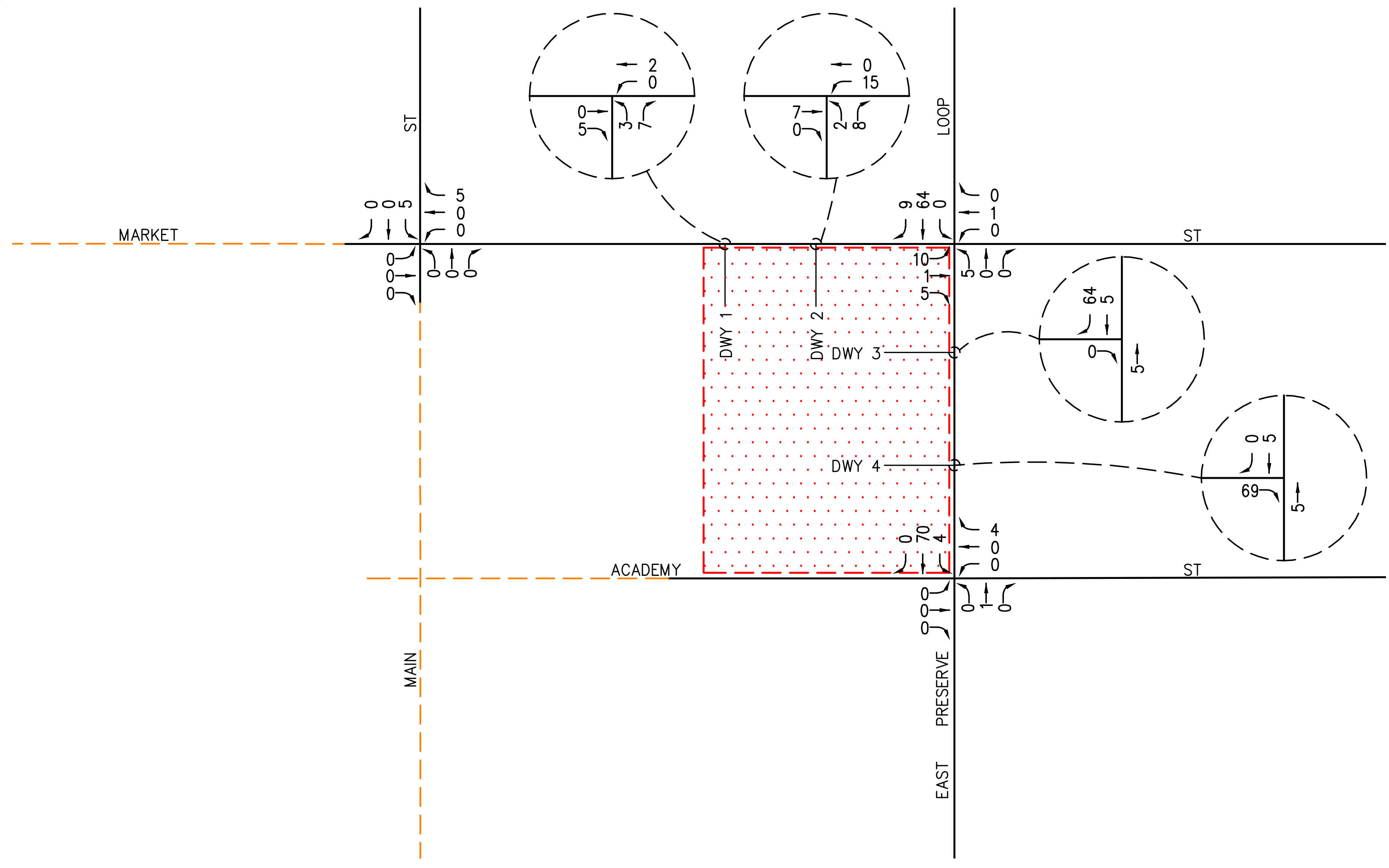
KEY

Ⓢ = STUDY INTERSECTION
– – = FUTURE YEAR 2030/2040 ROADWAY
▨ = PROJECT SITE

FIGURE 9

YEAR 2024 AM PEAK HOUR PROJECT TRAFFIC VOLUMES

CHINO VALLEY USD PRESERVE SCHOOL, CHINO



n:\3500\2153599 – block 4 south of pine – the preserve, chino\cvusd preserve school\dwg\3599 f–10.dwg LDP 08:26:01 04–12–2021 aguilar

LINSCOTT
LAW &
GREENSPAN
engineers

N
NO SCALE

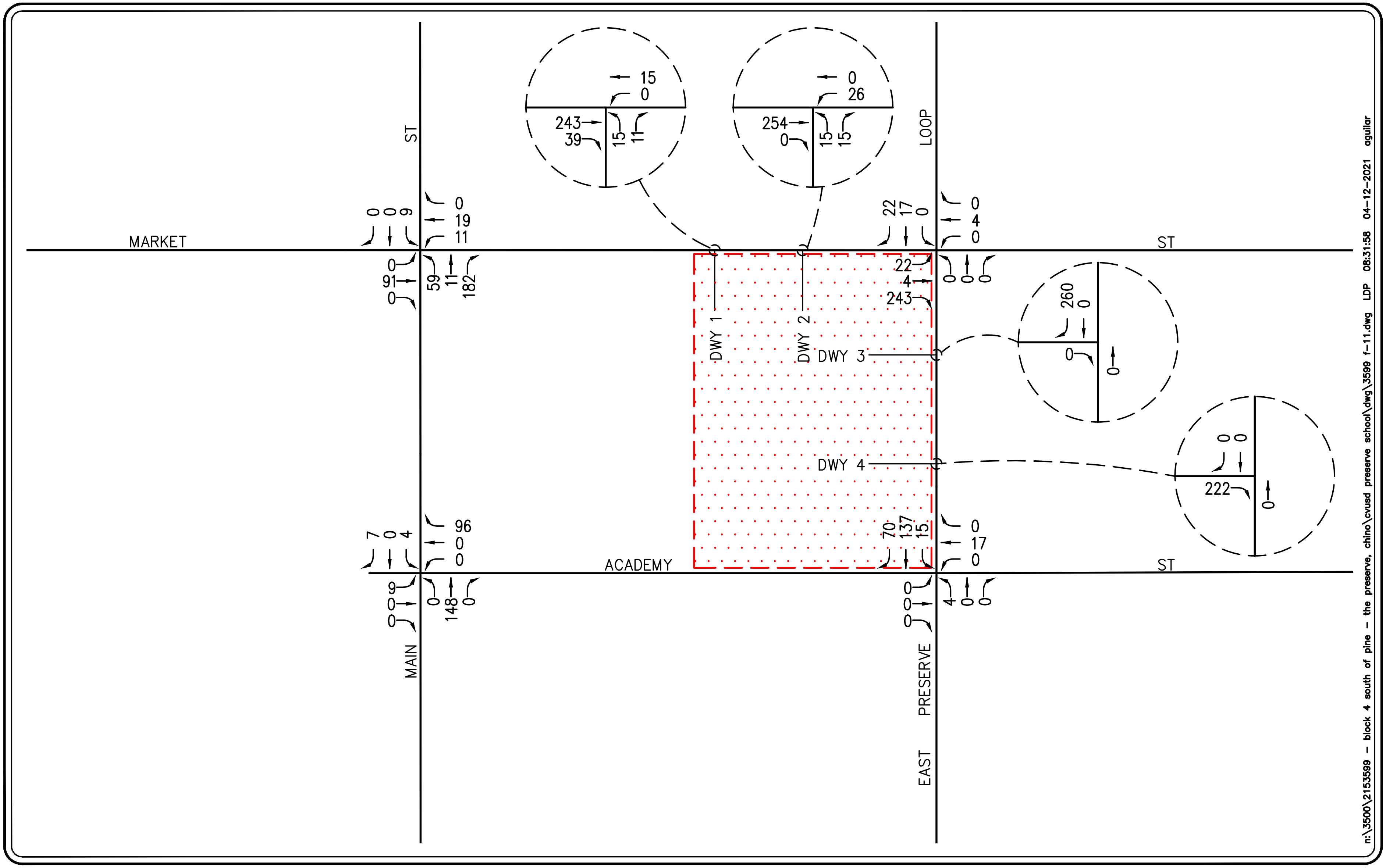
KEY

(#) = STUDY INTERSECTION
– – = FUTURE YEAR 2030/2040 ROADWAY
▨ = PROJECT SITE

FIGURE 10

YEAR 2024 PM PEAK HOUR PROJECT TRAFFIC VOLUMES

CHINO VALLEY USD PRESERVE SCHOOL, CHINO



LINSCOTT
LAW &
GREENSPAN
engineers

N
NO SCALE

KEY

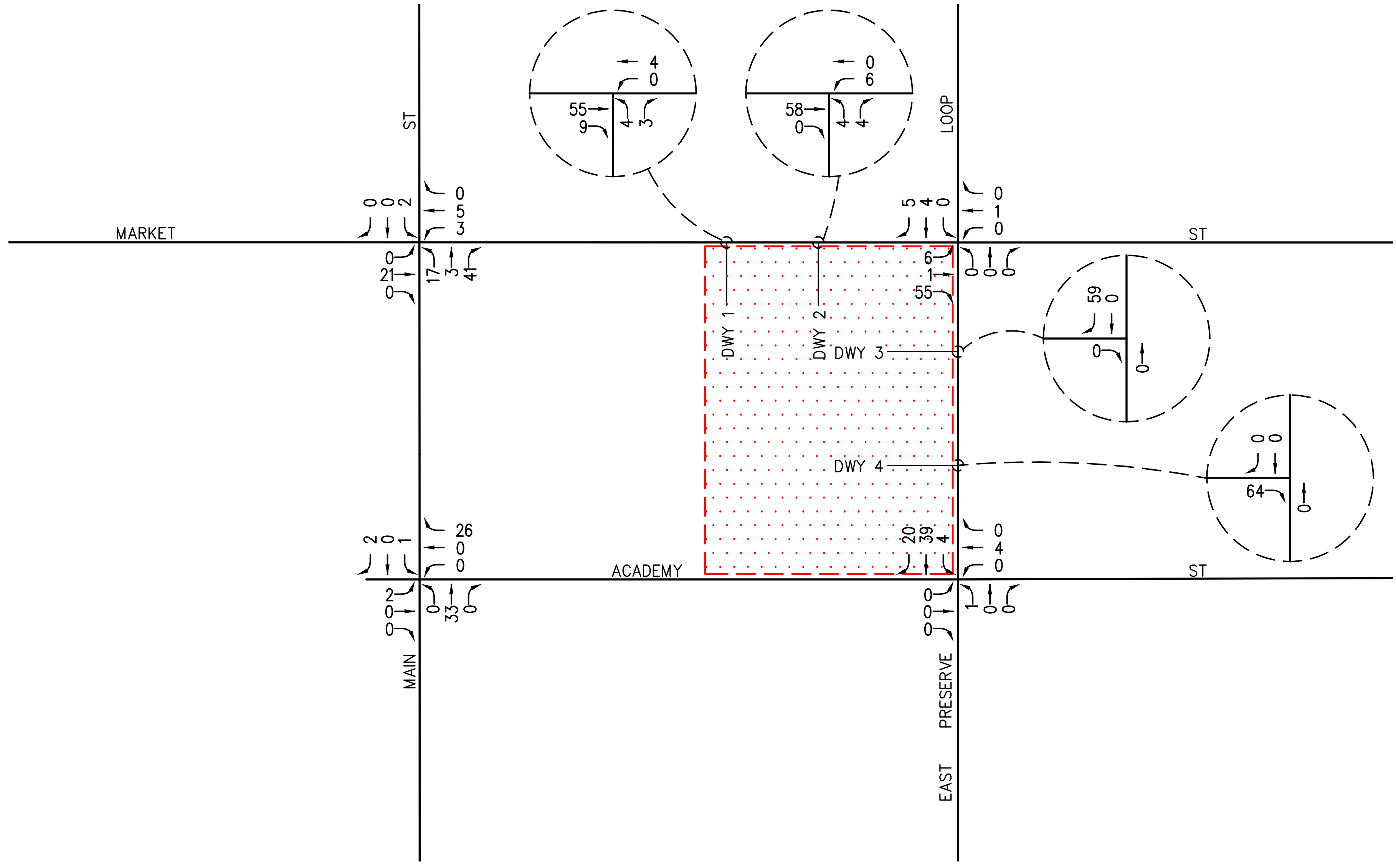
= STUDY INTERSECTION

▨ = PROJECT SITE

FIGURE 11

YEAR 2030/2040 BUILDOUT AM PEAK HOUR PROJECT TRAFFIC VOLUMES

CHINO VALLEY USD PRESERVE SCHOOL, CHINO



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LINSCOTT
LAW &
GREENSPAN
engineers

NO SCALE

KEY

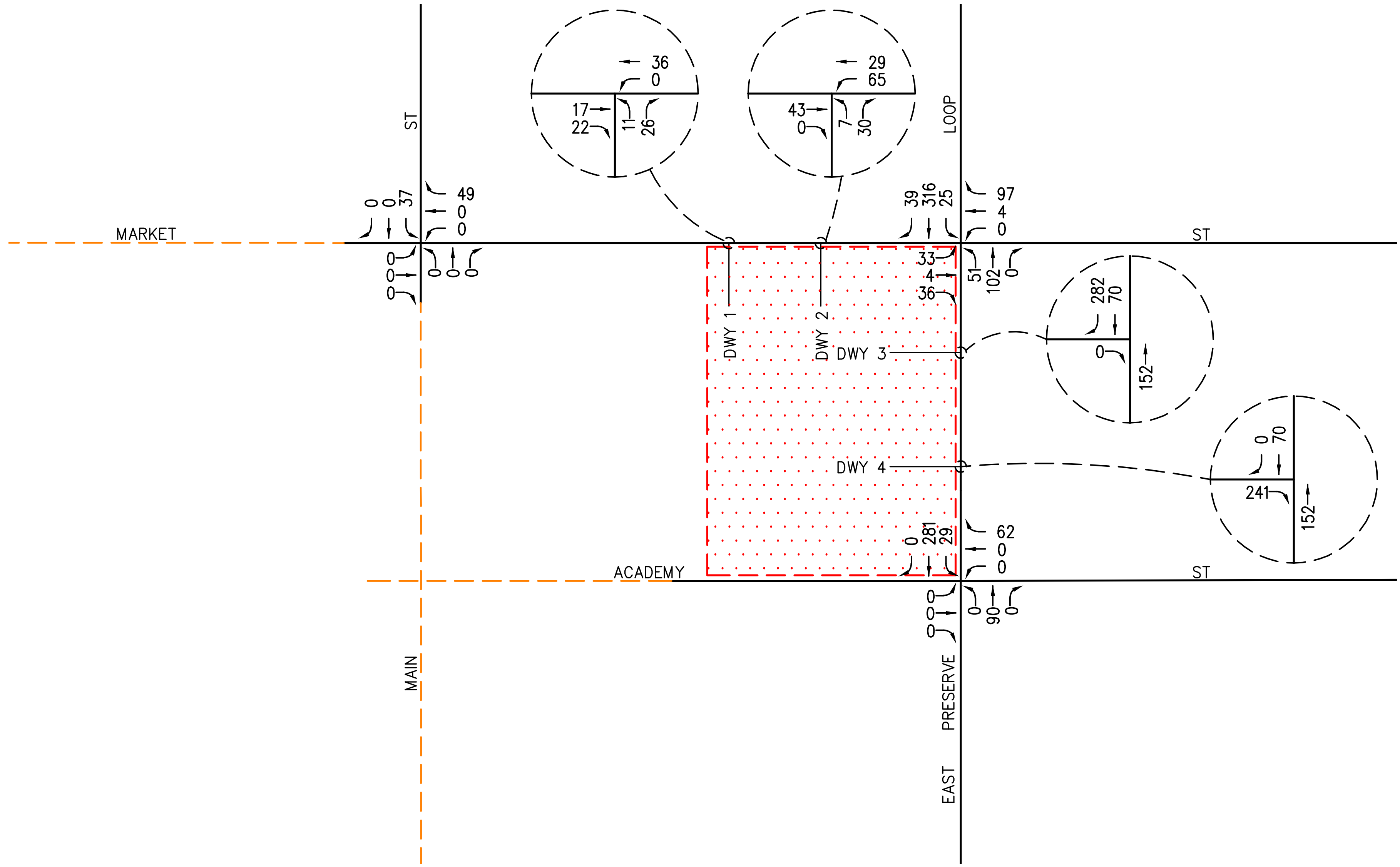
(#) = STUDY INTERSECTION

🟥 = PROJECT SITE

FIGURE 12

YEAR 2030/2040 BUILDOUT PM PEAK HOUR PROJECT TRAFFIC VOLUMES

CHINO VALLEY USD PRESERVE SCHOOL, CHINO



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LINSCOTT
LAW &
GREENSPAN
engineers

N
NO SCALE

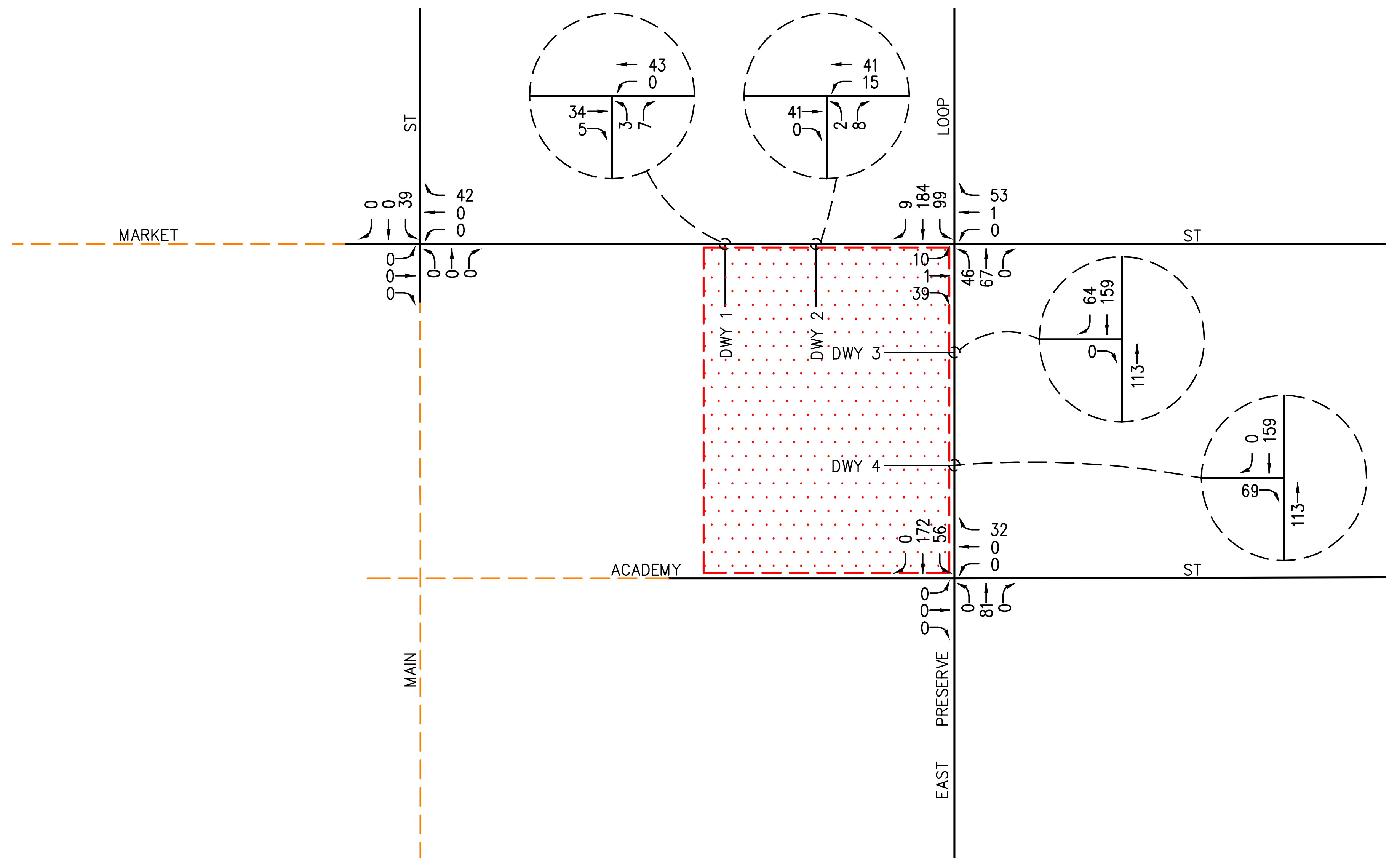
KEY

Ⓘ = STUDY INTERSECTION
– – = FUTURE YEAR 2030/2040 ROADWAY
▨ = PROJECT SITE

FIGURE 13

YEAR 2024 CUMULATIVE PLUS PROJECT AM PEAK HOUR TRAFFIC VOLUMES

CHINO VALLEY USD PRESERVE SCHOOL, CHINO



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LINSCOTT
LAW &
GREENSPAN
engineers

NO SCALE

KEY

(#) = STUDY INTERSECTION

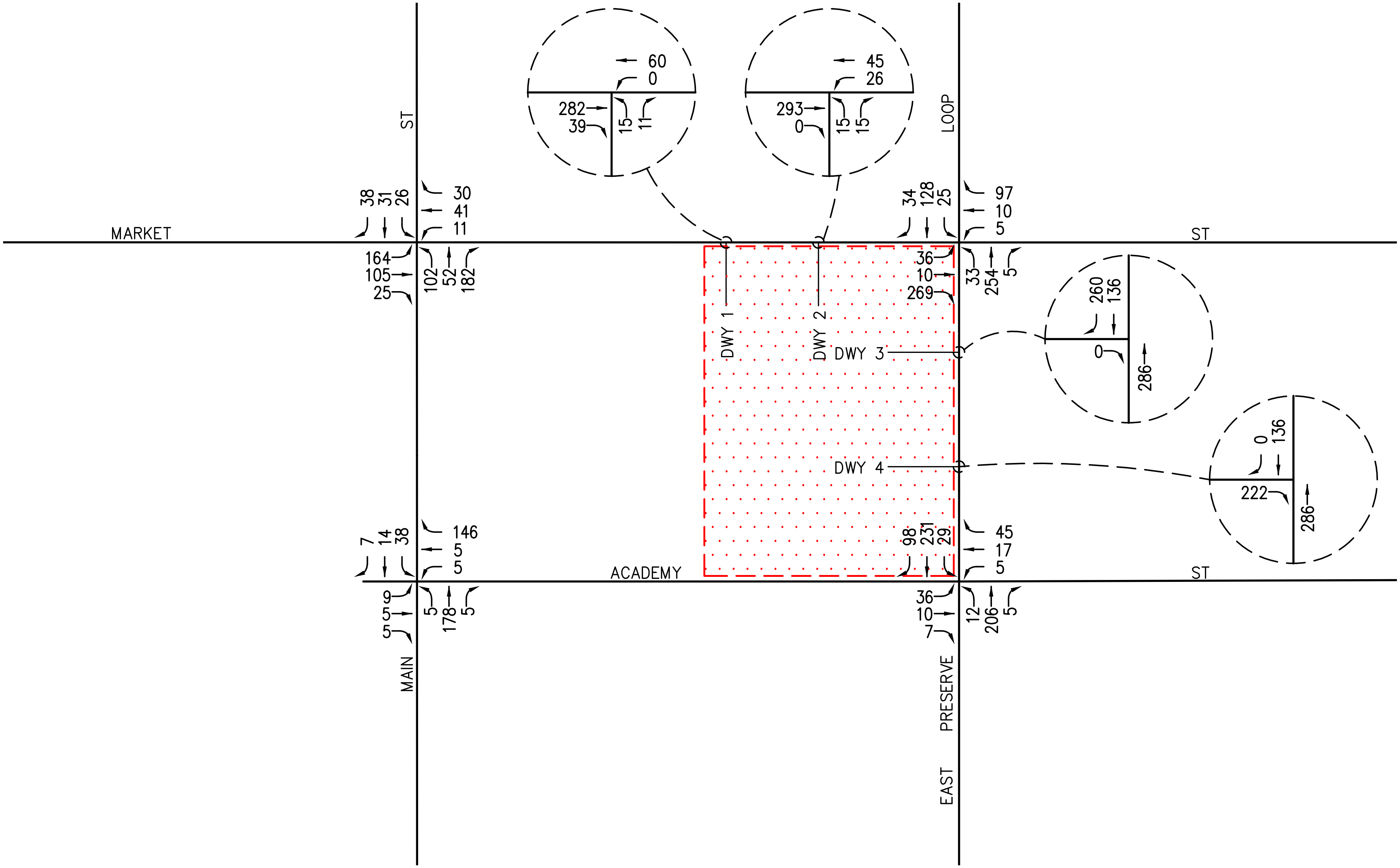
– – = FUTURE YEAR 2030/2040 ROADWAY

▨ = PROJECT SITE

FIGURE 14

YEAR 2024 CUMULATIVE PLUS PROJECT PM PEAK HOUR TRAFFIC VOLUMES

CHINO VALLEY USD PRESERVE SCHOOL, CHINO



n:\3500\2153599 – block 4 south of pine – the preserve, chino\cvusd preserve school\dwg\3599 f-15.dwg LDP 08:40:03 04-12-2021 aguilar

LINSCOTT LAW & GREENSPAN

engineers

N

NO SCALE

KEY

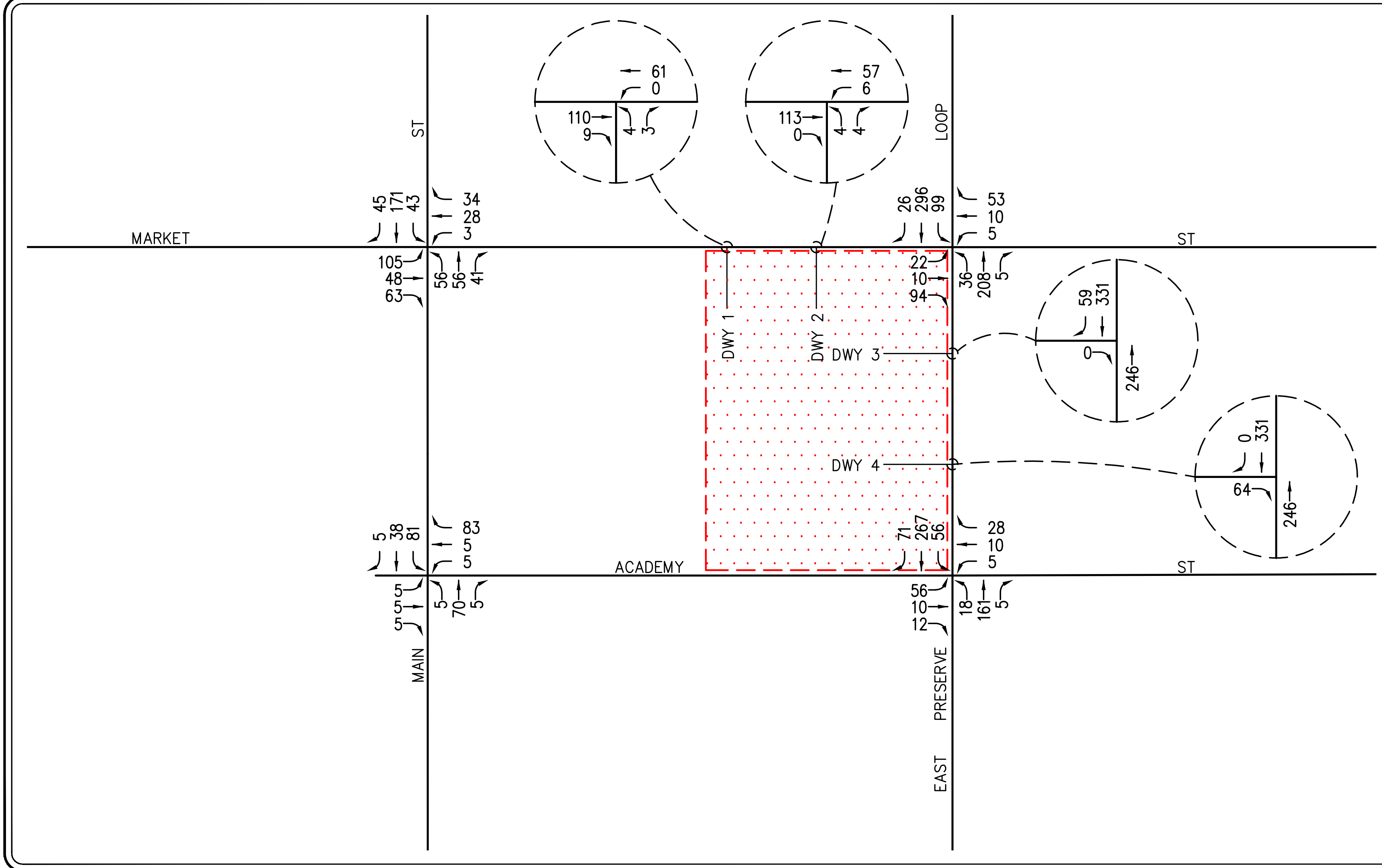
Ⓐ = STUDY INTERSECTION

▨ = PROJECT SITE

FIGURE 15

YEAR 2030/2040 BUILDOUT PLUS PROJECT AM PEAK HOUR TRAFFIC VOLUMES

CHINO VALLEY USD PRESERVE SCHOOL, CHINO



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LINSCOTT
LAW &
GREENSPAN
engineers

NO SCALE

KEY

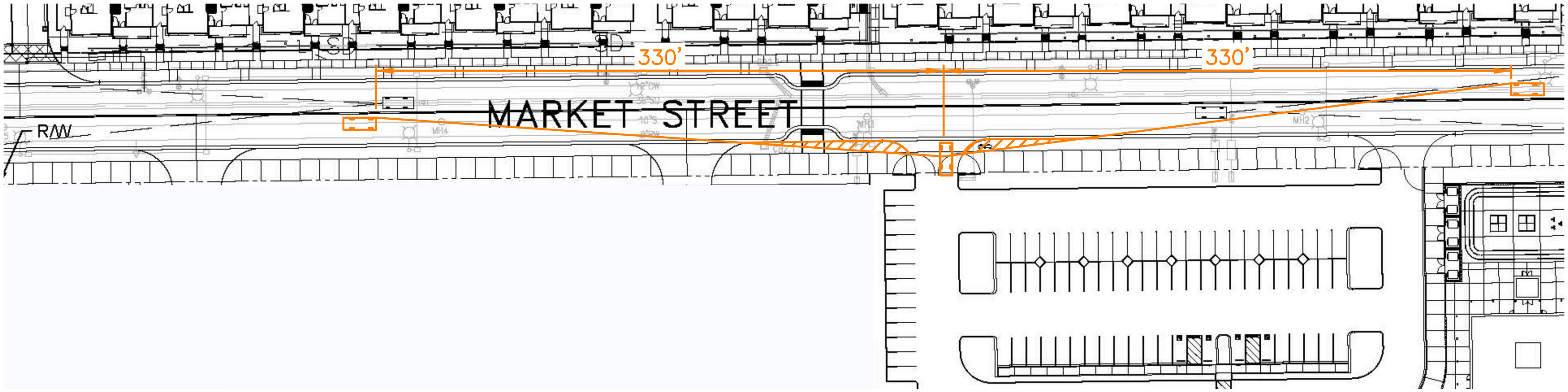
Ⓢ = STUDY INTERSECTION

▨ = PROJECT SITE

FIGURE 16

YEAR 2030/2040 BUILDOUT PLUS PROJECT PM PEAK HOUR TRAFFIC VOLUMES

CHINO VALLEY USD PRESERVE SCHOOL, CHINO



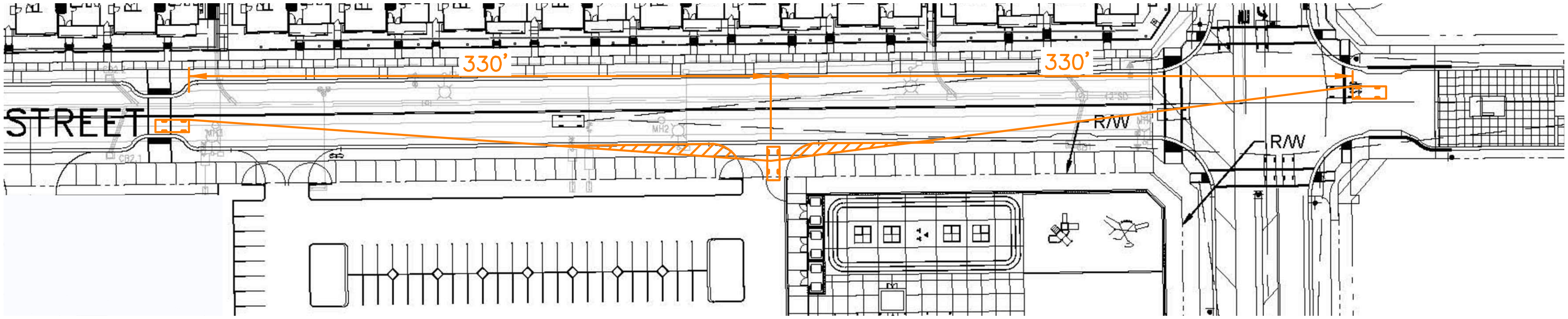
STOPPING SIGHT DISTANCE

DESIGN SPEED LIMIT: 30 MPH

REQUIRED STOPPING SIGHT DISTANCE: 330 FEET

LEGEND

▨ *LIMITED USE AREA: TO ENSURE ADEQUATE SIGHT DISTANCE, HARDSCAPE AND/OR LANDSCAPE SHALL NOT BE HIGHER THAN 30 INCHES. NO FENCES OR WALLS IN LIMITED USE AREA.*



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LINSCOTT
LAW &
GREENSPAN
engineers

SOURCE: KTGY

N

SCALE: 1"=100'

FIGURE 17

SIGHT DISTANCE ANALYSIS ON MARKET STREET

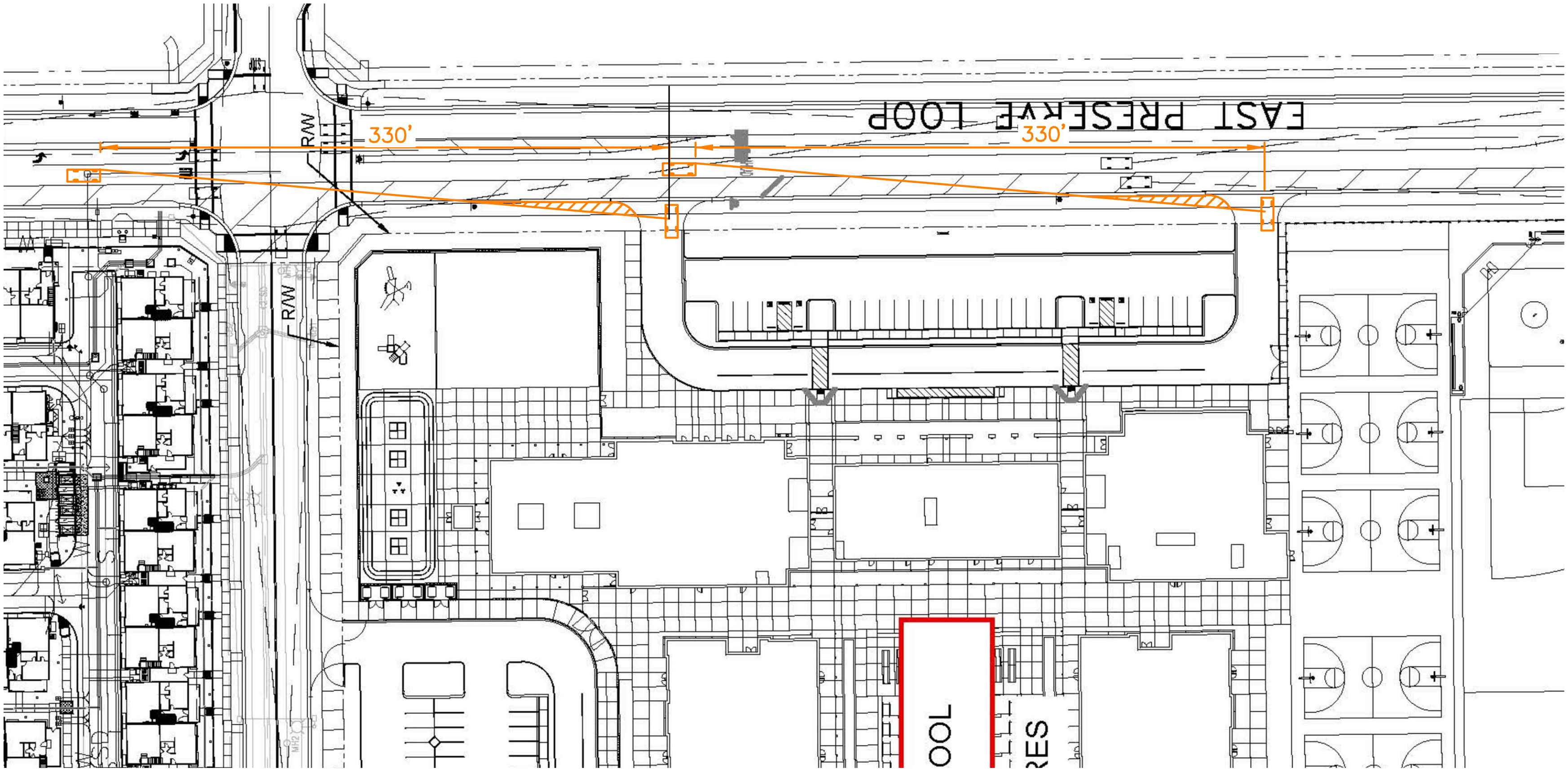
CHINO VALLEY USD PRESERVE SCHOOL, CHINO

STOPPING SIGHT DISTANCE

DESIGN SPEED LIMIT:	30 MPH
REQUIRED STOPPING SIGHT DISTANCE:	330 FEET

LEGEND

▨ *LIMITED USE AREA: TO ENSURE ADEQUATE SIGHT DISTANCE, HARDSCAPE AND/OR LANDSCAPE SHALL NOT BE HIGHER THAN 30 INCHES. NO FENCES OR WALLS IN LIMITED USE AREA.*



n:\3500\2153599 – block 4 south of pine – the preserve, chino\cvusd preserve school\dwg\3599 f–18.dwg LDP 10:07:08 04–14–2021 aguilar

LINSCOTT LAW & GREENSPAN *engineers*

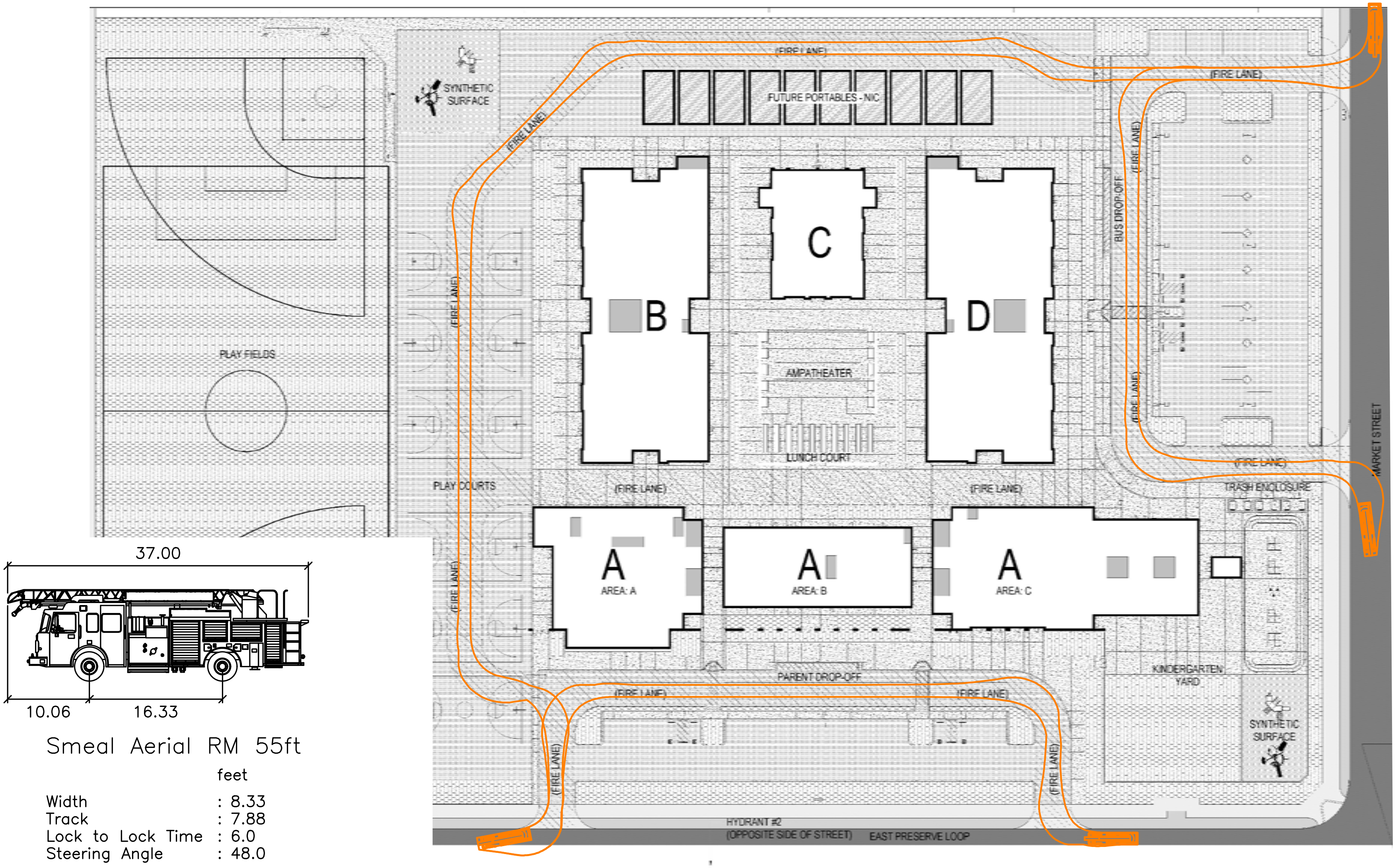
SOURCE: KTGY

SCALE: 1"=100'

FIGURE 18

SIGHT DISTANCE ANALYSIS ON EAST PRESERVE LOOP

CHINO VALLEY USD PRESERVE SCHOOL, CHINO



Smeal Aerial RM 55ft

feet

Width : 8.33
Track : 7.88
Lock to Lock Time : 6.0
Steering Angle : 48.0

n:\3500\2153599 – block 4 south of pine – the preserve, chino\cvusd preserve school\dwg\3599 f-19.dwg LDP 08:50:16 04-12-2021 aguilar

LINSCOTT
LAW &
GREENSPAN
engineers

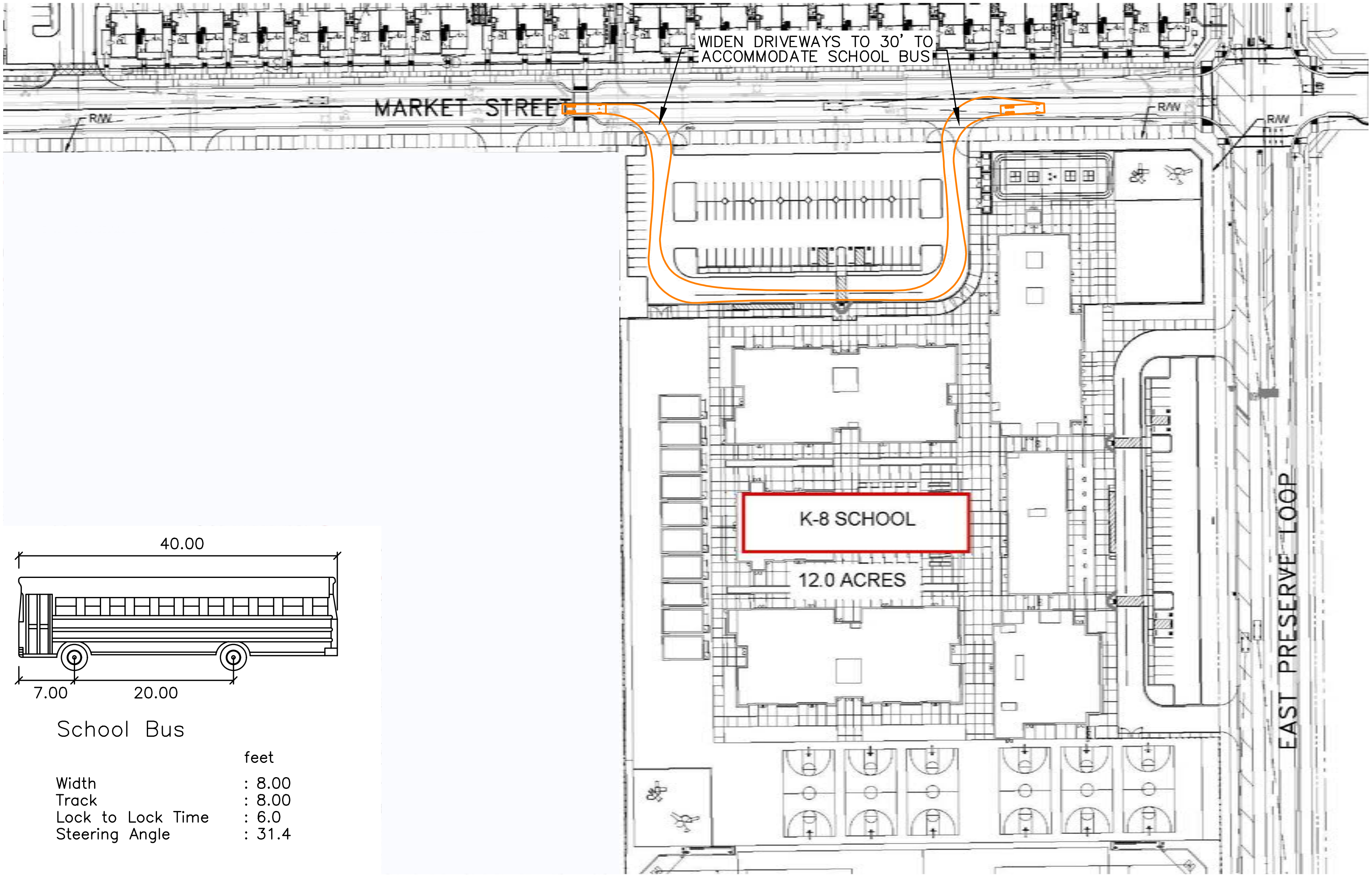
N
NO SCALE

SOURCE: KTGY

FIGURE 19

FIRE TRUCK TURNING ANALYSIS

CHINO VALLEY USD PRESERVE SCHOOL, CHINO



n:\3500\2153599 – block 4 south of pine – the preserve, chino\cvusd preserve school\dwg\3599 f–20.dwg LDP 10:16:16 04–14–2021 aguilar

LINSCOTT
LAW &
GREENSPAN
engineers

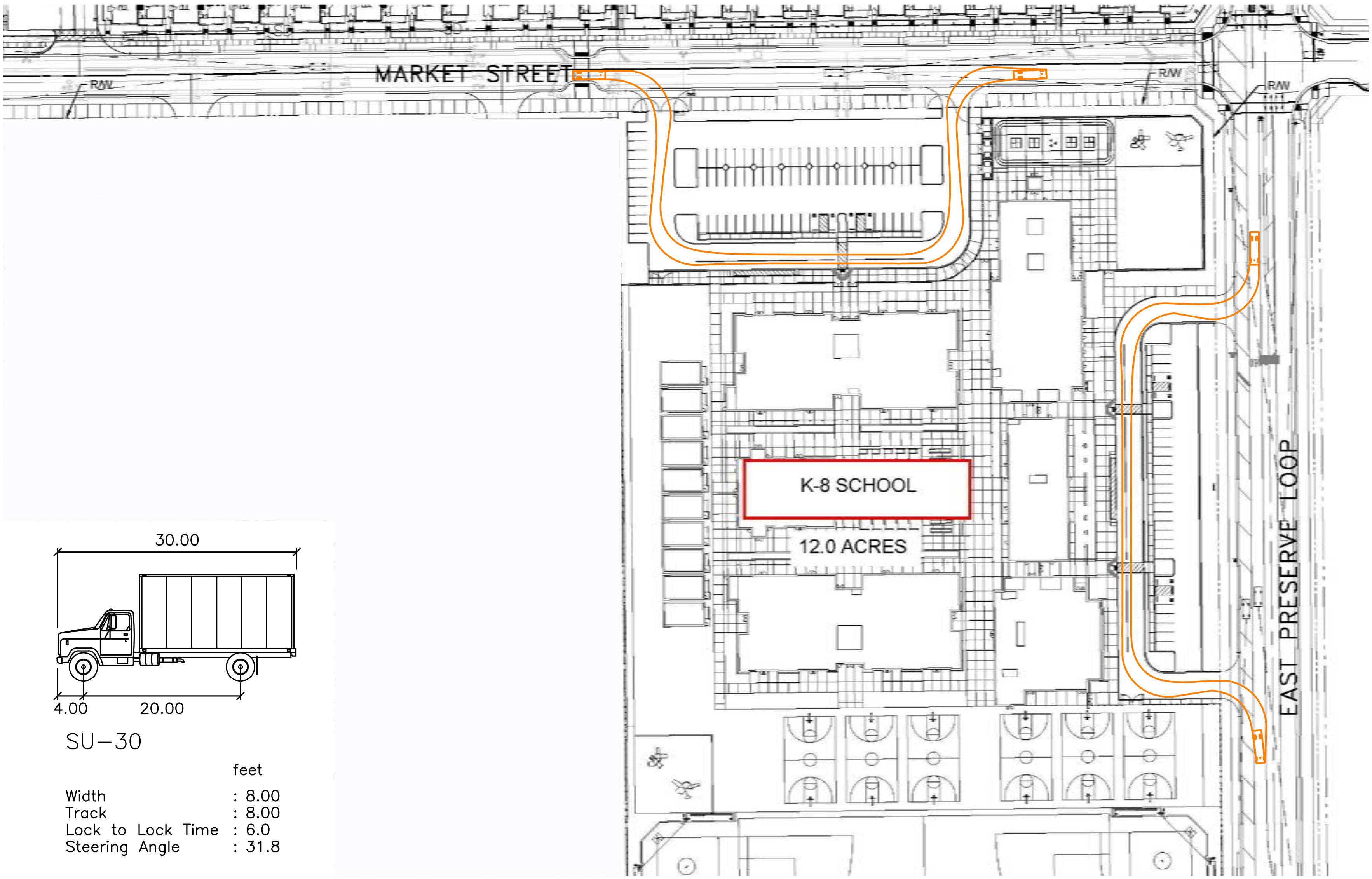
NO SCALE

SOURCE: KTGY

FIGURE 20

SCHOOL BUS TURNING ANALYSIS

CHINO VALLEY USD PRESERVE SCHOOL, CHINO



feet

Width : 8.00
Track : 8.00
Lock to Lock Time : 6.0
Steering Angle : 31.8

n:\3500\2153599 – block 4 south of pine – the preserve, chino\cvusd preserve school\dwg\3599 f–21.dwg LDP 10:28:55 04–14–2021 aguilar

LINSCOTT
LAW &
GREENSPAN
engineers

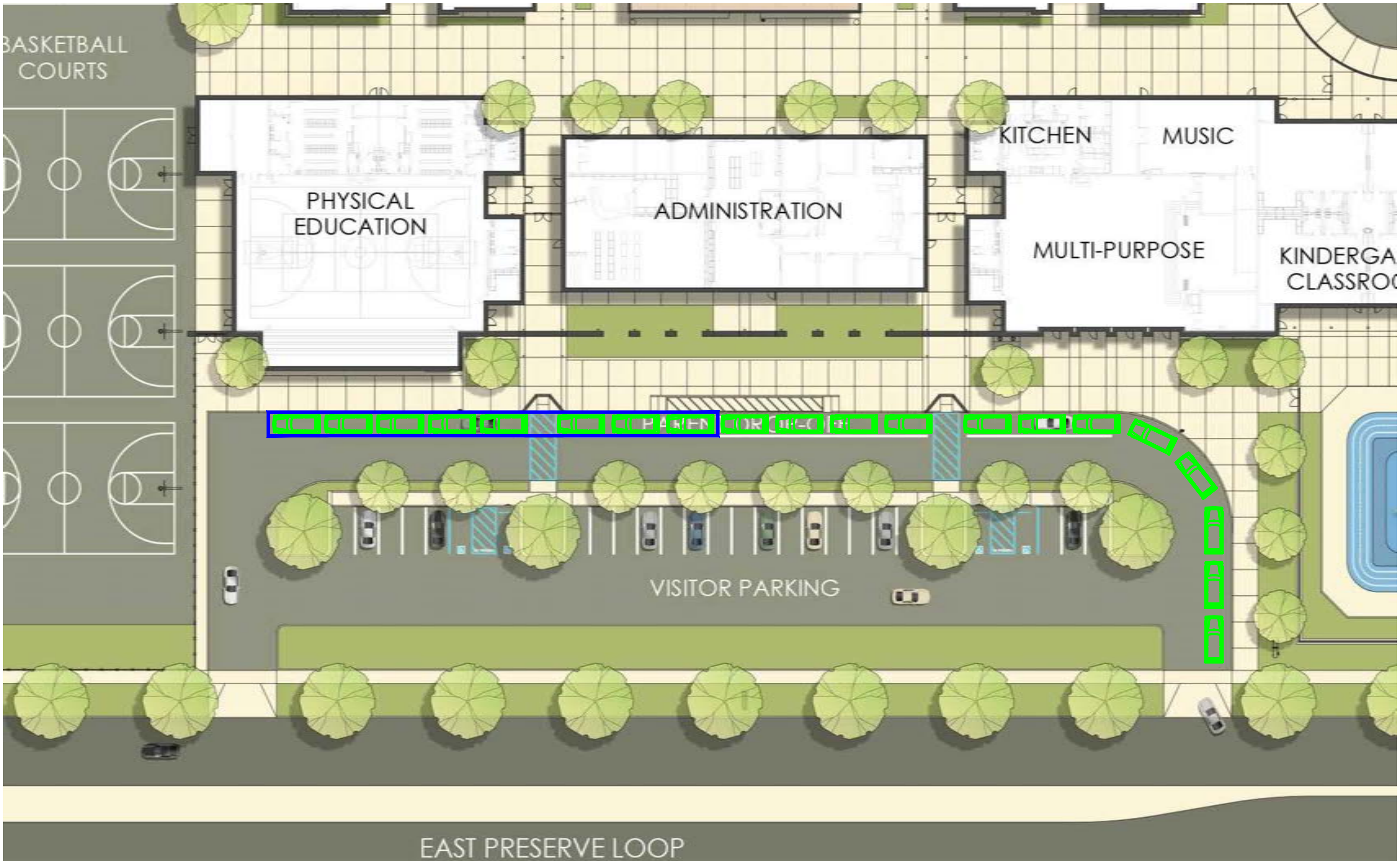
N NO SCALE

SOURCE: KTGY

FIGURE 21

SU–30 TRUCK TURNING ANALYSIS

CHINO VALLEY USD PRESERVE SCHOOL, CHINO



n:\3500\2153599 – block 4 south of pine – the preserve, chino\cvusd preserve school\dwg\3599 f-22.dwg LDP 08:47:17 04-22-2021 aguilar

LINSCOTT
LAW &
GREENSPAN
engineers

N
NO SCALE

SOURCE: KTGY

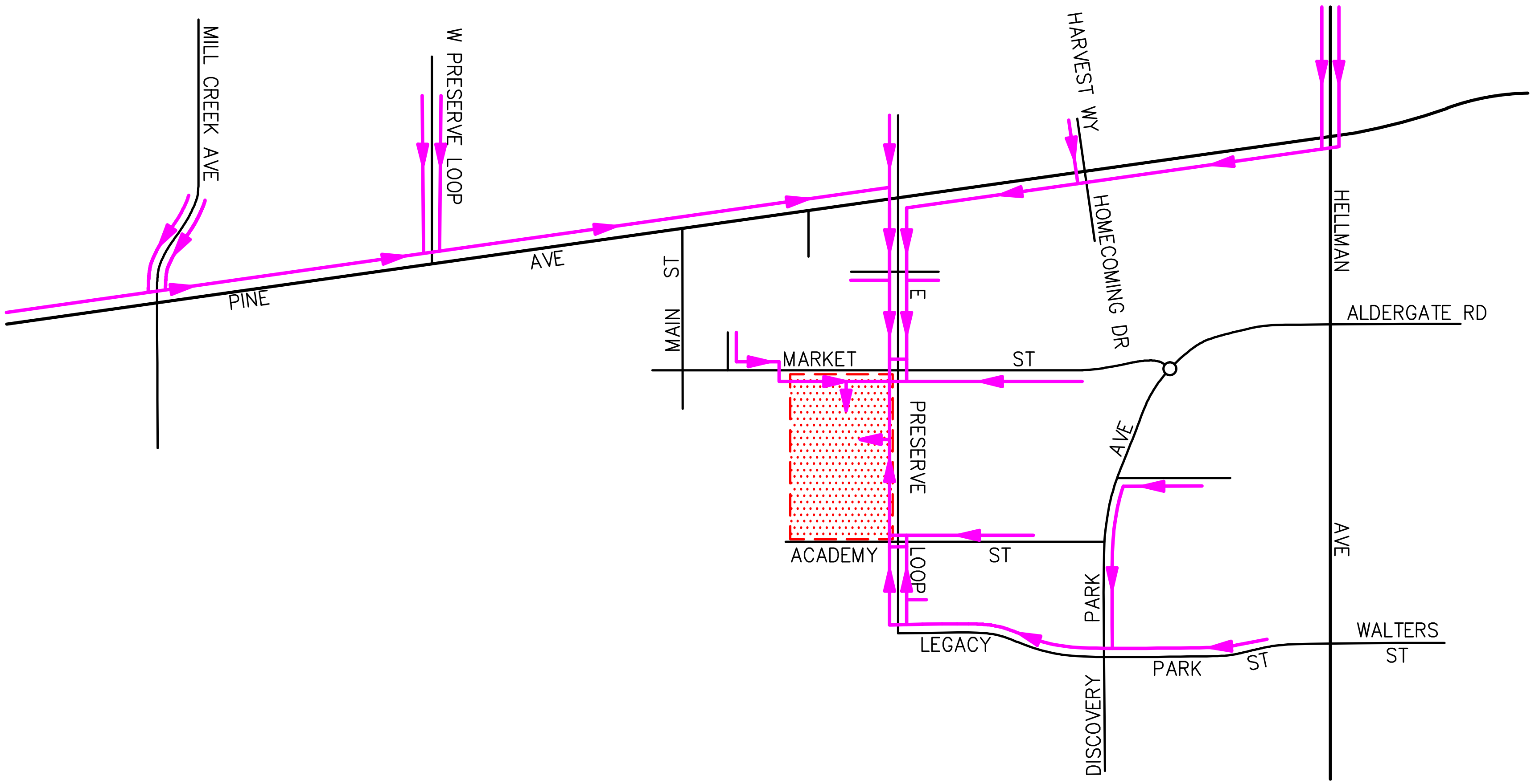
KEY

🟩 = PROVIDED QUEUE
🟦 = DROP–OFF/PICK–UP AREA

FIGURE 22

DROP–OFF/PICK–UP AREA QUEUING ANALYSIS

CHINO VALLEY USD PRESERVE SCHOOL, CHINO



n:\3500\2153599 – block 4 south of pine – the preserve, chino\cvusd preserve school\dwg\3599 f-23.dwg LDP 17:08:09 04-19-2021 lam

LINSCOTT
LAW &
GREENSPAN
engineers

N
NO SCALE

KEY

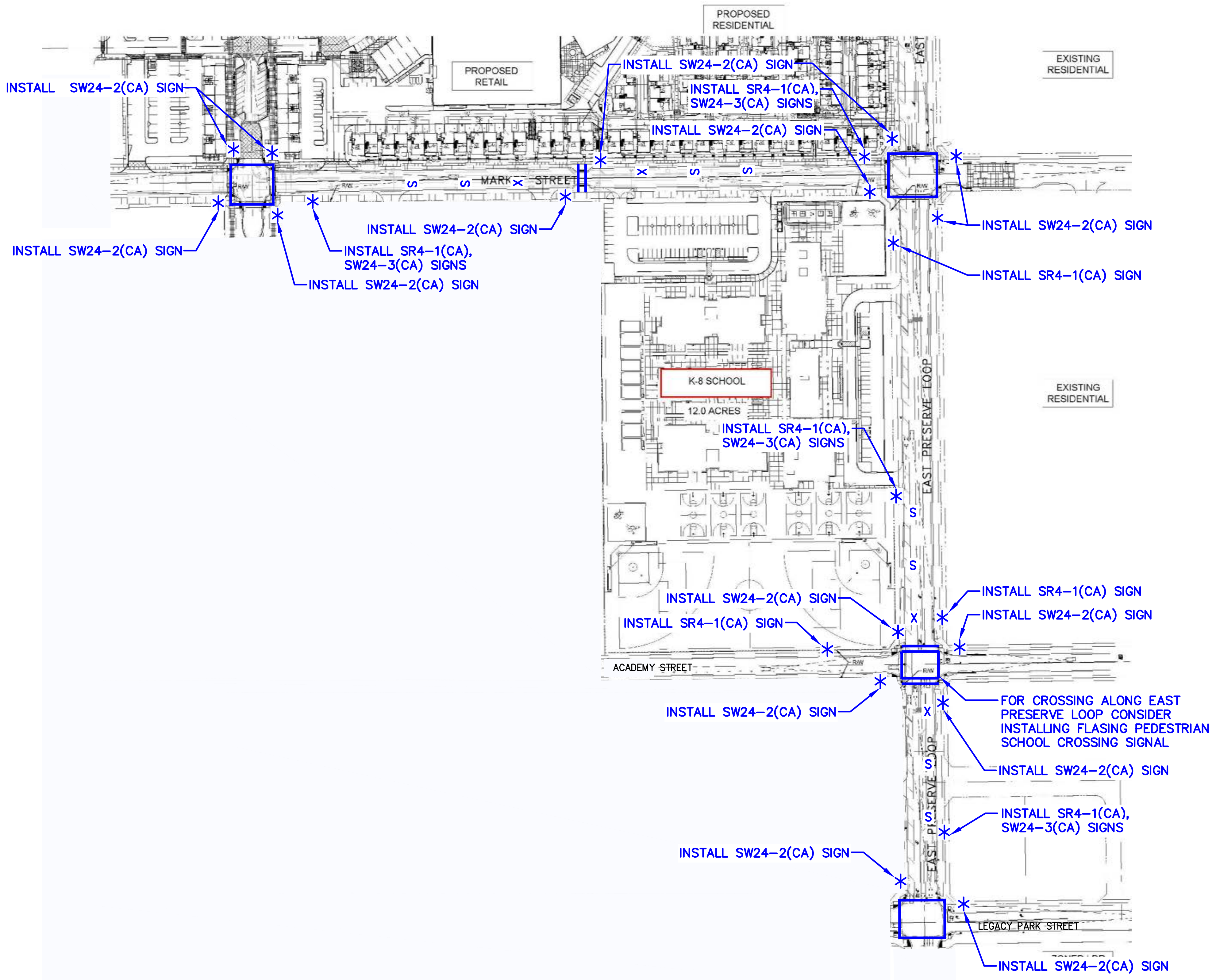
← = PEDESTRIAN PATH OF TRAVEL

▨ = PROJECT SITE

FIGURE 23

RECOMMENDED SAFE ROUTE TO SCHOOL STUDENT PATHS OF TRAVEL

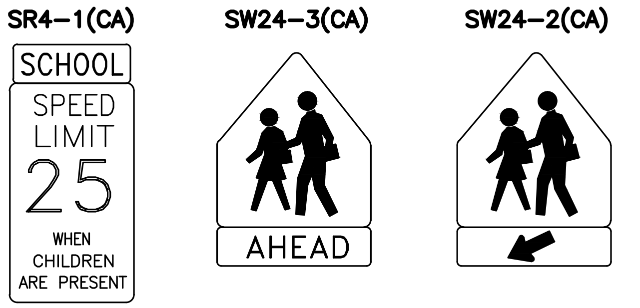
CHINO VALLEY USD PRESERVE SCHOOL, CHINO



KEY

□ = YELLOW CROSSWALKS
|| = FLASHING PEDESTRIAN SCHOOL CROSSING SIGNAL
* = SCHOOL ZONE SIGNAGE (SEE DETAIL)
SSX = SLOW SCHOOL XING

SIGN DETAILS



n:\3500\2153599 - block 4 south of pine - the preserve, chino\cvusd preserve school\dwg\3599 f-24.dwg LDP 17:08:48 04-19-2021 lam

LINSCOTT
LAW &
GREENSPAN
engineers

N
NO SCALE

FIGURE 24

RECOMMENDED SCHOOL SIGNS AND PAVEMENT MARKINGS
CHINO VALLEY USD PRESERVE SCHOOL, CHINO

TABLE 1
PROJECT DEVELOPMENT SUMMARY
CVUSD PRESERVE SCHOOL, CHINO

Land Use / Project Description	**Entitled Land Use/Development Totals**	**Proposed Land Use/Development Totals**
Block 9 South of Pine – Entitled Zoning		
▪ CC Non-Res – Elementary School	1,000 students	--
Block 9 South of Pine – Proposed Project		
▪ CC Non-Res – Elementary School	--	900 students for standard school calendar or 1,200 students for year-round schedule

TABLE 2
LOCATION AND DESCRIPTION OF CUMULATIVE PROJECTS
CVUSD PRESERVE SCHOOL, CHINO

No.	Location/Address	Location/Address	Description
1.	South of Pine Block 4[2]	West of Hellman Avenue, south of Market Street, east of East Preserve Loop, north of Legacy Park Street	388 DU single family detached residential and 454 DU multifamily residential (low-rise)
2.	Preserve Town Center	East of West Preserve Loop, south of Pine Avenue, west of East Preserve Loop, north of Market Street	16,300 SF office, 34,000 SF restaurant, 97,100 SF commercial retail and 324 DU multifamily residential

Notes:

- SF = Square-feet
- DU = Dwelling units

---

[2] Source: *Updated Focused Trip Generation and Internal Circulation Assessment for South of Pine iBlock 4* prepared by LLG Engineers in May 2019.

TABLE 3
CUMULATIVE PROJECTS TRAFFIC GENERATION FORECAST[3]
CVUSD PRESERVE SCHOOL, CHINO

Cumulative Project Description	**Daily 2-Way**	**AM Peak Hour In**	**AM Peak Hour Out**	**AM Peak Hour Total**	**PM Peak Hour In**	**PM Peak Hour Out**	**PM Peak Hour Total**
1. South of Pine Block 4[4]	6,985	121	376	497	403	236	639
2. Preserve Town Center	15,973	265	282	547	472	401	873
Total Trip Generation Forecast	**22,958**	**386**	**658**	**1,044**	**875**	**637**	**1,512**

---

[3] Source: *Trip Generation*, 10th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2017). Average rates used.

[4] Source: *Updated Focused Trip Generation and Internal Circulation Assessment for South of Pine iBlock 4* prepared by LLG Engineers in May 2019.

TABLE 4
PROJECT TRIP GENERATION FORECAST[5]
CVUSD PRESERVE SCHOOL, CHINO

		AM Peak Hour			**PM Peak Hour**		
ITE Land Use/Project Description	**Daily**	**Enter**	**Exit**	**Total**	**Enter**	**Exit**	**Total**
Trip Generation Rates:							
▪ 520: Elementary School (TE/Student)	1.89	54%	46%	0.67	48%	52%	0.17
▪ 522: Middle School/Junior High School (TE/Student)	2.13	54%	46%	0.58	49%	51%	0.17
Trip Generation Forecasts:							
Entitled Development/Current Zoning – Block 9							
▪ 520: Elementary School (1,000 students)	1,890	362	308	670	82	88	170
Proposed Project Standard School Schedule – Block 9							
▪ 520: Elementary School (900 students)	1,701	326	277	603	73	80	153
Difference in Trip Generation: ***Proposed Project Minus Entitled Land Use***	***-189***	***-36***	***-31***	***-67***	***-9***	***-8***	***-17***
Proposed Project Year-Round Schedule – Block 9							
▪ 520: Elementary School (1,200 students)	2,268	434	370	804	98	106	204
Difference in Trip Generation: ***Proposed Project Minus Entitled Land Use***	***378***	***72***	***62***	***134***	***16***	***18***	***34***

---

[5] Source*: Trip Generation, 10th Edition*, Institute of Transportation Engineers, (ITE) [Washington, D.C. (2017)].

TABLE 5
PEAK HOUR INTERSECTION CAPACITY ANALYSIS SUMMARY
CVUSD PRESERVE SCHOOL, CHINO

Key Intersection		Control Type	Time Period	(1) Year 2024 Cumulative Plus Project Traffic Conditions		(2) Year 2030/2040 Buildout Plus Project Traffic Conditions	
				Delay (s/v)	LOS	Delay (s/v)	LOS
6.	Main Street at	All-Way Stop	AM	6.9	A	11.3	B
	Market Street		PM	7.0	A	9.8	A
11.	East Preserve Loop at	All-Way Stop	AM	11.2	B	12.6	B
	Market Street		PM	8.8	A	11.4	B
12.	East Preserve Loop at	Two-Way Stop	AM	9.0	A	14.4	B
	Academy Street		PM	8.8	A	15.8	C
36.	Main Street at	Two-Way Stop	AM	--	--	11.2[6]	B[6]
	Academy Street		PM	--	--	10.5[6]	B[6]
A.	Project Driveway 1 at	One-Way Stop	AM	8.7	A	10.5	B
	Market Street		PM	8.7	A	9.2	A
B.	Project Driveway 2 at	One-Way Stop	AM	8.9	A	10.7	B
	Market Street		PM	8.7	A	9.2	A
C.	East Preserve Loop at	One-Way Stop	AM	0.0	A	0.0	A
	Project Driveway 3		PM	0.0	A	0.0	A
D.	East Preserve Loop at	One-Way Stop	AM	9.9	A	10.2	B
	Project Driveway 4		PM	9.5	A	10.6	B

Notes:

- s/v = seconds per vehicle (delay)
- **Bold HCM/LOS values** indicate adverse service levels based on LOS standards

---

[6] It is our understanding that the intersection of Main Street/Academy Street may potentially be designed as a roundabout. As such, the corresponding level of service results for a roundabout would be the following:
AM peak hour = 4.0 s/v, LOS A; PM peak hour = 3.4 s/v, LOS A

TABLE 6
TRAFFIC SIGNAL WARRANT ANALYSIS SUMMARY[7]
CVUSD PRESERVE SCHOOL, CHINO

Key Intersection		Time Period	(1) Year 2024 Cumulative Plus Project Traffic Conditions		(2) Year 2030/2040 Buildout Plus Project Traffic Conditions	
			Part A of Warrant 3 Satisfied?	Part B of Warrant 3 Satisfied?	Part A of Warrant 3 Satisfied?	Part B of Warrant 3 Satisfied?
6.	Main Street at	AM	No	No	No	No
	Market Street	PM	No	No	No	No
11.	East Preserve Loop at	AM	No	No	No	No
	Market Street	PM	No	No	No	No
12.	East Preserve Loop at	AM	No	No	No	No
	Academy Street	PM	No	No	No	No
36.	Main Street at	AM	--	--	No	No
	Academy Street	PM	--	--	No	No
A.	Project Driveway 1 at	AM	No	No	No	No
	Market Street	PM	No	No	No	No
B.	Project Driveway 2 at	AM	No	No	No	No
	Market Street	PM	No	No	No	No
C.	East Preserve Loop at	AM	No	No	No	No
	Project Driveway 3	PM	No	No	No	No
D.	East Preserve Loop at	AM	No	No	No	No
	Project Driveway 4	PM	No	No	No	No

---

[7] Signal Warrant checks based on Warrant 3, Part A – Peak Hour Delay Warrant and Part B – Peak Hour Volume Warrant combined in the California MUTCD.

TABLE 7
YEAR 2024 CUMULATIVE PLUS PROJECT QUEUING ANALYSIS
CVUSD PRESERVE SCHOOL, CHINO

	(1) Year 2024 Cumulative Plus Project Traffic Conditions				
		AM Peak Hour		PM Peak Hour	
Key Intersection	**Estimated/ Required Storage**	**Max. Queue/ Min. Storage Required[8]**	**Adequate Storage (Yes / No)**	**Max. Queue/ Min. Storage Required[8]**	**Adequate Storage (Yes / No)**
11. East Preserve Loop at Market Street					
Northbound Left-Turn	100’	48’	Yes	46’	Yes
Southbound Left-Turn	100’	45’	Yes	48’	Yes
12. East Preserve Loop at Academy Street					
Northbound Left-Turn	100’	25’	Yes	25’	Yes
Southbound Left-Turn	100’	25’	Yes	25’	Yes
A. Project Driveway 1 at Market Street					
Northbound Left/Right-Turn	25’	46’	Yes[9]	31’	Yes[9]
B. Project Driveway 2 at Market Street					
Northbound Left/Right-Turn	25’	48’	Yes[9]	31’	Yes[9]
C. East Preserve Loop at Project Driveway 3					
Eastbound Right-Turn	25’	25’	Yes	25’	Yes
D. East Preserve Loop at Project Driveway 4					
Eastbound Right-Turn	25’	83’	Yes[9]	48’	Yes[9]

---

[8] Maximum queue in feet (ft) is based on the 95th percentile queue for unsignalized intersections.

[9] The project site has the ability to accommodate up to 570 feet of additional queue.

TABLE 8
YEAR 2030/2040 BUILDOUT PLUS PROJECT QUEUING ANALYSIS
CVUSD PRESERVE SCHOOL, CHINO

	(1) Year 2030/2040 Buildout Plus Project Traffic Conditions				
		AM Peak Hour		PM Peak Hour	
Key Intersection	**Estimated/ Required Storage**	**Max. Queue/ Min. Storage Required[10]**	**Adequate Storage (Yes / No)**	**Max. Queue/ Min. Storage Required[10]**	**Adequate Storage (Yes / No)**
11. East Preserve Loop at Market Street					
Northbound Left-Turn	100’	46’	Yes	48’	Yes
Southbound Left-Turn	100’	45’	Yes	48’	Yes
12. East Preserve Loop at Academy Street					
Northbound Left-Turn	100’	25’	Yes	25’	Yes
Southbound Left-Turn	100’	25’	Yes	26’	Yes
A. Project Driveway 1 at Market Street					
Northbound Left/Right-Turn	25’	43’	Yes[11]	25’	Yes
B. Project Driveway 2 at Market Street					
Northbound Left/Right-Turn	25’	46’	Yes[11]	32’	Yes[11]
C. East Preserve Loop at Project Driveway 3					
Eastbound Right-Turn	25’	25’	Yes	25’	Yes
D. East Preserve Loop at Project Driveway 4					
Eastbound Right-Turn	25’	80’	Yes[11]	49’	Yes[11]

---

[10] Maximum queue in feet (ft) is based on the 95th percentile queue for unsignalized intersections.

[11] The project site has the ability to accommodate up to 570 feet of additional queue.

APPENDIX A

REFERENCED TRAFFIC IMPACT ANALYSIS STUDIES

LINSCOTT
LAW &
GREENSPAN
engineers

TRAFFIC IMPACT ANALYSIS
"SOUTH OF PINE AVENUE"
(TENTATIVE TRACT MAP NO. 16420)
THE PRESERVE PHASE 3 AND 4 AREAS
INTERNAL EVALUATION

Chino, California
Revised – January 9, 2008

Prepared for:

Lewis Operating Corporation
1156 North Mountain Avenue
Upland, CA 91785-0670

LLG Ref. 2-06-2760-1

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Exp. 9-30-09

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No. 1118
Exp. 9-30-09

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Senior Transportation Engineer

and

Shane Green
Transportation Engineer I

Under the Supervision of:
Paul W. Wilkinson, P.E.
Principal

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"SOUTH OF PINE AVENUE" (TENTATIVE TRACT MAP NO. 16420)
THE PRESERVE PHASE 3 AND 4 AREAS
INTERNAL EVALUATION

Chino, California
Revised – January 9, 2008

1.0 INTRODUCTION

This Traffic Impact Analysis is a companion document to an "External Evaluation" Report dated December 26, 2007, and addresses the potential internal traffic impacts and on-site internal circulation needs associated with the "South of Pine Avenue" Development Project (also known as Tentative Tract Map No. 16420 and as the Phase 3 and 4 Areas of The Preserve). A summary of Findings and Conclusions is presented in Section 15 of this report.

The project site is roughly a 540-acre parcel of land bounded by Pine Avenue to the north, Chino-Corona Road to the south, Mill Creek Avenue (formerly Cucamonga Avenue) to the west and Hellman Avenue to the east, in the City of Chino, California. The plan includes a total of 4,006 dwelling units (DU) plus retail, office, recreational, educational, and park uses. The 4,006 DU Plan is the focus of this report. Within this Plan is a 12-acre parcel programmed for 24 dwelling units of Estate Residential (ER). That 12-acre parcel has an optional designation as an elementary or K-8 school site, which would be the second such site in the South of Pine plan, and the third school site within the total Lewis Operating Corporation footprint of The Preserve. That option would substitute the school site for the ER designation on those 12 acres, and reduce the overall unit count to 3,982, while keeping all other elements of the plan the same. The variation in impacts due to the "potential third school site" plan is discussed in Section 14 of this report.

This report documents the findings and recommendations of a traffic impact analysis conducted by Linscott, Law & Greenspan, Engineers (LLG) to determine the potential impacts that the South of Pine Avenue Development Project may have on the internal roadway network within the project site, and to validate the internal circulation framework and provisions of the project plan. A total of nineteen (19) internal intersections, and all internal "backbone" street segments, as well as several key roadway segments bordering the project site have been identified as the locations that may be impacted by the proposed project. The project site has been visited and an inventory of adjacent area roadways and intersections completed.

The Scope of Work for this project was developed through on-going coordination with City of Chino staff and in consideration of the guidelines for the preparation of traffic impact analysis reports as outlined in the *Congestion Management Program for San Bernardino County, 2005 Update*, prepared by the San Bernardino Associated Governments (SANBAG). The *"South of Pine Avenue" (Tentative Tract Map No. 16420) The Preserve Phase 3 and 4 Areas External Evaluation*, prepared by LLG, dated December 26, 2007, will serve as the database for this analysis.

This traffic report analyzes future long-term (to reflect full buildout of the project plan) peak hour traffic conditions in the CMP horizon year (Year 2030). Long-term (Year 2030) peak hour traffic forecasts were projected in the above referenced "External" report based on modeled traffic projections prepared by Meyer, Mohaddes Associates (MMA) utilizing the City of Chino 2030 Model. Those projections were carried inward throughout the project site as part of this "Internal" evaluation.

1.1 Study Overview/Project Background

The Preserve has been the subject of a series of prior traffic investigations, some of which considered the entirety of the development area within the Specific Plan footprint, while other investigations focused to specific subareas in a cumulative near-term and/or long-term investigation. Among those documents, with an explanation of their relevance to a traffic assessment of the proposed South of Pine Avenue Development Project, are the following:

- *Chino Agriculture Preserve Subarea 2 Traffic Impact Analysis (Revised), Chino, California*; Urban Crossroads, Inc; July 16, 2002: Formed the basis of the traffic section within the Final Environmental Impact Report (EIR) for The Preserve. Provided Interim Year 2010, CMP Horizon Year 2020, and General Plan Post 2020 long-term cumulative traffic forecasts, impact and mitigation analysis in a Congestion Management Plan (CMP) format. The study utilized the Comprehensive Transportation Plan (CTP) traffic model, which was the only model being used for long range planning in San Bernardino County because of its "finding of consistency" from SCAG/SANBAG. The project development site was explicitly accounted for within the analysis based on the land use tabulation addressed in the EIR. The study investigated in excess of 60 intersections over a wide area, but only about 10 of these were within or nearly contiguous to The Preserve Specific Plan footprint.

- *The Preserve, Chino, Internal Traffic Model Methodology & Findings: Long-Term/Project Buildout Conditions*; Linscott, Law & Greenspan, Engineers; March 7, 2003: Starting from the EIR traffic study forecasts and analyses, took a finer-grained look at 40 key intersections within The Preserve footprint. Also considered a much more detailed development plan breakout than was in the EIR, segmenting the development to a refined internal traffic analysis zone (TAZ) system, with project trip generation details to match. Developed and presented buildout intersection lane geometry and traffic control recommendations throughout The Preserve to supplement those conclusions/recommendations of the Final EIR.

- *Revised Traffic Impact Study for the Van Vliet Site in The Preserve, Chino, California*; Linscott, Law & Greenspan, Engineers, December 16, 2005: Presented a near term (Phase 1 and Phase 2) analysis of key intersections surrounding the site (generally located south of Bickmore Avenue, north of Pine Avenue, east of Euclid Avenue, and west of the former Cucamonga Avenue). Compiled the initial list of cumulative projects emerging in the area, that when augmented with other cumulative project additions, has been carried over to the interim Year 2015 analysis of this study.

- *Traffic Impact Study for the DeBoer Site in The Preserve, Chino, California*; Linscott, Law & Greenspan, Engineers; June 23, 2006: Completed an assessment of that portion of the applicant's holdings in The Preserve generally located northwest of the Haven/Pine intersection; and inclusive of previously-studied Phase 1 and Phase 2 development components of The Preserve (noting that the South of Pine Development Project addressed in this current study has also been known as the Phase 3 and Phase 4 areas of The Preserve). The DeBoer study also refined long-term circulation needs/recommendations through an analysis of 19 intersections in a study area that overlaps that of this South of Pine Avenue study.

- *Chino Traffic Model,* Meyer Mohaddes Associates (now known as Iteris), 2007: Has provided an updated/refined basis to forecast Year 2030 traffic volumes throughout the study area. Linscott, Law & Greenspan, Engineers has obtained specifically tailored model forecasts based on General Plan buildout conditions in the study area. It should be noted that the General Plan Post 2020 long term horizon of The Preserve EIR (2002) is now replaced, for transportation planning purposes, by the Year 2030 volumes of the Chino Traffic Model. This change would also "roll" the long term (Post – 2020) reference year and intersection improvement needs in other studies discussed above to year 2030.

- *"South of Pine Avenue" (Tentative Tract Map No. 16420) The Preserve Phase 3 and 4 Areas External Evaluation;* Linscott, Law & Greenspan, Engineers; December 26, 2007: Developed traffic generation/distribution/assignment forecasts for the project as now proposed, and evaluated the off-site project impacts in the cumulative context of near-term (Year 2015) as well as long-term (Year 2030) cumulative traffic volumes, the latter based on Chino traffic model projections as provided by MMA.

1.2 Study Area

The nineteen (19) key study intersections selected for evaluation were determined based on the approved Traffic Study Scope of Work and discussions with City of Chino staff. ***Appendix A*** contains a copy of the approved Traffic Study Scope of Work. The key study intersections listed below all lie within the project site boundaries (note that all intersections along the project perimeter are evaluated in the previously referenced "External" study report).

1. West Preserve Loop at "A" Street
2. "F" Street at "A" Street
3. Main Street at "A" Street
4. 2nd Street at "A" Street
5. East Preserve Loop at "A" Street
6. West Preserve Loop at "B" Street
7. "F" Street at "B" Street
8. Main Street at "B" Street
9. "H" Street at "B" Street
10. East Preserve Loop at "B" Street
11. West Preserve Loop at "E" Street
12. Main Street at South Preserve Loop
13. Main Street at "C" Street
14. "H" Street at "C" Street
15. East Preserve Loop at "C" Street
16. "F" Street at "D" Street
17. Main Street at "D" Street
18. "H" Street at "D" Street
19. East Preserve Loop at "I" Street

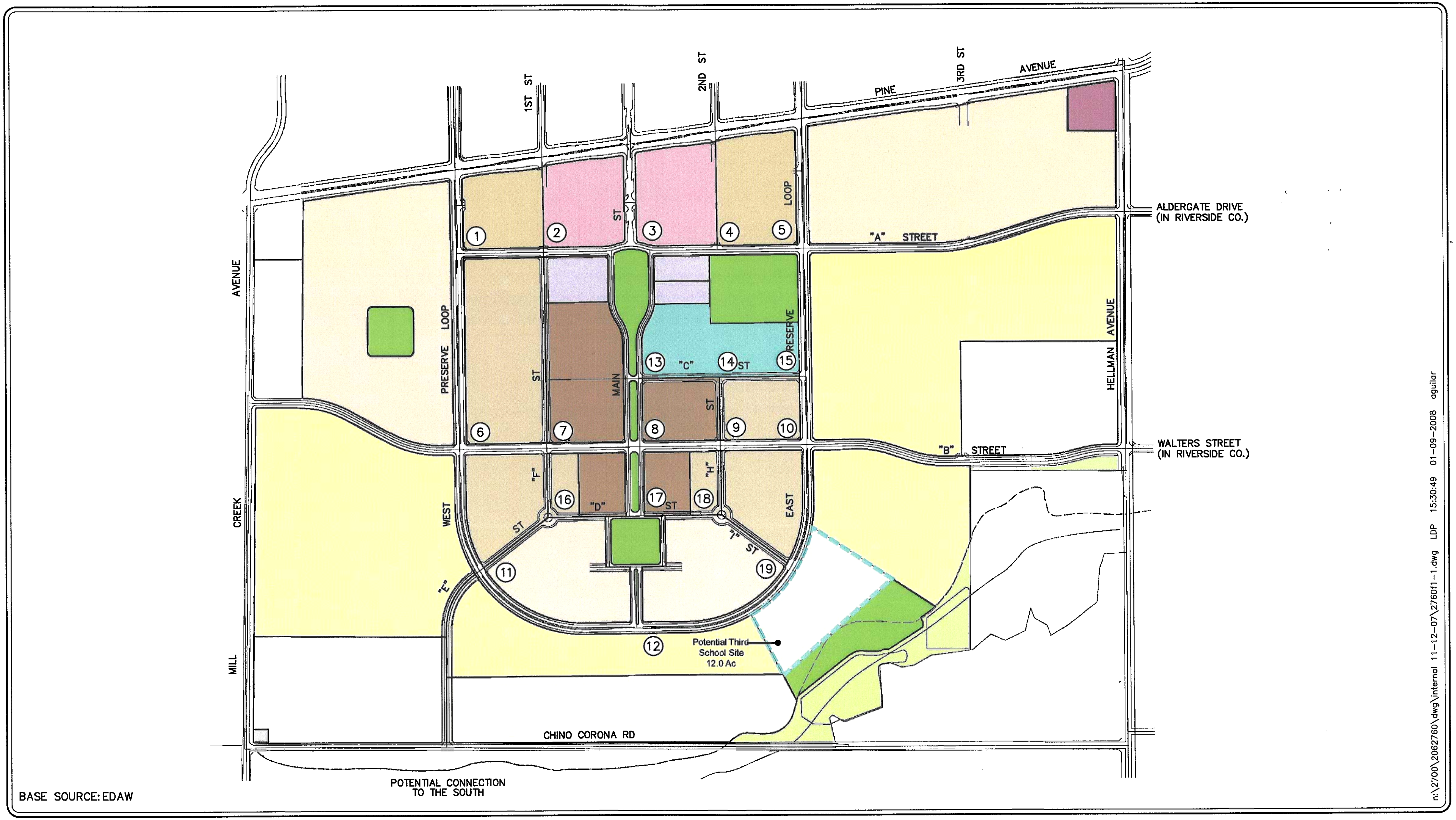
The roadway segments selected for evaluation, which include the segments bordering the project site (i.e. along Pine Avenue, Chino-Corona Road, Mill Creek Avenue and Hellman Avenue; these segments and their intersections are also analyzed in the "External" report with those investigations repeated in this document for convenience) as well as all segments internal to the site were also determined based on the approved Traffic Study Scope of Work and discussions with City of Chino staff.

Figure 1-1 presents a Vicinity Map, which illustrates the general location of the project and depicts the study locations and surrounding street system. It should be noted that the vicinity map identifies streets with their expected or current reference ("A" Street, "B" Street, etc.) name. Some of these streets are being re-named with the implementation of the Preserve Specific Plan. When identifying key intersections within close proximity to the site in this study, the updated name is used.

The Level of Service (LOS) investigations at these key locations were used to evaluate the potential traffic-related impacts, and validate proposed street geometries, associated with the proposed project at its full buildout in the long-term CMP horizon year (Year 2030). When necessary, this report recommends intersection improvements and/or roadway segment refinements that may be required to accommodate future traffic volumes and restore/maintain an acceptable Level of Service.

Included in this Traffic Impact Analysis are:

- Estimated project traffic generation/distribution/assignment (consistent with that presented in the companion "External" report),
- AM/PM peak hour analyses for long-term (Year 2030) buildout conditions with project traffic,
- Alternative Access Evaluation for Pine Avenue,
- Main Street Study Area Evaluation,
- Transit Lane Considerations,
- Review of other Special Issues as requested by City of Chino staff, and
- Internal Circulation Recommendations.



LINSCOTT LAW & GREENSPAN engineers

NO SCALE

KEY

Ⓧⓧ = STUDY INTERSECTION REFERENCE NUMBER

FIGURE 1-1

VICINITY MAP

SOUTH OF PINE AVENUE (TTM NO. 16420) INTERNAL EVALUATION, CHINO

2.0 PROJECT DESCRIPTION

The project site is roughly a 540-acre parcel of land bounded by Pine Avenue to the north, Chino-Corona Road to the south, Mill Creek Avenue (formerly or also known as Cucamonga Avenue) to the west and Hellman Avenue to the east, in the City of Chino, California.

Figure 2-1 presents the proposed site plan for the South of Pine Avenue Development Project, prepared by EDAW. Review of the proposed site plan indicates that the South of Pine Avenue Development Project will consist of eleven Planning Areas that are comprised of single family residential uses, condominium/townhouse uses, retail uses (shopping center), general office uses, recreation uses (i.e. community centers, neighborhood parks and City parks), library uses and an elementary school. The South of Pine Avenue Development Project will be constructed in several phases with an interim buildout of some of the Planning Areas expected (for the purposes of the near-term horizon year as evaluated in the "External" study) to occur by the Year 2015 (i.e. Planning Areas No. 1, No. 5, No. 8 and No. 9), and ultimate buildout of the entire site (all eleven Planning Areas) expected to occur by the Year 2030. The following two tables summarize the development tabulations for the Year 2015 and the Year 2030.

Although not further evaluated in this study (Year 2015 is addressed only in the "External Evaluation"), ***Table 2-1*** summarizes the Year 2015 proposed development tabulation for the South of Pine Avenue Development Project for the four Planning Areas expected to be fully completed or partially completed. This table shows the planning area number, the parcel type, the land use and the size of the land use. As shown at the bottom of *Table 2-1*, the proposed project in the Year 2015 will consist of 325 single-family homes, 1,542 condominiums/townhomes, 46,000 SF of recreation uses (i.e. community centers), a 20,000 SF library, 6.00 acres of neighborhood parks and 8.00 acres of City parks.

Table 2-2 summarizes the Year 2030 proposed development tabulation for the South of Pine Avenue Development Project for each of the eleven proposed planning areas. The structure of this table is similar to *Table 2-1*. As shown at the bottom of *Table 2-2*, the proposed project at completion will consist of 1,061 single-family homes, 2,945 condominiums/townhomes, 341,124 square feet (SF) of retail uses, 148,000 SF of general office uses, 46,000 SF of recreation uses (i.e. community centers), a 20,000 SF library, a 12.84 acre/1,000 student elementary school, 9.00 acres of neighborhood parks and 16.00 acres of City parks. For convenience, this exact project description is referred to as the "4,006 DU Plan", and this plan is the focus of this traffic study.

Within the 4,006 DU Plan footprint, there is a 12-acre parcel programmed for 24 dwelling units of Estate Residential. That 12-acre parcel has an optional designation as an elementary or K-8 school site, which would be the second such site in the South of Pine plan, and the third school site within the total Lewis Operating Corporation footprint of The Preserve. That option would substitute the school site for the prior ER designation on those 12 acres, and reduce the overall unit count to 3,982, while keeping all other elements of the plan the same. The exact development description as well as the variation in impacts (as compared to the 4,006 DU Plan) due to the "potential third school site" plan is discussed in Section 14 of this report.

TABLE 2-1
YEAR 2015 PROJECT DEVELOPMENT SUMMARY

Planning Area No.	Parcel Type	Land Use	Acres	Dwelling Units	Square-Footage
1	MDR	Single Family Residential	37.62	325 DU	--
	MDR	Condominium/Townhouse	6.00	62 DU	--
	MDR	Neighborhood Park	3.00	--	--
		Subtotal	*46.62*	*387 DU*	--
5	MDR	Condominium/Townhouse	49.11	690 DU	--
		Subtotal	*49.11*	*690 DU*	--
8	HDR	Condominium/Townhouse	19.64	310 DU	--
	CC Res	Condominium/Townhouse	14.01	250 DU	--
	CC Non Res-CF	Recreation Comm. Center	3.90	--	15,000 SF
	CC Non Res	Neighborhood Park	1.50	--	--
		Subtotal	*39.05*	*560 DU*	*15,000 SF*
9	HDR	Condominium/Townhouse	6.65	110 DU	--
	CC Res	Condominium/Townhouse	6.44	120 DU	--
	CC Non Res-CF	Recreation Comm. Center	1.82	--	31,000 SF
	CC Non Res-CF	Library	1.67	--	20,000 SF
	CC Non Res	City Park	8.00	--	--
	CC Non Res	Neighborhood Park	1.50	--	--
		Subtotal	*26.08*	*230 DU*	*51,000 SF*
Breakdown By Land Use					
▪ Single Family Residential			37.62	325 DU	--
▪ Condominium/Townhouse			101.85	1,542 DU	--
▪ Shopping Center			--	--	--
▪ General Office			--	--	--
▪ Recreation Community Center			5.72	--	46,000 SF
▪ Library			1.67	--	20,000 SF
▪ Elementary School			--	--	--
▪ Neighborhood Park			6.00	--	--
▪ City Park			8.00	--	--
Year 2015 Total Development			**160.86**	**1,867 DU**	**66,000 SF**

TABLE 2-2
YEAR 2030 PROJECT DEVELOPMENT SUMMARY (4,006 DU PLAN)

Planning Area No.	Parcel Type	Land Use	Acres	Dwelling Units	Square-Footage
1	MDR	Single Family Residential	37.62	325 DU	--
	MDR	Condominium/Townhouse	6.00	62 DU	--
	MDR	Neighborhood Park	3.00	--	--
		Subtotal	*46.62*	*387 DU*	--
2	LDR	Single Family Residential	28.01	141 DU	--
	LDR	Condominium/Townhouse	28.01	141 DU	--
	ER	Single Family Residential	27.06	53 DU	--
		Subtotal	*83.08*	*335 DU*	--
3	LDR	Single Family Residential	47.01	233 DU	--
	ER	Single Family Residential	29.11	57 DU	--
	ER	Single Family Residential	12.00	24 DU	--
	ER	City Park	8.00	--	--
		Subtotal	*96.12*	*314 DU*	--
4	LDR	Single Family Residential	30.83	183 DU	--
	LDR	Condominium/Townhouse	30.82	182 DU	--
	ER	Single Family Residential	23.10	45 DU	--
		Subtotal	*84.75*	*410 DU*	--
5	MDR	Condominium/Townhouse	49.11	690 DU	--
	NC	Shopping Center	3.00	--	43,124 SF
		Subtotal	*52.11*	*690 DU*	*43,124 SF*
6	HDR	Condominium/Townhouse	8.06	120 DU	--
	CC Non Res	General Office	3.28	--	74,000 SF
	CC Non Res	Shopping Center	3.28	--	149,000 SF
		Subtotal	*14.62*	*120 DU*	*223,000 SF*
7	HDR	Condominium/Townhouse	11.66	150 DU	--
	CC Non Res	General Office	3.94	--	74,000 SF
	CC Non Res	Shopping Center	3.94	--	149,000 SF
		Subtotal	*19.54*	*150 DU*	*223,000 SF*
8	HDR	Condominium/Townhouse	19.64	310 DU	--
	CC Res	Condominium/Townhouse	14.01	250 DU	--
	CC Non Res-CF	Recreation Comm. Center	3.90	--	15,000 SF
	CC Non Res	Neighborhood Park	1.50	--	--
		Subtotal	*39.05*	*560 DU*	*15,000 SF*

TABLE 2-2 (CONTINUED)
YEAR 2030 PROJECT DEVELOPMENT SUMMARY (4,006 DU PLAN)

Planning Area No.	Parcel Type	Land Use	Acres	Dwelling Units	Square-Footage
9	HDR	Condominium/Townhouse	6.65	110 DU	--
	CC Res	Condominium/Townhouse	6.44	120 DU	--
	CC Non Res-CF	Recreation Comm. Center	1.82	--	31,000 SF
	CC Non Res-CF	Library	1.67	--	20,000 SF
	CC Non Res	Elementary School[1]	12.84	--	--
	CC Non Res	City Park	8.00	--	--
	CC Non Res	Neighborhood Park	1.50	--	--
		Subtotal	*38.92*	*230 DU*	*51,000 SF*
10	HDR	Condominium/Townhouse	12.53	170 DU	--
	MDR	Condominium/Townhouse	14.56	180 DU	--
	CC Res	Condominium/Townhouse	3.70	55 DU	--
	CC Non Res	Neighborhood Park	1.50	--	--
		Subtotal	*32.29*	*405 DU*	--
11	HDR	Condominium/Townhouse	12.54	170 DU	--
	MDR	Condominium/Townhouse	14.56	180 DU	--
	CC Res	Condominium/Townhouse	3.69	55 DU	--
	CC Non Res	Neighborhood Park	1.50	--	--
		Subtotal	*32.29*	*405 DU*	--
Breakdown By Land Use					
▪ Single Family Residential			234.74	1,061 DU	--
▪ Condominium/Townhouse			241.98	2,945 DU	--
▪ Shopping Center			10.22	--	341,124 SF
▪ General Office			7.22	--	148,000 SF
▪ Recreation Community Center			5.72	--	46,000 SF
▪ Library			1.67	--	20,000 SF
▪ Elementary School			12.84	--	--
▪ Neighborhood Park			9.00	--	--
▪ City Park			16.00	--	--
Year 2030 Total Development			**539.39**	**4,006 DU**	**555,124 SF**

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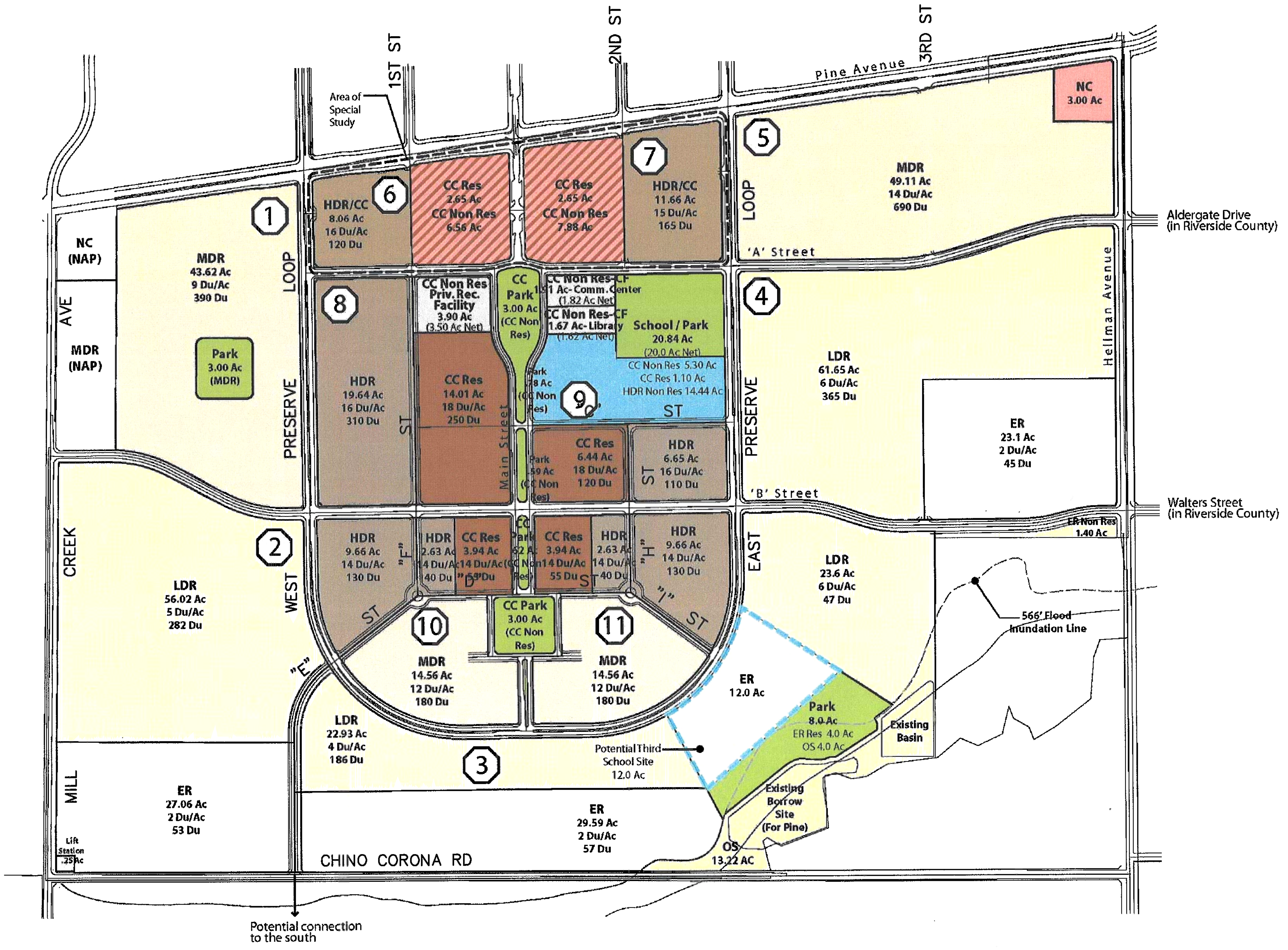
[1] Elementary School = 1,000 Students.

2.1 Site Access

Access to the South of Pine Avenue Development Project will generally be provided via Pine Avenue, Chino-Corona Road, Mill Creek Avenue (Cucamonga Avenue) and Hellman Avenue. The proposed project will provide connections to Pine Avenue via West Preserve Loop, 1st Street, Main Street, 2nd Street, East Preserve Loop and 3rd Street. "E" Street to be constructed by the proposed project will provide a connection to Chino-Corona Road. The proposed project will provide a connection to Mill Creek Avenue (Cucamonga Avenue) via "B" Street, and a connection to Hellman Avenue via "A" Street and "B" Street. ***Figure 2-2*** identifies expected local street and other local access locations/provisions throughout the site. The internal forecasting and assignment procedures carried out in this study reflect these specific provisions. *Figure 2-2* generally illustrates the potential access points along the local collectors. These may not be the final locations, and any variations that result in the final map stage for individual tracts should be reconciled with the forecasting and analysis components in this study. Additional access points could be provided along the local streets even though they are not shown in this figure.

Prior site planning activities anticipated the direct southerly extension of Main Street all the way to Chino-Corona Road. The "E" Street connection to Chino-Corona Road as shown in the current site plan is considered an equivalent connection from a transportation planning and impact perspective. Given the similarity of the connections in the context of the overall project plan, a similar traffic volume would be attracted to either alignment, and the internal impacts of the project not materially altered. This aspect is further discussed in Section 12.0 of this report.



BASE SOURCE: EDAW

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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(XX) = PLANNING AREA REFERENCE NUMBER

FIGURE 2-1

PROPOSED SITE PLAN

SOUTH OF PINE AVENUE (TTM NO. 16420) INTERNAL EVALUATION, CHINO

BASE SOURCE: EDAW

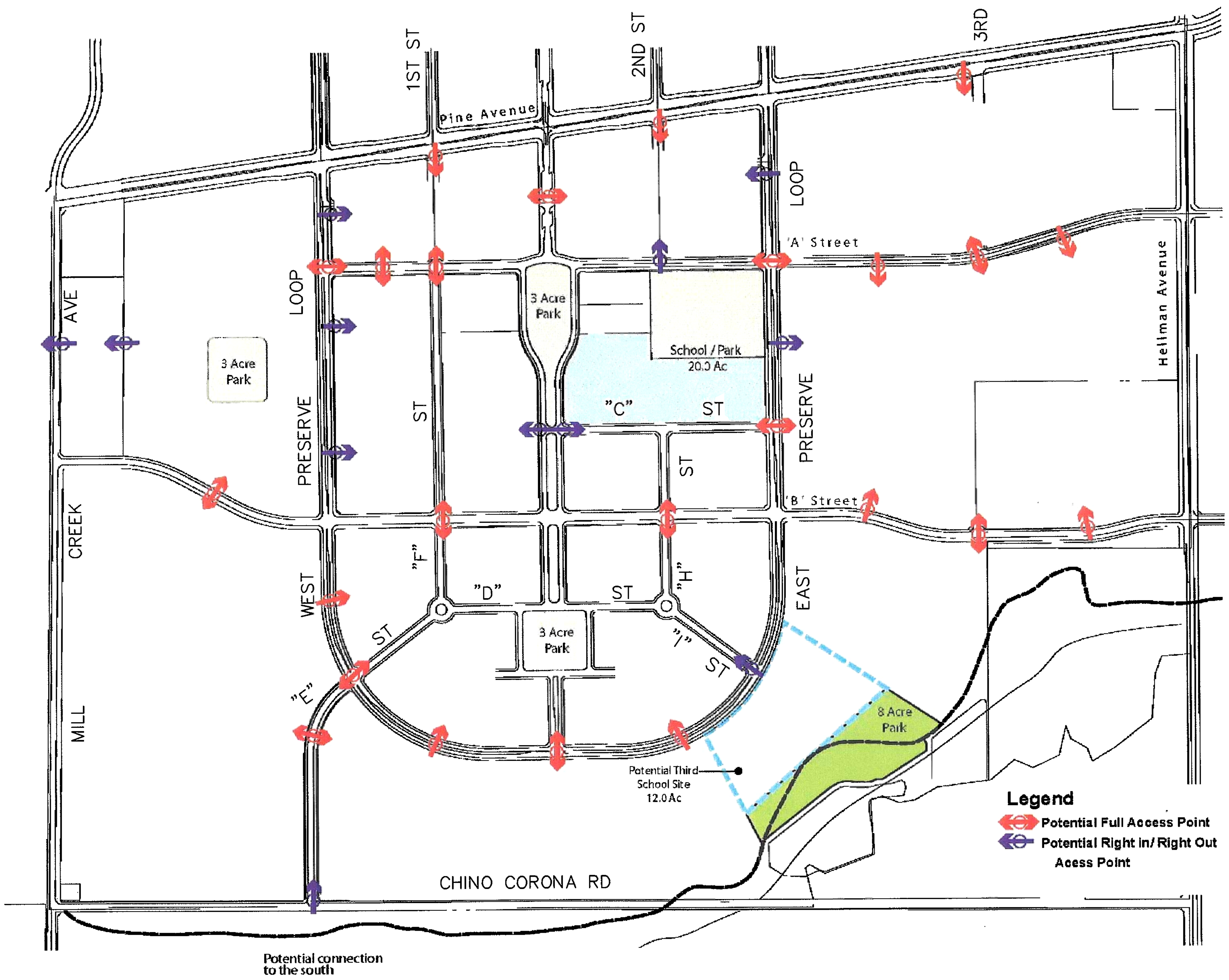

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FIGURE 2-2

POTENTIAL PROJECT ACCESS LOCATIONS
SOUTH OF PINE AVENUE (TTM NO. 16420) INTERNAL EVALUATION, CHINO

3.0 EXISTING STREET SYSTEM

The Chino Valley Freeway (SR-71) provides regional access to the Project site. The SR-71 is located west of the Project site. Regional access to the Project site is provided via a full interchange at Soquel Canyon Parkway/Central Avenue and Butterfield Ranch Road/Euclid Avenue.

The principal local network of streets serving the South of Pine Avenue Development Project includes Pine Avenue, Chino-Corona Road, Mill Creek Avenue (Cucamonga Avenue), Kimball Avenue, Bickmore Avenue, Euclid Avenue and Hellman Avenue. The following discussion provides a brief synopsis of these key area streets. The descriptions are based on an inventory of existing roadway conditions and the City of Chino General Plan Circulation Element.

Pine Avenue is currently generally a two-lane undivided roadway oriented in the east-west direction, which borders the project site to the north. Pine Avenue will provide access to the project site via West Preserve Loop, 1st Street, Main Street, 2nd Street, East Preserve Loop and 3rd Street. Parking is generally not permitted on either side of this roadway within the vicinity of the project. The posted speed limit on Pine Avenue in the vicinity of the project is 55 miles per hour (mph). Pine Avenue is designated as a Major Arterial in the City of Chino Circulation Element in the vicinity of the proposed project.

Chino-Corona Road is currently generally a two-lane undivided roadway oriented in the east-west direction, which borders the project site to the south. Chino-Corona Road will provide access to the project site via "E" Street. Parking is generally not permitted on either side of this roadway within the vicinity of the project. There is no posted speed limit on Chino-Corona Road. Chino-Corona Road is designated as a Local Collector in the City of Chino Circulation Element.

Mill Creek Avenue (Cucamonga Avenue) is currently generally a two-lane undivided roadway oriented in the north-south direction, which borders the project site to the west. Mill Creek Avenue will provide access to the project site via "B" Street. Parking is generally not permitted on either side of this roadway within the vicinity of the project. There is no posted speed limit on Mill Creek Avenue. Mill Creek Avenue is designated as a Local Collector in the City of Chino Circulation Element.

Kimball Avenue is an east west roadway, located north of the Project site. In the segment west of Euclid Avenue, a center two-way left-turn lane separates the eastbound and westbound travel lanes on Kimball Avenue. In the segment between Euclid Avenue and Mill Creek Road, Kimball Avenue is a two-lane roadway divided by double-double yellow centerline. In the segment east of Mill Creek Road, Kimball Avenue is a three-lane roadway (two lanes eastbound, one lane westbound) divided by a raised median. On-street parking is not permitted on either side of the roadway within the Project vicinity. The posted speed limit is 50 mph. Traffic signals exist at the intersections of Kimball Avenue at Mountain Avenue and Euclid Avenue.

Bickmore Avenue is generally an east-west, two-lane, undivided roadway, located north of the Project site. In the segment west of San Antonio Avenue, a center two-way left-turn lane separates the eastbound and westbound travel lanes on Bickmore Avenue. The segment between San Antonio Avenue and Euclid Avenue is currently under construction. In the segment east of Euclid Avenue, Bickmore Avenue is a two-lane undivided roadway. On-street parking is not permitted on either side of the roadway within the Project vicinity.

Euclid Avenue is a north-south, four-lane divided roadway that borders the Project area to the west. On-street parking is not permitted on either side of the roadway. The posted speed limit is 55 mph. Within the Project vicinity, traffic signals exist at the intersections of Euclid Avenue at Edison Avenue, Eucalyptus Avenue, Merrill Avenue, Kimball Avenue, Pine Avenue and the SR-71 Northbound Ramps.

Hellman Avenue is currently generally a two-lane undivided roadway oriented in the north-south direction, which borders the project site to the east. Hellman Avenue will provide access to the project site via "A" Street and "B" Street. Parking is generally not permitted on either side of this roadway within the vicinity of the project. There is no posted speed limit on Hellman Avenue. Hellman Avenue is designated as a Major Arterial in the City of Chino Circulation Element.

4.0 LEVEL OF SERVICE METHODOLOGY

In conformance with City of Chino and San Bernardino County CMP requirements, Year 2030 AM and PM peak hour operating conditions for signalized and unsignalized intersections are typically evaluated using the *Highway Capacity Manual 2000* (HCM 2000) methodology. While some intersections along the project perimeter are expected to be signalized, all intersections internal to the project site are not expected to meet warrants for signalization (see Section 9.0 and 13.0 for all signal warrants). For completeness, however, the methodologies applicable to unsignalized intersections as well as signalized intersections are explained below.

Please note that the saturation flow rates input to these analyses are per CMP default lane capacity values for future scenarios (i.e. Year 2030); 1900 for through lanes, 1800 for exclusive left turn lanes, 1900 for exclusive right turn lanes, and 3400 for dual left turn lanes.

4.1 Highway Capacity Manual (HCM) Method of Analysis (Signalized Intersections)

Based on the HCM operations method of analysis, level of service for signalized intersections is defined in terms of control delay, which is a measure of driver discomfort, frustration, fuel consumption, and lost travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, geometries, traffic, and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during ideal conditions: in the absence of traffic control, in the absence of geometric delay, in the absence of any incidents, and when there are no other vehicles on the road.

In Chapter 16 of the HCM, only the portion of total delay attributed to the control facility is quantified. This delay is called *control delay*. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. In contrast, in previous versions of the HCM (1994 and earlier), delay included only stopped delay. Specifically, LOS criteria for traffic signals are stated in terms of the average control delay per vehicle. The six qualitative categories of Level of Service that have been defined along with the corresponding HCM control delay value range for signalized intersections are shown in ***Table 4-1***.

4.2 Highway Capacity Manual (HCM) Method of Analysis (Unsignalized Intersections)

The 2000 HCM unsignalized methodology for stop-controlled intersections was utilized for the analysis of the unsignalized intersections. This methodology estimates the average control delay for each of the subject movements and determines the level of service for each movement. The overall average control delay measured in seconds per vehicle, and level of service is then calculated for the entire intersection. The HCM control delay value translates to a Level of Service (LOS) estimate, which is a relative measure of the intersection performance. The six qualitative categories of Level of Service have been defined along with the corresponding HCM control delay value range, as shown in ***Table 4-2***.

TABLE 4-1
LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS[2]

Level of Service (LOS)	Control Delay Per Vehicle (seconds/vehicle)	Level of Service Description
A	≤ 10.0	This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	> 10.0 and ≤ 20.0	This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.
C	> 20.0 and ≤ 35.0	Average traffic delays. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.
D	> 35.0 and ≤ 55.0	Long traffic delays At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high *v/c* ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	> 55.0 and ≤ 80.0	Very long traffic delays This level is considered by many agencies (i.e. SANBAG) to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high *v/c* ratios. Individual cycle failures are frequent occurrences.
F	≥ 80.0	Severe congestion This level, considered to be unacceptable to most drivers, often occurs with over saturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high *v/c* ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors to such delay levels.

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[2] Source: *Highway Capacity Manual 2000,* Chapter 16 (Signalized Intersections).

TABLE 4-2

LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS[3]

Level of Service (LOS)	Highway Capacity Manual Delay Value (sec/veh)	Level of Service Description
A	≤ 10.0	Little or no delay
B	> 10.0 and ≤ 15.0	Short traffic delays
C	> 15.0 and ≤ 25.0	Average traffic delays
D	> 25.0 and ≤ 35.0	Long traffic delays
E	> 35.0 and ≤ 50.0	Very long traffic delays
F	> 50.0	Severe congestion

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[3] Source: *Highway Capacity Manual 2000*, Chapter 17 (Unsignalized Intersections).

4.3 Roadway Segment Capacity Analysis

In addition to detailed intersection capacity analyses, daily operating conditions for the roadway segments bordering the project site and the internal roadway segments within the South of Pine Avenue Development Project have been investigated based on roadway classification information provided by the City of Chino General Plan, dated February 4, 1992 (Chapter III – Circulation – Table 1). ***Table 4-3*** presents the daily roadway capacities per level of service (i.e. A through E) for freeways, expressways, primary arterials, secondary arterials and collectors as provided by the City of Chino General Plan (Chapter III – Circulation – Table 1). For this evaluation, Pine Avenue was determined to be a six-lane Primary Arterial, Hellman Avenue was determined to be a four-lane Primary Arterial, and Mill Creek Avenue, Chino-Corona Road, and internal roadways within the project site were evaluated as two-lane Collectors.

4.4 Level of Service Criteria

According to the City of Chino, LOS "D" is the minimum acceptable condition that should be maintained during the peak commute hours at all City intersections.

The City of Chino targets LOS C for all roadway links except for those roadway links located at freeway interchanges where LOS D is considered acceptable.

TABLE 4-3

ROADWAY SEGMENT CAPACITIES[4]

	Freeway	Expressway	Primary Arterial			Secondary Arterial		Collector
LOS	**6 Lanes**	**4 Lanes**	**2 Lanes**	**4 Lanes**	**6 Lanes**	**2 Lanes**	**4 Lanes**	**2 Lanes**
A	72,000	19,000	10,000	18,000	29,000	8,000	17,000	8,000
B	84,000	22,000	11,000	20,000	34,000	10,000	20,000	9,000
C	96,000	26,000	13,000	24,000	38,000	11,000	22,000	10,000
D	108,000	29,000	14,000	27,000	43,000	13,000	25,000	12,000
E	120,000	32,000	16,000	30,000	48,000	14,000	28,000	13,000

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[4] Source: City of Chino General Plan (Chapter III – Circulation – Table 1).

5.0 TRAFFIC FORECASTING METHODOLOGY

In order to estimate the traffic impact characteristics of the proposed South of Pine Avenue Development Project, a multi-step process has been utilized. The first step is trip generation, which estimates the total arriving and departing traffic on a peak hour and daily basis. The traffic generation potential is forecast by applying the appropriate vehicle trip generation equations or rates to the project development tabulation.

The second step of the forecasting process is trip distribution, which identifies the origins and destinations of inbound and outbound project traffic. These origins and destinations are typically based on demographics and existing/anticipated travel patterns in the study area.

The third step is traffic assignment, which involves the allocation of project traffic to study area streets and intersections. Traffic assignment is typically based on minimization of travel time, which may or may not involve the shortest route, depending on prevailing operating conditions and travel speeds. Traffic distribution patterns are indicated by general percentage orientation, while traffic assignment allocates specific volume forecasts to individual roadway links and intersection turning movements throughout the study area.

With the forecasting process complete and project traffic assignments developed, the impact of the proposed project is isolated by comparing operational (LOS) conditions at selected key intersections using expected future traffic volumes with and without forecast project traffic. The need for site-specific and/or cumulative local area traffic improvements can then be evaluated and the significance of the project's impacts identified.

6.0 PROJECT TRAFFIC CHARACTERISTICS

6.1 Project Traffic Generation

Traffic generation is expressed in vehicle trip ends, defined as one-way vehicular movements, either entering or exiting the generating land use. Generation equations and/or rates used in the traffic forecasting procedure are found in the Seventh Edition of *Trip Generation*, published by the Institute of Transportation Engineers (ITE) [Washington D.C., 2003].

Table 6-1 summarizes the trip generation rates used in forecasting the vehicular trips generated by the proposed South of Pine Avenue Development Project. As shown in *Table 6-1*, trips generated by the proposed project were estimated using ITE Land Use Code 210: Single Family Detached Housing rates, ITE Land Use Code 230: Residential Condominium/Townhouse rates, ITE Land Use Code 495: Community Recreation Center rates, ITE Land Use Code 520: Elementary School rates, ITE Land Use Code 590: Library rates, ITE Land Use Code 710: General Office Building rates and ITE Land Use Code 820: Shopping Center rates.

In order to provide a more conservative trip generation forecast, trip rates for land use "City Park (Developed)" and "Neighborhood/County Park (Undeveloped)" as contained in San Diego Traffic Generators, published by SANDAG were utilized for the park components of the proposed project instead of ITE Land Use Code 411: City Park. The SANDAG publication indicates a trip rate of 50 trips per acre per day for a "City Park (Developed)" land use and a trip rate of 5 trips per acre per day for a "Neighborhood/County Park (Undeveloped)" land use while ITE indicates a trip rate of 1.59 trips per acre per day for a "City Park" land use. Hence, the use of SANDAG's "City Park (Developed)" and "Neighborhood/County Park (Undeveloped)" trip rates are considered conservative.

Table 6-2 presents the forecast long-term (Year 2030) daily and peak hour project traffic volumes for the 4,006 DU Plan on a "typical" weekday and provides a breakdown of the long-term project trips by land use (i.e. single family residential, condominium/townhouse, shopping center, general office, recreation community center, library, elementary school, neighborhood park and City park). Review of *Table 6-2* shows that overall the proposed project in the long-term (Year 2030) is expected to generate 42,977 daily trips, with 3,297 trips (1,172 inbound, 2,125 outbound) produced in the AM peak hour and 3,964 trips (2,283 inbound, 1,681 outbound) produced in the PM peak hour.

Please note that the aforementioned trip generation includes adjustments for pass-by trips that come directly from the everyday traffic stream on the adjoining streets (i.e. Pine Avenue). The factors used in this report, which are summarized in the footnotes of *Table 6-3*, are based on information published in the *Trip Generation Handbook*, 2nd Edition, published by ITE, June 2004.

TABLE 6-1
PROJECT TRAFFIC GENERATION RATES[5]

ITE Land Use Code	Time Period	Rates/Equations	Percent Entering	Percent Exiting
▪ 210: Single Family Detached Housing (TE/DU)	Daily	T = 9.57 (X)	50%	50%
	AM Peak	T = 0.75 (X)	25%	75%
	PM Peak	T = 1.01 (X)	63%	37%
▪ 230: Residential Condominium/ Townhouse (TE/DU)	Daily	T = 5.86 (X)	50%	50%
	AM Peak	T = 0.44 (X)	17%	83%
	PM Peak	T = 0.52 (X)	67%	33%
▪ 495: Community Recreation Center (TE/1,000 SF)	Daily	T = 22.88 (X)	50%	50%
	AM Peak	T = 1.62 (X)	61%	39%
	PM Peak	T = 1.64 (X)	29%	71%
▪ 520: Elementary School (TE/Student)	Daily	T = 1.29 (X)	50%	50%
	AM Peak	T = 0.42 (X)	55%	45%
	PM Peak	---	---	---
▪ 590: Library (TE/1,000 SF)	Daily	T = 54.00 (X)	50%	50%
	AM Peak	T = 1.06 (X)	72%	28%
	PM Peak	T = 7.09 (X)	48%	52%
▪ 710: General Office Building (TE/1,000 SF)	Daily	T = 11.01 (X)	50%	50%
	AM Peak	T = 1.55 (X)	88%	12%
	PM Peak	T = 1.49 (X)	17%	83%
▪ 820: Shopping Center (TE/1,000 SF)	Daily	T = 42.94 (X)	50%	50%
	AM Peak	T = 1.03 (X)	61%	39%
	PM Peak	T = 3.75 (X)	48%	52%
▪ City Park (TE/Acre)[6]	Daily	T = 50.00 (X)	50%	50%
	AM Peak	T = 6.50 (X)	50%	50%
	PM Peak	T = 4.50 (X)	50%	50%
▪ Neighborhood Park (TE/Acre)[6]	Daily	T = 5.00 (X)	50%	50%
	AM Peak	T = 0.20 (X)	50%	50%
	PM Peak	T = 0.40 (X)	50%	50%

Notes:
TE/DU = Trip ends per dwelling unit
TE/Student = Trip ends per student
TE/1,000 SF = Trip ends per 1,000 square feet of development
TE/Acre = Trip ends per acre

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[5] Source: *Trip Generation*, 7th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2003).

[6] Source: *San Diego Traffic Generators*, published by San Diego Association of Governments (SANDAG), dated April 2002.

TABLE 6-2
LONG-TERM (YEAR 2030) PROJECT TRAFFIC GENERATION FORECAST (4,006 DU PLAN)[7]

Project Description							Daily	AM Peak Hour			PM Peak Hour		
Prior TAZ No.[8]	PA No.	Parcel Type	Land Use	Acres	DU	T.S.F.	Trips	In	Out	Total	In	Out	Total
21	1	MDR	SF Residential	37.62	325	--	3,110	62	182	244	208	120	328
		MDR	Condo/Townhome	6.00	62	--	363	4	23	27	22	11	33
		MDR	Neighborhood Park	3.00	--	--	15	1	0	1	1	0	1
						Sub-Total	*3,488*	*67*	*205*	*272*	*231*	*131*	*362*
27	2	LDR	SF Residential	28.01	141	--	1,349	27	79	106	90	52	142
		LDR	Condo/Townhome	28.01	141	--	826	10	52	62	49	24	73
		ER	SF Residential	27.06	53	--	507	10	30	40	34	20	54
						Sub-Total	*2,682*	*47*	*161*	*208*	*173*	*96*	*269*
30	3	LDR	SF Residential	46.01	233	--	2,230	44	130	174	149	86	235
		ER	SF Residential	29.11	57	--	545	11	32	43	36	21	57
		ER	SF Residential	12.00	24	--	230	5	13	18	15	9	24
		ER	City Park	8.00	--	--	400	26	26	52	18	18	36
						Sub-Total	*3,405*	*86*	*201*	*287*	*218*	*134*	*352*
24	4	LDR	SF Residential	30.83	183	--	1,751	35	102	137	117	68	185
		LDR	Condo/Townhome	30.82	182	--	1,067	13	67	80	64	31	95
		ER	SF Residential	23.10	45	--	431	9	25	34	29	17	46
						Sub-Total	*3,249*	*57*	*194*	*251*	*210*	*116*	*326*

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[7] Source: *Trip Generation*, 7th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2003).

[8] Refers to the traffic zone references in The Preserve, Chino Internal Traffic Model Methodology and Findings: Long-Term/Project Buildout Conditions Report, prepared by LLG (March 7, 2003).

TABLE 6-2 (CONTINUED)

LONG-TERM (YEAR 2030) PROJECT TRAFFIC GENERATION FORECAST (4,006 DU PLAN)[9]

Project Description							Daily	AM Peak Hour			PM Peak Hour		
Prior TAZ No.[10]	PA No.	Parcel Type	Land Use	Acres	DU	T.S.F.	Trips	In	Out	Total	In	Out	Total
24	5	MDR	Condo/Townhome	49.11	690	--	4,043	48	255	303	241	117	358
		NC	Shopping Center	3.00	--	43.124	1,852	27	17	44	78	84	162
		--	Pass-By (34%)[11]	--	--	--	-630	0	0	0	-27	-29	-56
						Sub-Total	*5,265*	*75*	*272*	*347*	*292*	*172*	*464*
22	6	HDR	Condo/Townhome	8.06	120	--	703	8	44	52	42	20	62
		CC Non Res	General Office	3.28	--	74.000	815	101	14	115	19	92	111
		CC Non Res	Shopping Center	3.28	--	149.000	6,398	94	60	154	268	291	559
		--	Pass-By (34%)[11]	--	--	--	-2,175	0	0	0	-91	-99	-190
						Sub-Total	*5,741*	*203*	*118*	*321*	*238*	*304*	*542*
23	7	HDR	Condo/Townhome	11.66	150	--	879	11	56	67	53	26	79
		CC Non Res	General Office	3.94	--	74.000	815	101	14	115	19	92	111
		CC Non Res	Shopping Center	3.94	--	149.000	6,398	94	60	154	268	291	559
		--	Pass-By (34%)[11]	--	--	--	-2,175	0	0	0	-91	-99	-190
						Sub-Total	*5,917*	*206*	*130*	*336*	*249*	*310*	*559*

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[9] Source: *Trip Generation*, 7th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2003).

[10] Refers to the traffic zone references in The Preserve, Chino Internal Traffic Model Methodology and Findings: Long-Term/Project Buildout Conditions Report, prepared by LLG (March 7, 2003).

[11] Pass-by trips are trips made as intermediate stops on the way from an origin to a primary trip destination. Pass-by trips are attracted from traffic passing the site on adjacent streets (i.e. Pine Avenue), which contain direct access to the generator. A pass-by reduction factor of 34% was used for the PM peak hour (Source: *Trip Generation Handbook*, 2nd Edition, June 2004). This same factor was used to estimate the daily pass-by percentage.

TABLE 6-2 (CONTINUED)
LONG-TERM (YEAR 2030) PROJECT TRAFFIC GENERATION FORECAST (4,006 DU PLAN)[12]

Project Description							Daily	AM Peak Hour			PM Peak Hour		
Prior TAZ No.[13]	PA No.	Parcel Type	Land Use	Acres	DU	T.S.F.	Trips	In	Out	Total	In	Out	Total
25	8	HDR	Condo/Townhome	19.64	310	--	1,817	22	115	137	109	53	162
		CC Res	Condo/Townhome	14.01	250	--	1,465	18	93	111	88	43	131
		CC Non Res CF	Rec. Comm. Center	3.90	--	15.000	343	15	9	24	7	17	24
		CC Non Res	Neighborhood Park	1.50	--	--	8	0	0	0	1	0	1
						Sub-Total	*3,633*	*55*	*217*	*272*	*205*	*113*	*318*
26	9	HDR	Condo/Townhome	6.65	110	--	645	8	41	49	39	19	58
		CC Res	Condo/Townhome	6.44	120	--	703	8	44	52	42	20	62
		CC Non Res-CF	Rec. Comm. Center	1.82	--	31.000	709	31	20	51	15	36	51
		CC Non Res-CF	Library	1.67	--	20.000	1,080	15	6	21	68	74	142
		CC Non Res	Elementary School[14]	12.84	--	--	1,290	230	190	420	-	-	-
		CC Non Res	City Park	8.00	--	--	400	26	26	52	18	18	36
		CC Non Res	Neighborhood Park	1.50	--	--	8	0	0	0	1	0	1
						Sub-Total	*4,835*	*318*	*327*	*645*	*183*	*167*	*350*
28	10	HDR	Condo/Townhome	12.53	170	--	996	12	63	75	59	29	88
		MDR	Condo/Townhome	14.56	180	--	1,055	13	67	80	63	31	94
		CC Res	Condo/Townhome	3.70	55	--	322	4	20	24	19	9	28
		CC Non Res	Neighborhood Park	1.50	--	--	8	0	0	0	1	0	1
						Sub-Total	*2,381*	*29*	*150*	*179*	*142*	*69*	*211*

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[12] Source: *Trip Generation*, 7th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2003).

[13] Refers to the traffic zone references in The Preserve, Chino Internal Traffic Model Methodology and Findings: Long-Term/Project Buildout Conditions Report, prepared by LLG (March 7, 2003).

[14] Elementary School = 1,000 Students.

TABLE 6-2 (CONTINUED)
LONG-TERM (YEAR 2030) PROJECT TRAFFIC GENERATION FORECAST (4,006 DU PLAN)[15]

Project Description							Daily	AM Peak Hour			PM Peak Hour		
Prior TAZ No.[16]	PA No.	Parcel Type	Land Use	Acres	DU	T.S.F.	Trips	In	Out	Total	In	Out	Total
29	11	HDR	Condo/Townhome	12.54	170	--	996	12	63	75	59	29	88
		MDR	Condo/Townhome	14.56	180	--	1,055	13	67	80	63	31	94
		CC Res	Condo/Townhome	3.69	55	--	322	4	20	24	19	9	28
		CC Non Res	Neighborhood Park	1.50	--	--	8	0	0	0	1	0	1
						Sub-Total	*2,381*	*29*	*150*	*179*	*142*	*69*	*211*
Total Long-Term (Year 2030) Project Traffic Generation Forecast				**539.39**	**4,006**	**555.124**	**42,977**	**1,172**	**2,125**	**3,297**	**2,283**	**1,681**	**3,964**

				Daily	AM Peak Hour			PM Peak Hour		
Breakdown By Land Use	Acres	DU	T.S.F.	Trips	In	Out	Total	In	Out	Total
Single Family Residential	234.74	1,061	--	10,153	203	593	796	678	393	1,071
Condominium/Townhouse	241.16	2,945	--	17,257	208	1,090	1,298	1,031	502	1,533
Shopping Center	10.22	--	341.124	9,668	215	137	352	405	439	844
General Office	7.22	--	148.000	1,630	202	28	230	38	184	222
Recreation Community Center	5.72	--	46.000	1,052	46	29	75	22	53	75
Library	1.67	--	20.000	1,080	15	6	21	68	74	142
Elementary School	12.84	--	--	1,290	230	190	420	-	-	-
Neighborhood Park	9.00	--	--	47	1	0	1	5	0	5
City Park	16.00	--	--	800	52	52	104	36	36	72
Total Long-Term (Year 2030) Project Traffic Generation Forecast	**539.39**	**4,006**	**555.124**	**42,977**	**1,172**	**2,125**	**3,297**	**2,283**	**1,681**	**3,964**

---

[15] Source: *Trip Generation*, 7th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2003).

[16] Refers to the traffic zone references in The Preserve, Chino Internal Traffic Model Methodology and Findings: Long-Term/Project Buildout Conditions Report, prepared by LLG (March 7, 2003).

6.2 Project Traffic Distribution and Assignment

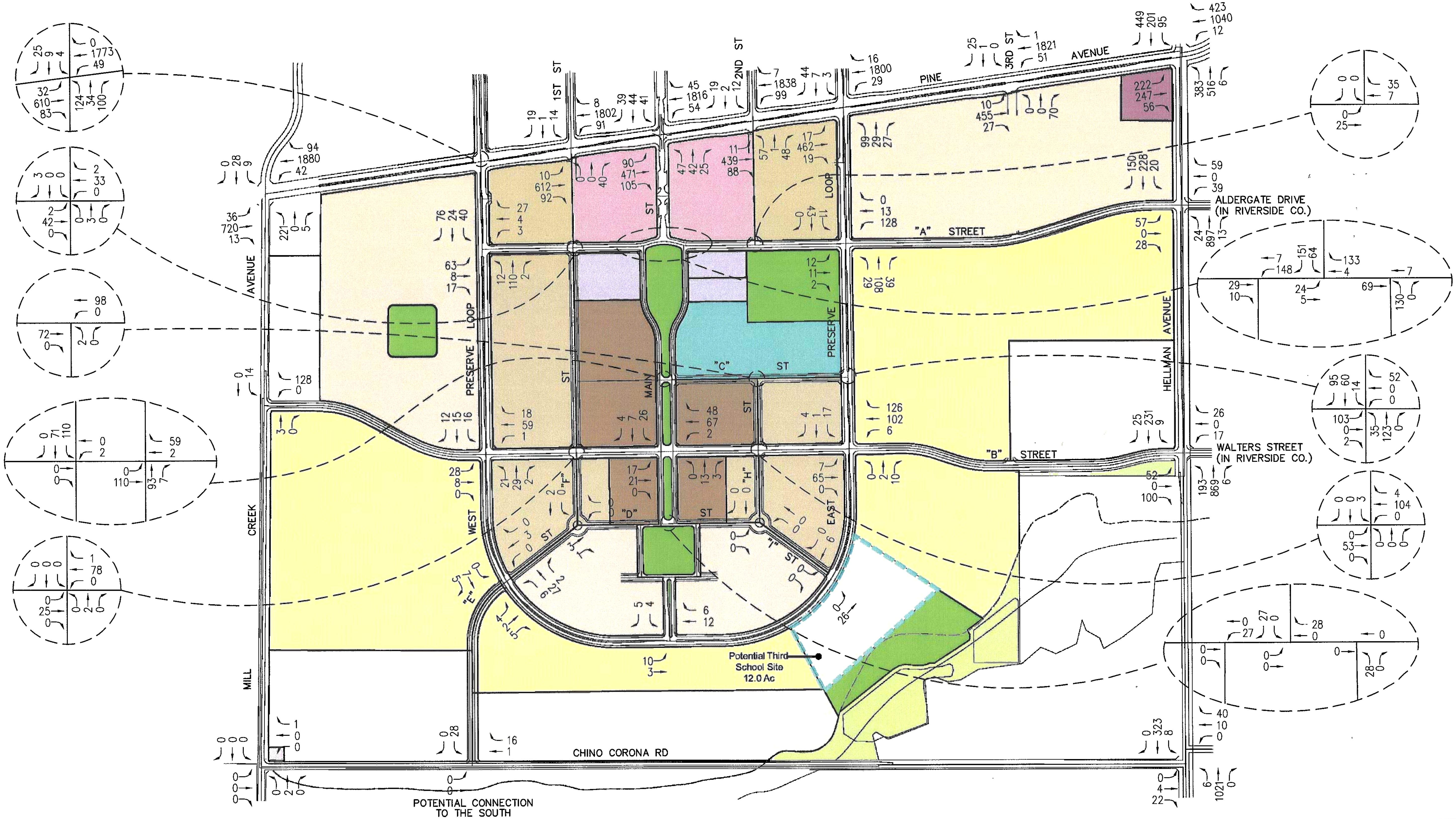
Consistent with the "External Evaluation", for Year 2030 traffic conditions, the explicit trip forecasts of *Table 6-2* were input to the Chino Traffic Model by MMA prior to making the model runs. Project traffic volumes specific to the 4,006 DU Plan are represented in the outputs, rather than the product of those forecasts multiplied by a percent assignment pattern. Actual plots of these zonal volumes are presented in Appendix D of the "External Report". It should be noted that given the nature of traffic modeling, the centroid connectors of the Chino Traffic Model zone structures within the project site mimic the site access provisions of *Figure 2-2*, but may not represent them exactly. The volumes on each final access point should be evaluated in the context of this study's forecasting as subsequent tract maps are reviewed and approved.

6.2.1 *Long-Term (Year 2030) Roadway Network Assumptions*

All roadways within the project site area bounded by Pine Avenue to the north, Chino-Corona Road to the south, Mill Creek Avenue (Cucamonga Avenue) to the west and Hellman Avenue to the east were assumed to be complete by the Year 2030 and were included in the select zone model runs for the proposed project.

6.2.2 *Long-Term (Year 2030) Project Traffic Volumes*

The anticipated long-term (Year 2030) AM peak hour, PM peak hour and daily background plus project traffic volumes associated with the proposed South of Pine Avenue Development Project are presented in ***Figures 6-1, 6-2*** and ***6-3***, respectively. The traffic volume assignments presented in *Figures 6-1, 6-2* and *6-3* are consistent with the traffic distribution characteristics of the long-term select zone model runs and the traffic generation forecast presented in *Table 6-3*. Further, these volumes reflect the total traffic expected in the Year 2030 for each identified location.



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NOTE: A "0" VOLUME INDICATES NEGLIGIBLE TRAFFIC ON THE INDICATED MOVEMENT

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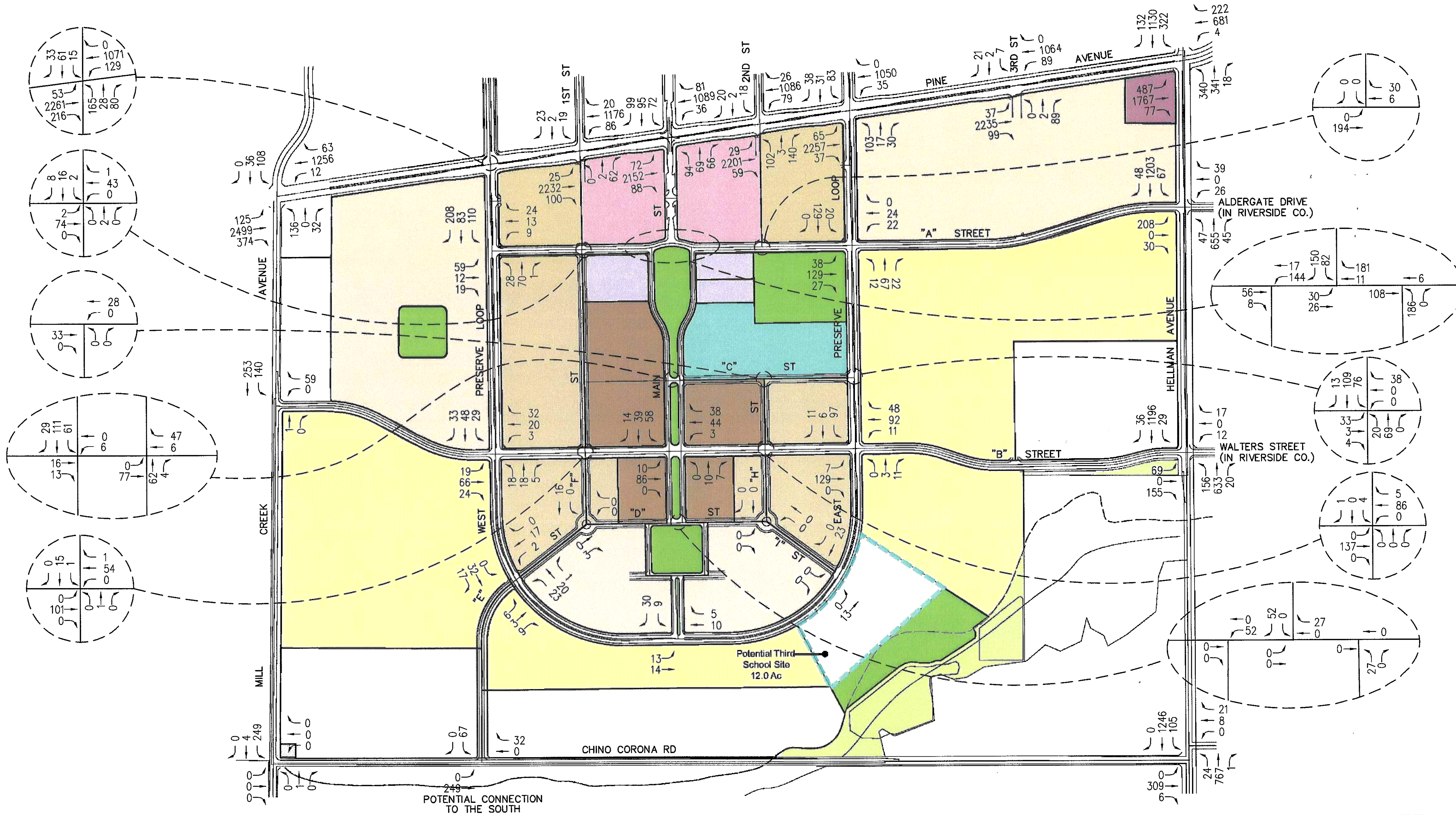
GREENSPAN
engineers

N NO SCALE

FIGURE 6-1

YEAR 2030 AM PEAK HOUR TRAFFIC VOLUMES WITH PROJECT TRAFFIC
SOUTH OF PINE AVENUE (TTM NO. 16420) INTERNAL EVALUATION, CHINO



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LINSCOTT LAW & GREENSPAN
engineers

N NO SCALE

NOTE: A "0" VOLUME INDICATES NEGLIGIBLE TRAFFIC ON THE INDICATED MOVEMENT

FIGURE 6-2

YEAR 2030 PM PEAK HOUR TRAFFIC VOLUMES WITH PROJECT TRAFFIC
SOUTH OF PINE AVENUE (TTM NO. 16420) INTERNAL EVALUATION, CHINO

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GREENSPAN
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KEY

XX,XXX = AVERAGE DAILY TRAFFIC VOLUME

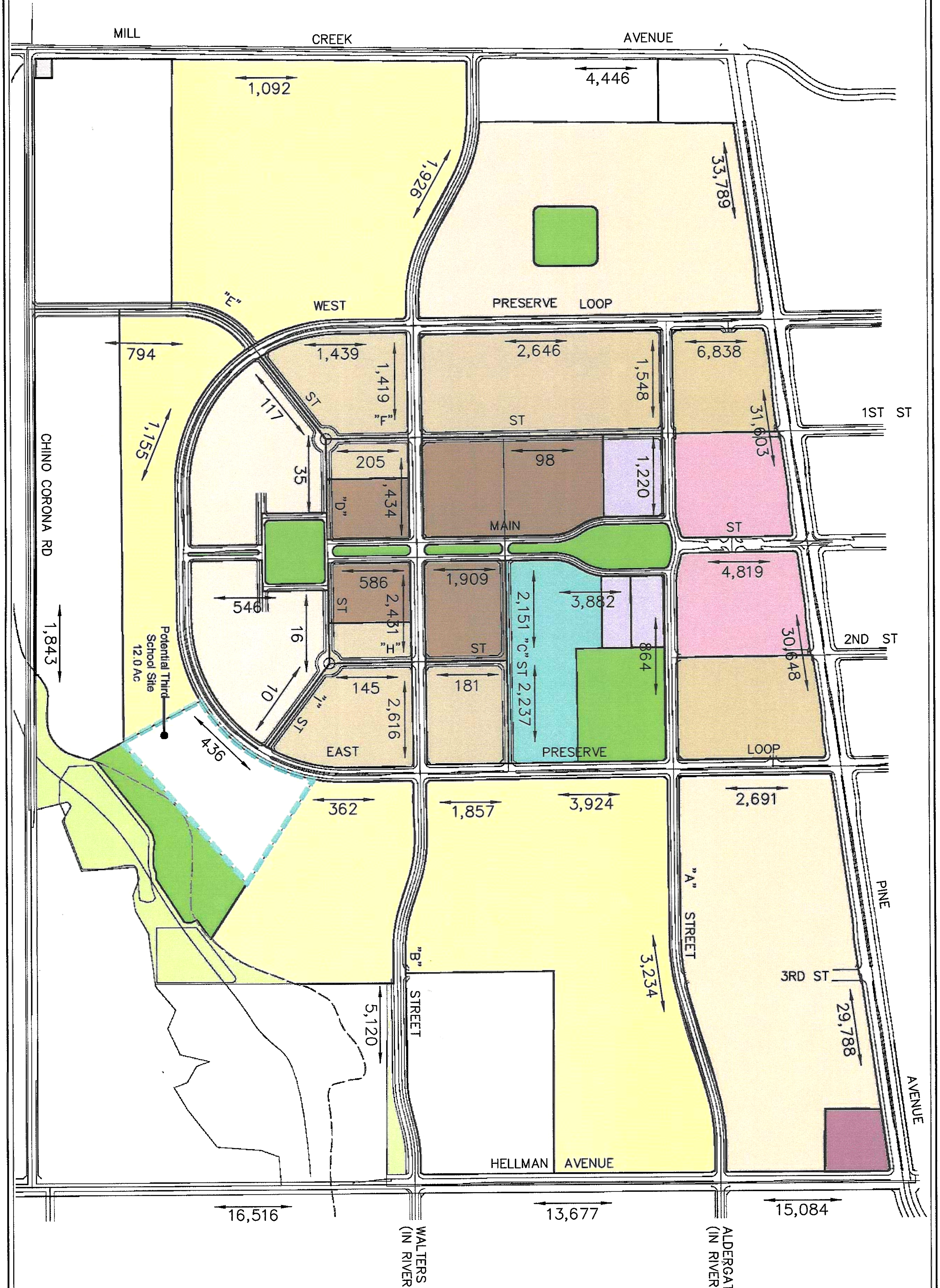

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FIGURE 6-3

YEAR 2030 DAILY TRAFFIC VOLUMES

SOUTH OF PINE AVENUE (TTM NO. 16420) INTERNAL EVALUATION, CHINO

7.0 TRAFFIC IMPACT ANALYSIS METHODOLOGY

The absolute impacts of the proposed South of Pine Avenue Development Project during the AM and PM peak hours, and on a daily basis were evaluated based on analysis of 19 internal key study intersections, all internal "backbone" street segments and several key roadway segments bordering the project site. The previously discussed capacity analysis procedures were utilized to investigate the future Year 2030 volume-to-capacity relationships and service level characteristics. The significance of the potential impacts of the proposed South of Pine Avenue Development Project was then evaluated using the following traffic impact criteria.

7.1 Level of Service Criteria

The City of Chino considers LOS "D" to be the minimum acceptable condition that should be maintained during the peak commute hours. Therefore, any intersection operating at LOS "E" or "F" is considered deficient/unsatisfactory.

The City of Chino targets LOS C for all roadway links except for those roadway links located at freeway interchanges where LOS D is considered acceptable.

7.2 Traffic Impact Analysis Scenarios

The following scenarios are those for which volume/capacity calculations have been performed at the key intersections and for key roadway segments for long-term (Year 2030) conditions:

1. Year 2030 Future Traffic Conditions plus the South of Pine Avenue Development Project;
2. Scenario (2) with Mitigation and/or plan refinements, if necessary.

8.0 YEAR 2030 PROJECT ANALYSIS

8.1 Peak Hour Intersection Capacity Analysis

The following section summarizes the peak hour intersection capacity analysis for the nineteen (19) internal key study intersections based on full buildout of the project in the long-term (Year 2030).

8.1.1 *Long-Term (Year 2030) Intersection Lane Geometrics and Intersection Controls*

Figure 8-1 graphically illustrates the Year 2030 required lane geometrics and intersection controls at the 19 key study intersections. The lane geometrics and intersection controls identified in *Figure 8-1* are based on our review of the proposed street geometries depicted in the project tract map, Year 2030 AM and PM peak hour volumes presented previously in *Figures 6-1* and *6*-2 and further adjustments made for arterial/arterial intersection locations based on discussions with City staff. The *Figure 8-1* geometries also account for the planned Transit Lane provisions (with a "T" designation) that will provide for essentially a clockwise circulating route involving southbound travel on East Preserve Loop, westbound travel on "B" Street, and northbound travel on West Preserve Loop. Where that Transit Lane intersects a side-street to the right, the Transit Lane is treated as a defacto right-turn lane for non-transit vehicles (largely because those vehicles must weave through the Transit Lane to initiate their right turn).

8.1.2 *Long-Term (Year 2030) Intersection Traffic Evaluation*

Table 8-1 summarizes the peak hour level of service results at the 19 key study intersections for the Year 2030. The first column (1) of *Table 8-1* identifies the expected intersection control and the second column (2) identifies forecast Year 2030 LOS traffic conditions for the combination of any background traffic plus the South of Pine Avenue Development Project. Review of *Table 8-1* indicates that all 19 key study intersections are forecast to operate at acceptable LOS A in the Year 2030 with the proposed South of Pine Avenue Development Project. In addition, all side streets/minor street approaches are forecast to operate at LOS D or better. ***Appendix B*** presents the long-term (Year 2030) HCM/LOS calculations for the 19 key study intersections for the AM and PM peak hours.

8.1.3 *Year 2030 Intersection Roadway Improvement Recommendations*

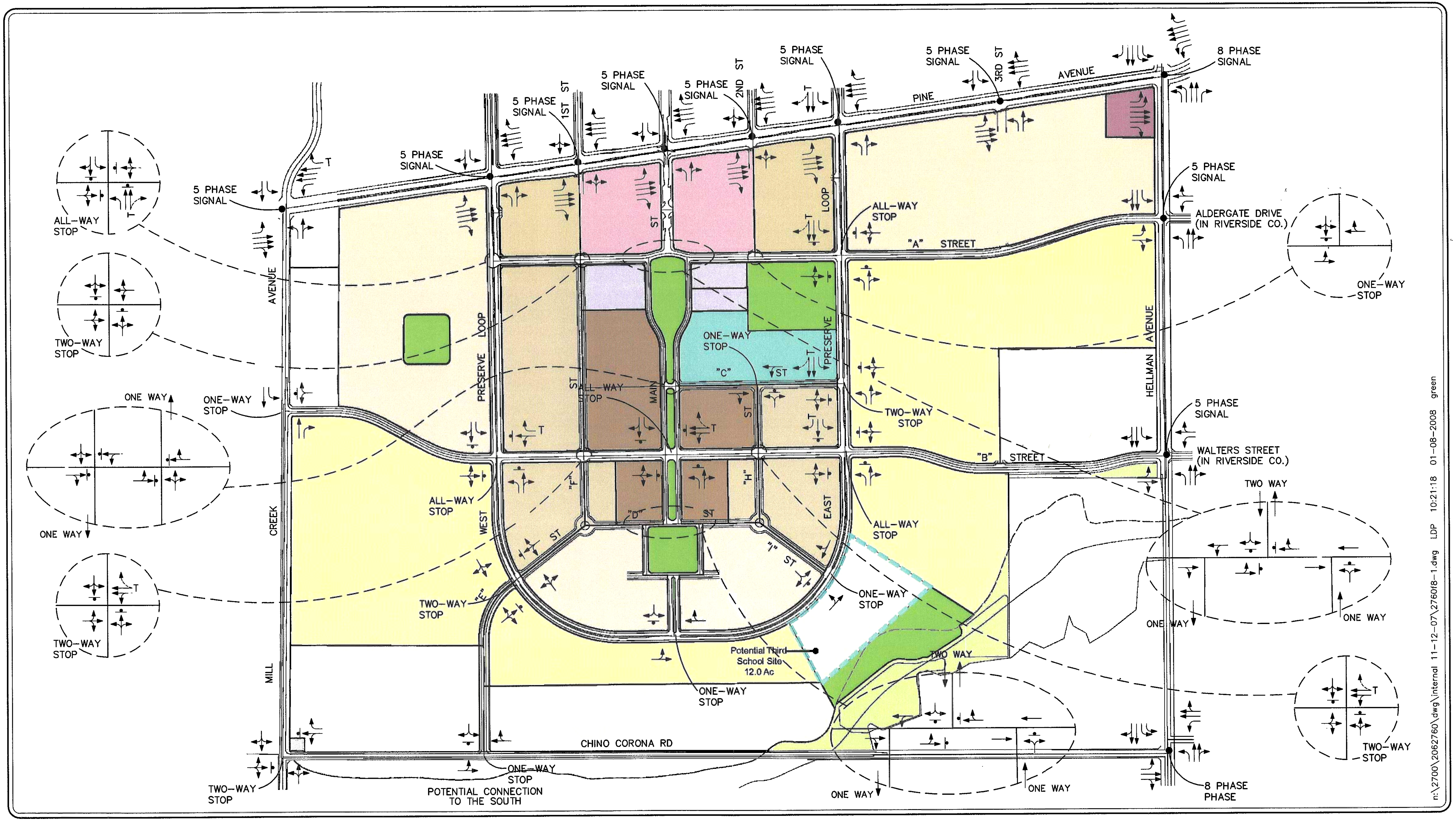
The acceptable LOS results, as identified in *Table 8-1,* are explicitly a function of the lane geometries/traffic controls depicted in *Figure 8-1.* Progressive implementation of these intersection configurations, are an integral part of achieving the acceptable service levels presented here.

8.2 Daily Roadway Segment Capacity Analysis

The following section summarizes the Year 2030 roadway segment level of service results for the roadway segments bordering the project site and the internal roadway segments within the South of Pine Avenue Development Project.

8.2.1 *Long-Term (Year 2030) Roadway Segment Lane Geometrics*

Figure 8-2 graphically illustrates the Year 2030 required roadway segment lane geometrics for the roadway segments bordering the project site and also the internal roadway segments within the South of Pine Avenue Development Project. The roadway segment lane geometrics identified in *Figure 8-2* are based on our review of the Year 2030 daily traffic volumes presented previously in *Figure 6-3* and review of the City of Chino General Plan Circulation Element.



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KEY

- ● = TRAFFIC SIGNAL
- ⊥ = STOP SIGN
- T = TRANSIT LANE FUNCTIONS AS A SEPARATE RIGHT-TURN LANE AT THE INTERSECTION UNLESS OTHERWISE NOTED
- ← = APPROACH LANE

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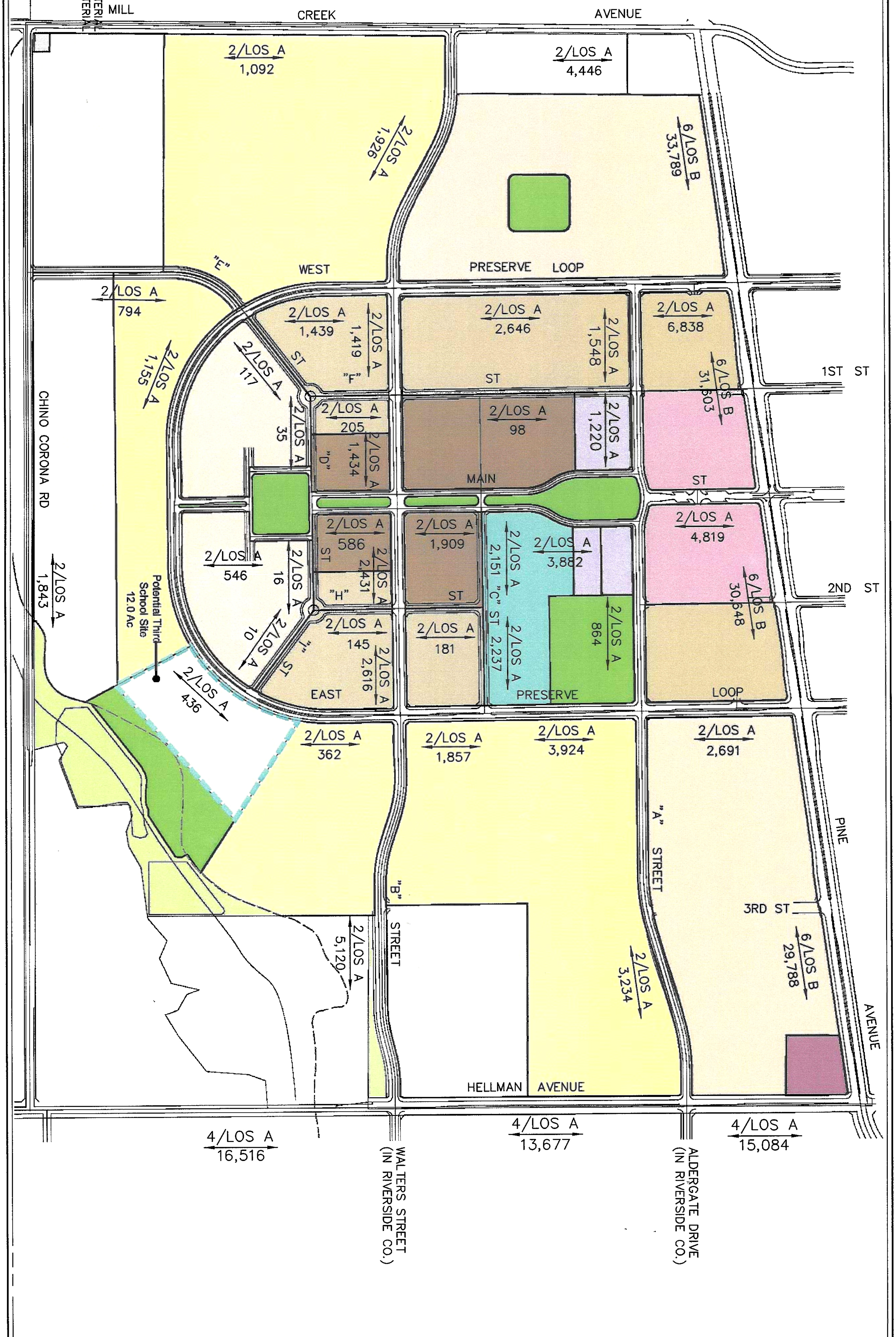
N NO SCALE

FIGURE 8-1

MINIMUM REQUIRED INTERSECTION LANE GEOMETRY AND TRAFFIC CONTROLS

SOUTH OF PINE AVENUE (TTM NO. 16420) INTERNAL EVALUATION, CHINO

NOTES:
PINE AVENUE = PRIMARY ARTERIAL
HELLMAN AVENUE = PRIMARY ARTERIAL
MILL CREEK AVENUE = COLLECTOR
CHINO CORONA ROAD = COLLECTOR
INTERNAL ROADS = COLLECTOR



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NO SCALE

KEY
X/LOS X
XX,XXX = # OF TRAVEL LANES (SUM OF BOTH DIRECTIONS)/DAILY LEVEL OF SERVICE
AVERAGE DAILY TRAFFIC VOLUME

FIGURE 8-2

MINIMUM REQUIRED ROADWAY LINK LANE GEOMETRY
AND YEAR 2030 DAILY LINK LEVEL OF SERVICE
SOUTH OF PINE AVENUE (TTM NO. 16420) INTERNAL EVALUATION, CHINO

TABLE 8-1
YEAR 2030 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Study Intersection	Time Period	(1) Intersection Control	(2) Year 2030 Plus Project Traffic Conditions	
			Delay	LOS
1. West Preserve Loop at	AM	All – Way	8.1 sec/veh	A
A Street	PM	Stop	9.3 sec/veh	A
2. F Street at	AM	Two – Way	0.8 sec/veh	A
A Street	PM	Stop	1.9 sec/veh	A
3a. Main Street at	AM	Unsignalized	0.0 sec/veh	A
A Street	PM		0.0 sec/veh	A
3b. Main Street at	AM	All – Way	7.9 sec/veh	A
A Street	PM	Stop	8.4 sec/veh	A
3c. Main Street at	AM	One – Way	6.0 sec/veh	A
A Street	PM	Stop	6.4 sec/veh	A
4. 2nd Street at	AM	One – Way	0.0 sec/veh	A
A Street	PM	Stop	0.0 sec/veh	A
5. East Preserve Loop at	AM	All – Way	8.6 sec/veh	A
A Street	PM	Stop	8.9 sec/veh	A
6. West Preserve Loop at	AM	All – Way	7.8 sec/veh	A
B Street	PM	Stop	8.2 sec/veh	A
7. F Street at	AM	Two – Way	0.2 sec/veh	A
B Street	PM	Stop	1.0 sec/veh	A
8. Main Street at	AM	All – Way	7.7 sec/veh	A
B Street	PM	Stop	8.2 sec/veh	A
9. H Street at	AM	Two – Way	0.2 sec/veh	A
B Street	PM	Stop	0.2 sec/veh	A
10. East Preserve Loop at	AM	All – Way	7.9 sec/veh	A
B Street	PM	Stop	8.5 sec/veh	A

TABLE 8-1 (CONTINUED)
YEAR 2030 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Study Intersection		Time Period	(1) Intersection Control	(2) Year 2030 Plus Project Traffic Conditions	
				Delay	LOS
11.	West Preserve Loop at	AM	Two – Way	2.7 sec/veh	A
	E Street	PM	Stop	4.0 sec/veh	A
12.	Main Street at	AM	One – Way	3.7 sec/veh	A
	South Preserve Loop	PM	Stop	5.3 sec/veh	A
13a.	Main Street at	AM	Two – Way	5.9 sec/veh	A
	C Street	PM	Stop	3.9 sec/veh	A
13b.	Main Street at	AM	Two– Way	6.2 sec/veh	A
	C Street	PM	Stop	6.3 sec/veh	A
14.	H Street at	AM	One – Way	0.1 sec/veh	A
	C Street	PM	Stop	0.0 sec/veh	A
15.	East Preserve Loop at	AM	Two – Way	4.5 sec/veh	A
	C Street	PM	Stop	4.2 sec/veh	A
16.	F Street at	AM	Roundabout	3.0 sec/veh	A
	D Street	PM		3.0 sec/veh	A
17a.	Main Street at	AM	Unsignalized	0.0 sec/veh	A
	D Street	PM		0.0 sec/veh	A
17b.	Main Street at	AM	All – Way	6.6 sec/veh	A
	D Street	PM	Stop	6.6 sec/veh	A
17c.	Main Street at	AM	One – Way	9.1 sec/veh	A
	D Street	PM	Stop	9.1 sec/veh	A
18.	H Street at	AM	Roundabout	3.0 sec/veh	A
	D Street	PM		0.0 sec/veh	A
19.	East Preserve Loop at	AM	One – Way	0.0 sec/veh	A
	I Street	PM	Stop	0.0 sec/veh	A

8.2.2 *Long-Term (Year 2030) Roadway Segment Traffic Evaluation*

Figure 8-2 also summarizes the daily level of service results for the roadway segments bordering the project site and the internal roadway segments within the South of Pine Avenue Development Project for the Year 2030. As shown in *Figure 8-2*, all roadway segments are forecast to operate at acceptable LOS A on a daily basis except for the roadway segments along Pine Avenue which are forecast to operate at acceptable LOS B in the Year 2030.

8.2.3 *Year 2030 Roadway Segment Improvement Recommendations*

The acceptable service level results, as identified in Section 8.2.2, are explicitly a function of the roadway segment lane geometrics depicted in *Figure 8-2*. Implementation of these roadway segment configurations, are an integral part of achieving the acceptable service levels presented here.

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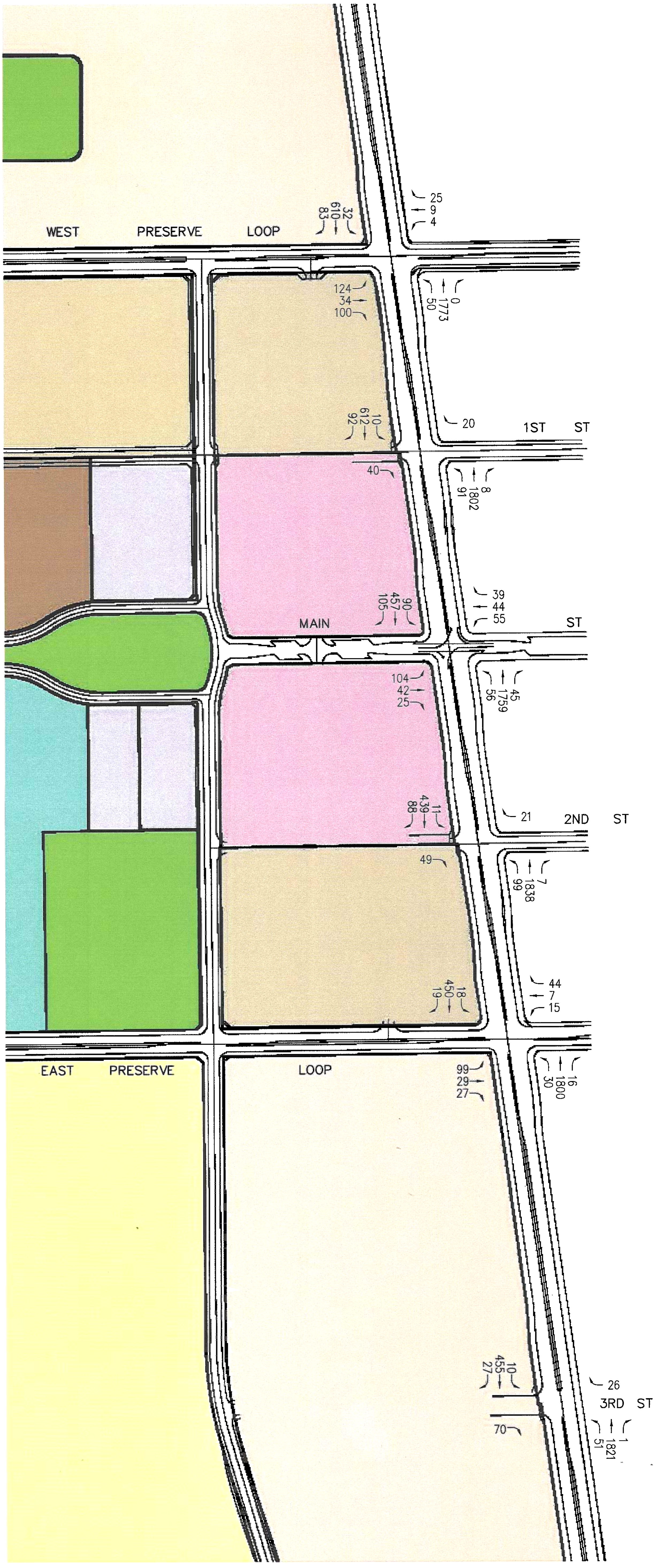
FIGURE 9-1

YEAR 2030 AM PEAK HOUR TRAFFIC VOLUMES WITH PROJECT TRAFFIC - OPTION NO. 1 AND OPTION NO. 2 (LEFT TURN OUT RESTRICTIONS)

SOUTH OF PINE AVENUE (TTM NO. 16420) INTERNAL EVALUATION, CHINO



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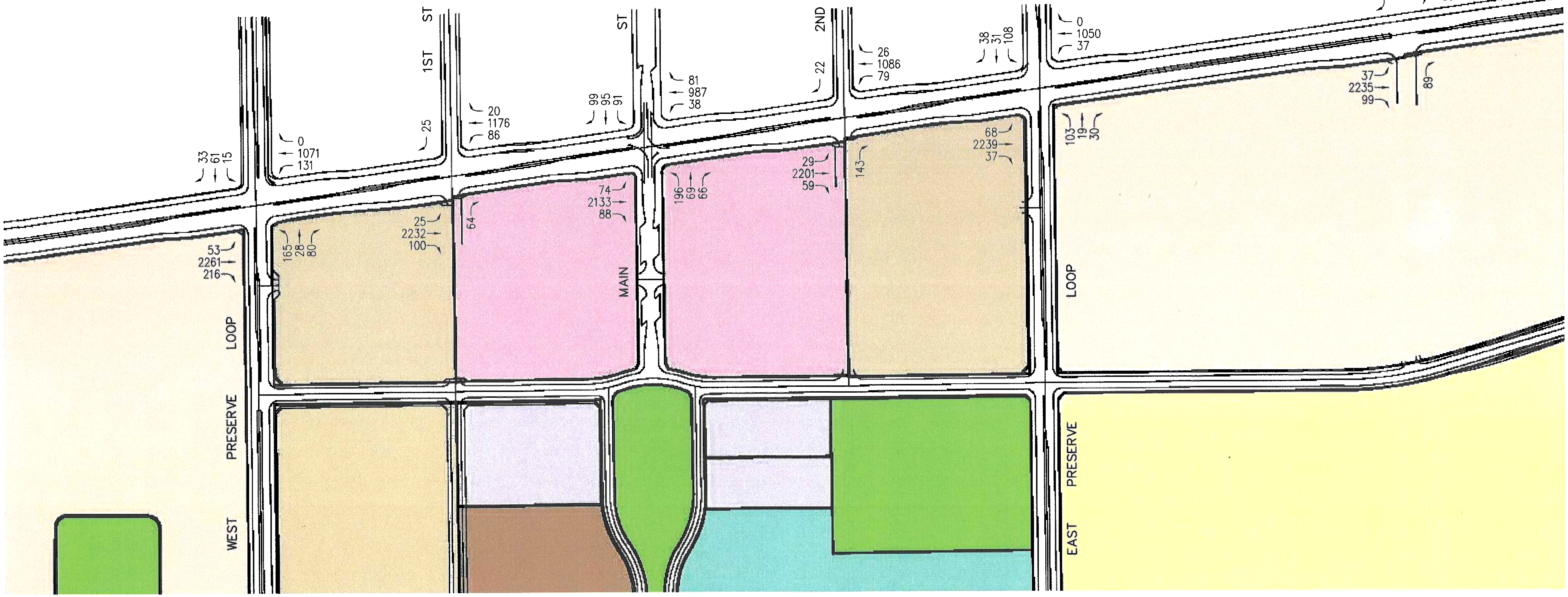

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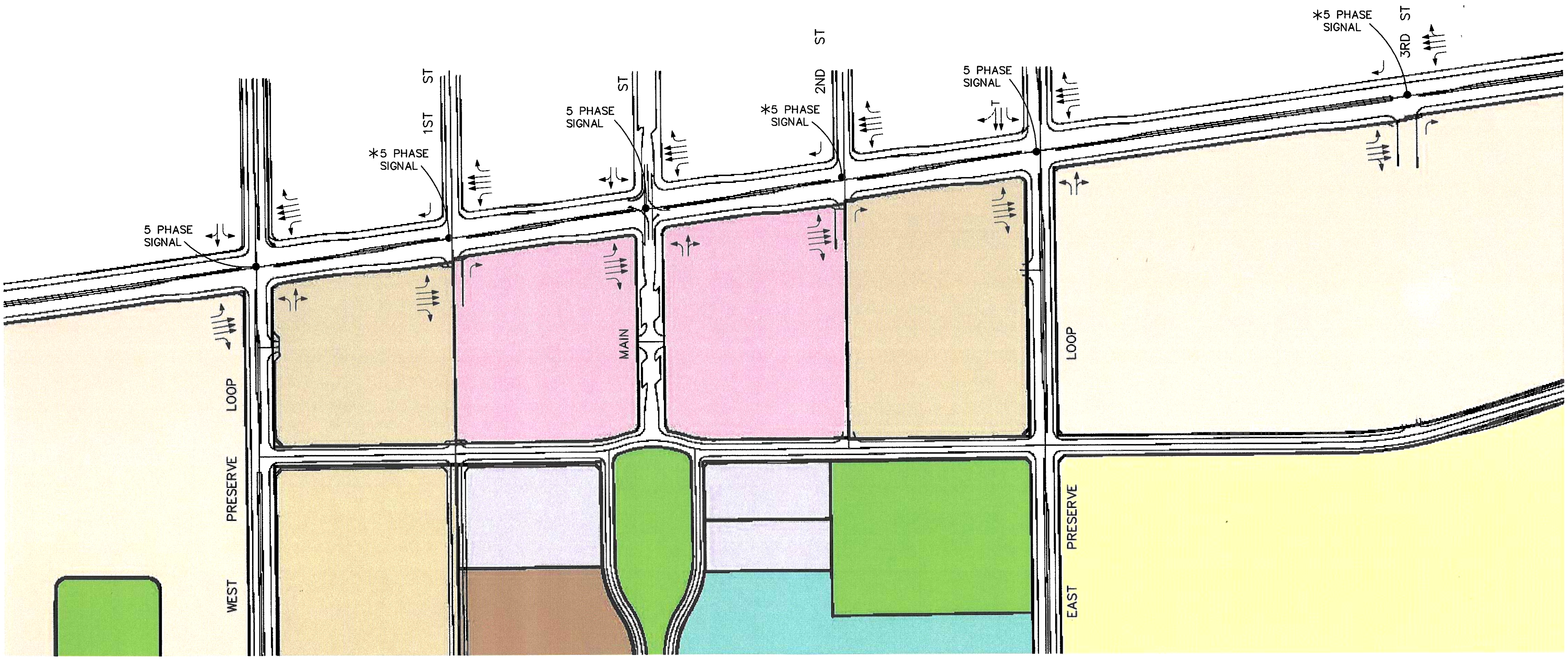
FIGURE 9-2

YEAR 2030 PM PEAK HOUR TRAFFIC VOLUMES WITH PROJECT TRAFFIC – OPTION NO. 1 AND OPTION NO. 2 (LEFT TURN OUT RESTRICTIONS)
SOUTH OF PINE AVENUE (TTM NO. 16420) INTERNAL EVALUATION, CHINO



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KEY

● = TRAFFIC SIGNAL

T = TRANSIT LANE FUNCTIONS AS A SEPARATE RIGHT-TURN LANE AT THE INTERSECTION UNLESS OTHERWISE NOTED

←— = APPROACH LANE

* = OPTION NO. 2 DELETES SIGNAL AND ADDS SIDE STREET STOP

FIGURE 9-3

MINIMUM REQUIRED INTERSECTION LANE GEOMETRY
AND TRAFFIC CONTROLS – OPTION NO. 1 (LEFT TURN OUT RESTRICTIONS)
SOUTH OF PINE AVENUE (TTM NO. 16420) INTERNAL EVALUATION, CHINO

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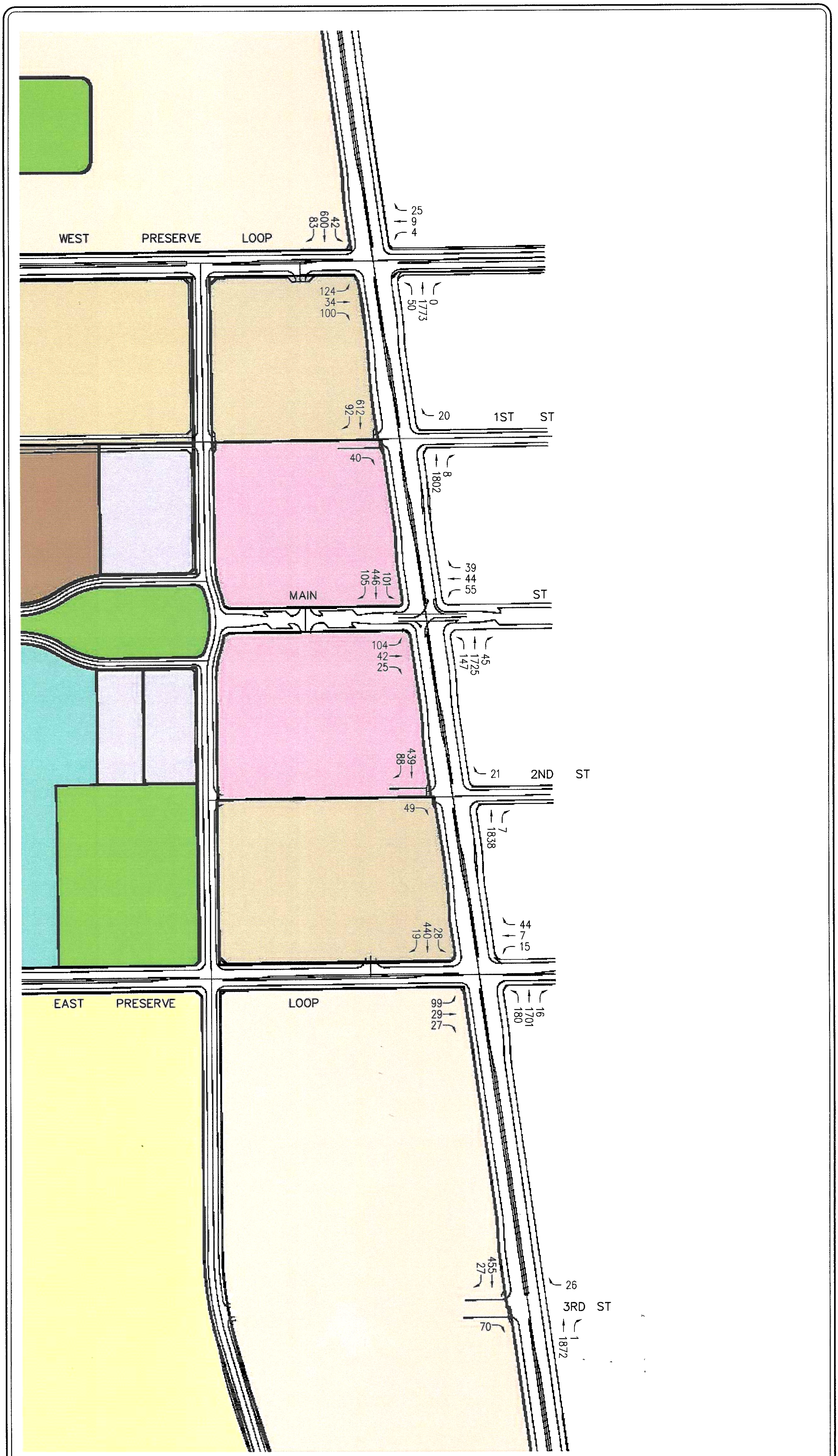

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FIGURE 9-4

YEAR 2030 AM PEAK HOUR TRAFFIC VOLUMES WITH PROJECT TRAFFIC – OPTION NO. 3 (RIGHT TURN IN/RIGHT TURN OUT ONLY RESTRICTIONS)

SOUTH OF PINE AVENUE (TTM NO. 16420) INTERNAL EVALUATION, CHINO

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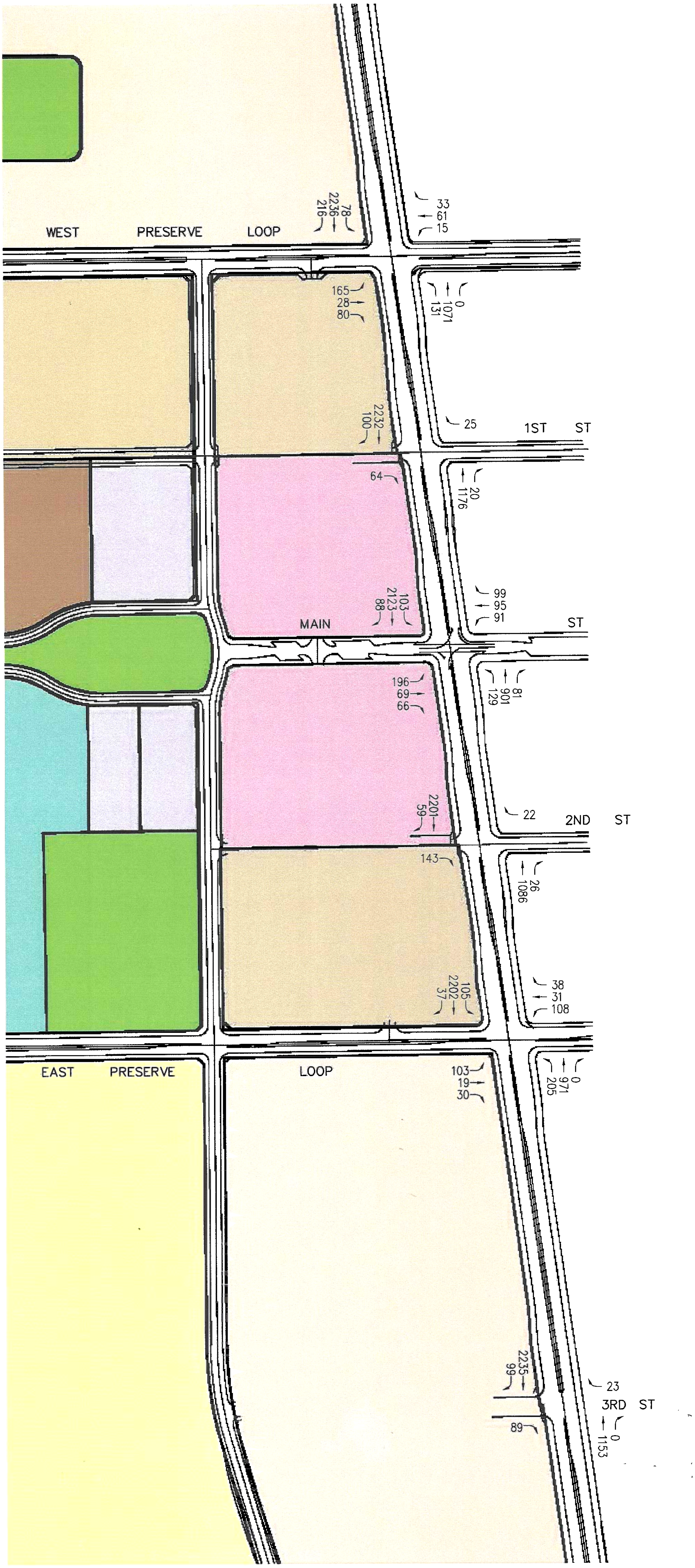

FIGURE 9-5

YEAR 2030 PM PEAK HOUR TRAFFIC VOLUMES WITH PROJECT TRAFFIC – OPTION NO. 3 (RIGHT TURN IN/RIGHT TURN OUT ONLY RESTRICTIONS)

SOUTH OF PINE AVENUE (TTM NO. 16420) INTERNAL EVALUATION, CHINO

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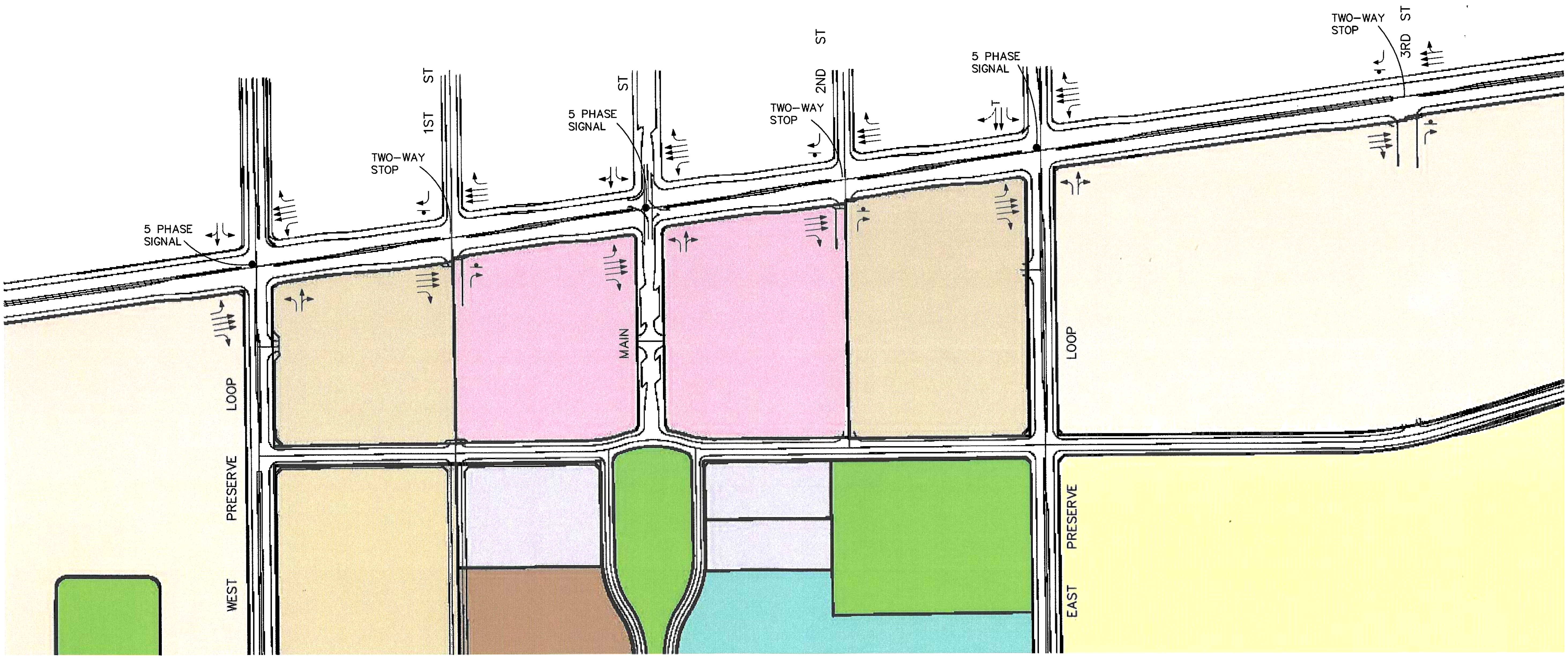

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NO SCALE

KEY

● = TRAFFIC SIGNAL
┬ = STOP SIGN
T = TRANSIT LANE FUNCTIONS AS A SEPARATE RIGHT-TURN LANE AT THE INTERSECTION UNLESS OTHERWISE NOTED
← - = APPROACH LANE

FIGURE 9-6

MINIMUM REQUIRED INTERSECTION LANE GEOMETRY AND TRAFFIC CONTROLS – OPTION NO. 3 (RIGHT TURN IN/RIGHT TURN OUT ONLY RESTRICTIONS)
SOUTH OF PINE AVENUE (TTM NO. 16420) INTERNAL EVALUATION, CHINO

9.0 ALTERNATIVE ACCESS EVALUATION FOR PINE AVENUE

As requested by the City of Chino, an Alternative Access Evaluation for Pine Avenue was prepared and included within the "External" study report for long-term (Year 2030) traffic conditions. The purpose of that investigation was to focus on access opportunities at the intersections of 1st Street/Pine Avenue, 2nd Street/Pine Avenue and 3rd Street/Pine Avenue from the perspective of potential signal progression characteristics along Pine Avenue. This section adds traffic volume forecasting reflected in those analyses, related service level calculations, and signal warrant analysis findings. The following four access options were analyzed for the Year 2030.

- Applicant-Preferred Project Option: Assumes full access signalized intersections at 1st Street/Pine Avenue, 2nd Street/Pine Avenue and 3rd Street/Pine Avenue. Year 2030 AM and PM peak hour volume forecasts were presented previously in *Figures 6-1* and *6-2,* respectively.

- Option No. 1: Assumes signalized intersections at 1st Street/Pine Avenue, 2nd Street/Pine Avenue and 3rd Street/Pine Avenue with access restricted to left-turns in/right-turns in and right-turns out only. ***Figures 9-1*** and ***9-2*** present the Year 2030 AM and PM peak hour volume forecasts associated with this alternative access option. There are no north-south cross (left or through) movements. ***Figure 9-3*** graphically illustrates the Year 2030 required lane geometrics and intersection controls along Pine Avenue between West Preserve Loop and 3rd Street for Option No. 1.

- Option No. 2: Assumes two-way stop (side-street stop) controlled intersections at 1st Street/Pine Avenue, 2nd Street/Pine Avenue and 3rd Street/Pine Avenue with access restricted to left-turns in/right-turns in and right-turns out only. The Year 2030 AM and PM peak hour volume forecasts for this access scenario are identical to those presented in *Figures 9-1* and *9-2* for Option No. 1. There are no north-south cross (left or through) movements. The required lane geometrics and intersection controls for this access scenario are identical to those presented in *Figure 9-3* except that two-way stops (side-street stops) are assumed at 1st Street/Pine Avenue, 2nd Street/Pine Avenue and 3rd Street/Pine Avenue.

- Option No. 3: Assumes two-way stop (side-street stop) controlled intersections at 1st Street/Pine Avenue, 2nd Street/Pine Avenue and 3rd Street/Pine Avenue with access restricted to right-turns in and right-turns out only. ***Figures 9-4*** and ***9-5*** present the Year 2030 AM and PM peak hour volume forecasts associated with this alternative access option. There are no north-south cross (left or through) movements. ***Figure 9-6*** graphically illustrates the Year 2030 required lane geometrics and intersection controls along Pine Avenue between West Preserve Loop and 3rd Street for Option No. 3.

Please note that the Year 2030 traffic volumes and lane geometrics presented in the aforementioned figures are consistent with those contained within The *"South of Pine Avenue" (Tentative Tract Map No. 16420) The Preserve Phase 3 and 4 Areas External Evaluation*, prepared by LLG, dated December 26, 2007.

Table 9-1 presents the delay and level of service calculation results of the Year 2030 Alternative Access Evaluation for the Applicant-Preferred Project Option, Option No. 1, Option No. 2 and Option No. 3. The first column (1) presents the results for the Applicant-Preferred Project Option, the second column (2) presents the results for Option No. 1, the third column (3) presents the results for Option No. 2 and the fourth column (4) presents the results for Option No. 3. Note that these results are explicitly tied to the traffic control provisions described above for each option.

Review of *Table 9-1* indicates that all six key study intersections along the Pine Avenue corridor between West Preserve Loop and 3rd Street are forecast to operate at an acceptable level of service under all four-access options as defined above.

Appendix C presents the long-term (Year 2030) HCM/LOS calculations for the alternative access evaluation for the AM peak hour and PM peak hour.

9.1 Traffic Signal Warrant Evaluation

To investigate whether or not the installation of traffic signals at the intersections of West Preserve Loop/Pine Avenue, 1st Street/Pine Avenue, Main Street/Pine Avenue, 2nd Street/Pine Avenue, East Preserve Loop/Pine Avenue and 3rd Street/Pine Avenue under the four access options are potentially warranted, peak hour traffic signal warrant worksheets were prepared using the Year 2030 recommended lane geometrics and the Year 2030 peak hour traffic volumes. Review of the traffic signal warrants contained in *Appendix C* for the Applicant-Preferred Project Option and Option No. 1 indicates that all intersections warrant the installation of a traffic signal except for the intersections of 1st Street/Pine Avenue and 3rd Street/Pine Avenue. It should be noted that the final development plans and block-level internal circulation provisions adjoining the Pine Avenue intersections with 1st Street and/or 2nd Street may affect these warrant findings.

Under Option No. 2 and Option No. 3 the installation of a traffic signal is still warranted at the intersections of West Preserve Loop/Pine Avenue, Main Street/Pine Avenue and East Preserve Loop/Pine Avenue. It should be noted that the intersections of 1st Street/Pine Avenue, 2nd Street/Pine Avenue and 3rd Street/Pine Avenue are identified as two-way stop (side-street stop) controlled intersections under Option No. 2 and Option No. 3.

TABLE 9-1
YEAR 2030 ALTERNATIVE ACCESS EVALUATION

Key Intersections	Time Period	(1) Applicant-Preferred Project Option[17]		(2) Option No. 1[18]		(3) Option No. 2[19]		(4) Option No. 3[20]	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
West Preserve Loop at Pine Avenue	AM	19.9 s/v	B	17.9 s/v	B	17.9 s/v	B	18.0 s/v	B
	PM	24.4 s/v	C	22.1 s/v	C	22.1 s/v	C	22.2 s/v	C
1st Street at Pine Avenue	AM	18.6 s/v	B[21]	16.4 s/v	B[21]	0.6 s/v	A	0.3 s/v	A
	PM	20.9 s/v	C	18.4 s/v	B	1.4 s/v	A	0.4 s/v	A
Main Street at Pine Avenue	AM	21.6 s/v	C	20.1 s/v	C	20.1 s/v	C	22.0 s/v	C
	PM	21.1 s/v	C	19.8 s/v	B	19.8 s/v	B	23.5 s/v	C
2nd Street at Pine Avenue	AM	18.9 s/v	B	16.3 s/v	B	0.7 s/v	A	0.3 s/v	A
	PM	21.6 s/v	C	18.6 s/v	B	1.8 s/v	A	1.0 s/v	A
East Preserve Loop at Pine Ave	AM	18.7 s/v	B	16.7 s/v	B	16.7 s/v	B	18.8 s/v	B
	PM	20.8 s/v	C	18.6 s/v	B	18.6 s/v	B	26.3 s/v	C
3rd Street at Pine Avenue	AM	16.6 s/v	B[21]	14.5 s/v	B[21]	0.7 s/v	A	0.4 s/v	A
	PM	20.2 s/v	C	17.8 s/v	B	1.7 s/v	A	0.6 s/v	A

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[17] Assumes full access signalized intersections at 1st Street/Pine Avenue, 2nd Street/Pine Avenue and 3rd Street/Pine Avenue.

[18] Assumes signalized intersections at 1st Street/Pine Avenue, 2nd Street/Pine Avenue and 3rd Street/Pine Avenue with access restricted to left- turns in/right-turns in and right-turns out only.

[19] Assumes two-way stop (side-street stop) controlled intersections at 1st Street/Pine Avenue, 2nd Street/Pine Avenue and 3rd Street/Pine Avenue with access restricted to left-turns in/right-turns in and right-turns out only.

[20] Assumes two-way stop (side-street stop) controlled intersections at 1st Street/Pine Avenue, 2nd Street/Pine Avenue and 3rd Street/Pine Avenue with access restricted to right-turns in and right-turns out only.

[21] Please note that the Year 2030 side-street traffic volumes at this key study intersection do not warrant the installation of a traffic signal as shown in the traffic signal warrant worksheets contained in *Appendix D*.

10.0 MAIN STREET STUDY AREA EVALUATION

10.1 Roadway Description

Figure 10-1 presents an illustrative concept (with possible landscaping and adjoining building footprints shown) of the Main Street Corridor from "A" Street south to Preserve Loop. Accompanying tract map details (these are presented graphically in Section 12.0 of this report) reveal a basic Main Street section to include two 28'-wide roadbeds, in essentially a one-way couplet configuration, separated by a landscaped element known as the Preserve Commons. This Commons measures 260-feet in width immediately south of "A" Street, transitioning to a 60-foot width for the remainder of the alignment southerly to "D" Street. The western-most roadbed will be one-way in the southbound direction, and the eastern-most roadbed will be one-way northbound.

This 28-foot roadbed section (in each direction) includes a single lane in each direction plus 8'-wide curb parking lane along only the outer edge (to the driver's right). Thus in the presence of parked vehicles, a 20-foot clear width is maintained for passage by emergency vehicles.

South of "D" Street, the Main Street couplet separates further to a distance of over 300' between roadbeds as they adjoin the Neighborhood Park (Lot 55). Each roadbed remains 28' as described in the preceding paragraphs.

South of the park, Main Street returns to a more typical divided alignment with a 20' roadbed in each direction separated by a 26' median. Parking prohibitions are expected along this segment, and the tract map details suggest that the median will transition to a southbound left turn pocket on its approach to Preserve Loop. While that turn pocket will add a convenience at the intersection, it is noted that the pocket is not explicitly called for in *Figure 8-1*.

10.2 Design Speed Considerations

The entire alignment is a tangent section (no curvature) except along that portion where the Commons width is transitioned. An intersecting segment of "A" Street, along the north edge of the Commons, also includes a radiused element as illustrated in *Figure 10-1*. The later has a centerline radius of 319', and those along Main Street itself measure 300'. These radii are consistent with the *Caltrans Highway Design Manual* (September 1, 2006) "Standards for Curve Radius" (Table 203.2) which indicates a 300' radius as corresponding to a design speed of 30 mph. Further, that manual identifies 300' as being consistent with a "comfort curve" (Figure 202.2: "Maximum Comfortable Speed on Horizontal Curves") speed of 25 mph based on a common superelevation rate for a normal roadway crown of negative 2%. On that basis, it can be concluded that the Main Street (and adjoining "A" Street) centerline alignments are consistent with design speed criteria associated with their expected 25 mph posting.

10.3 Lane Geometries, Traffic Controls and Levels of Service

For convenience purposes, the lane geometries and traffic controls from *Figure 8-1* have been reiterated within *Figure 10-1*. All of the traffic controls along this roadway have been developed in conjunction with City staff, and were forecast in *Table 8-1* to provide an acceptable level of service based on the indicated geometries and stop controls shown in the *Figure 10-1*. The lane configurations generally call for a single lane approach in both the northbound and southbound

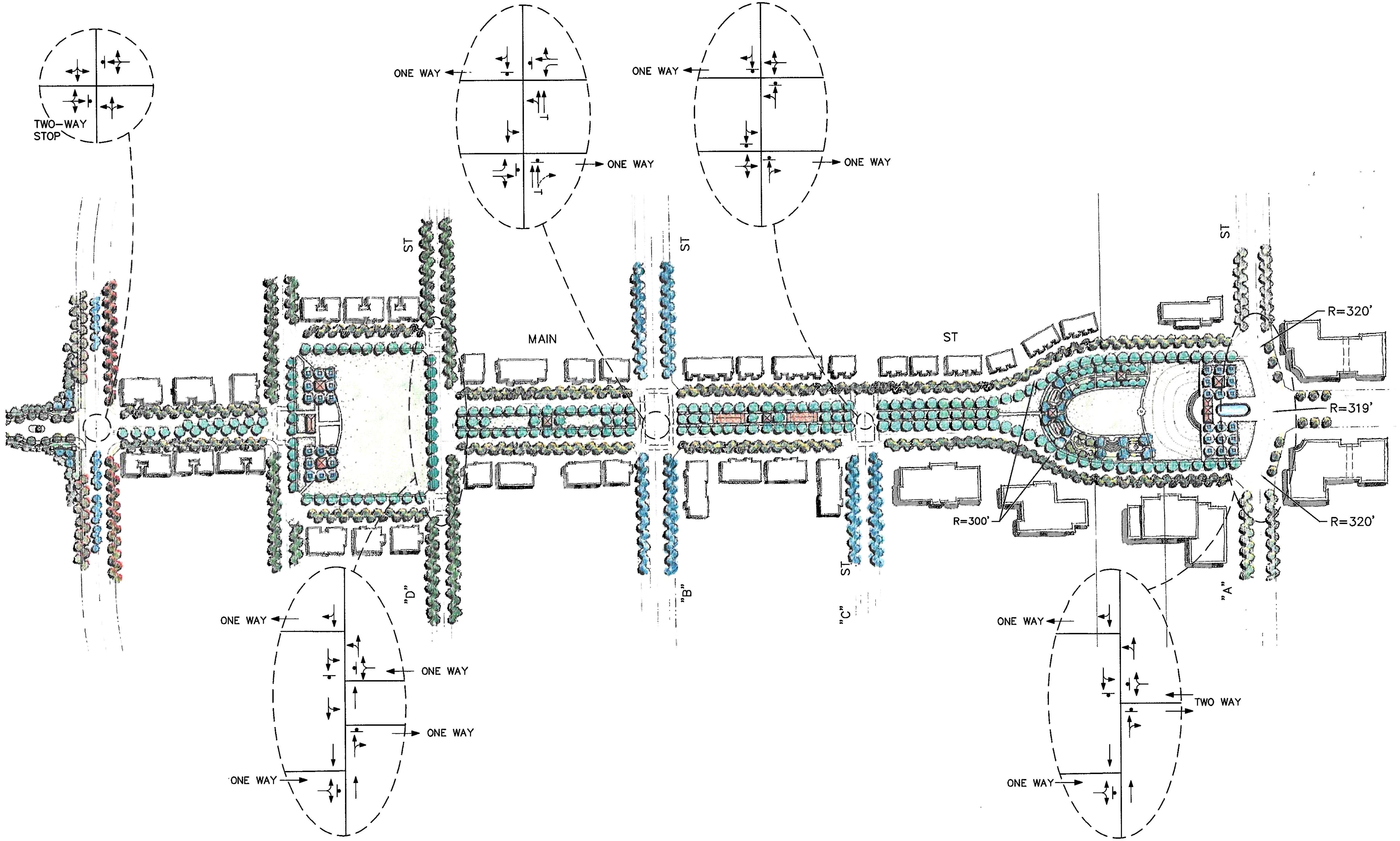

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FIGURE 10-1

MAIN STREET CORRIDOR
SOUTH OF PINE AVENUE (TTM NO. 16420) INTERNAL EVALUATION, CHINO

direction between and including the "A" Street and Preserve Loop intersections. An exception is at "B" Street, where both a northbound and southbound left turn pocket is called for. The provision of both of these left turn pockets is consistent with the 28' (in each direction) roadbeds of Main Street if on-street parking is prohibited within the immediate vicinity of the intersection.

Looking to *Figure 6-3*, forecast Main Street link volumes are consistent with the volumes that would be expected along a local collector. Moreover, those south of "B" Street are consistent with local street volumes.

10.4 Cross-Sectional Considerations

The 28-foot roadbed width, composed on an 8'-wide parking lane and defacto 20'-wide single travel lane, could result in greater than desired speeds, be travelled by some motorists as two inferred travel lanes, or in the absence of traffic pressures/signage/markings to the contrary, result in parking at the other (inside) curb. To discourage these actions, it is recommended that a striping and signing plan to reinforce the intended single lane of travel, together with parking at only one curb, be developed in conjunction with final roadway construction plans. In that case, curb parking areas could have "T" markings to delineate individual spaces.

10.5 Main Street in the Town Center Area

Looking to the very north end of Main at Pine, the Town Center (core) area segment of Main Street is expected to feature angled on-street parking consistent with the intended character of that area. Such parking should be restricted on Main in both the northbound and southbound directions, immediately south of Pine Avenue, to integrate a northbound left-turn pocket. This pocket length plus transition distance varies based on the different access types at 1st Street, 2nd Street, and 3rd Street. These values are reported in *Figures 13-1, 13-2, 13-3 and 13-4.*

On Main Street immediately south of Pine Avenue, the tract map calls for a 40' street width (outside of the angled parking segment). This width is consistent with the provision of a northbound left turn lane, a combined northbound through-right turn lane, and a southbound receiving lane.

11.0 TRANSIT LANE AND BIKE LANES

11.1 Transit Lane Provisions

A dedicated transit lane will be provided within the project site along a continuous series of street segments, generally operating in a clockwise direction. ***Figure 11-1*** presents the transit lane path in conjunction with other lane and trail details within the site. The figure also shows preliminary transit stop locations.

As shown in *Figure 11-1*, the transit lane will extend into the site from and along southbound East Preserve Loop, making a right turn and continuing westbound on "B" Street, followed by a right turn to northbound West Preserve Loop. At Pine Avenue, transit vehicles will turn westbound.

Within the site, the transit lane is expected to be a dedicated lane separated from adjoining traffic by striping and identified by pavement markings and signage. Tract map roadway cross-sectional details (see Section 12 of this report) indicate a divided roadway along East and West Preserve Loop, with 26'-wide roadbed in the direction of travel for transit vehicles. That section includes a 12' transit width, with remaining 14' lane for other (mixed flow) traffic. Much like on-street bike lanes, transit lane striping is expected to "skip out" as it approaches side streets intersecting from the right, providing a defacto right turn lane for other vehicles in the immediate vicinity of those intersections. The service level calculations of *Table 8-1* reflect this characteristic at affected intersections.

Transit stops identified in *Figure 11-1* are generally located between Pine and "A" Street on both East and West Preserve Loop, and on "B" Street generally adjoining the "H" and "F" Street intersections. Transit vehicles will stop in their lane to service these stops, and bus turnouts are not needed due to the exclusive nature of the transit lane. Review of the transit stop locations suggests they are reasonably placed as to general location, although it recommended that the finalized locations have a "far side" placement with respect to intersections and any driveways. Such a placement reduces conflicts between transit movements and right turning vehicles, and will preserve side street sight distance that could otherwise be interrupted by a standing transit vehicle.

For the West Preserve Loop stop, it is recommended that the stop be closer to the "A" Street intersection at the northeast corner of the West Preserve Loop/ "A" Street intersection. This adjustment will allow the transit vehicle to make an easy weave from the transit stop to the northbound left-turn lane at the West Preserve Loop/Pine Avenue intersection, placing the stop roughly 400' from the intersection. It is also noted that the transit lane could be terminated north of that stop since transit vehicles will be maneuvering to a left turn lane intended to serve all vehicle types. Further, an exclusive transit left turn lane is considered unwarranted, since transit vehicles will operate in mixed flow lanes along westbound Pine Avenue.

11.2 Bike Lane Provisions

Figure 11-1 also identified bike lane provisions within the site, which consist of a mix of Class I (off-street paths) and Class II (on-street marked lanes). Since some these lanes are affected somewhat by the transit lane provisions, their discussion is undertaken in this section. Further,

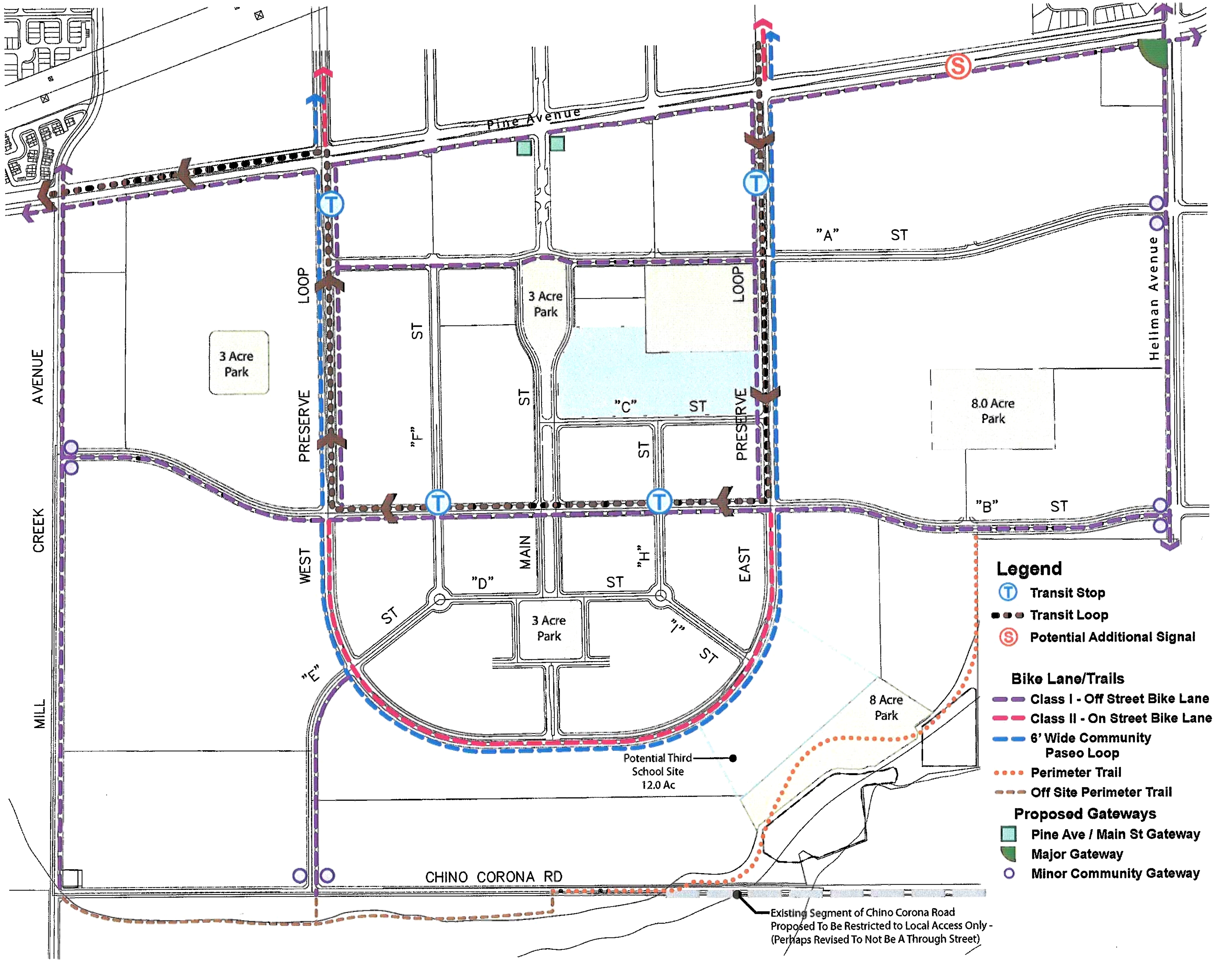
Figure 11-2 provides a finer-grained illustration of bike lane/path routing, and ***Figure 11-3*** provides cross-sectional details that illustrate bike lane and path specifics.

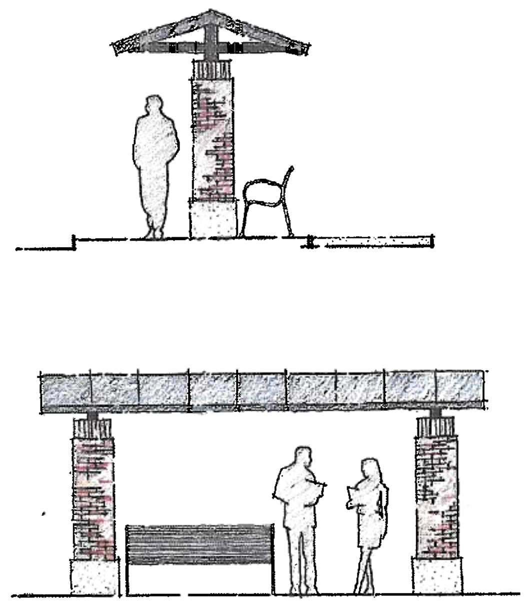
Figures 11-2 and *11-3* (Cross-Section 6) indentify Class II (on-street) bike lanes (5' in width) in both directions on Preserve Loop segments south of "B" Street. These lanes occur in areas not influenced by transit lane provisions, and they are among the only street segments of the project with bike lanes in the vehicular roadbed. These segments also correspond to relatively light traffic volumes as previously identified in *Figure 6-3*.

Figure 11-2 shows that north of "B" Street, the on-street (Class II) lanes continue in the direction opposite that of transit operations that is northbound on East Preserve Loop, and southbound on West Preserve Loop. But in the direction of transit operations, these lanes are moved off the Loop roads. *Figure 11-3* (Cross-Section 5) illustrates this configuration, where bicycle movements in the direction of transit operations would be accommodated by a 10'-wide multi-use trail, equivalent to a Class I path.

Other Class I paths are shown continuously along "B" Street from Mill Creek Avenue to Hellman Avenue, and within the core on "A" Street between East and West Preserve Loop. Potential bike storage areas are shown along that path, with added storage areas adjoining the proposed commercial areas. An additional Class I path is shown along "E" Street.

Review of the network of paths indicated in *Figure 11-2* indicates that most of the internal circulation spine roads of the site have a bike lane or path component, and that the site would be well served in that aspect.





Sketches: Transit Stop Conceptual Sketches

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FIGURE 11-1

TRANSIT AND BIKE LANE CIRCULATION PLAN
SOUTH OF PINE AVENUE (TTM NO. 16420) INTERNAL EVALUATION, CHINO

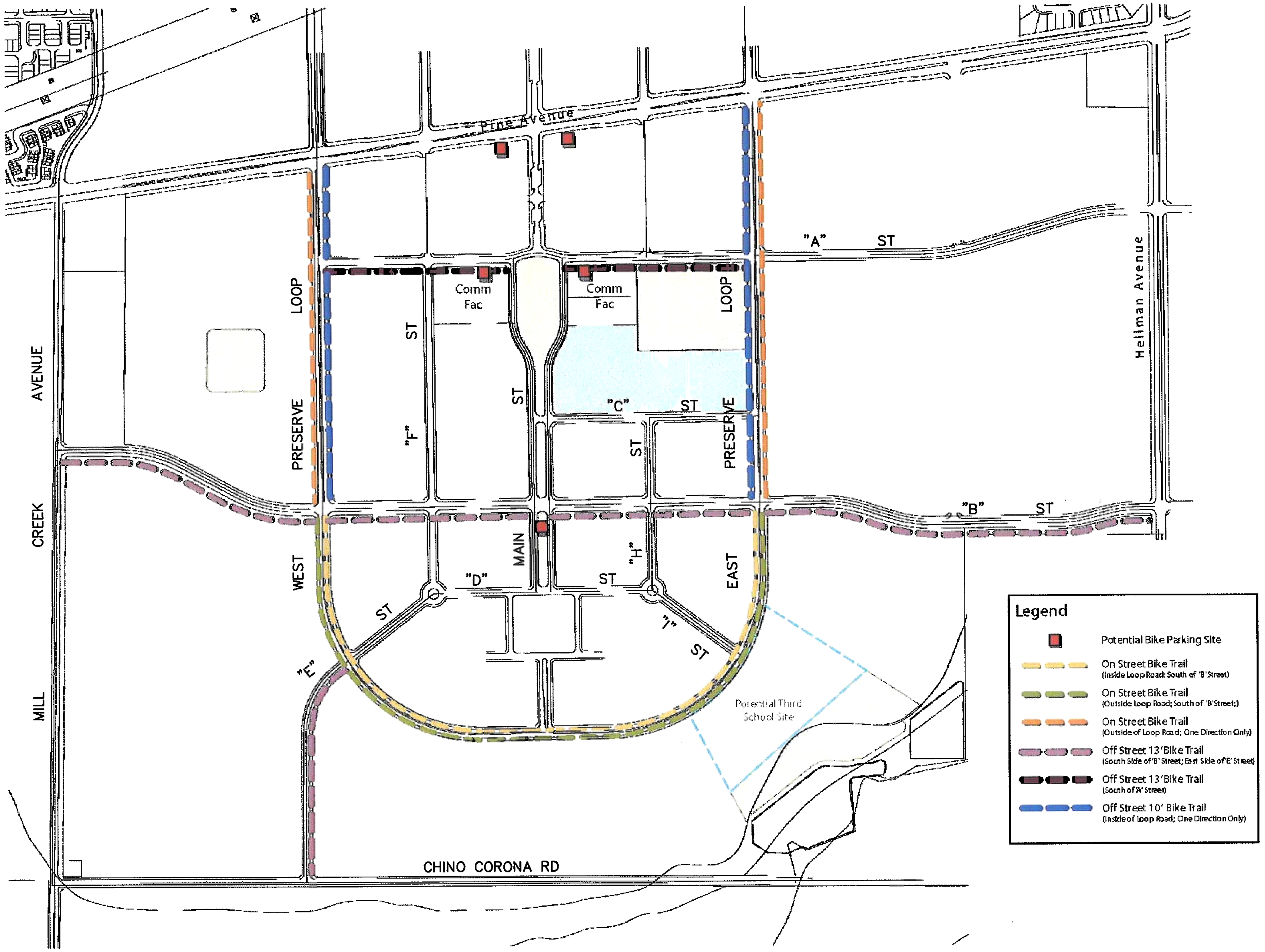

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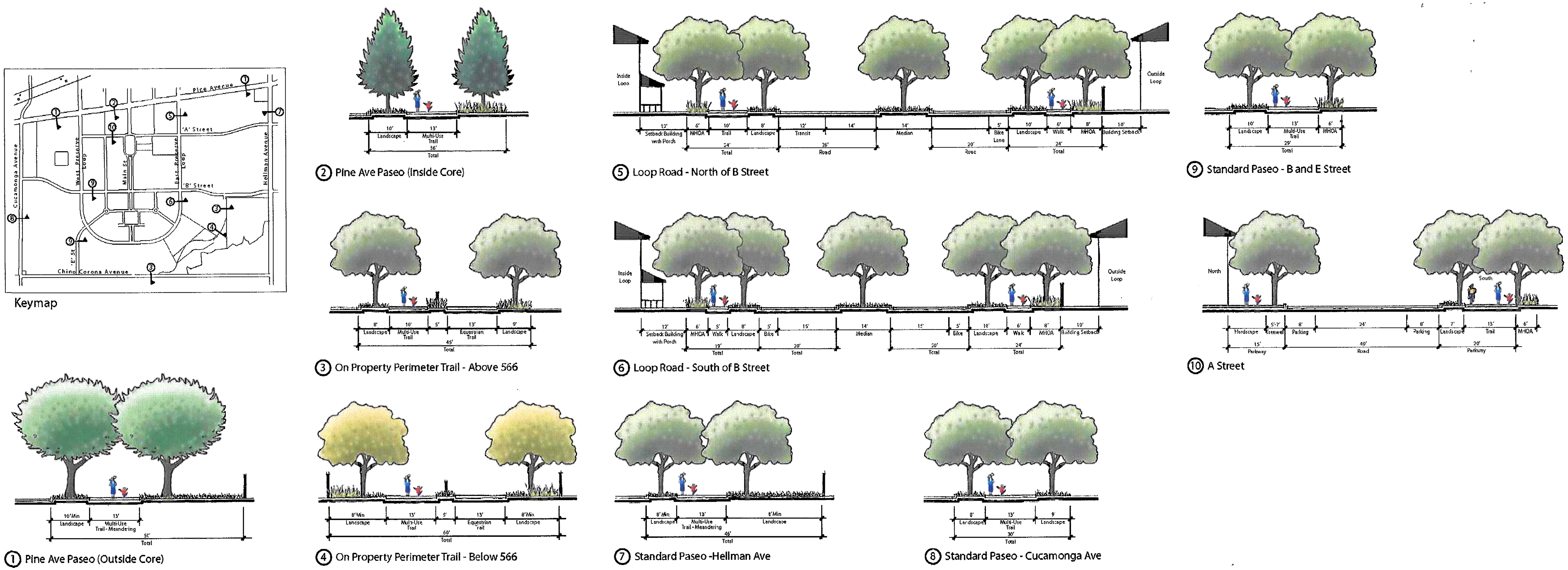
FIGURE 11-2

BIKE TRAIL CIRCULATION PLAN
SOUTH OF PINE AVENUE (TTM NO. 16420) INTERNAL EVALUATION, CHINO



Keymap

① Pine Ave Paseo (Outside Core)

② Pine Ave Paseo (Inside Core)

③ On Property Perimeter Trail - Above 566

④ On Property Perimeter Trail - Below 566

⑤ Loop Road - North of B Street

⑥ Loop Road - South of B Street

⑦ Standard Paseo -Hellman Ave

⑧ Standard Paseo - Cucamonga Ave

⑨ Standard Paseo - B and E Street

⑩ A Street

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FIGURE 11-3

TRAIL / PATH CROSS-SECTIONAL DETAILS

SOUTH OF PINE AVENUE (TTM NO. 16420) INTERNAL EVALUATION, CHINO

12.0 SPECIAL ISSUES

12.1 Comparison to Prior Specific Plan Street Alignments

The following discusses the proposed alignment of "A" Street, "B" Street and "E" Street in comparison to the alignments contained within the prior specific plan.

"A" Street as proposed will provide a connection between West Preserve Loop and Hellman Avenue (directly opposite of Aldergate Drive), which varies from the prior specific plan. The prior specific plan provided for "A" Street only between West Preserve Loop and East Preserve Loop. The extension of "A" Street as now proposed from East Preserve Loop to Hellman Avenue will provide added project convenience for vehicles travelling to Hellman Avenue to access either Pine Avenue or Chino-Corona Road. As indicated in *Figure 6-3*, this segment is forecast to carry roughly 3,200 vehicles per day.

"B" Street as proposed will provide a connection between Mill Creek Avenue and Hellman Avenue, which is consistent with the prior specific plan. The only change in "B" Street's alignment is at its connection with Hellman Avenue, which is now proposed to be located directly opposite of Walters Street instead of being offset as shown in the prior specific plan. This is considered a positive refinement because it consolidates access points between the two sides of Hellman Avenue.

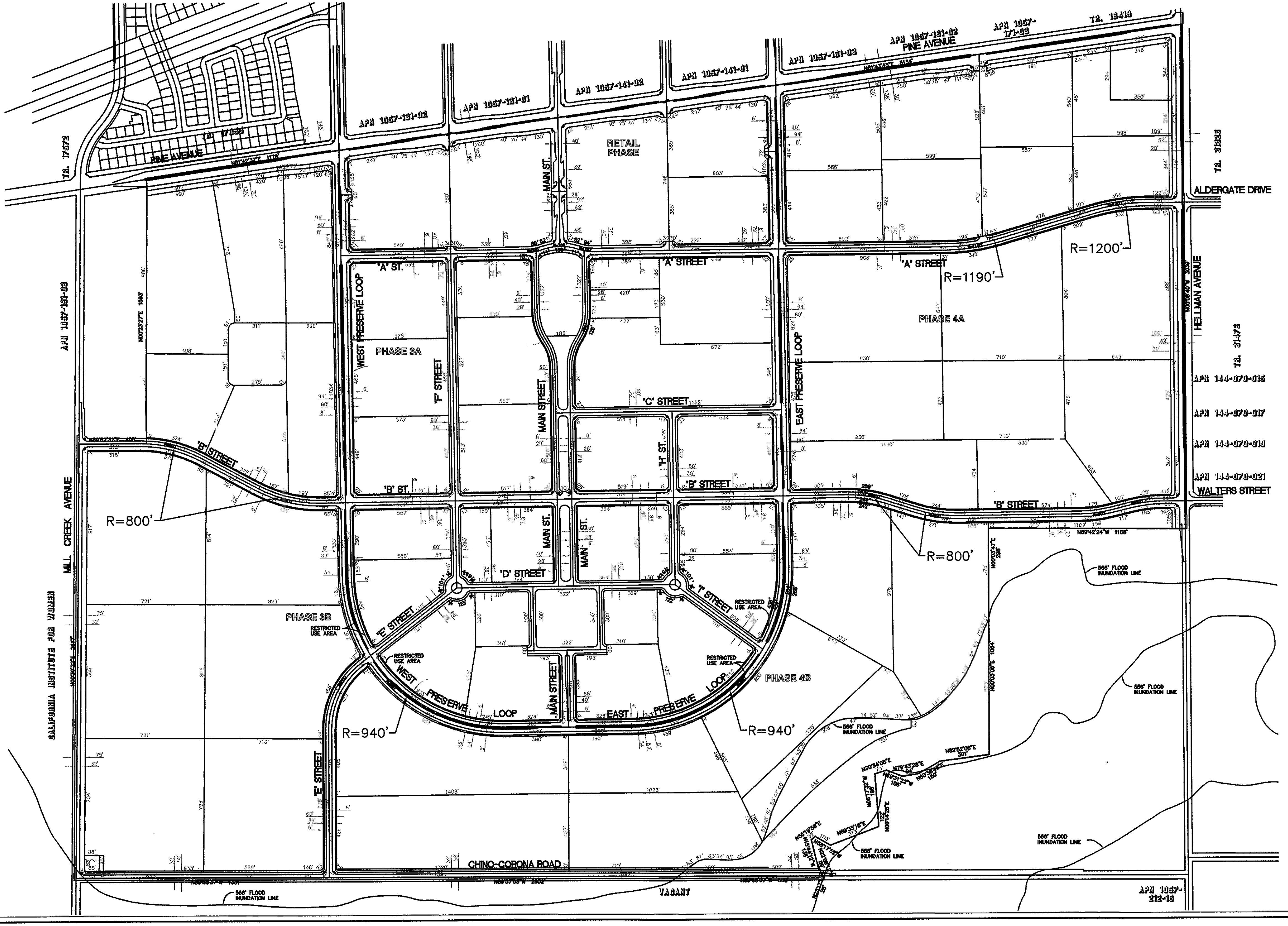
"E" Street as proposed will provide a connection between West Preserve Loop and Chino-Corona Road, which also varies with the prior specific plan. The prior specific plan did not contain "E" Street; instead Main Street was extended from the Preserve Loop to Chino-Corona Road. Even though the proposed Project does not include this Main Street connection to Chino-Corona Road, the proposed "E" Street connection will generally provide the same connectivity between the Preserve Loop and Chino-Corona Road. Further, given that the primary orientation of this traffic is actually toward towards Hellman Avenue, the "A" Street and "B" Street connections further facilitate that travel desire.

12.2 Internal Street Sections

The following investigates the consistency of the tract map proposed roadway cross sections with the intersection lane geometrics presented previously in *Figure 8-1*, and discusses the recommended design speeds for the West Preserve Loop and the East Preserve Loop.

12.2.1 *Consistency With Intersection Lane Configurations/Traffic Controls*

Figures 12-1 and ***12-2*** present the cross sections for Pine Avenue, Mill Creek Avenue, Chino-Corona Road, Hellman Avenue, Main Street, "A" Street, "B" Street, "C" Street, "D" Street, "E" Street, "F" Street, "G" Street, "H" Street, "I" Street and "J" Street. A review of the cross sections depicted in *Figure 12-2* was performed in comparison to the intersection lane geometrics identified in *Figure 8-1* to validate the ability to provide for the recommended intersection lane geometrics within the prescribed street-sections of the tentative tract map. All intersection lane geometrics of *Figure 8-1* are consistent with the tract map cross-sections except for some locations along Main Street, East or West Preserve Loop, and "B" Street where exclusive turning lanes are recommended in *Figure 8-1*. However upon further review of the cross-sections, the exclusive turning lanes at the



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NOTE: SEE FIGURE 12-2 FOR DETAILED ROADWAY CROSS-SECTIONS

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FIGURE 12-1

PROPOSED ROADWAY CIRCULATION SYSTEM

SOUTH OF PINE AVENUE (TTM NO. 16420) INTERNAL EVALUATION, CHINO

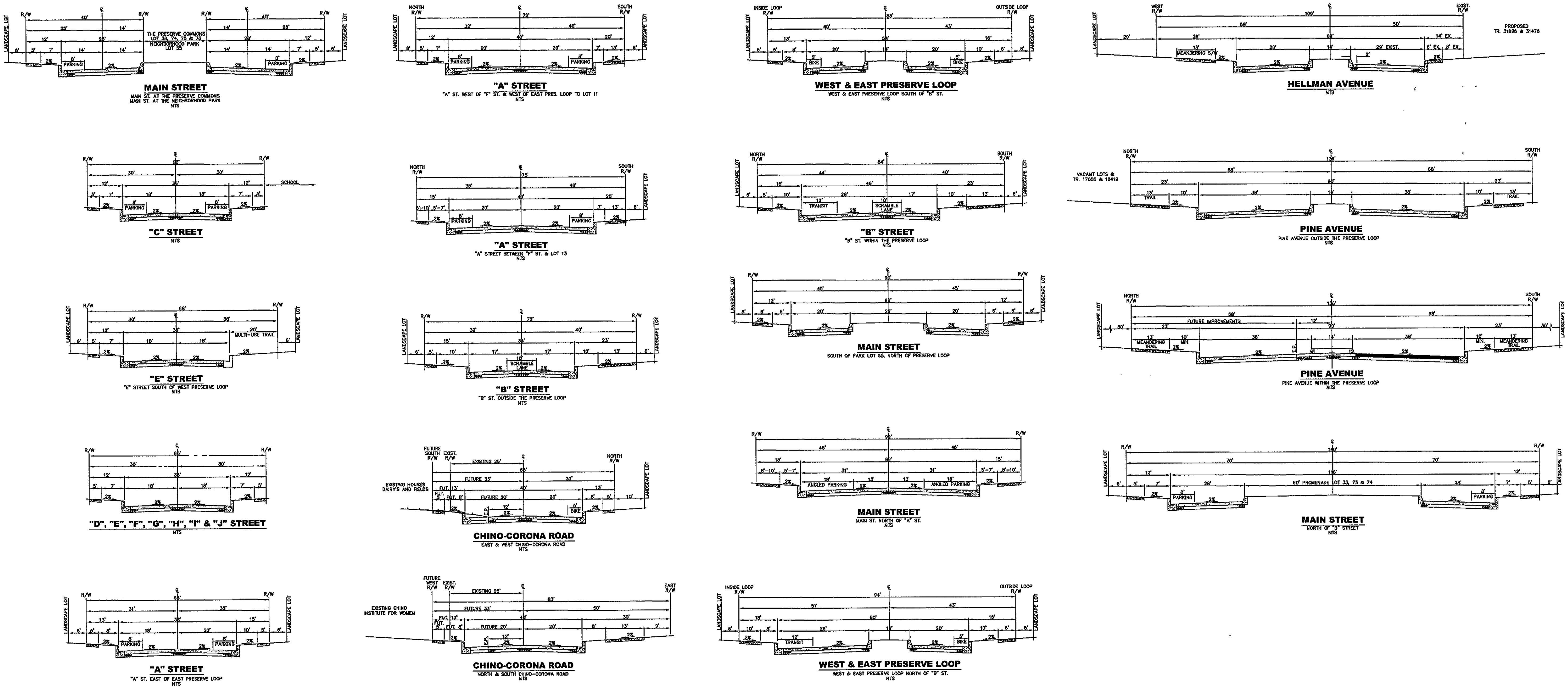

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FIGURE 12-2

PROPOSED ROADWAY CROSS-SECTIONS

SOUTH OF PINE AVENUE (TTM NO. 16420) INTERNAL EVALUATION, CHINO

intersections can be accommodated through the following interpretation/refinement to the cross section:

- Main Street = restrict parking at the intersection and translate the width "gain" to a formalized left-turn pocket
- Preserve Loop = substitute some median width at an intersection in combination with excess through lane width to formalize left-turn pockets where needed
- "B" Street = utilize the "scramble lane" called out in the cross-section for a left-turn refuge at the intersection

With the aforementioned modifications all intersection lane geometrics identified in *Figure 8-1* can be implemented and accommodated within the cross sections presented in *Figures 12-1* and *12-2*.

Concerns have been expressed by City staff relative to issues related to potential left turning movements into our out of driveways serving the commercial access along the portions of East or West Preserve Loop in the initial block south of Pine Avenue. It will be noted from *Figure 12-1* and *12-2* that the Loop Road cross-sections in these segments will preclude such left-turn activity with the presence of a raised median.

12.2.2 *Design Speed of Circulation Spine Roadways*

Most roadway segments within the project are tangent sections. Exceptions include elements of Main Street (addressed in Section 10.0 of this report), "A" Street, "B" Street, "E" Street, East Preserve Loop, and West Preserve Loop.

Section 10.0 cited the Caltrans reference materials for minimum horizontal curves as a function of design speed, and also those for "comfort curves" which relate to the comfortable travel speeds through a horizontal curve. Using those same reference materials (Table 203.2: "Standards for Curve Radius" and Figure 202.2: "Maximum Comfortable Speed on Horizontal Curves"), ***Table 12-1*** summarizes centerline horizontal curve data from *Figure 12-1* and compares it to the Caltrans criteria. The "comfort curve" values are all based on the common superelevation rate for a normal roadway crown of negative 2%. Further, the table makes a preliminary recommendation as to the recommended speed posting along these roadways. This recommendation may be subject to final site plan design, sight distance considerations, speed zoning, etc.

As indicated in *Table 12-1*, radii along internal roadways range from a minimum of 300' to 1200', inferring minimum design speeds of 30 mph to 60 mph, respectively. "Comfort curve" speeds are incrementally less, ranging from 25 mph to 55 mph.

Overall, the design radii of the roadways are consistent with Caltrans criteria, in all instances meet the criteria, and in many, conservatively exceed it. Further the proposed criteria are appropriate to the intended character of on-site roadways, and their relative hierarchy. The suggested speed postings respect those criteria, and reinforce the intended character and hierarchy of those spine roads as well.

TABLE 12-1
CURVE DATA AND CALTRANS CRITERIA COMPARISON

Street Reference	Radius Shown (Feet)	Curve Radius Standard (Caltrans Table 203.2)[22]		Maximum Comfortable Speed On Horizontal Curves (Caltrans Figure 202.2)		Preliminary Recommended Speed Limit Posting (MPH)	Status
		Minimum Radius (Feet)	Design Speed (MPH)	Curve Radius (Feet)	Speed (MPH)		
Main Street	300	300	30	300	25	25	OK
"A" Street	300	300	30	300	25	25	OK
	1,190	1,150	60	1,100	55	25	OK
	1,200	1,150	60	1,100	55	25	OK
"B" Street (Multiple Locations)	800	850	50	800	40	35	OK
"E" Street	500	550	40	500	35	35	OK
West Preserve Loop	940	850	50	900	40	35	OK
East Preserve Loop	940	850	50	900	40	35	OK

---

[22] Tabular value closest to proposed radius is shown.

12.3 Pine Avenue Pedestrian Crossings

The signalized intersections along Pine Avenue between West Preserve Loop and East Preserve Loop will provide pedestrian interaction between the developments to the north and the proposed Project to the south via proposed crosswalks. The pedestrian walkways and paseos within the proposed Project will be linked to provide connections to the sidewalks leading to Pine Avenue thus providing adequate and safe pedestrian access. It should be noted that the level of service calculations presented previously in Section 9.0 take into consideration the minimum required clearance times for pedestrians to cross Pine Avenue.

12.4 Truck Traffic on Pine Avenue Adjoining the Site

The Year 2030 AM peak hour and PM peak hour traffic volumes presented previously in *Figures 6-1* and *6-2* as well as those contained within Section 9.0 account for truck traffic along Pine Avenue. Truck traffic was manually added to the volumes obtained from the model runs prepared by MMA and was included in our Year 2030 volume forecasts and level of service evaluation for the intersections along Pine Avenue presented previously in Section 9.0. Please note that approximately three percent (3.0%) and two percent (2.0%) of traffic along Pine Avenue is forecast to be truck traffic during the AM and PM peak hours, respectively.

12.5 Direct Vehicular and Pedestrian Access

12.5.1 *Vehicular Access*

As previously shown in *Figure 2-2*, vehicular access to the project site is expected to be provided via several full access local street connections and right-turn in/right-turn out only connections along the streets within the project site. As mentioned previously, additional access points along the local streets may be provided although not shown in this figure. The final location and characteristics of internal access points will be further evaluated during the refinement and development of specific tract maps with each of the proposed Planning Areas.

12.5.2 *Pedestrian Access*

Sidewalks are a typical feature of the streets within the proposed Project site. These sidewalks together with the mixed use trail elements of *Figure 11-3* will provide connectivity between the different land uses (i.e. commercial, residential, park, school, etc.) within the proposed Project site. Pedestrian connectivity between the different land uses will be further evaluated during the refinement and development of specific site plans within each of the proposed Planning Areas.

12.6 Gated Community Details

Some elements of the project may feature gated communities. Planning area-specific tract maps are not available at this stage of project review, and thus an analysis of entrance features that will serve those communities, if gated, is not possible at this time. It is expected that they will be reviewed in detail as tract maps are brought forward at that level of detail.

Gated community entrances do commonly involve a number of features/elements that are generally described here as a basis of design review when those tract maps are brought forward. They include:

- An entrance stacking length (between the public street and control point) capable of storing maximum (typically inbound PM peak hour traffic) without queueing back to the public street. A common rule of thumb is one foot of storage length for each peak hour vehicle, and this overall requirement could be divided amongst multiple lanes, if provided. It should be noted that new technologies and applications are serving to reduce this stacking length requirement. Wireless transmitters for residents, combined with a rolling or swing gate at the control point, result in a processing of "platoons" of vehicles, rather than each vehicle individually.

- A by-pass capability, where arriving residents may by-pass visitor traffic being processed through the control position. Such a provision also manages the entrance queue, and provides greater convenience/efficiency for residents.
- An explicit visitor processing provision, either by keypad/intercom, or manned position.
- A turnaround for visitor traffic that cannot gain entry. This is commonly accomplished by a u-turn opportunity beyond the entry control position, but in advance of the gate position. This turning path is commonly designed to be capable of a u-turn by a Single Unit (SU) design vehicle, sometimes via a multi-point turn, rather than a continuous movement, depending on setting/application.
- Lane widths and geometric features along "through movements" consistent with the needs of larger design vehicles (to provide for trash trucks, delivery vehicles, towing vehicles, moving vans, etc.)
- Lanes widths and geometric features consistent with fire department circulation criteria.
- Exiting provisions that provide ample storage and lane provisions for movements outbound onto the adjoining public roadway.

12.7 Traffic Calming

Traffic calming measures can be implemented on roadways within a project development to address potential concerns related to safety on a roadway, the amount of traffic volume on a roadway, the speed on a roadway, and access on a roadway, etc. ***Table 12-2*** summarizes potential actions within a traffic calming toolbox to address some of the aforementioned concerns that may occur within the street system of a project development. The structure of this table is such that the "potential concerns" are listed along the top and the traffic calming measures are listed along the side. The toolbox has a total of nineteen (19) traffic calming measures and each one is rated with either one asterisk, two asterisks or three asterisks for the "potential concerns" listed along the top dependent upon the measures level of effectiveness. These measures could be utilized in the design/evaluation of future site plans and tract maps proposed within each of the project's planning areas.

TABLE 12-2
TRAFFIC CALMING TOOL BOX

Toolbox		Volume Reduction	Speed Reduction	Safety Improvement	Access Restriction	Emergency Access Restriction	Maintenance Problems	Cost
7.1	All Way Stop	*	**	**	*	*	*	*
7.2	Basket Weaving Stop Signs	*	**	***	*	*	*	*
7.3	Chicanes / Curvilnear Reconstruction	**	**	**	*	*	*	***
7.4	Chokers	**	*	**	*	*	*	***
7.5	Crossing Islands	*	*	**	*	*	*	**
7.6	Curb Extensions / Bulb-Outs	**	**	**	*	*	*	***
7.7	Deflections / Diverters	**	**	**	***	***	*	***
7.8	Gateways	*	**	*	*	*	*	**
7.9	Increased Police Enforcement	*	***	**	*	*	*	**
7.10	Mini-Roundabouts	*	**	**	*	*	**	***
7.11	Pavement Markings - Edgelines	*	*	*	*	*	*	*
7.12	Paving Materials	*	*	**	*	*	*	**
7.13	Raised Crosswalks	**	***	**	*	**	**	**
7.14	Raised Intersections	**	***	**	*	**	**	***
7.15	Rumble Strips	*	*	**	*	*	*	*
7.16	Speed Humps	**	***	*	*	**	**	**
7.17	Speed Watch	*	***	**	*	*	*	*
7.18	Street Closure	**	***	**	***	***	*	***
7.19	Variable Speed Display	*	***	**	*	*	*	*

Key

*	Low, Unlikely, No
**	Mid, Moderate, Possible
***	High, Likely , Yes

13.0 INTERNAL CIRCULATION RECOMMENDATIONS

13.1 Intersection Queuing Evaluation

In addition to the identification and validation of the internal spine street system in Section 8.0 of this report, a "turn pocket" queuing evaluation was prepared for the key study intersections that border the project site and for the 19 key internal study intersections to determine the required stacking/storage lengths for all recommended exclusive left-turn lanes and right-turn lanes for the following four (4) project options.

- Applicant-Preferred Project Option
- Option No. 1
- Option No. 2
- Option No. 3

The queuing evaluation was conducted based on projected Year 2030 peak hour traffic volumes and the Highway Design Manual (Caltrans) method that determines the required pocket length as 1.5 times the average queue length (feet) in the peak hour. Those average queue lengths are reported in the output of the Traffix-generated service level calculation worksheets like those in *Appendix B* and *Appendix C.*

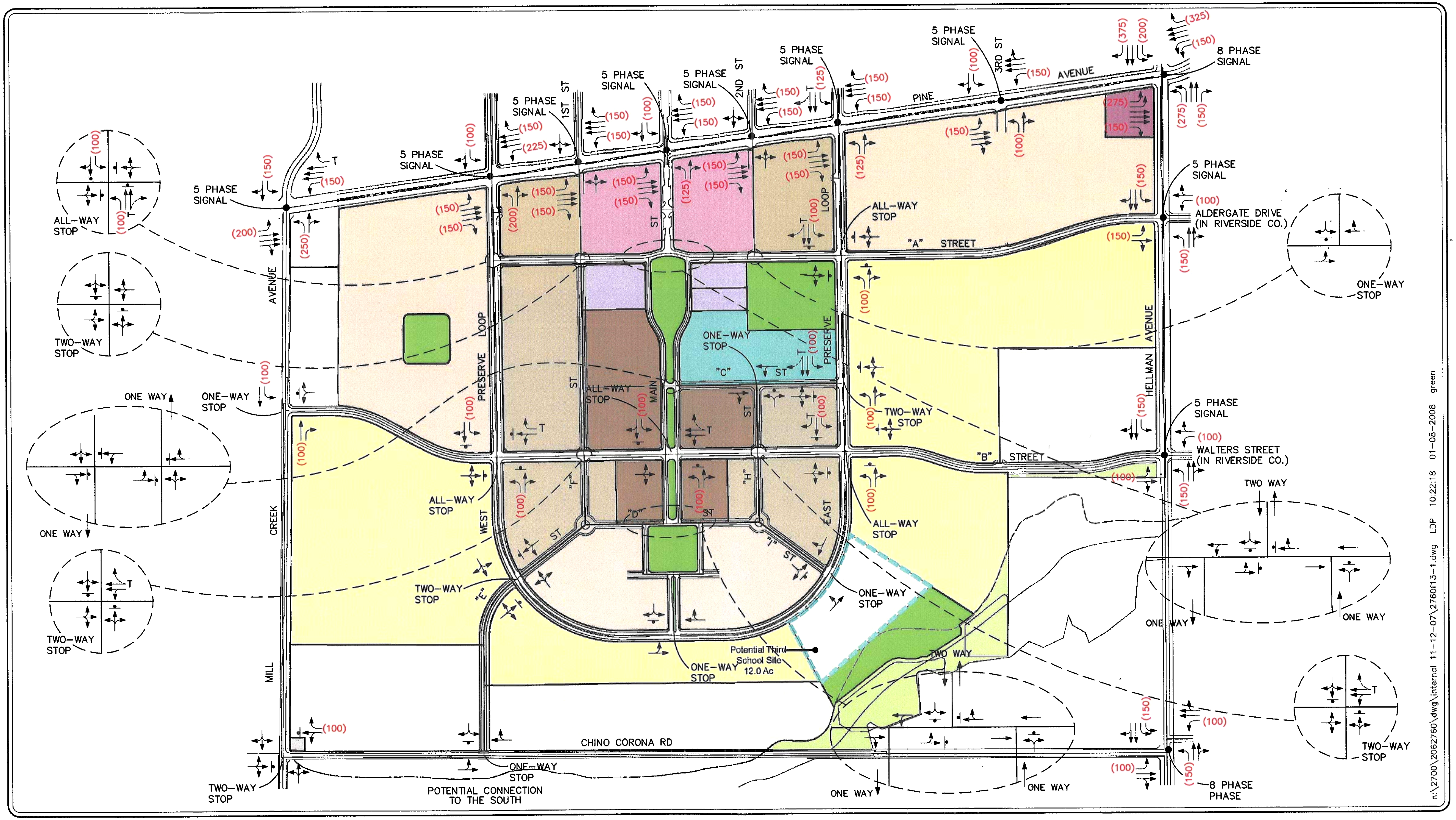
Figures 13-1, 13-2, 13-3 and ***13-4*** repeat the lane geometry and intersection control measure summary previously presented and further identify the required stacking/storage lengths for all recommended exclusive left-turn lanes and right-turn lanes along the perimeter of the project site and within the internal street network of the project site. These figures do so for the Applicant Preferred Project Option, Option No. 1, Option No. 2 and Option No. 3, respectively. Please note that only the intersections affected by the access restrictions along Pine Avenue are shown in *Figures 13-2, 13-3* and *13-4*. The stacking/storage lengths required for the remaining intersections outside of the Pine Avenue corridor between West Preserve Loop and 3rd Street are the same as those identified in *Figure 13-1*.

The stacking/storage requirements shown in *Figures 13-1* through *13-4* are required at a minimum to ensure that vehicles do not queue beyond the turn pockets causing interruptions to through traffic on the roadways serving the project site (i.e. Pine Avenue, West Preserve Loop, East Preserve Loop, etc.). It should also be noted that the storage lengths do not include the transitions, which are typically ninety feet in length (90 feet).

13.2 Traffic Signal Warrant Evaluation

Table 13-1 summarizes the results of a signal warrant evaluation conducted at the nineteen (19) internal key study intersections based on Year 2030 AM and PM peak hour traffic volumes and the lane geometrics previously presented in *Figure 8-1*. Review of *Table 13-1* indicates that all 19 internal key study intersections **do not** satisfy the peak hour warrants for installation of a traffic signal. Therefore, based on the results of the signal warrant evaluation and the level of service analysis presented previously in *Table 8-1,* all 19 internal key study intersections will operate at an acceptable level of service as stop-controlled intersections.

Appendix D contains the traffic signal warrant worksheets for the 19 internal key study intersections.



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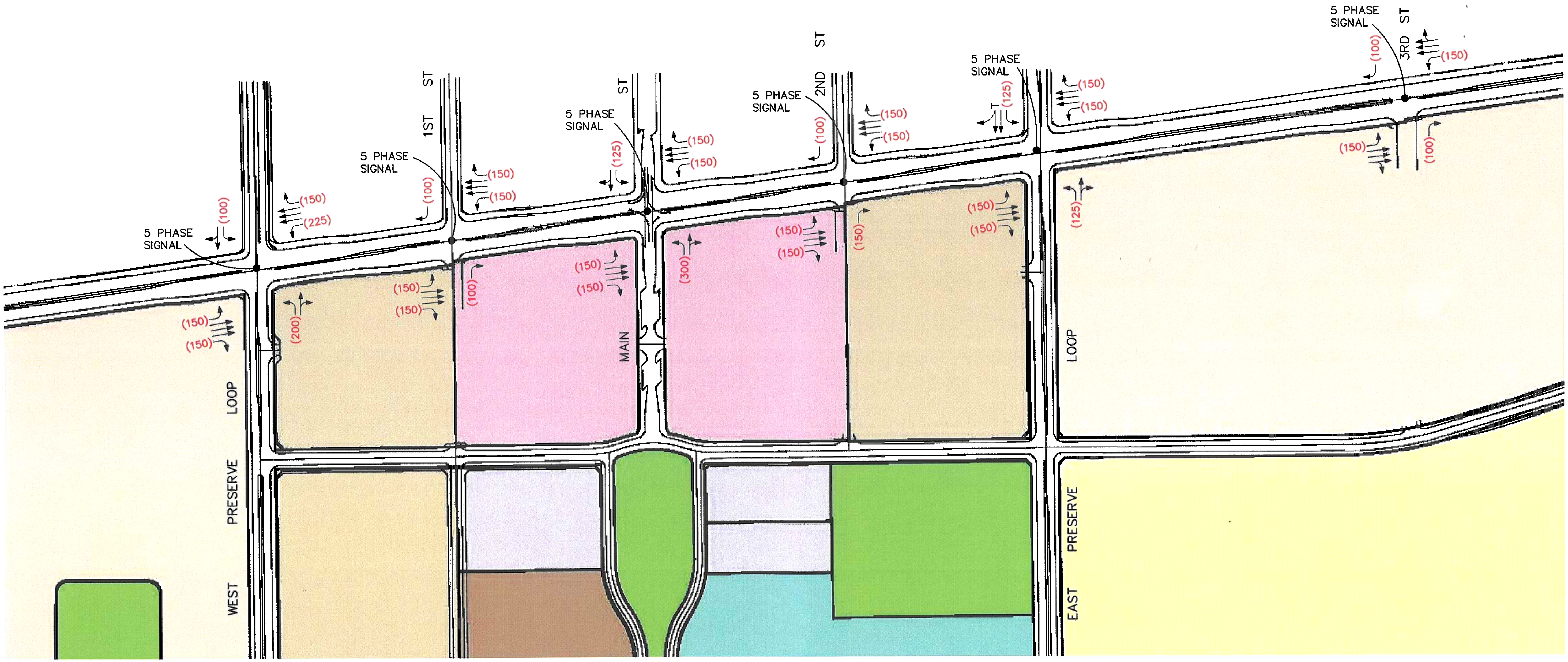
KEY

● = TRAFFIC SIGNAL
⊥ = STOP SIGN
T = TRANSIT LANE FUNCTIONS AS A SEPARATE RIGHT-TURN LANE AT THE INTERSECTION UNLESS OTHERWISE NOTED
←— = APPROACH LANE
(###) = REQUIRED STORAGE LENGTH FOR TURN POCKET (FEET)

FIGURE 13-1

MINIMUM STORAGE LENGTH REQUIREMENTS

SOUTH OF PINE AVENUE (TTM NO. 16420) INTERNAL EVALUATION, CHINO



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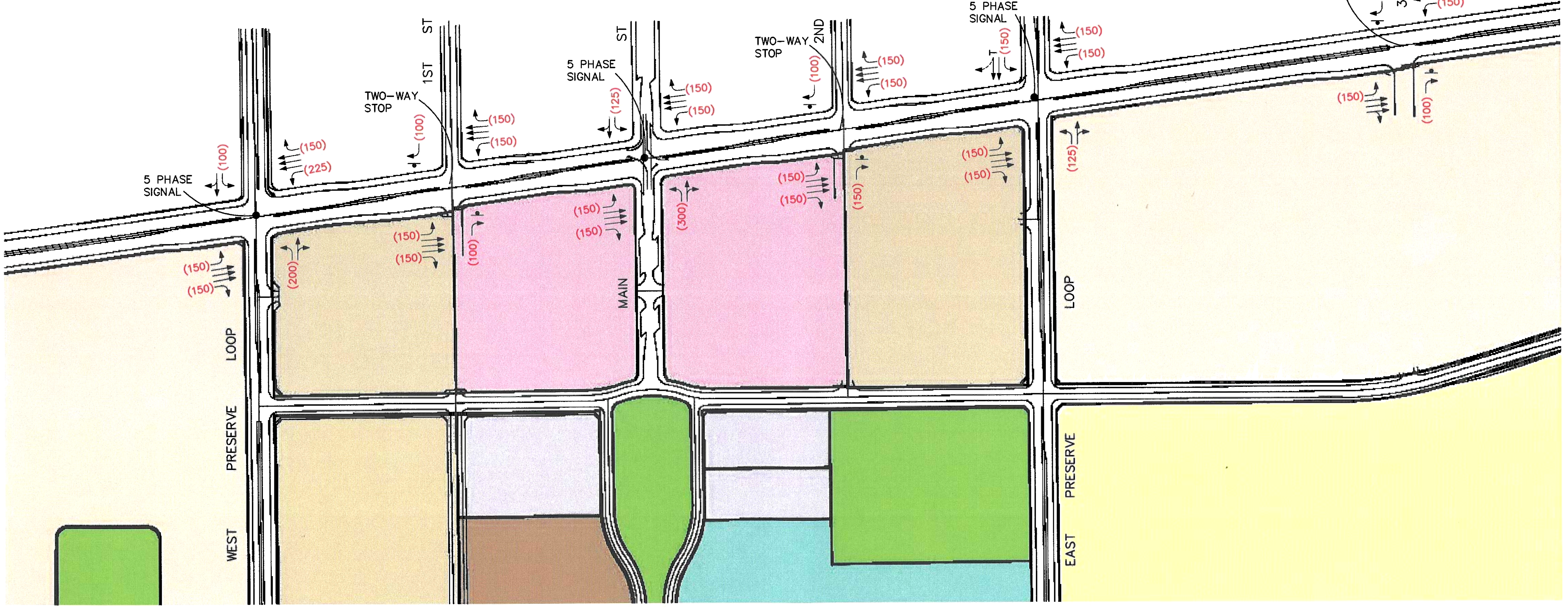
KEY

- ● = TRAFFIC SIGNAL
- T = TRANSIT LANE FUNCTIONS AS A SEPARATE RIGHT-TURN LANE AT THE INTERSECTION UNLESS OTHERWISE NOTED
- ← = APPROACH LANE
- (###) = REQUIRED STORAGE LENGTH FOR TURN POCKET (FEET)

FIGURE 13-2

MINIMUM STORAGE LENGTH REQUIREMENTS – OPTION NO. 1 (LEFT TURN OUT RESTRICTIONS)

SOUTH OF PINE AVENUE (TTM NO. 16420) INTERNAL EVALUATION, CHINO



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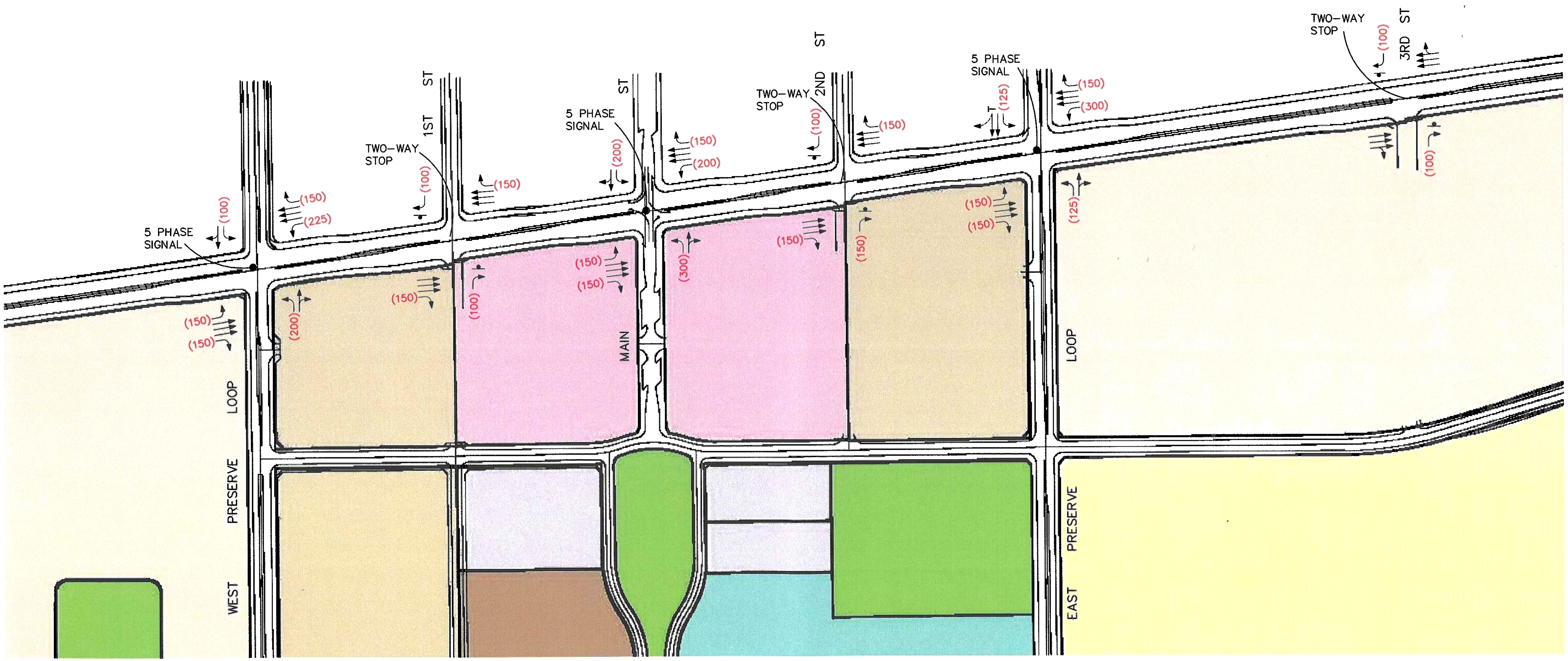
KEY

● = TRAFFIC SIGNAL
┬ = STOP SIGN
T = TRANSIT LANE FUNCTIONS AS A SEPARATE RIGHT-TURN LANE AT THE INTERSECTION UNLESS OTHERWISE NOTED
←— = APPROACH LANE
(###) = REQUIRED STORAGE LENGTH FOR TURN POCKET (FEET)

FIGURE 13-3

MINIMUM STORAGE LENGTH REQUIREMENTS – OPTION NO. 2 (LEFT TURN OUT RESTRICTIONS)

SOUTH OF PINE AVENUE (TTM NO. 16420) INTERNAL EVALUATION, CHINO



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● = TRAFFIC SIGNAL
-┬- = STOP SIGN
T = TRANSIT LANE FUNCTIONS AS A SEPARATE RIGHT-TURN LANE AT THE INTERSECTION UNLESS OTHERWISE NOTED
←— = APPROACH LANE
(###) = REQUIRED STORAGE LENGTH FOR TURN POCKET (FEET)

FIGURE 13-4

MINIMUM STORAGE LENGTH REQUIREMENTS –
OPTION NO. 3 (RIGHT TURN IN/RIGHT TURN OUT ONLY RESTRICTIONS)
SOUTH OF PINE AVENUE (TTM NO. 16420) INTERNAL EVALUATION, CHINO

TABLE 13-1

TRAFFIC SIGNAL WARRANTS FOR INTERNAL KEY STUDY INTERSECTIONS

Key Study Intersection	Peak Hour	Traffic Signal Warrant Satisfied (Yes/No)
1. West Preserve Loop at	AM	No
A Street	PM	No
2. F Street at	AM	No
A Street	PM	No
3a. Main Street at	AM	No
A Street	PM	No
3b. Main Street at	AM	No
A Street	PM	No
3c. Main Street at	AM	No
A Street	PM	No
4. 2nd Street at	AM	No
A Street	PM	No
5. East Preserve Loop at	AM	No
A Street	PM	No
6. West Preserve Loop at	AM	No
B Street	PM	No
7. F Street at	AM	No
B Street	PM	No
8. Main Street at	AM	No
B Street	PM	No
9. H Street at	AM	No
B Street	PM	No
10. East Preserve Loop at	AM	No
B Street	PM	No
11. West Preserve Loop at	AM	No
E Street	PM	No
12. Main Street at	AM	No
South Preserve Loop	PM	No

TABLE 13-1 (CONTINUED)

TRAFFIC SIGNAL WARRANTS FOR INTERNAL KEY STUDY INTERSECTIONS

Key Study Intersection	Peak Hour	Traffic Signal Warrant Satisfied (Yes/No)
13a. Main Street at	AM	No
C Street	PM	No
13b. Main Street at	AM	No
C Street	PM	No
14. H Street at	AM	No
C Street	PM	No
15. East Preserve Loop at	AM	No
C Street	PM	No
16. F Street at	AM	No
D Street	PM	No
17a. Main Street at	AM	No
D Street	PM	No
17b. Main Street at	AM	No
D Street	PM	No
17c. Main Street at	AM	No
D Street	PM	No
18. H Street at	AM	No
D Street	PM	No
19. East Preserve Loop at	AM	No
I Street	PM	No

14.0 "POTENTIAL THIRD SCHOOL SITE"

The preceding Year 2030 analyses have all been based on the 4,006 DU development tabulation of *Table 2-2*, as illustrated in *Figure 2-1*. That figure identifies a "Potential Third School Site" within Planning Area 3 that if implemented, would be the third school within the overall Lewis Operating Corp. planning footprint of The Preserve. If built, it would replace an ER site of 12 acres, on which 24 units would otherwise be built.

The South of Pine plan of *Figure 2-1* already includes a school site within Planning Area 9. That school site would be the second within the Lewis Operating Corp. planning footprint of the overall Preserve (the first being generally south of Kimball Avenue and west of Main Street in the Phase 1 area). The Planning Area 9 school site was represented in the Section 8 capacity analyses of this study as an elementary school of 1,000 students.

This section isolates and analyzes the differences in potential project impacts if the "Potential Third School Site" were to be implemented instead of the 24 ER dwelling units.

14.1 Potential Third School Site Description

Based on information provided by Lewis Operating Corp., the "Potential Third School Site" could take one of two configurations, as follows:

- an elementary school with 22 classrooms, 40-50 teachers and administrative personnel, and 600 students, or
- a maximum case scenario would include grades K-8 with 39 classrooms and no gym facility. Teachers and administrative personnel would total 28 to 35. Enrollment would total 900-1,000 students on a year-round program.

In either case, the school's anticipated student service area is expected to be wholly south of Pine Avenue.

Given that the 1,000-student scenario represents the school option with the greatest trip-making potential, it formed the basis of the analysis that follows.

14.2 Trip Generation Characteristics

Table 14-1 updates the project summary of *Table 2-2* as well as the trip generation forecast of *Table 6-2* to make the 1,000-student school substitution for the 24 ER dwelling units in Planning Area 3. All other developmental line items of the table are identical to those in the prior tables. School trips are forecast using the trip ends/student rate equations of *Table 6-1*.

Looking at the bottom of the final page of *Table 14-1* indicates that the school site substitution actually reduces the PM (commuter) peak hour trip making potential of the project site. This is because the PM traffic peak for schools themselves occurs as classes end mid-afternoon, in advance of the commuter peak hour. Thus, even if this option were exercised, the PM peak hour service level evaluations and related analyses presented previously in this study remain valid with development of the third school site.

TABLE 14-1
LONG-TERM (YEAR 2030) PROJECT TRAFFIC GENERATION FORECAST (3,982 DU PLAN + POTENTIAL THIRD SCHOOL SITE)[23]

Project Description							Daily	AM Peak Hour			PM Peak Hour		
Prior TAZ No.[24]	PA No.	Parcel Type	Land Use	Acres	DU	T.S.F.	Trips	In	Out	Total	In	Out	Total
21	1	MDR	SF Residential	37.62	325	--	3,110	62	182	244	208	120	328
		MDR	Condo/Townhome	6.00	62	--	363	4	23	27	22	11	33
		MDR	Neighborhood Park	3.00	--	--	15	1	0	1	1	0	1
						Sub-Total	*3,488*	*67*	*205*	*272*	*231*	*131*	*362*
27	2	LDR	SF Residential	28.01	141	--	1,349	27	79	106	90	52	142
		LDR	Condo/Townhome	28.01	141	--	826	10	52	62	49	24	73
		ER	SF Residential	27.06	53	--	507	10	30	40	34	20	54
						Sub-Total	*2,682*	*47*	*161*	*208*	*173*	*96*	*269*
30	3	LDR	SF Residential	46.01	233	--	2,230	44	130	174	149	86	235
		ER	SF Residential	29.11	57	--	545	11	32	43	36	21	57
		ER	Elementary School[25]	12.00	--	--	1,290	230	190	420	--	--	--
		ER	City Park	8.00	--	--	400	26	26	52	18	18	36
						Sub-Total	*4,465*	*311*	*378*	*689*	*203*	*125*	*328*
24	4	LDR	SF Residential	30.83	183	--	1,751	35	102	137	117	68	185
		LDR	Condo/Townhome	30.82	182	--	1,067	13	67	80	64	31	95
		ER	SF Residential	23.10	45	--	431	9	25	34	29	17	46
						Sub-Total	*3,249*	*57*	*194*	*251*	*210*	*116*	*326*

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[23] Source: *Trip Generation*, 7th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2003).

[24] Refers to the traffic zone references in The Preserve, Chino Internal Traffic Model Methodology and Findings: Long-Term/Project Buildout Conditions Report, prepared by LLG (March 7, 2003).

[25] Elementary School = 1,000 Students.

TABLE 14-1 (CONTINUED)
LONG-TERM (YEAR 2030) PROJECT TRAFFIC GENERATION FORECAST (3,982 DU PLAN + POTENTIAL THIRD SCHOOL SITE)[26]

Project Description							Daily	AM Peak Hour			PM Peak Hour		
Prior TAZ No.[27]	PA No.	Parcel Type	Land Use	Acres	DU	T.S.F.	Trips	In	Out	Total	In	Out	Total
24	5	MDR	Condo/Townhome	49.11	690	--	4,043	48	255	303	241	117	358
		NC	Shopping Center	3.00	--	43.124	1,852	27	17	44	78	84	162
		--	Pass-By (34%)[28]	--	--	--	-630	0	0	0	-27	-29	-56
						Sub-Total	*5,265*	*75*	*272*	*347*	*292*	*172*	*464*
22	6	HDR	Condo/Townhome	8.06	120	--	703	8	44	52	42	20	62
		CC Non Res	General Office	3.28	--	74.000	815	101	14	115	19	92	111
		CC Non Res	Shopping Center	3.28	--	149.000	6,398	94	60	154	268	291	559
		--	Pass-By (34%)[28]	--	--	--	-2,175	0	0	0	-91	-99	-190
						Sub-Total	*5,741*	*203*	*118*	*321*	*238*	*304*	*542*
23	7	HDR	Condo/Townhome	11.66	150	--	879	11	56	67	53	26	79
		CC Non Res	General Office	3.94	--	74.000	815	101	14	115	19	92	111
		CC Non Res	Shopping Center	3.94	--	149.000	6,398	94	60	154	268	291	559
		--	Pass-By (34%)[28]	--	--	--	-2,175	0	0	0	-91	-99	-190
						Sub-Total	*5,917*	*206*	*130*	*336*	*249*	*310*	*559*

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[26] Source: *Trip Generation*, 7th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2003).

[27] Refers to the traffic zone references in The Preserve, Chino Internal Traffic Model Methodology and Findings: Long-Term/Project Buildout Conditions Report, prepared by LLG (March 7, 2003).

[28] Pass-by trips are trips made as intermediate stops on the way from an origin to a primary trip destination. Pass-by trips are attracted from traffic passing the site on adjacent streets (i.e. Pine Avenue), which contain direct access to the generator. A pass-by reduction factor of 34% was used for the PM peak hour (Source: *Trip Generation Handbook*, 2nd Edition, June 2004). This same factor was used to estimate the daily pass-by percentage.

TABLE 14-1 (CONTINUED)
LONG-TERM (YEAR 2030) PROJECT TRAFFIC GENERATION FORECAST (3,982 DU PLAN + POTENTIAL THIRD SCHOOL SITE)[29]

Project Description							Daily	AM Peak Hour			PM Peak Hour		
Prior TAZ No.[30]	PA No.	Parcel Type	Land Use	Acres	DU	T.S.F.	Trips	In	Out	Total	In	Out	Total
25	8	HDR	Condo/Townhome	19.64	310	--	1,817	22	115	137	109	53	162
		CC Res	Condo/Townhome	14.01	250	--	1,465	18	93	111	88	43	131
		CC Non Res CF	Rec. Comm. Center	3.90	--	15.000	343	15	9	24	7	17	24
		CC Non Res	Neighborhood Park	1.50	--	--	8	0	0	0	1	0	1
						Sub-Total	*3,633*	*55*	*217*	*272*	*205*	*113*	*318*
26	9	HDR	Condo/Townhome	6.65	110	--	645	8	41	49	39	19	58
		CC Res	Condo/Townhome	6.44	120	--	703	8	44	52	42	20	62
		CC Non Res-CF	Rec. Comm. Center	1.82	--	31.000	709	31	20	51	15	36	51
		CC Non Res-CF	Library	1.67	--	20.000	1,080	15	6	21	68	74	142
		CC Non Res	Elementary School[31]	12.84	--	--	1,290	230	190	420	-	-	-
		CC Non Res	City Park	8.00	--	--	400	26	26	52	18	18	36
		CC Non Res	Neighborhood Park	1.50	--	--	8	0	0	0	1	0	1
						Sub-Total	*4,835*	*318*	*327*	*645*	*183*	*167*	*350*
28	10	HDR	Condo/Townhome	12.53	170	--	996	12	63	75	59	29	88
		MDR	Condo/Townhome	14.56	180	--	1,055	13	67	80	63	31	94
		CC Res	Condo/Townhome	3.70	55	--	322	4	20	24	19	9	28
		CC Non Res	Neighborhood Park	1.50	--	--	8	0	0	0	1	0	1
						Sub-Total	*2,381*	*29*	*150*	*179*	*142*	*69*	*211*

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[29] Source: *Trip Generation*, 7th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2003).

[30] Refers to the traffic zone references in The Preserve, Chino Internal Traffic Model Methodology and Findings: Long-Term/Project Buildout Conditions Report, prepared by LLG (March 7, 2003).

[31] Elementary School = 1,000 Students.

TABLE 14-1 (CONTINUED)
LONG-TERM (YEAR 2030) PROJECT TRAFFIC GENERATION FORECAST (3,982 DU PLAN + POTENTIAL THIRD SCHOOL SITE)[32]

Project Description							Daily	AM Peak Hour			PM Peak Hour		
Prior TAZ No.[33]	PA No.	Parcel Type	Land Use	Acres	DU	T.S.F.	Trips	In	Out	Total	In	Out	Total
29	11	HDR	Condo/Townhome	12.54	170	--	996	12	63	75	59	29	88
		MDR	Condo/Townhome	14.56	180	--	1,055	13	67	80	63	31	94
		CC Res	Condo/Townhome	3.69	55	--	322	4	20	24	19	9	28
		CC Non Res	Neighborhood Park	1.50	--	--	8	0	0	0	1	0	1
						Sub-Total	*2,381*	*29*	*150*	*179*	*142*	*69*	*211*
Total Long-Term (Year 2030) Project Traffic Generation Forecast				**539.39**	**3,982**	**555.124**	**44,037**	**1,397**	**2,302**	**3,699**	**2,268**	**1,672**	**3,940**

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[32] Source: *Trip Generation*, 7th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2003).

[33] Refers to the traffic zone references in The Preserve, Chino Internal Traffic Model Methodology and Findings: Long-Term/Project Buildout Conditions Report, prepared by LLG (March 7, 2003).

TABLE 14-1 (CONTINUED)

LONG-TERM (YEAR 2030) PROJECT TRAFFIC GENERATION FORECAST (3,982 DU PLAN + POTENTIAL THIRD SCHOOL PLAN)[34]

Breakdown By Land Use	Acres	DU	T.S.F.	Daily Trips	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
Single Family Residential	222.74	1,037	--	10,153	203	593	796	678	393	1,071
Condominium/Townhouse	241.16	2,945	--	17,257	208	1,090	1,298	1,031	502	1,533
Shopping Center	10.22	--	341.124	9,668	215	137	352	405	439	844
General Office	7.22	--	148.000	1,630	202	28	230	38	184	222
Recreation Community Center	5.72	--	46.000	1,052	46	29	75	22	53	75
Library	1.67	--	20.000	1,080	15	6	21	68	74	142
Elementary School	24.84	--	--	2,580	460	380	840	-	-	-
Neighborhood Park	9.00	--	--	47	1	0	1	5	0	5
City Park	16.00	--	--	800	52	52	104	36	36	72
Total (With Potential Third School Site)	**539.39**	**3,982**	**555.124**	**44,037**	**1,397**	**2,302**	**3,699**	**2,268**	**1,672**	**3,940**
Total (Without Potential Third School Site)	**539.39**	**4,006**	**555.124**	**42,979**	**1,169**	**2,126**	**3,295**	**2,286**	**1,679**	**3,965**
Net Addition Due to Third School Site	**0**	**-24**	**0.000**	**1,058**	**228**	**176**	**404**	**-18**	**-7**	**-25**

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[34] Source: *Trip Generation*, 7th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2003).

The school arrival hour does typically coincide with the AM peak hour of the adjoining street system, and *Table 14-1* indicates an increase of 228 inbound trip ends, 176 outbound trip ends, and 404 total 2-way trip ends during that period.

14.3 Traffic Distribution and Assignment

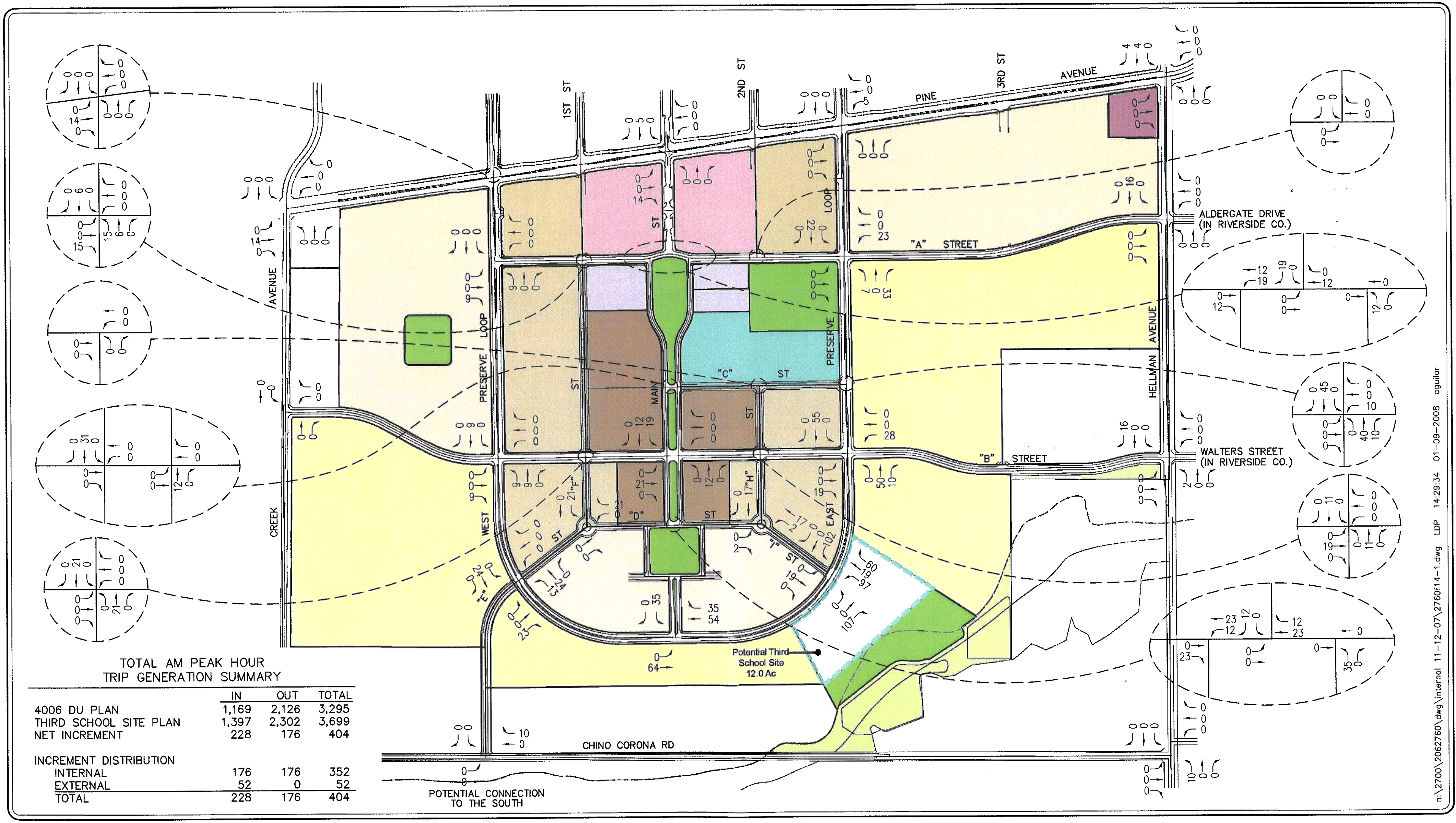
Much of the AM peak hour traffic increment related to the third school site will be by parents dropping off their child at school, followed by a return to their home, or continuation on a linked trip that is otherwise represented in the overall forecasting for the project. Their traffic movements to and from the school, show up in both the inbound and outbound trip ends increment of *Table 14-1*. Thus on a net basis, most of this additive traffic will begin and end its travel in the area south of Pine Avenue, which coincides with the expected student service area of this third school. Traffic generated by others from outside this service area, and thus travelling on the external street system as well as the internal street system, can be expected to be by almost exclusively teacher and administrative personnel, who arrive, but do not leave again in the AM peak hour. The 404 AM peak hour trips (228 inbound and 176 outbound) shown in the bottom of *Table 14-1* have been distributed to the internal street system using the patterns derived from the select zone analyses discussed previously.

Figure 14-1 presents the Year 2030 AM peak hour resultant traffic increments due to the potential third school site. ***Figure 14-2*** presents the Year 2030 AM peak hour traffic volumes associated with the proposed Project with the potential third school site. As indicated previously, the school site substitution actually reduces the PM peak hour trip making potential of the project site. Therefore the Year 2030 PM peak hour traffic volumes presented previously in *Figure 6-2* provide a conservative volume forecast and are still valid with development of the third school site.

14.4 Long Term (Year 2030) Traffic Evaluation

Table 14-2 presents an update to the *Table 8-1* Year 2030 level of service analysis to reflect the integration of the potential third school site within the plan. Review of column two of *Table 14-2* indicates that all 19 key study intersections are forecast to operate at acceptable LOS A in the Year 2030 with the third school site. Review of column four indicates that the delay increment related to the third school site is very small and ranges from a reduction of 1.4 seconds to an increase of 2.7 seconds. Please note that five of the reported locations have unchanged values. Also note that delay and LOS values are not shown for the PM peak hour because the school site substitution reduces the PM peak hour trip making potential. Therefore, the Year 2030 PM peak hour delay and LOS values presented previously in *Table 8-1* represent a conservative analysis and are still valid with development of the third school site.

Appendix E presents the long-term (Year 2030) HCM/LOS third school site calculations for the 19 key study intersections for the AM peak hour.



TOTAL AM PEAK HOUR
TRIP GENERATION SUMMARY

	IN	OUT	TOTAL
4006 DU PLAN	1,169	2,126	3,295
THIRD SCHOOL SITE PLAN	1,397	2,302	3,699
NET INCREMENT	228	176	404
INCREMENT DISTRIBUTION			
INTERNAL	176	176	352
EXTERNAL	52	0	52
TOTAL	228	176	404

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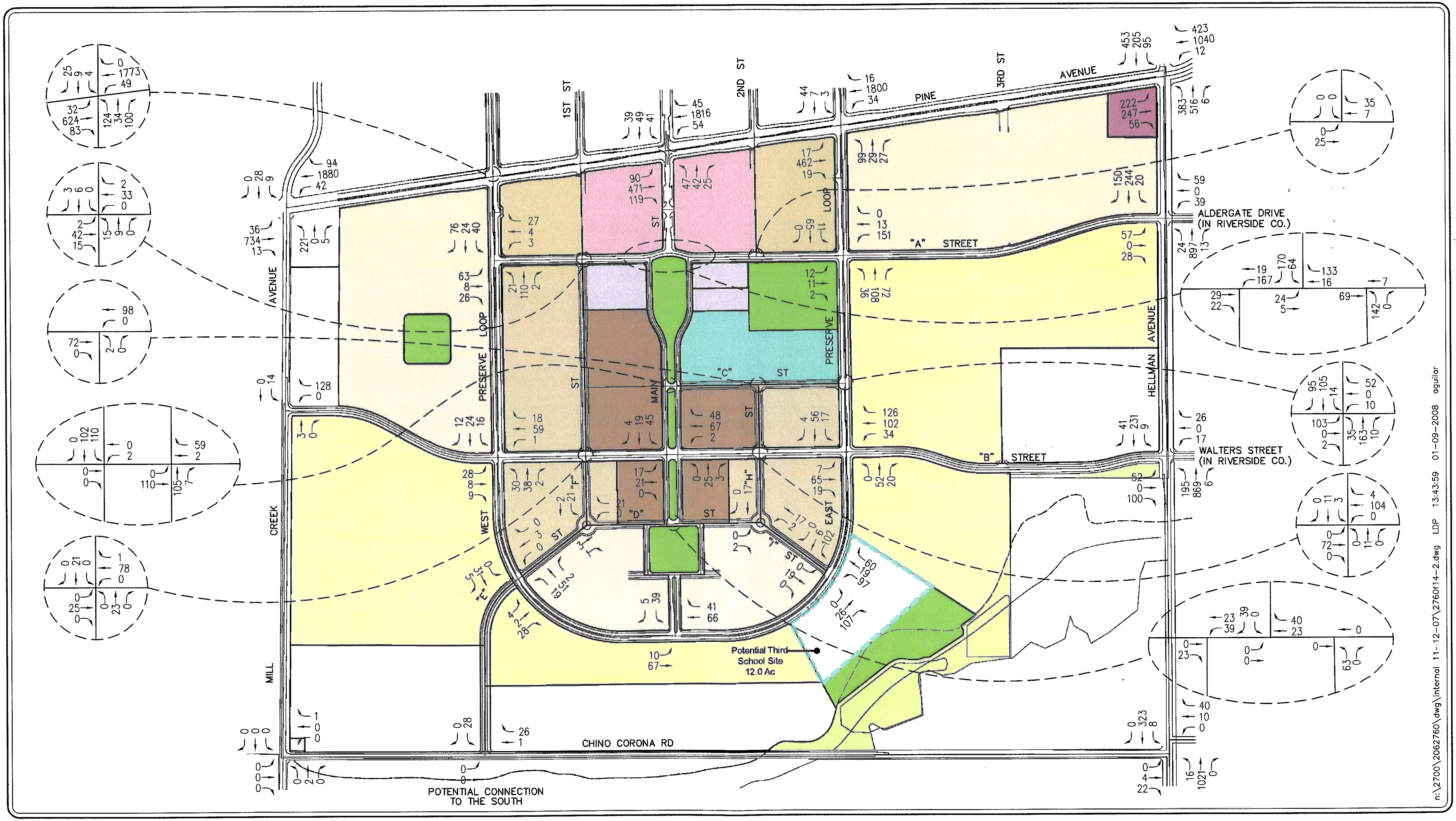
NOTE: A "0" VOLUME INDICATES NEGLIGIBLE TRAFFIC ON THE INDICATED MOVEMENT

LINSCOTT LAW & GREENSPAN engineers

NO SCALE

FIGURE 14-1

YEAR 2030 AM PEAK HOUR TRIP INCREMENT DUE TO POTENTIAL THIRD SCHOOL SITE
SOUTH OF PINE AVENUE (TTM NO. 16420) INTERNAL EVALUATION, CHINO



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NOTE: A "0" VOLUME INDICATES NEGLIGIBLE TRAFFIC ON THE INDICATED MOVEMENT

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

FIGURE 14-2

YEAR 2030 AM PEAK HOUR TRAFFIC VOLUMES WITH POTENTIAL THIRD SCHOOL SITE

SOUTH OF PINE AVENUE (TTM NO. 16420) INTERNAL EVALUATION, CHINO

TABLE 14-2

YEAR 2030 PEAK HOUR INTERSECTION CAPACITY ANALYSIS WITH POTENTIAL THIRD SCHOOL SITE[35]

Key Intersections	Time Period	(1) Year 2030 Plus Project Traffic (4,006 DU Plan)[36]		(2) Year 2030 Plus Project Traffic w/ Potential Third School Site		(3) Acceptable LOS	(4) Potential School Site Increment
		Delay	LOS	Delay	LOS	Yes/No	
1. West Preserve Loop at A Street	AM	8.1 s/v	A	8.2 s/v	A	Yes	0.1
	PM	N/A	N/A	N/A	N/A	N/A	N/A
2. F Street at A Street	AM	0.8 s/v	A	2.5 s/v	A	Yes	1.7
	PM	N/A	N/A	N/A	N/A	N/A	N/A
3a. Main Street at A Street	AM	0.0 s/v	A	0.0 s/v	A	Yes	0.0
	PM	N/A	N/A	N/A	N/A	N/A	N/A
3b. Main Street at A Street	AM	7.9 s/v	A	8.0 s/v	A	Yes	0.1
	PM	N/A	N/A	N/A	N/A	N/A	N/A
3c. Main Street at A. Street	AM	6.0 s/v	A	6.3 s/v	A	Yes	0.3
	PM	N/A	N/A	N/A	N/A	N/A	N/A
4. 2nd Street at A Street	AM	0.0 s/v	A	0.0 s/v	A	Yes	0.0
	PM	N/A	N/A	N/A	N/A	N/A	N/A
5. East Preserve Loop at A Street	AM	8.6 s/v	A	9.0 s/v	A	Yes	0.4
	PM	N/A	N/A	N/A	N/A	N/A	N/A
6. West Preserve Loop at B Street	AM	7.8 s/v	A	7.9 s/v	A	Yes	0.1
	PM	N/A	N/A	N/A	N/A	N/A	N/A
7. F Street at B Street	AM	0.2 s/v	A	2.9 s/v	A	Yes	2.7
	PM	N/A	N/A	N/A	N/A	N/A	N/A
8. Main Street at B Street	AM	7.7 s/v	A	7.9 s/v	A	Yes	0.2
	PM	N/A	N/A	N/A	N/A	N/A	N/A
9. H Street at B Street	AM	0.2 s/v	A	1.2 s/v	A	Yes	1.0
	PM	N/A	N/A	N/A	N/A	N/A	N/A
10. East Preserve Loop at B Street	AM	7.9 s/v	A	8.7 s/v	A	Yes	0.8
	PM	N/A	N/A	N/A	N/A	N/A	N/A

Notes:
s/v = seconds per vehicle (delay)

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[35] **Bold HCM/LOS values** indicate adverse service levels based on City of Chino LOS standards.

[36] Values are directly from *Table 8-1*.

TABLE 14-2 (CONTINUED)

YEAR 2030 PEAK HOUR INTERSECTION CAPACITY ANALYSIS WITH POTENTIAL THIRD SCHOOL SITE[37]

Key Intersections	Time Period	(1) Year 2030 Plus Project Traffic (4,006 DU Plan)[38]		(2) Year 2030 Plus Project Traffic w/ Potential Third School Site		(3) Acceptable LOS	(4) Potential School Site Increment
		Delay	LOS	Delay	LOS	Yes/No	
11. West Preserve Loop at E Street	AM	2.7 s/v	A	3.2 s/v	A	Yes	0.5
	PM	N/A	N/A	N/A	N/A	N/A	N/A
12. Main Street at South Preserve Loop	AM	3.7 s/v	A	2.2 s/v	A	Yes	-1.5
	PM	N/A	N/A	N/A	N/A	N/A	N/A
13a. Main Street at C Street	AM	5.9 s/v	A	5.0 s/v	A	Yes	-0.9
	PM	N/A	N/A	N/A	N/A	N/A	N/A
13b. Main Street at C Street	AM	6.2 s/v	A	6.0 s/v	A	Yes	-0.2
	PM	N/A	N/A	N/A	N/A	N/A	N/A
14. H Street at C Street	AM	0.1 s/v	A	0.1 s/v	A	Yes	0.0
	PM	N/A	N/A	N/A	N/A	N/A	N/A
15. East Preserve Loop at C Street	AM	4.5 s/v	A	4.2 s/v	A	Yes	-0.3
	PM	N/A	N/A	N/A	N/A	N/A	N/A
16. F Street at D Street	AM	3.0 s/v	A	3.1 s/v	A	Yes	0.1
	PM	N/A	N/A	N/A	N/A	N/A	N/A
17a. Main Street at D Street	AM	0.0 s/v	A	0.0 s/v	A	Yes	0.0
	PM	N/A	N/A	N/A	N/A	N/A	N/A
17b. Main Street at D Street	AM	6.6 s/v	A	6.8 s/v	A	Yes	0.2
	PM	N/A	N/A	N/A	N/A	N/A	N/A
17c. Main Street at D Street	AM	9.1 s/v	A	9.3 s/v	A	Yes	0.2
	PM	N/A	N/A	N/A	N/A	N/A	N/A
18. H Street at D Street	AM	3.0 s/v	A	3.0 s/v	A	Yes	0.0
	PM	N/A	N/A	N/A	N/A	N/A	N/A
19. East Preserve Loop at I Street	AM	0.0 s/v	A	7.3 s/v	A	Yes	7.3
	PM	N/A	N/A	N/A	N/A	N/A	N/A

Notes:
s/v = seconds per vehicle (delay)

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[37] **Bold HCM/LOS values** indicate adverse service levels based on City of Chino LOS standards.

[38] Values are directly from *Table 8-1*.

14.5 Conclusions for Potential Third School Site Evaluation

From the above, it can be concluded that the substitution of a third school site for 24 ER residential units will not significantly alter the internal project impact analyses and conclusions drawn in prior sections of this report. Those include elements of:

- Internal trip generation potential
- Long Term (Year 2030) capacity analyses
- Long Term (Year 2030) intersection lane geometrics and intersection controls (*Figure 8-1*)
- Long Term (Year 2030) roadway segment lane geometrics (*Figure 8-2*)
- Signal warrants analysis (*Table 13-1*)

15.0 SUMMARY OF FINDINGS AND CONCLUSIONS

- ***Project Description*** – The project site is roughly a 540-acre parcel of land bounded by Pine Avenue to the north, Chino-Corona Road to the south, Mill Creek Avenue (formerly or also known as Cucamonga Avenue) to the west and Hellman Avenue to the east, in the City of Chino, California. The proposed South of Pine Avenue Development Project will consist of eleven Planning Areas that are comprised of single family residential uses, condominium/townhouse uses, retail uses (shopping center), general office uses, recreation uses (i.e. community centers, neighborhood parks and City parks), library uses and an elementary school. The South of Pine Avenue Development Project will be constructed in several phases with an interim buildout of some of the Planning Areas expected to occur by the Year 2015 (i.e. Planning Areas No. 1, No. 5, No. 8 and No. 9) and ultimate buildout of the entire site (all eleven Planning Areas) expected to occur by the Year 2030.

  The proposed project in the Year 2015 will consist of 325 single-family homes, 1,542 condominiums/townhomes, 46,000 SF of recreation uses, a 20,000 SF library, 6.00 acres of neighborhood parks and 8.00 acres of City parks.

  The proposed project at completion in the Year 2030 will consist of a total of 1,061 single-family homes, 2,945 condominiums/townhomes, 341,124 SF of retail uses, 148,000 SF of general office uses, 46,000 SF of recreation uses, a 20,000 SF library, a 12.82 acre/1,000 student elementary school, 9.00 acres of neighborhood parks and 16.00 acres of City parks. This study refers to this exact project description as the 4,006 DU Plan. The 4,006 DU Plan is the primary focus of this report.

  A variant of this plan would substitute a school site in place of 24 ER units on a 12-acre parcel in Planning Area 3. The variation in project impacts due to this "Optional Third School Site" are addressed in Section 14 of this report.

  Access to the South of Pine Avenue Development Project will generally be provided via Pine Avenue, Chino-Corona Road, Mill Creek Avenue (Cucamonga Avenue) and Hellman Avenue. The proposed project will provide connections to Pine Avenue via West Preserve Loop, 1st Street, Main Street, 2nd Street, East Preserve Loop and 3rd Street. "E" Street to be constructed by the proposed project will provide a connection to Chino-Corona Road. The proposed project will provide a connection to Mill Creek Avenue (Cucamonga Avenue) via "B" Street and a connection to Hellman Avenue via "A" Street and "B" Street. Prior site planning activities anticipated the direct southerly extension of Main Street all the way to Chino – Corona Road. The "E" Street connection to Chino – Corona Road as shown in the current site plan is considered an equivalent connection from a transportation planning and impact perspective. Given the similarity of the connections in the context of the overall project plan, a similar traffic volume would be attracted to either alignment, and the internal impacts of the project not materially altered.

- ***Study Scope*** – The following nineteen (19) key study intersections were selected for analysis based on the approved Traffic Study Scope of Work and discussions with City of Chino staff.

  1. West Preserve Loop at "A" Street
  2. "F" Street at "A" Street
  3. Main Street at "A" Street
  4. 2nd Street at "A" Street
  5. East Preserve Loop at "A" Street
  6. West Preserve Loop at "B" Street
  7. "F" Street at "B" Street
  8. Main Street at "B" Street
  9. "H" Street at "B" Street
  10. East Preserve Loop at "B" Street
  11. West Preserve Loop at "E" Street
  12. Main Street at South Preserve Loop
  13. Main Street at "C" Street
  14. "H" Street at "C" Street
  15. East Preserve Loop at "C" Street
  16. "F" Street at "D" Street
  17. Main Street at "D" Street
  18. "H" Street at "D" Street
  19. East Preserve Loop at "I" Street

  Detailed peak hour level of service analyses were prepared for Year 2030 Future Background plus Project Traffic Conditions at these locations based on analysis criteria described in this report.

- ***Level of Service (LOS) Standards and Significant Impact Criteria*** – The City of Chino considers LOS "D" to be the minimum acceptable condition that should be maintained during the peak commute hours. Therefore, any intersection operating at LOS "E" or "F" is considered deficient/unsatisfactory. The City of Chino targets LOS C for all roadway links except for those roadway links located at freeway interchanges where LOS D is considered acceptable.

- ***Long-Term (Year 2030) Project Trip Generation*** – On a typical weekday, overall the proposed Project in the long-term (Year 2030) is expected to generate 42,977 daily trips, with 3,297 trips (1,172 inbound, 2,125 outbound) produced in the AM peak hour and 3,964 trips (2,283 inbound, 1,681 outbound) produced in the PM peak hour.

- ***Year 2030 Background plus Project Traffic Conditions*** – The results of the traffic analysis indicate that the 19 key study intersections are forecast to operate at acceptable LOS A in the Year 2030 with the proposed South of Pine Avenue Development Project. In addition, all side streets/minor street approaches are forecast to operate at LOS D or better. Further, all roadway segments are forecast to operate at acceptable LOS A on a daily basis except for the roadway segments along Pine Avenue which are forecast to operate at acceptable LOS B in the Year 2030 with the proposed South of Pine Avenue Development Project.

- ***Year 2030 Recommended Improvements*** – Refer to *Figures 8-1* and *8-2* for all Year 2030 recommended improvements with respect to intersection lane geometrics/traffic controls and roadway segment lane geometrics, respectively. The improvements depicted in *Figure 8-2* are an integral part of achieving the Year 2030 acceptable service levels.

- ***Alternative Access Evaluation for Pine Avenue*** – The results of the Alternative Access Evaluation indicate that all six key study intersections along the Pine Avenue corridor between West Preserve Loop and 3rd Street are forecast to operate at an acceptable level of service under all four-access options. Therefore adequate ingress/egress to the project site will be provided under all four-access options.

- ***Main Street Study Area Evaluation*** – Refer to Section 10.0 for detailed information regarding the description of Main Street, design speed considerations, lane geometrics, traffic controls, cross-sectional considerations and its function within the Town Center Area of the proposed Project.

- ***Transit Lane and Bike Lanes*** – Refer to Section 11.0 for detailed information regarding transit lane provisions and bike lane provisions.

- ***Special Issues*** – Refer to Section 12.0 for detailed information regarding internal street alignments in comparison to the prior specific plan, internal street sections with a focus on their consistency with the recommended intersection lane geometrics/traffic controls, design speed of circulation spine roadways, Pine Avenue pedestrian crossings, truck traffic along Pine Avenue, direct vehicular/pedestrian access, gated community details and traffic calming.

- ***Turning Lane Storage Length Requirements*** – Recommended turning lane storage length requirements have been determined based on Year 2030 conditions for the nineteen (19) key study intersections as well as for locations along Pine Avenue adjacent to the site. Refer to *Figure 13-1* for recommendations for the Applicant-Preferred Option, *Figure 13-2* for Option No. 1, *Figure 13-3* for Option No. 2 and *Figure 13-4* for Option No. 3.

- ***Signal Warrant Analysis*** – Signal warrants were prepared for all nineteen (19) key internal study intersections based on Year 2030 traffic volumes. Refer to *Table 13-1* for those results.

- ***"Potential Third School Site"*** – It can be concluded that the substitution of a third school site for 24 ER residential units will not significantly alter the internal project impact analyses and the conclusions drawn in prior sections of this report. The "Potential Third School Site" evaluation details are in Section 14.0 of this report.

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TRAFFIC IMPACT ANALYSIS
"SOUTH OF PINE AVENUE"
(TENTATIVE TRACT MAP NO. 16420)
THE PRESERVE PHASE 3 AND 4 AREAS
EXTERNAL EVALUATION

Chino, California
Revised – January 21, 2008
Part 1 of 3

Prepared for:

Lewis Operating Corporation
1156 North Mountain Avenue
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LLG Ref. 2-06-2760-1

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TRAFFIC IMPACT ANALYSIS

"SOUTH OF PINE AVENUE" (TENTATIVE TRACT MAP NO. 16420)

THE PRESERVE PHASE 3 AND 4 AREAS

EXTERNAL EVALUATION

Chino, California
Revised – January 21, 2008

1.0 INTRODUCTION

This Traffic Impact Analysis addresses the potential traffic impacts and circulation needs associated with the "South of Pine Avenue" Development Project (also known as Tentative Tract Map No. 16420 and as the Phase 3 and 4 Areas of The Preserve). A summary of Findings and Conclusions is presented in Section 15 of this report.

The project site is roughly a 540-acre parcel of land bounded by Pine Avenue to the north, Chino-Corona Road (East/West: E/W) to the south, Chino-Corona Road (North/South: N/S) to the west and Hellman Avenue to the east, in the City of Chino, California. The plan includes a total of 4,006 dwelling units (DU) plus retail, office, recreational, educational, and park uses. The 4,006 DU Plan is the focus of this report. Within this Plan is a 12-acre parcel programmed for 24 dwelling units of Estate Residential (ER). That 12-acre parcel has an optional designation as an elementary or K-8 school site, which would be the second such site in the South of Pine plan, and the third school site within the total Lewis Operating Corporation footprint of The Preserve. That option would substitute the school site for the ER designation on those 12 acres, and reduce the overall unit count to 3,982, while keeping all other elements of the plan the same. The variation in impacts due to the "potential third school site" plan is discussed in Section 14 of this report.

This report documents the findings and recommendations of a traffic impact analysis conducted by Linscott, Law & Greenspan, Engineers (LLG) to determine the potential impacts that the South of Pine Avenue Development Project may have on the local and regional network in the vicinity of the project site. A total of thirty-four (34) intersections, located in the City of Chino, City of Chino Hills, unincorporated County of San Bernardino and unincorporated County of Riverside have been identified as the locations that may be impacted by the proposed project. The project site has been visited and an inventory of adjacent area roadways and intersections completed. Existing traffic count information has been compiled and is utilized in this report in support of a detailed intersection capacity analysis.

The Scope of Work for this project was developed based on coordination with City of Chino staff and in consideration of the guidelines for the preparation of traffic impact analysis reports as outlined in the *Congestion Management Program for San Bernardino County, 2005 Update*, prepared by the San Bernardino Associated Governments (SANBAG).

This traffic report analyzes existing traffic conditions and future peak hour traffic conditions in a near-term (Year 2015) setting and in the CMP horizon year (Year 2030). Near-term (Year 2015) cumulative peak hour traffic forecasts were projected by incorporating a one (1%) percent annual growth rate and the trip generation potential of eighty-one (81) related projects. Long-term (Year 2030) peak hour traffic forecasts were projected based on modeled traffic projections prepared by Meyer, Mohaddes Associates (MMA) utilizing the City of Chino 2030 Model.

1.1 Study Overview/Project Background

The Preserve has been the subject of a series of prior traffic investigations, some of which considered the entirety of the development area within the Specific Plan footprint, while other investigations focused to specific subareas in a cumulative near-term and/or long-term investigation. Among those documents, with an explanation of their relevance to a traffic assessment of the proposed South of Pine Avenue Development Project, are the following:

- *Chino Agriculture Preserve Subarea 2 Traffic Impact Analysis (Revised), Chino, California*; Urban Crossroads, Inc; July 16, 2002: Formed the basis of the traffic section within the Final Environmental Impact Report (EIR) for The Preserve. Provided Interim Year 2010, CMP Horizon Year 2020, and General Plan Post 2020 long-term cumulative traffic forecasts, impact and mitigation analysis in a Congestion Management Plan (CMP) format. The study utilized the Comprehensive Transportation Plan (CTP) traffic model, which was the only model being used for long range planning in San Bernardino County because of its "finding of consistency" from SCAG/SANBAG. The project development site was explicitly accounted for within the analysis based on the land use tabulation addressed in the EIR. The study investigated in excess of 60 intersections over a wide area, but only about 10 of these were within or nearly contiguous to The Preserve Specific Plan footprint.

- *The Preserve, Chino, Internal Traffic Model Methodology & Findings: Long-Term/Project Buildout Conditions*; Linscott, Law & Greenspan, Engineers; March 7, 2003: Starting from the EIR traffic study forecasts and analyses, took a finer-grained look at 40 key intersections within The Preserve footprint. Also considered a much more detailed development plan breakout than was in the EIR, segmenting the development to a refined internal traffic analysis zone (TAZ) system, with project trip generation details to match. Developed and presented buildout intersection lane geometry and traffic control recommendations throughout The Preserve to supplement those conclusions/recommendations of the Final EIR.

- *Revised Traffic Impact Study for the Van Vliet Site in The Preserve, Chino, California*; Linscott, Law & Greenspan, Engineers, December 16, 2005: Presented a near term (Phase 1 and Phase 2) analysis of key intersections surrounding the site (generally located south of Bickmore Avenue, north of Pine Avenue, east of Euclid Avenue, and west of the former Cucamonga Avenue). Compiled the initial list of cumulative projects emerging in the area, that when augmented with other cumulative project additions, has been carried over to the interim Year 2015 analysis of this study.

- T*raffic Impact Study for the DeBoer Site in The Preserve, Chino, California*; Linscott, Law & Greenspan, Engineers; June 23, 2006: Completed an assessment of that portion of the applicant's holdings in The Preserve generally located northwest of the Haven/Pine intersection; and inclusive of previously-studied Phase 1 and Phase 2 development components of The Preserve (noting that the South of Pine Development Project addressed in this current study has also been known as the Phase 3 and Phase 4 areas of The Preserve). The DeBoer study also refined long-term circulation needs/recommendations through an analysis of 19 intersections in a study area that overlaps that of this South of Pine Avenue study.

- *Chino Traffic Model,* Meyer Mohaddes Associates (now known as Iteris), 2007: Has provided an updated/refined basis to forecast Year 2030 traffic volumes throughout the study area. Linscott, Law & Greenspan, Engineers has obtained specifically tailored model forecasts based on General Plan buildout conditions in the study area. It should be noted that the General Plan Post 2020 long term horizon of The Preserve EIR (2002) is now replaced, for transportation planning purposes, by the Year 2030 volumes of the Chino Traffic Model. This change would also "roll" the long term (Post – 2020) reference year and intersection improvement needs in other studies discussed above to year 2030.

1.2 Study Area

A total of thirty-four (34) key study intersections were selected for evaluation in one or more analytical years utilizing CMP analysis criteria and/or requirements/expectations of the City of Chino. Per the San Bernardino County CMP, the study area must include CMP roadways with 50 or more peak hour project trips (two-way), and many, but not all of the 34 candidate intersections meet that criteria in Year 2030. In addition, the analysis need not extend more than five miles beyond the proposed project site, even if there are more than 50 project trips on an arterial.

To further aid in our determination of the project study area, a comparison of the project trips associated with the site within existing General Plan traffic model forecasts ("existing general plan") versus those associated with the proposed project plan merged to a General-Plan-based background condition ("proposed project-general plan") was conducted at approximately fifty intersections within the vicinity of the proposed project to determine where the CMP 50-trip threshold was exceeded. Any intersection where the net difference in project trips was greater than 50-trips was also included in our analysis. ***Appendix A*** contains the "existing general plan" versus the "proposed project-general plan" comparison summary table.

Given the aforementioned criteria, the intersections listed below, of which 12 do not currently exist, provide both local and regional access to the study area and define the extent of the boundaries for this traffic impact investigation.

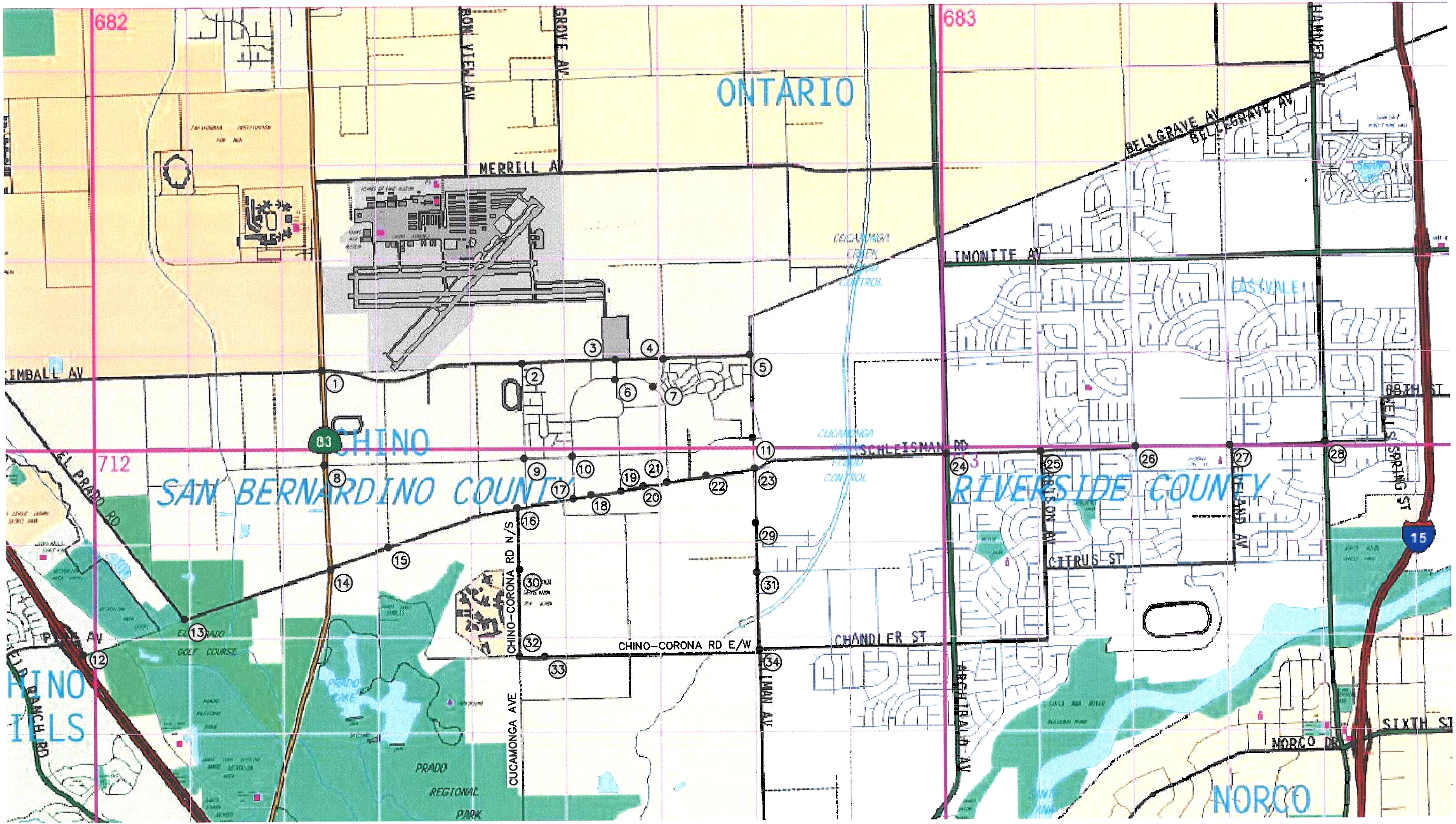
1. Euclid Avenue at Kimball Avenue
2. Mill Creek Avenue at Kimball Avenue
3. Main Street at Kimball Avenue
4. "C" Street at Kimball Avenue
5. Hellman Avenue at Kimball Avenue/Limonite Ave
6. Main Street at North Preserve Loop
7. "C" Street at North Preserve Loop
8. Euclid Avenue at Bickmore Avenue
9. Mill Creek Avenue at Bickmore Avenue
10. West Preserve Loop at Bickmore Avenue
11. Hellman Avenue at Bickmore Avenue
12. SR-71 NB Ramp at Pine Avenue
13. El Prado Road at Pine Avenue
14. Euclid Avenue at Pine Avenue
15. Sultana Avenue at Pine Avenue
16. Mill Creek Ave/Chino-Corona Rd N/S at Pine Ave
17. West Preserve Loop at Pine Avenue
18. 1st Street at Pine Avenue
19. Main Street at Pine Avenue
20. 2nd Street at Pine Avenue
21. East Preserve Loop at Pine Avenue
22. 3rd Street at Pine Avenue
23. Hellman Ave at Pine Ave/Schleisman Road
24. Archibald Avenue at Schleisman Road
25. Harrison Avenue at Schleisman Road
26. Sumner Avenue at Schleisman Road
27. Cleveland Avenue at Schleisman Road
28. Hamner Avenue at Schleisman Road
29. Hellman Avenue at "A" Street
30. Chino-Corona Rd N/S at "B" Street
31. Hellman Avenue at "B" Street
32. Chino-Corona Rd N/S at Chino-Corona Road E/W
33. "E" Street at Chino-Corona Road E/W
34. Hellman Ave at Chino-Corona Rd/Chandler Street

Figure 1-1 presents a Vicinity Map, which illustrates the general location of the project and depicts the study candidate intersection locations and surrounding street system.

The Level of Service (LOS) investigations at these key locations were used to evaluate the potential traffic-related impacts associated with area growth, related projects and the proposed project. When necessary, this report recommends intersection improvements that may be required to accommodate future traffic volumes and restore/maintain an acceptable Level of Service.

Included in this Traffic Impact Analysis are:

- Existing traffic counts,
- Estimated cumulative project traffic generation/assignment,
- Estimated project traffic generation/distribution/assignment,
- AM and PM peak hour analyses for existing conditions, near-term (Year 2015), and long-term (Year 2030) conditions without and with project traffic,
- General Plan comparison,
- Area traffic improvements,
- Project-related fair-share contributions,
- Alternative access evaluation for Pine Avenue,
- Synchro evaluation for Pine Avenue,
- Signal warrant analyses,
- Turning lane storage requirements,
- An analysis of the external impact variation due to the "Potential Third School Site",
- A summary of findings and conclusions.



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SOURCE: THOMAS BROS.

KEY

(#) = STUDY INTERSECTIONS

FIGURE 1-1

VICINITY MAP

SOUTH OF PINE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO

2.0 PROJECT DESCRIPTION

The project site is a roughly 540-acre parcel of land bounded by Pine Avenue to the north, Chino-Corona Road E/W to the south, Chino-Corona Road N/S to the west and Hellman Avenue to the east, in the City of Chino, California.

Figure 2-1 presents the proposed site plan for the South of Pine Avenue Development Project, prepared by EDAW. Review of the proposed site plan indicates that the South of Pine Avenue Development Project will consist of eleven Planning Areas that are comprised of single family residential uses, condominium/townhouse uses, retail uses (shopping center), general office uses, recreation uses (i.e. community centers, neighborhood parks and City parks), library uses and an elementary school. The South of Pine Avenue Development Project will be constructed in several phases with an interim buildout of some of the Planning Areas expected to occur by the Year 2015 (i.e. Planning Areas No. 1, No. 5, No. 8 and No. 9) and ultimate buildout of the entire site (all eleven Planning Areas) expected to occur by the Year 2030. The following two tables summarize the development tabulations for the Year 2015 and the Year 2030.

Table 2-1 summarizes the Year 2015 proposed development tabulation for the South of Pine Avenue Development Project for the four Planning Areas expected to be fully completed or partially completed. This table shows the planning area number, the parcel type, the land use and the size of the land use. As shown at the bottom of *Table 2-1*, the proposed project in the Year 2015 will consist of 325 single-family homes, 1,542 condominiums/townhomes, 46,000 SF of recreation uses (i.e. community centers), a 20,000 SF library, 6.00 acres of neighborhood parks and 8.00 acres of City parks.

Table 2-2 summarizes the Year 2030 proposed development tabulation for the South of Pine Avenue Development Project for each of the eleven proposed planning areas. The structure of this table is similar to *Table 2-1*. As shown at the bottom of *Table 2-2*, the proposed project at completion will consist of 1,061 single-family homes, 2,945 condominiums/townhomes, 341,124 square feet (SF) of retail uses, 148,000 SF of general office uses, 46,000 SF of recreation uses (i.e. community centers), a 20,000 SF library, a 12.84 acre/1,000 student elementary school, 9.00 acres of neighborhood parks and 16.00 acres of City parks. For convenience, this exact project description is referred to as the "4,006 DU Plan", and this plan is the focus of this traffic study.

Within the 4,006 DU Plan footprint, there is a 12-acre parcel programmed for 24 dwelling units of Estate Residential. That 12-acre parcel has an optional designation as an elementary or K-8 school site, which would be the second such site in the South of Pine plan, and the third school site within the total Lewis Operating Corporation footprint of The Preserve. That option would substitute the school site for the prior ER designation on those 12 acres, and reduce the overall unit count to 3,982, while keeping all other elements of the plan the same. The exact development description as well as the variation in impacts (as compared to the 4,006 DU Plan) due to the "potential third school site" plan is discussed in Section 14 of this report.

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FIGURE 2-1

PROPOSED SITE PLAN

SOUTH OF PINE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO

2.1 Site Access

Access to the South of Pine Avenue Development Project will generally be provided via Pine Avenue, Chino-Corona Road E/W, Chino-Corona Road N/S and Hellman Avenue. The proposed project will provide connections to Pine Avenue via West Preserve Loop, 1st Street, Main Street, 2nd Street, East Preserve Loop and 3rd Street. "E" Street to be constructed by the proposed project will provide a connection to Chino-Corona Road. The proposed project will provide a connection to Chino-Corona Road N/S via "B" Street and a connection to Hellman Avenue via "A" Street and "B" Street.

Prior site planning activities anticipated the direct southerly extension of Main Street all the way to Chino-Corona Road E/W. The "E" Street connection to Chino-Corona Road E/W as shown in the current site plan is considered an equivalent connection from a transportation planning and impact perspective. Given the similarity of the connections in the context of the overall project plan, a similar traffic volume would be attracted to either alignment, and the external impacts of the project not materially altered.

TABLE 2-1
YEAR 2015 PROJECT DEVELOPMENT SUMMARY

Planning Area No.	Parcel Type	Land Use	Acres	Dwelling Units	Square-Footage
1	MDR	Single Family Residential	37.62	325 DU	--
	MDR	Condominium/Townhouse	6.00	62 DU	--
	MDR	Neighborhood Park	3.00	--	--
		Subtotal	*46.62*	*387 DU*	--
5	MDR	Condominium/Townhouse	49.11	690 DU	--
		Subtotal	*49.11*	*690 DU*	--
8	HDR	Condominium/Townhouse	19.64	310 DU	--
	CC Res	Condominium/Townhouse	14.01	250 DU	--
	CC Non Res-CF	Recreation Comm. Center	3.90	--	15,000 SF
	CC Non Res	Neighborhood Park	1.50	--	--
		Subtotal	*39.05*	*560 DU*	*15,000 SF*
9	HDR	Condominium/Townhouse	6.65	110 DU	--
	CC Res	Condominium/Townhouse	6.44	120 DU	--
	CC Non Res-CF	Recreation Comm. Center	1.82	--	31,000 SF
	CC Non Res-CF	Library	1.67	--	20,000 SF
	CC Non Res	City Park	8.00	--	--
	CC Non Res	Neighborhood Park	1.50	--	--
		Subtotal	*26.08*	*230 DU*	*51,000 SF*
Breakdown By Land Use					
▪ Single Family Residential			37.62	325 DU	--
▪ Condominium/Townhouse			101.85	1,542 DU	--
▪ Shopping Center			--	--	--
▪ General Office			--	--	--
▪ Recreation Community Center			5.72	--	46,000 SF
▪ Library			1.67	--	20,000 SF
▪ Elementary School			--	--	--
▪ Neighborhood Park			6.00	--	--
▪ City Park			8.00	--	--
Year 2015 Total Development			**160.86**	**1,867 DU**	**66,000 SF**

TABLE 2-2
YEAR 2030 PROJECT DEVELOPMENT SUMMARY (4,006 DU PLAN)

Planning Area No.	Parcel Type	Land Use	Acres	Dwelling Units	Square-Footage
1	MDR	Single Family Residential	37.62	325 DU	--
	MDR	Condominium/Townhouse	6.00	62 DU	--
	MDR	Neighborhood Park	3.00	--	--
		Subtotal	*46.62*	*387 DU*	--
2	LDR	Single Family Residential	28.01	141 DU	--
	LDR	Condominium/Townhouse	28.01	141 DU	--
	ER	Single Family Residential	27.06	53 DU	--
		Subtotal	*83.08*	*335 DU*	--
3	LDR	Single Family Residential	47.01	233 DU	--
	ER	Single Family Residential	29.11	57 DU	--
	ER	Single Family Residential	12.00	24 DU	--
	ER	City Park	8.00	--	--
		Subtotal	*96.12*	*314 DU*	--
4	LDR	Single Family Residential	30.83	183 DU	--
	LDR	Condominium/Townhouse	30.82	182 DU	--
	ER	Single Family Residential	23.10	45 DU	--
		Subtotal	*84.75*	*410 DU*	--
5	MDR	Condominium/Townhouse	49.11	690 DU	--
	NC	Shopping Center	3.00	--	43,124 SF
		Subtotal	*52.11*	*690 DU*	*43,124 SF*
6	HDR	Condominium/Townhouse	8.06	120 DU	--
	CC Non Res	General Office	3.28	--	74,000 SF
	CC Non Res	Shopping Center	3.28	--	149,000 SF
		Subtotal	*14.62*	*120 DU*	*223,000 SF*
7	HDR	Condominium/Townhouse	11.66	150 DU	--
	CC Non Res	General Office	3.94	--	74,000 SF
	CC Non Res	Shopping Center	3.94	--	149,000 SF
		Subtotal	*19.54*	*150 DU*	*223,000 SF*
8	HDR	Condominium/Townhouse	19.64	310 DU	--
	CC Res	Condominium/Townhouse	14.01	250 DU	--
	CC Non Res-CF	Recreation Comm. Center	3.90	--	15,000 SF
	CC Non Res	Neighborhood Park	1.50	--	--
		Subtotal	*39.05*	*560 DU*	*15,000 SF*

TABLE 2-2 (CONTINUED)
YEAR 2030 PROJECT DEVELOPMENT SUMMARY (4,006DU PLAN)

Planning Area No.	Parcel Type	Land Use	Acres	Dwelling Units	Square-Footage
9	HDR	Condominium/Townhouse	6.65	110 DU	--
	CC Res	Condominium/Townhouse	6.44	120 DU	--
	CC Non Res-CF	Recreation Comm. Center	1.82	--	31,000 SF
	CC Non Res-CF	Library	1.67	--	20,000 SF
	CC Non Res	Elementary School[1]	12.84	--	--
	CC Non Res	City Park	8.00	--	--
	CC Non Res	Neighborhood Park	1.50	--	--
		Subtotal	*38.92*	*230 DU*	*51,000 SF*
10	HDR	Condominium/Townhouse	12.53	170 DU	--
	MDR	Condominium/Townhouse	14.56	180 DU	--
	CC Res	Condominium/Townhouse	3.70	55 DU	--
	CC Non Res	Neighborhood Park	1.50	--	--
		Subtotal	*32.29*	*405 DU*	--
11	HDR	Condominium/Townhouse	12.54	170 DU	--
	MDR	Condominium/Townhouse	14.56	180 DU	--
	CC Res	Condominium/Townhouse	3.69	55 DU	--
	CC Non Res	Neighborhood Park	1.50	--	--
		Subtotal	*32.29*	*405 DU*	--
Breakdown By Land Use					
▪ Single Family Residential			2347.74	1,061 DU	--
▪ Condominium/Townhouse			241.98	2,945 DU	--
▪ Shopping Center			10.22	--	341,124 SF
▪ General Office			7.22	--	148,000 SF
▪ Recreation Community Center			5.72	--	46,000 SF
▪ Library			1.67	--	20,000 SF
▪ Elementary School			12.84	--	--
▪ Neighborhood Park			9.00	--	--
▪ City Park			16.00	--	--
Year 2030 Total Development			**539.39**	**4,006 DU**	**555,124 SF**

---

[1] Elementary School = 1,000 Students.

3.0 EXISTING CONDITIONS

3.1 Existing Street System

The Chino Valley Freeway (SR-71) provides regional access to the Project site. The SR-71 is located west of the Project site. Regional access to the Project site is provided via a full interchange at Soquel Canyon Parkway/Central Avenue and Butterfield Ranch Road/Euclid Avenue.

The principal local network of streets serving the South of Pine Avenue Development Project includes Pine Avenue, Chino-Corona Road E/W, Chino-Corona Road N/S, Kimball Avenue, Bickmore Avenue, Euclid Avenue and Hellman Avenue. The following discussion provides a brief synopsis of these key area streets. The descriptions are based on an inventory of existing roadway conditions and the City of Chino General Plan Circulation Element.

Pine Avenue is generally a two-lane undivided roadway oriented in the east-west direction, which borders the project site to the north. Pine Avenue will provide access to the project site via West Preserve Loop, 1st Street, Main Street, 2nd Street, East Preserve Loop and 3rd Street. Parking is generally not permitted on either side of this roadway within the vicinity of the project. The posted speed limit on Pine Avenue in the vicinity of the project is 55 miles per hour (mph). Pine Avenue is designated as a Major Arterial in the City of Chino Circulation Element in the vicinity of the project.

Chino-Corona Road E/W is generally a two-lane undivided roadway oriented in the east-west direction, which borders the project site to the south. Chino-Corona Road E/W will provide access to the site via "E" Street. Parking is generally not permitted on either side of this roadway within the vicinity of the project. There is no posted speed limit on Chino-Corona Road E/W. Chino-Corona Road E/W is designated as a Local Collector in the City of Chino Circulation Element.

Chino-Corona Road N/S is generally a two-lane undivided roadway oriented in the north-south direction, which borders the project site to the west. Chino-Corona Road N/S will provide access to the project site via "B" Street. Parking is generally not permitted on either side of this roadway within the vicinity of the project. There is no posted speed limit on Chino-Corona Road N/S. Chino-Corona Road N/S is designated as a Local Collector in the City of Chino Circulation Element.

Kimball Avenue is an east west roadway, located north of the Project site. In the segment west of Euclid Avenue, a center two-way left-turn lane separates the eastbound and westbound travel lanes on Kimball Avenue. In the segment between Euclid Avenue and Mill Creek Road, Kimball Avenue is a two-lane roadway divided by double-double yellow centerline. In the segment east of Mill Creek Road, Kimball Avenue is a three-lane roadway (two lanes eastbound, one lane westbound) divided by a raised median. On-street parking is not permitted on either side of the roadway within the Project vicinity. The posted speed limit is 50 mph. Traffic signals exist at the intersections of Kimball Avenue at Mountain Avenue and Euclid Avenue.

Bickmore Avenue is generally an east-west, two-lane, undivided roadway, located north of the Project site. In the segment west of San Antonio Avenue, a center two-way left-turn lane separates the eastbound and westbound travel lanes on Bickmore Avenue. The segment between San Antonio Avenue and Euclid Avenue is currently under construction. In the segment east of Euclid Avenue, Bickmore Avenue is a two-lane undivided roadway. On-street parking is not permitted on either side of the roadway within the Project vicinity.

Euclid Avenue is a north-south, four-lane divided roadway that borders the Project area to the west. On-street parking is not permitted on either side of the roadway. The posted speed limit is 55 mph. Within the Project vicinity, traffic signals exist at the intersections of Euclid Avenue at Edison Avenue, Eucalyptus Avenue, Merrill Avenue, Kimball Avenue, Pine Avenue and the SR-71 Northbound Ramps.

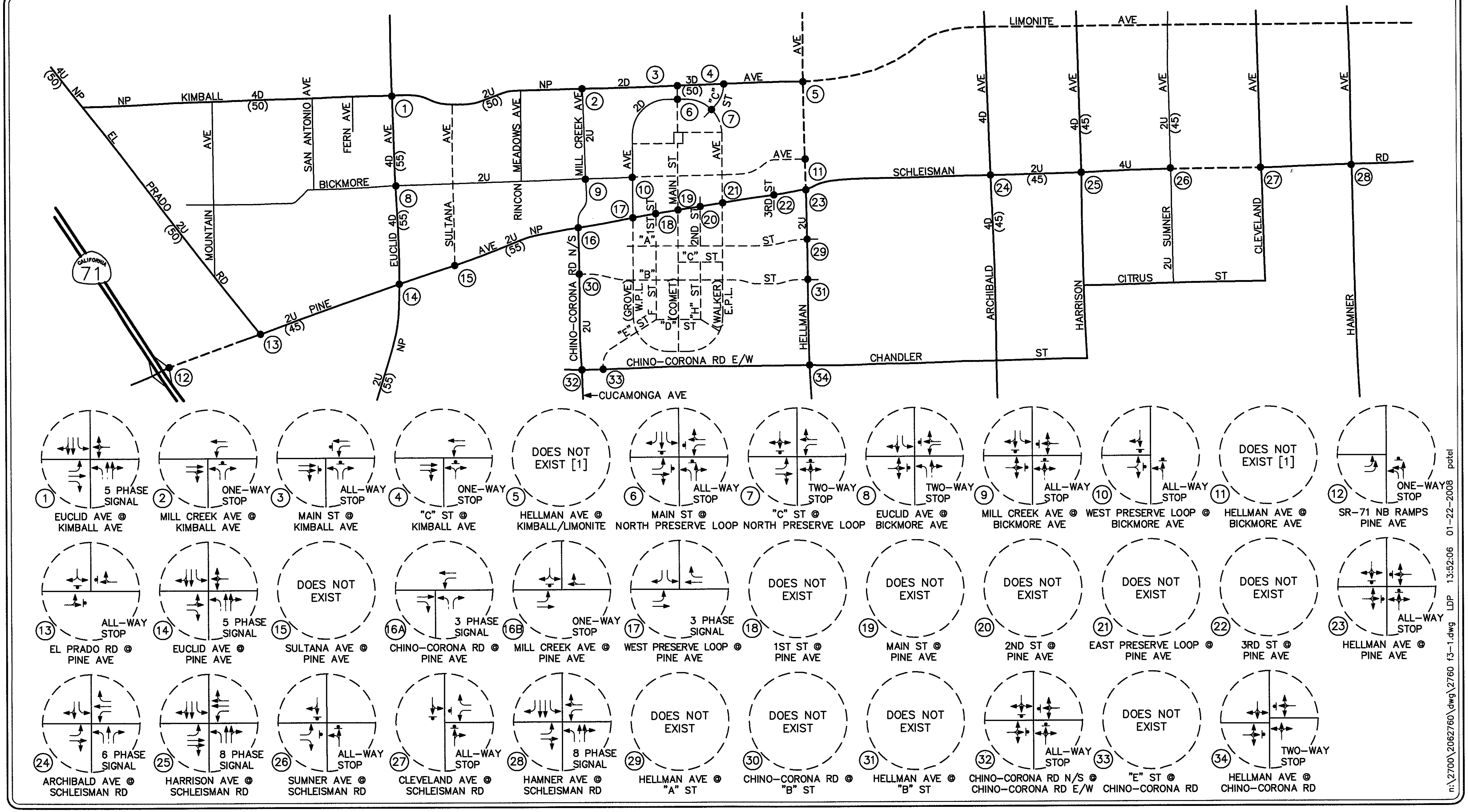
Hellman Avenue is generally a two-lane undivided roadway oriented in the north-south direction, which borders the project site to the east. Hellman Avenue will provide access to the project site via "A" Street and "B" Street. Parking is generally not permitted on either side of this roadway within the vicinity of the project. There is no posted speed limit on Hellman Avenue. Hellman Avenue is designated as a Major Arterial in the City of Chino Circulation Element.

Figure 3-1 presents an inventory of the existing roadway conditions for the arterials and intersections evaluated in this report. This figure identifies the number of travel lanes for key arterials, as well as intersection configurations and controls for the key area study intersections. It should be noted that Hellman Avenue at Kimball/Limonite Avenue (Intersection 5) and Hellman Avenue at Bickmore Avenue (Intersection 11) are now existing and newly constructed following the data gathering and traffic counts taken for this study.

3.2 Existing Traffic Volumes

Thirty-four (34) key study intersections have been identified as the potential locations at which to evaluate the impacts of the project. Twenty-two (22) of these intersections existed during the data gathering and traffic counts taken for this study. Some portion of potential project-related traffic may pass through each of these intersections. ***Figures 3-2*** and ***3-3*** illustrate the existing AM and PM peak hour traffic volumes, respectively, at the twenty-two (22) existing key study intersections evaluated in this report. The existing AM and PM peak hour traffic counts for intersections 1, 2, 3, 4, 6, 7, 8, 9 and 10 were obtained from the Traffic Impact Study for the Van Vliet Site in The Preserve, prepared by Linscott, Law and Greenspan, Engineers (dated December 16, 2005). The existing traffic volumes were obtained for the aforementioned nine intersections by subtracting out all related projects from the Van Vliet cumulative base. The existing AM and PM peak hour traffic counts for 12 other intersections (i.e. 13, 14, 16, 17, 23, 24, 25, 26, 27, 28, 32 and 34) were obtained from traffic counts conducted in August 2007 and September 2007 by National Data and Surveying Services. Count data for intersection 12 comes from a 2007 count already in LLG's files.

The existing AM and PM peak hour traffic volumes illustrated in *Figures 3-2* and *3-3* are comprised of passenger vehicles, large 2-axle trucks, 3-axle trucks and 4+-axle trucks. The truck traffic turning movements were converted to passenger car equivalents (P.C.E.'s) using SANBAG approved factors. P.C.E. factors of 1.5, 2.0 and 3.0 were utilized for large 2-axle trucks, 3-axle trucks and 4+-axle trucks, respectively. ***Appendix B*** contains copies of the peak period count sheets for the existing key study intersections.



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LINSCOTT
LAW &
GREENSPAN
engineers

N
NO SCALE

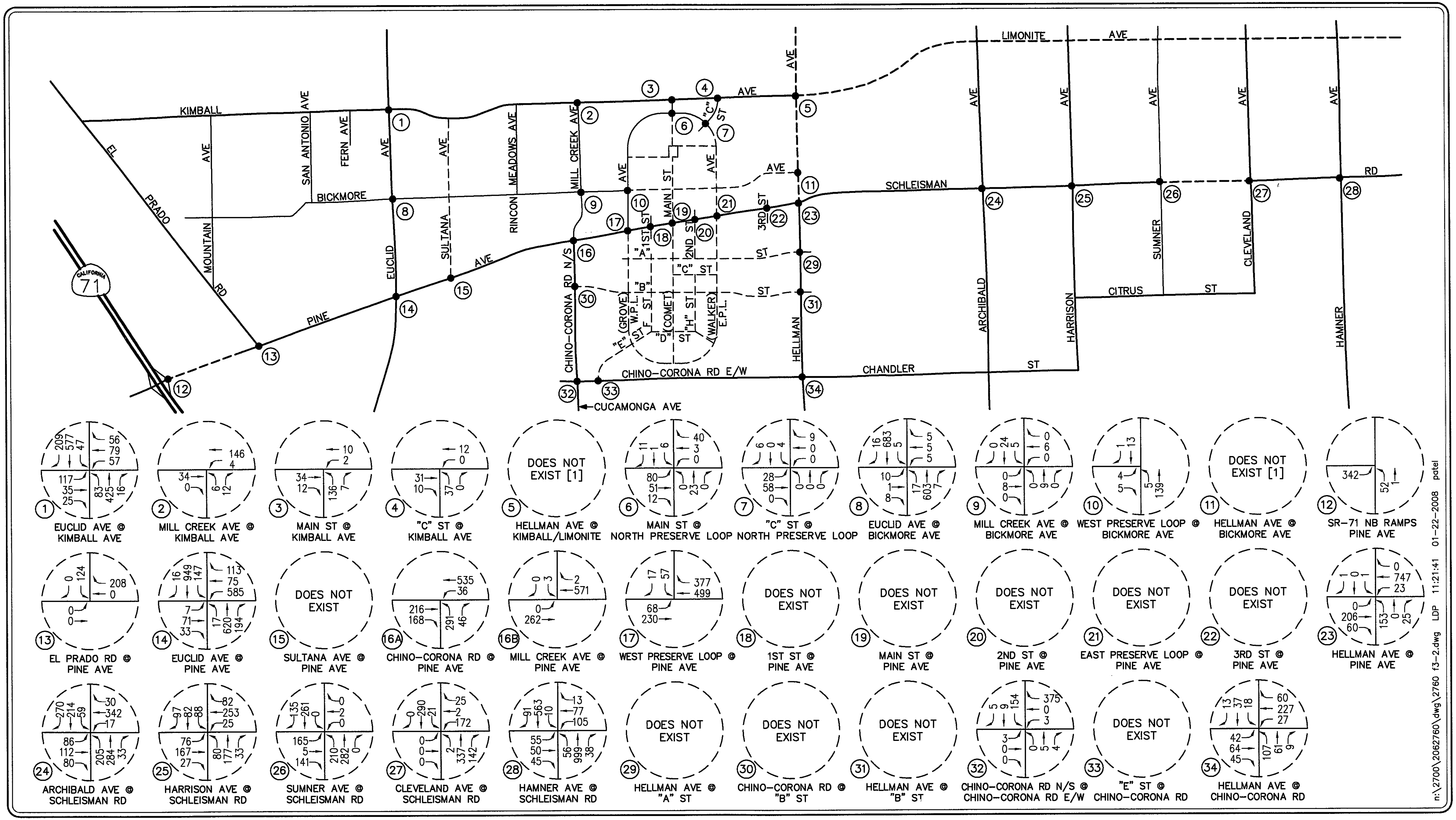
NOTE:
[1] INTERSECTIONS ARE NEWLY CONSTRUCTED FOLLOWING THE DATA GATHERING AND TRAFFIC COUNTS TAKEN FOR THIS STUDY.

LEGEND

– – – –	FUTURE ROADWAY
W.P.L. =	WEST PRESERVE LOOP
E.P.L. =	EAST PRESERVE LOOP

FIGURE 3-1

EXISTING ROADWAY CONDITIONS AND INTERSECTION CONTROLS
SOUTH OF PINE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO



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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

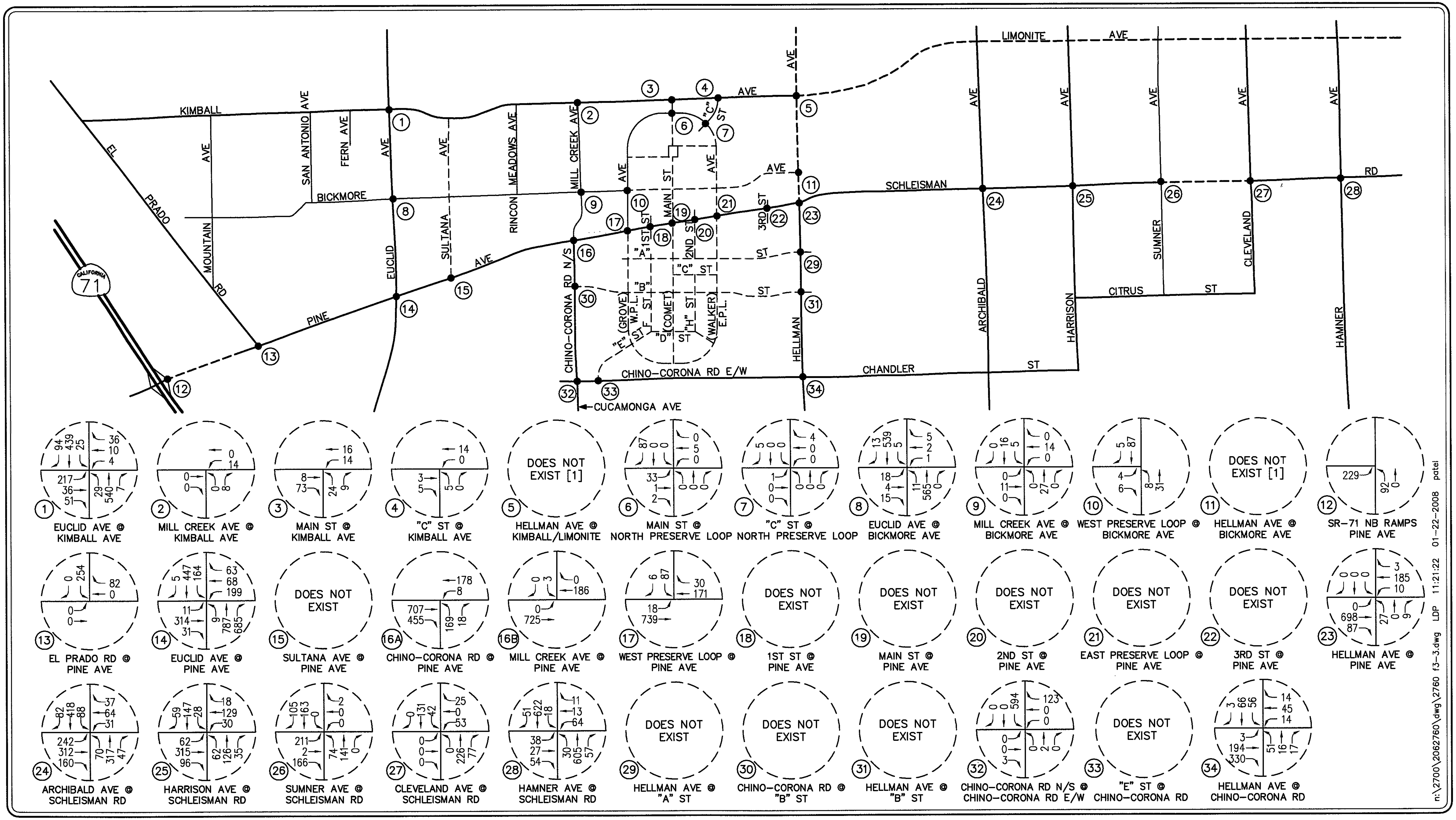
NOTE:
[1] INTERSECTIONS ARE NEWLY CONSTRUCTED FOLLOWING THE DATA GATHERING AND TRAFFIC COUNTS TAKEN FOR THIS STUDY.

LEGEND
– – – – FUTURE ROADWAY
W.P.L. = WEST PRESERVE LOOP
E.P.L. = EAST PRESERVE LOOP

FIGURE 3-2

EXISTING AM PEAK HOUR TRAFFIC VOLUMES

SOUTH OF PINE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO



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LINSCOTT LAW & GREENSPAN engineers

NO SCALE

NOTE:
[1] INTERSECTIONS ARE NEWLY CONSTRUCTED FOLLOWING THE DATA GATHERING AND TRAFFIC COUNTS TAKEN FOR THIS STUDY.

LEGEND
– – – – FUTURE ROADWAY
W.P.L. = WEST PRESERVE LOOP
E.P.L. = EAST PRESERVE LOOP

G-171

FIGURE 3-3

EXISTING PM PEAK HOUR TRAFFIC VOLUMES
SOUTH OF PINE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO

3.3 Existing Intersection Conditions

In conformance with the City of Chino and San Bernardino County CMP requirements, existing AM and PM peak hour operating conditions for the signalized and unsignalized intersections were evaluated using the *Highway Capacity Manual 2000* (HCM 2000) methodology. Saturation flow rates input to these analyses are per CMP default lane capacity values; 1800 for through lanes, 1700 for exclusive left turn lanes, 1600 for exclusive right turn lanes, and 3200 for dual left turn lanes.

3.3.1 *Highway Capacity Manual (HCM) Method of Analysis (Signalized Intersections)*

Based on the HCM operations method of analysis, level of service for signalized intersections is defined in terms of control delay, which is a measure of driver discomfort, frustration, fuel consumption, and lost travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, geometries, traffic, and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during ideal conditions: in the absence of traffic control, in the absence of geometric delay, in the absence of any incidents, and when there are no other vehicles on the road.

In Chapter 16 of the HCM, only the portion of total delay attributed to the control facility is quantified. This delay is called *control delay.* Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. In contrast, in previous versions of the HCM (1994 and earlier), delay included only stopped delay. Specifically, LOS criteria for traffic signals are stated in terms of the average control delay per vehicle. The six qualitative categories of Level of Service that have been defined along with the corresponding HCM control delay value range for signalized intersections are shown in ***Table 3-1***.

According to the City of Chino, LOS "D" is the minimum acceptable condition that should be maintained during the peak commute hours at all City intersections, except those on the Congestion Management Program Highway System (CMPHS) of San Bernardino County, where LOS E is defined in the CMP for San Bernardino County as the acceptable limit. For those study intersections within the City of Chino Hills, LOS "D" is also the minimum acceptable condition that should be maintained during the peak commute hours. For those study intersections within unincorporated County of San Bernardino and unincorporated County of Riverside, LOS "C" is the minimum acceptable condition that should be maintained during the peak commute hours.

3.3.2 *Highway Capacity Manual (HCM) Method of Analysis (Unsignalized Intersections)*

The 2000 HCM unsignalized methodology for stop-controlled intersections was utilized for the analysis of the unsignalized intersections. This methodology estimates the average control delay for each of the subject movements and determines the level of service for each movement. The overall average control delay measured in seconds per vehicle, and level of service is then calculated for the entire intersection. The HCM control delay value translates to a Level of Service (LOS) estimate, which is a relative measure of the intersection performance. The six qualitative categories of Level of Service have been defined along with the corresponding HCM control delay value range, as shown in ***Table 3-2***.

TABLE 3-1
LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS[2]

Level of Service (LOS)	Control Delay Per Vehicle (seconds/vehicle)	Level of Service Description
A	≤ 10.0	This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	> 10.0 and ≤ 20.0	This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.
C	> 20.0 and ≤ 35.0	Average traffic delays. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.
D	> 35.0 and ≤ 55.0	Long traffic delays At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high *v/c* ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	> 55.0 and ≤ 80.0	Very long traffic delays This level is considered by many agencies (i.e. SANBAG) to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high *v/c* ratios. Individual cycle failures are frequent occurrences.
F	≥ 80.0	Severe congestion This level, considered to be unacceptable to most drivers, often occurs with over saturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high *v/c* ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors to such delay levels.

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[2] Source: *Highway Capacity Manual 2000,* Chapter 16 (Signalized Intersections).

TABLE 3-2
LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS[3]

Level of Service (LOS)	Highway Capacity Manual Delay Value (sec/veh)	Level of Service Description
A	≤ 10.0	Little or no delay
B	> 10.0 and ≤ 15.0	Short traffic delays
C	> 15.0 and ≤ 25.0	Average traffic delays
D	> 25.0 and ≤ 35.0	Long traffic delays
E	> 35.0 and ≤ 50.0	Very long traffic delays
F	> 50.0	Severe congestion

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[3] Source: *Highway Capacity Manual 2000*, Chapter 17 (Unsignalized Intersections).

3.4 Existing Level of Service Results

Table 3-3 summarizes the existing peak hour service level calculations for all twenty-two (22) existing key study area intersections based on existing traffic volumes (Figures 3-2 and 3-3) and current street geometry (Figure 3-1). Review of *Table 3-3* indicates that 20 existing key study intersections currently operate at an acceptable LOS when compared to the LOS criteria identified in this report. Intersection 22 (Hellman Avenue at Pine Avenue/Schleisman Road) calculates to an adverse LOS F in the AM peak hour based on its all-way stop control. Archibald Avenue at Schleisman Road calculates to LOS D in both peak hours, exceeding the LOS C criteria of Riverside County.

Appendix C presents the HCM/LOS calculations for the key study intersections for the AM peak hour and PM peak hour.

Please note that *Table 3-3* also indicates the control type for each study intersection (i.e. signalized or unsignalized). For clarification, the following bulleted items provide a definition of the types of signal phasing presented in *Table 3-3* for signalized intersections.

- Two-phase signal = traffic signal does not provide protected left-turn phasing along the major street and the cross-street (minor street). All movements (left, through, right) occur on a "green ball".
- Three-phase signal = traffic signal provides for protected left-turn phasing along the major street and protected phasing along the cross-street (minor street). This type of phasing is common for "T" intersections.
- Five-phase signal = traffic signal provides for protected left-turn phasing along the major street. The traffic signal does not provide protected left-turn phasing along the cross-street (minor street) and all cross-street movements (left, through, right) occur on a "green ball".
- Six-phase signal = traffic signal provides for protected left-turn phasing along the major street. The traffic signal provides protected phasing/split-phasing for each direction along the cross-street (minor street).
- Eight-phase signal = traffic signal provides for protected left-turn phasing along the major street and the cross-street (minor street).

TABLE 3-3
EXISTING PEAK HOUR LEVELS OF SERVICE[4]

Key Intersections	Jurisdiction	Time Period	Control Type	Delay (sec/veh)	LOS
1. Euclid Avenue at Kimball Avenue	City of Chino	AM	5Ø Traffic Signal	21.9 s/v	C
		PM		19.9 s/v	B
2. Mill Creek Avenue at Kimball Avenue	City of Chino	AM	One – Way Stop	0.9 s/v	A
		PM		9.1 s/v	A
3. Main Street at Kimball Avenue	City of Chino	AM	All – Way Stop	6.7 s/v	A
		PM		2.8 s/v	A
4. "C" Street at Kimball Avenue	City of Chino	AM	One – Way Stop	3.7 s/v	A
		PM		1.6 s/v	A
5. Hellman Avenue at Kimball Avenue/Limonite Ave	City of Chino/Riverside County	AM	Intersection Currently Does Not Exist [a]		
		PM			
6. Main Street at North Preserve Loop	City of Chino	AM	All – Way Stop	7.8 s/v	A
		PM		7.4 s/v	A
7. "C" Street at North Preserve Loop	City of Chino	AM	Two – Way Stop	2.8 s/v	A
		PM		4.9 s/v	A
8. Euclid Avenue at Bickmore Avenue	City of Chino	AM	Two – Way Stop	0.9 s/v	A
		PM		1.0 s/v	A
9. Mill Creek Avenue at Bickmore Avenue	City of Chino	AM	All – Way Stop	7.3 s/v	A
		PM		7.2 s/v	A
10. West Preserve Loop at Bickmore Avenue	City of Chino	AM	All – Way Stop	7.6 s/v	A
		PM		7.3 s/v	A
11. Hellman Avenue at Bickmore Avenue	City of Chino/Riverside County	AM	Intersection Currently Does Not Exist [a]		
		PM			
12. SR-71 Northbound Ramp at Pine Avenue	City of Chino Hills/ Caltrans	AM	One– Way Stop	12.7 s/v	B
		PM		11.6 s/v	B

Notes:
s/v = seconds per vehicle (delay)
[a] = Intersection construction completed following data gathering and traffic counts taken for this study.

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[4] **Bold HCM/LOS values** indicate adverse service levels based on City of Chino, City of Chino Hills, County of San Bernardino and County of Riverside LOS standards.

TABLE 3-3 (CONTINUED)
EXISTING PEAK HOUR LEVELS OF SERVICE[5]

Key Intersections	Jurisdiction	Time Period	Control Type	Delay (sec/veh)	LOS
13. El Prado Road at	City of Chino	AM	All – Way	7.9 s/v	A
Pine Avenue		PM	Stop	8.8 s/v	A
14. Euclid Avenue at	City of Chino	AM	5∅ Traffic	47.1 s/v	D
Pine Avenue		PM	Signal	34.2 s/v	C
15. Sultana Avenue at	City of Chino	AM	Intersection Currently Does Not Exist		
Pine Avenue		PM			
16a. Chino-Corona Rd N/S at	City of Chino	AM	3∅ Traffic	25.6 s/v	C
Pine Avenue		PM	Signal	17.5 s/v	B
16b. Mill Creek Avenue at	City of Chino	AM	One-Way	0.0 s/v	A
Pine Avenue		PM	Stop	0.0 s/v	A
17. West Preserve Loop at	City of Chino	AM	3∅ Traffic	12.2 s/v	B
Pine Avenue		PM	Signal	11.9 s/v	B
18. 1st Street at	City of Chino	AM	Intersection Currently Does Not Exist		
Pine Avenue		PM			
19. Main Street at	City of Chino	AM	Intersection Currently Does Not Exist		
Pine Avenue		PM			
20. 2nd Street at	City of Chino	AM	Intersection Currently Does Not Exist		
Pine Avenue		PM			
21. East Preserve Loop at	City of Chino	AM	Intersection Currently Does Not Exist		
Pine Avenue		PM			
22. 3rd Street at	City of Chino	AM	Intersection Currently Does Not Exist		
Pine Avenue		PM			
23. Hellman Ave at	City of Chino/Riverside County	AM	All – Way	57.9 s/v	**F**
Pine Ave/Schleisman Rd		PM	Stop	34.0 s/v	D

Notes:
s/v = seconds per vehicle (delay)

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[5] **Bold HCM/LOS values** indicate adverse service levels based on City of Chino, City of Chino Hills, County of San Bernardino and County of Riverside LOS standards.

TABLE 3-3 (CONTINUED)
EXISTING PEAK HOUR LEVELS OF SERVICE[6]

Key Intersections	Jurisdiction	Time Period	Control Type	Delay (sec/veh)	LOS
24. Archibald Avenue at Schleisman Road	Riverside County	AM PM	6∅ Traffic Signal	54.1 s/v 51.2 s/v	**D** **D**
25. Harrison Avenue at Schleisman Road	Riverside County	AM PM	8∅ Traffic Signal	27.7 s/v 25.0 s/v	C C
26. Sumner Avenue at Schleisman Road	Riverside County	AM PM	All – Way Stop	19.6 s/v 11.1 s/v	C B
27. Cleveland Avenue at Schleisman Road	Riverside County	AM PM	All – Way Stop	14.9 s/v 9.2 s/v	B A
28. Hamner Avenue at Schleisman Road	Riverside County	AM PM	8∅ Traffic Signal	28.5 s/v 24.1 s/v	C C
29. Hellman Avenue at "A" Street	City of Chino/Riverside County	AM PM	Intersection Currently Does Not Exist		
30. Chino-Corona Rd N/S at "B" Street	City of Chino	AM PM	Intersection Currently Does Not Exist		
31. Hellman Avenue at "B" Street	City of Chino/Riverside County	AM PM	Intersection Currently Does Not Exist		
32. Chino-Corona Rd N/S at Chino-Corona Rd E/W	City of Chino	AM PM	All – Way Stop	9.4 s/v 18.4 s/v	A C
33. "E" Street at Chino-Corona Rd E/W	City of Chino	AM PM	Intersection Currently Does Not Exist		
34. Hellman Ave at Chino-Corona Rd/Chandler St	City of Chino/Riverside County	AM PM	Two – Way Stop	14.3 s/v 16.2 s/v	B C

Notes:
s/v = seconds per vehicle (delay)

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[6] **Bold HCM/LOS values** indicate adverse service levels based on City of Chino, City of Chino Hills, County of San Bernardino and County of Riverside LOS standards.

4.0 TRAFFIC FORECASTING METHODOLOGY

In order to estimate the traffic impact characteristics of the proposed South of Pine Avenue Development Project, a multi-step process has been utilized. The first step is trip generation, which estimates the total arriving and departing traffic on a peak hour and daily basis. The traffic generation potential is forecast by applying the appropriate vehicle trip generation equations or rates to the project development tabulation.

The second step of the forecasting process is trip distribution, which identifies the origins and destinations of inbound and outbound project traffic. These origins and destinations are typically based on demographics and existing/anticipated travel patterns in the study area.

The third step is traffic assignment, which involves the allocation of project traffic to study area streets and intersections. Traffic assignment is typically based on minimization of travel time, which may or may not involve the shortest route, depending on prevailing operating conditions and travel speeds. Traffic distribution patterns are commonly indicated by general percentage orientation, while traffic assignment allocates specific volume forecasts to individual roadway links and intersection turning movements throughout the study area. In this study, the distribution and assignment of project trips to key area roadways was determined by special runs of the Chino Traffic Model as carried out by Meyer Mohaddes Associates, and not by "manual" techniques that apply percentage assignment values to the project's peak hour traffic forecasts.

With the forecasting process complete and project traffic assignments developed, the impact of the proposed project is isolated by comparing operational (LOS) conditions at selected key intersections using expected future traffic volumes with and without forecast project traffic. The need for site-specific and/or cumulative local area traffic improvements can then be evaluated and the significance of the project's impacts identified.

5.0 PROJECT TRAFFIC CHARACTERISTICS

5.1 Project Traffic Generation

Traffic generation is expressed in vehicle trip ends, defined as one-way vehicular movements, either entering or exiting the generating land use. Generation equations and/or rates used in the traffic forecasting procedure are found in the Seventh Edition of *Trip Generation*, published by the Institute of Transportation Engineers (ITE) [Washington D.C., 2003].

Table 5-1 summarizes the trip generation rates used in forecasting the vehicular trips generated by the proposed South of Pine Avenue Development Project. As shown in *Table 5-1*, trips generated by the proposed project were estimated using ITE Land Use Code 210: Single Family Detached Housing rates, ITE Land Use Code 230: Residential Condominium/Townhouse rates, ITE Land Use Code 495: Community Recreation Center rates, ITE Land Use Code 520: Elementary School rates, ITE Land Use Code 590: Library rates, ITE Land Use Code 710: General Office Building rates and ITE Land Use Code 820: Shopping Center rates.

In order to provide a more conservative trip generation forecast, trip rates for land use "City Park (Developed)" and "Neighborhood/County Park (Undeveloped)" as contained in San Diego Traffic Generators, published by SANDAG were utilized for the park components of the proposed project instead of ITE Land Use Code 411: City Park. The SANDAG publication indicates a trip rate of 50 trips per acre per day for a "City Park (Developed)" land use and a trip rate of 5 trips per acre per day for a "Neighborhood/County Park (Undeveloped)" land use while ITE indicates a trip rate of 1.59 trips per acre per day for a "City Park" land use. Hence, the use of SANDAG's "City Park (Developed)" and "Neighborhood/County Park (Undeveloped)" trip rates are considered conservative.

Table 5-2 presents the forecast near-term (Year 2015) daily and peak hour project traffic volumes, as a subset of the 4,006 DU Plan, on a "typical" weekday, and provides a breakdown of the near-term project trips by land use (i.e. single family residential, condominium/townhouse, recreation community center, library, neighborhood park and City park). Review of *Table 5-2* shows that overall the proposed project in the near-term (Year 2015) is expected to generate 14,709 daily trips, with 1,072 trips (258 inbound, 814 outbound) produced in the AM peak hour and 1,388 trips (860 inbound, 528 outbound) produced in the PM peak hour.

The above values reflect the explicit development types and totals identified in Table 5-2. That development tabulation incorporates recent refinements to the overall 4,006 DU Plan. As shown at the end of Table 5-2, a slightly greater trip forecast was input to the Year 2015 analysis. That forecast resulted from a prior and very similar iteration of the plan that had slightly more trips (21 in the AM peak hour and 33 in the PM peak hour) than the current version. This analysis methodology is conservative but not excessively so, and did not require a total recalculation of trip assignments or service level calculations for Year 2015 conditions.

Table 5-3 presents the forecast long-term (Year 2030) daily and peak hour project traffic volumes for the 4,006 DU Plan on a "typical" weekday, and provides a breakdown of the long-term project trips

TABLE 5-1
PROJECT TRAFFIC GENERATION RATES[7]

ITE Land Use Code	Time Period	Rates/Equations	Percent Entering	Percent Exiting
▪ 210: Single Family Detached Housing (TE/DU)	Daily	T = 9.57 (X)	50%	50%
	AM Peak	T = 0.75 (X)	25%	75%
	PM Peak	T = 1.01 (X)	63%	37%
▪ 230: Residential Condominium/ Townhouse (TE/DU)	Daily	T = 5.86 (X)	50%	50%
	AM Peak	T = 0.44 (X)	17%	83%
	PM Peak	T = 0.52 (X)	67%	33%
▪ 495: Community Recreation Center (TE/1,000 SF)	Daily	T = 22.88 (X)	50%	50%
	AM Peak	T = 1.62 (X)	61%	39%
	PM Peak	T = 1.64 (X)	29%	71%
▪ 520: Elementary School (TE/Student)	Daily	T = 1.29 (X)	50%	50%
	AM Peak	T = 0.42 (X)	55%	45%
	PM Peak	---	---	---
▪ 590: Library (TE/1,000 SF)	Daily	T = 54.00 (X)	50%	50%
	AM Peak	T = 1.06 (X)	72%	28%
	PM Peak	T = 7.09 (X)	48%	52%
▪ 710: General Office Building (TE/1,000 SF)	Daily	T = 11.01 (X)	50%	50%
	AM Peak	T = 1.55 (X)	88%	12%
	PM Peak	T = 1.49 (X)	17%	83%
▪ 820: Shopping Center (TE/1,000 SF)	Daily	T = 42.94 (X)	50%	50%
	AM Peak	T = 1.03 (X)	61%	39%
	PM Peak	T = 3.75 (X)	48%	52%
▪ City Park (TE/Acre)[8]	Daily	T = 50.00 (X)	50%	50%
	AM Peak	T = 6.50 (X)	50%	50%
	PM Peak	T = 4.50 (X)	50%	50%
▪ Neighborhood Park (TE/Acre)[8]	Daily	T = 5.00 (X)	50%	50%
	AM Peak	T = 0.20 (X)	50%	50%
	PM Peak	T = 0.40 (X)	50%	50%

Notes:
TE/DU = Trip ends per dwelling unit
TE/Student = Trip ends per student
TE/1,000 SF = Trip ends per 1,000 square feet of development
TE/Acre = Trip ends per acre

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[7] Source: *Trip Generation*, 7th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2003).

[8] Source: *San Diego Traffic Generators*, published by San Diego Association of Governments (SANDAG), dated April 2002.

TABLE 5-2
NEAR-TERM (YEAR 2015) PROJECT TRAFFIC GENERATION FORECAST[9]

Project Description							Daily	AM Peak Hour			PM Peak Hour		
Prior TAZ No.[10]	**PA No.**	**Parcel Type**	**Land Use**	**Acres**	**DU**	**T.S.F.**	**Trips**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
21	1	MDR	SF Residential	37.62	325	--	3,110	62	182	244	208	120	328
		MDR	Condo/Townhome	6.00	62	--	363	4	23	27	22	11	33
		MDR	Neighborhood Park	3.00	--	--	15	1	0	1	1	0	1
						Sub-Total	*3,488*	*67*	*205*	*272*	*231*	*131*	*362*
24	5	MDR	Condo/Townhome	49.11	690	--	4,043	48	255	303	241	117	358
						Sub-Total	*4,043*	*48*	*255*	*303*	*241*	*117*	*358*
25	8	HDR	Condo/Townhome	19.64	310	--	1,817	22	115	137	109	53	162
		CC Res	Condo/Townhome	14.01	250	--	1,465	18	93	111	88	43	131
		CC Non Res CF	Rec. Comm. Center	3.90	--	15.000	343	15	9	24	7	17	24
		CC Non Res	Neighborhood Park	1.50	--	--	8	0	0	0	1	0	1
						Sub-Total	*3,633*	*55*	*217*	*272*	*205*	*113*	*318*
26	9	HDR	Condo/Townhome	6.65	110	--	645	8	41	49	39	19	58
		CC Res	Condo/Townhome	6.44	120	--	703	8	44	52	42	20	62
		CC Non Res-CF	Rec. Comm. Center	1.82	--	31.000	709	31	20	51	15	36	51
		CC Non Res-CF	Library	1.67	--	20.000	1,080	15	6	21	68	74	142
		CC Non Res	City Park	8.00	--	--	400	26	26	52	18	18	36
		CC Non Res	Neighborhood Park	1.50	--	--	8	0	0	0	1	0	1
						Sub-Total	*3,545*	*88*	*137*	*225*	*183*	*167*	*350*
Total Near-Term (Year 2015) Project Traffic Generation Forecast				**160.86**	**1,867**	**66.000**	**14,709**	**258**	**814**	**1,072**	**860**	**528**	**1,388**

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[9] Source: *Trip Generation*, 7th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2003).

[10] Refers to the traffic zone references in The Preserve, Chino Internal Traffic Model Methodology and Findings: Long-Term/Project Buildout Conditions Report, prepared by LLG (March 7, 2003).

TABLE 5-2 (CONTINUED)
NEAR-TERM (YEAR 2015) PROJECT TRAFFIC GENERATION FORECAST[11]

Breakdown By Land Use	Acres	DU	T.S.F.	Daily Trips	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
Single Family Residential	37.62	325	--	3,110	62	182	244	208	120	328
Condominium/Townhouse	101.85	1,542	--	9,036	108	571	679	541	263	804
Shopping Center	--	--	--	--	--	--	--	--	--	--
General Office	--	--	--	--	--	--	--	--	--	--
Recreation Community Center	5.72	--	46.000	1,052	46	29	75	22	53	75
Library	1.67	--	20.000	1,080	15	6	21	68	74	142
Elementary School	--	--	--	--	--	--	--	--	--	--
Neighborhood Park	6.00	--	--	31	1	0	1	3	0	3
City Park	8.00	--	--	400	26	26	52	18	18	36
Total Near-Term (Year 2015) Project Traffic Generation Forecast[12]	**160.86**	**1,867**	**66.000**	**14,709**	**258**	**814**	**1,072**	**860**	**528**	**1,388**
Total Near-Term (Year 2015) Project Traffic Generation Forecast Input to Level of Service Analysis[13]	**160.86**	**1,870**	**66.000**	**14,968**	**266**	**827**	**1,093**	**880**	**541**	**1,421**

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[11] Source: *Trip Generation*, 7th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2003).

[12] Development and trip forecast totals are explicit to this exact development plan following minor adjustments to integrate a potential third school site.

[13] Reflects the slightly more conservative forecasts derived in prior plan assessments. See report text.

TABLE 5-3
LONG-TERM (YEAR 2030) PROJECT TRAFFIC GENERATION FORECAST (4,006 DU PLAN)[14]

Project Description							Daily	AM Peak Hour			PM Peak Hour		
Prior TAZ No.[15]	PA No.	Parcel Type	Land Use	Acres	DU	T.S.F.	Trips	In	Out	Total	In	Out	Total
21	1	MDR	SF Residential	37.62	325	--	3,110	62	182	244	208	120	328
		MDR	Condo/Townhome	6.00	62	--	363	4	23	27	22	11	33
		MDR	Neighborhood Park	3.00	--	--	15	1	0	1	1	0	1
						Sub-Total	*3,488*	*67*	*205*	*272*	*231*	*131*	*362*
27	2	LDR	SF Residential	28.01	141	--	1,349	27	79	106	90	52	142
		LDR	Condo/Townhome	28.01	141	--	826	10	52	62	49	24	73
		ER	SF Residential	27.06	53	--	507	10	30	40	34	20	54
						Sub-Total	*2,682*	*47*	*161*	*208*	*173*	*96*	*269*
30	3	LDR	SF Residential	46.01	233	--	2,230	44	130	174	149	86	235
		ER	SF Residential	29.11	57	--	545	11	32	43	36	21	57
		ER	SF Residential	12.00	24	--	230	5	13	18	15	9	24
		ER	City Park	8.00	--	--	400	26	26	52	18	18	36
						Sub-Total	*3,405*	*86*	*201*	*287*	*218*	*134*	*352*
24	4	LDR	SF Residential	30.83	183	--	1,751	35	102	137	117	68	185
		LDR	Condo/Townhome	30.82	182	--	1,067	13	67	80	64	31	95
		ER	SF Residential	23.10	45	--	431	9	25	34	29	17	46
						Sub-Total	*3,249*	*57*	*194*	*251*	*210*	*116*	*326*

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[14] Source: *Trip Generation*, 7th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2003).

[15] Refers to the traffic zone references in The Preserve, Chino Internal Traffic Model Methodology and Findings: Long-Term/Project Buildout Conditions Report, prepared by LLG (March 7, 2003).

TABLE 5-3 (CONTINUED)

LONG-TERM (YEAR 2030) PROJECT TRAFFIC GENERATION FORECAST (4,006 DU PLAN)[16]

Project Description							Daily Trips	AM Peak Hour			PM Peak Hour		
Prior TAZ No.[17]	PA No.	Parcel Type	Land Use	Acres	DU	T.S.F.		In	Out	Total	In	Out	Total
24	5	MDR	Condo/Townhome	49.11	690	--	4,043	48	255	303	241	117	358
		NC	Shopping Center	3.00	--	43.124	1,852	27	17	44	78	84	162
		--	Pass-By (34%)[18]	--	--	--	-630	0	0	0	-27	-29	-56
						Sub-Total	*5,265*	*75*	*272*	*347*	*292*	*172*	*464*
22	6	HDR	Condo/Townhome	8.06	120	--	703	8	44	52	42	20	62
		CC Non Res	General Office	3.28	--	74.000	815	101	14	115	19	92	111
		CC Non Res	Shopping Center	3.28	--	149.000	6,398	94	60	154	268	291	559
		--	Pass-By (34%)[18]	--	--	--	-2,175	0	0	0	-91	-99	-190
						Sub-Total	*5,741*	*203*	*118*	*321*	*238*	*304*	*542*
23	7	HDR	Condo/Townhome	11.66	150	--	879	11	56	67	53	26	79
		CC Non Res	General Office	3.94	--	74.000	815	101	14	115	19	92	111
		CC Non Res	Shopping Center	3.94	--	149.000	6,398	94	60	154	268	291	559
		--	Pass-By (34%)[18]	--	--	--	-2,175	0	0	0	-91	-99	-190
						Sub-Total	*5,917*	*206*	*130*	*336*	*249*	*310*	*559*

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[16] Source: *Trip Generation*, 7th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2003).

[17] Refers to the traffic zone references in The Preserve, Chino Internal Traffic Model Methodology and Findings: Long-Term/Project Buildout Conditions Report, prepared by LLG (March 7, 2003).

[18] Pass-by trips are trips made as intermediate stops on the way from an origin to a primary trip destination. Pass-by trips are attracted from traffic passing the site on adjacent streets (i.e. Pine Avenue), which contain direct access to the generator. A pass-by reduction factor of 34% was used for the PM peak hour (Source: *Trip Generation Handbook*, 2nd Edition, June 2004). This same factor was used to estimate the daily pass-by percentage.

TABLE 5-3 (CONTINUED)
LONG-TERM (YEAR 2030) PROJECT TRAFFIC GENERATION FORECAST (4,006 DU PLAN)[19]

Project Description							Daily	AM Peak Hour			PM Peak Hour		
Prior TAZ No.[20]	**PA No.**	**Parcel Type**	**Land Use**	**Acres**	**DU**	**T.S.F.**	**Trips**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
25	8	HDR	Condo/Townhome	19.64	310	--	1,817	22	115	137	109	53	162
		CC Res	Condo/Townhome	14.01	250	--	1,465	18	93	111	88	43	131
		CC Non Res CF	Rec. Comm. Center	3.90	--	15.000	343	15	9	24	7	17	24
		CC Non Res	Neighborhood Park	1.50	--	--	8	0	0	0	1	0	1
						Sub-Total	*3,633*	*55*	*217*	*272*	*205*	*113*	*318*
26	9	HDR	Condo/Townhome	6.65	110	--	645	8	41	49	39	19	58
		CC Res	Condo/Townhome	6.44	120	--	703	8	44	52	42	20	62
		CC Non Res-CF	Rec. Comm. Center	1.82	--	31.000	709	31	20	51	15	36	51
		CC Non Res-CF	Library	1.67	--	20.000	1,080	15	6	21	68	74	142
		CC Non Res	Elementary School[21]	12.84	--	--	1,290	230	190	420	-	-	-
		CC Non Res	City Park	8.00	--	--	400	26	26	52	18	18	36
		CC Non Res	Neighborhood Park	1.50	--	--	8	0	0	0	1	0	1
						Sub-Total	*4,835*	*318*	*327*	*645*	*183*	*167*	*350*
28	10	HDR	Condo/Townhome	12.53	170	--	996	12	63	75	59	29	88
		MDR	Condo/Townhome	14.56	180	--	1,055	13	67	80	63	31	94
		CC Res	Condo/Townhome	3.70	55	--	322	4	20	24	19	9	28
		CC Non Res	Neighborhood Park	1.50	--	--	8	0	0	0	1	0	1
						Sub-Total	*2,381*	*29*	*150*	*179*	*142*	*69*	*211*

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[19] Source: *Trip Generation,* 7th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2003).

[20] Refers to the traffic zone references in The Preserve, Chino Internal Traffic Model Methodology and Findings: Long-Term/Project Buildout Conditions Report, prepared by LLG (March 7, 2003).

[21] Elementary School = 1,000 Students.

Table 5-3 (Continued)
Long-Term (Year 2030) Project Traffic Generation Forecast (4,006 DU Plan)[22]

Project Description							Daily Trips	AM Peak Hour			PM Peak Hour		
Prior TAZ No.[23]	PA No.	Parcel Type	Land Use	Acres	DU	T.S.F.		In	Out	Total	In	Out	Total
29	11	HDR	Condo/Townhome	12.54	170	--	996	12	63	75	59	29	88
		MDR	Condo/Townhome	14.56	180	--	1,055	13	67	80	63	31	94
		CC Res	Condo/Townhome	3.69	55	--	322	4	20	24	19	9	28
		CC Non Res	Neighborhood Park	1.50	--	--	8	0	0	0	1	0	1
						Sub-Total	*2,381*	*29*	*150*	*179*	*142*	*69*	*211*
Total Long-Term (Year 2030) Project Traffic Generation Forecast				**539.39**	**4,006**	**555.124**	**42,977**	**1,172**	**2,125**	**3,297**	**2,283**	**1,681**	**3,964**

Breakdown By Land Use	Acres	DU	T.S.F.	Daily Trips	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
Single Family Residential	234.74	1,061	--	10,153	203	593	796	678	393	1,071
Condominium/Townhouse	241.16	2,945	--	17,257	208	1,090	1,298	1,031	502	1,533
Shopping Center	10.22	--	341.124	9,668	215	137	352	405	439	844
General Office	7.22	--	148.000	1,630	202	28	230	38	184	222
Recreation Community Center	5.72	--	46.000	1,052	46	29	75	22	53	75
Library	1.67	--	20.000	1,080	15	6	21	68	74	142
Elementary School	12.84	--	--	1,290	230	190	420	-	-	-
Neighborhood Park	9.00	--	--	47	1	0	1	5	0	5
City Park	16.00	--	--	800	52	52	104	36	36	72
Total Long-Term (Year 2030) Project Traffic Generation Forecast	**539.39**	**4,006**	**555.124**	**42,977**	**1,172**	**2,125**	**3,297**	**2,283**	**1,681**	**3,964**

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[22] Source: *Trip Generation*, 7th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2003).

[23] Refers to the traffic zone references in The Preserve, Chino Internal Traffic Model Methodology and Findings: Long-Term/Project Buildout Conditions Report, prepared by LLG (March 7, 2003).

by land use (i.e. single family residential, condominium/townhouse, shopping center, general office, recreation community center, library, elementary school, neighborhood park and City park). Review of *Table 5-3* shows that overall the proposed project in the long-term (Year 2030) is expected to generate 42,977 daily trips, with 3,297 trips (1,172 inbound, 2,125 outbound) produced in the AM peak hour and 3,964 trips (2,283 inbound, 1,681 outbound) produced in the PM peak hour.

Please note that the aforementioned trip generation includes adjustments for pass-by trips that come directly from the everyday traffic stream on the adjoining streets (i.e. Pine Avenue). The factors used in this report, which are summarized in the footnotes of *Table 5-3*, are based on information published in the *Trip Generation Handbook*, 2nd Edition, published by ITE, June 2004.

5.2 Trip Generation Comparison

Table 5-4 provides a long-term (Year 2030) trip generation comparison of the proposed South of Pine Avenue Development Project versus the site's representation (Transportation Analysis Zone No. 2) as contained within The Preserve Final Environmental Impact Report (EIR), 2002, as previously certified by the City of Chino. As shown in *Table 5-4*, the proposed South of Pine Avenue Development Project is expected to generate 7,598 fewer daily trips, 176 fewer AM peak hour trips and 985 fewer PM peak hour trips than the previously attributable to the site (TAZ No. 2) as contained within The Preserve EIR as previously certified.

Please note that the trips associated with the agriculture component of TAZ No. 2 were not included in the comparison because this component is located south of Chino-Corona Road E/W, the southern boundary of the proposed project. Even though the proposed South of Pine Avenue Development Project generates less traffic on a daily, AM peak hour and PM peak hour basis than previously attributed to the site (TAZ No. 2) as contained within The Preserve EIR, this traffic impact study will evaluate the proposed project trips as identified in *Table 5-3* and shown in the first row of *Table 5-4* (i.e. 42,977 daily trips, 3,297 AM peak hour trips and 3,964 PM peak hour trips).

5.3 Project Traffic Distribution and Assignment

Traffic distribution typically determines the directional orientation of traffic. It is based upon the location, intensity of use, accessibility of existing and planned residential areas, employment centers, and other commercial activities. Traffic assignment is the determination of specific trip routes, given the previously developed traffic distribution. Primary factors in route selection are the generalized travel direction, minimum time and minimum distance paths. In simpler studies, the trip assignment process calculates the project trips assigned to key intersections based on percentage values applied "manually" to the project's trip generation forecasts.

For this South of Pine evaluation, a method rooted in the City's traffic model was applied, where project generated traffic was distributed and assigned to the site-area roadway system in keeping with the traffic distribution pattern inferred, or actual volume assignment plots from, the City of Chino "select zone" model runs prepared by MMA. The select zone model runs are model outputs that show only those trips generated by the designated or selected zone. The select zone model outputs (i.e., the model plots) show the origin of project trips (i.e., trips entering or leaving a particular zone) and their modeled routing through the area circulation system.

TABLE 5-4
TRIP GENERATION COMPARISON

Project Description	Daily 2-Way	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
• South of Pine Avenue Development Project as Proposed	42,977	1,172	2,125	3,297	2,283	1,681	3,964
• TAZ No. 2 – The Preserve EIR (2002)[24]	50,575	1,251	2,222	3,473	2,831	2,118	4,949
Net Trip Generation Forecast	**-7,598**	**-79**	**-97**	**-176**	**-548**	**-437**	**-985**

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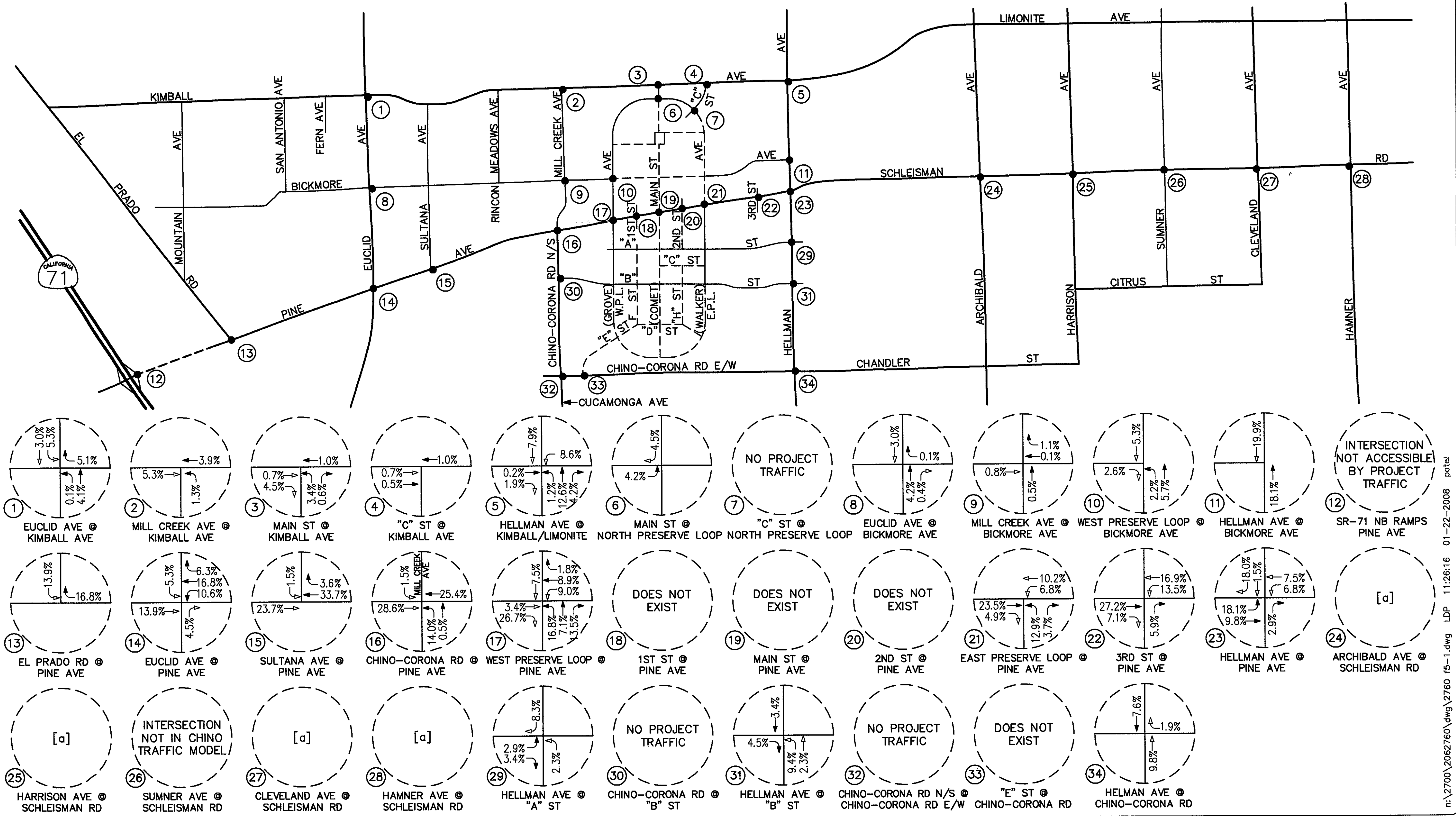
[24] Trips are exclusive of those in the EIR related to 185 acres of agricultural use.

The City of Chino select zone and total traffic model runs for the project reflect the peak period traffic volumes based on the Year 2030 daily trip generation forecast. The AM peak period corresponds to a three-hour morning commute period while the PM peak period corresponds to a four-hour afternoon commute period. Based on a common post-processing forecasting technique, the distributed and assigned AM and PM peak hour project traffic volumes (i.e., the one hour peak project traffic volumes) were determined by factoring the modeled peak period traffic volumes. In combining the factored peak hour trips of the select zone model run and comparing those volumes to the overall peak hour project trip generation, the project traffic distribution patterns (i.e., percentages) could be inferred for each key study location or intersection. This approach was taken for the combination of zones corresponding to the Year 2015 development footprint of the project (Planning Areas 1, 5, 8 and 9), and the aggregate project distribution/assignment patterns through key intersections developed accordingly.

Figures 5-1 and ***5-2*** present those percentage values for the AM and PM peak hours, respectively. These values reflect adjustments to the model outputs consistent with the street system to be complete in Year 2015, as described in the next sub-section of this report. Please note that due to the large footprint of the proposed project and the different land uses proposed, the City Traffic Model does not result in 100% of project traffic being assigned to the external intersections. This is because the model allocates some trip interaction between the land uses within the proposed Planning Areas. In other words, not every project trip leaves the project site, causing a portion of the trips to be absorbed internally within the site.

In the case of the South of Pine project, a summation of project percentages along the project perimeter equates to 90% of project trips in the AM peak hour, and 88% in the PM peak hour. These results indicate that the model assigns 10% and 12% (during the AM and PM peak hour, respectively) of the *Table 5-2* project trip forecasts to internal destinations. It should be noted that this is not a presumed or calculated internal traffic adjustment, but results automatically within the model output.

For Year 2030 conditions, the explicit trip forecasts of *Table 5-3* were input to the Chino Traffic Model by MMA prior to making the model runs. Project traffic volumes specific to the 4,006 DU Plan are represented in the outputs, rather than the product of those forecasts multiplied by a percent assignment pattern. Trip assignments at each intersection were isolated by the differences between post-processed Year 2030 volumes without, then with the project. This approach is consistent with the site-wide AM and PM peak period volumes for the total of all project zones. Actual plots of these zonal volumes are presented in Appendix D.



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NOTE:
[a] YEAR 2030 ANALYSIS GOVERNS PROJECT IMPACT ASSESSMENT AND MITIGATION NEEDS.

LEGEND
- – – – – FUTURE ROADWAY
- W.P.L. = WEST PRESERVE LOOP
- E.P.L. = EAST PRESERVE LOOP
- ⇠ = INBOUND PERCENTAGE
- ← = OUTBOUND PERCENTAGE

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FIGURE 5-1

YEAR 2015 AM PEAK HOUR PROJECT DISTRIBUTION

SOUTH OF PINE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO

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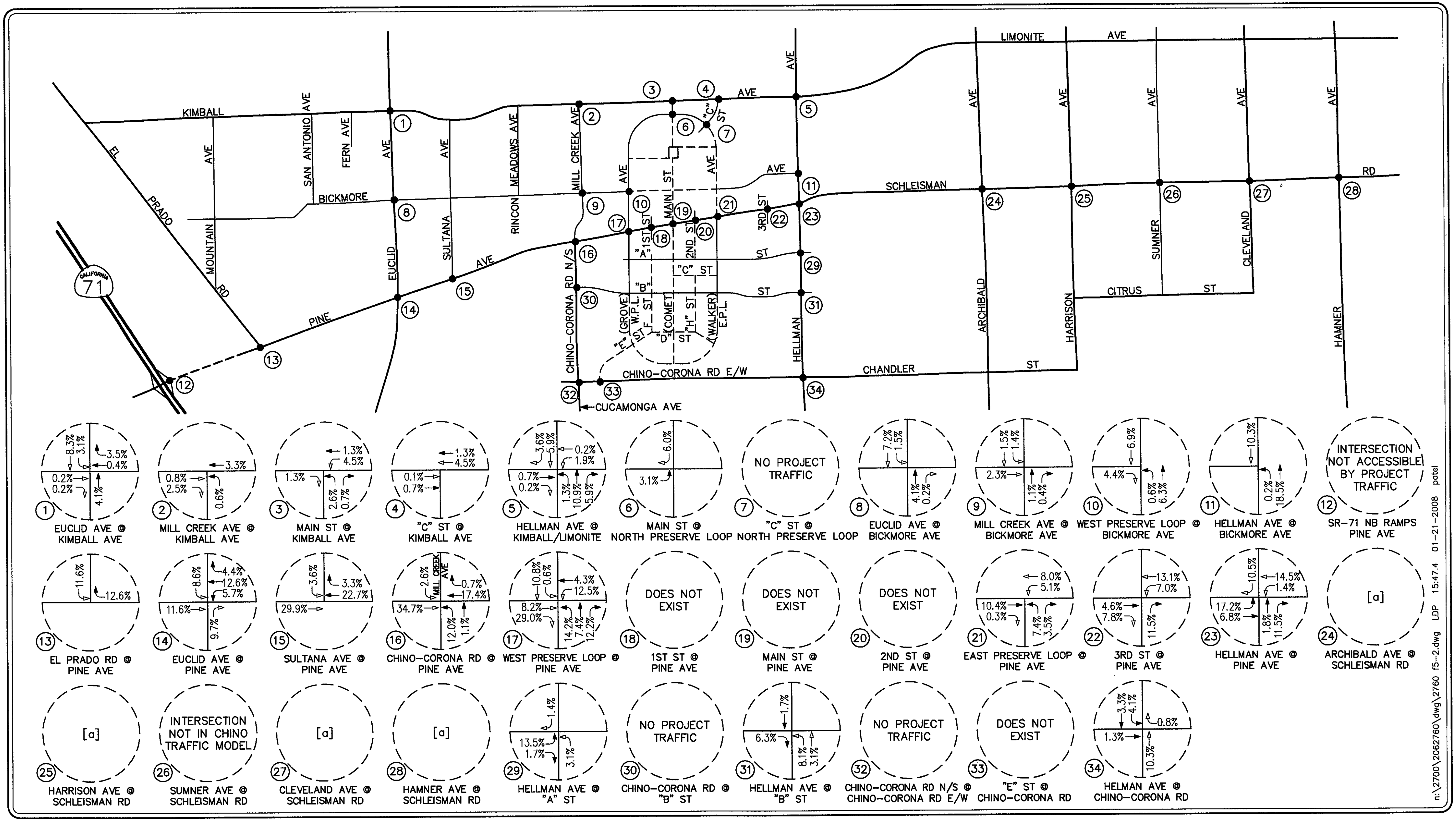

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NOTE:
[a] YEAR 2030 ANALYSIS GOVERNS PROJECT IMPACT ASSESSMENT AND MITIGATION NEEDS.

LEGEND
- – – – – = FUTURE ROADWAY
- W.P.L. = WEST PRESERVE LOOP
- E.P.L. = EAST PRESERVE LOOP
- ⇠ = INBOUND PERCENTAGE
- ← = OUTBOUND PERCENTAGE

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FIGURE 5-2

YEAR 2015 PM PEAK HOUR PROJECT DISTRIBUTIONS
SOUTH OF PINE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO

5.3.1 *Near–Term (Year 2015) Roadway Network Assumptions*

Based on information provided by City staff and/or the applicant, the following roadways were assumed to be complete by the Year 2015 and were considered in the select zone model runs for those portions of the proposed project to be completed by that time.

- Sultana Avenue between Kimball Avenue and Pine Avenue
- West Preserve Loop between Bickmore Avenue "B" Street
- East Preserve Loop between Pine Avenue "B" Street
- Bickmore Avenue between East Preserve Loop and Hellman Avenue
- "A" Street between West Preserve Loop and Hellman Avenue
- "B" Street between Chino-Corona Road N/S and Hellman Avenue

5.3.2 *Long–Term (Year 2030) Roadway Network Assumptions*

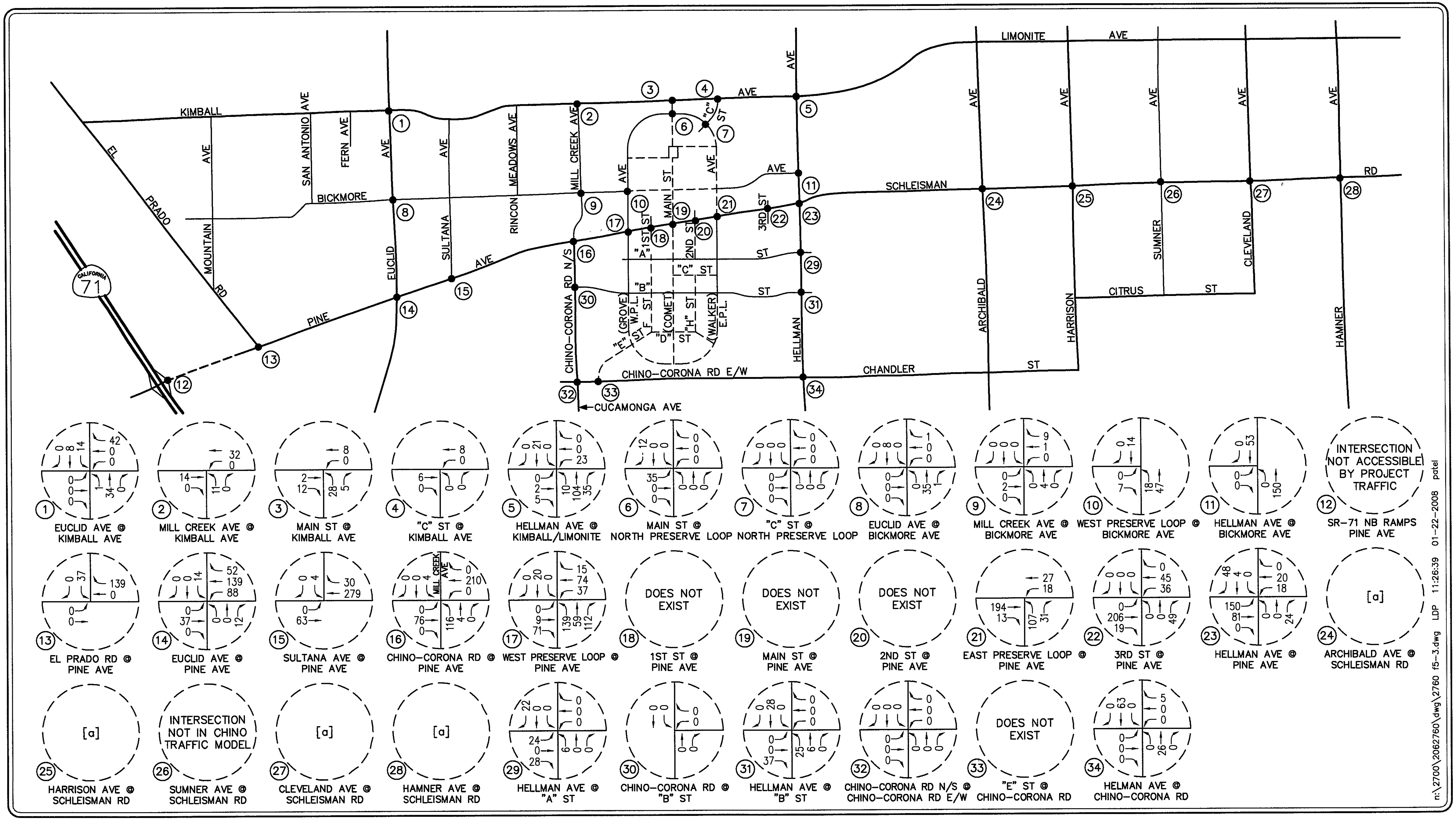
All roadways within the area bounded by Kimball Avenue to the north, Chino-Corona Road E/W to the south, Chino-Corona Road N/S to the west and Hellman Avenue to the east were assumed to be complete by the Year 2030 and were included in the select zone model runs for the proposed project.

5.3.3 *Near–Term (Year 2015) Project Traffic Volumes*

The anticipated near-term (Year 2015) AM and PM peak hour project traffic volumes associated with the proposed South of Pine Avenue Development Project are presented in ***Figures 5-3*** and ***5-4***, respectively. The traffic volume assignments presented in *Figures 5-3* and *5-4* reflect the traffic distribution characteristics of the near-term analysis of select zone model runs and the traffic generation forecast presented in *Table 5-2*.

5.3.4 *Long–Term (Year 2030) Project Traffic Volumes*

The anticipated long-term (Year 2030) AM and PM peak hour project traffic volumes associated with the proposed South of Pine Avenue Development Project are presented in ***Figures 5-5*** and ***5-6***, respectively. The traffic volume assignments presented in *Figures 5-5* and *5-6* are consistent with the traffic distribution characteristics of the long-term select zone model runs and the traffic generation forecast presented in *Table 5-3*.



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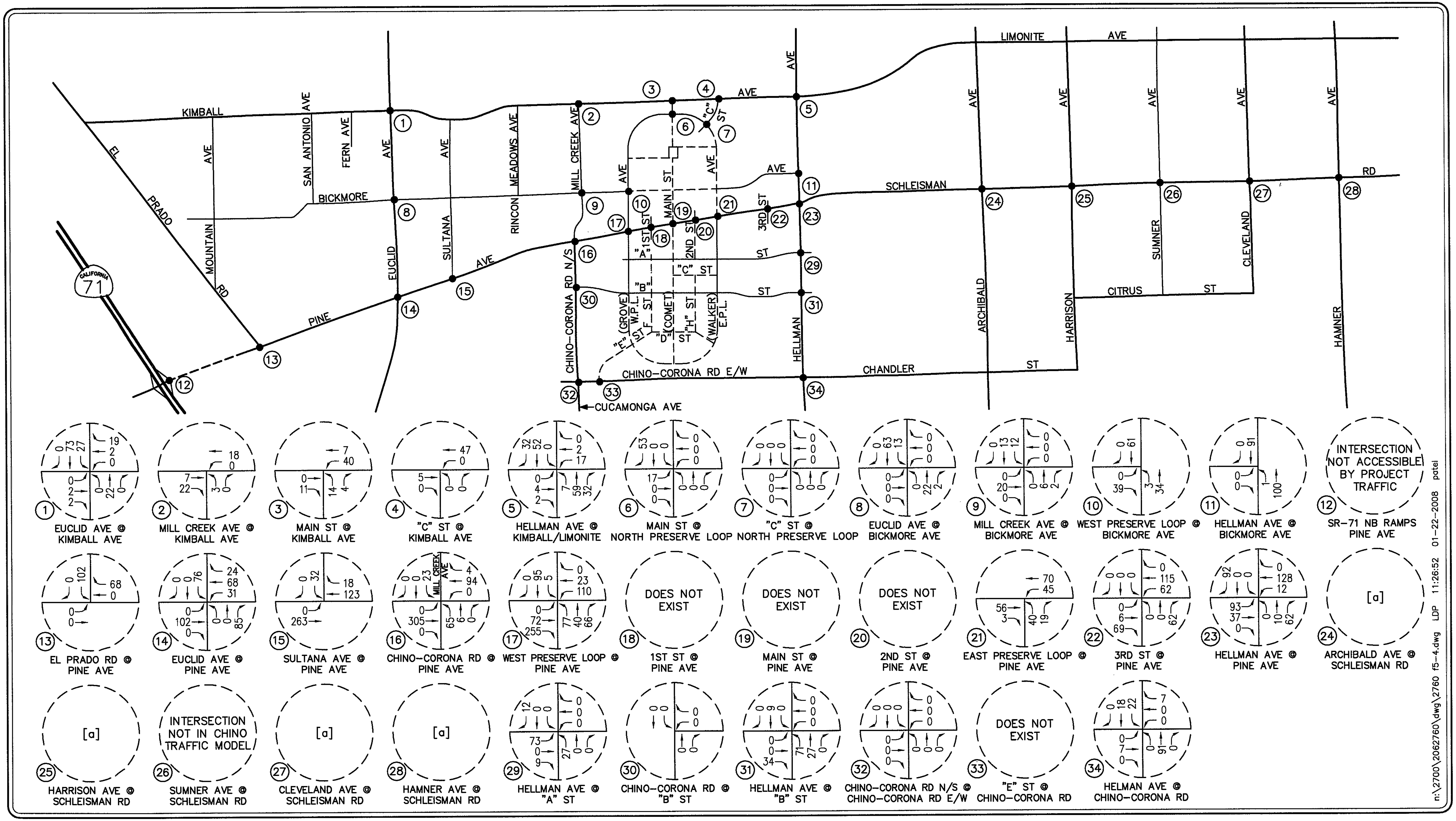
NOTE:
[a] YEAR 2030 ANALYSIS GOVERNS PROJECT IMPACT ASSESSMENT AND MITIGATION NEEDS.

LEGEND
– – – – FUTURE ROADWAY
W.P.L. = WEST PRESERVE LOOP
E.P.L. = EAST PRESERVE LOOP

FIGURE 5–3

YEAR 2015 AM PEAK HOUR PROJECT TRAFFIC VOLUMES
SOUTH OF PINE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO



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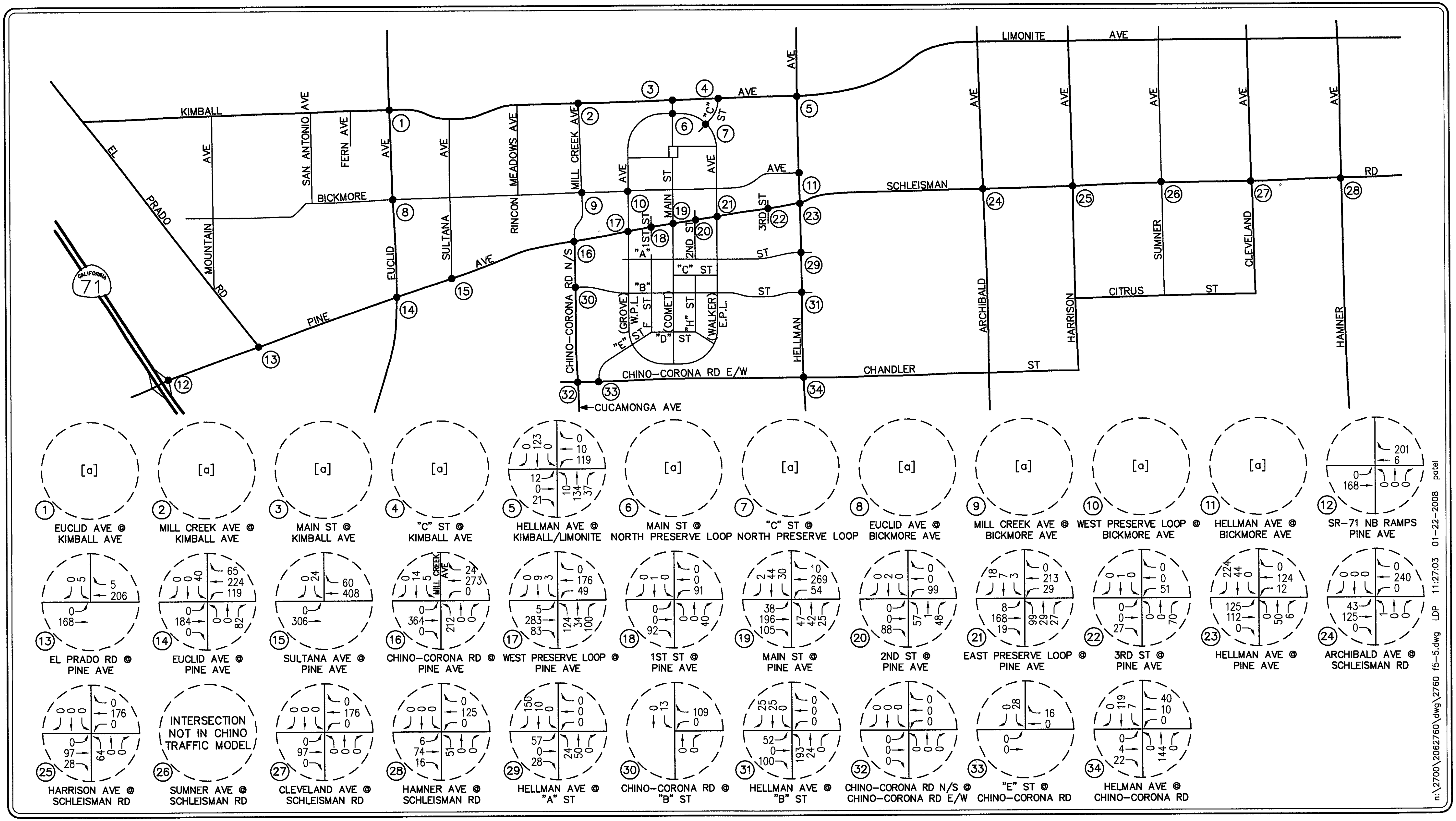
NOTE:
[a] YEAR 2030 ANALYSIS GOVERNS PROJECT IMPACT ASSESSMENT AND MITIGATION NEEDS.

LEGEND
– – – – FUTURE ROADWAY
W.P.L. = WEST PRESERVE LOOP
E.P.L. = EAST PRESERVE LOOP

FIGURE 5-4

YEAR 2015 PM PEAK HOUR PROJECT TRAFFIC VOLUMES
SOUTH OF PINE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO



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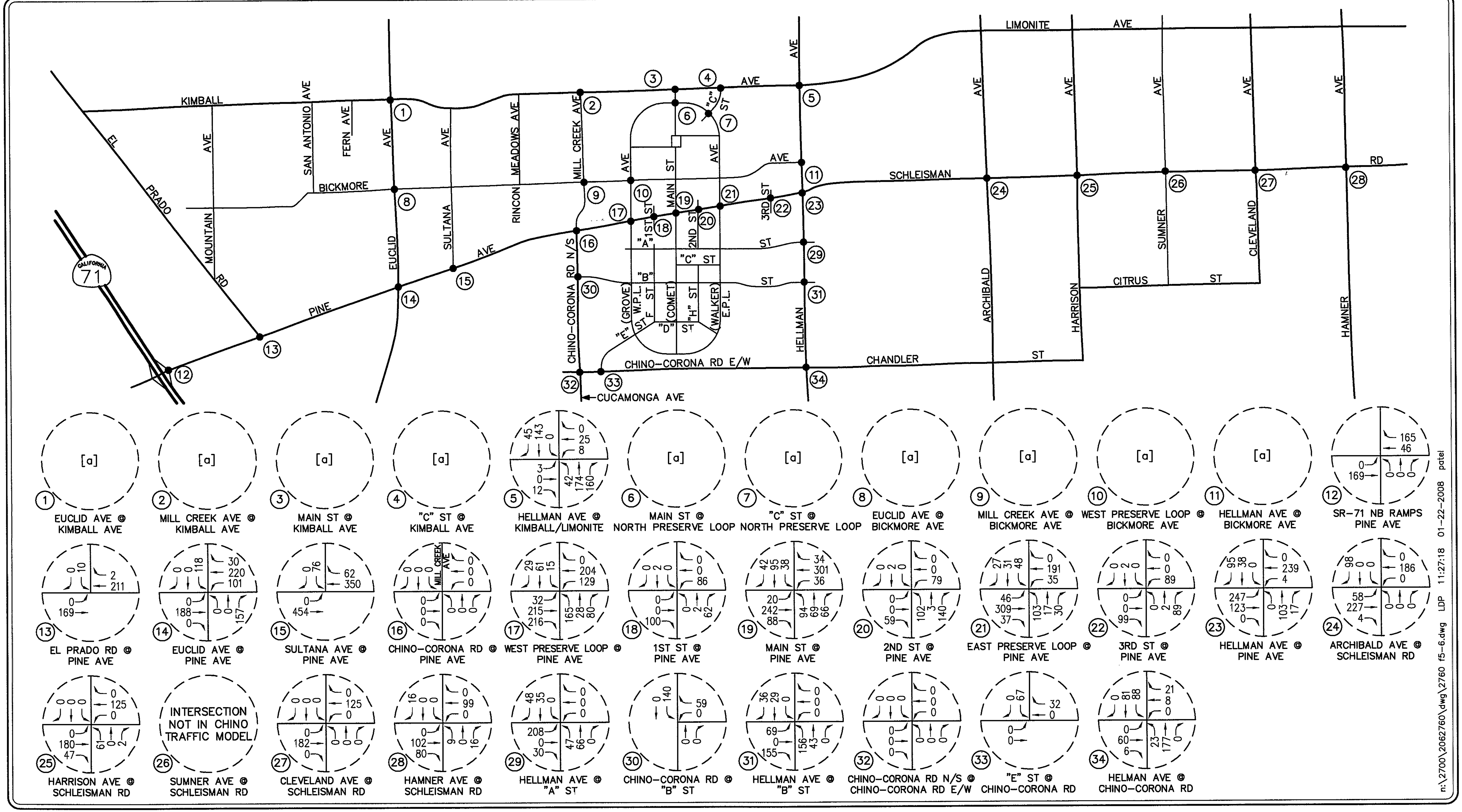
NOTE:
[a] INTERSECTION DOES NOT MEET OR EXCEED 50 PROJECT TRIP THRESHOLD FOR ANALYSIS.

LEGEND
W.P.L. = WEST PRESERVE LOOP
E.P.L. = EAST PRESERVE LOOP

FIGURE 5-5

YEAR 2030 AM PEAK HOUR PROJECT TRAFFIC VOLUMES

SOUTH OF PINE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO



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LEGEND
W.P.L. = WEST PRESERVE LOOP
E.P.L. = EAST PRESERVE LOOP

FIGURE 5-6

YEAR 2030 PM PEAK HOUR PROJECT TRAFFIC VOLUMES
SOUTH OF PINE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO

6.0 FUTURE TRAFFIC CONDITIONS

6.1 Year 2015 Traffic Conditions

Horizon year, background traffic growth estimates have been calculated using an ambient growth factor. The ambient traffic growth factor is intended to include unknown and future related projects in the study area, as well as account for regular growth in traffic volumes due to the development of projects outside the study area. Given the extensive list of cumulative projects accounted for in this study, the future growth in traffic volumes attributable to factors other than this cumulative project list has been estimated at one percent (1%) per year. The validation of this growth factor, in combination with an accounting for related projects traffic, is discussed in a following subsection. Application of this factor to existing Year 2007 traffic volumes results in an eight percent (8%) ambient growth in existing volumes to horizon year 2015.

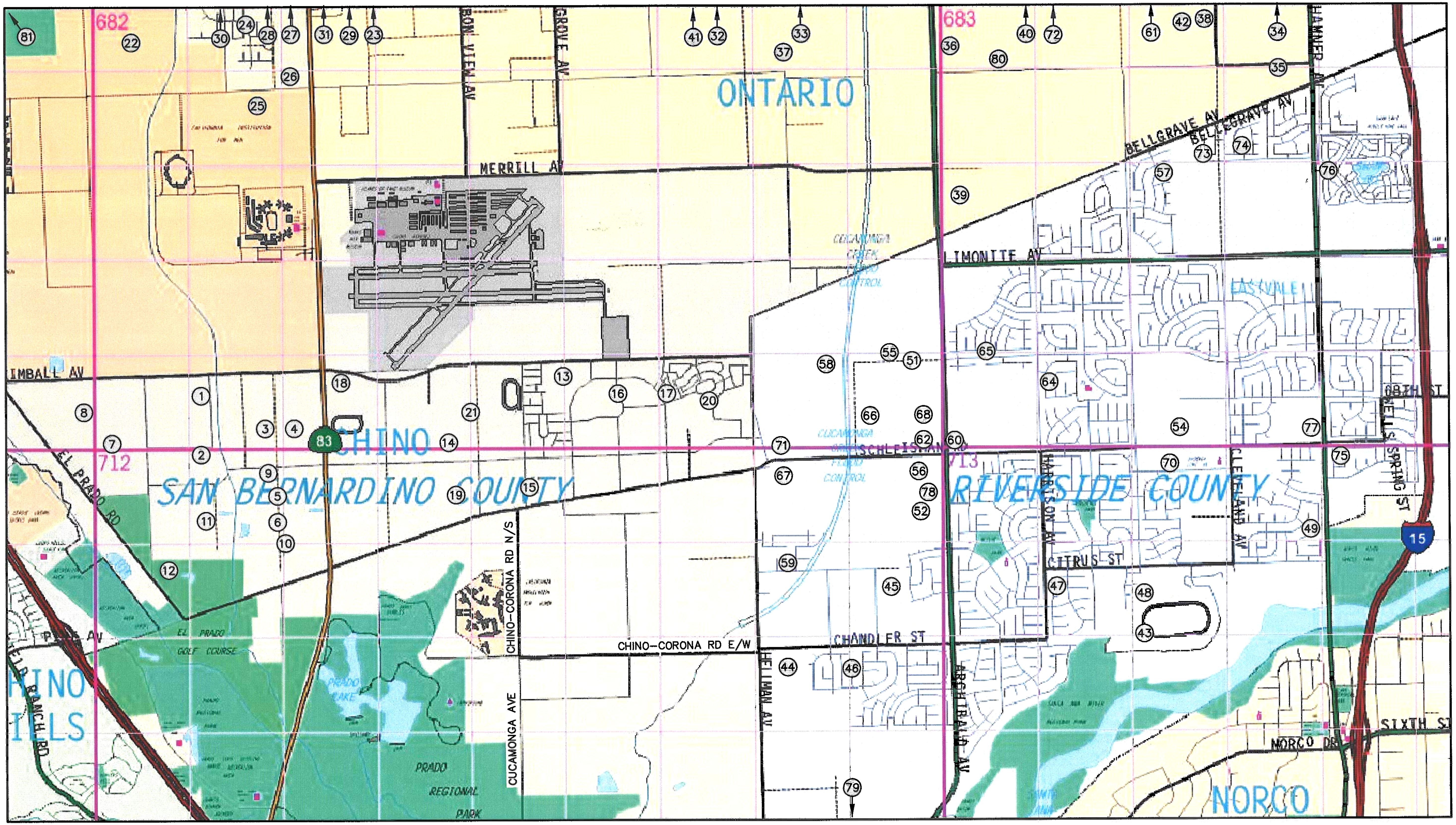
6.2 Related Projects Traffic Characteristics

In order to make a realistic estimate of future on-street conditions prior to implementation of the South of Pine Avenue Development Project, the status of other known development projects (related projects) in the area has been researched at the City of Chino, City of Ontario and the County of Riverside. With this information, the potential impact of the proposed project can be evaluated within the context of the cumulative impact of all ongoing development.

Based on our research, there are thirty-two (32) related projects located in the City of Chino, eleven (11) related projects in the City of Ontario and thirty-eight (38) related projects in the County of Riverside that have either been built, but not yet fully occupied, or are being processed for approval. These eighty-one (81) related projects have been included as part of the Year 2015 cumulative background setting. ***Figure 6-1*** graphically illustrates the location of the 81 related projects.

Table E located in ***Appendix E*** presents the trip generation for the 81 related projects. As shown in *Table E*, the 81 related projects are expected to generate a combined total of 376,192 daily trips on a weekday, with 28,608 trips (11,509 inbound and 17,099 outbound) forecast during the AM peak hour, and 36,077 trips (20,569 inbound and 15,508 outbound) during the PM peak hour. Given the magnitude of the cumulative development expected to occur by the Year 2015 and the fact that many of the related project trip ends will be captured amongst the 81 related projects, which is essentially double counting, a 30% adjustment (reduction factor) was applied to the aforementioned trip generation to account for the interaction between the 81 related projects. This factor was selected after iteratively reviewing the otherwise forecast interim year volumes at key intersections versus the corresponding volumes related to area General Plan Buildout. With the adjustment, the 81 related projects are expected to generate a net of 263,335 daily trips on a weekday, with 20,025 trips (8,056 inbound and 11,969 outbound) forecast during the AM peak hour, and 25,254 trips (14,398 inbound and 10,856 outbound) during the PM peak hour.

Table 6-1 further considers the 30% overlap factor in combination with the 1% annual growth rate applied to existing traffic volumes, and also with a 2% growth rate sometimes used in smaller studies. This test was conducted for the three intersections that bracket the overall study area. As for the overlap factor itself, when such an extensive related project list is involved, it is common to



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SOURCE: THOMAS BROS.

KEY

(#) = RELATED PROJECTS (SEE TABLE D-1)

FIGURE 6-1

RELATED PROJECTS LOCATION MAP

SOUTH OF PINE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO

account for some trip interaction (overlap) between related projects. For example, an inbound trip from a retail project could be an outbound trip from a housing development. Therefore, a reduction factor needs to be applied to the related projects to account for this trip interaction. Even a long term traffic model like that for Chino essentially does this; in that case, because every trip has two ends, the overlap correction approaches 50%.

The resulting 30% overlap factor was based on an iterative estimating process and verified by comparing our resulting Year 2015 forecast traffic volumes to the Year 2030 traffic volumes provided by the model. That comparison indicated that our Year 2015 forecasts were greater than the 2030 model volumes factored to Year 2015 traffic forecasts (a common analytical technique), and in some cases, greater than the Year 2030 modeled forecasts themselves. Review of *Table 1* shows the comparison between a 1% growth rate with a 30% reduction, 2% growth rate with a 30% reduction, and the Year 2015 values factored from Year 2030 model outputs. In all cases, LLG-derived volumes were greater than the factored values. Therefore, utilizing a 30% reduction was concluded to be an appropriate and conservative adjustment, and that adjustment combined with a 1% annual growth rate, a good fit for this study.

TABLE 6-1

INTERIM YEAR FORECAST COMPARISON FOR SELECT LOCATIONS AND ALTERNATIVE METHODOLOGIES[25]

Key Intersections	**Time Period**	**(1)** **Year 2007 Existing Volumes**	**Year 2015 Volumes Without Project Based On:** **(2)** **Factored Year 2030 Model Forecast**[26]	**(3)** **1% Growth Rate Plus 81 Related Projects With 30% Overlap**[27]	**(4)** **2% Growth Rate Plus 81 Related Projects With 30% Overlap**	**(5)** **Year 2030 without Project Volumes**
14 Euclid Avenue at	AM	2,827	3,105	***4,608***	4,834	3,626
Pine Avenue	PM	2,783	3,858	**5,073**	5,295	5,875
23 Hellman Avenue at	AM	1,216	1,820	***3,865***	3,963	2,953
Pine Avenue	PM	1,019	2,284	**4,469**	4,550	4,655
34 Hellman Avenue at	AM	710	841	***2,432***	2,489	1,088
Chino Corona/Chandler	PM	809	1,231	***2,779***	2,843	2,023

---

[25] All volumes are derived by taking the summation of all turning movements at the specified locations.

[26] [[(Column (5) – Column (1))/(Year 2030 – Year 2007)]*(Year 2015 – Year 2007)] + Column (1)

[27] **Bold** values represent the volume set used.
Italic values represent utilized volumes that are greater in year 2015 than modeled year 2030.

6.3 Year 2030 Traffic Conditions

The Year 2030 traffic volume forecasts for the twenty-three key study intersections evaluated in the long-term were obtained through utilization of the City of Chino Year 2030 traffic model for passenger vehicles and the CTP Truck Model for trucks, both with outputs provided by MMA. MMA provided Year 2030 plus project intersection turning movements directly for 14 of the 23 long-term key study intersections (i.e. 16, 17, 18, 19, 20, 21, 22, 23, 29, 30, 31, 32, 33 and 34). To obtain Year 2030 background traffic volumes at the aforementioned 14 key study intersections, the South of Pine Avenue Development Project was backed out from the model turning movements using the project select zone model runs described previously in Section 5-3.

The Year 2030 background traffic volumes for the remaining 9 key study intersections (i.e. 5, 12, 13, 14, 15, 24, 25, 27 and 28) were obtained from MMA-provided link data utilizing the SANBAG post-processing methodology. Specifically, from the peak period model runs (i.e., the model runs described in the "Project Trip Distribution" section of this report), the one-hour peak hour traffic volumes were determined. The first step was to obtain the approach and departure volumes from the model for each leg of the analyzed intersections. The next step converts the model approach and departure volumes from AM and PM peak period volumes to peak hour volumes. The AM peak hour volumes for passenger cars are calculated by multiplying the AM peak period volumes by 38%. Similarly, the PM peak hour volumes for passenger cars are calculated by multiplying the PM period volumes by 28%. The AM peak hour volumes for trucks are calculated by multiplying the AM peak period volumes by 33.3%. Similarly, the PM peak hour volumes for trucks are calculated by multiplying the PM period volumes by 25%. These are the percentages of vehicles that are assumed to occur in the peak hour of the peak period. These factors are derived from SCAG research. The next step is to determine the difference between the base year peak hour model volumes and the build-out peak hour model volumes. This "difference" represents the projected growth in traffic on each approach from the base year to the build-out using the City of Chino model.

6.3.1 *B-turn Methodology*

The base year turning movement counts for each intersection must be converted to approach and departure volumes for each leg of the intersection. Once the base counts are in this format, the difference between the build-out model and base model are then added to the base year counts for each corresponding approach and departure volume. This step provides the adjusted volumes that will be used to determine the build-out turning movement volumes. The next process in the forecasting of future turning volumes applies the B-turn methodology. The B-turn methodology is generally described in the *"National Cooperative Highway Research Program Report (NCHRP) 255: Highway Traffic Data for Urbanized Area Project Planning and Design", Chapter 8*. The B-turn method uses the base year turning percentages (from traffic counts) and proceeds through an iterative computational technique to produce a final set of future year turning volumes. The computations involve alternatively balancing the rows (approaches) and the columns (departures) of a turning movement matrix until an acceptable convergence is obtained. Future year link volumes are fixed using this method and the turning movements are adjusted to match. The results must be checked for reasonableness, and manual adjustments are sometimes necessary.

Finally, it should be noted that all provided volumes are from a Citywide General Plan level model that was not specifically developed for analysis of individual intersection turning movements. Therefore each projected volume was reviewed carefully and adjustments were applied as warranted based on local conditions and professional engineering judgment.

Please note that the post-processing methodology utilized in this report is consistent with SCAG/SANBAG requirements. Copies of the model post-processing worksheets for the aforementioned nine key study intersections are contained in ***Appendix F***.

6.4 Year 2015 and Year 2030 Traffic Volumes

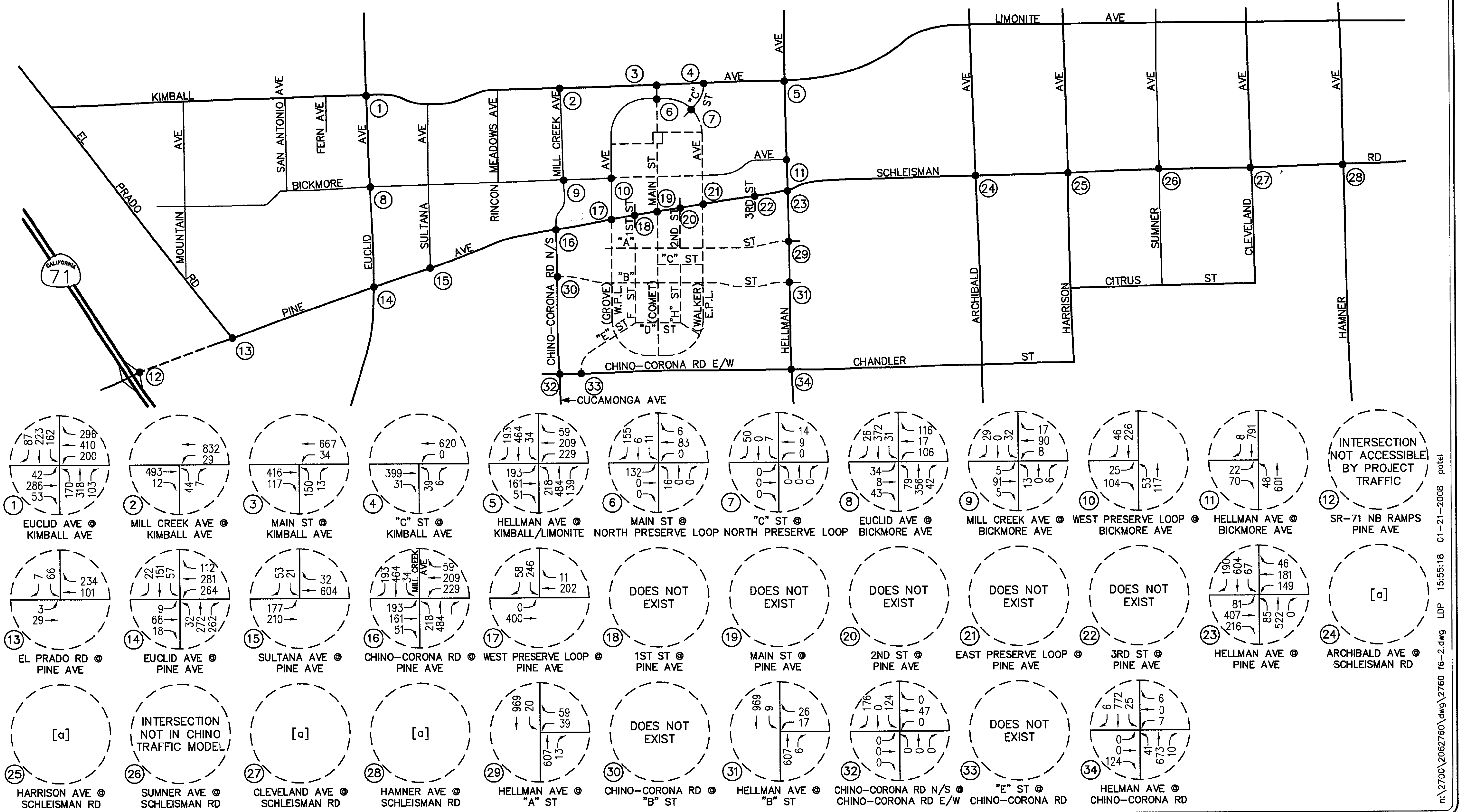
6.4.1 *Year 2015 Traffic Volumes*

The AM and PM peak hour traffic volumes associated with the eighty-one (81) related projects in the Year 2015 are presented in ***Figures 6-2*** and ***6-3***, respectively. ***Figures 6-4*** and ***6-5*** present the AM and PM peak hour background traffic volumes (existing traffic + ambient growth + related projects) at the key intersections for the Year 2015, respectively. ***Figures 6-6*** and ***6-7*** illustrate the Year 2015 forecast AM and PM peak hour traffic volumes, with the inclusion of the trips generated by the proposed South of Pine Avenue Development Project, respectively.

6.4.2 *Year 2030 Traffic Volumes*

Figures 6-8 and ***6-9*** present the Year 2030 AM and PM peak hour background traffic volumes at the key study intersections, respectively. ***Figures 6-10*** and ***6-11*** illustrate the Year 2030 forecast AM and PM peak hour traffic volumes, with the inclusion of the trips generated by the proposed South of Pine Avenue Development Project, respectively.

Please note that the long-term forecasts are the "benchmark" volume set because they came from direct post-processing of City model outputs. In developing Year 2015 forecasts, LLG tried to be very conservative in accounting for explicit other area projects, and Year 2015 volumes are likely overstated for conservancy. Thus with the City model-driven long-term volumes being the "benchmark", the near term forecasts are concluded to be conservatively "high", at locations like intersections 30 and 32, rather than the long-term volumes being inappropriately low. The near term volumes also reflect a conservative approach because not all the street segments are constructed. However, the long-term volumes reflect a completed network.



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NOTE:
[a] YEAR 2030 ANALYSIS GOVERNS PROJECT IMPACT ASSESSMENT AND MITIGATION NEEDS.

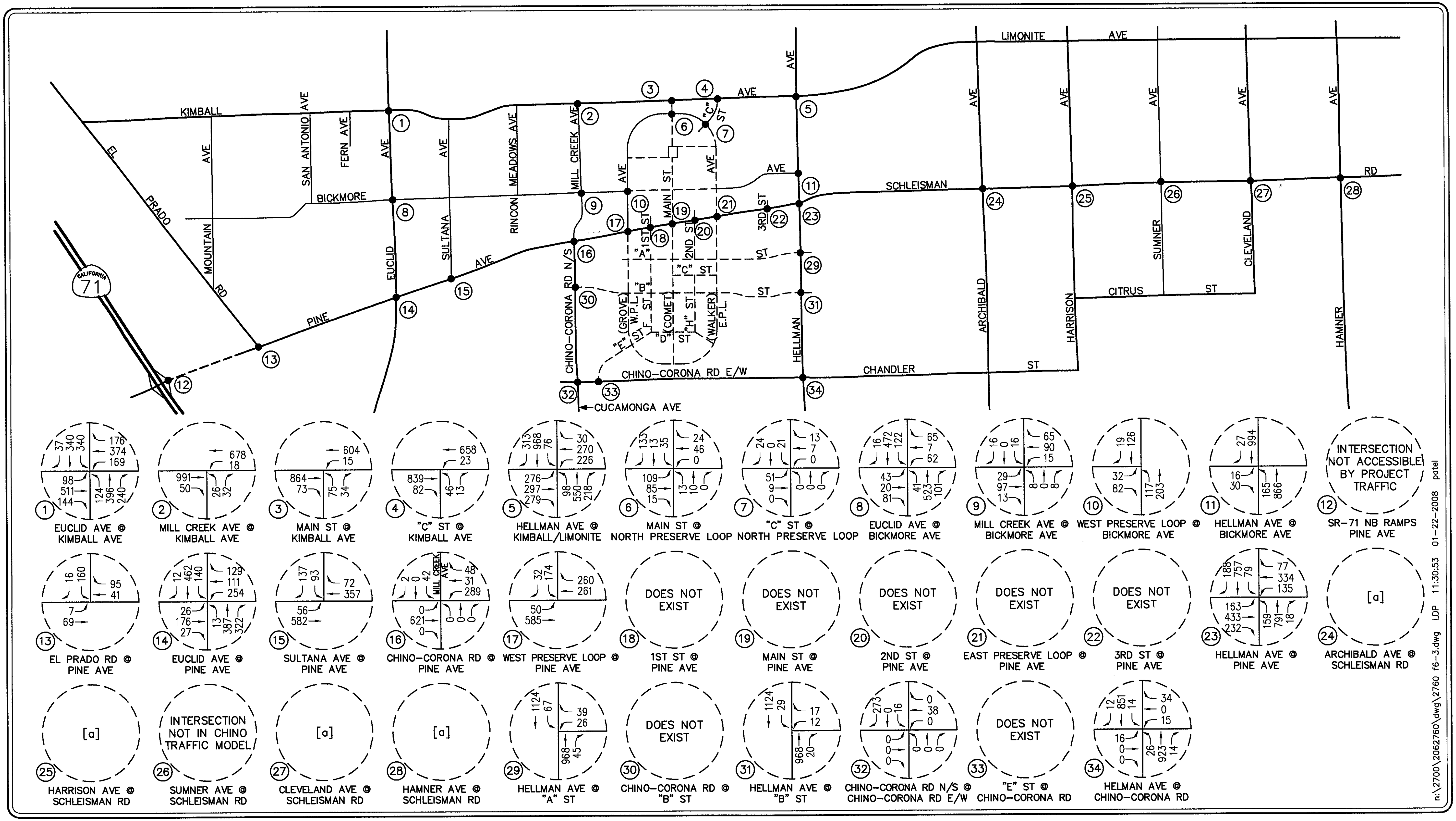
LEGEND
- - - - - FUTURE ROADWAY
W.P.L. = WEST PRESERVE LOOP
E.P.L. = EAST PRESERVE LOOP

G-204

FIGURE 6-2

YEAR 2015 AM PEAK HOUR RELATED PROJECTS TRAFFIC VOLUMES

SOUTH OF PINE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO



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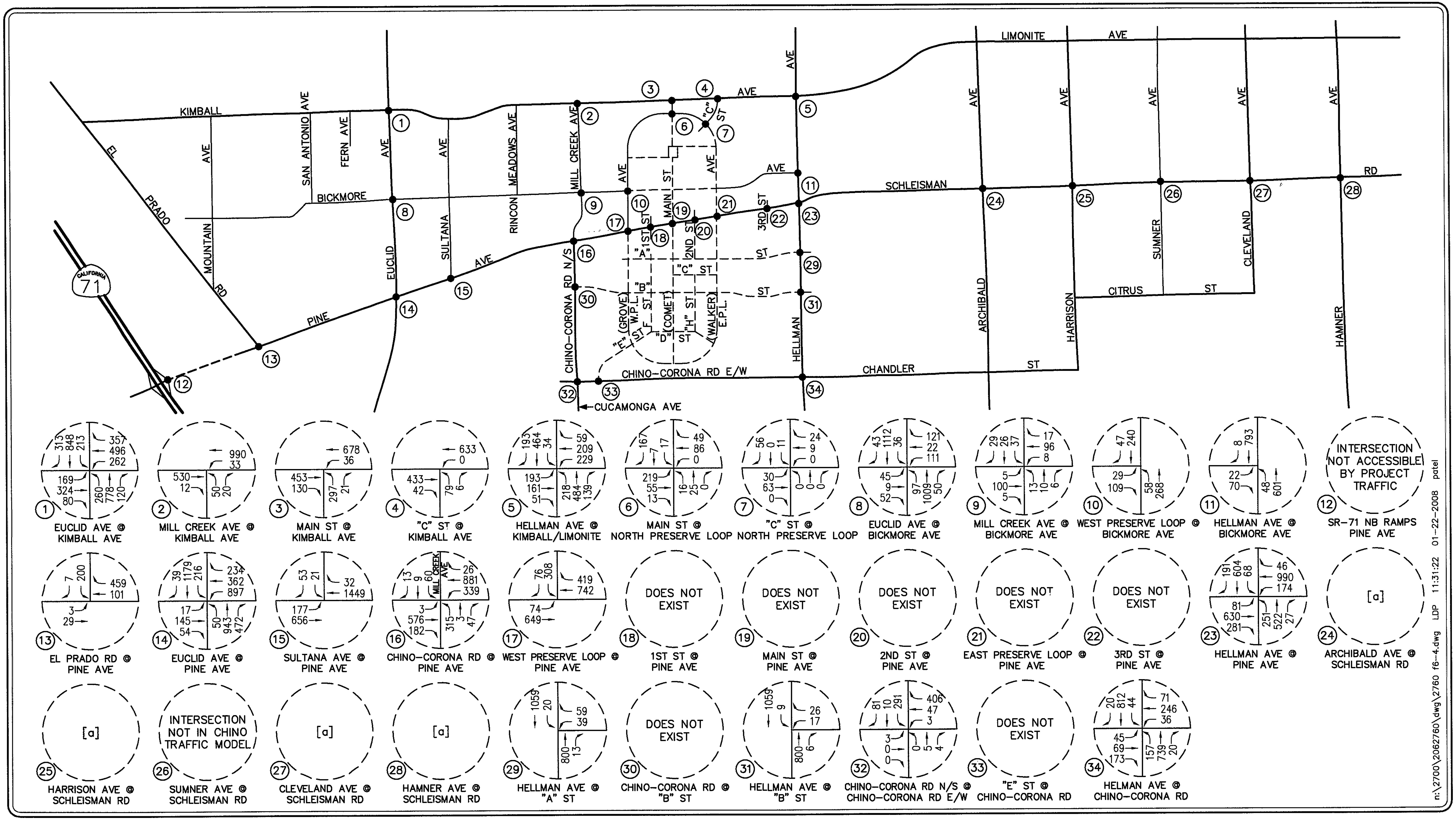
NOTE:
[a] YEAR 2030 ANALYSIS GOVERNS PROJECT IMPACT ASSESSMENT AND MITIGATION NEEDS.

LEGEND
– – – – FUTURE ROADWAY
W.P.L. = WEST PRESERVE LOOP
E.P.L. = EAST PRESERVE LOOP

FIGURE 6-3

YEAR 2015 PM PEAK HOUR RELATED PROJECTS TRAFFIC VOLUMES
SOUTH OF PINE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO



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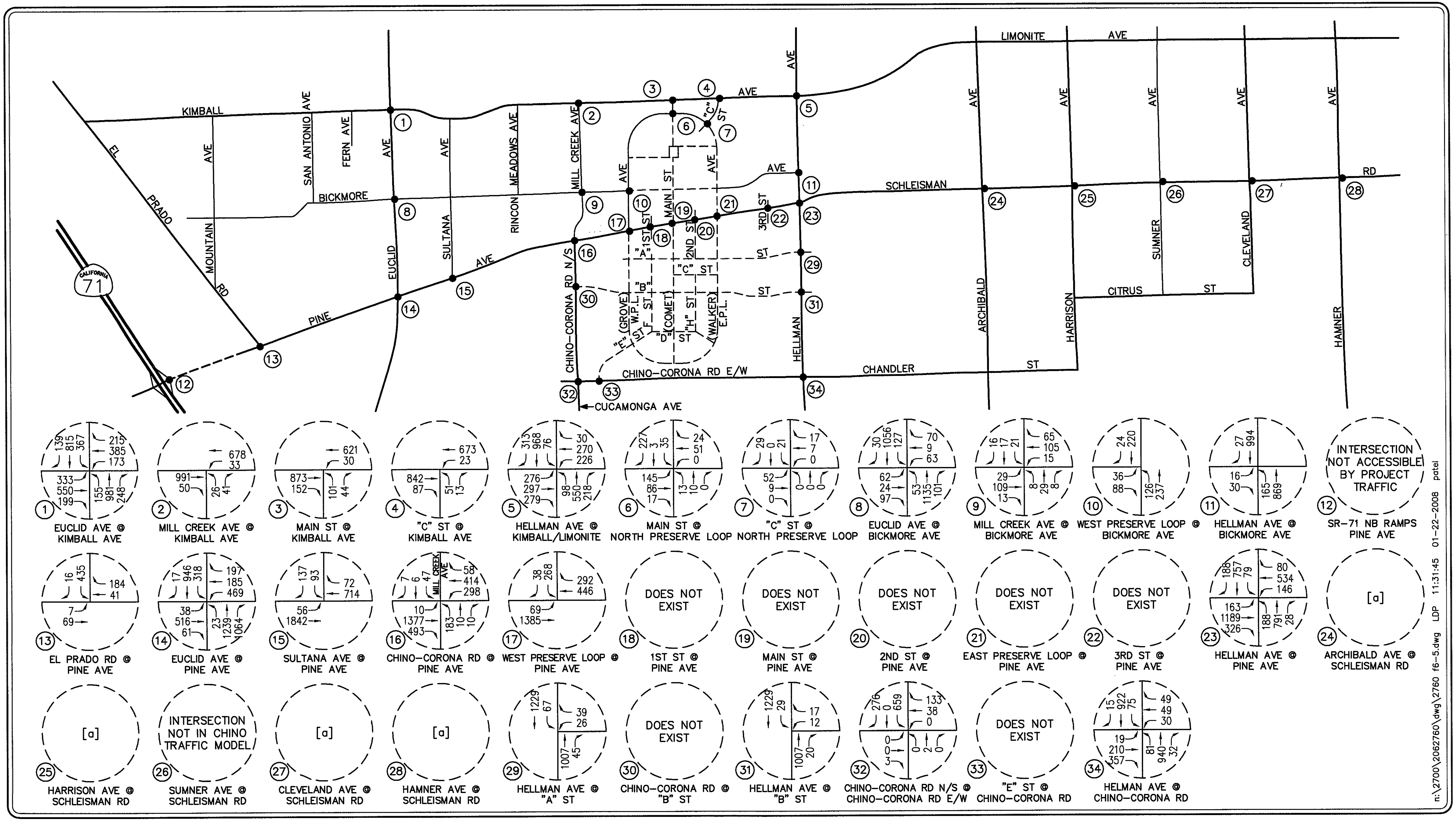
NOTE:
[a] YEAR 2030 ANALYSIS GOVERNS PROJECT IMPACT ASSESSMENT AND MITIGATION NEEDS.

LEGEND
– – – – FUTURE ROADWAY
W.P.L. = WEST PRESERVE LOOP
E.P.L. = EAST PRESERVE LOOP

FIGURE 6-4

YEAR 2015 AM PEAK HOUR BACKGROUND TRAFFIC VOLUMES
SOUTH OF PINE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO



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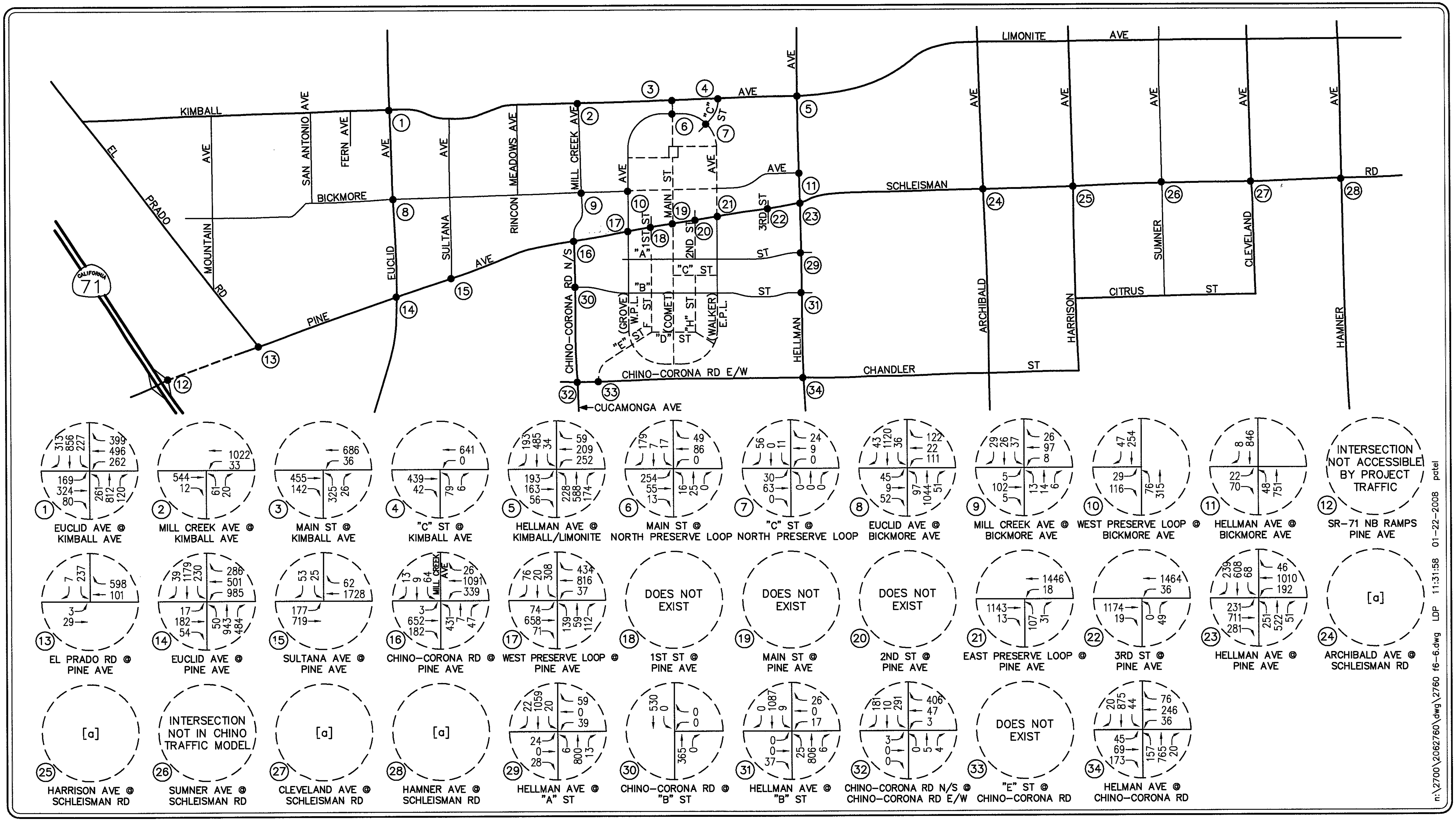
NOTE:
[a] YEAR 2030 ANALYSIS GOVERNS PROJECT IMPACT ASSESSMENT AND MITIGATION NEEDS.

LEGEND
– – – – FUTURE ROADWAY
W.P.L. = WEST PRESERVE LOOP
E.P.L. = EAST PRESERVE LOOP

FIGURE 6–5

YEAR 2015 PM PEAK HOUR BACKGROUND TRAFFIC VOLUMES

SOUTH OF PINE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO



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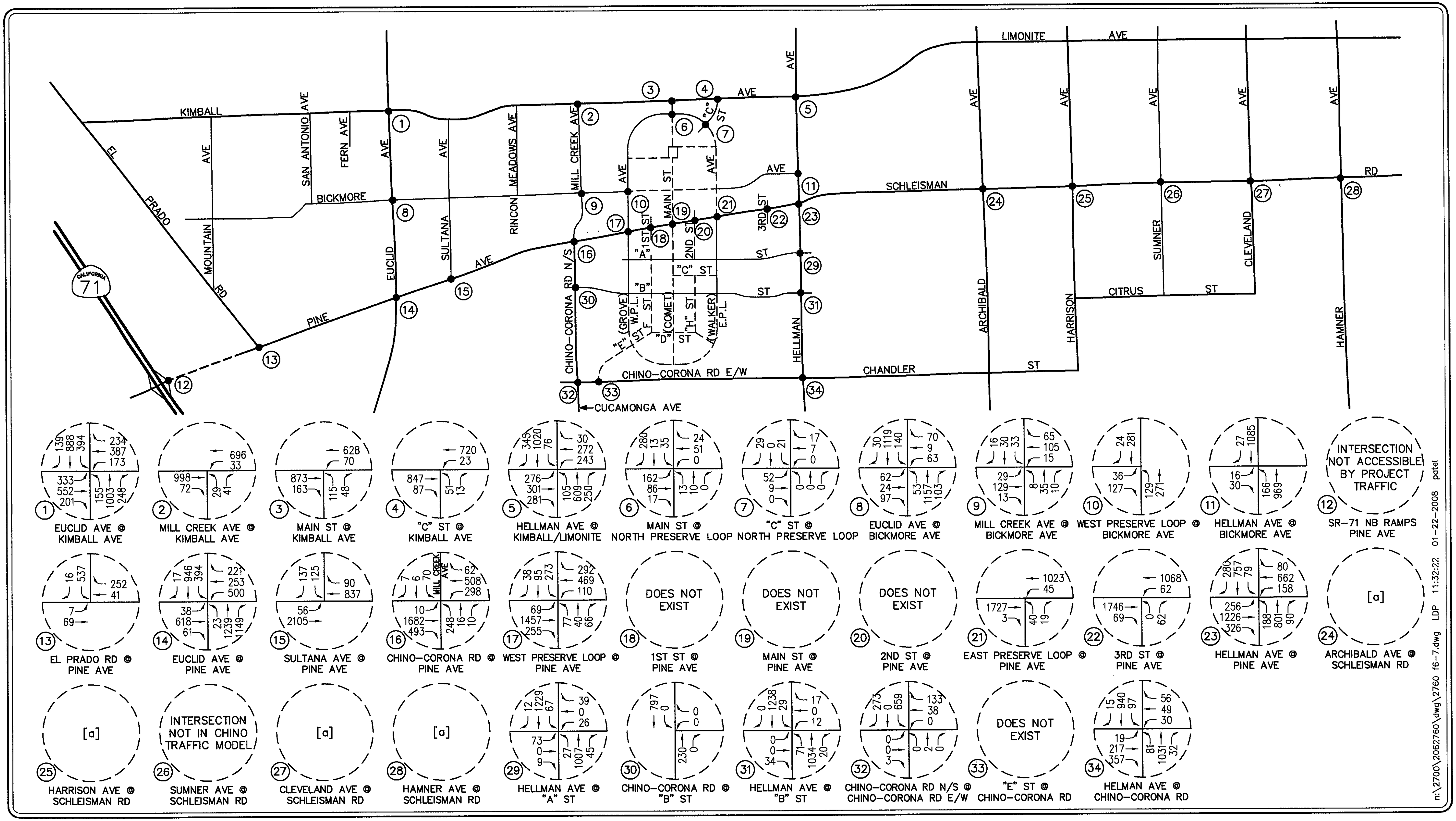
NOTE:
[a] YEAR 2030 ANALYSIS GOVERNS PROJECT IMPACT ASSESSMENT AND MITIGATION NEEDS.

LEGEND
– – – – FUTURE ROADWAY
W.P.L. = WEST PRESERVE LOOP
E.P.L. = EAST PRESERVE LOOP

FIGURE 6-6

YEAR 2015 AM PEAK HOUR TRAFFIC VOLUMES WITH PROJECT TRAFFIC
SOUTH OF PINE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO



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NOTE:
[a] YEAR 2030 ANALYSIS GOVERNS PROJECT IMPACT ASSESSMENT AND MITIGATION NEEDS.

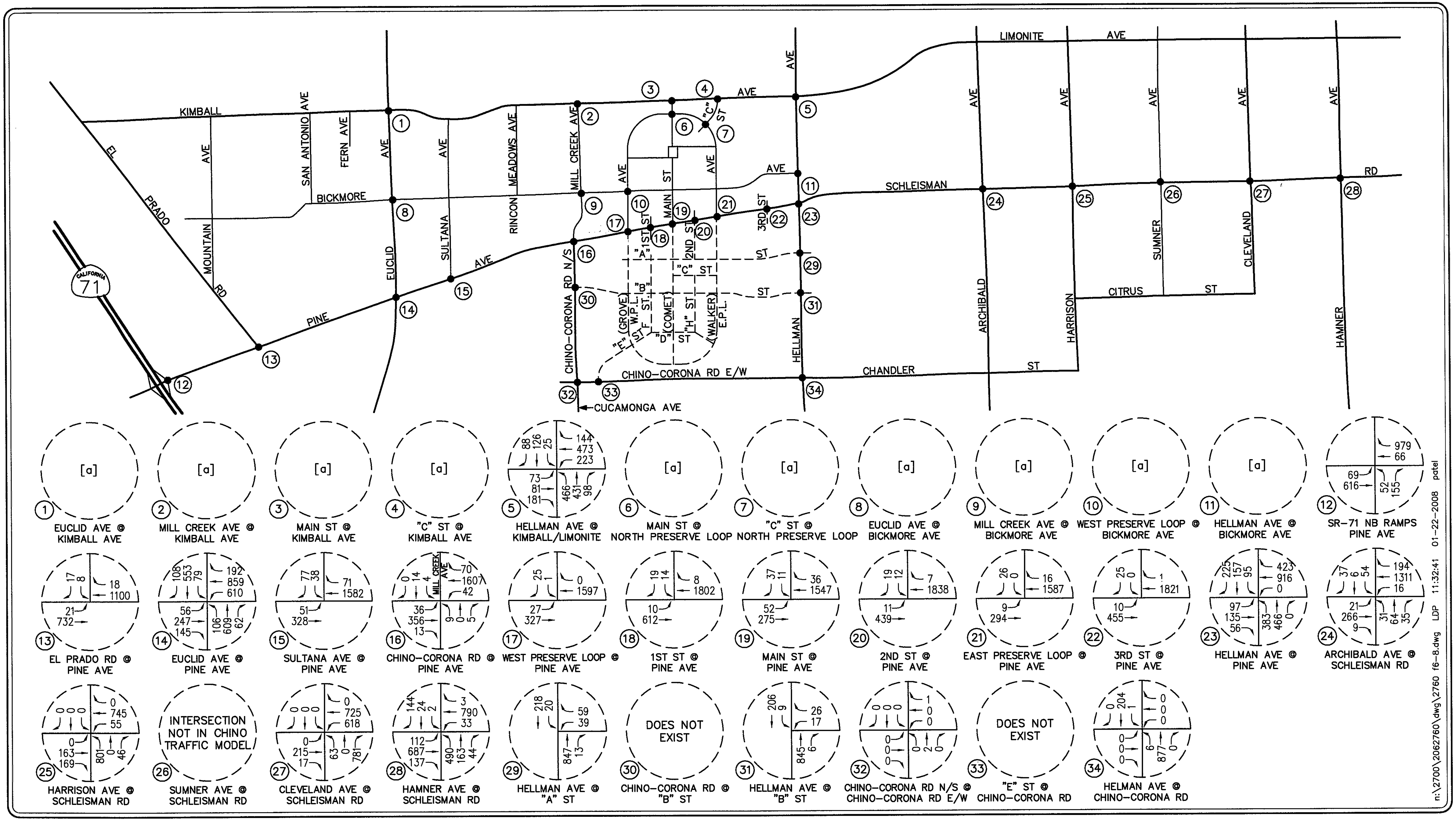
LEGEND

– – – – FUTURE ROADWAY
W.P.L. = WEST PRESERVE LOOP
E.P.L. = EAST PRESERVE LOOP

FIGURE 6-7

YEAR 2015 PM PEAK HOUR TRAFFIC VOLUMES WITH PROJECT TRAFFIC

SOUTH OF PINE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO



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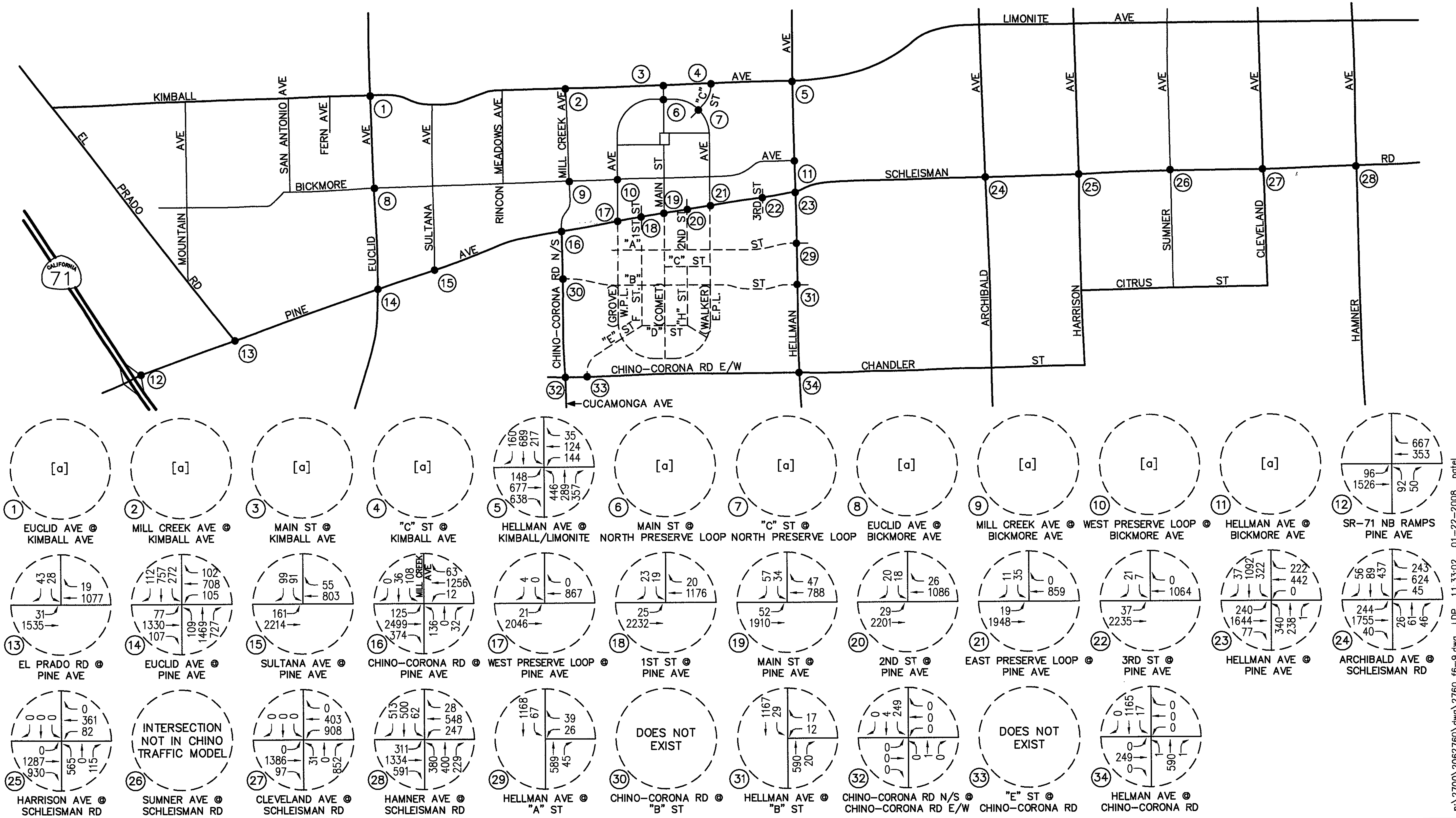
NOTE:
[a] INTERSECTION DOES NOT MEET OR EXCEED 50 PROJECT TRIP THRESHOLD FOR ANALYSIS.

LEGEND
— — — — FUTURE ROADWAY
W.P.L. = WEST PRESERVE LOOP
E.P.L. = EAST PRESERVE LOOP

FIGURE 6-8

YEAR 2030 AM PEAK HOUR BACKGROUND TRAFFIC VOLUMES

SOUTH OF PINE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO



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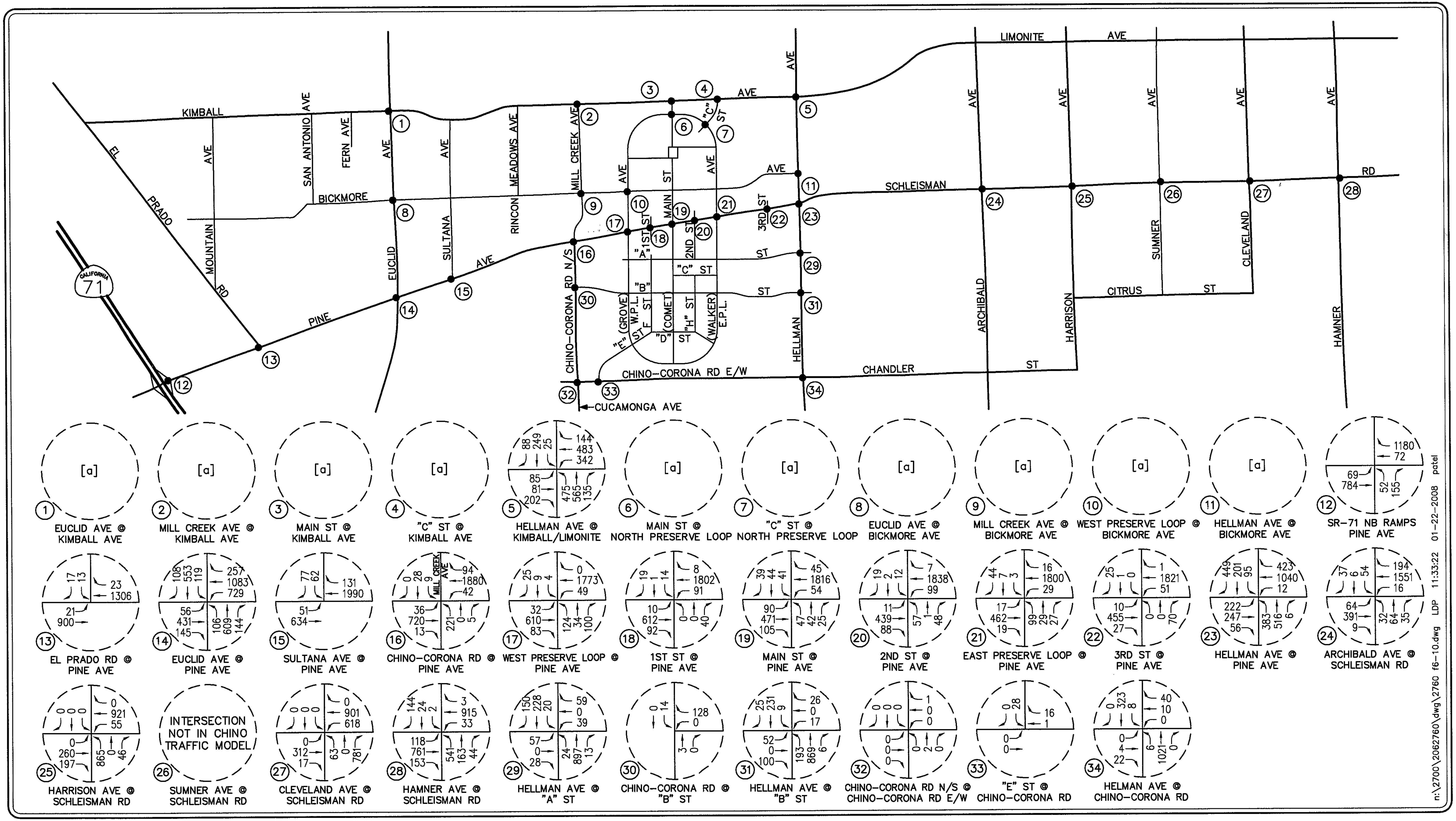
NOTE:
[a] INTERSECTION DOES NOT MEET OR EXCEED 50 PROJECT TRIP THRESHOLD FOR ANALYSIS.

LEGEND

– – – – FUTURE ROADWAY
W.P.L. = WEST PRESERVE LOOP
E.P.L. = EAST PRESERVE LOOP

FIGURE 6-9

YEAR 2030 PM PEAK HOUR BACKGROUND TRAFFIC VOLUMES
SOUTH OF PINE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO



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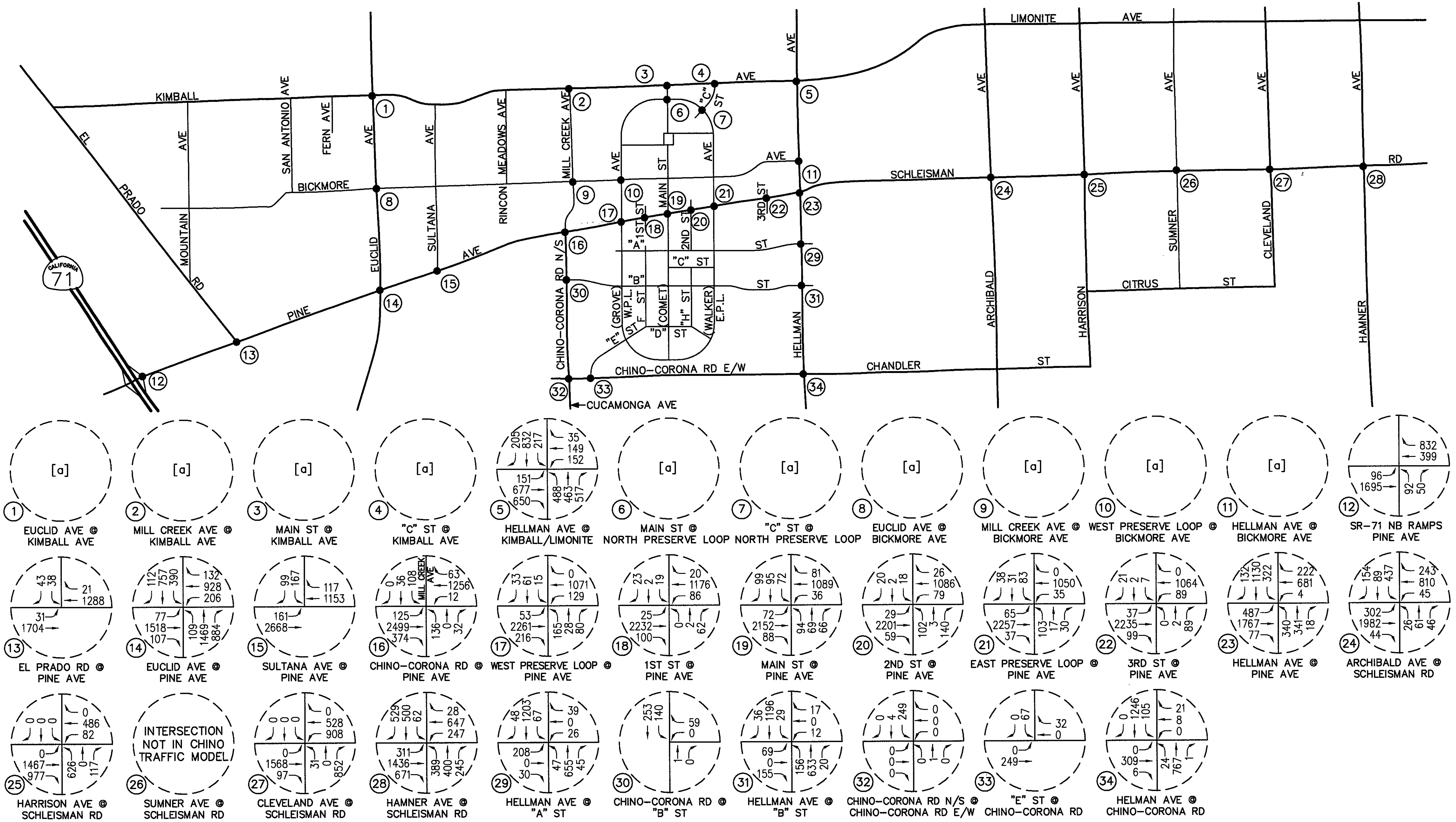
NOTE:
[a] INTERSECTION DOES NOT MEET OR EXCEED 50 PROJECT TRIP THRESHOLD FOR ANALYSIS.

LEGEND
W.P.L. = WEST PRESERVE LOOP
E.P.L. = EAST PRESERVE LOOP

FIGURE 6-10

YEAR 2030 AM PEAK HOUR TRAFFIC VOLUMES WITH PROJECT TRAFFIC

SOUTH OF PINE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO



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NOTE:
[a] INTERSECTION DOES NOT MEET OR EXCEED 50 PROJECT TRIP THRESHOLD FOR ANALYSIS.

LEGEND

W.P.L. = WEST PRESERVE LOOP
E.P.L. = EAST PRESERVE LOOP

FIGURE 6-11

YEAR 2030 PM PEAK HOUR TRAFFIC VOLUMES WITH PROJECT TRAFFIC
SOUTH OF PINE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO

7.0 TRAFFIC IMPACT ANALYSIS METHODOLOGY

The relative impact of the added peak hour project traffic volumes generated by the South of Pine Avenue Development Project have been evaluated based on the analysis of future operating conditions at the key study intersections. Operating conditions at the key study intersections were evaluated during the AM and PM peak hours for existing traffic conditions and future near-term (2015) and long-term (2030) traffic conditions without, then with the proposed project.

The previously discussed capacity analysis procedures were utilized to investigate the future volume-to-capacity relationships and service level characteristics at each study intersection. The significance of the potential impacts of the project at each key intersection was then evaluated using the City of Chino, City of Chino Hills, County of San Bernardino and County of Riverside LOS standards and the impact criteria summarized below.

7.1 Definition of Deficiency and Significance Criteria

The City of Chino considers LOS "D" to be the minimum acceptable condition that should be maintained during the peak commute hours, except those on the Congestion Management Program Highway System (CMPHS) of San Bernardino County, where LOS E is defined in the CMP for San Bernardino County as the acceptable limit. Therefore, any intersection operating at LOS "E" or "F" is considered deficient/unsatisfactory. The City of Chino Hills also considers LOS "D" to be the minimum acceptable condition that should be maintained during the peak commute hours. The County of San Bernardino and the County of Riverside consider LOS "C" to be the minimum acceptable condition that should be maintained during the peak commute hours.

7.2 Traffic Impact Analysis Scenarios

The following scenarios are those for which volume/capacity calculations have been performed at the key intersections for near-term (Year 2015) and long-term (Year 2030) conditions:

1. Existing Traffic Conditions;
2. Year 2015 Background Traffic Conditions;
3. Year 2015 Background Traffic Conditions plus the South of Pine Avenue Development Project;
4. Scenario (3) with Mitigation, if necessary;
5. Year 2030 Background Traffic Conditions;
6. Year 2030 Future Traffic Conditions plus the South of Pine Avenue Development Project;
7. Scenario (6) with Mitigation, if necessary.

8.0 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

The following sections summarize the peak hour intersection capacity analysis for the twenty-four near-term (Year 2015) key study intersections and the twenty-three long-term (Year 2030) key study intersections.

8.1 Near-Term (Year 2015) Peak Hour Intersection Capacity Analysis

8.1.1 *Near-Term (Year 2015) Lane Geometrics and Intersection Controls*

Figure 8-1 graphically illustrates the lane geometrics and intersection controls assumed in the Year 2015 cumulative background traffic setting at the 24 near-term key study intersections. The lane geometrics and intersection controls identified in *Figure 8-1* are based in part on The Preserve, Chino Internal Traffic Model Methodology and Findings: Long-Term/Project Buildout Conditions Report, prepared by LLG (March 7, 2003) with further adjustments made based on discussions with City staff and/or the specifics of the South of Pine Avenue Development Project along its perimeter. Further, geometries for intersections 3, 4, 5 and 11 show interim and not necessarily total buildout lane provisions based on the LLG 2006 Study for the DeBoer site (see Section 1.1 for overview of that study). Ultimate lane provisions at those locations are shown in the DeBoer study for the Year 2020 condition. Given the update of the area modeling horizon to Year 2030, the Year 2020 buildout geometrics of the DeBoer and other area studies now "roll" to Year 2030.

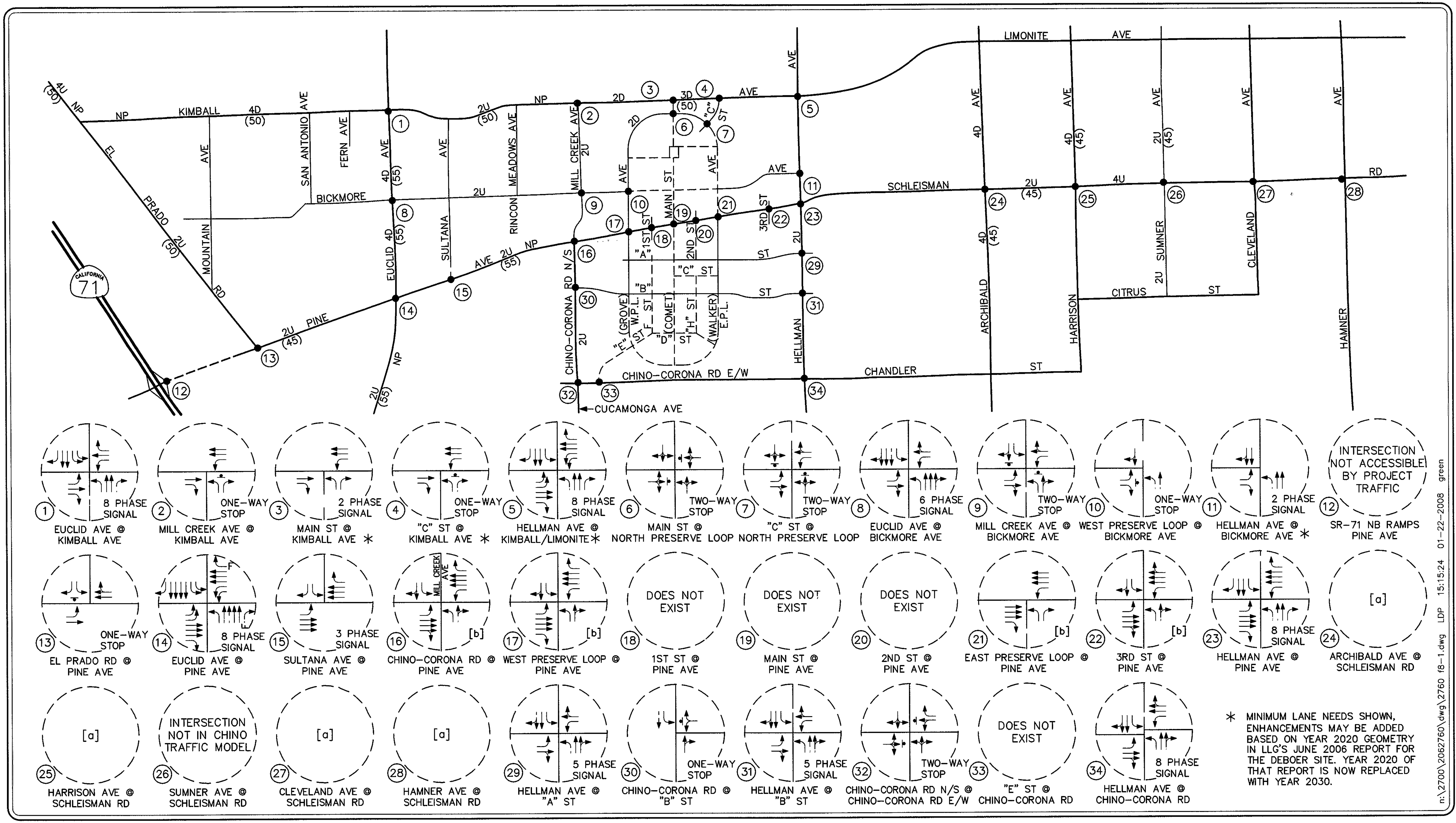
8.1.2 *Near-Term (Year 2015) Traffic Evaluation*

Table 8-1 summarizes the peak hour Level of Service results at the 24 near-term key study intersections for the Year 2015. The first column (1) of HCM/LOS values in *Table 8-1* presents a summary of existing AM and PM peak hour traffic conditions (which were previously presented in *Table 3-3*).

The second column (2) lists forecast 2015 background conditions (existing traffic plus ambient growth traffic plus related projects traffic) based on the lane geometrics and intersection controls presented in *Figure 8-1*, but without any traffic generated from the proposed project. The third column (3) presents future forecast traffic conditions with the addition of traffic generated by the South of Pine Avenue Development Project. The fourth column (4) indicates whether the intersection will operate at an acceptable level of service with the proposed project based on the LOS standards defined in this report.

Year 2015 Background Traffic Conditions

An analysis of future (Year 2015) background traffic conditions indicates that ambient traffic growth and related projects traffic will adversely impact one of the 24 near-term key study intersections. The intersection of Euclid Avenue at Pine Avenue is forecast to operate at unacceptable LOS F during the AM peak hour. The remaining twenty-three (23) near-term key study intersections are forecast to continue to operate at an acceptable LOS with the addition of ambient growth traffic and related projects traffic.



* MINIMUM LANE NEEDS SHOWN, ENHANCEMENTS MAY BE ADDED BASED ON YEAR 2020 GEOMETRY IN LLG'S JUNE 2006 REPORT FOR THE DEBOER SITE. YEAR 2020 OF THAT REPORT IS NOW REPLACED WITH YEAR 2030.

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NOTE:
[a] YEAR 2030 ANALYSIS GOVERNS PROJECT IMPACT ASSESSMENT AND MITIGATION NEEDS.
[b] REFER TO TABLE 11-1 FOR SIGNAL PHASING DESCRIPTION AND FIGURE 13-1 THROUGH 13-5 FOR REVISED LANE GEOMETRIES BASED ON PINE AVENUE ACCESS OPTIONS.

LEGEND
– – – – FUTURE ROADWAY
W.P.L. = WEST PRESERVE LOOP
E.P.L. = EAST PRESERVE LOOP

FIGURE 8-1

YEAR 2015 RECOMMENDED LANE GEOMETRICS AND INTERSECTION CONTROLS
SOUTH OF PINE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO

TABLE 8-1
YEAR 2015 PEAK HOUR INTERSECTION CAPACITY ANALYSIS[28]

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2015 Background Traffic		(3) Year 2015 Plus Project Traffic		(4) Acceptable LOS
		Delay	LOS	Delay	LOS	Delay	LOS	Yes/No
1. Euclid Avenue at Kimball Avenue	AM	21.9 s/v	C	54.0 s/v	D	54.2 s/v	D	Yes
	PM	19.9 s/v	B	51.2 s/v	D	52.0 s/v	D	Yes
2. Mill Creek Avenue at Kimball Avenue	AM	0.9 s/v	A	1.3 s/v	A	1.6 s/v	A	Yes
	PM	9.1 s/v	A	1.2 s/v	A	1.3 s/v	A	Yes
3. Main Street at Kimball Avenue	AM	6.7 s/v	A	11.6 s/v	B	12.1 s/v	B	Yes
	PM	2.8 s/v	A	10.7 s/v	B	10.7 s/v	B	Yes
4. "C" Street at Kimball Avenue	AM	3.7 s/v	A	1.4 s/v	A	1.4 s/v	A	Yes
	PM	1.6 s/v	A	1.6 s/v	A	1.6 s/v	A	Yes
5. Hellman Avenue at Kimball Avenue/Limonite Avenue	AM	Intersection Does Not Exist		38.1 s/v	D	38.1 s/v	D	Yes
	PM			46.7 s/v	D	52.8 s/v	D	Yes
6. Main Street at North Preserve Loop	AM	7.8 s/v	A	10.0 s/v	A	11.1 s/v	B	Yes
	PM	7.4 s/v	A	7.9 s/v	A	8.0 s/v	A	Yes
7. "C" Street at North Preserve Loop	AM	2.8 s/v	A	4.2 s/v	A	4.2 s/v	A	Yes
	PM	4.9 s/v	A	6.1 s/v	A	6.1 s/v	A	Yes
8. Euclid Avenue at Bickmore Avenue	AM	0.9 s/v	A	16.8 s/v	B	16.7 s/v	B	Yes
	PM	1.0 s/v	A	23.3 s/v	C	23.6 s/v	C	Yes
9. Mill Creek Avenue at Bickmore Avenue	AM	7.3 s/v	A	3.8 s/v	A	3.8 s/v	A	Yes
	PM	7.2 s/v	A	3.3 s/v	A	3.9 s/v	A	Yes

Notes:
s/v = seconds per vehicle (delay)

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[28] **Bold HCM/LOS values** indicate adverse service levels based on City of Chino, City of Chino Hills, County of San Bernardino and County of Riverside LOS standards.

TABLE 8-1 (CONTINUED)
YEAR 2015 PEAK HOUR INTERSECTION CAPACITY ANALYSIS[29]

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2015 Background Traffic		(3) Year 2015 Plus Project Traffic		(4) Acceptable LOS
		Delay	LOS	Delay	LOS	Delay	LOS	Yes/No
10. West Preserve Loop at	AM	7.6 s/v	A	2.7 s/v	A	2.8 s/v	A	Yes
Bickmore Avenue	PM	7.3 s/v	A	3.4 s/v	A	3.6 s/v	A	Yes
11. Hellman Avenue at	AM	Intersection Does Not Exist		9.3 s/v	A	9.4 s/v	A	Yes
Bickmore Avenue	PM			9.3 s/v	A	9.6 s/v	A	Yes
12. SR-71 Northbound Ramp at	AM	12.7 s/v	B	Intersection will not service Project traffic until Pine connection is made				
Pine Avenue	PM	11.6 s/v	B					
13. El Prado Road at	AM	7.9 s/v	A	2.8 s/v	A	2.8 s/v	A	Yes
Pine Avenue	PM	8.8 s/v	A	8.2 s/v	A	9.9 s/v	A	Yes
14. Euclid Avenue at	AM	47.1 s/v	D	**84.8 s/v**	**F**	**100.9 s/v**	**F**	**No**
Pine Avenue	PM	34.2 s/v	C	42.6 s/v	D	50.7 s/v	D	Yes
15. Sultana Avenue at	AM	Intersection Does Not Exist		20.9 s/v	C	21.2 s/v	C	Yes
Pine Avenue	PM			15.7 s/v	B	16.2 s/v	B	Yes
16. Mill Creek Ave/Chino-Corona Rd N/S at	AM	25.6 / 0.0	C / A[30]	27.4 s/v	C	28.4 s/v	C	Yes
Pine Avenue	PM	17.5 / 0.0	B / A	35.3 s/v	D	41.0 s/v	D	Yes
17. West Preserve Loop at	AM	12.2 s/v	B	18.0 s/v	B	20.8 s/v	C	Yes
Pine Avenue	PM	11.9 s/v	B	18.6 s/v	B	23.0 s/v	C	Yes
18. 1st Street at	AM	Intersection Does Not Exist						
Pine Avenue	PM							

Notes:
s/v = seconds per vehicle (delay)

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[29] **Bold HCM/LOS values** indicate adverse service levels based on City of Chino, City of Chino Hills, County of San Bernardino and County of Riverside LOS standards.

[30] Presents the level of service for existing intersection 16a and 16b as shown previously in Table 3-3. This key study intersection will be re-aligned in the Year 2015 to function as one intersection.

TABLE 8-1 (CONTINUED)
YEAR 2015 PEAK HOUR INTERSECTION CAPACITY ANALYSIS[31]

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2015 Background Traffic		(3) Year 2015 Plus Project Traffic		(4) Acceptable LOS
		Delay	LOS	Delay	LOS	Delay	LOS	Yes/No
19. Main Street at	AM	Intersection Does Not Exist						
Pine Avenue	PM							
20. 2nd Street at	AM	Intersection Does Not Exist						
Pine Avenue	PM							
21. East Preserve Loop at	AM	Intersection Does Not Exist				13.4 s/v	B	Yes
Pine Avenue	PM					14.7 s/v	B	Yes
22. 3rd Street at	AM	Intersection Does Not Exist				11.7 s/v	B	Yes
Pine Avenue	PM					14.1 s/v	B	Yes
23. Hellman Ave at	AM	**57.9 s/v**	**F**	39.3 s/v	D	44.1 s/v	D	Yes
Pine Ave/Schleisman Rd	PM	34.0 s/v	D	38.4 s/v	D	41.1 s/v	D	Yes
24. Archibald Avenue at	AM	54.1 s/v	D	Year 2030 Analysis Governs for Project Impact Assessment and Mitigation Needs				
Schleisman Road	PM	51.2 s/v	D					
25. Harrison Avenue at	AM	27.7 s/v	C	Year 2030 Analysis Governs for Project Impact Assessment and Mitigation Needs				
Schleisman Road	PM	25.0 s/v	C					
26. Sumner Avenue at	AM	19.6 s/v	C	Intersection Not in Chino Traffic Model				
Schleisman Road	PM	11.1 s/v	B					
27. Cleveland Avenue at	AM	14.9 s/v	B	Year 2030 Analysis Governs for Project Impact Assessment and Mitigation Needs				
Schleisman Road	PM	9.2 s/v	A					

Notes:
s/v = seconds per vehicle (delay)

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[31] **Bold HCM/LOS values** indicate adverse service levels based on City of Chino, City of Chino Hills, County of San Bernardino and County of Riverside LOS standards.

TABLE 8-1 (CONTINUED)
YEAR 2015 PEAK HOUR INTERSECTION CAPACITY ANALYSIS[32]

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2015 Background Traffic		(3) Year 2015 Plus Project Traffic		(4) Acceptable LOS
		Delay	LOS	Delay	LOS	Delay	LOS	Yes/No
28. Hamner Avenue at	AM	28.5 s/v	C	Year 2030 Analysis Governs for Project Impact Assessment and Mitigation Needs				
Schleisman Road	PM	24.1 s/v	C					
29. Hellman Avenue at	AM	Intersection Does Not Exist		11.8 s/v	B	16.3 s/v	B	Yes
"A" Street	PM			13.3 s/v	B	17.7 s/v	B	Yes
30. Chino-Corona Rd N/S at	AM	Intersection Does Not Exist				0.0 s/v	A	Yes
"B" Street	PM					0.0 s/v	A	Yes
31. Hellman Avenue at	AM	Intersection Currently Does Not Exist		11.2 s/v	B	16.1 s/v	B	Yes
"B" Street	PM			12.4 s/v	B	17.6 s/v	B	Yes
32. Chino-Corona Rd N/S at	AM	9.4 s/v	A	8.2 s/v	A	8.2 s/v	A	Yes
Chino-Corona Rd E/W	PM	18.4 s/v	C	23.0 s/v	C	23.0 s/v	C	Yes
33. "E" Street at	AM	Intersection Does Not Exist						
Chino-Corona Rd E/W	PM							
34. Hellman Ave at	AM	14.3 s/v	B	28.9 s/v	C	29.5 s/v	C	Yes
Chino-Corona Rd/Chandler St	PM	16.2 s/v	C	28.8 s/v	C	30.4 s/v	C	Yes

Notes:
s/v = seconds per vehicle (delay)

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[32] **Bold HCM/LOS values** indicate adverse service levels based on City of Chino, City of Chino Hills, County of San Bernardino and County of Riverside LOS standards.

Year 2015 With Project Traffic Conditions

Review of Columns 3 and 4 of *Table 8-1* indicates that with the proposed South of Pine Avenue Development Project, one of the 24 near-term key study intersections is forecast to continue to operate at an unacceptable level of service when compared to the LOS standards specified in this report. The intersection of Euclid Avenue at Pine Avenue is forecast to operate at unacceptable LOS F during the AM peak hour. The remaining 23 key study intersections are forecast to continue to operate at an acceptable LOS with the addition of project generated traffic in the Year 2015.

The Year 2015 unacceptable level of service at the intersection of Euclid Avenue and Pine Avenue during the AM peak hour can be attributed to not having the connection of Pine Avenue between El Prado Road and the SR-71 Freeway. Without the connection to the SR-71 Freeway from Pine Avenue, vehicles traveling westbound on Pine Avenue need to make a westbound left-turn (which will be serviced by a planned dual left-turn lane) at the intersection of Pine Avenue/Euclid Avenue to travel south on Euclid Avenue to the SR-71 Freeway. This movement causes the intersection to operate at an unacceptable level of service. The connection between El Prado Road and the SR-71 Freeway will alleviate the congestion within the dual westbound left-turn lanes resulting in an acceptable level of service at the intersection. The Year 2030 level of service described in the following section at this location illustrates how the intersection of Pine Avenue/Euclid Avenue will operate at an acceptable level of service with the Pine Avenue connection between El Prado Road and the SR-71 Freeway.

Appendix C also presents the near-term (Year 2015) HCM/LOS calculations for the key study intersections for the AM peak hour and PM peak hour.

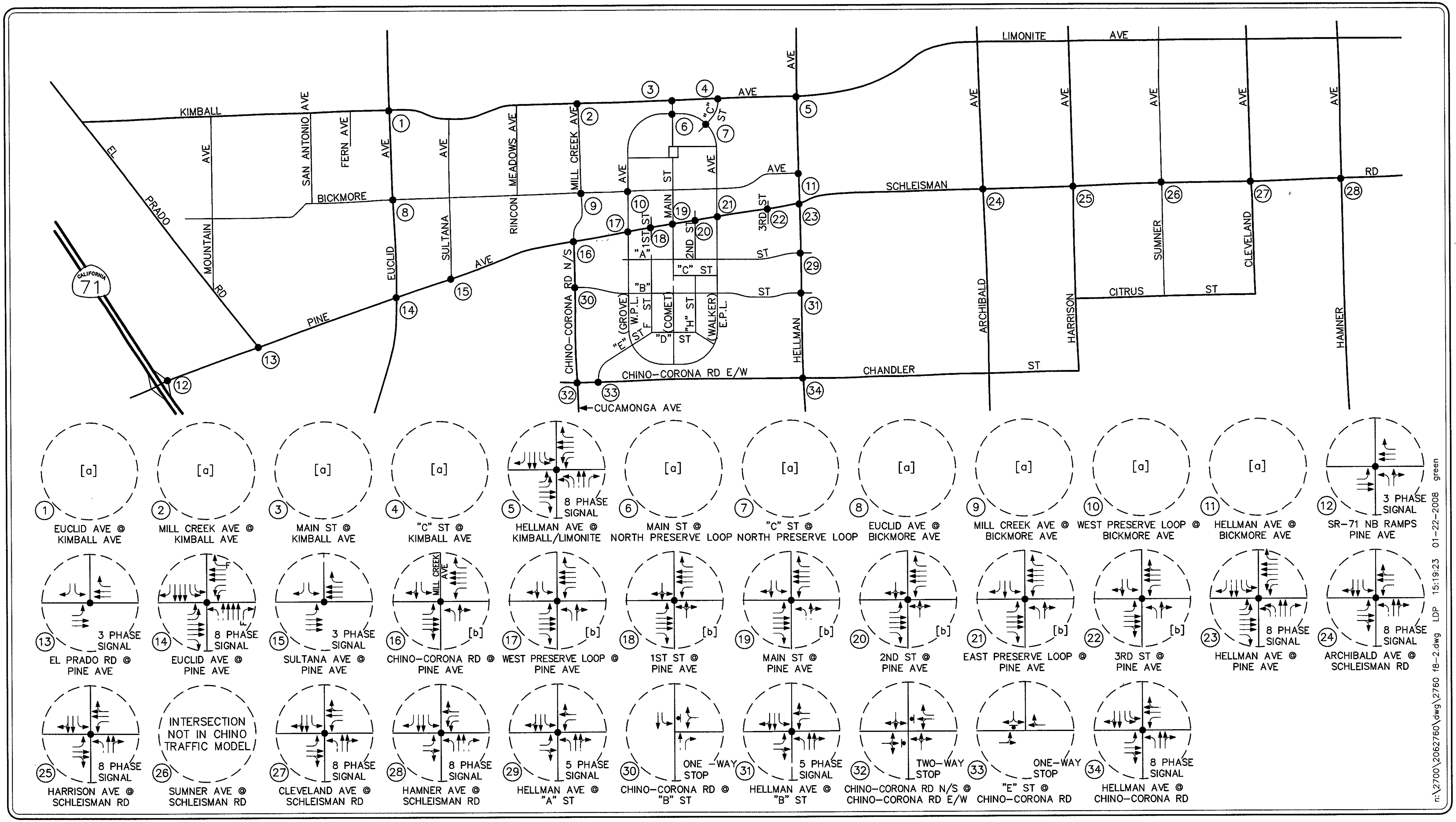
Year 2015 Roadway Improvement Recommendations

The acceptable service level results, as identified in *Table 8-1,* with project traffic added to the forecast Year 2015 background condition, are explicitly a function of the lane geometries and traffic controls depicted in *Figure 8-1.* Progressive implementation of these intersection configurations, as adjoining area projects are considered, conditioned and approved, are an integral part of achieving the acceptable service levels presented here.

8.2 Long-Term (Year 2030) Peak Hour Intersection Capacity Analysis

8.2.1 *Long-Term (Year 2030) Lane Geometrics and Intersection Controls*

Figure 8-2 graphically illustrates the lane geometrics and intersection controls assumed in the Year 2030 cumulative background traffic setting at the 23 long-term key study intersections. The lane geometrics and intersection controls identified in *Figure 8-2* are based from The Preserve, Chino Internal Traffic Model Methodology and Findings: Long-Term/Project Buildout Conditions Report, prepared by LLG (March 7, 2003) with further adjustments made based on discussions with City staff and/or the specifics of the South of Pine Avenue Development Project along its perimeter. For Hellman at Pine/Schleisman (intersection 23) the geometries vary slightly from those in the 2002 EIR because of refined analyses and design decisions made by the City since the EIR was certified.



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NOTE:

[a] INTERSECTION DOES NOT MEET OR EXCEED 50 PROJECT TRIP THRESHOLD FOR ANALYSIS.

[b] REFER TO TABLE 11–1 FOR SIGNAL PHASING DESCRIPTION AND FIGURE 13–1 THROUGH 13–5 FOR REVISED LANE GEOMETRIES BASED ON PINE AVENUE ACCESS OPTIONS.

KEY

← = APPROACH LANE ASSIGNMENT
● = TRAFFIC SIGNAL, ▾ STOP SIGN
F = FREE RIGHT
OL = RIGHT TURN OVERLAP
W.P.L. = WEST PRESERVE LOOP
E.P.L. = EAST PRESERVE LOOP

FIGURE 8–2

YEAR 2030 RECOMMENDED LANE GEOMETRICS AND INTERSECTION CONTROLS

SOUTH OF PINE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO

8.2.2 *Long-Term (Year 2030) Traffic Evaluation*

Table 8-2 summarizes the peak hour Level of Service results at the 23 long-term key study intersections for the Year 2030. These are locations where, based on Appendix A materials, the 50-project trip threshold is met or exceeded. The first column (1) of HCM/LOS values in *Table 8-2* lists forecast 2030 background traffic conditions based on the lane geometrics and intersection controls presented in *Figure 8-2*, but without any traffic generated from the proposed project. The second column (2) presents future forecast traffic conditions with the addition of traffic generated by the South of Pine Avenue Development Project. The third column (3) indicates whether the intersection will operate at an acceptable level of service with the proposed project based on the LOS standards defined in this report. The fourth column (4) provides the long-term level of delay at key study intersections as contained within The Preserve EIR, dated August 2002; if delay calculations and LOS results are not shown, the intersection was not evaluated in the 2002 EIR. The fifth column (5) provides the long-term level of service at select key study intersections for the current General Plan with its prior assumptions for the South of Pine Avenue Development Project site. These are also provided only for locations that were analyzed in the 2002 EIR, recognizing that the Year 2030 Plus Project results consider the total future traffic condition at each intersection. For those locations with a Current General Plan delay and LOS value, it will be noted that the differences between that value and the Year 2030 Plus Project value are very small, echoing the similarities of the Project's current trip generation characteristics versus the site's placeholder in the City's modeling for the General Plan (see Table 5-4).

Year 2030 Background Traffic Conditions

An analysis of future (Year 2030) background traffic conditions indicates that four of the 23 long-term key study intersections are forecast to operate at an unacceptable level of service. The County of Riverside intersections of Archibald Avenue at Schleisman Road, Harrison Avenue at Schleisman Road, Cleveland Avenue at Schleisman Road and Hamner Avenue at Schleisman Road are forecast to operate at unacceptable LOS E and/or LOS F during the AM and/or PM peak hours. The Sumner Avenue at Schleisman Road intersection is not in the Chino Traffic Model and so delay and LOS values are not presented in Table 8-2. LOS deficiencies, if any, are therefore unknown, but this study does make a recommendation for project participation should future Riverside County studies determine a possible LOS deficiency and mitigation/improvement need. The remaining long-term key study intersections are forecast to continue to operate at an acceptable LOS in the Year 2030 based on *Figure 8-2* lane geometrics and traffic controls.

Year 2030 With Project Traffic Conditions

Review of Columns 2 and 3 of *Table 8-2* indicates that with the proposed South of Pine Avenue Development Project, four of the 23 long-term key study intersections are forecast to continue to operate at an unacceptable level of service when compared to the LOS standards specified in this report. The County of Riverside intersections of Archibald Avenue at Schleisman Road, Harrison Avenue at Schleisman Road, Cleveland Avenue at Schleisman Road, and Hamner Avenue at Schleisman Road are forecast to operate at unacceptable LOS E and/or LOS F during the AM and/or PM peak hours (The LOS Standard in Riverside County is LOS C). The remaining key study intersections are forecast to continue to operate at an acceptable LOS with the addition of project generated traffic in the Year 2030, including all within Chino, Chino Hills, and San Bernardino County.

Review of the second row of LOS values within column 2 for the intersections of Archibald Avenue at Schleisman Road, Cleveland Avenue at Schleisman Road and Hamner Avenue at Schleisman Road indicates that these three County of Riverside intersections will continue to operate at an unacceptable level of service even with full buildout of the intersections assumed per the Riverside County General Plan Circulation Element. A review of the Harrison Avenue at Schleisman Road LOS worksheets indicates that even the further addition of right turn lanes would not alter the LOS results. Given that these four intersections will continue to operate at unacceptable levels of service in the Year 2030, the proposed South of Pine Avenue Development Project can be expected to pay a proportional fair-share towards improvements at those locations. A similar contribution is identified, if and warranted, for Sumner Avenue at Schleisman Road.

Appendix C also presents the long-term (Year 2030) HCM/LOS calculations for the key study intersections for the AM peak hour and PM peak hour.

TABLE 8-2

YEAR 2030 PEAK HOUR INTERSECTION CAPACITY ANALYSIS[33]

Key Intersections	Time Period	(1) Year 2030 Background Traffic		(2) Year 2030 Plus Project Traffic		(3) Acceptable LOS	(4) The Preserve EIR 2002 Traffic Conditions[34]		(5) Current General Plan Traffic Conditions[35]	
		Delay	LOS	Delay	LOS	Yes/No	Delay	LOS	Delay	LOS
1. Euclid Avenue at	AM	Intersection Does Not Meet or Exceed 50 Project Trip Threshold					N/A[36]	N/A[36]	N/A[37]	N/A[37]
Kimball Avenue	PM						N/A[36]	N/A[36]	N/A[37]	N/A[37]
2. Mill Creek Avenue at	AM	Intersection Does Not Meet or Exceed 50 Project Trip Threshold					N/A[36]	N/A[36]	N/A[37]	N/A[37]
Kimball Avenue	PM						N/A[36]	N/A[36]	N/A[37]	N/A[37]
3. Main Street at	AM	Intersection Does Not Meet or Exceed 50 Project Trip Threshold					N/A[36]	N/A[36]	N/A[37]	N/A[37]
Kimball Avenue	PM						N/A[36]	N/A[36]	N/A[37]	N/A[37]
4. "C" Street at	AM	Intersection Does Not Meet or Exceed 50 Project Trip Threshold					N/A[36]	N/A[36]	N/A[37]	N/A[37]
Kimball Avenue	PM						N/A[36]	N/A[36]	N/A[37]	N/A[37]
5. Hellman Avenue at	AM	34.1 s/v	C	36.4 s/v	D	Yes	N/A[36]	N/A[36]	N/A[37]	N/A[37]
Kimball Avenue/Limonite Avenue	PM	43.8 s/v	D	51.2 s/v	D	Yes	N/A[36]	N/A[36]	N/A[37]	N/A[37]
6. Main Street at	AM	Intersection Does Not Meet or Exceed 50 Project Trip Threshold					N/A[36]	N/A[36]	N/A[37]	N/A[37]
North Preserve Loop	PM						N/A[36]	N/A[36]	N/A[37]	N/A[37]
7. "C" Street at	AM	Intersection Does Not Meet or Exceed 50 Project Trip Threshold					N/A[36]	N/A[36]	N/A[37]	N/A[37]
North Preserve Loop	PM						N/A[36]	N/A[36]	N/A[37]	N/A[37]
8. Euclid Avenue at	AM	Intersection Does Not Meet or Exceed 50 Project Trip Threshold					N/A[36]	N/A[36]	N/A[37]	N/A[37]
Bickmore Avenue	PM						N/A[36]	N/A[36]	N/A[37]	N/A[37]
9. Mill Creek Avenue at	AM	Intersection Does Not Meet or Exceed 50 Project Trip Threshold					N/A[36]	N/A[36]	N/A[37]	N/A[37]
Bickmore Avenue	PM						N/A[36]	N/A[36]	N/A[37]	N/A[37]
10. West Preserve Loop at	AM	Intersection Does Not Meet or Exceed 50 Project Trip Threshold					N/A[36]	N/A[36]	N/A[37]	N/A[37]
Bickmore Avenue	PM						N/A[36]	N/A[36]	N/A[37]	N/A[37]

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[33] **Bold HCM/LOS values** indicate adverse service levels based on City of Chino, City of Chino Hills, County of San Bernardino and County of Riverside LOS standards.

[34] Source: The Preserve Environmental Impact Report (EIR), dated August 2002.

[35] The LOS values within this column represent the City's Current General Plan without modifications to the South of Pine Avenue Development Project.

[36] This Intersection is not evaluated in the Preserve EIR 2002.

[37] For comparison purposes, current General Plan conditions are reported only for those locations previously evaluated in the Preserve EIR 2002.

TABLE 8-2 (CONTINUED)
YEAR 2030 PEAK HOUR INTERSECTION CAPACITY ANALYSIS[38]

Key Intersections	Time Period	(1) Year 2030 Background Traffic		(2) Year 2030 Plus Project Traffic		(3) Acceptable LOS	(4) The Preserve EIR 2002 Traffic Conditions[39]		(5) Current General Plan Traffic Conditions[40]	
		Delay	LOS	Delay	LOS	Yes/No	Delay	LOS	Delay	LOS
11. Hellman Avenue at Bickmore Avenue	AM PM	Intersection Does Not Meet or Exceed 50 Project Trip Threshold					N/A[41] N/A[41]	N/A[41] N/A[41]	N/A[42] N/A[42]	N/A[42] N/A[42]
12. SR-71 Northbound Ramp at Pine Avenue	AM PM	15.0 s/v 8.7 s/v	B A	19.9 s/v 8.8 s/v	B A	Yes Yes	43.5 s/v 45.5 s/v	D D	20.3 s/v 8.6 s/v	C A
13. El Prado Road at Pine Avenue	AM PM	12.2 s/v 15.1 s/v	B B	13.1 s/v 16.2 s/v	B B	Yes Yes	26.0 s/v 36.9 s/v	C D	13.2 s/v 15.4 s/v	B B
14. Euclid Avenue at Pine Avenue	AM PM	36.6 s/v 33.0 s/v	D C	40.7 s/v 39.4 s/v	D D	Yes Yes	48.6 s/v 39.7 s/v	D D	43.3 s/v 40.3 s/v	D D
15. Sultana Avenue at Pine Avenue	AM PM	14.6 s/v 17.5 s/v	B B	14.9 s/v 18.8 s/v	B B	Yes Yes	N/A[41] N/A[41]	N/A[41] N/A[41]	N/A[42] N/A[42]	N/A[42] N/A[42]
16. Mill Creek Ave/Chino-Corona Rd N/S at Pine Avenue	AM PM	15.6 s/v 23.1 s/v	B C	18.7 s/v 23.1 s/v	B C	Yes Yes	N/A[41] N/A[41]	N/A[41] N/A[41]	N/A[42] N/A[42]	N/A[42] N/A[42]
17. West Preserve Loop at Pine Avenue	AM PM	14.6 s/v 15.1 s/v	B B	19.9 s/v 24.4 s/v	B C	Yes Yes	26.4 s/v 20.9 s/v	C C	19.0 s/v 20.9 s/v	B C
18. 1st Street at Pine Avenue	AM PM	14.5 s/v 15.8 s/v	B B	18.6 s/v 20.9 s/v	B C	Yes Yes	N/A[41] N/A[41]	N/A[41] N/A[41]	N/A[42] N/A[42]	N/A[42] N/A[42]
19. Main Street at Pine Avenue	AM PM	15.5 s/v 15.8 s/v	B B	21.6 s/v 21.1 s/v	C C	Yes Yes	N/A[41] N/A[41]	N/A[41] N/A[41]	N/A[42] N/A[42]	N/A[42] N/A[42]
20. 2nd Street at Pine Avenue	AM PM	15.0 s/v 15.7 s/v	B B	18.9 s/v 21.6 s/v	B C	Yes Yes	N/A[41] N/A[41]	N/A[41] N/A[41]	N/A[42] N/A[42]	N/A[42] N/A[42]

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[38] **Bold HCM/LOS values** indicate adverse service levels based on City of Chino, City of Chino Hills, County of San Bernardino and County of Riverside LOS standards.

[39] Source: The Preserve Environmental Impact Report (EIR), dated August 2002.

[40] The LOS values within this column represent the City's Current General Plan without modifications to the South of Pine Avenue Development Project.

[41] This Intersection is not evaluated in the Preserve EIR 2002.

[42] For comparison purposes, current General Plan conditions are reported only for those locations previously evaluated in the Preserve EIR 2002.

TABLE 8-2 (CONTINUED)

YEAR 2030 PEAK HOUR INTERSECTION CAPACITY ANALYSIS[43]

Key Intersections	Time Period	(1) Year 2030 Background Traffic		(2) Year 2030 Plus Project Traffic		(3) Acceptable LOS	(4) The Preserve EIR 2002 Traffic Conditions[44]		(5) Current General Plan Traffic Conditions[45]	
		Delay	LOS	Delay	LOS	Yes/No	Delay	LOS	Delay	LOS
21. East Preserve Loop at	AM	14.2 s/v	B	18.7 s/v	B	Yes	N/A[46]	N/A[46]	N/A[47]	N/A[47]
Pine Avenue	PM	15.1 s/v	B	20.8 s/v	C	Yes	N/A[46]	N/A[46]	N/A[47]	N/A[47]
22. 3rd Street at	AM	13.1 s/v	B	16.6 s/v	B	Yes	N/A[46]	N/A[46]	N/A[47]	N/A[47]
Pine Avenue	PM	14.1 s/v	B	20.2 s/v	C	Yes	N/A[46]	N/A[46]	N/A[47]	N/A[47]
23. Hellman Ave at	AM	31.8 s/v	C	35.7 s/v	D	No	48.2 s/v	D	37.8 s/v	D
Pine Ave/Schleisman Rd	PM	38.9 s/v	D	51.0 s/v	D	Yes	54.8 s/v	D	50.0 s/v	D
24. Archibald Avenue at	AM	23.9 s/v	C	27.6 s/v	C	Yes	54.3 s/v	D	N/A[47]	N/A[47]
Schleisman Road[48]	PM	**102.6 s/v**	**F**	**130.4 s/v**	**F**	No	45.9 s/v	D	N/A[47]	N/A[47]
Archibald Avenue at	AM	--	--	24.0 s/v	C	Yes	N/A[46]	N/A[46]	N/A[47]	N/A[47]
Schleisman Road[49]	PM	--	--	**118.4 s/v**	**F**	No	N/A[46]	N/A[46]	N/A[47]	N/A[47]
25. Harrison Avenue at	AM	31.7 s/v	C	**39.5 s/v**	**D**	No	N/A[46]	N/A[46]	N/A[47]	N/A[47]
Schleisman Road	PM	**50.3 s/v**	**D**	**62.4 s/v**	**E**	No	N/A[46]	N/A[46]	N/A[47]	N/A[47]
26. Sumner Avenue at	AM	Intersection Not In Chino Traffic Model								
Schleisman Road	PM									
27. Cleveland Avenue at	AM	**85.1 s/v**	**F**	**79.9 s/v**	**E**	No	N/A[46]	N/A[46]	N/A[47]	N/A[47]
Schleisman Road	PM	**295.9 s/v**	**F**	**310.7 s/v**	**F**	No	N/A[46]	N/A[46]	N/A[47]	N/A[47]
Cleveland Avenue at	AM	--	--	**79.8 s/v**	**E**	No	N/A[46]	N/A[46]	N/A[47]	N/A[47]
Schleisman Road[49]	PM	--	--	**291.4 s/v**	**F**	No	N/A[46]	N/A[46]	N/A[47]	N/A[47]

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[43] **Bold HCM/LOS values** indicate adverse service levels based on City of Chino, City of Chino Hills, County of San Bernardino and County of Riverside LOS standards.

[44] Source: The Preserve Environmental Impact Report (EIR), dated August 2002.

[45] The LOS values within this column represent the City's Current General Plan without modifications to the South of Pine Avenue Development Project.

[46] This Intersection is not evaluated in the Preserve EIR 2002.

[47] For comparison purposes, current General Plan conditions are reported only for those locations previously evaluated in the Preserve EIR 2002.

[48] The delay and LOS values for this key study intersection are based on the lane geometrics contained in The Preserve Environmental Impact Report (EIR), dated August 2002.

[49] The delay and LOS values for this key study intersection are based on review of the typical roadway cross sections contained in the Riverside County General Plan Circulation Element. The geometries utilized assume buildout of the intersection per the Circulation Element.

TABLE 8-2 (CONTINUED)
YEAR 2030 PEAK HOUR INTERSECTION CAPACITY ANALYSIS[50]

Key Intersections	Time Period	(1) Year 2030 Background Traffic		(2) Year 2030 Plus Project Traffic		(3) Acceptable LOS	(4) The Preserve EIR 2002 Traffic Conditions[51]		(5) Current General Plan Traffic Conditions[52]	
		Delay	LOS	Delay	LOS	Yes/No	Delay	LOS	Delay	LOS
28. Hamner Avenue at	AM	**92.0 s/v**	**F**	**136.0 s/v**	**F**	No	45.6 s/v	D	N/A[55]	N/A[55]
Schleisman Road[53]	PM	**289.1 s/v**	**F**	**328.1 s/v**	**F**	No	54.4 s/v	D	N/A[55]	N/A[55]
Hamner Avenue at	AM	--	--	**45.7 s/v**	**D**	No	N/A[54]	N/A[54]	N/A[55]	N/A[55]
Schleisman Road[56]	PM	--	--	**109.1 s/v**	**F**	No	N/A[54]	N/A[54]	N/A[55]	N/A[55]
29. Hellman Avenue at	AM	13.0 s/v	B	15.9 s/v	B	Yes	N/A[54]	N/A[54]	N/A[55]	N/A[55]
"A" Street	PM	13.6 s/v	B	18.5 s/v	B	Yes	N/A[54]	N/A[54]	N/A[55]	N/A[55]
30. Chino-Corona Rd N/S at	AM	0.0 s/v	A	8.4 s/v	A	Yes	N/A[54]	N/A[54]	N/A[55]	N/A[55]
"B" Street	PM	0.0 s/v	A	3.4 s/v	A	Yes	N/A[54]	N/A[54]	N/A[55]	N/A[55]
31. Hellman Avenue at	AM	12.1 s/v	B	17.7 s/v	B	Yes	N/A[54]	N/A[54]	N/A[55]	N/A[55]
"B" Street	PM	12.9 s/v	B	21.5 s/v	C	Yes	N/A[54]	N/A[54]	N/A[55]	N/A[55]
32. Chino-Corona Rd N/S at	AM	2.8 s/v	A	2.8 s/v	A	Yes	N/A[54]	N/A[54]	N/A[55]	N/A[55]
Chino-Corona Rd E/W	PM	7.5 s/v	A	7.5 s/v	A	Yes	N/A[54]	N/A[54]	N/A[55]	N/A[55]
33. "E" Street at	AM	0.0 s/v	A	5.4 s/v	A	Yes	N/A[54]	N/A[54]	N/A[55]	N/A[55]
Chino-Corona Rd E/W	PM	0.0 s/v	A	2.0 s/v	A	Yes	N/A[54]	N/A[54]	N/A[55]	N/A[55]
34. Hellman Ave at	AM	4.0 s/v	A	15.9 s/v	B	Yes	N/A[54]	N/A[54]	N/A[55]	N/A[55]
Chino-Corona Rd/Chandler St	PM	17.9 s/v	B	21.2 s/v	C	Yes	N/A[54]	N/A[54]	N/A[55]	N/A[55]

Notes: s/v = seconds per vehicle (delay)

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[50] **Bold HCM/LOS values** indicate adverse service levels based on City of Chino, City of Chino Hills, County of San Bernardino and County of Riverside LOS standards.

[51] Source: The Preserve Environmental Impact Report (EIR), dated August 2002.

[52] The LOS values within this column represent the City's Current General Plan without modifications to the South of Pine Avenue Development Project.

[53] The delay and LOS values for this key study intersection are based on the lane geometrics contained in The Preserve Environmental Impact Report (EIR), dated August 2002.

[54] This Intersection is not evaluated in the Preserve EIR 2002.

[55] For comparison purposes, current General Plan conditions are reported only for those locations previously evaluated in the Preserve EIR 2002.

[56] The delay and LOS values for this key study intersection are based on review of the typical roadway cross sections contained in the Riverside County General Plan Circulation Element. The geometries utilized assume buildout of the intersection per the Circulation Element.

Year 2030 Roadway Improvement Recommendations

The acceptable service level results, as identified in *Table 8-2,* with project traffic added to the forecast Year 2030 background condition, are explicitly a function of the lane geometries and traffic controls depicted in *Figure 8-2.* Progressive implementation of these intersection configurations, as adjoining area projects are considered, conditioned and approved, are an integral part of achieving the acceptable service levels presented here.

The Preserve EIR Comparison

Column 4 provides the long-term level of service at select key study intersections as contained within The Preserve Environmental Impact Report (EIR), dated August 2002. LOS values from The Preserve EIR are provided for the intersections of the SR-71 NB Ramp/Pine Avenue, El Prado Road/Pine Avenue, Euclid Avenue/Pine Avenue, West Preserve Loop/Pine Avenue, Hellman Avenue/Pine Avenue, Archibald Avenue/Schleisman Road and Hamner Avenue/Schleisman Road. Comparing the LOS values from column 4 to those in column 2 indicates that the two are relatively the same, or the LOS values in column 2 (based on the South of Pine Avenue Development Project as proposed) are better than those in column 4 except for the intersections of Archibald Avenue/Schleisman Road and Hamner Avenue/Schleisman Road. The LOS values for Archibald Avenue/Schleisman Road and Hamner Avenue/Schleisman Road in column 3 are worse than those presented in column 4 and these two locations are forecast to operate at an unacceptable LOS. As mentioned above, the proposed South of Pine Avenue Development Project can be expected to pay a proportional fair-share towards improvements at these two locations.

The Current General Plan Comparison

Column 5 provides the long-term level of service at select key study intersections (also studied in the 2002 EIR) for the "Current General Plan" (based on its own assumptions for the South of Pine Avenue Development Project site). LOS values are provided for the intersections of the SR-71 NB Ramp/Pine Avenue, El Prado Road/Pine Avenue, Euclid Avenue/Pine Avenue, West Preserve Loop/Pine Avenue and Hellman Avenue/Pine Avenue. Comparing the LOS values from column 5 to those in column 2 indicates that the two are relatively the same and all five locations operate at an acceptable level of service under either scenario. These results suggest that the South of Pine Avenue Development Project as proposed, on the basis of traffic impact potential, is internally consistent with the City's own General Plan forecasts, related service level projections, and roadway network needs.

Appendix C also presents the current General Plan (Year 2030) HCM/LOS calculations for select key study intersections for the AM peak hour and PM peak hour.

9.0 PROJECT-RELATED FAIR SHARE CONTRIBUTION

As mentioned previously, the proposed South of Pine Avenue Development Project can be expected to pay a proportional "fair-share" towards improvements at the four County of Riverside intersections forecast to operate at an unacceptable level of service in the Year 2030.

Table 9-1 presents the AM peak hour and PM peak hour percentage of net traffic impact at the study intersections forecast to operate at an unacceptable level of service in the Year 2030 with project traffic. These fair share calculations are based on the recommended methodology contained in the San Bernardino County CMP.

As presented in this table, the first column (1) presents a total of all intersection peak hour movements for existing conditions. The second column (2) presents future Year 2030 background traffic conditions. The third column (3) presents future Year 2030 traffic conditions with project traffic. The fourth column (4) represents what percentage of total intersection peak hour traffic is project-related traffic.

Review of *Table 9-1* shows that the South of Pine Avenue Development Project's fair share contribution (for the greater of the AM or PM peak hour) at the intersections of Archibald Avenue at Schleisman Road, Harrison Avenue at Schleisman Road, Cleveland Avenue at Schleisman Road, and Hamner Avenue and Schleisman Road ranges between 16.0% and 24.2%.

The fifth Riverside County location is Sumner Avenue at Schleisman Road, and this intersection is not represented in the Chino Traffic Model. Schleisman Road is now essentially unimproved at this location, and there is insufficient information with which to estimate future levels of service. Thus, LOS deficiencies, if any, are unknown. However, a project share of future additive traffic can be estimated using east-west through volumes, should Riverside County studies determine a possible LOS deficiency and mitigation/improvement need. This has been done at the bottom of Table 9-1, and identifies a project share of 21.4% in the AM peak hour and 14.3% in the PM peak hour.

TABLE 9-1
YEAR 2030 PROJECT FAIR SHARE COST CONTRIBUTION

Key Intersections	Impacted Time Period	(1) Existing Traffic	(2) Year 2030 Background Traffic	(3) Year 2030 w/Project Traffic	(4) Net Project Percent Increase
24. Archibald Avenue at Schleisman Road	PM	1,868	3,666	4,239	24.2%
25. Harrison Avenue at Schleisman Road	PM	1,868	3,340	3,755	22.0%
27. Cleveland Avenue at Schleisman Road	AM PM	991 554	2,419 3,677	2,692 3,984	16.0% 9.0%
28. Hamner Avenue at Schleisman Road	AM PM	1,590 2,102	2,629 5,143	2,901 5,465	20.7% 9.6%
26. Sumner Avenue at Schleisman Road[57]	AM PM	7 2	1,009 1,845	1,282 2,152	21.4% 14.3%

Notes:
Net Project Percent Increase (4) = [Column (3) – Column (2)] / [Column (3) – Column (1)].

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[57] Intersection not included within Chino Traffic Model, but east-west through volumes can be isolated from model outputs. Project fair share, if required, is calculated for project east-west volumes as a percentage of the growth in east-west traffic.

10.0 ALTERNATIVE ACCESS EVALUATION FOR PINE AVENUE

As requested by the City of Chino, an Alternative Access Evaluation for Pine Avenue has been prepared for long-term (Year 2030) traffic conditions with a focus on access opportunities at the intersections of 1st Street/Pine Avenue, 2nd Street/Pine Avenue and 3rd Street/Pine Avenue. The following four access options were analyzed for the Year 2030.

- Full Access Option: Assumes full access signalized intersections at 1st Street/Pine Avenue, 2nd Street/Pine Avenue and 3rd Street/Pine Avenue. Year 2030 AM and PM peak hour volume forecasts were presented previously in *Figures 6-10* and *6-11,* respectively.

- Option No. 1: Assumes signalized intersections at 1st Street/Pine Avenue, 2nd Street/Pine Avenue and 3rd Street/Pine Avenue with access restricted to left-turns in/right-turns in and right-turns out only. ***Figures 10-1*** and ***10-2*** present the Year 2030 AM and PM peak hour volume forecasts associated with this alternative access option. There are no north-south cross (left or through) movements.

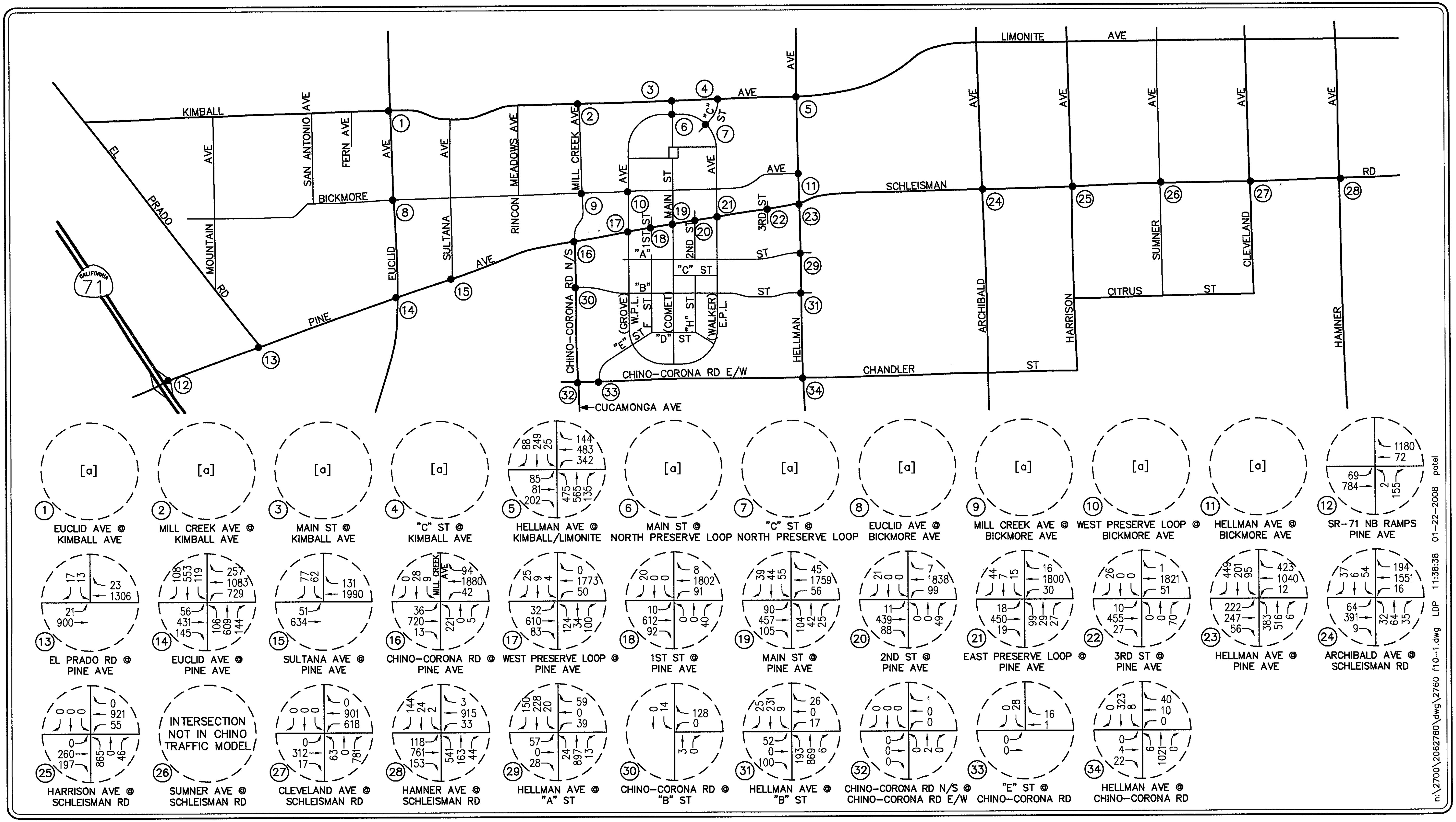
- Option No. 2: Assumes two-way stop (side-street stop) controlled intersections at 1st Street/Pine Avenue, 2nd Street/Pine Avenue and 3rd Street/Pine Avenue with access restricted to left-turns in/right-turns in and right-turns out only. The Year 2030 AM and PM peak hour volume forecasts for this access scenario are identical to those presented in *Figures 10-1* and *10-2* for Option No. 1. There are no north-south cross (left or through) movements.

- Option No. 3: Assumes two-way stop (side-street stop) controlled intersections at 1st Street/Pine Avenue, 2nd Street/Pine Avenue and 3rd Street/Pine Avenue with access restricted to right-turns in and right-turns out only. ***Figures 10-3*** and ***10-4*** present the Year 2030 AM and PM peak hour volume forecasts associated with this alternative access option. There are no north-south cross (left or through) movements.

- Option No. 4: Assumes two-way stop (side-street stop) controlled intersections at 1st Street/Pine Avenue and 2nd Street/Pine Avenue with access restricted to right-turns in and right-turns out only. Assumes a full access signalized intersection at 3rd Street/Pine Avenue. ***Figures 10-5*** and ***10-6*** present the Year 2030 AM and PM peak hour volume forecasts associated with this alternative access option. 1st Street/Pine Avenue and 2nd Street/Pine Avenue do not allow north-south cross (left or through) movements.

It should be noted that rerouting of volumes in the above options, based on vehicle movement restrictions specific to each option, do not presume/reflect u-turns because of the restricted location. The nature of local access, and the "grid-like" pattern of Pine, its "A" Street parallel, plus the north-south parallels of Main Street, West Preserve Loop and East Preserve Loop are expected to offer a reasonable rerouting, rather than induce u-turns.

Table 10-1 adds to the *Table 8-2* findings and presents the results of the Year 2030 Alternative Access Evaluation for the Full Access Option, Option No. 1, Option No. 2, Option No. 3 and Option No. 4. Columns one (1) through five (5) present the results for the Full Access Option, Option No. 1, Option No. 2, Option No. 3 and Option No. 4, respectively. It should be noted that the values presented in column 1 are the same values that were presented previously in column 2 of *Table 8-2.*



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engineers

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NO SCALE

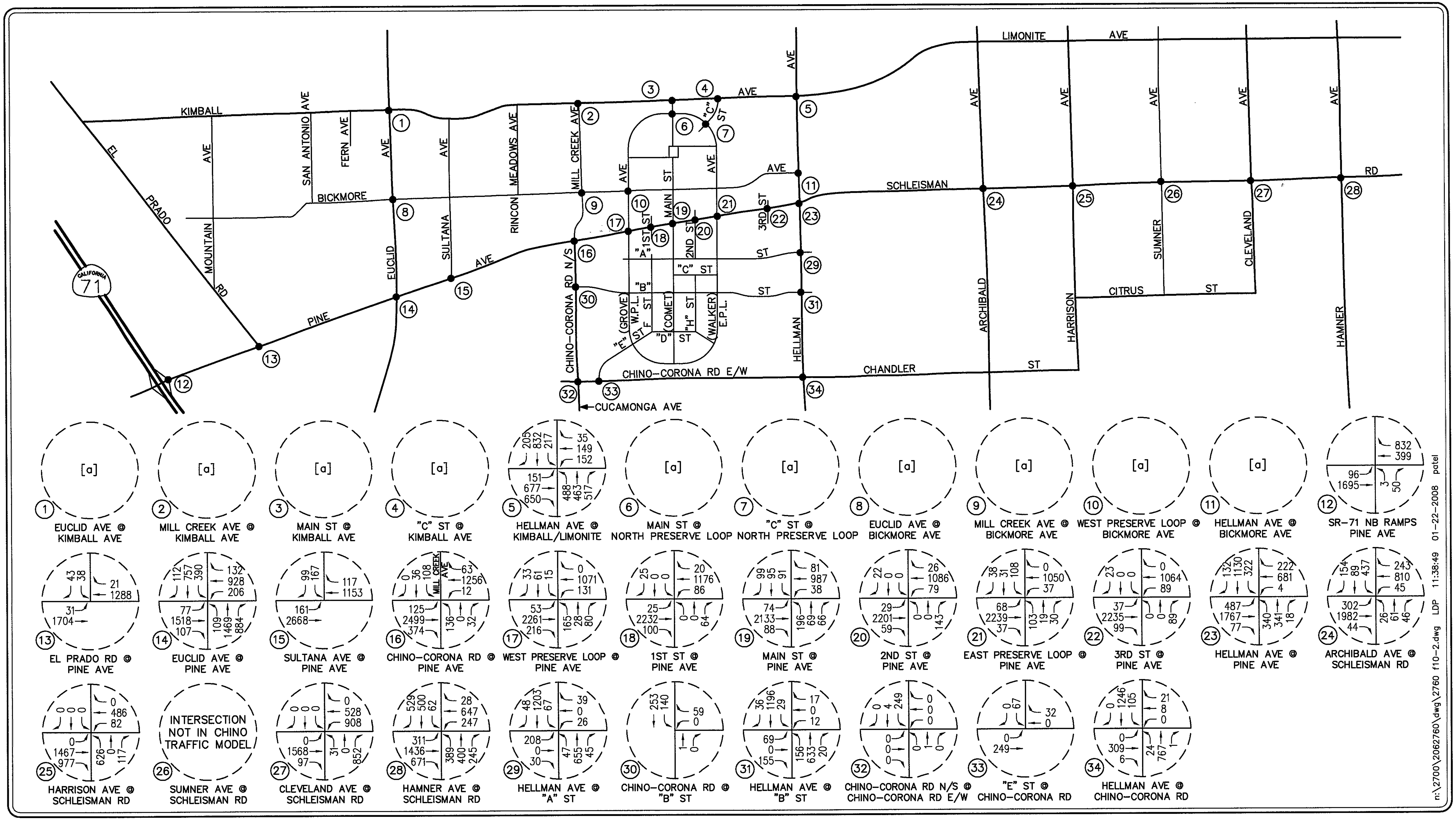
NOTE:
[a] INTERSECTION DOES NOT MEET OR EXCEED 50 PROJECT TRIP THRESHOLD FOR ANALYSIS.

LEGEND
W.P.L. = WEST PRESERVE LOOP
E.P.L. = EAST PRESERVE LOOP

FIGURE 10-1

YEAR 2030 AM PEAK HOUR TRAFFIC VOLUMES WITH PROJECT TRAFFIC – OPTION 1 & 2

SOUTH OF PINE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO



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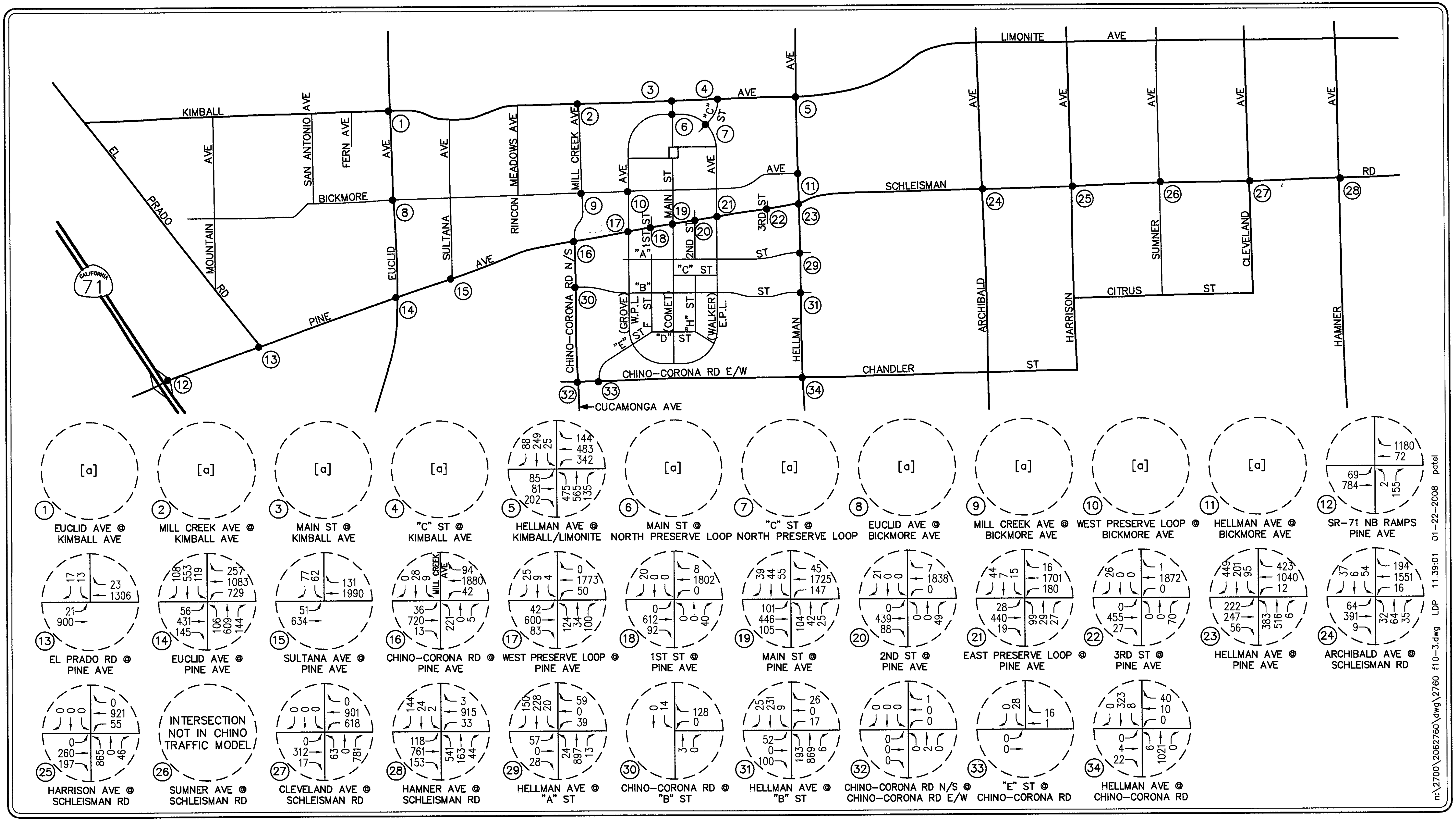
NOTE:
[a] INTERSECTION DOES NOT MEET OR EXCEED 50 PROJECT TRIP THRESHOLD FOR ANALYSIS.

LEGEND
W.P.L. = WEST PRESERVE LOOP
E.P.L. = EAST PRESERVE LOOP

FIGURE 10-2

YEAR 2030 PM PEAK HOUR TRAFFIC VOLUMES WITH PROJECT TRAFFIC – OPTION 1 & 2

SOUTH OF PINE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO



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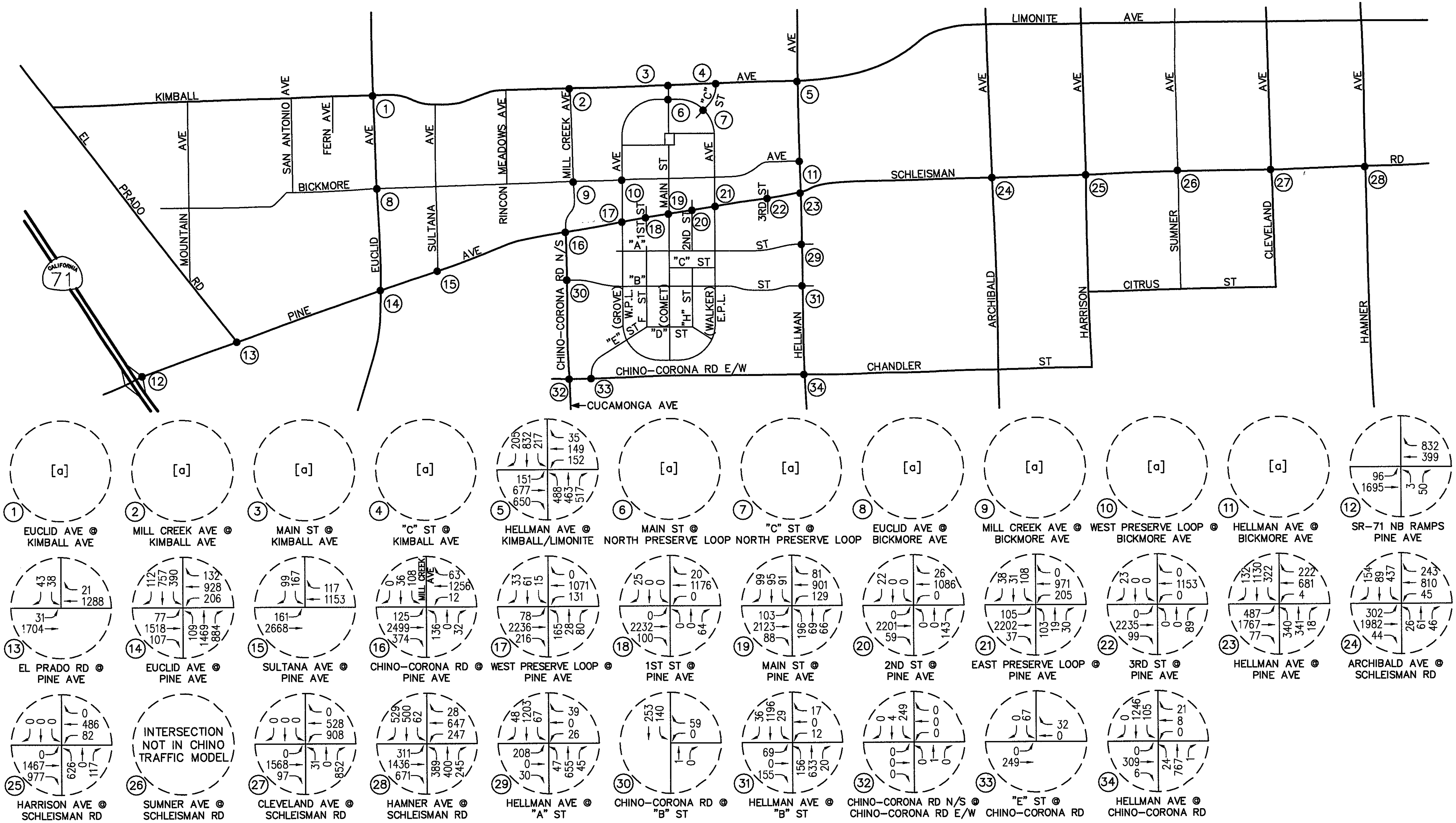
NOTE:
[a] INTERSECTION DOES NOT MEET OR EXCEED 50 PROJECT TRIP THRESHOLD FOR ANALYSIS.

LEGEND
W.P.L. = WEST PRESERVE LOOP
E.P.L. = EAST PRESERVE LOOP

FIGURE 10-3

YEAR 2030 AM PEAK HOUR TRAFFIC VOLUMES WITH PROJECT TRAFFIC – OPTION 3
SOUTH OF PINE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO



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NOTE:
[a] INTERSECTION DOES NOT MEET OR EXCEED 50 PROJECT TRIP THRESHOLD FOR ANALYSIS.

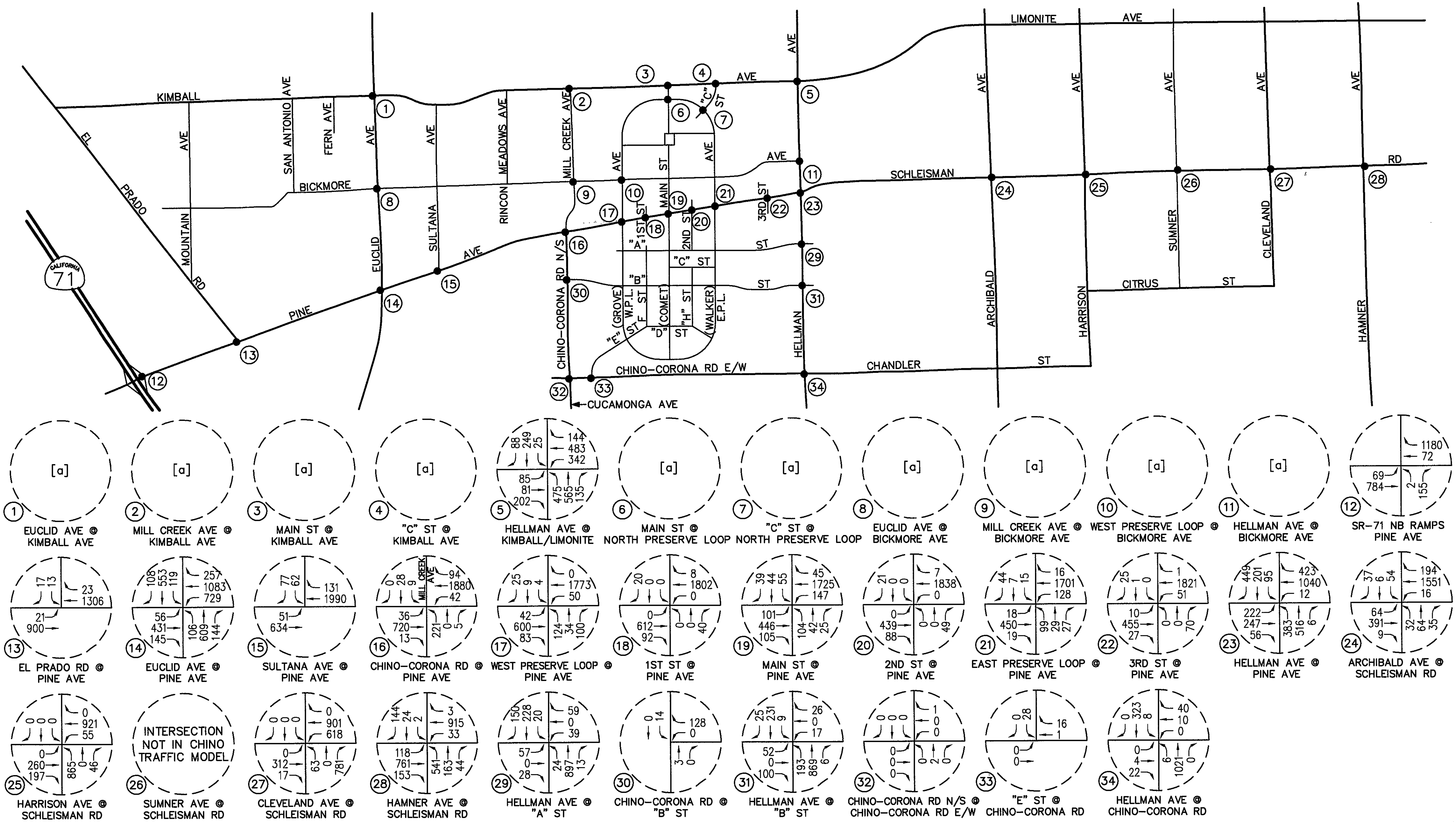
LEGEND
W.P.L. = WEST PRESERVE LOOP
E.P.L. = EAST PRESERVE LOOP

FIGURE 10-4

YEAR 2030 PM PEAK HOUR TRAFFIC VOLUMES WITH PROJECT TRAFFIC – OPTION 3

SOUTH OF PINE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO

G-236



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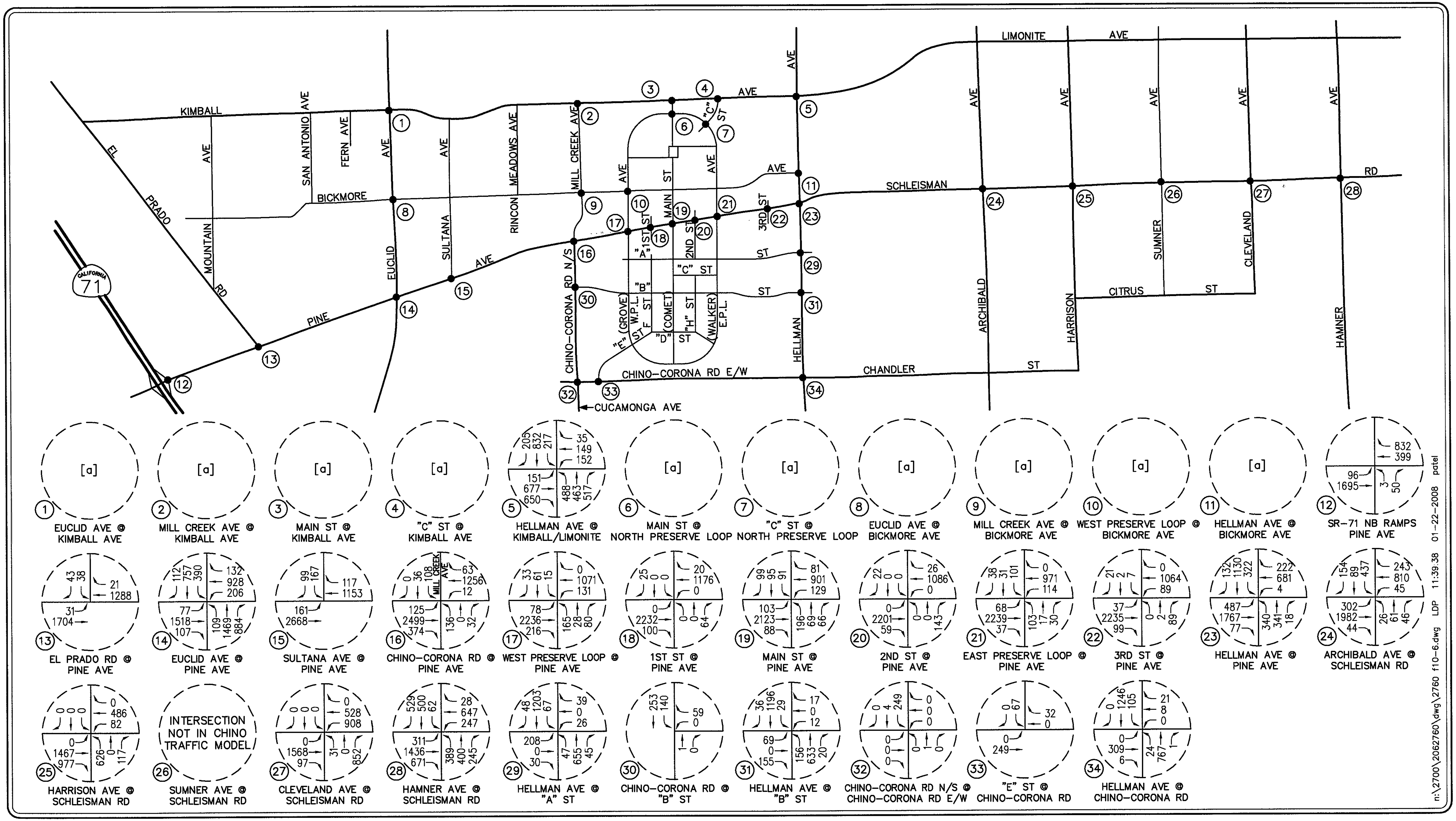
NOTE:
[a] INTERSECTION DOES NOT MEET OR EXCEED 50 PROJECT TRIP THRESHOLD FOR ANALYSIS.

LEGEND
W.P.L. = WEST PRESERVE LOOP
E.P.L. = EAST PRESERVE LOOP

FIGURE 10-5

YEAR 2030 AM PEAK HOUR TRAFFIC VOLUMES WITH PROJECT TRAFFIC – OPTION 4

SOUTH OF PINE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO



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N NO SCALE

NOTE:
[a] INTERSECTION DOES NOT MEET OR EXCEED 50 PROJECT TRIP THRESHOLD FOR ANALYSIS.

LEGEND
W.P.L. = WEST PRESERVE LOOP
E.P.L. = EAST PRESERVE LOOP

FIGURE 10–6

YEAR 2030 PM PEAK HOUR TRAFFIC VOLUMES WITH PROJECT TRAFFIC – OPTION 4
SOUTH OF PINE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO

TABLE 10-1
YEAR 2030 ALTERNATIVE ACCESS EVALUATION

Key Intersections		Time Period	(1) Full Access Option[58]		(2) Option No. 1[59]		(3) Option No. 2[60]		(4) Option No. 3[61]		(5) Option No. 4[62]	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
17.	West Preserve Loop at	AM	19.9 s/v	B	17.9 s/v	B	17.9 s/v	B	18.0 s/v	B	18.0 s/v	B
	Pine Avenue	PM	24.4 s/v	C	22.1 s/v	C	22.1 s/v	C	22.2 s/v	C	22.2 s/v	C
18.	1st Street at	AM	18.6 s/v	B	16.4 s/v	B	0.6 s/v	A	0.3 s/v	A	0.3 s/v	A
	Pine Avenue	PM	20.9 s/v	C	18.4 s/v	B	1.4 s/v	A	0.4 s/v	A	0.4 s/v	A
19.	Main Street at	AM	21.6 s/v	C	20.1 s/v	C	20.1 s/v	C	22.0 s/v	C	22.0 s/v	C
	Pine Avenue	PM	21.1 s/v	C	19.8 s/v	B	19.8 s/v	B	23.5 s/v	C	23.5 s/v	C
20.	2nd Street at	AM	18.9 s/v	B	16.3 s/v	B	0.7 s/v	A	0.3 s/v	A	0.3 s/v	A
	Pine Avenue	PM	21.6 s/v	C	18.6 s/v	B	1.8 s/v	A	1.0 s/v	A	1.0 s/v	A
21.	East Preserve Loop at	AM	18.7 s/v	B	16.7 s/v	B	16.7 s/v	B	18.8 s/v	B	17.8 s/v	B
	Pine Ave	PM	20.8 s/v	C	18.6 s/v	B	18.6 s/v	B	26.3 s/v	C	21.6 s/v	C
22.	3rd Street at	AM	16.6 s/v	B	14.5 s/v	B	0.7 s/v	A	0.4 s/v	A	16.6 s/v	B
	Pine Avenue	PM	20.2 s/v	C	17.8 s/v	B	1.7 s/v	A	0.6 s/v	A	20.5 s/v	C

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[58] Assumes full access signalized intersections at 1st Street/Pine Avenue, 2nd Street/Pine Avenue and 3rd Street/Pine Avenue.

[59] Assumes signalized intersections at 1st Street/Pine Avenue, 2nd Street/Pine Avenue and 3rd Street/Pine Avenue with access restricted to left-turns in/right-turns in and right-turns out only.

[60] Assumes two-way stop (side-street stop) controlled intersections at 1st Street/Pine Avenue, 2nd Street/Pine Avenue and 3rd Street/Pine Avenue with access restricted to left-turns in/right-turns in and right-turns out only.

[61] Assumes two-way stop (side-street stop) controlled intersections at 1st Street/Pine Avenue, 2nd Street/Pine Avenue and 3rd Street/Pine Avenue with access restricted to right-turns in and right-turns out only.

[62] Assumes two-way stop (side-street stop) controlled intersections at 1st Street/Pine Avenue and 2nd Street/Pine Avenue with access restricted to right-turns in and right-turns out only. Assumes a full access signalized intersection at 3rd Street/Pine Avenue.

Review of *Table 10-1* indicates that all six key study intersections along the Pine Avenue corridor between West Preserve Loop and 3rd Street are forecast to operate at an acceptable level of service under all five-access options as defined above. Therefore adequate ingress/egress to the project site would be provided under all five-access options based on the volume forecasts of this study. It should be noted that these forecasts for side-street intersections could vary at the 1st Street, 2nd Street or 3rd Street intersections based on the final internal circulation characteristics in each adjoining development area. ***Appendix G*** presents the long-term (Year 2030) HCM/LOS calculations for the alternative access evaluation in the AM peak hour and PM peak hour.

11.0 TRAFFIC SIGNAL PROGRESSION ANALYSIS FOR PINE AVENUE

As requested by the City of Chino, a Traffic Signal Progression Analysis for Pine Avenue between Mill Creek Avenue (formerly Cucamonga Avenue) and Hellman Avenue has been prepared for long-term (Year 2030) traffic conditions utilizing the *SYNCHRO 7.0* traffic analysis software. The purpose of the Progression Analysis is to investigate the long-term (Year 2030) coordination and/or progression impacts/opportunities on Pine Avenue based on the proposed installation of traffic signals at 1st Street/Pine Avenue, 2nd Street/Pine Avenue and 3rd Street/Pine Avenue. The following four options were analyzed for the Year 2030.

- Full Access Option: Assumes full access signalized intersections at 1st Street/Pine Avenue, 2nd Street/Pine Avenue and 3rd Street/Pine Avenue.
- Option No. 1: Assumes signalized intersections at 1st Street/Pine Avenue, 2nd Street/Pine Avenue and 3rd Street/Pine Avenue with access restricted to left-turns in/right-turns in and right-turns out only. There are no north-south cross (left or through) movements.
- Option No. 2: Assumes two-way stop (side-street stop) controlled intersections at 1st Street/Pine Avenue, 2nd Street/Pine Avenue and 3rd Street/Pine Avenue with access restricted to left-turns in/right-turns in and right-turns out only. There are no north-south cross (left or through) movements.
- Option No. 3: Assumes two-way stop (side-street stop) controlled intersections at 1st Street/Pine Avenue, 2nd Street/Pine Avenue and 3rd Street/Pine Avenue with access restricted to right-turns in and right-turns out only. There are no north-south cross (left or through) movements.
- Option No. 4: Assumes two-way stop (side-street stop) controlled intersections at 1st Street/Pine Avenue and 2nd Street/Pine Avenue with access restricted to right-turns in and right-turns out only. Assumes a full access signalized intersection at 3rd Street/Pine Avenue. 1st Street/Pine Avenue and 2nd Street/Pine Avenue do not allow north-south cross (left or through) movements.

Please note the aforementioned four options are the same as those identified in Chapter 10.0 for the alternative access evaluation.

11.1 Street Network

Table 11-1 identifies the eight (8) key study intersections considered in the long-term (Year 2030) progression analysis and identifies the type of intersection control for each location for the Full Access Option, Option No. 1, Option No. 2, Option No. 3 and Option No. 4.

11.2 Synchro 7.0 Method of Analysis

Synchro 7.0 analyzes intersection capacity, as well as progression/coordination operations along an arterial street. *Synchro 7.0* provides an alternative method for calculating intersection delays called the Percentile Delay Method. This method provides key benefits over Webster's formula, used by the Highway Capacity Manual, as it is able to model the following situations:

TABLE 11-1
POTENTIAL INTERSECTION CONTROLS

Key Study Intersection		Intersection Controls				
		Full Access Option	Option No. 1	Option No. 2	Option No. 3	Option No. 4
16.	Mill Creek Ave/Chino-Corona Rd N/S at Pine Ave	Traffic Signal [a] and [b]	Traffic Signal [a] and [b]	Traffic Signal [a] and [b]	Traffic Signal [a] and [b]	Traffic Signal [a] and [b]
17.	West Preserve Loop at Pine Ave	Traffic Signal [a] and [b]	Traffic Signal [a] and [b]	Traffic Signal [a] and [b]	Traffic Signal [a] and [b]	Traffic Signal [a] and [b]
18.	1st St at Pine Ave	Traffic Signal [a] and [b]	Traffic Signal [a] and [b]	Two-Way Stop	Two-Way Stop	Two-Way Stop
19.	Main St at Pine Ave	Traffic Signal [a] and [b]	Traffic Signal [a] and [b]	Traffic Signal [a] and [b]	Traffic Signal [a] and [b]	Traffic Signal [a] and [b]
20.	2nd St at Pine Ave	Traffic Signal [a] and [b]	Traffic Signal [a] and [b]	Two-Way Stop	Two-Way Stop	Two-Way Stop
21.	East Preserve Loop at Pine Ave	Traffic Signal [a] and [b]	Traffic Signal [a] and [b]	Traffic Signal [a] and [b]	Traffic Signal [a] and [b]	Traffic Signal [a] and [b]
22.	3rd St at Pine Ave	Traffic Signal [a] and [b]	Traffic Signal [a] and [b]	Two-Way Stop	Two-Way Stop	Traffic Signal [a] and [b]
23.	Hellman Ave at Pine Ave	Traffic Signal [a] and [c]	Traffic Signal [a] and [c]	Traffic Signal [a] and [c]	Traffic Signal [a] and [c]	Traffic Signal [a] and [c]

Notes:
[a] = traffic signal provides for protected left-turn movements along Pine Avenue
[b] = traffic signal does not provide the cross street with protected left-turn phasing at Pine Avenue, and all cross-street movements (left, through, right) occur on a "green ball"
[c] = traffic signal provides for protected left-turn movements along the cross-street that intersects Pine Avenue

- Signals in coordination
- Actuated and semi-actuated signals
- Near saturation and super saturated signals

In a coordinated arterial network, *Synchro 7.0* calculates the progression factor and the effects of coordination. To optimize traffic progression along an arterial street, *Synchro 7.0* optimizes splits and offsets to reduce vehicular delays. This makes *Synchro's* timing plans similar to *TRANSYT*, which optimizes to reduce stops and delays. *PASSER-II 90* and other arterial software optimize to maximize the arterial bandwidth.

As such, utilizing the calculated green splits, phase sequences, and coordination offsets, *Synchro 7.0* produces generated solutions with minimal delays and maximum possible arterial progression for the given geometric, traffic, and signal control conditions. The generated progression solutions are typically evaluated based on the following measures of effectiveness:

- **Band A/B:** The "A" and "B" direction bandwidths (in seconds) indicate the period of time available for traffic to flow in the easterly and westerly directions (Pine Avenue), respectively, within the band from one end of the arterial to and through the other intersections.

- **Efficiency:** The average fraction of the cycle used for progression, ranging from 0.00 to 0.50. Efficiency values for a desirable progression should preferably be greater than 0.25, however efficiency values greater than 0.13 are typically acceptable. Efficiency is calculated based on the following formula:

  - **Efficiency** = (Band A + Band B) / (2 * Cycle Length)

Table 11-2 summarizes the measures of effectiveness criteria, as detailed above.

11.3 Progression Analysis Results

Table 11-3 summarizes the peak period progression analysis results for future long-term (Year 2030) traffic conditions for the Full Access Option, Option No. 1, Option No. 2, Option No. 3 and Option No. 4. The Efficiency values are reported in column (1) and the respective bandwidths for the eastbound and westbound directions are reported in column (2). Column (3) reports the progression results. It should be noted that these results are based on City of Chino Pedestrian Timing Worksheet values, with sample as shown on the first sheet within Appendix H, input to the Synchro 7.0 application.

TABLE 11-2

EFFICIENCY CRITERIA FOR PROGRESSION[63]

Efficiency	Description
0.00 – 0.12	Poor Progression
0.13 – 0.24	Fair Progression
0.25 – 0.36	Good Progression
0.37 – 1.00	Great Progression

---

[63] Source: *PASSER II-90 Program User's Guide* (June 1991, Texas Transportation Institute).

TABLE 11-3
YEAR 2030 SIGNAL PROGRESSION SUMMARY[64]

Year 2030 Traffic Conditions	Time Period	(1) Efficiency	(2) Bandwidth (seconds)		(3) Progression Results
			Eastbound	**Westbound**	
Full Access Option[65]	AM	0.14	0	32	"Fair"
	PM	0.19	44	0	"Fair"
Option No. 1[66]	AM	0.14	0	27	"Fair"
	PM	0.13	30	0	"Fair"
Option No. 2[67]	AM	0.20	16	28	"Fair"
	PM	0.20	44	0	"Fair"
Option No. 3[68]	AM	0.24	22	31	"Fair"
	PM	0.30	53	11	"Good"
Option No. 4[69]	AM	0.19	18	20	"Fair"
	PM	0.32	47	26	"Good"

---

[64] Source: *Synchro 7.0*, Percentile Delay Methodology.

[65] Assumes full access signalized intersections at 1st Street/Pine Avenue, 2nd Street/Pine Avenue and 3rd Street/Pine Avenue.

[66] Assumes signalized intersections at 1st Street/Pine Avenue, 2nd Street/Pine Avenue and 3rd Street/Pine Avenue with access restricted to left-turns in/right-turns in and right-turns out only.

[67] Assumes two-way stop (side-street stop) controlled intersections at 1st Street/Pine Avenue, 2nd Street/Pine Avenue and 3rd Street/Pine Avenue with access restricted to left-turns in/right-turns in and right-turns out only.

[68] Assumes two-way stop (side-street stop) controlled intersections at 1st Street/Pine Avenue, 2nd Street/Pine Avenue and 3rd Street/Pine Avenue with access restricted to right-turns in and right-turns out only.

[69] Assumes two-way stop (side-street stop) controlled intersections at 1st Street/Pine Avenue and 2nd Street/Pine Avenue with access restricted to right-turns in and right-turns out only and a full access signalized intersection at 3rd Street/Pine Avenue.

Review of the first row of *Table 11-3* shows that for the Full Access Option, traffic signal progression along Pine Avenue in the eastbound and westbound directions is forecast to be "fair" during the AM and PM peak hours (efficiency values of 0.14 and 0.19, respectively) for long-term (Year 2030) traffic conditions. In the eastbound direction, the bandwidth is expected to be 0 seconds in the AM peak hour and 44 seconds in the PM peak hour. In the westbound direction, the bandwidth is expected to be 32 seconds in the AM peak hour and 0 seconds in the PM peak hour. Although based on the definition of efficiency and the values of *Table 11-2*, progression is fair, a bandwidth of 0 seconds in any direction is typically discouraged and avoided.

Review of the second row of *Table 11-3* shows that for Option No. 1 (keeps a signal at all locations but restricts specific movements), traffic signal progression along Pine Avenue in the eastbound and westbound directions is forecast to be "fair" during the AM and PM peak hours for long-term (Year 2030) traffic conditions. In the eastbound direction, the bandwidth is expected to be 0 seconds in the AM peak hour and 30 seconds in the PM peak hour. In the westbound direction, the bandwidth is expected to be 27 seconds in the AM peak hour and 0 seconds in the PM peak hour. Although by the *Table 11-2* criteria, progression is fair, a bandwidth of 0 seconds in any direction is typically discouraged and avoided.

Review of the third row of *Table 11-3* shows that for Option No. 2 (removes three signals and restricts movements), traffic signal progression along Pine Avenue in the eastbound and westbound directions is forecast to be "fair" during the AM and PM peak hours for long-term (Year 2030) traffic conditions. In the eastbound direction, the bandwidth is expected to be 16 seconds in the AM peak hour and 44 seconds in the PM peak hour. In the westbound direction, the bandwidth is expected to be 28 seconds in the AM peak hour and 0 seconds in the PM peak hour. Although by the *Table 11-2* criteria, progression is fair, a bandwidth of 0 seconds in any direction is typically discouraged and avoided.

Review of the fourth row of *Table 11-3* shows that for Option No. 3 (essentially removes any median break and creates only a side-street stop at three locations), traffic signal progression along Pine Avenue in the eastbound and westbound directions is forecast to be "fair" during the AM peak hour and "good" during the PM peak hour for long-term (Year 2030) traffic conditions. In the eastbound direction, the bandwidth is expected to be 22 seconds in the AM peak hour and 53 seconds in the PM peak hour. In the westbound direction, the bandwidth is expected to be 31 seconds in the AM peak hour and 11 seconds in the PM peak hour.

Review of the fifth row of *Table 11-3* shows that for Option No. 4 (essentially removes any median break and creates only a side-street stop at 1st Street and 2nd Street; 3rd Street becomes a full access signalized intersection), traffic signal progression along Pine Avenue in the eastbound and westbound directions is forecast to be "fair" during the AM peak hour and "good" during the PM peak hour for long-term (Year 2030) traffic conditions. In the eastbound direction, the bandwidth is expected to be 18 seconds in the AM peak hour and 47 seconds in the PM peak hour. In the westbound direction, the bandwidth is expected to be 20 seconds in the AM peak hour and 26 seconds in the PM peak hour.

Please note that the 0 seconds value under the Full Access Option, Option No. 1 and Option No. 2 indicates an overall lack of progression in that direction, and is primarily due to the length of the study link, which makes it difficult to achieve a consistent bandwidth in both directions over the length of the link (>0.5 miles).

Based on the aforementioned results, traffic signal progression along Pine Avenue in the long-term (Year 2030) is generally forecast to be "fair" for all Project Options with resulting efficiency values all forecast to be within acceptable levels (greater than 0.13), noting that the Full Access Option as well as Options No. 1 and No. 2 have progression issues in one direction or the other in the peak hour. Option No. 3 and Option No. 4 both have PM results where progression is forecast to be "good". Further, both of these offer bandwidths in both directions during the PM peak hour, and Option No. 4 is forecast at 26 seconds of westbound bandwidth versus 11 seconds for Option No. 3 during that peak.

In that regard, Options No. 3 and No. 4 can be concluded to offer better results than the other three options, and on that basis, are the preferred options. Implementation of Option No. 4 would require that the 3rd Street intersection meet warrants for signalization based on the specifics of the final site plan in Planning Area 5.

Appendix H contains the *Synchro 7.0* calculation worksheets and time-space diagrams for the future long-term (Year 2030) traffic conditions during the AM and PM peak hours for the Full Access Option, Option No. 1, Option No. 2, Option No. 3 and Option No. 4.

12.0 SIGNAL WARRANT ANALYSIS

The prior service level calculations for future conditions typically presume the installation of signals at all key intersections unless otherwise noted.

12.1 Warrant Analysis Results

Table 12-1 summarizes the results of a signal warrant analysis for existing conditions as well as Year 2015 and Year 2030 conditions. Those future year scenarios consider both "without project" and "with project" permutations. Intersections along the project perimeter are denoted with an asterisk. The warrant sheets that substantiate these results are included in Appendix I.

12.1.1 Existing Conditions

The "existing" column of *Table 12-1* indicates that none of the existing intersections that are unsignalized now meet warrants for signalization.

12.1.2 Year 2015

From Table 12-1, six locations will satisfy warrants for signalization in 2015, with or without project traffic. Three additional intersections, (two of which are created by the project), to include El Prado at Pine, Pine at East Preserve Loop and Pine at 3rd Street, will also satisfy warrants with project traffic additions.

12.1.3 Year 2030

In addition to locations satisfying warrants in Year 2015, Year 2030 volumes without the project will satisfy warrants for Cleveland Avenue at Schleisman Road. Further, the addition of project volumes will cause warrants to be satisfied for:

12. SR-71 Northbound Ramp at Pine Avenue
19. Main Street at Pine Avenue
20. 2nd Street at Pine Avenue
29. Hellman Avenue at "A" Street
31. Hellman Avenue at "B" Street

It is worth noting from Table 12-1 that the following immediate project access intersections do not meet warrants for signalization in Year 2030 following the addition of project traffic:

18. 1st Street at Pine Avenue
22. 3rd Street at Pine Avenue
30. Chino-Corona Road N/S at "B" Street
32. Chino-Corona Road N/S at Chino-Corona Road E/W
33. "E" Street at Chino-Corona Road E/W

It should be noted that the final site and access plan details for the commercial project components or in Planning Area 5 could alter the results for intersections 18 and 22, respectively.

TABLE 12-1
SIGNAL WARRANTS ANALYSIS

External Intersections	Peak Hour	TRAFFIC SIGNAL WARRANTS MET?				
		EXISTING (2007)	YEAR 2015		YEAR 2030	
			Without Project	With Project	Without Project	With Project
1. Euclid Avenue at	AM	Existing Signal				
Kimball Avenue	PM					
2. Mill Creek Avenue at	AM	No	No	No	Does Not Meet 50 Trip Threshold	
Kimball Avenue	PM	No	No	No		
3. Main Street at	AM	No	Yes	Yes	Does Not Meet 50 Trip Threshold	
Kimball Avenue	PM	No	No	Yes		
4. "C" Street at	AM	No	No	No	Does Not Meet 50 Trip Threshold	
Kimball Avenue	PM	No	No	No		
5. Hellman Avenue at	AM	Does Not Exist	Yes	Yes	Yes	Yes
Kimball Avenue/Limonite Ave	PM		Yes	Yes	Yes	Yes
6. Main Street at	AM	No	No	No	Does Not Meet 50 Trip Threshold	
North Preserve Loop	PM	No	No	No		
7. "C" Street at	AM	No	No	No	Does Not Meet 50 Trip Threshold	
North Preserve Loop	PM	No	No	No		
8. Euclid Avenue at	AM	No	Yes	Yes	Does Not Meet 50 Trip Threshold	
Bickmore Avenue	PM	No	Yes	Yes		
9. Mill Creek Avenue at	AM	No	No	No	Does Not Meet 50 Trip Threshold	
Bickmore Avenue	PM	No	No	No		
10. West Preserve Loop at	AM	No	No	No	Does Not Meet 50 Trip Threshold	
Bickmore Avenue	PM	No	No	No		
11. Hellman Avenue at	AM	Does Not Exist	No	No	Does Not Meet 50 Trip Threshold	
Bickmore Avenue	PM		No	No		
12. SR 71 NB Ramp at	AM	Intersection Does Not Service Project Traffic Until Pine Connection is Made			No	Yes
Pine Avenue	PM				No	No
13. El Prado Road at	AM	No	No	No	No	No
Pine Avenue	PM	No	No	Yes	No	No
14. Euclid Avenue at	AM	Existing Signal				
Pine Avenue	PM					

* = Identifies intersection location along project perimeter

TABLE 12-1 (CONTINUED)
SIGNAL WARRANTS ANALYSIS

External Intersections	Peak Hour	TRAFFIC SIGNAL WARRANTS MET?				
		EXISTING (2007)	YEAR 2015		YEAR 2030	
			Without Project	With Project	Without Project	With Project
15. Sultana Avenue at	AM	Does Not Exist	No	Yes	Yes	Yes
Pine Avenue	PM		Yes	Yes	Yes	Yes
16. Mill Creek Ave/Chino-Corona Rd N/S at	AM	Existing Signal				
Pine Avenue	PM					
17. West Preserve Loop at	AM	Existing Signal				
Pine Avenue*	PM					
18. 1st Street at	AM	Intersection Does Not Exist			No	No
Pine Ave*	PM				No	No
19. Main Street at	AM	Intersection Does Not Exist			No	Yes
Pine Avenue*	PM				No	Yes
20. 2nd Street at	AM	Intersection Does Not Exist			No	Yes
Pine Avenue*	PM				No	Yes
21. East Preserve Loop at	AM	Does Not Exist		Yes	No	Yes
Pine Avenue*	PM			No	No	Yes
22. 3rd Street at	AM	Does Not Exist		Yes	No	No
Pine Avenue*	PM			No	No	No
23. Hellman Avenue at	AM	No	Yes	Yes	Yes	Yes
Pine Avenue/Schleisman Road*	PM	No	Yes	Yes	Yes	Yes
24. Archibald Avenue at	AM	Existing Signal				
Schleisman Road	PM					
25. Harrison Avenue at	AM	Existing Signal				
Schleisman Road	PM					
26. Sumner Avenue at	AM	Intersection Not in Chino Traffic Model				
Schleisman Road	PM					
27. Cleveland Avenue at	AM	No	Year 2030 Analysis Governs Mitigation		Yes	Yes
Schleisman Road	PM	No			Yes	Yes
28. Hamner Avenue at	AM	Existing Signal				
Schleisman Road	PM					

* = Identifies intersection location along project perimeter

TABLE 12-1 (CONTINUED)
SIGNAL WARRANTS ANALYSIS

External Intersections		Peak Hour	TRAFFIC SIGNAL WARRANTS MET?				
				YEAR 2015		YEAR 2030	
			EXISTING (2007)	Without Project	With Project	Without Project	With Project
29.	Hellman Avenue at	AM	Does Not Exist	No	No	No	No
	"A" Street*	PM		No	No	No	Yes
30.	Chino-Corona Rd N/S at	AM	Does Not Exist		No	Does Not Exist	No
	"B" Street*	PM			No		No
31.	Hellman Avenue at	AM	Does Not Exist	No	No	No	No
	"B" Street*	PM		No	No	No	Yes
32.	Chino-Corona Rd N/S at	AM	No	No	No	No	No
	Chino-Corona Road E/W*	PM	No	No	No	No	No
33.	"E" Street at	AM	Intersection Does Not Exist				No
	Chino-Corona Road E/W*	PM					No
34.	Hellman Avenue at	AM	No	Yes	Yes	No	No
	Chino-Corona Road/Chandler Street	PM	No	Yes	Yes	Yes	Yes

* = Identifies intersection location along project perimeter

13.0 TURNING LANE STORAGE LENGTH REQUIREMENTS

13.1 Intersection Queuing Evaluation

In addition to the identification and validation of street geometries in Section 8.0 of this report, a "turn pocket" queuing evaluation was prepared for the key roadways that border the project site, their mutual intersections, and all intervening project access intersections, to determine the required stacking/storage lengths for all recommended exclusive left-turn lanes and right-turn lanes along that perimeter.

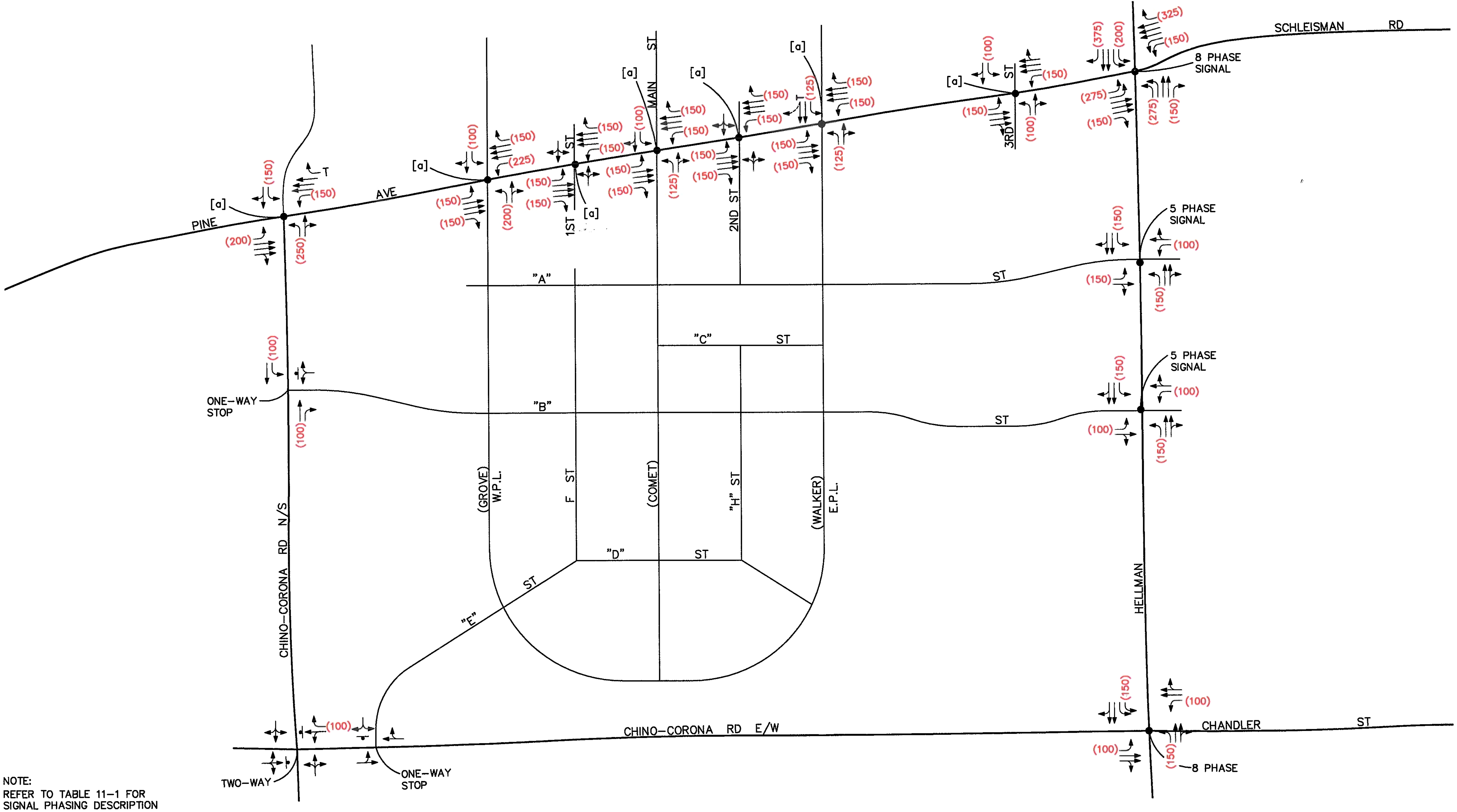
The queuing evaluation was conducted based on projected Year 2030 peak hour traffic volumes and the Highway Design Manual (Caltrans) method that determines the required pocket length as 1.5 times the average queue length in the peak hour. Those average queue lengths are reported in the output of the Traffix-generated service level calculation sheets like those in Appendix C and Appendix G.

Those pocket lengths are further input to the Synchro analyses of Appendix H. If the input length (1.5 times average) will service the 95th percentile queue, the input value is included in our pocket length recommendation. If the Synchro need is greater, that value is used instead. All of these values are based on 22 feet per vehicle.

On that basis, ***Figure 13-1*** identifies the pocket length needs at all perimeter locations based on Year 2030 volumes with project traffic included. It should be noted that the *Figure 13-1* pocket lengths are consistent with the Full Access Option for access and signalization along the project's Pine Avenue frontage.

Section 10 of this report investigated four Pine Avenue options as a variation to the Full Access Option. ***Figures 13-2, 13-3, 13-4*** and ***13-5*** report the adjusted pocket length needs, where applicable, based on Options 1, 2, 3 and 4, respectively. Please note that only the intersections affected by the access restrictions along Pine Avenue are shown in *Figures 13-2, 13-3, 13-4* and *13-5*. The stacking/storage lengths required for the remaining intersections outside of the Pine Avenue corridor between West Preserve Loop and 3rd Street are the same as those identified in *Figure 13-1*.

The stacking/storage requirements shown in *Figures 13-1* through *13-5* are the minimum required to ensure that vehicles do not queue beyond the turn pockets causing interruptions to through traffic on the roadways serving the project site (i.e. Pine Avenue, West Preserve Loop, East Preserve Loop, etc.). It should also be noted that the storage lengths do not include the transitions, which are typically ninety feet in length (90 feet).



NOTE:
[a] REFER TO TABLE 11-1 FOR SIGNAL PHASING DESCRIPTION

n:\2700\2062760\dwg\2760f13-1.dwg LDP 13:50:07 01-22-2008 patel

LINSCOTT
LAW &
GREENSPAN
engineers

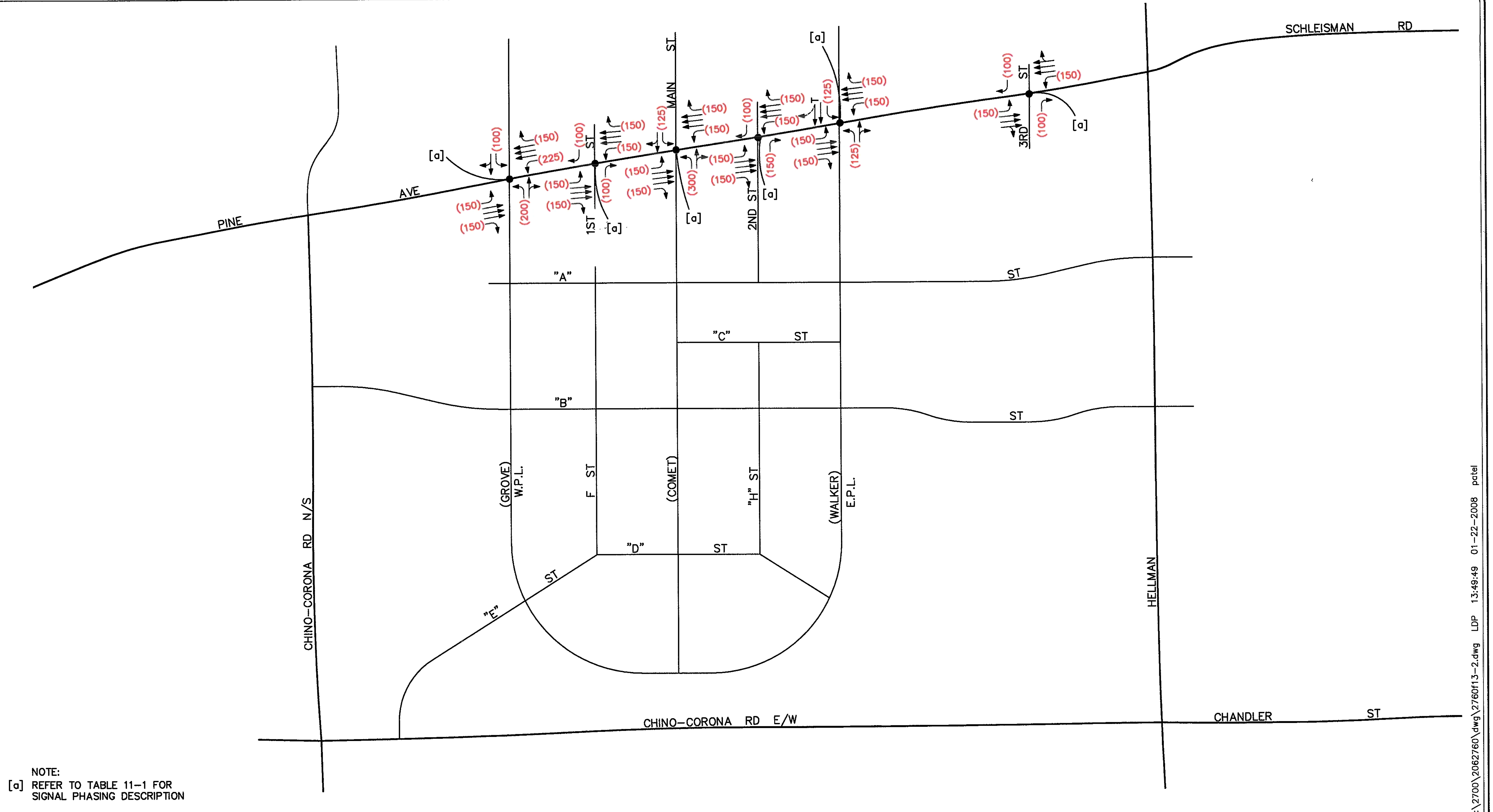
NO SCALE

KEY

● = TRAFFIC SIGNAL
┴ = STOP SIGN
T = TRANSIT LANE FUNCTIONS AS A SEPARATE RIGHT-TURN LANE AT THE INTERSECTION UNLESS OTHERWISE NOTED
← = APPROACH LANE
(###) = REQUIRED STORAGE LENGTH FOR TURN POCKET (FEET)

FIGURE 13-1

MINIMUM STORAGE LENGTH REQUIREMENTS – FULL ACCESS OPTION
SOUTH OF PINE AVENUE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO



NOTE:
[a] REFER TO TABLE 11-1 FOR SIGNAL PHASING DESCRIPTION

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LINSCOTT
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GREENSPAN
engineers

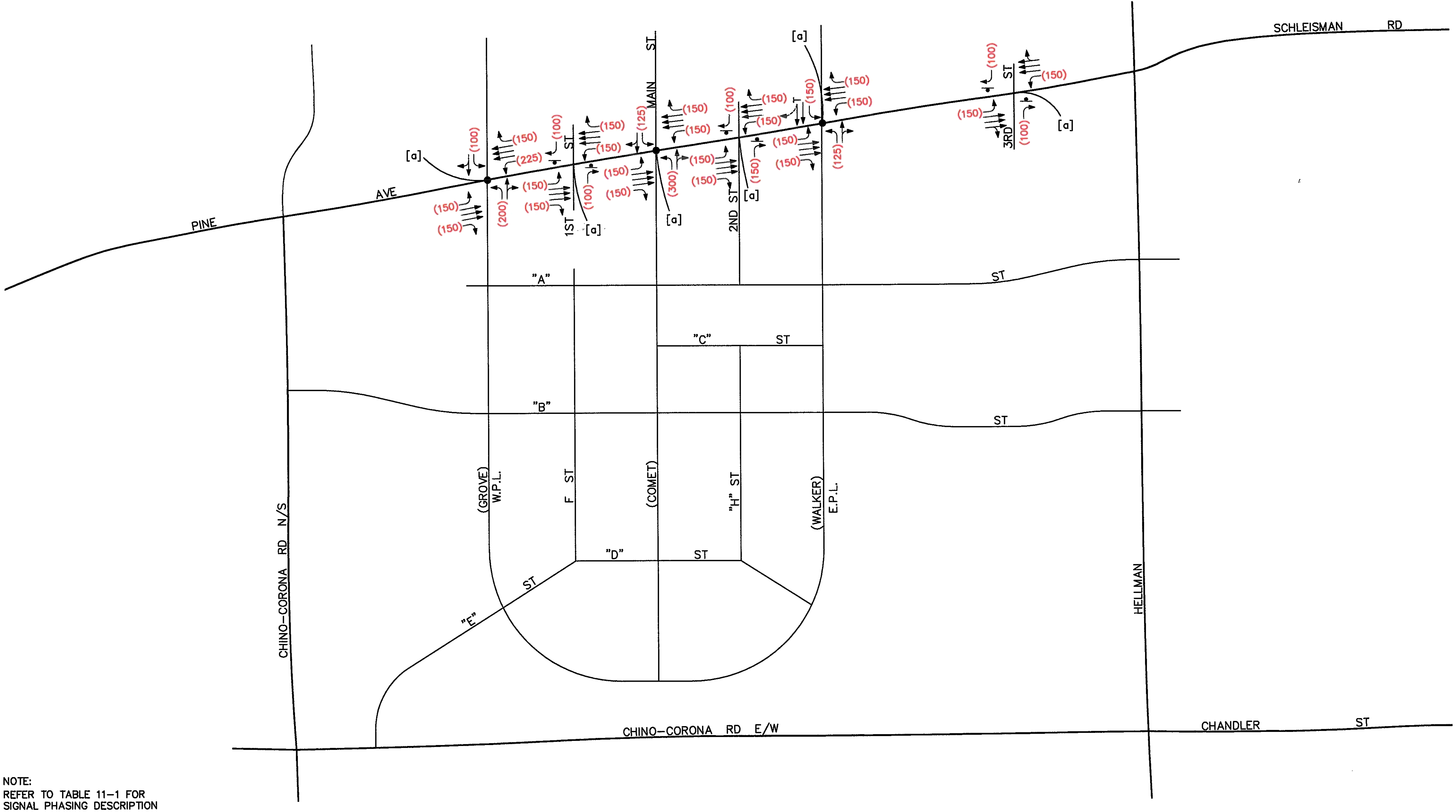
NO SCALE

KEY

● = TRAFFIC SIGNAL
T = TRANSIT LANE FUNCTIONS AS A SEPARATE RIGHT-TURN LANE AT THE INTERSECTION UNLESS OTHERWISE NOTED
←— = APPROACH LANE
(###) = REQUIRED STORAGE LENGTH FOR TURN POCKET (FEET)

FIGURE 13-2

MINIMUM STORAGE LENGTH REQUIREMENTS – OPTION 1
SOUTH OF PINE AVENUE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO



NOTE:
[a] REFER TO TABLE 11–1 FOR SIGNAL PHASING DESCRIPTION

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GREENSPAN
engineers

NO SCALE

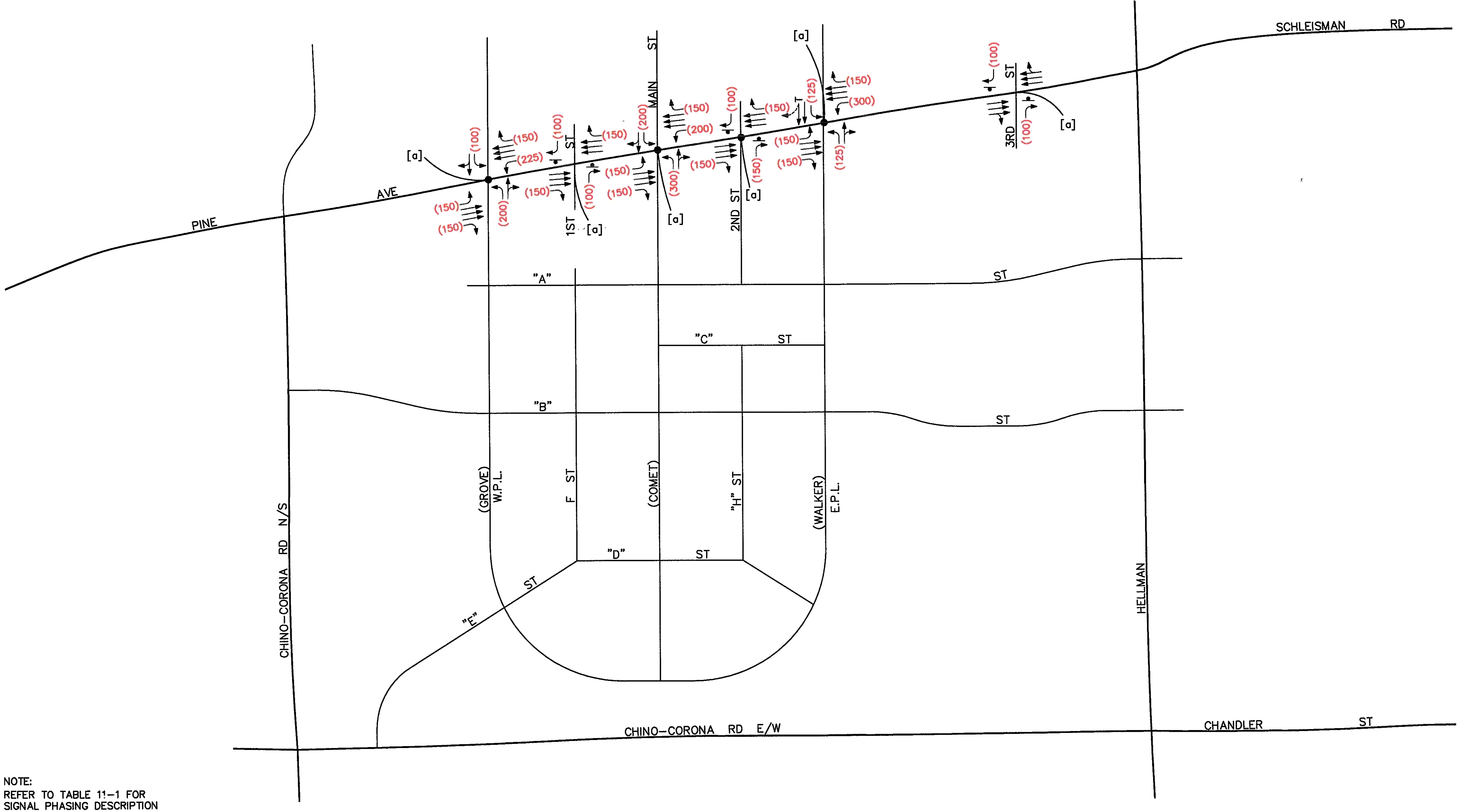
KEY

● = TRAFFIC SIGNAL
⊥ = STOP SIGN
T = TRANSIT LANE FUNCTIONS AS A SEPARATE RIGHT–TURN LANE AT THE INTERSECTION UNLESS OTHERWISE NOTED
←— = APPROACH LANE
(###) = REQUIRED STORAGE LENGTH FOR TURN POCKET (FEET) G-255

FIGURE 13–3

MINIMUM STORAGE LENGTH REQUIREMENTS – OPTION 2

SOUTH OF PINE AVENUE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO



NOTE:
[a] REFER TO TABLE 11–1 FOR SIGNAL PHASING DESCRIPTION

n:\2700\2062760\dwg\2760f13-4.dwg LDP 13:49:28 01-22-2008 patel

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GREENSPAN
engineers

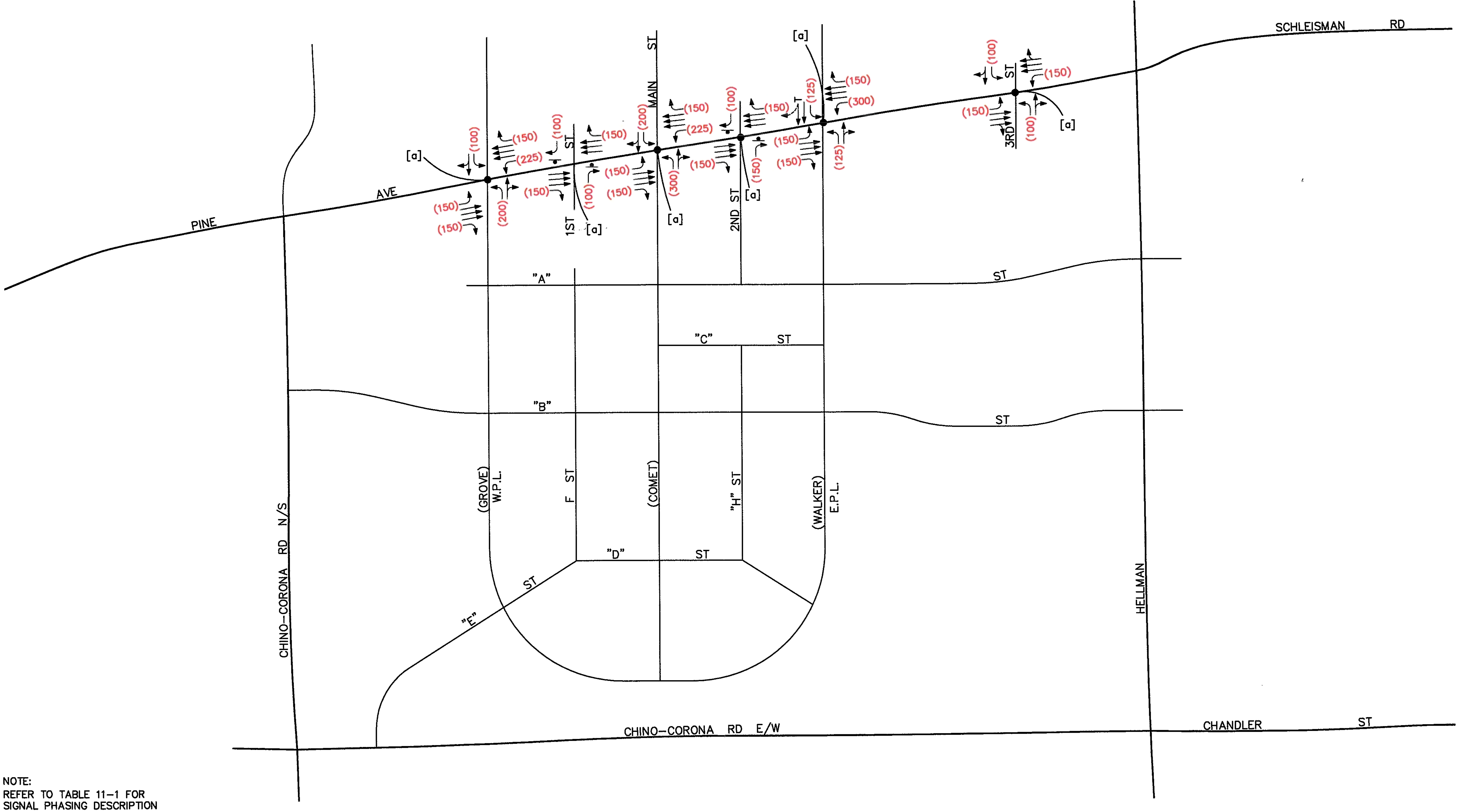
N
NO SCALE

KEY

- ● = TRAFFIC SIGNAL
- ┬ = STOP SIGN
- T = TRANSIT LANE FUNCTIONS AS A SEPARATE RIGHT–TURN LANE AT THE INTERSECTION UNLESS OTHERWISE NOTED
- ← = APPROACH LANE
- (###) = REQUIRED STORAGE LENGTH FOR TURN POCKET (FEET)

FIGURE 13–4

MINIMUM STORAGE LENGTH REQUIREMENTS – OPTION 3
SOUTH OF PINE AVENUE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO



NOTE:
[a] REFER TO TABLE 11–1 FOR SIGNAL PHASING DESCRIPTION

n:\2700\2062760\dwg\2760f13-5.dwg LDP 13:49:18 01-22-2008 patel

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GREENSPAN
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N NO SCALE

KEY
● = TRAFFIC SIGNAL
┬ = STOP SIGN
T = TRANSIT LANE FUNCTIONS AS A SEPARATE RIGHT–TURN LANE AT THE INTERSECTION UNLESS OTHERWISE NOTED
←— = APPROACH LANE
(###) = REQUIRED STORAGE LENGTH FOR TURN POCKET (FEET)

FIGURE 13–5

MINIMUM STORAGE LENGTH REQUIREMENTS –OPTION 4

SOUTH OF PINE AVENUE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO

14.0 "POTENTIAL THIRD SCHOOL SITE"

The preceding Year 2030 analyses have all been based on the 4,006 DU development tabulation of *Table 2-2*, as illustrated in *Figure 2-1*. That figure identifies a "Potential Third School Site" within Planning Area 3 that if implemented, would be the third school within the overall Lewis Operating Corp. planning footprint of The Preserve. If built, it would replace an ER site of 12 acres, on which 24 units would otherwise be built.

The South of Pine plan of *Figure 2-1* already includes a school site within Planning Area 9. That school site would be the second within the Lewis Operating Corp. planning footprint of the overall Preserve (the first being generally south of Kimball Avenue and west of Main Street in the Phase 1 area). The Planning Area 9 school site was represented in the Section 8 capacity analyses of this study as an elementary school of 1,000 students.

This section isolates and analyzes the differences in potential project impacts if the school were to be implemented instead of the 24 ER dwelling units.

14.1 Potential Third School Site Description

Based on information provided by Lewis Operating Corp., the "Potential Third School Site" could take one of two configurations, as follows:

- an elementary school with 22 classrooms, 40-50 teachers and administrative personnel, and 600 students, or
- a maximum case scenario would include grades K-8 with 39 classrooms and no gym facility. Teachers and administrative personnel would total 28 to 35. Enrollment would total 900-1,000 students on a year-round program.

In either case, the school's anticipated student service area is expected to be wholly south of Pine Avenue.

Given that the 1,000-student scenario represents the school option with the greatest trip-making potential, it formed the basis of the analysis that follows.

14.2 Trip Generation Characteristics

Table 14-1 updates the project summary of *Table 2-2* as well as the trip generation forecast of Table 5-3 to make the 1,000-student school substitution for the 24 ER dwelling units in Planning Area 3. All other developmental line items of the table are identical to those in the prior tables. School trips are forecast using the trip ends/student rate equations of *Table 5-1*.

Looking at the bottom of the final page of *Table 14-1* indicates that the school site substitution actually reduces the PM (commuter) peak hour trip making potential of the project site. This is because the PM traffic peak for schools themselves occurs as classes end mid-afternoon, in advance of the commuter peak hour. Thus, even if this option were exercised, the PM peak hour service level evaluations and related analyses presented previously in this study remain valid with development of the third school site.

TABLE 14-1

LONG-TERM (YEAR 2030) PROJECT TRAFFIC GENERATION FORECAST (3,982 DU PLAN + POTENTIAL THIRD SCHOOL SITE)[70]

Project Description							Daily Trips	AM Peak Hour			PM Peak Hour		
Prior TAZ No.[71]	PA No.	Parcel Type	Land Use	Acres	DU	T.S.F.		In	Out	Total	In	Out	Total
21	1	MDR	SF Residential	37.62	325	--	3,110	62	182	244	208	120	328
		MDR	Condo/Townhome	6.00	62	--	363	4	23	27	22	11	33
		MDR	Neighborhood Park	3.00	--	--	15	1	0	1	1	0	1
						Sub-Total	*3,488*	*67*	*205*	*272*	*231*	*131*	*362*
27	2	LDR	SF Residential	28.01	141	--	1,349	27	79	106	90	52	142
		LDR	Condo/Townhome	28.01	141	--	826	10	52	62	49	24	73
		ER	SF Residential	27.06	53	--	507	10	30	40	34	20	54
						Sub-Total	*2,682*	*47*	*161*	*208*	*173*	*96*	*269*
30	3	LDR	SF Residential	46.01	233	--	2,230	44	130	174	149	86	235
		ER	SF Residential	29.11	57	--	545	11	32	43	36	21	57
		ER	Elementary School[72]	12.00	--	--	1,290	230	190	420	--	--	--
		ER	City Park	8.00	--	--	400	26	26	52	18	18	36
						Sub-Total	*4,465*	*311*	*378*	*689*	*203*	*125*	*328*
24	4	LDR	SF Residential	30.83	183	--	1,751	35	102	137	117	68	185
		LDR	Condo/Townhome	30.82	182	--	1,067	13	67	80	64	31	95
		ER	SF Residential	23.10	45	--	431	9	25	34	29	17	46
						Sub-Total	*3,249*	*57*	*194*	*251*	*210*	*116*	*326*

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[70] Source: *Trip Generation*, 7th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2003).

[71] Refers to the traffic zone references in The Preserve, Chino Internal Traffic Model Methodology and Findings: Long-Term/Project Buildout Conditions Report, prepared by LLG (March 7, 2003).

[72] Elementary School = 1,000 Students.

TABLE 14-1 (CONTINUED)
LONG-TERM (YEAR 2030) PROJECT TRAFFIC GENERATION FORECAST (3,982 DU PLAN + POTENTIAL THIRD SCHOOL SITE)[73]

Project Description							Daily	AM Peak Hour			PM Peak Hour		
Prior TAZ No.[74]	**PA No.**	**Parcel Type**	**Land Use**	**Acres**	**DU**	**T.S.F.**	**Trips**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
24	5	MDR	Condo/Townhome	49.11	690	--	4,043	48	255	303	241	117	358
		NC	Shopping Center	3.00	--	43.124	1,852	27	17	44	78	84	162
		--	Pass-By (34%)[75]	--	--	--	-630	0	0	0	-27	-29	-56
						Sub-Total	*5,265*	*75*	*272*	*347*	*292*	*172*	*464*
22	6	HDR	Condo/Townhome	8.06	120	--	703	8	44	52	42	20	62
		CC Non Res	General Office	3.28	--	74.000	815	101	14	115	19	92	111
		CC Non Res	Shopping Center	3.28	--	149.000	6,398	94	60	154	268	291	559
		--	Pass-By (34%)[75]	--	--	--	-2,175	0	0	0	-91	-99	-190
						Sub-Total	*5,741*	*203*	*118*	*321*	*238*	*304*	*542*
23	7	HDR	Condo/Townhome	11.66	150	--	879	11	56	67	53	26	79
		CC Non Res	General Office	3.94	--	74.000	815	101	14	115	19	92	111
		CC Non Res	Shopping Center	3.94	--	149.000	6,398	94	60	154	268	291	559
		--	Pass-By (34%)[75]	--	--	--	-2,175	0	0	0	-91	-99	-190
						Sub-Total	*5,917*	*206*	*130*	*336*	*249*	*310*	*559*

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[73] Source: *Trip Generation*, 7th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2003).

[74] Refers to the traffic zone references in The Preserve, Chino Internal Traffic Model Methodology and Findings: Long-Term/Project Buildout Conditions Report, prepared by LLG (March 7, 2003).

[75] Pass-by trips are trips made as intermediate stops on the way from an origin to a primary trip destination. Pass-by trips are attracted from traffic passing the site on adjacent streets (i.e. Pine Avenue), which contain direct access to the generator. A pass-by reduction factor of 34% was used for the PM peak hour (Source: *Trip Generation Handbook*, 2nd Edition, June 2004). This same factor was used to estimate the daily pass-by percentage.

TABLE 14-1 (CONTINUED)
LONG-TERM (YEAR 2030) PROJECT TRAFFIC GENERATION FORECAST (3,982 DU PLAN + POTENTIAL THIRD SCHOOL SITE)[76]

Project Description							Daily	AM Peak Hour			PM Peak Hour		
Prior TAZ No.[77]	PA No.	Parcel Type	Land Use	Acres	DU	T.S.F.	Trips	In	Out	Total	In	Out	Total
25	8	HDR	Condo/Townhome	19.64	310	--	1,817	22	115	137	109	53	162
		CC Res	Condo/Townhome	14.01	250	--	1,465	18	93	111	88	43	131
		CC Non Res CF	Rec. Comm. Center	3.90	--	15.000	343	15	9	24	7	17	24
		CC Non Res	Neighborhood Park	1.50	--	--	8	0	0	0	1	0	1
						Sub-Total	*3,633*	*55*	*217*	*272*	*205*	*113*	*318*
26	9	HDR	Condo/Townhome	6.65	110	--	645	8	41	49	39	19	58
		CC Res	Condo/Townhome	6.44	120	--	703	8	44	52	42	20	62
		CC Non Res-CF	Rec. Comm. Center	1.82	--	31.000	709	31	20	51	15	36	51
		CC Non Res-CF	Library	1.67	--	20.000	1,080	15	6	21	68	74	142
		CC Non Res	Elementary School[78]	12.84	--	--	1,290	230	190	420	-	-	-
		CC Non Res	City Park	8.00	--	--	400	26	26	52	18	18	36
		CC Non Res	Neighborhood Park	1.50	--	--	8	0	0	0	1	0	1
						Sub-Total	*4,835*	*318*	*327*	*645*	*183*	*167*	*350*
28	10	HDR	Condo/Townhome	12.53	170	--	996	12	63	75	59	29	88
		MDR	Condo/Townhome	14.56	180	--	1,055	13	67	80	63	31	94
		CC Res	Condo/Townhome	3.70	55	--	322	4	20	24	19	9	28
		CC Non Res	Neighborhood Park	1.50	--	--	8	0	0	0	1	0	1
						Sub-Total	*2,381*	*29*	*150*	*179*	*142*	*69*	*211*

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[76] Source: *Trip Generation*, 7th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2003).

[77] Refers to the traffic zone references in The Preserve, Chino Internal Traffic Model Methodology and Findings: Long-Term/Project Buildout Conditions Report, prepared by LLG (March 7, 2003).

[78] Elementary School = 1,000 Students.

TABLE 14-1 (CONTINUED)

LONG-TERM (YEAR 2030) PROJECT TRAFFIC GENERATION FORECAST (3,982 DU PLAN + POTENTIAL THIRD SCHOOL SITE)[79]

Project Description							Daily	AM Peak Hour			PM Peak Hour		
Prior TAZ No.[80]	**PA No.**	**Parcel Type**	**Land Use**	**Acres**	**DU**	**T.S.F.**	**Trips**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
29	11	HDR	Condo/Townhome	12.54	170	--	996	12	63	75	59	29	88
		MDR	Condo/Townhome	14.56	180	--	1,055	13	67	80	63	31	94
		CC Res	Condo/Townhome	3.69	55	--	322	4	20	24	19	9	28
		CC Non Res	Neighborhood Park	1.50	--	--	8	0	0	0	1	0	1
						Sub-Total	*2,381*	*29*	*150*	*179*	*142*	*69*	*211*
Total Long-Term (Year 2030) Project Traffic Generation Forecast				**539.39**	**3,982**	**555.124**	**44,037**	**1,397**	**2,302**	**3,699**	**2,268**	**1,672**	**3,940**

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[79] Source: *Trip Generation*, 7th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2003).

[80] Refers to the traffic zone references in The Preserve, Chino Internal Traffic Model Methodology and Findings: Long-Term/Project Buildout Conditions Report, prepared by LLG (March 7, 2003).

TABLE 14-1 (CONTINUED)

LONG-TERM (YEAR 2030) PROJECT TRAFFIC GENERATION FORECAST (3,982 DU PLAN + POTENTIAL THIRD SCHOOL PLAN)[81]

Breakdown By Land Use	Acres	DU	T.S.F.	Daily Trips	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
Single Family Residential	222.74	1,037	--	10,153	203	593	796	678	393	1,071
Condominium/Townhouse	241.16	2,945	--	17,257	208	1,090	1,298	1,031	502	1,533
Shopping Center	10.22	--	341.124	9,668	215	137	352	405	439	844
General Office	7.22	--	148.000	1,630	202	28	230	38	184	222
Recreation Community Center	5.72	--	46.000	1,052	46	29	75	22	53	75
Library	1.67	--	20.000	1,080	15	6	21	68	74	142
Elementary School	24.84	--	--	2,580	460	380	840	-	-	-
Neighborhood Park	9.00	--	--	47	1	0	1	5	0	5
City Park	16.00	--	--	800	52	52	104	36	36	72
Total (With Potential Third School Site)	**539.39**	**3,982**	**555.124**	**44,037**	**1,397**	**2,302**	**3,699**	**2,268**	**1,672**	**3,940**
Total (Without Potential Third School Site)	**539.39**	**4,006**	**555.124**	**42,979**	**1,169**	**2,126**	**3,295**	**2,286**	**1,679**	**3,965**
Net Addition Due to Third School Site	**0**	**-24**	**0.000**	**1,058**	**228**	**176**	**404**	**-18**	**-7**	**-25**

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[81] Source: *Trip Generation*, 7th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2003).

The school arrival hour does typically coincide with the AM peak hour of the adjoining street system, and *Table 14-1* indicates an increase of 228 inbound trip ends, 176 outbound trip ends, and 404 total 2-way trip ends during that period.

14.3 Traffic Distribution and Assignment

Much of the AM peak hour traffic increment related to the third school site will be by parents dropping off their child at school, followed by a return to their home, or continuation on a linked trip that is otherwise represented in the overall forecasting for the project. Their traffic movements to and from the school, show up in both the inbound and outbound trip ends increment of *Table 14-1*. Thus on a net basis, most of this additive traffic will begin and end its travel in the area south of Pine Avenue, which coincides with the expected student service area of this third school.

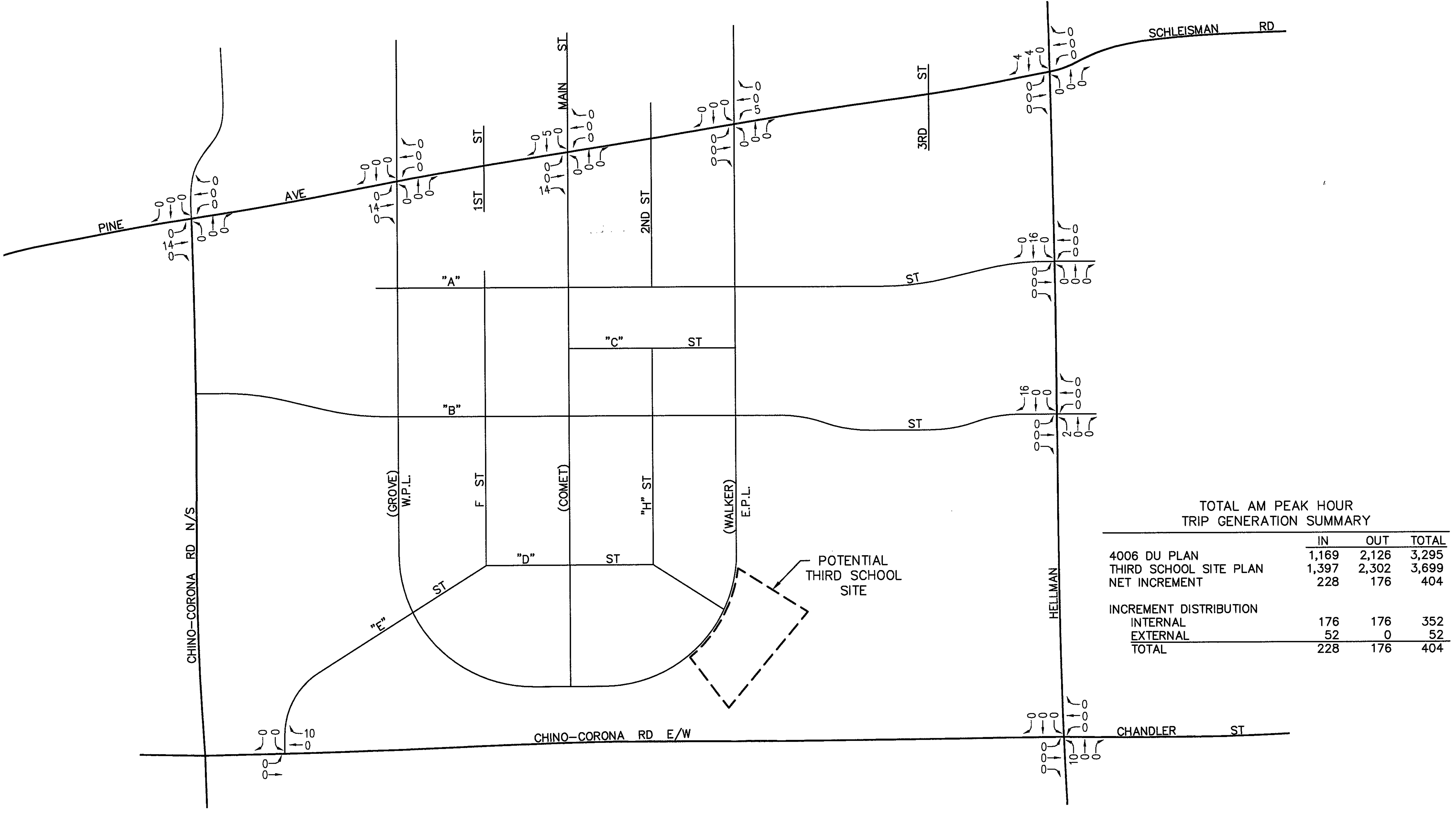
Traffic generated by others from outside this service area, and thus travelling on the external street system, can be expected to be by almost exclusively teacher and administrative personnel, who arrive, but do not leave again in the AM peak hour. Thus this external component can be isolated as the difference between inbound and outbound traffic movements at the school itself. From *Table 14-1*, that is expected to be on the order of 52 trips (228 inbound less 176 outbound movements). These 52 trips have been distributed to the external street system using the overall off-site patterns derived from select zone analyses discussed previously. ***Figure 14-1*** presents the resultant traffic increments.

As shown in *Figure 14-1*, beyond the boundaries of the project site itself, the additive trip increments due to the added school are typically very small, and in most evaluations, would be considered negligible.

14.4 Long Term (Year 2030) Traffic Evaluation

The incremental volumes of *Figure 14-1* have been added to total Year 2030 volumes as previously presented, and the delay and service level analyses of *Table 8-2* updated accordingly. ***Table 14-2*** presents that update. Due to the relatively small magnitude of these incremental volumes, the intersection list has been contracted to consider those locations in tightest proximity to the project site.

Review of *Table 14-2* indicates that the delay increment related to the third school site is very small and ranges from a reduction of 0.1 seconds to an increase of 0.2 seconds. Seven of the reported locations have unchanged values.



TOTAL AM PEAK HOUR
TRIP GENERATION SUMMARY

	IN	OUT	TOTAL
4006 DU PLAN	1,169	2,126	3,295
THIRD SCHOOL SITE PLAN	1,397	2,302	3,699
NET INCREMENT	228	176	404
INCREMENT DISTRIBUTION			
INTERNAL	176	176	352
EXTERNAL	52	0	52
TOTAL	228	176	404

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LINSCOTT LAW & GREENSPAN engineers

NO SCALE

NOTE: A "0" VOLUME INDICATES NEGLIGIBLE ADDITIVE SCHOOL TRAFFIC ON THE INDICATED MOVEMENT.

FIGURE 14-1

YEAR 2030 EXTERNAL AM PEAK HOUR TRIP INCREMENT DUE TO POTENTIAL THIRD SCHOOL SITE

SOUTH OF PINE (TTM NO. 16420) EXTERNAL EVALUATION, CHINO

TABLE 14-2

YEAR 2030 PEAK HOUR INTERSECTION CAPACITY ANALYSIS WITH POTENTIAL THIRD SCHOOL SITE[82]

Key Intersections	Time Period	(1) Year 2030 Plus Project Traffic (4,006 DU Plan)[83]		(2) Year 2030 Plus Project Traffic w/ Potential Third School Site		(3) Acceptable LOS	(4) Potential School Site Increment
		Delay	LOS	Delay	LOS	Yes/No	
16. Mill Creek Ave/Chino-Corona Rd N/S at	AM	18.7 s/v	B	18.6 s/v	B	Yes	-0.1
Pine Avenue	PM	N/A	N/A	N/A	N/A	N/A	N/A
17. West Preserve Loop at	AM	19.9 s/v	B	19.9 s/v	B	Yes	0.0
Pine Avenue	PM	N/A	N/A	N/A	N/A	N/A	N/A
18. 1st Street at	AM	18.6 s/v	B	18.6 s/v	B	Yes	0.0
Pine Avenue	PM	N/A	N/A	N/A	N/A	N/A	N/A
19. Main Street at	AM	21.6 s/v	C	21.6 s/v	C	Yes	0.0
Pine Avenue	PM	N/A	N/A	N/A	N/A	N/A	N/A
20. 2nd Street at	AM	18.9 s/v	B	18.9 s/v	B	Yes	0.0
Pine Avenue	PM	N/A	N/A	N/A	N/A	N/A	N/A
21. East Preserve Loop at	AM	18.7 s/v	B	18.7 s/v	B	Yes	0.0
Pine Avenue	PM	N/A	N/A	N/A	N/A	N/A	N/A
22. 3rd Street at	AM	16.6 s/v	B	16.6 s/v	B	Yes	0.0
Pine Avenue	PM	N/A	N/A	N/A	N/A	N/A	N/A
23. Hellman Ave at	AM	35.7 s/v	D	35.8 s/v	B	Yes	0.1
Pine Ave/Schleisman Rd	PM	N/A	N/A	N/A	N/A	N/A	N/A
29. Hellman Avenue at	AM	15.9 s/v	B	15.9 s/v	B	Yes	0.0
"A" Street	PM	N/A	N/A	N/A	N/A	N/A	N/A
31. Hellman Avenue at	AM	17.7 s/v	B	17.8 s/v	B	Yes	0.1
"B" Street	PM	N/A	N/A	N/A	N/A	N/A	N/A
33. "E" Street at	AM	5.4 s/v	A	4.4 s/v	A	Yes	-1.0
Chino-Corona Rd E/W	PM	N/A	N/A	N/A	N/A	N/A	N/A
34. Hellman Ave at	AM	15.9 s/v	B	16.1 s/v	B	Yes	0.2
Chino-Corona Rd/Chandler St	PM	N/A	N/A	N/A	N/A	N/A	N/A

Notes:
s/v = seconds per vehicle (delay)

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[82] **Bold HCM/LOS values** indicate adverse service levels based on City of Chino, City of Chino Hills, County of San Bernardino and County of Riverside LOS standards.

[83] Values are directly from *Table 8-2*.

14.5 Conclusions for Potential Third School Site Evaluation

From the above, it can be concluded that the substitution of a third school site for 24 ER residential units will not significantly alter the external project impact analyses and conclusions drawn in prior sections of this report. Those include elements of:

- External trip generation potential
- Long Term (Year 2030) capacity analyses
- Long Term (Year 2030) lane geometrics and intersection controls (*Figure 8-2*)
- Fair share contributions (*Table 9-1*)
- Alternative access evaluations (*Table 10-1*)
- Traffic signal progression on Pine Avenue (*Table 11-3*)
- Signal warrants analysis (*Table 12-1*)

15.0 SUMMARY OF FINDINGS AND CONCLUSIONS

- ***Project Description*** – The project site is roughly a 540-acre parcel of land bounded by Pine Avenue to the north, Chino-Corona Road E/W to the south, Chino-Corona Road N/S to the west and Hellman Avenue to the east, in the City of Chino, California. The proposed South of Pine Avenue Development Project will consist of eleven Planning Areas that are comprised of single family residential uses, condominium/townhouse uses, retail uses (shopping center), general office uses, recreation uses (i.e. community centers, neighborhood parks, and City parks), library uses and an elementary school. The South of Pine Avenue Development Project will be constructed in several phases with an interim buildout of some of the Planning Areas expected to occur by the Year 2015 (i.e. Planning Areas No. 1, No. 5, No. 8 and No. 9) and ultimate buildout of the entire site (all eleven Planning Areas) expected to occur by the Year 2030.

  The proposed project in the Year 2015 will consist of 325 single-family homes, 1,542 condominiums/townhomes, 46,000 SF of recreation uses, a 20,000 SF library, 6.00 acres of neighborhood parks and 8.00 acres of City parks.

  The proposed project at completion in the Year 2030 will consist of a total of 1,061 single-family homes, 2,945 condominiums/townhomes, 341,124 SF of retail uses, 148,000 SF of general office uses, 46,000 SF of recreation uses, a 20,000 SF library, a 12.82 acre/1,000 student elementary school, 9.00 acres of neighborhood parks and 16.00 acres of City parks. This study refers to this exact project description as the 4,006 DU Plan. The 4,006 DU Plan is the primary focus of this report.

  A variant of this plan would substitute a school site in place of 24 ER units on a 12-acre parcel in Planning Area 3. The variation in project impacts due to this "Optional Third School Site" are addressed in Section 14 of this report.

  Access to the South of Pine Avenue Development Project will generally be provided via Pine Avenue, Chino-Corona Road E/W, Chino-Corona Road N/S and Hellman Avenue. The proposed project will provide connections to Pine Avenue via West Preserve Loop, 1st Street, Main Street, 2nd Street, East Preserve Loop and 3rd Street. "E" Street to be constructed by the proposed project will provide a connection to Chino-Corona Road E/W. The proposed project will provide a connection to Chino-Corona Road N/S via "B" Street and a connection to Hellman Avenue via "A" Street and "B" Street. Prior site planning activities anticipated the direct southerly extension of Main Street all the way to Chino-Corona Road E/W. The "E" Street connection to Chino-Corona Road E/W as shown in the current site plan is considered an equivalent connection from a transportation planning and impact perspective. Given the similarity of the connections in the context of the overall project plan, a similar traffic volume would be attracted to either alignment, and the external impacts of the project not materially altered.

- ***Study Scope*** – The following thirty-four (34) existing or future intersections were selected for analysis in one or more analytical years based on the City of Chino requirements and through application of San Bernardino County Congestion Management Program (CMP) criteria.

1. Euclid Avenue at Kimball Avenue
2. Mill Creek Avenue at Kimball Avenue
3. Main Street at Kimball Avenue
4. "C" Street at Kimball Avenue
5. Hellman Avenue at Kimball Avenue/Limonite Ave
6. Main Street at North Preserve Loop
7. "C" Street at North Preserve Loop
8. Euclid Avenue at Bickmore Avenue
9. Mill Creek Avenue at Bickmore Avenue
10. West Preserve Loop at Bickmore Avenue
11. Hellman Avenue at Bickmore Avenue
12. SR-71 NB Ramp at Pine Avenue
13. El Prado Road at Pine Avenue
14. Euclid Avenue at Pine Avenue
15. Sultana Avenue at Pine Avenue
16. Mill Creek Ave/Chino-Corona Rd N/S at Pine Ave
17. West Preserve Loop at Pine Avenue
18. 1st Street at Pine Avenue
19. Main Street at Pine Avenue
20. 2nd Street at Pine Avenue
21. East Preserve Loop at Pine Avenue
22. 3rd Street at Pine Avenue
23. Hellman Ave at Pine Ave/Schleisman Road
24. Archibald Avenue at Schleisman Road
25. Harrison Avenue at Schleisman Road
26. Sumner Avenue at Schleisman Road
27. Cleveland Avenue at Schleisman Road
28. Hamner Avenue at Schleisman Road
29. Hellman Avenue at "A" Street
30. Chino-Corona Rd N/S at "B" Street
31. Hellman Avenue at "B" Street
32. Chino-Corona Rd N/S at Chino-Corona Road E/W
33. "E" Street at Chino-Corona Road E/W
34. Hellman Ave at Chino-Corona Rd/Chandler Street

Detailed peak hour level of service analyses were prepared for Existing Traffic Conditions, Year 2015 Background Traffic Conditions, Year 2015 Future Background plus Project Traffic Conditions, Year 2030 Background Traffic Conditions and Year 2030 Future Background plus Project Traffic Conditions at these locations based on analysis criteria described in this report.

- ***Level of Service (LOS) Standards and Significant Impact Criteria*** – The City of Chino considers LOS "D" to be the minimum acceptable condition that should be maintained during the peak commute hours, except those on the Congestion Management Program Highway System (CMPHS) of San Bernardino County, where LOS E is defined in the CMP for San Bernardino County as the acceptable limit. Therefore, any intersection operating at LOS "E" or "F" is considered deficient/unsatisfactory. The City of Chino Hills also considers LOS "D" to be the minimum acceptable condition that should be maintained during the peak commute hours. The County of San Bernardino and the County of Riverside consider LOS "C" to be the minimum acceptable condition that should be maintained during the peak commute hours.

- ***Existing Traffic Conditions*** – Twenty (20) key study intersections currently operate at an acceptable LOS when compared to the LOS criteria identified in this report. Hellman Avenue at Pine Avenue/Schleisman Road calculates to an adverse LOS F in the AM peak hour based on its all-way stop control. Archibald Avenue at Schleisman Road calculates to LOS D in both peak hours, exceeding the LOS C criteria of Riverside County.

- ***Near-Term (Year 2015) Project Trip Generation*** – On a typical weekday, the proposed Project in the near-term (Year 2015) is expected to generate 14,709 daily trips, with 1,072 trips (258 inbound, 814 outbound) produced in the AM peak hour and 1,388 trips (860 inbound, 528 outbound) produced in the PM peak hour.

- ***Long-Term (Year 2030) Project Trip Generation*** – On a typical weekday, overall the proposed Project in the long-term (Year 2030) is expected to generate 42,977 daily trips, with 3,297 trips (1,172 inbound, 2,125 outbound) produced in the AM peak hour and 3,964 trips (2,283 inbound, 1,681 outbound) produced in the PM peak hour. These values are less than those presented for TAZ No. 2 in the prior Preserve EIR (2002) as certified by the City.

- ***Related Projects Traffic Characteristics*** – Eighty-one (81) related projects were considered as part of the Year 2015 cumulative background setting. The 81 related projects are expected to generate a combined total of 376,192 daily trips on a weekday, with 28,608 trips (11,509 inbound and 17,099 outbound) forecast during the AM peak hour, and 36,077 trips (20,569 inbound and 15,508 outbound) during the PM peak hour.

  Given the magnitude of the cumulative development expected to occur by the Year 2015 and the fact that many of the related project trip ends will be captured amongst the 81 related projects, which is essentially double counting, a 30% adjustment (overlap factor) was applied to the aforementioned trip generation to account for the interaction between the 81 related projects. This factor was selected after iteratively reviewing the otherwise forecast interim year volumes at key intersections versus the corresponding volumes related to area General Plan Buildout. With the adjustment, the 81 related projects are expected to generate a net of 263,335 daily trips on a weekday, with 20,025 trips (8,056 inbound and 11,969 outbound) forecast during the AM peak hour, and 25,254 trips (14,398 inbound and 10,856 outbound) during the PM peak hour.

- ***Year 2015 Background plus Project Traffic Conditions*** – The results of the traffic impact analysis indicates that one of the twenty-four (24) near-term key study intersections is forecast to operate at an unacceptable LOS with project traffic. The intersection of Euclid Avenue at Pine Avenue is forecast to operate at unacceptable LOS F during the AM peak hour. The Year 2015 unacceptable level of service at the intersection of Euclid Avenue and Pine Avenue during the AM peak hour can be attributed to not having the connection of Pine Avenue between El Prado Road and the SR-71 Freeway. Without the connection to the SR-71 Freeway from Pine Avenue, vehicles traveling westbound on Pine Avenue need to make a westbound left-turn (which will be serviced by a planned dual left-turn lane) at the intersection of Pine Avenue/Euclid Avenue to travel south on Euclid Avenue to the SR-71 Freeway. This movement causes the intersection to operate at an unacceptable level of service. The connection between El Prado Road and the SR-71 Freeway will alleviate the congestion within the dual westbound left-turn lanes resulting in an acceptable level of service at the intersection (see Year 2030 LOS results). The remaining twenty-three (23) key study intersections are forecast to operate at an acceptable LOS with the addition of project generated traffic in the Year 2015.

- ***Year 2030 Background plus Project Traffic Conditions*** – The results of the traffic analysis indicate that four of the twenty-three (23) long-term key study intersections are forecast to operate at an unacceptable LOS with project traffic. The County of Riverside intersections of Archibald Avenue at Schleisman Road, Harrison Avenue at Schleisman Road, Cleveland Avenue at Schleisman Road, and Hamner Avenue at Schleisman Road are forecast to operate at unacceptable LOS D, LOS E and/or LOS F during the AM and/or PM peak hours. Given that these four intersections will continue to operate at unacceptable levels of service in the Year 2030, the proposed South of Pine Avenue Development Project can be expected to pay a proportional fair-share towards improvements at those locations. The remaining key study intersections are forecast to continue to operate at an acceptable LOS with the addition of project generated traffic in the Year 2030.

- ***Year 2015 Recommended Improvements*** – Refer to *Figure 8-1* for all Year 2015 recommended improvements with respect to intersection lane geometrics and traffic controls. The improvements depicted in *Figure 8-1* are an integral part of achieving the Year 2015 acceptable service levels.

- ***Year 2030 Recommended Improvements*** – Refer to *Figure 8-2* for all Year 2030 recommended improvements with respect to intersection lane geometrics and traffic controls. The improvements depicted in *Figure 8-2* are an integral part of achieving the Year 2030 acceptable service levels.

- ***Year 2030 Project Fair Share Contribution*** – The proposed South of Pine Avenue Development Project can be expected to pay a proportional "fair-share" towards improvements at five County of Riverside intersections forecast to operate at an unacceptable level of service in the Year 2030. The project's "fair-share" contribution is presented below.

Key Intersection	**City/Jurisdiction**	**Fair-Share Contribution**
24. Archibald Avenue at Schleisman Road	County of Riverside	24.2%
25. Harrison Avenue at Schleisman Road	County of Riverside	22.0%
27. Cleveland Avenue at Schleisman Road	County of Riverside	16.0%
28. Hamner Avenue at Schleisman Road	County of Riverside	20.7%
26. Sumner Avenue at Schleisman Road	County of Riverside	21.4%

Please note that Intersection 26 is not represented in the Chino Traffic Model outputs, but the projects link fair-share contribution is reported in the table above.

- ***Alternative Access Evaluation for Pine Avenue*** – The results of the Alternative Access Evaluation indicate that all six key study intersections along the Pine Avenue corridor between West Preserve Loop and 3rd Street are forecast to operate at an acceptable level of service under all five-access options. Therefore adequate ingress/egress to the project site will be provided under all five-access options.

- ***Traffic Signal Progression Analysis for Pine Avenue*** – Traffic signal progression along Pine Avenue in the long-term (Year 2030) is generally forecast to be "fair" or better for all Project Options with resulting efficiency values all forecast to be within acceptable levels (greater than 0.13). Options No. 3 and No. 4 both provide "good" progression in both directions during the PM Peak hour and each would provide both eastbound and westbound bandwidths in both peak hours. On that basis, they can be concluded to be the preferred options when compared to the Full Access Option, Option No. 1 or Option No. 2.

- ***Signal Warrant Analysis*** - All unsignalized study intersections have been evaluated for satisfaction of signal warrants in the existing, Year 2015, and Year 2030 conditions. Refer to *Table 12-1* for those results.

- ***Turning Lane Storage Length Requirements*** - Recommended turning lane storage length requirements have been determined based on Year 2030 conditions at all locations along the project site perimeter. Refer to *Figure 13-1* for recommendations for the Full Access Option along the project's Pine Avenue frontage. Refer to *Figures 13-3* and *13-4* for the requirements accounted with Option No. 3 and Option No. 4, respectively.

- ***"Potential Third School Site"*** - It can be concluded that the substitution of a third school site for 24 ER residential units will not significantly alter the external project impact analyses and conclusions drawn in prior sections of this report.

APPENDIX B

INTERSECTION LEVEL OF SERVICE CALCULATION WORKSHEETS

APPENDIX B-I

YEAR 2024 CUMULATIVE PLUS PROJECT TRAFFIC CONDITIONS

Intersection	
Intersection Delay, s/veh	6.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Vol, veh/h	0	0	0	0	0	49	0	0	0	37	0	0
Future Vol, veh/h	0	0	0	0	0	49	0	0	0	37	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	52	0	0	0	39	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	0	6.6	0	7.4
HCM LOS	-	A	-	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	0%	100%
Vol Thru, %	100%	100%	0%	0%
Vol Right, %	0%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	0	49	37
LT Vol	0	0	0	37
Through Vol	0	0	0	0
RT Vol	0	0	49	0
Lane Flow Rate	0	0	52	39
Geometry Grp	1	1	1	1
Degree of Util (X)	0	0	0.049	0.046
Departure Headway (Hd)	4.055	4.042	3.402	4.225
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	0	0	1052	851
Service Time	2.07	2.067	1.424	2.231
HCM Lane V/C Ratio	0	0	0.049	0.046
HCM Control Delay	7.1	7.1	6.6	7.4
HCM Lane LOS	N	N	A	A
HCM 95th-tile Q	0	0	0.2	0.1

Intersection	
Intersection Delay, s/veh	11.2
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥		↰	↱		↰	↱	
Traffic Vol, veh/h	33	4	36	0	4	97	51	102	0	25	316	39
Future Vol, veh/h	33	4	36	0	4	97	51	102	0	25	316	39
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	35	4	38	0	4	102	54	107	0	26	333	41
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	9	8.7	9.2	13.1
HCM LOS	A	A	A	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	45%	0%	100%	0%
Vol Thru, %	0%	100%	5%	4%	0%	89%
Vol Right, %	0%	0%	49%	96%	0%	11%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	51	102	73	101	25	355
LT Vol	51	0	33	0	25	0
Through Vol	0	102	4	4	0	316
RT Vol	0	0	36	97	0	39
Lane Flow Rate	54	107	77	106	26	374
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.088	0.16	0.112	0.143	0.041	0.526
Departure Headway (Hd)	5.871	5.367	5.25	4.841	5.651	5.07
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	606	664	677	735	631	706
Service Time	3.647	3.142	3.326	2.911	3.414	2.833
HCM Lane V/C Ratio	0.089	0.161	0.114	0.144	0.041	0.53
HCM Control Delay	9.2	9.2	9	8.7	8.7	13.4
HCM Lane LOS	A	A	A	A	A	B
HCM 95th-tile Q	0.3	0.6	0.4	0.5	0.1	3.1

12: East Preserve Loop & Academy St

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥		↰	↱		↰	↱	
Traffic Vol, veh/h	0	0	0	0	0	62	0	90	0	29	281	0
Future Vol, veh/h	0	0	0	0	0	62	0	90	0	29	281	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	65	0	95	0	31	296	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	486	453	296	453	453	95	296	0	0	95	0	0
Stage 1	358	358	-	95	95	-	-	-	-	-	-	-
Stage 2	128	95	-	358	358	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	492	503	743	517	503	962	1265	-	-	1499	-	-
Stage 1	660	628	-	912	816	-	-	-	-	-	-	-
Stage 2	876	816	-	660	628	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	451	492	743	509	492	962	1265	-	-	1499	-	-
Mov Cap-2 Maneuver	451	492	-	509	492	-	-	-	-	-	-	-
Stage 1	660	615	-	912	816	-	-	-	-	-	-	-
Stage 2	817	816	-	646	615	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	9	0	0.7
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1265	-	-	-	962	1499	-	-
HCM Lane V/C Ratio	-	-	-	-	0.068	0.02	-	-
HCM Control Delay (s)	0	-	-	0	9	7.5	-	-
HCM Lane LOS	A	-	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.2	0.1	-	-

37: East Preserve Loop & Dwy 3

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↱		↑	↳	
Traffic Vol, veh/h	0	0	0	152	70	282
Future Vol, veh/h	0	0	0	152	70	282
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	160	74	297

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	223	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	817	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	817	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	0	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	-	-	-

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↱		↑	↳	
Traffic Vol, veh/h	0	241	0	152	70	0
Future Vol, veh/h	0	241	0	152	70	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	254	0	160	74	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	74	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	988	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	988	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	988	-	-
HCM Lane V/C Ratio	-	0.257	-	-
HCM Control Delay (s)	-	9.9	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	1	-	-

39: Dwy 1 & Market St

Intersection	
Int Delay, s/veh	2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	↰↱	
Traffic Vol, veh/h	17	22	0	36	11	26
Future Vol, veh/h	17	22	0	36	11	26
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	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	23	0	38	12	27

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	41	0	68	30
Stage 1	-	-	-	-	30	-
Stage 2	-	-	-	-	38	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1568	-	937	1044
Stage 1	-	-	-	-	993	-
Stage 2	-	-	-	-	984	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1568	-	937	1044
Mov Cap-2 Maneuver	-	-	-	-	937	-
Stage 1	-	-	-	-	993	-
Stage 2	-	-	-	-	984	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1010	-	-	1568	-
HCM Lane V/C Ratio	0.039	-	-	-	-
HCM Control Delay (s)	8.7	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	4.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	⋎	
Traffic Vol, veh/h	43	0	65	29	7	30
Future Vol, veh/h	43	0	65	29	7	30
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	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	45	0	68	31	7	32

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	45	0	212	45
Stage 1	-	-	-	-	45	-
Stage 2	-	-	-	-	167	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1563	-	776	1025
Stage 1	-	-	-	-	977	-
Stage 2	-	-	-	-	863	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1563	-	742	1025
Mov Cap-2 Maneuver	-	-	-	-	742	-
Stage 1	-	-	-	-	977	-
Stage 2	-	-	-	-	825	-

Approach	EB	WB	NB
HCM Control Delay, s	0	5.1	8.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	956	-	-	1563	-
HCM Lane V/C Ratio	0.041	-	-	0.044	-
HCM Control Delay (s)	8.9	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Volume (vph)	0	0	0	0	0	49	0	0	0	37	0	0
Future Volume (vph)	0	0	0	0	0	49	0	0	0	37	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.865							
Flt Protected											0.950	
Satd. Flow (prot)	0	1863	0	0	1611	0	0	1863	0	0	1770	0
Flt Permitted											0.950	
Satd. Flow (perm)	0	1863	0	0	1611	0	0	1863	0	0	1770	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		363			1021			327			502	
Travel Time (s)		8.3			23.2			7.4			11.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	0	0	52	0	0	0	39	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	52	0	0	0	0	0	39	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 13.3% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣		↰	↱		↰	↱	
Traffic Volume (vph)	33	4	36	0	4	97	51	102	0	25	316	39
Future Volume (vph)	33	4	36	0	4	97	51	102	0	25	316	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.933			0.870						0.984	
Flt Protected		0.978					0.950			0.950		
Satd. Flow (prot)	0	1700	0	0	1621	0	1770	1863	0	1770	1833	0
Flt Permitted		0.978					0.950			0.950		
Satd. Flow (perm)	0	1700	0	0	1621	0	1770	1863	0	1770	1833	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		193			744			356			493	
Travel Time (s)		4.4			16.9			8.1			11.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	35	4	38	0	4	102	54	107	0	26	333	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	77	0	0	106	0	54	107	0	26	374	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 43.2% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣		↰	↱		↰	↱	
Traffic Volume (vph)	0	0	0	0	0	62	0	90	0	29	281	0
Future Volume (vph)	0	0	0	0	0	62	0	90	0	29	281	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.865							
Flt Protected										0.950		
Satd. Flow (prot)	0	1863	0	0	1611	0	1863	1863	0	1770	1863	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	1863	0	0	1611	0	1863	1863	0	1770	1863	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		665			594			355			313	
Travel Time (s)		15.1			13.5			8.1			7.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	0	0	65	0	95	0	31	296	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	65	0	0	95	0	31	296	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 25.3% ICU Level of Service A

Analysis Period (min) 15

	↗	↘	↖	↑	↓	↙
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↱		↑	↳	
Traffic Volume (vph)	0	0	0	152	70	282
Future Volume (vph)	0	0	0	152	70	282
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.892	
Flt Protected						
Satd. Flow (prot)	0	1863	0	1863	1662	0
Flt Permitted						
Satd. Flow (perm)	0	1863	0	1863	1662	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	239			240	356	
Travel Time (s)	5.4			5.5	8.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	160	74	297
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	160	371	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 24.4% ICU Level of Service A

Analysis Period (min) 15

38: East Preserve Loop & Dwy 4

AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↱		↑	↳	
Traffic Volume (vph)	0	241	0	152	70	0
Future Volume (vph)	0	241	0	152	70	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865				
Flt Protected						
Satd. Flow (prot)	0	1611	0	1863	1863	0
Flt Permitted						
Satd. Flow (perm)	0	1611	0	1863	1863	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	240			313	240	
Travel Time (s)	5.5			7.1	5.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	254	0	160	74	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	254	0	160	74	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 25.3% ICU Level of Service A

Analysis Period (min) 15

39: Dwy 1 & Market St

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	Y	
Traffic Volume (vph)	17	22	0	36	11	26
Future Volume (vph)	17	22	0	36	11	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.924				0.907	
Flt Protected					0.985	
Satd. Flow (prot)	1721	0	0	1863	1664	0
Flt Permitted					0.985	
Satd. Flow (perm)	1721	0	0	1863	1664	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	1021			180	198	
Travel Time (s)	23.2			4.1	4.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	18	23	0	38	12	27
Shared Lane Traffic (%)						
Lane Group Flow (vph)	41	0	0	38	39	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 13.3% ICU Level of Service A

Analysis Period (min) 15

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	Y	
Traffic Volume (vph)	43	0	65	29	7	30
Future Volume (vph)	43	0	65	29	7	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.889	
Flt Protected				0.967	0.991	
Satd. Flow (prot)	1863	0	0	1801	1641	0
Flt Permitted				0.967	0.991	
Satd. Flow (perm)	1863	0	0	1801	1641	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	180			193	205	
Travel Time (s)	4.1			4.4	4.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	45	0	68	31	7	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	45	0	0	99	39	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 21.8% ICU Level of Service A

Analysis Period (min) 15

Intersection	
Intersection Delay, s/veh	7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Vol, veh/h	0	0	0	0	0	42	0	0	0	39	0	0
Future Vol, veh/h	0	0	0	0	0	42	0	0	0	39	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	44	0	0	0	41	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	0	6.6	0	7.4
HCM LOS	-	A	-	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	0%	100%
Vol Thru, %	100%	100%	0%	0%
Vol Right, %	0%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	0	42	39
LT Vol	0	0	0	39
Through Vol	0	0	0	0
RT Vol	0	0	42	0
Lane Flow Rate	0	0	44	41
Geometry Grp	1	1	1	1
Degree of Util (X)	0	0	0.042	0.048
Departure Headway (Hd)	4.042	4.038	3.404	4.211
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	0	0	1051	854
Service Time	2.058	2.065	1.428	2.217
HCM Lane V/C Ratio	0	0	0.042	0.048
HCM Control Delay	7.1	7.1	6.6	7.4
HCM Lane LOS	N	N	A	A
HCM 95th-tile Q	0	0	0.1	0.2

Intersection	
Intersection Delay, s/veh	8.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥		↰	↱		↰	↱	
Traffic Vol, veh/h	10	1	39	0	1	53	46	67	0	99	184	9
Future Vol, veh/h	10	1	39	0	1	53	46	67	0	99	184	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	1	41	0	1	56	48	71	0	104	194	9
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	7.9	7.8	8.5	9.3
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	20%	0%	100%	0%
Vol Thru, %	0%	100%	2%	2%	0%	95%
Vol Right, %	0%	0%	78%	98%	0%	5%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	46	67	50	54	99	193
LT Vol	46	0	10	0	99	0
Through Vol	0	67	1	1	0	184
RT Vol	0	0	39	53	0	9
Lane Flow Rate	48	71	53	57	104	203
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.075	0.099	0.067	0.07	0.157	0.276
Departure Headway (Hd)	5.564	5.061	4.576	4.412	5.417	4.882
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	644	708	782	811	666	739
Service Time	3.296	2.793	2.607	2.442	3.117	2.582
HCM Lane V/C Ratio	0.075	0.1	0.068	0.07	0.156	0.275
HCM Control Delay	8.7	8.4	7.9	7.8	9.1	9.4
HCM Lane LOS	A	A	A	A	A	A
HCM 95th-tile Q	0.2	0.3	0.2	0.2	0.6	1.1

12: East Preserve Loop & Academy St

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥		↰	↱		↰	↱	
Traffic Vol, veh/h	0	0	0	0	0	32	0	81	0	56	172	0
Future Vol, veh/h	0	0	0	0	0	32	0	81	0	56	172	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	34	0	85	0	59	181	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	401	384	181	384	384	85	181	0	0	85	0	0
Stage 1	299	299	-	85	85	-	-	-	-	-	-	-
Stage 2	102	85	-	299	299	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	560	550	862	574	550	974	1394	-	-	1512	-	-
Stage 1	710	666	-	923	824	-	-	-	-	-	-	-
Stage 2	904	824	-	710	666	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	525	529	862	557	529	974	1394	-	-	1512	-	-
Mov Cap-2 Maneuver	525	529	-	557	529	-	-	-	-	-	-	-
Stage 1	710	640	-	923	824	-	-	-	-	-	-	-
Stage 2	873	824	-	682	640	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	8.8	0	1.8
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1394	-	-	-	974	1512	-	-
HCM Lane V/C Ratio	-	-	-	-	0.035	0.039	-	-
HCM Control Delay (s)	0	-	-	0	8.8	7.5	-	-
HCM Lane LOS	A	-	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↱		↑	↳	
Traffic Vol, veh/h	0	0	0	113	159	64
Future Vol, veh/h	0	0	0	113	159	64
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	119	167	67

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	201	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	840	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	840	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	0	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	-	-	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↱		↑	↱	
Traffic Vol, veh/h	0	69	0	113	159	0
Future Vol, veh/h	0	69	0	113	159	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	73	0	119	167	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	167	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	877	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	877	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	877	-	-
HCM Lane V/C Ratio	-	0.083	-	-
HCM Control Delay (s)	-	9.5	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0.3	-	-

39: Dwy 1 & Market St

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	↰↱	
Traffic Vol, veh/h	34	5	0	43	3	7
Future Vol, veh/h	34	5	0	43	3	7
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	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	36	5	0	45	3	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	41	0	84	39
Stage 1	-	-	-	-	39	-
Stage 2	-	-	-	-	45	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1568	-	918	1033
Stage 1	-	-	-	-	983	-
Stage 2	-	-	-	-	977	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1568	-	918	1033
Mov Cap-2 Maneuver	-	-	-	-	918	-
Stage 1	-	-	-	-	983	-
Stage 2	-	-	-	-	977	-

Approach	EB		WB		NB
HCM Control Delay, s	0		0		8.7
HCM LOS					A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	996	-	-	1568	-
HCM Lane V/C Ratio	0.011	-	-	-	-
HCM Control Delay (s)	8.7	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	Y	
Traffic Vol, veh/h	41	0	15	41	2	8
Future Vol, veh/h	41	0	15	41	2	8
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	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	0	16	43	2	8

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	43	0	118	43
Stage 1	-	-	-	-	43	-
Stage 2	-	-	-	-	75	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1566	-	878	1027
Stage 1	-	-	-	-	979	-
Stage 2	-	-	-	-	948	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1566	-	869	1027
Mov Cap-2 Maneuver	-	-	-	-	869	-
Stage 1	-	-	-	-	979	-
Stage 2	-	-	-	-	939	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2	8.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	991	-	-	1566	-
HCM Lane V/C Ratio	0.011	-	-	0.01	-
HCM Control Delay (s)	8.7	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Lanes, Volumes, Timings
6: Main St & Market St

Year 2024 Plus Project
PM Peak Hour

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Volume (vph)	0	0	0	0	0	42	0	0	0	39	0	0
Future Volume (vph)	0	0	0	0	0	42	0	0	0	39	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.865							
Flt Protected											0.950	
Satd. Flow (prot)	0	1863	0	0	1611	0	0	1863	0	0	1770	0
Flt Permitted											0.950	
Satd. Flow (perm)	0	1863	0	0	1611	0	0	1863	0	0	1770	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		386			1021			347			502	
Travel Time (s)		8.8			23.2			7.9			11.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	0	0	44	0	0	0	41	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	44	0	0	0	0	0	41	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 13.3% ICU Level of Service A

Analysis Period (min) 15

Lanes, Volumes, Timings
Year 2024 Plus Project

11: East Preserve Loop & Market St

PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥		↰	↱		↰	↱	
Traffic Volume (vph)	10	1	39	0	1	53	46	67	0	99	184	9
Future Volume (vph)	10	1	39	0	1	53	46	67	0	99	184	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.896			0.867						0.993	
Flt Protected		0.990					0.950			0.950		
Satd. Flow (prot)	0	1652	0	0	1615	0	1770	1863	0	1770	1850	0
Flt Permitted		0.990					0.950			0.950		
Satd. Flow (perm)	0	1652	0	0	1615	0	1770	1863	0	1770	1850	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		193			744			356			493	
Travel Time (s)		4.4			16.9			8.1			11.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	1	41	0	1	56	48	71	0	104	194	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	53	0	0	57	0	48	71	0	104	203	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 33.2% ICU Level of Service A

Analysis Period (min) 15

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥		↰	↱		↰	↱	
Traffic Volume (vph)	0	0	0	0	0	32	0	81	0	56	172	0
Future Volume (vph)	0	0	0	0	0	32	0	81	0	56	172	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.865							
Flt Protected										0.950		
Satd. Flow (prot)	0	1863	0	0	1611	0	1863	1863	0	1770	1863	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	1863	0	0	1611	0	1863	1863	0	1770	1863	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		665			594			355			313	
Travel Time (s)		15.1			13.5			8.1			7.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	0	0	34	0	85	0	59	181	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	34	0	0	85	0	59	181	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 19.8% ICU Level of Service A

Analysis Period (min) 15

	↗	↘	↖	↑	↓	↙
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↱		↑	↑↱	
Traffic Volume (vph)	0	0	0	113	159	64
Future Volume (vph)	0	0	0	113	159	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.961	
Flt Protected						
Satd. Flow (prot)	0	1863	0	1863	1790	0
Flt Permitted						
Satd. Flow (perm)	0	1863	0	1863	1790	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	239			240	356	
Travel Time (s)	5.4			5.5	8.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	119	167	67
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	119	234	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 15.6% ICU Level of Service A

Analysis Period (min) 15

	↗	↘	↖	↑	↓	↙
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↱		↑	↑→	
Traffic Volume (vph)	0	69	0	113	159	0
Future Volume (vph)	0	69	0	113	159	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865				
Flt Protected						
Satd. Flow (prot)	0	1611	0	1863	1863	0
Flt Permitted						
Satd. Flow (perm)	0	1611	0	1863	1863	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	240			313	240	
Travel Time (s)	5.5			7.1	5.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	73	0	119	167	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	73	0	119	167	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 19.3% ICU Level of Service A

Analysis Period (min) 15

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	⑂	
Traffic Volume (vph)	34	5	0	43	3	7
Future Volume (vph)	34	5	0	43	3	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.984				0.905	
Flt Protected					0.985	
Satd. Flow (prot)	1833	0	0	1863	1660	0
Flt Permitted					0.985	
Satd. Flow (perm)	1833	0	0	1863	1660	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	1021			180	198	
Travel Time (s)	23.2			4.1	4.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	36	5	0	45	3	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	41	0	0	45	10	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 13.3% ICU Level of Service A

Analysis Period (min) 15

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	↰↱	
Traffic Volume (vph)	41	0	15	41	2	8
Future Volume (vph)	41	0	15	41	2	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.892	
Flt Protected				0.987	0.990	
Satd. Flow (prot)	1863	0	0	1839	1645	0
Flt Permitted				0.987	0.990	
Satd. Flow (perm)	1863	0	0	1839	1645	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	180			193	205	
Travel Time (s)	4.1			4.4	4.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	43	0	16	43	2	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	43	0	0	59	10	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 19.7% ICU Level of Service A

Analysis Period (min) 15

APPENDIX B-II

YEAR 2030/2040 BUILDOUT PLUS PROJECT TRAFFIC CONDITIONS

Intersection	
Intersection Delay, s/veh	11.3
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Vol, veh/h	164	105	25	11	41	30	102	52	182	26	31	38
Future Vol, veh/h	164	105	25	11	41	30	102	52	182	26	31	38
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	164	105	25	11	41	30	102	52	182	26	31	38
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	12.1	9.1	11.7	9.1
HCM LOS	B	A	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	30%	56%	13%	27%
Vol Thru, %	15%	36%	50%	33%
Vol Right, %	54%	9%	37%	40%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	336	294	82	95
LT Vol	102	164	11	26
Through Vol	52	105	41	31
RT Vol	182	25	30	38
Lane Flow Rate	336	294	82	95
Geometry Grp	1	1	1	1
Degree of Util (X)	0.444	0.427	0.121	0.139
Departure Headway (Hd)	4.861	5.234	5.313	5.26
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	746	691	677	683
Service Time	2.861	3.234	3.328	3.283
HCM Lane V/C Ratio	0.45	0.425	0.121	0.139
HCM Control Delay	11.7	12.1	9.1	9.1
HCM Lane LOS	B	B	A	A
HCM 95th-tile Q	2.3	2.1	0.4	0.5

Intersection	
Intersection Delay, s/veh	12.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣		↰	↑↱		↰	↑	↱
Traffic Vol, veh/h	36	10	269	5	10	97	33	254	5	25	128	34
Future Vol, veh/h	36	10	269	5	10	97	33	254	5	25	128	34
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	36	10	269	5	10	97	33	254	5	25	128	34
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	1	1
HCM Control Delay	13.6	10	14	10.3
HCM LOS	B	A	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	11%	4%	100%	0%	0%
Vol Thru, %	0%	98%	3%	9%	0%	100%	0%
Vol Right, %	0%	2%	85%	87%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	33	259	315	112	25	128	34
LT Vol	33	0	36	5	25	0	0
Through Vol	0	254	10	10	0	128	0
RT Vol	0	5	269	97	0	0	34
Lane Flow Rate	33	259	315	112	25	128	34
Geometry Grp	8	8	7	7	7	7	7
Degree of Util (X)	0.063	0.46	0.488	0.183	0.047	0.223	0.053
Departure Headway (Hd)	6.916	6.392	5.576	5.872	6.786	6.277	5.564
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	517	562	646	608	526	570	641
Service Time	4.675	4.151	3.327	3.637	4.548	4.038	3.325
HCM Lane V/C Ratio	0.064	0.461	0.488	0.184	0.048	0.225	0.053
HCM Control Delay	10.1	14.5	13.6	10	9.9	10.8	8.6
HCM Lane LOS	B	B	B	A	A	B	A
HCM 95th-tile Q	0.2	2.4	2.7	0.7	0.1	0.8	0.2

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥		↰	↱		↰	↑	↱
Traffic Vol, veh/h	36	10	7	5	17	45	12	206	5	29	231	98
Future Vol, veh/h	36	10	7	5	17	45	12	206	5	29	231	98
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	36	10	7	5	17	45	12	206	5	29	231	98

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	553	524	231	580	620	209	329	0	0	211	0	0
Stage 1	289	289	-	233	233	-	-	-	-	-	-	-
Stage 2	264	235	-	347	387	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	444	458	808	426	404	831	1231	-	-	1360	-	-
Stage 1	719	673	-	770	712	-	-	-	-	-	-	-
Stage 2	741	710	-	669	610	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	396	444	808	405	391	831	1231	-	-	1360	-	-
Mov Cap-2 Maneuver	396	444	-	405	391	-	-	-	-	-	-	-
Stage 1	712	659	-	762	705	-	-	-	-	-	-	-
Stage 2	677	703	-	639	597	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.4	11.6	0.4	0.6
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1231	-	-	434	609	1360	-	-
HCM Lane V/C Ratio	0.01	-	-	0.122	0.11	0.021	-	-
HCM Control Delay (s)	8	-	-	14.4	11.6	7.7	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.4	0.1	-	-

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Vol, veh/h	9	5	5	5	5	146	5	178	5	38	14	7
Future Vol, veh/h	9	5	5	5	5	146	5	178	5	38	14	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	5	5	5	5	146	5	178	5	38	14	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	360	287	18	290	288	181	21	0	0	183	0	0
Stage 1	94	94	-	191	191	-	-	-	-	-	-	-
Stage 2	266	193	-	99	97	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	596	623	1061	662	622	862	1595	-	-	1392	-	-
Stage 1	913	817	-	811	742	-	-	-	-	-	-	-
Stage 2	739	741	-	907	815	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	480	604	1061	639	603	862	1595	-	-	1392	-	-
Mov Cap-2 Maneuver	480	604	-	639	603	-	-	-	-	-	-	-
Stage 1	910	794	-	809	740	-	-	-	-	-	-	-
Stage 2	608	739	-	872	792	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.2	10.3	0.2	4.9
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1595	-	-	599	841	1392	-	-
HCM Lane V/C Ratio	0.003	-	-	0.032	0.185	0.027	-	-
HCM Control Delay (s)	7.3	0	-	11.2	10.3	7.7	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.7	0.1	-	-

37: East Preserve Loop & Dwy 3

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↱		↑	↑	↱
Traffic Vol, veh/h	0	0	0	286	136	260
Future Vol, veh/h	0	0	0	286	136	260
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	286	136	260

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	136	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	913	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	913	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	0	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	-	-	-

38: East Preserve Loop & Dwy 4

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↱		↑	↑	↱
Traffic Vol, veh/h	0	222	0	286	136	0
Future Vol, veh/h	0	222	0	286	136	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	222	0	286	136	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	136	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	913	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	913	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	913	-	-
HCM Lane V/C Ratio	-	0.243	-	-
HCM Control Delay (s)	-	10.2	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	1	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	Y	
Traffic Vol, veh/h	282	39	0	60	15	11
Future Vol, veh/h	282	39	0	60	15	11
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	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	282	39	0	60	15	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	321	0	362	302
Stage 1	-	-	-	-	302	-
Stage 2	-	-	-	-	60	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1239	-	637	738
Stage 1	-	-	-	-	750	-
Stage 2	-	-	-	-	963	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1239	-	637	738
Mov Cap-2 Maneuver	-	-	-	-	637	-
Stage 1	-	-	-	-	750	-
Stage 2	-	-	-	-	963	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	676	-	-	1239	-
HCM Lane V/C Ratio	0.038	-	-	-	-
HCM Control Delay (s)	10.5	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

40: Dwy 2 & Market St

Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	⮃	
Traffic Vol, veh/h	293	0	26	45	15	15
Future Vol, veh/h	293	0	26	45	15	15
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	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	293	0	26	45	15	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	293	0	390	293
Stage 1	-	-	-	-	293	-
Stage 2	-	-	-	-	97	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1269	-	614	746
Stage 1	-	-	-	-	757	-
Stage 2	-	-	-	-	927	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1269	-	601	746
Mov Cap-2 Maneuver	-	-	-	-	601	-
Stage 1	-	-	-	-	757	-
Stage 2	-	-	-	-	908	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.9	10.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	666	-	-	1269	-
HCM Lane V/C Ratio	0.045	-	-	0.02	-
HCM Control Delay (s)	10.7	-	-	7.9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Volume (vph)	164	105	25	11	41	30	102	52	182	26	31	38
Future Volume (vph)	164	105	25	11	41	30	102	52	182	26	31	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.989			0.951			0.927			0.946	
Flt Protected		0.973			0.993			0.985			0.987	
Satd. Flow (prot)	0	1793	0	0	1759	0	0	1701	0	0	1739	0
Flt Permitted		0.973			0.993			0.985			0.987	
Satd. Flow (perm)	0	1793	0	0	1759	0	0	1701	0	0	1739	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		408			944			903			482	
Travel Time (s)		9.3			21.5			20.5			11.0	
Peak Hour Factor	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. Flow (vph)	164	105	25	11	41	30	102	52	182	26	31	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	294	0	0	82	0	0	336	0	0	95	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 55.7% ICU Level of Service B

Analysis Period (min) 15

11: East Preserve Loop & Market St

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥		↰	↱		↰	↑	↱
Traffic Volume (vph)	36	10	269	5	10	97	33	254	5	25	128	34
Future Volume (vph)	36	10	269	5	10	97	33	254	5	25	128	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		1
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.885			0.883			0.997				0.850
Flt Protected		0.994			0.998		0.950			0.950		
Satd. Flow (prot)	0	1639	0	0	1642	0	1770	1857	0	1770	1863	1583
Flt Permitted		0.994			0.998		0.950			0.950		
Satd. Flow (perm)	0	1639	0	0	1642	0	1770	1857	0	1770	1863	1583
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		193			744			356			493	
Travel Time (s)		4.4			16.9			8.1			11.2	
Peak Hour Factor	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. Flow (vph)	36	10	269	5	10	97	33	254	5	25	128	34
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	315	0	0	112	0	33	259	0	25	128	34
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 52.8%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥		↰	↱		↰	↑	↱
Traffic Volume (vph)	36	10	7	5	17	45	12	206	5	29	231	98
Future Volume (vph)	36	10	7	5	17	45	12	206	5	29	231	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		1
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.982			0.909			0.996				0.850
Flt Protected		0.967			0.996		0.950			0.950		
Satd. Flow (prot)	0	1769	0	0	1686	0	1770	1855	0	1770	1863	1583
Flt Permitted		0.967			0.996		0.950			0.950		
Satd. Flow (perm)	0	1769	0	0	1686	0	1770	1855	0	1770	1863	1583
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1329			594			355			313	
Travel Time (s)		30.2			13.5			8.1			7.1	
Peak Hour Factor	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. Flow (vph)	36	10	7	5	17	45	12	206	5	29	231	98
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	53	0	0	67	0	12	211	0	29	231	98
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 35.1% ICU Level of Service A

Analysis Period (min) 15

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Volume (vph)	9	5	5	5	5	146	5	178	5	38	14	7
Future Volume (vph)	9	5	5	5	5	146	5	178	5	38	14	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.964			0.874			0.996			0.984	
Flt Protected		0.977			0.998			0.999			0.969	
Satd. Flow (prot)	0	1754	0	0	1625	0	0	1853	0	0	1776	0
Flt Permitted		0.977			0.998			0.999			0.969	
Satd. Flow (perm)	0	1754	0	0	1625	0	0	1853	0	0	1776	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		359			1329			292			903	
Travel Time (s)		8.2			30.2			6.6			20.5	
Peak Hour Factor	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. Flow (vph)	9	5	5	5	5	146	5	178	5	38	14	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	19	0	0	156	0	0	188	0	0	59	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 32.9% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↱		↑	↑	↱
Traffic Volume (vph)	0	0	0	286	136	260
Future Volume (vph)	0	0	0	286	136	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850
Flt Protected						
Satd. Flow (prot)	0	1863	0	1863	1863	1583
Flt Permitted						
Satd. Flow (perm)	0	1863	0	1863	1863	1583
Link Speed (mph)	30			30	30	
Link Distance (ft)	239			240	356	
Travel Time (s)	5.4			5.5	8.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	286	136	260
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	286	136	260
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 19.4% ICU Level of Service A
Analysis Period (min) 15

	↗	↘	↖	↑	↓	↙
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↱		↑	↑	↱
Traffic Volume (vph)	0	222	0	286	136	0
Future Volume (vph)	0	222	0	286	136	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865				
Flt Protected						
Satd. Flow (prot)	0	1611	0	1863	1863	1863
Flt Permitted						
Satd. Flow (perm)	0	1611	0	1863	1863	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	240			313	240	
Travel Time (s)	5.5			7.1	5.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	222	0	286	136	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	222	0	286	136	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 27.6% ICU Level of Service A

Analysis Period (min) 15

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	↰↱	
Traffic Volume (vph)	282	39	0	60	15	11
Future Volume (vph)	282	39	0	60	15	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.984				0.943	
Flt Protected					0.972	
Satd. Flow (prot)	1833	0	0	1863	1707	0
Flt Permitted					0.972	
Satd. Flow (perm)	1833	0	0	1863	1707	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	944			180	198	
Travel Time (s)	21.5			4.1	4.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	282	39	0	60	15	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	321	0	0	60	26	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 27.2% ICU Level of Service A

Analysis Period (min) 15

Lanes, Volumes, Timings
40: Dwy 2 & Market St

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	↖↗	
Traffic Volume (vph)	293	0	26	45	15	15
Future Volume (vph)	293	0	26	45	15	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.932	
Flt Protected				0.982	0.976	
Satd. Flow (prot)	1863	0	0	1829	1694	0
Flt Permitted				0.982	0.976	
Satd. Flow (perm)	1863	0	0	1829	1694	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	180			193	205	
Travel Time (s)	4.1			4.4	4.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	293	0	26	45	15	15
Shared Lane Traffic (%)						
Lane Group Flow (vph)	293	0	0	71	30	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 32.6%	ICU Level of Service A
Analysis Period (min) 15	

Intersection	
Intersection Delay, s/veh	9.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Vol, veh/h	105	48	63	3	28	34	56	56	41	43	171	45
Future Vol, veh/h	105	48	63	3	28	34	56	56	41	43	171	45
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	105	48	63	3	28	34	56	56	41	43	171	45
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.1	8.5	9.2	10.3
HCM LOS	B	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	37%	49%	5%	17%
Vol Thru, %	37%	22%	43%	66%
Vol Right, %	27%	29%	52%	17%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	153	216	65	259
LT Vol	56	105	3	43
Through Vol	56	48	28	171
RT Vol	41	63	34	45
Lane Flow Rate	153	216	65	259
Geometry Grp	1	1	1	1
Degree of Util (X)	0.207	0.295	0.089	0.341
Departure Headway (Hd)	4.859	4.914	4.902	4.746
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	733	726	723	754
Service Time	2.93	2.983	2.987	2.809
HCM Lane V/C Ratio	0.209	0.298	0.09	0.344
HCM Control Delay	9.2	10.1	8.5	10.3
HCM Lane LOS	A	B	A	B
HCM 95th-tile Q	0.8	1.2	0.3	1.5

Intersection	
Intersection Delay, s/veh	11.4
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥		↰	↑↱		↰	↑	↱
Traffic Vol, veh/h	22	10	94	5	10	53	36	208	5	99	296	26
Future Vol, veh/h	22	10	94	5	10	53	36	208	5	99	296	26
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	10	94	5	10	53	36	208	5	99	296	26
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	1	1
HCM Control Delay	10.2	9.5	11.9	11.7
HCM LOS	B	A	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	17%	7%	100%	0%	0%
Vol Thru, %	0%	98%	8%	15%	0%	100%	0%
Vol Right, %	0%	2%	75%	78%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	36	213	126	68	99	296	26
LT Vol	36	0	22	5	99	0	0
Through Vol	0	208	10	10	0	296	0
RT Vol	0	5	94	53	0	0	26
Lane Flow Rate	36	213	126	68	99	296	26
Geometry Grp	8	8	7	7	7	7	7
Degree of Util (X)	0.066	0.361	0.208	0.113	0.164	0.449	0.034
Departure Headway (Hd)	6.623	6.101	5.933	5.976	5.967	5.463	4.756
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	541	590	605	600	602	660	753
Service Time	4.356	3.833	3.666	3.713	3.692	3.187	2.48
HCM Lane V/C Ratio	0.067	0.361	0.208	0.113	0.164	0.448	0.035
HCM Control Delay	9.8	12.3	10.2	9.5	9.9	12.6	7.6
HCM Lane LOS	A	B	B	A	A	B	A
HCM 95th-tile Q	0.2	1.6	0.8	0.4	0.6	2.3	0.1

12: East Preserve Loop & Academy St

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥		↰	↱		↰	↑	↱
Traffic Vol, veh/h	56	10	12	5	10	28	18	161	5	56	267	71
Future Vol, veh/h	56	10	12	5	10	28	18	161	5	56	267	71
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	56	10	12	5	10	28	18	161	5	56	267	71

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	598	581	267	626	650	164	338	0	0	166	0	0
Stage 1	379	379	-	200	200	-	-	-	-	-	-	-
Stage 2	219	202	-	426	450	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	414	425	772	397	388	881	1221	-	-	1412	-	-
Stage 1	643	615	-	802	736	-	-	-	-	-	-	-
Stage 2	783	734	-	606	572	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	376	402	772	368	367	881	1221	-	-	1412	-	-
Mov Cap-2 Maneuver	376	402	-	368	367	-	-	-	-	-	-	-
Stage 1	633	590	-	790	725	-	-	-	-	-	-	-
Stage 2	737	723	-	563	549	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.8	11.6	0.8	1.1
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1221	-	-	412	592	1412	-	-
HCM Lane V/C Ratio	0.015	-	-	0.189	0.073	0.04	-	-
HCM Control Delay (s)	8	-	-	15.8	11.6	7.7	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.7	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Vol, veh/h	5	5	5	5	5	83	5	70	5	81	38	5
Future Vol, veh/h	5	5	5	5	5	83	5	70	5	81	38	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	5	5	5	83	5	70	5	81	38	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	330	288	41	291	288	73	43	0	0	75	0	0
Stage 1	203	203	-	83	83	-	-	-	-	-	-	-
Stage 2	127	85	-	208	205	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	623	622	1030	661	622	989	1566	-	-	1524	-	-
Stage 1	799	733	-	925	826	-	-	-	-	-	-	-
Stage 2	877	824	-	794	732	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	543	587	1030	625	587	989	1566	-	-	1524	-	-
Mov Cap-2 Maneuver	543	587	-	625	587	-	-	-	-	-	-	-
Stage 1	797	693	-	922	824	-	-	-	-	-	-	-
Stage 2	796	822	-	742	692	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.5	9.3	0.5	4.9
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1566	-	-	664	926	1524	-	-
HCM Lane V/C Ratio	0.003	-	-	0.023	0.1	0.053	-	-
HCM Control Delay (s)	7.3	0	-	10.5	9.3	7.5	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.3	0.2	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↱		↑	↑	↱
Traffic Vol, veh/h	0	0	0	246	331	59
Future Vol, veh/h	0	0	0	246	331	59
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	246	331	59

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	331	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	711	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	711	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	0	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	-	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↱		↑	↑	↱
Traffic Vol, veh/h	0	64	0	246	331	0
Future Vol, veh/h	0	64	0	246	331	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	64	0	246	331	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	331	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	711	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	711	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	711	-	-
HCM Lane V/C Ratio	-	0.09	-	-
HCM Control Delay (s)	-	10.6	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.3	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	Y	
Traffic Vol, veh/h	110	9	0	61	4	3
Future Vol, veh/h	110	9	0	61	4	3
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	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	110	9	0	61	4	3

Major/Minor	Major1			Major2	Minor1	
Conflicting Flow All	0	0	119	0	176	115
Stage 1	-	-	-	-	115	-
Stage 2	-	-	-	-	61	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1469	-	814	937
Stage 1	-	-	-	-	910	-
Stage 2	-	-	-	-	962	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1469	-	814	937
Mov Cap-2 Maneuver	-	-	-	-	814	-
Stage 1	-	-	-	-	910	-
Stage 2	-	-	-	-	962	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	863	-	-	1469	-
HCM Lane V/C Ratio	0.008	-	-	-	-
HCM Control Delay (s)	9.2	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	↔	
Traffic Vol, veh/h	113	0	6	57	4	4
Future Vol, veh/h	113	0	6	57	4	4
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	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	113	0	6	57	4	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	113	0	182	113
Stage 1	-	-	-	-	113	-
Stage 2	-	-	-	-	69	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1476	-	807	940
Stage 1	-	-	-	-	912	-
Stage 2	-	-	-	-	954	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1476	-	804	940
Mov Cap-2 Maneuver	-	-	-	-	804	-
Stage 1	-	-	-	-	912	-
Stage 2	-	-	-	-	950	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	9.2
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	867	-	-	1476	-
HCM Lane V/C Ratio	0.009	-	-	0.004	-
HCM Control Delay (s)	9.2	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

6: Main St & Market St

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Volume (vph)	105	48	63	3	28	34	56	56	41	43	171	45
Future Volume (vph)	105	48	63	3	28	34	56	56	41	43	171	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.961			0.929			0.964			0.977	
Flt Protected		0.976			0.998			0.982			0.992	
Satd. Flow (prot)	0	1747	0	0	1727	0	0	1763	0	0	1805	0
Flt Permitted		0.976			0.998			0.982			0.992	
Satd. Flow (perm)	0	1747	0	0	1727	0	0	1763	0	0	1805	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		400			944			903			419	
Travel Time (s)		9.1			21.5			20.5			9.5	
Peak Hour Factor	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. Flow (vph)	105	48	63	3	28	34	56	56	41	43	171	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	216	0	0	65	0	0	153	0	0	259	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 42.1% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥		↰	↱		↰	↑	↱
Traffic Volume (vph)	22	10	94	5	10	53	36	208	5	99	296	26
Future Volume (vph)	22	10	94	5	10	53	36	208	5	99	296	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		1
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.899			0.895			0.996				0.850
Flt Protected		0.991			0.996		0.950			0.950		
Satd. Flow (prot)	0	1660	0	0	1660	0	1770	1855	0	1770	1863	1583
Flt Permitted		0.991			0.996		0.950			0.950		
Satd. Flow (perm)	0	1660	0	0	1660	0	1770	1855	0	1770	1863	1583
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		193			744			356			493	
Travel Time (s)		4.4			16.9			8.1			11.2	
Peak Hour Factor	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. Flow (vph)	22	10	94	5	10	53	36	208	5	99	296	26
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	126	0	0	68	0	36	213	0	99	296	26
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 42.5% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥		↰	↱		↰	↑	↱
Traffic Volume (vph)	56	10	12	5	10	28	18	161	5	56	267	71
Future Volume (vph)	56	10	12	5	10	28	18	161	5	56	267	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		1
Taper Length (ft)	60			60			60			60		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.979			0.912			0.995				0.850
Flt Protected		0.965			0.994		0.950			0.950		
Satd. Flow (prot)	0	1760	0	0	1689	0	1770	1853	0	1770	1863	1583
Flt Permitted		0.965			0.994		0.950			0.950		
Satd. Flow (perm)	0	1760	0	0	1689	0	1770	1853	0	1770	1863	1583
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1329			594			355			313	
Travel Time (s)		30.2			13.5			8.1			7.1	
Peak Hour Factor	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. Flow (vph)	56	10	12	5	10	28	18	161	5	56	267	71
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	78	0	0	43	0	18	166	0	56	267	71
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 38.4% ICU Level of Service A

Analysis Period (min) 15

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Volume (vph)	5	5	5	5	5	83	5	70	5	81	38	5
Future Volume (vph)	5	5	5	5	5	83	5	70	5	81	38	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.955			0.880			0.992			0.995	
Flt Protected		0.984			0.997			0.997			0.968	
Satd. Flow (prot)	0	1750	0	0	1634	0	0	1842	0	0	1794	0
Flt Permitted		0.984			0.997			0.997			0.968	
Satd. Flow (perm)	0	1750	0	0	1634	0	0	1842	0	0	1794	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		435			1329			292			903	
Travel Time (s)		9.9			30.2			6.6			20.5	
Peak Hour Factor	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. Flow (vph)	5	5	5	5	5	83	5	70	5	81	38	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	15	0	0	93	0	0	80	0	0	124	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 25.9% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
	↗	↘	↖	↑	↓	↙
Lane Configurations		↱		↑	↑	↱
Traffic Volume (vph)	0	0	0	246	331	59
Future Volume (vph)	0	0	0	246	331	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850
Flt Protected						
Satd. Flow (prot)	0	1863	0	1863	1863	1583
Flt Permitted						
Satd. Flow (perm)	0	1863	0	1863	1863	1583
Link Speed (mph)	30			30	30	
Link Distance (ft)	239			240	356	
Travel Time (s)	5.4			5.5	8.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	246	331	59
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	246	331	59
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 20.8% ICU Level of Service A

Analysis Period (min) 15

38: East Preserve Loop & Dwy 4

	↗	↘	↖	↑	↓	↙
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↱		↑	↑	↱
Traffic Volume (vph)	0	64	0	246	331	0
Future Volume (vph)	0	64	0	246	331	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865				
Flt Protected						
Satd. Flow (prot)	0	1611	0	1863	1863	1863
Flt Permitted						
Satd. Flow (perm)	0	1611	0	1863	1863	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	240			313	240	
Travel Time (s)	5.5			7.1	5.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	64	0	246	331	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	64	0	246	331	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 28.1% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
	→	↘	↙	←	↖	↗
Lane Configurations	↱			↰	Y	
Traffic Volume (vph)	110	9	0	61	4	3
Future Volume (vph)	110	9	0	61	4	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.990				0.942	
Flt Protected					0.972	
Satd. Flow (prot)	1844	0	0	1863	1706	0
Flt Permitted					0.972	
Satd. Flow (perm)	1844	0	0	1863	1706	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	944			180	198	
Travel Time (s)	21.5			4.1	4.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	110	9	0	61	4	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	119	0	0	61	7	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 16.3% ICU Level of Service A

Analysis Period (min) 15

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	↰↱	
Traffic Volume (vph)	113	0	6	57	4	4
Future Volume (vph)	113	0	6	57	4	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.932	
Flt Protected				0.995	0.976	
Satd. Flow (prot)	1863	0	0	1853	1694	0
Flt Permitted				0.995	0.976	
Satd. Flow (perm)	1863	0	0	1853	1694	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	180			193	205	
Travel Time (s)	4.1			4.4	4.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	113	0	6	57	4	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	113	0	0	63	8	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 18.0% ICU Level of Service A

Analysis Period (min) 15

APPENDIX C

TRAFFIC SIGNAL WARRANT WORKSHEETS

APPENDIX C-I

YEAR 2024 CUMULATIVE PLUS PROJECT TRAFFIC CONDITIONS

Signal Warrants Report For Intersection 6: Main Street at Market Street

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	0	37	49	0
2	0	36	47	0
3	0	35	46	0
4	0	30	39	0
5	0	28	37	0
6	0	25	33	0
7	0	23	31	0
8	0	22	29	0
9	0	18	24	0
10	0	17	22	0
11	0	17	22	0
12	0	16	21	0
13	0	14	19	0
14	0	13	18	0
15	0	13	18	0
16	0	13	17	0
17	0	7	10	0
18	0	4	5	0
19	0	4	5	0
20	0	1	2	0
21	0	1	1	0
22	0	1	1	0
23	0	1	1	0
24	0	1	1	0

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	37	2	49	No	No	No	No	No	No	No	No	No	No
2	2	36	2	47	No	No	No	No	No	No	No	No	No	No
3	2	35	2	46	No	No	No	No	No	No	No	No	No	No
4	2	30	2	39	No	No	No	No	No	No	No	No	No	No
5	2	28	2	37	No	No	No	No	No	No	No	No	No	No
6	2	25	2	33	No	No	No	No	No	No	No	No	No	No
7	2	23	2	31	No	No	No	No	No	No	No	No	No	No
8	2	22	2	29	No	No	No	No	No	No	No	No	No	No
9	2	18	2	24	No	No	No	No	No	No	No	No	No	No
10	2	17	2	22	No	No	No	No	No	No	No	No	No	No
11	2	17	2	22	No	No	No	No	No	No	No	No	No	No
12	2	16	2	21	No	No	No	No	No	No	No	No	No	No
13	2	14	2	19	No	No	No	No	No	No	No	No	No	No
14	2	13	2	18	No	No	No	No	No	No	No	No	No	No
15	2	13	2	18	No	No	No	No	No	No	No	No	No	No
16	2	13	2	17	No	No	No	No	No	No	No	No	No	No
17	2	7	2	10	No	No	No	No	No	No	No	No	No	No
18	2	4	2	5	No	No	No	No	No	No	No	No	No	No
19	2	4	2	5	No	No	No	No	No	No	No	No	No	No
20	2	1	2	2	No	No	No	No	No	No	No	No	No	No
21	2	1	2	1	No	No	No	No	No	No	No	No	No	No
22	2	1	2	1	No	No	No	No	No	No	No	No	No	No
23	2	1	2	1	No	No	No	No	No	No	No	No	No	No
24	2	1	2	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	6.6	
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:05	0:00
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	49	0
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	86	86
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

Signal Warrants Report For Intersection 11: EPL at Market Street

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S, N
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	E	W	S	N
1	101	73	153	380
2	97	70	147	365
3	95	69	144	357
4	81	58	122	304
5	77	55	116	289
6	69	50	104	258
7	64	46	96	239
8	61	44	92	228
9	48	35	73	182
10	45	33	69	171
11	45	33	69	171
12	43	31	66	163
13	39	28	60	148
14	36	26	55	137
15	36	26	55	137
16	35	26	54	133
17	20	15	31	76
18	11	8	17	42
19	10	7	15	38
20	4	3	6	15
21	3	2	5	11
22	3	2	5	11
23	2	1	3	8
24	2	1	3	8

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	174	4	533	No	No	No	No	No	No	No	No	No	No
2	2	167	4	512	No	No	No	No	No	No	No	No	No	No
3	2	164	4	501	No	No	No	No	No	No	No	No	No	No
4	2	139	4	426	No	No	No	No	No	No	No	No	No	No
5	2	132	4	405	No	No	No	No	No	No	No	No	No	No
6	2	119	4	362	No	No	No	No	No	No	No	No	No	No
7	2	110	4	335	No	No	No	No	No	No	No	No	No	No
8	2	105	4	320	No	No	No	No	No	No	No	No	No	No
9	2	83	4	255	No	No	No	No	No	No	No	No	No	No
10	2	78	4	240	No	No	No	No	No	No	No	No	No	No
11	2	78	4	240	No	No	No	No	No	No	No	No	No	No
12	2	74	4	229	No	No	No	No	No	No	No	No	No	No
13	2	67	4	208	No	No	No	No	No	No	No	No	No	No
14	2	62	4	192	No	No	No	No	No	No	No	No	No	No
15	2	62	4	192	No	No	No	No	No	No	No	No	No	No
16	2	61	4	187	No	No	No	No	No	No	No	No	No	No
17	2	35	4	107	No	No	No	No	No	No	No	No	No	No
18	2	19	4	59	No	No	No	No	No	No	No	No	No	No
19	2	17	4	53	No	No	No	No	No	No	No	No	No	No
20	2	7	4	21	No	No	No	No	No	No	No	No	No	No
21	2	5	4	16	No	No	No	No	No	No	No	No	No	No
22	2	5	4	16	No	No	No	No	No	No	No	No	No	No
23	2	3	4	11	No	No	No	No	No	No	No	No	No	No
24	2	3	4	11	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	9	12.5
Number of Lanes on Minor Street Approach	2	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:23	1:18
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	153	380
High Minor Volume Condition Met	Yes	Yes
Total Entering Volume on All Approaches During Same Hour	707	707
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

Signal Warrants Report For Intersection 12: EPL at Academy St

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	90	310	62	0
2	86	298	60	0
3	85	291	58	0
4	72	248	50	0
5	68	236	47	0
6	61	211	42	0
7	57	195	39	0
8	54	186	37	0
9	43	149	30	0
10	41	140	28	0
11	41	140	28	0
12	39	133	27	0
13	35	121	24	0
14	32	112	22	0
15	32	112	22	0
16	31	109	22	0
17	18	62	12	0
18	10	34	7	0
19	9	31	6	0
20	4	12	2	0
21	3	9	2	0
22	3	9	2	0
23	2	6	1	0
24	2	6	1	0

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	4	400	2	62	No	No	No	No	No	No	No	No	No	No
2	4	384	2	60	No	No	No	No	No	No	No	No	No	No
3	4	376	2	58	No	No	No	No	No	No	No	No	No	No
4	4	320	2	50	No	No	No	No	No	No	No	No	No	No
5	4	304	2	47	No	No	No	No	No	No	No	No	No	No
6	4	272	2	42	No	No	No	No	No	No	No	No	No	No
7	4	252	2	39	No	No	No	No	No	No	No	No	No	No
8	4	240	2	37	No	No	No	No	No	No	No	No	No	No
9	4	192	2	30	No	No	No	No	No	No	No	No	No	No
10	4	181	2	28	No	No	No	No	No	No	No	No	No	No
11	4	181	2	28	No	No	No	No	No	No	No	No	No	No
12	4	172	2	27	No	No	No	No	No	No	No	No	No	No
13	4	156	2	24	No	No	No	No	No	No	No	No	No	No
14	4	144	2	22	No	No	No	No	No	No	No	No	No	No
15	4	144	2	22	No	No	No	No	No	No	No	No	No	No
16	4	140	2	22	No	No	No	No	No	No	No	No	No	No
17	4	80	2	12	No	No	No	No	No	No	No	No	No	No
18	4	44	2	7	No	No	No	No	No	No	No	No	No	No
19	4	40	2	6	No	No	No	No	No	No	No	No	No	No
20	4	16	2	2	No	No	No	No	No	No	No	No	No	No
21	4	12	2	2	No	No	No	No	No	No	No	No	No	No
22	4	12	2	2	No	No	No	No	No	No	No	No	No	No
23	4	8	2	1	No	No	No	No	No	No	No	No	No	No
24	4	8	2	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	9	11.5
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:09	0:00
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	62	0
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	462	462
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

Signal Warrants Report For Intersection 37: EPL at Driveway 3

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	152	352	0
2	146	338	0
3	143	331	0
4	122	282	0
5	116	268	0
6	103	239	0
7	96	222	0
8	91	211	0
9	73	169	0
10	68	158	0
11	68	158	0
12	65	151	0
13	59	137	0
14	55	127	0
15	55	127	0
16	53	123	0
17	30	70	0
18	17	39	0
19	15	35	0
20	6	14	0
21	5	11	0
22	5	11	0
23	3	7	0
24	3	7	0

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	504	1	0	No	No	No	No	No	No	No	No	No	No
2	2	484	1	0	No	No	No	No	No	No	No	No	No	No
3	2	474	1	0	No	No	No	No	No	No	No	No	No	No
4	2	404	1	0	No	No	No	No	No	No	No	No	No	No
5	2	384	1	0	No	No	No	No	No	No	No	No	No	No
6	2	342	1	0	No	No	No	No	No	No	No	No	No	No
7	2	318	1	0	No	No	No	No	No	No	No	No	No	No
8	2	302	1	0	No	No	No	No	No	No	No	No	No	No
9	2	242	1	0	No	No	No	No	No	No	No	No	No	No
10	2	226	1	0	No	No	No	No	No	No	No	No	No	No
11	2	226	1	0	No	No	No	No	No	No	No	No	No	No
12	2	216	1	0	No	No	No	No	No	No	No	No	No	No
13	2	196	1	0	No	No	No	No	No	No	No	No	No	No
14	2	182	1	0	No	No	No	No	No	No	No	No	No	No
15	2	182	1	0	No	No	No	No	No	No	No	No	No	No
16	2	176	1	0	No	No	No	No	No	No	No	No	No	No
17	2	100	1	0	No	No	No	No	No	No	No	No	No	No
18	2	56	1	0	No	No	No	No	No	No	No	No	No	No
19	2	50	1	0	No	No	No	No	No	No	No	No	No	No
20	2	20	1	0	No	No	No	No	No	No	No	No	No	No
21	2	16	1	0	No	No	No	No	No	No	No	No	No	No
22	2	16	1	0	No	No	No	No	No	No	No	No	No	No
23	2	10	1	0	No	No	No	No	No	No	No	No	No	No
24	2	10	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	9.3
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:00
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	0
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	504
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 38: EPL at Driveway 4

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	152	70	241
2	146	67	231
3	143	66	227
4	122	56	193
5	116	53	183
6	103	48	164
7	96	44	152
8	91	42	145
9	73	34	116
10	68	32	108
11	68	32	108
12	65	30	104
13	59	27	94
14	55	25	87
15	55	25	87
16	53	25	84
17	30	14	48
18	17	8	27
19	15	7	24
20	6	3	10
21	5	2	7
22	5	2	7
23	3	1	5
24	3	1	5

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	222	1	241	No	No	No	No	No	No	No	No	No	No
2	2	213	1	231	No	No	No	No	No	No	No	No	No	No
3	2	209	1	227	No	No	No	No	No	No	No	No	No	No
4	2	178	1	193	No	No	No	No	No	No	No	No	No	No
5	2	169	1	183	No	No	No	No	No	No	No	No	No	No
6	2	151	1	164	No	No	No	No	No	No	No	No	No	No
7	2	140	1	152	No	No	No	No	No	No	No	No	No	No
8	2	133	1	145	No	No	No	No	No	No	No	No	No	No
9	2	107	1	116	No	No	No	No	No	No	No	No	No	No
10	2	100	1	108	No	No	No	No	No	No	No	No	No	No
11	2	100	1	108	No	No	No	No	No	No	No	No	No	No
12	2	95	1	104	No	No	No	No	No	No	No	No	No	No
13	2	86	1	94	No	No	No	No	No	No	No	No	No	No
14	2	80	1	87	No	No	No	No	No	No	No	No	No	No
15	2	80	1	87	No	No	No	No	No	No	No	No	No	No
16	2	78	1	84	No	No	No	No	No	No	No	No	No	No
17	2	44	1	48	No	No	No	No	No	No	No	No	No	No
18	2	25	1	27	No	No	No	No	No	No	No	No	No	No
19	2	22	1	24	No	No	No	No	No	No	No	No	No	No
20	2	9	1	10	No	No	No	No	No	No	No	No	No	No
21	2	7	1	7	No	No	No	No	No	No	No	No	No	No
22	2	7	1	7	No	No	No	No	No	No	No	No	No	No
23	2	4	1	5	No	No	No	No	No	No	No	No	No	No
24	2	4	1	5	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	9.8
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:39
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	241
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	463
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 39: Driveway 1 at Market Street

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	S
1	36	39	37
2	35	37	36
3	34	37	35
4	29	31	30
5	27	30	28
6	24	27	25
7	23	25	23
8	22	23	22
9	17	19	18
10	16	18	17
11	16	18	17
12	15	17	16
13	14	15	14
14	13	14	13
15	13	14	13
16	13	14	13
17	7	8	7
18	4	4	4
19	4	4	4
20	1	2	1
21	1	1	1
22	1	1	1
23	1	1	1
24	1	1	1

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	75	1	37	No	No	No	No	No	No	No	No	No	No
2	2	72	1	36	No	No	No	No	No	No	No	No	No	No
3	2	71	1	35	No	No	No	No	No	No	No	No	No	No
4	2	60	1	30	No	No	No	No	No	No	No	No	No	No
5	2	57	1	28	No	No	No	No	No	No	No	No	No	No
6	2	51	1	25	No	No	No	No	No	No	No	No	No	No
7	2	48	1	23	No	No	No	No	No	No	No	No	No	No
8	2	45	1	22	No	No	No	No	No	No	No	No	No	No
9	2	36	1	18	No	No	No	No	No	No	No	No	No	No
10	2	34	1	17	No	No	No	No	No	No	No	No	No	No
11	2	34	1	17	No	No	No	No	No	No	No	No	No	No
12	2	32	1	16	No	No	No	No	No	No	No	No	No	No
13	2	29	1	14	No	No	No	No	No	No	No	No	No	No
14	2	27	1	13	No	No	No	No	No	No	No	No	No	No
15	2	27	1	13	No	No	No	No	No	No	No	No	No	No
16	2	27	1	13	No	No	No	No	No	No	No	No	No	No
17	2	15	1	7	No	No	No	No	No	No	No	No	No	No
18	2	8	1	4	No	No	No	No	No	No	No	No	No	No
19	2	8	1	4	No	No	No	No	No	No	No	No	No	No
20	2	3	1	1	No	No	No	No	No	No	No	No	No	No
21	2	2	1	1	No	No	No	No	No	No	No	No	No	No
22	2	2	1	1	No	No	No	No	No	No	No	No	No	No
23	2	2	1	1	No	No	No	No	No	No	No	No	No	No
24	2	2	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S
Total Stopped Delay Per Vehicle on Minor Approach (s)	8.7
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:05
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	37
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	112
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 40: Driveway 2 at Market St

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	S
1	94	43	37
2	90	41	36
3	88	40	35
4	75	34	30
5	71	33	28
6	64	29	25
7	59	27	23
8	56	26	22
9	45	21	18
10	42	19	17
11	42	19	17
12	40	18	16
13	37	17	14
14	34	15	13
15	34	15	13
16	33	15	13
17	19	9	7
18	10	5	4
19	9	4	4
20	4	2	1
21	3	1	1
22	3	1	1
23	2	1	1
24	2	1	1

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	137	1	37	No	No	No	No	No	No	No	No	No	No
2	2	131	1	36	No	No	No	No	No	No	No	No	No	No
3	2	128	1	35	No	No	No	No	No	No	No	No	No	No
4	2	109	1	30	No	No	No	No	No	No	No	No	No	No
5	2	104	1	28	No	No	No	No	No	No	No	No	No	No
6	2	93	1	25	No	No	No	No	No	No	No	No	No	No
7	2	86	1	23	No	No	No	No	No	No	No	No	No	No
8	2	82	1	22	No	No	No	No	No	No	No	No	No	No
9	2	66	1	18	No	No	No	No	No	No	No	No	No	No
10	2	61	1	17	No	No	No	No	No	No	No	No	No	No
11	2	61	1	17	No	No	No	No	No	No	No	No	No	No
12	2	58	1	16	No	No	No	No	No	No	No	No	No	No
13	2	54	1	14	No	No	No	No	No	No	No	No	No	No
14	2	49	1	13	No	No	No	No	No	No	No	No	No	No
15	2	49	1	13	No	No	No	No	No	No	No	No	No	No
16	2	48	1	13	No	No	No	No	No	No	No	No	No	No
17	2	28	1	7	No	No	No	No	No	No	No	No	No	No
18	2	15	1	4	No	No	No	No	No	No	No	No	No	No
19	2	13	1	4	No	No	No	No	No	No	No	No	No	No
20	2	6	1	1	No	No	No	No	No	No	No	No	No	No
21	2	4	1	1	No	No	No	No	No	No	No	No	No	No
22	2	4	1	1	No	No	No	No	No	No	No	No	No	No
23	2	3	1	1	No	No	No	No	No	No	No	No	No	No
24	2	3	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S
Total Stopped Delay Per Vehicle on Minor Approach (s)	8.9
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:05
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	37
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	174
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 6: Main Street at Market Street

Warrants Summary

Warrant	**Name**	**Met?**
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	**Major Streets**		**Minor Streets**	
	S	N	E	W
1	0	39	42	0
2	0	37	40	0
3	0	37	39	0
4	0	31	34	0
5	0	30	32	0
6	0	27	29	0
7	0	25	26	0
8	0	23	25	0
9	0	19	20	0
10	0	18	19	0
11	0	18	19	0
12	0	17	18	0
13	0	15	16	0
14	0	14	15	0
15	0	14	15	0
16	0	14	15	0
17	0	8	8	0
18	0	4	5	0
19	0	4	4	0
20	0	2	2	0
21	0	1	1	0
22	0	1	1	0
23	0	1	1	0
24	0	1	1	0

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	39	2	42	No	No	No	No	No	No	No	No	No	No
2	2	37	2	40	No	No	No	No	No	No	No	No	No	No
3	2	37	2	39	No	No	No	No	No	No	No	No	No	No
4	2	31	2	34	No	No	No	No	No	No	No	No	No	No
5	2	30	2	32	No	No	No	No	No	No	No	No	No	No
6	2	27	2	29	No	No	No	No	No	No	No	No	No	No
7	2	25	2	26	No	No	No	No	No	No	No	No	No	No
8	2	23	2	25	No	No	No	No	No	No	No	No	No	No
9	2	19	2	20	No	No	No	No	No	No	No	No	No	No
10	2	18	2	19	No	No	No	No	No	No	No	No	No	No
11	2	18	2	19	No	No	No	No	No	No	No	No	No	No
12	2	17	2	18	No	No	No	No	No	No	No	No	No	No
13	2	15	2	16	No	No	No	No	No	No	No	No	No	No
14	2	14	2	15	No	No	No	No	No	No	No	No	No	No
15	2	14	2	15	No	No	No	No	No	No	No	No	No	No
16	2	14	2	15	No	No	No	No	No	No	No	No	No	No
17	2	8	2	8	No	No	No	No	No	No	No	No	No	No
18	2	4	2	5	No	No	No	No	No	No	No	No	No	No
19	2	4	2	4	No	No	No	No	No	No	No	No	No	No
20	2	2	2	2	No	No	No	No	No	No	No	No	No	No
21	2	1	2	1	No	No	No	No	No	No	No	No	No	No
22	2	1	2	1	No	No	No	No	No	No	No	No	No	No
23	2	1	2	1	No	No	No	No	No	No	No	No	No	No
24	2	1	2	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	6.6	
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:04	0:00
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	42	0
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	81	81
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

Signal Warrants Report For Intersection 11: EPL at Market Street

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S, N
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	E	W	S	N
1	54	50	113	292
2	52	48	108	280
3	51	47	106	274
4	43	40	90	234
5	41	38	86	222
6	37	34	77	199
7	34	32	71	184
8	32	30	68	175
9	26	24	54	140
10	24	23	51	131
11	24	23	51	131
12	23	22	49	126
13	21	20	44	114
14	19	18	41	105
15	19	18	41	105
16	19	18	40	102
17	11	10	23	58
18	6	6	12	32
19	5	5	11	29
20	2	2	5	12
21	2	2	3	9
22	2	2	3	9
23	1	1	2	6
24	1	1	2	6

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	104	4	405	No	No	No	No	No	No	No	No	No	No
2	2	100	4	388	No	No	No	No	No	No	No	No	No	No
3	2	98	4	380	No	No	No	No	No	No	No	No	No	No
4	2	83	4	324	No	No	No	No	No	No	No	No	No	No
5	2	79	4	308	No	No	No	No	No	No	No	No	No	No
6	2	71	4	276	No	No	No	No	No	No	No	No	No	No
7	2	66	4	255	No	No	No	No	No	No	No	No	No	No
8	2	62	4	243	No	No	No	No	No	No	No	No	No	No
9	2	50	4	194	No	No	No	No	No	No	No	No	No	No
10	2	47	4	182	No	No	No	No	No	No	No	No	No	No
11	2	47	4	182	No	No	No	No	No	No	No	No	No	No
12	2	45	4	175	No	No	No	No	No	No	No	No	No	No
13	2	41	4	158	No	No	No	No	No	No	No	No	No	No
14	2	37	4	146	No	No	No	No	No	No	No	No	No	No
15	2	37	4	146	No	No	No	No	No	No	No	No	No	No
16	2	37	4	142	No	No	No	No	No	No	No	No	No	No
17	2	21	4	81	No	No	No	No	No	No	No	No	No	No
18	2	12	4	44	No	No	No	No	No	No	No	No	No	No
19	2	10	4	40	No	No	No	No	No	No	No	No	No	No
20	2	4	4	17	No	No	No	No	No	No	No	No	No	No
21	2	4	4	12	No	No	No	No	No	No	No	No	No	No
22	2	4	4	12	No	No	No	No	No	No	No	No	No	No
23	2	2	4	8	No	No	No	No	No	No	No	No	No	No
24	2	2	4	8	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	8.4	9.2
Number of Lanes on Minor Street Approach	2	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:15	0:44
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	113	292
High Minor Volume Condition Met	No	Yes
Total Entering Volume on All Approaches During Same Hour	509	509
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

Signal Warrants Report For Intersection 12: EPL at Academy St

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	81	228	32	0
2	78	219	31	0
3	76	214	30	0
4	65	182	26	0
5	62	173	24	0
6	55	155	22	0
7	51	144	20	0
8	49	137	19	0
9	39	109	15	0
10	36	103	14	0
11	36	103	14	0
12	35	98	14	0
13	32	89	12	0
14	29	82	12	0
15	29	82	12	0
16	28	80	11	0
17	16	46	6	0
18	9	25	4	0
19	8	23	3	0
20	3	9	1	0
21	2	7	1	0
22	2	7	1	0
23	2	5	1	0
24	2	5	1	0

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	4	309	2	32	No	No	No	No	No	No	No	No	No	No
2	4	297	2	31	No	No	No	No	No	No	No	No	No	No
3	4	290	2	30	No	No	No	No	No	No	No	No	No	No
4	4	247	2	26	No	No	No	No	No	No	No	No	No	No
5	4	235	2	24	No	No	No	No	No	No	No	No	No	No
6	4	210	2	22	No	No	No	No	No	No	No	No	No	No
7	4	195	2	20	No	No	No	No	No	No	No	No	No	No
8	4	186	2	19	No	No	No	No	No	No	No	No	No	No
9	4	148	2	15	No	No	No	No	No	No	No	No	No	No
10	4	139	2	14	No	No	No	No	No	No	No	No	No	No
11	4	139	2	14	No	No	No	No	No	No	No	No	No	No
12	4	133	2	14	No	No	No	No	No	No	No	No	No	No
13	4	121	2	12	No	No	No	No	No	No	No	No	No	No
14	4	111	2	12	No	No	No	No	No	No	No	No	No	No
15	4	111	2	12	No	No	No	No	No	No	No	No	No	No
16	4	108	2	11	No	No	No	No	No	No	No	No	No	No
17	4	62	2	6	No	No	No	No	No	No	No	No	No	No
18	4	34	2	4	No	No	No	No	No	No	No	No	No	No
19	4	31	2	3	No	No	No	No	No	No	No	No	No	No
20	4	12	2	1	No	No	No	No	No	No	No	No	No	No
21	4	9	2	1	No	No	No	No	No	No	No	No	No	No
22	4	9	2	1	No	No	No	No	No	No	No	No	No	No
23	4	7	2	1	No	No	No	No	No	No	No	No	No	No
24	4	7	2	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	8.8	10.8
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:04	0:00
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	32	0
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	341	341
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

Signal Warrants Report For Intersection 37: EPL at Driveway 3

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	**Major Streets**		**Minor Streets**
	S	N	W
1	113	223	0
2	108	214	0
3	106	210	0
4	90	178	0
5	86	169	0
6	77	152	0
7	71	140	0
8	68	134	0
9	54	107	0
10	51	100	0
11	51	100	0
12	49	96	0
13	44	87	0
14	41	80	0
15	41	80	0
16	40	78	0
17	23	45	0
18	12	25	0
19	11	22	0
20	5	9	0
21	3	7	0
22	3	7	0
23	2	4	0
24	2	4	0

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	336	1	0	No	No	No	No	No	No	No	No	No	No
2	2	322	1	0	No	No	No	No	No	No	No	No	No	No
3	2	316	1	0	No	No	No	No	No	No	No	No	No	No
4	2	268	1	0	No	No	No	No	No	No	No	No	No	No
5	2	255	1	0	No	No	No	No	No	No	No	No	No	No
6	2	229	1	0	No	No	No	No	No	No	No	No	No	No
7	2	211	1	0	No	No	No	No	No	No	No	No	No	No
8	2	202	1	0	No	No	No	No	No	No	No	No	No	No
9	2	161	1	0	No	No	No	No	No	No	No	No	No	No
10	2	151	1	0	No	No	No	No	No	No	No	No	No	No
11	2	151	1	0	No	No	No	No	No	No	No	No	No	No
12	2	145	1	0	No	No	No	No	No	No	No	No	No	No
13	2	131	1	0	No	No	No	No	No	No	No	No	No	No
14	2	121	1	0	No	No	No	No	No	No	No	No	No	No
15	2	121	1	0	No	No	No	No	No	No	No	No	No	No
16	2	118	1	0	No	No	No	No	No	No	No	No	No	No
17	2	68	1	0	No	No	No	No	No	No	No	No	No	No
18	2	37	1	0	No	No	No	No	No	No	No	No	No	No
19	2	33	1	0	No	No	No	No	No	No	No	No	No	No
20	2	14	1	0	No	No	No	No	No	No	No	No	No	No
21	2	10	1	0	No	No	No	No	No	No	No	No	No	No
22	2	10	1	0	No	No	No	No	No	No	No	No	No	No
23	2	6	1	0	No	No	No	No	No	No	No	No	No	No
24	2	6	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	9.2
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:00
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	0
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	336
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 38: EPL at Driveway 4

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	113	159	69
2	108	153	66
3	106	149	65
4	90	127	55
5	86	121	52
6	77	108	47
7	71	100	43
8	68	95	41
9	54	76	33
10	51	72	31
11	51	72	31
12	49	68	30
13	44	62	27
14	41	57	25
15	41	57	25
16	40	56	24
17	23	32	14
18	12	17	8
19	11	16	7
20	5	6	3
21	3	5	2
22	3	5	2
23	2	3	1
24	2	3	1

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	272	1	69	No	No	No	No	No	No	No	No	No	No
2	2	261	1	66	No	No	No	No	No	No	No	No	No	No
3	2	255	1	65	No	No	No	No	No	No	No	No	No	No
4	2	217	1	55	No	No	No	No	No	No	No	No	No	No
5	2	207	1	52	No	No	No	No	No	No	No	No	No	No
6	2	185	1	47	No	No	No	No	No	No	No	No	No	No
7	2	171	1	43	No	No	No	No	No	No	No	No	No	No
8	2	163	1	41	No	No	No	No	No	No	No	No	No	No
9	2	130	1	33	No	No	No	No	No	No	No	No	No	No
10	2	123	1	31	No	No	No	No	No	No	No	No	No	No
11	2	123	1	31	No	No	No	No	No	No	No	No	No	No
12	2	117	1	30	No	No	No	No	No	No	No	No	No	No
13	2	106	1	27	No	No	No	No	No	No	No	No	No	No
14	2	98	1	25	No	No	No	No	No	No	No	No	No	No
15	2	98	1	25	No	No	No	No	No	No	No	No	No	No
16	2	96	1	24	No	No	No	No	No	No	No	No	No	No
17	2	55	1	14	No	No	No	No	No	No	No	No	No	No
18	2	29	1	8	No	No	No	No	No	No	No	No	No	No
19	2	27	1	7	No	No	No	No	No	No	No	No	No	No
20	2	11	1	3	No	No	No	No	No	No	No	No	No	No
21	2	8	1	2	No	No	No	No	No	No	No	No	No	No
22	2	8	1	2	No	No	No	No	No	No	No	No	No	No
23	2	5	1	1	No	No	No	No	No	No	No	No	No	No
24	2	5	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	9.4
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:10
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	69
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	341
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 39: Driveway 1 at Market Street

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	S
1	43	39	10
2	41	37	10
3	40	37	9
4	34	31	8
5	33	30	8
6	29	27	7
7	27	25	6
8	26	23	6
9	21	19	5
10	19	18	5
11	19	18	5
12	18	17	4
13	17	15	4
14	15	14	4
15	15	14	4
16	15	14	4
17	9	8	2
18	5	4	1
19	4	4	1
20	2	2	0
21	1	1	0
22	1	1	0
23	1	1	0
24	1	1	0

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	82	1	10	No	No	No	No	No	No	No	No	No	No
2	2	78	1	10	No	No	No	No	No	No	No	No	No	No
3	2	77	1	9	No	No	No	No	No	No	No	No	No	No
4	2	65	1	8	No	No	No	No	No	No	No	No	No	No
5	2	63	1	8	No	No	No	No	No	No	No	No	No	No
6	2	56	1	7	No	No	No	No	No	No	No	No	No	No
7	2	52	1	6	No	No	No	No	No	No	No	No	No	No
8	2	49	1	6	No	No	No	No	No	No	No	No	No	No
9	2	40	1	5	No	No	No	No	No	No	No	No	No	No
10	2	37	1	5	No	No	No	No	No	No	No	No	No	No
11	2	37	1	5	No	No	No	No	No	No	No	No	No	No
12	2	35	1	4	No	No	No	No	No	No	No	No	No	No
13	2	32	1	4	No	No	No	No	No	No	No	No	No	No
14	2	29	1	4	No	No	No	No	No	No	No	No	No	No
15	2	29	1	4	No	No	No	No	No	No	No	No	No	No
16	2	29	1	4	No	No	No	No	No	No	No	No	No	No
17	2	17	1	2	No	No	No	No	No	No	No	No	No	No
18	2	9	1	1	No	No	No	No	No	No	No	No	No	No
19	2	8	1	1	No	No	No	No	No	No	No	No	No	No
20	2	4	1	0	No	No	No	No	No	No	No	No	No	No
21	2	2	1	0	No	No	No	No	No	No	No	No	No	No
22	2	2	1	0	No	No	No	No	No	No	No	No	No	No
23	2	2	1	0	No	No	No	No	No	No	No	No	No	No
24	2	2	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S
Total Stopped Delay Per Vehicle on Minor Approach (s)	8.6
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:01
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	10
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	92
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 40: Driveway 2 at Market St

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	S
1	56	41	10
2	54	39	10
3	53	39	9
4	45	33	8
5	43	31	8
6	38	28	7
7	35	26	6
8	34	25	6
9	27	20	5
10	25	18	5
11	25	18	5
12	24	18	4
13	22	16	4
14	20	15	4
15	20	15	4
16	20	14	4
17	11	8	2
18	6	5	1
19	6	4	1
20	2	2	0
21	2	1	0
22	2	1	0
23	1	1	0
24	1	1	0

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	97	1	10	No	No	No	No	No	No	No	No	No	No
2	2	93	1	10	No	No	No	No	No	No	No	No	No	No
3	2	92	1	9	No	No	No	No	No	No	No	No	No	No
4	2	78	1	8	No	No	No	No	No	No	No	No	No	No
5	2	74	1	8	No	No	No	No	No	No	No	No	No	No
6	2	66	1	7	No	No	No	No	No	No	No	No	No	No
7	2	61	1	6	No	No	No	No	No	No	No	No	No	No
8	2	59	1	6	No	No	No	No	No	No	No	No	No	No
9	2	47	1	5	No	No	No	No	No	No	No	No	No	No
10	2	43	1	5	No	No	No	No	No	No	No	No	No	No
11	2	43	1	5	No	No	No	No	No	No	No	No	No	No
12	2	42	1	4	No	No	No	No	No	No	No	No	No	No
13	2	38	1	4	No	No	No	No	No	No	No	No	No	No
14	2	35	1	4	No	No	No	No	No	No	No	No	No	No
15	2	35	1	4	No	No	No	No	No	No	No	No	No	No
16	2	34	1	4	No	No	No	No	No	No	No	No	No	No
17	2	19	1	2	No	No	No	No	No	No	No	No	No	No
18	2	11	1	1	No	No	No	No	No	No	No	No	No	No
19	2	10	1	1	No	No	No	No	No	No	No	No	No	No
20	2	4	1	0	No	No	No	No	No	No	No	No	No	No
21	2	3	1	0	No	No	No	No	No	No	No	No	No	No
22	2	3	1	0	No	No	No	No	No	No	No	No	No	No
23	2	2	1	0	No	No	No	No	No	No	No	No	No	No
24	2	2	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S
Total Stopped Delay Per Vehicle on Minor Approach (s)	8.7
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:01
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	10
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	107
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

APPENDIX C-II

YEAR 2030/2040 BUILDOUT PLUS PROJECT TRAFFIC CONDITIONS

Signal Warrants Report For Intersection 6: Main Street at Market Street

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	336	95	82	294
2	323	91	79	282
3	316	89	77	276
4	269	76	66	235
5	255	72	62	223
6	228	65	56	200
7	212	60	52	185
8	202	57	49	176
9	161	46	39	141
10	151	43	37	132
11	151	43	37	132
12	144	41	35	126
13	131	37	32	115
14	121	34	30	106
15	121	34	30	106
16	118	33	29	103
17	67	19	16	59
18	37	10	9	32
19	34	10	8	29
20	13	4	3	12
21	10	3	2	9
22	10	3	2	9
23	7	2	2	6
24	7	2	2	6

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	431	2	376	No	No	Yes	Yes	No	No	No	No	No	No
2	2	414	2	361	No	No	No	Yes	No	No	No	No	No	No
3	2	405	2	353	No	No	No	Yes	No	No	No	No	No	No
4	2	345	2	301	No	No	No	Yes	No	No	No	No	No	No
5	2	327	2	285	No	No	No	No	No	No	No	No	No	No
6	2	293	2	256	No	No	No	No	No	No	No	No	No	No
7	2	272	2	237	No	No	No	No	No	No	No	No	No	No
8	2	259	2	225	No	No	No	No	No	No	No	No	No	No
9	2	207	2	180	No	No	No	No	No	No	No	No	No	No
10	2	194	2	169	No	No	No	No	No	No	No	No	No	No
11	2	194	2	169	No	No	No	No	No	No	No	No	No	No
12	2	185	2	161	No	No	No	No	No	No	No	No	No	No
13	2	168	2	147	No	No	No	No	No	No	No	No	No	No
14	2	155	2	136	No	No	No	No	No	No	No	No	No	No
15	2	155	2	136	No	No	No	No	No	No	No	No	No	No
16	2	151	2	132	No	No	No	No	No	No	No	No	No	No
17	2	86	2	75	No	No	No	No	No	No	No	No	No	No
18	2	47	2	41	No	No	No	No	No	No	No	No	No	No
19	2	44	2	37	No	No	No	No	No	No	No	No	No	No
20	2	17	2	15	No	No	No	No	No	No	No	No	No	No
21	2	13	2	11	No	No	No	No	No	No	No	No	No	No
22	2	13	2	11	No	No	No	No	No	No	No	No	No	No
23	2	9	2	8	No	No	No	No	No	No	No	No	No	No
24	2	9	2	8	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	1	4	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	9.1	12.1
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:12	0:59
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	82	294
High Minor Volume Condition Met	No	Yes
Total Entering Volume on All Approaches During Same Hour	807	807
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

Signal Warrants Report For Intersection 11: EPL at Market Street

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S, N
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	E	W	S	N
1	112	315	292	187
2	108	302	280	180
3	105	296	274	176
4	90	252	234	150
5	85	239	222	142
6	76	214	199	127
7	71	198	184	118
8	67	189	175	112
9	54	151	140	90
10	50	142	131	84
11	50	142	131	84
12	48	135	126	80
13	44	123	114	73
14	40	113	105	67
15	40	113	105	67
16	39	110	102	65
17	22	63	58	37
18	12	35	32	21
19	11	32	29	19
20	4	13	12	7
21	3	9	9	6
22	3	9	9	6
23	2	6	6	4
24	2	6	6	4

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	427	5	479	No	No	Yes	Yes	No	No	No	No	No	No
2	2	410	5	460	No	No	No	Yes	No	No	No	No	No	No
3	2	401	5	450	No	No	No	Yes	No	No	No	No	No	No
4	2	342	5	384	No	No	No	Yes	No	No	No	No	No	No
5	2	324	5	364	No	No	No	No	No	No	No	No	No	No
6	2	290	5	326	No	No	No	No	No	No	No	No	No	No
7	2	269	5	302	No	No	No	No	No	No	No	No	No	No
8	2	256	5	287	No	No	No	No	No	No	No	No	No	No
9	2	205	5	230	No	No	No	No	No	No	No	No	No	No
10	2	192	5	215	No	No	No	No	No	No	No	No	No	No
11	2	192	5	215	No	No	No	No	No	No	No	No	No	No
12	2	183	5	206	No	No	No	No	No	No	No	No	No	No
13	2	167	5	187	No	No	No	No	No	No	No	No	No	No
14	2	153	5	172	No	No	No	No	No	No	No	No	No	No
15	2	153	5	172	No	No	No	No	No	No	No	No	No	No
16	2	149	5	167	No	No	No	No	No	No	No	No	No	No
17	2	85	5	95	No	No	No	No	No	No	No	No	No	No
18	2	47	5	53	No	No	No	No	No	No	No	No	No	No
19	2	43	5	48	No	No	No	No	No	No	No	No	No	No
20	2	17	5	19	No	No	No	No	No	No	No	No	No	No
21	2	12	5	15	No	No	No	No	No	No	No	No	No	No
22	2	12	5	15	No	No	No	No	No	No	No	No	No	No
23	2	8	5	10	No	No	No	No	No	No	No	No	No	No
24	2	8	5	10	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	1	4	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	14.1	10.3
Number of Lanes on Minor Street Approach	2	3
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	1:08	0:32
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	292	187
High Minor Volume Condition Met	Yes	Yes
Total Entering Volume on All Approaches During Same Hour	906	906
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

Signal Warrants Report For Intersection 12: EPL at Academy St

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	223	358	67	53
2	214	344	64	51
3	210	337	63	50
4	178	286	54	42
5	169	272	51	40
6	152	243	46	36
7	140	226	42	33
8	134	215	40	32
9	107	172	32	25
10	100	161	30	24
11	100	161	30	24
12	96	154	29	23
13	87	140	26	21
14	80	129	24	19
15	80	129	24	19
16	78	125	23	19
17	45	72	13	11
18	25	39	7	6
19	22	36	7	5
20	9	14	3	2
21	7	11	2	2
22	7	11	2	2
23	4	7	1	1
24	4	7	1	1

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	5	581	2	120	No	No	No	No	No	No	No	Yes	No	No
2	5	558	2	115	No	No	No	No	No	No	No	Yes	No	No
3	5	547	2	113	No	No	No	No	No	No	No	Yes	No	No
4	5	464	2	96	No	No	No	No	No	No	No	No	No	No
5	5	441	2	91	No	No	No	No	No	No	No	No	No	No
6	5	395	2	82	No	No	No	No	No	No	No	No	No	No
7	5	366	2	75	No	No	No	No	No	No	No	No	No	No
8	5	349	2	72	No	No	No	No	No	No	No	No	No	No
9	5	279	2	57	No	No	No	No	No	No	No	No	No	No
10	5	261	2	54	No	No	No	No	No	No	No	No	No	No
11	5	261	2	54	No	No	No	No	No	No	No	No	No	No
12	5	250	2	52	No	No	No	No	No	No	No	No	No	No
13	5	227	2	47	No	No	No	No	No	No	No	No	No	No
14	5	209	2	43	No	No	No	No	No	No	No	No	No	No
15	5	209	2	43	No	No	No	No	No	No	No	No	No	No
16	5	203	2	42	No	No	No	No	No	No	No	No	No	No
17	5	117	2	24	No	No	No	No	No	No	No	No	No	No
18	5	64	2	13	No	No	No	No	No	No	No	No	No	No
19	5	58	2	12	No	No	No	No	No	No	No	No	No	No
20	5	23	2	5	No	No	No	No	No	No	No	No	No	No
21	5	18	2	4	No	No	No	No	No	No	No	No	No	No
22	5	18	2	4	No	No	No	No	No	No	No	No	No	No
23	5	11	2	2	No	No	No	No	No	No	No	No	No	No
24	5	11	2	2	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	3	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	11.6	14.4
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:12	0:12
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	67	53
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	701	701
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

Signal Warrants Report For Intersection 36: Main Street at Academy Street

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	188	59	156	19
2	180	57	150	18
3	177	55	147	18
4	150	47	125	15
5	143	45	119	14
6	128	40	106	13
7	118	37	98	12
8	113	35	94	11
9	90	28	75	9
10	85	27	70	9
11	85	27	70	9
12	81	25	67	8
13	73	23	61	7
14	68	21	56	7
15	68	21	56	7
16	66	21	55	7
17	38	12	31	4
18	21	6	17	2
19	19	6	16	2
20	8	2	6	1
21	6	2	5	1
22	6	2	5	1
23	4	1	3	0
24	4	1	3	0

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	247	2	175	No	No	No	No	No	No	No	No	No	No
2	2	237	2	168	No	No	No	No	No	No	No	No	No	No
3	2	232	2	165	No	No	No	No	No	No	No	No	No	No
4	2	197	2	140	No	No	No	No	No	No	No	No	No	No
5	2	188	2	133	No	No	No	No	No	No	No	No	No	No
6	2	168	2	119	No	No	No	No	No	No	No	No	No	No
7	2	155	2	110	No	No	No	No	No	No	No	No	No	No
8	2	148	2	105	No	No	No	No	No	No	No	No	No	No
9	2	118	2	84	No	No	No	No	No	No	No	No	No	No
10	2	112	2	79	No	No	No	No	No	No	No	No	No	No
11	2	112	2	79	No	No	No	No	No	No	No	No	No	No
12	2	106	2	75	No	No	No	No	No	No	No	No	No	No
13	2	96	2	68	No	No	No	No	No	No	No	No	No	No
14	2	89	2	63	No	No	No	No	No	No	No	No	No	No
15	2	89	2	63	No	No	No	No	No	No	No	No	No	No
16	2	87	2	62	No	No	No	No	No	No	No	No	No	No
17	2	50	2	35	No	No	No	No	No	No	No	No	No	No
18	2	27	2	19	No	No	No	No	No	No	No	No	No	No
19	2	25	2	18	No	No	No	No	No	No	No	No	No	No
20	2	10	2	7	No	No	No	No	No	No	No	No	No	No
21	2	8	2	6	No	No	No	No	No	No	No	No	No	No
22	2	8	2	6	No	No	No	No	No	No	No	No	No	No
23	2	5	2	3	No	No	No	No	No	No	No	No	No	No
24	2	5	2	3	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	10.3	11.2
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:26	0:03
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	156	19
High Minor Volume Condition Met	Yes	No
Total Entering Volume on All Approaches During Same Hour	422	422
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

Signal Warrants Report For Intersection 37: EPL at Driveway 3

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	286	396	0
2	275	380	0
3	269	372	0
4	229	317	0
5	217	301	0
6	194	269	0
7	180	249	0
8	172	238	0
9	137	190	0
10	129	178	0
11	129	178	0
12	123	170	0
13	112	154	0
14	103	143	0
15	103	143	0
16	100	139	0
17	57	79	0
18	31	44	0
19	29	40	0
20	11	16	0
21	9	12	0
22	9	12	0
23	6	8	0
24	6	8	0

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	3	682	1	0	No	No	No	No	No	No	No	No	No	No
2	3	655	1	0	No	No	No	No	No	No	No	No	No	No
3	3	641	1	0	No	No	No	No	No	No	No	No	No	No
4	3	546	1	0	No	No	No	No	No	No	No	No	No	No
5	3	518	1	0	No	No	No	No	No	No	No	No	No	No
6	3	463	1	0	No	No	No	No	No	No	No	No	No	No
7	3	429	1	0	No	No	No	No	No	No	No	No	No	No
8	3	410	1	0	No	No	No	No	No	No	No	No	No	No
9	3	327	1	0	No	No	No	No	No	No	No	No	No	No
10	3	307	1	0	No	No	No	No	No	No	No	No	No	No
11	3	307	1	0	No	No	No	No	No	No	No	No	No	No
12	3	293	1	0	No	No	No	No	No	No	No	No	No	No
13	3	266	1	0	No	No	No	No	No	No	No	No	No	No
14	3	246	1	0	No	No	No	No	No	No	No	No	No	No
15	3	246	1	0	No	No	No	No	No	No	No	No	No	No
16	3	239	1	0	No	No	No	No	No	No	No	No	No	No
17	3	136	1	0	No	No	No	No	No	No	No	No	No	No
18	3	75	1	0	No	No	No	No	No	No	No	No	No	No
19	3	69	1	0	No	No	No	No	No	No	No	No	No	No
20	3	27	1	0	No	No	No	No	No	No	No	No	No	No
21	3	21	1	0	No	No	No	No	No	No	No	No	No	No
22	3	21	1	0	No	No	No	No	No	No	No	No	No	No
23	3	14	1	0	No	No	No	No	No	No	No	No	No	No
24	3	14	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	8.9
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:00
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	0
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	682
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 38: EPL at Driveway 4

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	286	136	222
2	275	131	213
3	269	128	209
4	229	109	178
5	217	103	169
6	194	92	151
7	180	86	140
8	172	82	133
9	137	65	107
10	129	61	100
11	129	61	100
12	123	58	95
13	112	53	87
14	103	49	80
15	103	49	80
16	100	48	78
17	57	27	44
18	31	15	24
19	29	14	22
20	11	5	9
21	9	4	7
22	9	4	7
23	6	3	4
24	6	3	4

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	3	422	1	222	No	No	Yes	Yes	No	No	No	No	No	No
2	3	406	1	213	No	No	No	Yes	No	No	No	No	No	No
3	3	397	1	209	No	No	No	Yes	No	No	No	No	No	No
4	3	338	1	178	No	No	No	Yes	No	No	No	No	No	No
5	3	320	1	169	No	No	No	No	No	No	No	No	No	No
6	3	286	1	151	No	No	No	No	No	No	No	No	No	No
7	3	266	1	140	No	No	No	No	No	No	No	No	No	No
8	3	254	1	133	No	No	No	No	No	No	No	No	No	No
9	3	202	1	107	No	No	No	No	No	No	No	No	No	No
10	3	190	1	100	No	No	No	No	No	No	No	No	No	No
11	3	190	1	100	No	No	No	No	No	No	No	No	No	No
12	3	181	1	95	No	No	No	No	No	No	No	No	No	No
13	3	165	1	87	No	No	No	No	No	No	No	No	No	No
14	3	152	1	80	No	No	No	No	No	No	No	No	No	No
15	3	152	1	80	No	No	No	No	No	No	No	No	No	No
16	3	148	1	78	No	No	No	No	No	No	No	No	No	No
17	3	84	1	44	No	No	No	No	No	No	No	No	No	No
18	3	46	1	24	No	No	No	No	No	No	No	No	No	No
19	3	43	1	22	No	No	No	No	No	No	No	No	No	No
20	3	16	1	9	No	No	No	No	No	No	No	No	No	No
21	3	13	1	7	No	No	No	No	No	No	No	No	No	No
22	3	13	1	7	No	No	No	No	No	No	No	No	No	No
23	3	9	1	4	No	No	No	No	No	No	No	No	No	No
24	3	9	1	4	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	1	4	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	10.2
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:37
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	222
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	644
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 39: Driveway 1 at Market Street

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	S
1	60	321	26
2	58	308	25
3	56	302	24
4	48	257	21
5	46	244	20
6	41	218	18
7	38	202	16
8	36	193	16
9	29	154	12
10	27	144	12
11	27	144	12
12	26	138	11
13	23	125	10
14	22	116	9
15	22	116	9
16	21	112	9
17	12	64	5
18	7	35	3
19	6	32	3
20	2	13	1
21	2	10	1
22	2	10	1
23	1	6	1
24	1	6	1

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	381	1	26	No	No	No	No	No	No	No	No	No	No
2	2	366	1	25	No	No	No	No	No	No	No	No	No	No
3	2	358	1	24	No	No	No	No	No	No	No	No	No	No
4	2	305	1	21	No	No	No	No	No	No	No	No	No	No
5	2	290	1	20	No	No	No	No	No	No	No	No	No	No
6	2	259	1	18	No	No	No	No	No	No	No	No	No	No
7	2	240	1	16	No	No	No	No	No	No	No	No	No	No
8	2	229	1	16	No	No	No	No	No	No	No	No	No	No
9	2	183	1	12	No	No	No	No	No	No	No	No	No	No
10	2	171	1	12	No	No	No	No	No	No	No	No	No	No
11	2	171	1	12	No	No	No	No	No	No	No	No	No	No
12	2	164	1	11	No	No	No	No	No	No	No	No	No	No
13	2	148	1	10	No	No	No	No	No	No	No	No	No	No
14	2	138	1	9	No	No	No	No	No	No	No	No	No	No
15	2	138	1	9	No	No	No	No	No	No	No	No	No	No
16	2	133	1	9	No	No	No	No	No	No	No	No	No	No
17	2	76	1	5	No	No	No	No	No	No	No	No	No	No
18	2	42	1	3	No	No	No	No	No	No	No	No	No	No
19	2	38	1	3	No	No	No	No	No	No	No	No	No	No
20	2	15	1	1	No	No	No	No	No	No	No	No	No	No
21	2	12	1	1	No	No	No	No	No	No	No	No	No	No
22	2	12	1	1	No	No	No	No	No	No	No	No	No	No
23	2	7	1	1	No	No	No	No	No	No	No	No	No	No
24	2	7	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S
Total Stopped Delay Per Vehicle on Minor Approach (s)	10.5
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:04
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	26
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	407
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 40: Driveway 2 at Market St

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	S
1	71	293	30
2	68	281	29
3	67	275	28
4	57	234	24
5	54	223	23
6	48	199	20
7	45	185	19
8	43	176	18
9	34	141	14
10	32	132	14
11	32	132	14
12	31	126	13
13	28	114	12
14	26	105	11
15	26	105	11
16	25	103	11
17	14	59	6
18	8	32	3
19	7	29	3
20	3	12	1
21	2	9	1
22	2	9	1
23	1	6	1
24	1	6	1

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	364	1	30	No	No	No	No	No	No	No	No	No	No
2	2	349	1	29	No	No	No	No	No	No	No	No	No	No
3	2	342	1	28	No	No	No	No	No	No	No	No	No	No
4	2	291	1	24	No	No	No	No	No	No	No	No	No	No
5	2	277	1	23	No	No	No	No	No	No	No	No	No	No
6	2	247	1	20	No	No	No	No	No	No	No	No	No	No
7	2	230	1	19	No	No	No	No	No	No	No	No	No	No
8	2	219	1	18	No	No	No	No	No	No	No	No	No	No
9	2	175	1	14	No	No	No	No	No	No	No	No	No	No
10	2	164	1	14	No	No	No	No	No	No	No	No	No	No
11	2	164	1	14	No	No	No	No	No	No	No	No	No	No
12	2	157	1	13	No	No	No	No	No	No	No	No	No	No
13	2	142	1	12	No	No	No	No	No	No	No	No	No	No
14	2	131	1	11	No	No	No	No	No	No	No	No	No	No
15	2	131	1	11	No	No	No	No	No	No	No	No	No	No
16	2	128	1	11	No	No	No	No	No	No	No	No	No	No
17	2	73	1	6	No	No	No	No	No	No	No	No	No	No
18	2	40	1	3	No	No	No	No	No	No	No	No	No	No
19	2	36	1	3	No	No	No	No	No	No	No	No	No	No
20	2	15	1	1	No	No	No	No	No	No	No	No	No	No
21	2	11	1	1	No	No	No	No	No	No	No	No	No	No
22	2	11	1	1	No	No	No	No	No	No	No	No	No	No
23	2	7	1	1	No	No	No	No	No	No	No	No	No	No
24	2	7	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S
Total Stopped Delay Per Vehicle on Minor Approach (s)	10.7
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:05
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	30
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	394
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 6: Main Street at Market Street

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	**Major Streets**		**Minor Streets**	
	S	N	E	W
1	153	259	65	216
2	147	249	62	207
3	144	243	61	203
4	122	207	52	173
5	116	197	49	164
6	104	176	44	147
7	96	163	41	136
8	92	155	39	130
9	73	124	31	104
10	69	117	29	97
11	69	117	29	97
12	66	111	28	93
13	60	101	25	84
14	55	93	23	78
15	55	93	23	78
16	54	91	23	76
17	31	52	13	43
18	17	28	7	24
19	15	26	7	22
20	6	10	3	9
21	5	8	2	6
22	5	8	2	6
23	3	5	1	4
24	3	5	1	4

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	412	2	281	No	No	No	Yes	No	No	No	No	No	No
2	2	396	2	269	No	No	No	Yes	No	No	No	No	No	No
3	2	387	2	264	No	No	No	Yes	No	No	No	No	No	No
4	2	329	2	225	No	No	No	No	No	No	No	No	No	No
5	2	313	2	213	No	No	No	No	No	No	No	No	No	No
6	2	280	2	191	No	No	No	No	No	No	No	No	No	No
7	2	259	2	177	No	No	No	No	No	No	No	No	No	No
8	2	247	2	169	No	No	No	No	No	No	No	No	No	No
9	2	197	2	135	No	No	No	No	No	No	No	No	No	No
10	2	186	2	126	No	No	No	No	No	No	No	No	No	No
11	2	186	2	126	No	No	No	No	No	No	No	No	No	No
12	2	177	2	121	No	No	No	No	No	No	No	No	No	No
13	2	161	2	109	No	No	No	No	No	No	No	No	No	No
14	2	148	2	101	No	No	No	No	No	No	No	No	No	No
15	2	148	2	101	No	No	No	No	No	No	No	No	No	No
16	2	145	2	99	No	No	No	No	No	No	No	No	No	No
17	2	83	2	56	No	No	No	No	No	No	No	No	No	No
18	2	45	2	31	No	No	No	No	No	No	No	No	No	No
19	2	41	2	29	No	No	No	No	No	No	No	No	No	No
20	2	16	2	12	No	No	No	No	No	No	No	No	No	No
21	2	13	2	8	No	No	No	No	No	No	No	No	No	No
22	2	13	2	8	No	No	No	No	No	No	No	No	No	No
23	2	8	2	5	No	No	No	No	No	No	No	No	No	No
24	2	8	2	5	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	3	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	8.5	10.1
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:09	0:36
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	65	216
High Minor Volume Condition Met	No	Yes
Total Entering Volume on All Approaches During Same Hour	693	693
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

Signal Warrants Report For Intersection 11: EPL at Market Street

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S, N
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	E	W	S	N
1	68	126	249	421
2	65	121	239	404
3	64	118	234	396
4	54	101	199	337
5	52	96	189	320
6	46	86	169	286
7	43	79	157	265
8	41	76	149	253
9	33	60	120	202
10	31	57	112	189
11	31	57	112	189
12	29	54	107	181
13	27	49	97	164
14	24	45	90	152
15	24	45	90	152
16	24	44	87	147
17	14	25	50	84
18	7	14	27	46
19	7	13	25	42
20	3	5	10	17
21	2	4	7	13
22	2	4	7	13
23	1	3	5	8
24	1	3	5	8

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	194	5	670	No	No	No	No	No	No	No	No	No	No
2	2	186	5	643	No	No	No	No	No	No	No	No	No	No
3	2	182	5	630	No	No	No	No	No	No	No	No	No	No
4	2	155	5	536	No	No	No	No	No	No	No	No	No	No
5	2	148	5	509	No	No	No	No	No	No	No	No	No	No
6	2	132	5	455	No	No	No	No	No	No	No	No	No	No
7	2	122	5	422	No	No	No	No	No	No	No	No	No	No
8	2	117	5	402	No	No	No	No	No	No	No	No	No	No
9	2	93	5	322	No	No	No	No	No	No	No	No	No	No
10	2	88	5	301	No	No	No	No	No	No	No	No	No	No
11	2	88	5	301	No	No	No	No	No	No	No	No	No	No
12	2	83	5	288	No	No	No	No	No	No	No	No	No	No
13	2	76	5	261	No	No	No	No	No	No	No	No	No	No
14	2	69	5	242	No	No	No	No	No	No	No	No	No	No
15	2	69	5	242	No	No	No	No	No	No	No	No	No	No
16	2	68	5	234	No	No	No	No	No	No	No	No	No	No
17	2	39	5	134	No	No	No	No	No	No	No	No	No	No
18	2	21	5	73	No	No	No	No	No	No	No	No	No	No
19	2	20	5	67	No	No	No	No	No	No	No	No	No	No
20	2	8	5	27	No	No	No	No	No	No	No	No	No	No
21	2	6	5	20	No	No	No	No	No	No	No	No	No	No
22	2	6	5	20	No	No	No	No	No	No	No	No	No	No
23	2	4	5	13	No	No	No	No	No	No	No	No	No	No
24	2	4	5	13	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	11.8	11.6
Number of Lanes on Minor Street Approach	2	3
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:49	1:21
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	249	421
High Minor Volume Condition Met	Yes	Yes
Total Entering Volume on All Approaches During Same Hour	864	864
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

Signal Warrants Report For Intersection 12: EPL at Academy St

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	184	394	43	78
2	177	378	41	75
3	173	370	40	73
4	147	315	34	62
5	140	299	33	59
6	125	268	29	53
7	116	248	27	49
8	110	236	26	47
9	88	189	21	37
10	83	177	19	35
11	83	177	19	35
12	79	169	18	34
13	72	154	17	30
14	66	142	15	28
15	66	142	15	28
16	64	138	15	27
17	37	79	9	16
18	20	43	5	9
19	18	39	4	8
20	7	16	2	3
21	6	12	1	2
22	6	12	1	2
23	4	8	1	2
24	4	8	1	2

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	5	578	2	121	No	No	No	No	No	No	No	Yes	No	No
2	5	555	2	116	No	No	No	No	No	No	No	Yes	No	No
3	5	543	2	113	No	No	No	No	No	No	No	Yes	No	No
4	5	462	2	96	No	No	No	No	No	No	No	No	No	No
5	5	439	2	92	No	No	No	No	No	No	No	No	No	No
6	5	393	2	82	No	No	No	No	No	No	No	No	No	No
7	5	364	2	76	No	No	No	No	No	No	No	No	No	No
8	5	346	2	73	No	No	No	No	No	No	No	No	No	No
9	5	277	2	58	No	No	No	No	No	No	No	No	No	No
10	5	260	2	54	No	No	No	No	No	No	No	No	No	No
11	5	260	2	54	No	No	No	No	No	No	No	No	No	No
12	5	248	2	52	No	No	No	No	No	No	No	No	No	No
13	5	226	2	47	No	No	No	No	No	No	No	No	No	No
14	5	208	2	43	No	No	No	No	No	No	No	No	No	No
15	5	208	2	43	No	No	No	No	No	No	No	No	No	No
16	5	202	2	42	No	No	No	No	No	No	No	No	No	No
17	5	116	2	25	No	No	No	No	No	No	No	No	No	No
18	5	63	2	14	No	No	No	No	No	No	No	No	No	No
19	5	57	2	12	No	No	No	No	No	No	No	No	No	No
20	5	23	2	5	No	No	No	No	No	No	No	No	No	No
21	5	18	2	3	No	No	No	No	No	No	No	No	No	No
22	5	18	2	3	No	No	No	No	No	No	No	No	No	No
23	5	12	2	3	No	No	No	No	No	No	No	No	No	No
24	5	12	2	3	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	3	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	11.6	15.7
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:08	0:20
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	43	78
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	699	699
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

Signal Warrants Report For Intersection 36: Main Street at Academy Street

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	80	124	93	15
2	77	119	89	14
3	75	117	87	14
4	64	99	74	12
5	61	94	71	11
6	54	84	63	10
7	50	78	59	9
8	48	74	56	9
9	38	60	45	7
10	36	56	42	7
11	36	56	42	7
12	34	53	40	6
13	31	48	36	6
14	29	45	33	5
15	29	45	33	5
16	28	43	33	5
17	16	25	19	3
18	9	14	10	2
19	8	12	9	2
20	3	5	4	1
21	2	4	3	0
22	2	4	3	0
23	2	2	2	0
24	2	2	2	0

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	204	2	108	No	No	No	No	No	No	No	No	No	No
2	2	196	2	103	No	No	No	No	No	No	No	No	No	No
3	2	192	2	101	No	No	No	No	No	No	No	No	No	No
4	2	163	2	86	No	No	No	No	No	No	No	No	No	No
5	2	155	2	82	No	No	No	No	No	No	No	No	No	No
6	2	138	2	73	No	No	No	No	No	No	No	No	No	No
7	2	128	2	68	No	No	No	No	No	No	No	No	No	No
8	2	122	2	65	No	No	No	No	No	No	No	No	No	No
9	2	98	2	52	No	No	No	No	No	No	No	No	No	No
10	2	92	2	49	No	No	No	No	No	No	No	No	No	No
11	2	92	2	49	No	No	No	No	No	No	No	No	No	No
12	2	87	2	46	No	No	No	No	No	No	No	No	No	No
13	2	79	2	42	No	No	No	No	No	No	No	No	No	No
14	2	74	2	38	No	No	No	No	No	No	No	No	No	No
15	2	74	2	38	No	No	No	No	No	No	No	No	No	No
16	2	71	2	38	No	No	No	No	No	No	No	No	No	No
17	2	41	2	22	No	No	No	No	No	No	No	No	No	No
18	2	23	2	12	No	No	No	No	No	No	No	No	No	No
19	2	20	2	11	No	No	No	No	No	No	No	No	No	No
20	2	8	2	5	No	No	No	No	No	No	No	No	No	No
21	2	6	2	3	No	No	No	No	No	No	No	No	No	No
22	2	6	2	3	No	No	No	No	No	No	No	No	No	No
23	2	4	2	2	No	No	No	No	No	No	No	No	No	No
24	2	4	2	2	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	9.3	10.5
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:14	0:02
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	93	15
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	312	312
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

Signal Warrants Report For Intersection 37: EPL at Driveway 3

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	246	390	0
2	236	374	0
3	231	367	0
4	197	312	0
5	187	296	0
6	167	265	0
7	155	246	0
8	148	234	0
9	118	187	0
10	111	176	0
11	111	176	0
12	106	168	0
13	96	152	0
14	89	140	0
15	89	140	0
16	86	137	0
17	49	78	0
18	27	43	0
19	25	39	0
20	10	16	0
21	7	12	0
22	7	12	0
23	5	8	0
24	5	8	0

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	3	636	1	0	No	No	No	No	No	No	No	No	No	No
2	3	610	1	0	No	No	No	No	No	No	No	No	No	No
3	3	598	1	0	No	No	No	No	No	No	No	No	No	No
4	3	509	1	0	No	No	No	No	No	No	No	No	No	No
5	3	483	1	0	No	No	No	No	No	No	No	No	No	No
6	3	432	1	0	No	No	No	No	No	No	No	No	No	No
7	3	401	1	0	No	No	No	No	No	No	No	No	No	No
8	3	382	1	0	No	No	No	No	No	No	No	No	No	No
9	3	305	1	0	No	No	No	No	No	No	No	No	No	No
10	3	287	1	0	No	No	No	No	No	No	No	No	No	No
11	3	287	1	0	No	No	No	No	No	No	No	No	No	No
12	3	274	1	0	No	No	No	No	No	No	No	No	No	No
13	3	248	1	0	No	No	No	No	No	No	No	No	No	No
14	3	229	1	0	No	No	No	No	No	No	No	No	No	No
15	3	229	1	0	No	No	No	No	No	No	No	No	No	No
16	3	223	1	0	No	No	No	No	No	No	No	No	No	No
17	3	127	1	0	No	No	No	No	No	No	No	No	No	No
18	3	70	1	0	No	No	No	No	No	No	No	No	No	No
19	3	64	1	0	No	No	No	No	No	No	No	No	No	No
20	3	26	1	0	No	No	No	No	No	No	No	No	No	No
21	3	19	1	0	No	No	No	No	No	No	No	No	No	No
22	3	19	1	0	No	No	No	No	No	No	No	No	No	No
23	3	13	1	0	No	No	No	No	No	No	No	No	No	No
24	3	13	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	10.1
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:00
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	0
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	636
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 38: EPL at Driveway 4

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	246	331	64
2	236	318	61
3	231	311	60
4	197	265	51
5	187	252	49
6	167	225	44
7	155	209	40
8	148	199	38
9	118	159	31
10	111	149	29
11	111	149	29
12	106	142	28
13	96	129	25
14	89	119	23
15	89	119	23
16	86	116	22
17	49	66	13
18	27	36	7
19	25	33	6
20	10	13	3
21	7	10	2
22	7	10	2
23	5	7	1
24	5	7	1

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	3	577	1	64	No	No	No	No	No	No	No	Yes	No	No
2	3	554	1	61	No	No	No	No	No	No	No	Yes	No	No
3	3	542	1	60	No	No	No	No	No	No	No	Yes	No	No
4	3	462	1	51	No	No	No	No	No	No	No	No	No	No
5	3	439	1	49	No	No	No	No	No	No	No	No	No	No
6	3	392	1	44	No	No	No	No	No	No	No	No	No	No
7	3	364	1	40	No	No	No	No	No	No	No	No	No	No
8	3	347	1	38	No	No	No	No	No	No	No	No	No	No
9	3	277	1	31	No	No	No	No	No	No	No	No	No	No
10	3	260	1	29	No	No	No	No	No	No	No	No	No	No
11	3	260	1	29	No	No	No	No	No	No	No	No	No	No
12	3	248	1	28	No	No	No	No	No	No	No	No	No	No
13	3	225	1	25	No	No	No	No	No	No	No	No	No	No
14	3	208	1	23	No	No	No	No	No	No	No	No	No	No
15	3	208	1	23	No	No	No	No	No	No	No	No	No	No
16	3	202	1	22	No	No	No	No	No	No	No	No	No	No
17	3	115	1	13	No	No	No	No	No	No	No	No	No	No
18	3	63	1	7	No	No	No	No	No	No	No	No	No	No
19	3	58	1	6	No	No	No	No	No	No	No	No	No	No
20	3	23	1	3	No	No	No	No	No	No	No	No	No	No
21	3	17	1	2	No	No	No	No	No	No	No	No	No	No
22	3	17	1	2	No	No	No	No	No	No	No	No	No	No
23	3	12	1	1	No	No	No	No	No	No	No	No	No	No
24	3	12	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	3	0	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	10.6
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:11
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	64
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	641
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 39: Driveway 1 at Market Street

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	S
1	61	119	7
2	59	114	7
3	57	112	7
4	49	95	6
5	46	90	5
6	41	81	5
7	38	75	4
8	37	71	4
9	29	57	3
10	27	54	3
11	27	54	3
12	26	51	3
13	24	46	3
14	22	43	3
15	22	43	3
16	21	42	2
17	12	24	1
18	7	13	1
19	6	12	1
20	2	5	0
21	2	4	0
22	2	4	0
23	1	2	0
24	1	2	0

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	180	1	7	No	No	No	No	No	No	No	No	No	No
2	2	173	1	7	No	No	No	No	No	No	No	No	No	No
3	2	169	1	7	No	No	No	No	No	No	No	No	No	No
4	2	144	1	6	No	No	No	No	No	No	No	No	No	No
5	2	136	1	5	No	No	No	No	No	No	No	No	No	No
6	2	122	1	5	No	No	No	No	No	No	No	No	No	No
7	2	113	1	4	No	No	No	No	No	No	No	No	No	No
8	2	108	1	4	No	No	No	No	No	No	No	No	No	No
9	2	86	1	3	No	No	No	No	No	No	No	No	No	No
10	2	81	1	3	No	No	No	No	No	No	No	No	No	No
11	2	81	1	3	No	No	No	No	No	No	No	No	No	No
12	2	77	1	3	No	No	No	No	No	No	No	No	No	No
13	2	70	1	3	No	No	No	No	No	No	No	No	No	No
14	2	65	1	3	No	No	No	No	No	No	No	No	No	No
15	2	65	1	3	No	No	No	No	No	No	No	No	No	No
16	2	63	1	2	No	No	No	No	No	No	No	No	No	No
17	2	36	1	1	No	No	No	No	No	No	No	No	No	No
18	2	20	1	1	No	No	No	No	No	No	No	No	No	No
19	2	18	1	1	No	No	No	No	No	No	No	No	No	No
20	2	7	1	0	No	No	No	No	No	No	No	No	No	No
21	2	6	1	0	No	No	No	No	No	No	No	No	No	No
22	2	6	1	0	No	No	No	No	No	No	No	No	No	No
23	2	3	1	0	No	No	No	No	No	No	No	No	No	No
24	2	3	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S
Total Stopped Delay Per Vehicle on Minor Approach (s)	9.2
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:01
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	7
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	187
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 40: Driveway 2 at Market St

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	S
1	63	113	8
2	60	108	8
3	59	106	8
4	50	90	6
5	48	86	6
6	43	77	5
7	40	71	5
8	38	68	5
9	30	54	4
10	28	51	4
11	28	51	4
12	27	49	3
13	25	44	3
14	23	41	3
15	23	41	3
16	22	40	3
17	13	23	2
18	7	12	1
19	6	11	1
20	3	5	0
21	2	3	0
22	2	3	0
23	1	2	0
24	1	2	0

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	176	1	8	No	No	No	No	No	No	No	No	No	No
2	2	168	1	8	No	No	No	No	No	No	No	No	No	No
3	2	165	1	8	No	No	No	No	No	No	No	No	No	No
4	2	140	1	6	No	No	No	No	No	No	No	No	No	No
5	2	134	1	6	No	No	No	No	No	No	No	No	No	No
6	2	120	1	5	No	No	No	No	No	No	No	No	No	No
7	2	111	1	5	No	No	No	No	No	No	No	No	No	No
8	2	106	1	5	No	No	No	No	No	No	No	No	No	No
9	2	84	1	4	No	No	No	No	No	No	No	No	No	No
10	2	79	1	4	No	No	No	No	No	No	No	No	No	No
11	2	79	1	4	No	No	No	No	No	No	No	No	No	No
12	2	76	1	3	No	No	No	No	No	No	No	No	No	No
13	2	69	1	3	No	No	No	No	No	No	No	No	No	No
14	2	64	1	3	No	No	No	No	No	No	No	No	No	No
15	2	64	1	3	No	No	No	No	No	No	No	No	No	No
16	2	62	1	3	No	No	No	No	No	No	No	No	No	No
17	2	36	1	2	No	No	No	No	No	No	No	No	No	No
18	2	19	1	1	No	No	No	No	No	No	No	No	No	No
19	2	17	1	1	No	No	No	No	No	No	No	No	No	No
20	2	8	1	0	No	No	No	No	No	No	No	No	No	No
21	2	5	1	0	No	No	No	No	No	No	No	No	No	No
22	2	5	1	0	No	No	No	No	No	No	No	No	No	No
23	2	3	1	0	No	No	No	No	No	No	No	No	No	No
24	2	3	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S
Total Stopped Delay Per Vehicle on Minor Approach (s)	9.2
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:01
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	8
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	184
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

APPENDIX D

SIMTRAFFIC QUEUEING WORKSHEETS

APPENDIX D-I

YEAR 2024 CUMULATIVE PLUS PROJECT TRAFFIC CONDITIONS

Queuing and Blocking Report

Intersection: 6: Market St & Main St

Movement	WB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	64	65
Average Queue (ft)	26	25
95th Queue (ft)	52	51
Link Distance (ft)	959	474
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 11: East Preserve Loop & Market St

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (ft)	54	56	47	67	51	115
Average Queue (ft)	31	34	25	36	18	61
95th Queue (ft)	51	52	48	54	45	96
Link Distance (ft)	137	710		300		465
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			100		100	
Storage Blk Time (%)				0		1
Queuing Penalty (veh)				0		0

Intersection: 12: East Preserve Loop & Academy St

Movement	WB	SB
Directions Served	LTR	L
Maximum Queue (ft)	49	31
Average Queue (ft)	28	3
95th Queue (ft)	46	17
Link Distance (ft)	560	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		100
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 37: East Preserve Loop & Dwy 3

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 38: East Preserve Loop & Dwy 4

Movement	EB
Directions Served	R
Maximum Queue (ft)	107
Average Queue (ft)	52
95th Queue (ft)	83
Link Distance (ft)	206
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 39: Dwy 1 & Market St

Movement	NB
Directions Served	LR
Maximum Queue (ft)	51
Average Queue (ft)	21
95th Queue (ft)	46
Link Distance (ft)	170
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 40: Dwy 2 & Market St

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	31	49
Average Queue (ft)	2	24
95th Queue (ft)	16	48
Link Distance (ft)	137	177
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

Queuing and Blocking Report

Intersection: 6: Main St & Market St

Movement	WB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	44	56
Average Queue (ft)	23	24
95th Queue (ft)	46	49
Link Distance (ft)	959	474
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 11: East Preserve Loop & Market St

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (ft)	56	54	36	49	55	88
Average Queue (ft)	26	26	23	30	30	44
95th Queue (ft)	50	50	46	47	48	71
Link Distance (ft)	137	710		300		465
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			100		100	
Storage Blk Time (%)						0
Queuing Penalty (veh)						0

Intersection: 12: East Preserve Loop & Academy St

Movement	WB	SB
Directions Served	LTR	L
Maximum Queue (ft)	47	31
Average Queue (ft)	20	4
95th Queue (ft)	44	20
Link Distance (ft)	560	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		100
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 37: East Preserve Loop & Dwy 3

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 38: East Preserve Loop & Dwy 4

Movement	EB
Directions Served	R
Maximum Queue (ft)	58
Average Queue (ft)	29
95th Queue (ft)	48
Link Distance (ft)	206
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 39: Dwy 1 & Market St

Movement	NB
Directions Served	LR
Maximum Queue (ft)	30
Average Queue (ft)	9
95th Queue (ft)	31
Link Distance (ft)	170
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report

Intersection: 40: Dwy 2 & Market St

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	25	30
Average Queue (ft)	1	9
95th Queue (ft)	10	31
Link Distance (ft)	137	177
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

APPENDIX D-II

YEAR 2030/2040 BUILDOUT PLUS PROJECT TRAFFIC CONDITIONS

Intersection: 6: Main St & Market St

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	94	65	119	75
Average Queue (ft)	57	34	59	37
95th Queue (ft)	86	57	95	59
Link Distance (ft)	380	882	846	454
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: East Preserve Loop & Market St

Movement	EB	WB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	TR	L	T	R
Maximum Queue (ft)	93	66	46	95	52	63	62
Average Queue (ft)	53	34	20	49	18	38	23
95th Queue (ft)	80	55	46	77	45	58	50
Link Distance (ft)	125	710		300		465	465
Upstream Blk Time (%)	0						
Queuing Penalty (veh)	0						
Storage Bay Dist (ft)			100		100		
Storage Blk Time (%)				0			
Queuing Penalty (veh)				0			

Intersection: 12: East Preserve Loop & Academy St

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	L	L	R
Maximum Queue (ft)	46	81	31	31	9
Average Queue (ft)	20	32	5	5	1
95th Queue (ft)	39	58	23	23	7
Link Distance (ft)	1253	560			257
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			100	100	
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 36: Main St & Academy St

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	40	91	11	42
Average Queue (ft)	15	42	0	6
95th Queue (ft)	41	66	5	28
Link Distance (ft)	331	1253	264	846
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 37: East Preserve Loop & Dwy 3

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 38: East Preserve Loop & Dwy 4

Movement	EB
Directions Served	R
Maximum Queue (ft)	98
Average Queue (ft)	50
95th Queue (ft)	80
Link Distance (ft)	194
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 39: Dwy 1 & Market St

Movement	NB
Directions Served	LR
Maximum Queue (ft)	44
Average Queue (ft)	17
95th Queue (ft)	43
Link Distance (ft)	170
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 40: Dwy 2 & Market St

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	11	40	50
Average Queue (ft)	0	7	19
95th Queue (ft)	8	29	46
Link Distance (ft)	124	125	177
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 0

Intersection: 6: Main St & Market St

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	84	60	66	110
Average Queue (ft)	47	30	40	56
95th Queue (ft)	73	52	60	86
Link Distance (ft)	372	882	846	391
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: East Preserve Loop & Market St

Movement	EB	WB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	TR	L	T	R
Maximum Queue (ft)	68	68	50	84	54	102	50
Average Queue (ft)	38	31	22	44	32	55	21
95th Queue (ft)	58	55	48	70	48	86	47
Link Distance (ft)	125	710		300		465	465
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			100		100		
Storage Blk Time (%)				0		0	
Queuing Penalty (veh)				0		0	

Intersection: 12: East Preserve Loop & Academy St

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	L	L	R
Maximum Queue (ft)	49	68	36	36	4
Average Queue (ft)	25	25	5	6	0
95th Queue (ft)	43	55	25	26	4
Link Distance (ft)	1253	560			257
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			100	100	
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 36: Main St & Academy St

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	40	60	35
Average Queue (ft)	11	33	5
95th Queue (ft)	36	53	25
Link Distance (ft)	407	1253	846
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 37: East Preserve Loop & Dwy 3

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 38: East Preserve Loop & Dwy 4

Movement	EB
Directions Served	R
Maximum Queue (ft)	52
Average Queue (ft)	29
95th Queue (ft)	49
Link Distance (ft)	194
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report

Intersection: 39: Dwy 1 & Market St

Movement	NB
Directions Served	LR
Maximum Queue (ft)	30
Average Queue (ft)	6
95th Queue (ft)	25
Link Distance (ft)	170
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 40: Dwy 2 & Market St

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	19	35
Average Queue (ft)	1	9
95th Queue (ft)	9	32
Link Distance (ft)	125	177
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0