

ATTACHMENT A - EXHIBIT 2

**Villa Siena Project
Final Environmental Impact Report (FEIR)**



FINAL
Environmental Impact Report
Villa Siena Residential Project
City of Wildomar, County of Riverside, California
State Clearinghouse Number 2014041075

Prepared for:



City of Wildomar

23873 Clinton Keith Road, Suite 201
Wildomar, CA 92595
951.677.7751

Contact: Matthew C. Bassi, Planning Director

Prepared by:

FirstCarbon Solutions

621 E. Carnegie Drive, Suite 100
San Bernardino, CA 92408
909.884.2255

Contact: Frank Coyle, Project Director
Charles Holcombe, Project Manager

Date: August 5, 2015

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Table of Contents

Section 1: Introduction.....1-1

Section 2: Responses to Written Comments2-1

 2.1 - List of Authors 2-1

 2.2 - Responses to Comments 2-1

Section 3: Errata.....3-1

 3.1 - Changes in Response to Specific Comments 3-1

Appendix A: Villa Siena Supplemental Traffic Analysis

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SECTION 1: INTRODUCTION

In accordance with the California Environmental Quality Act (CEQA) Guidelines Section 15088, the City of Wildomar has evaluated the comments received on the Villa Siena Residential Project Draft Environmental Impact Report (Draft EIR). The responses to the comments and errata, which are included in this document, comprise the Final EIR for use by the City of Wildomar in its review.

This document is organized into three sections:

- **Section 1 – Introduction.**
- **Section 2 – Responses to Written Comments:** Provides a list of the agencies, organizations, and individuals that commented on the Draft EIR. Copies of all of the letters received regarding the Draft EIR and responses thereto are included in this section.
- **Section 3 – Errata:** Includes an addendum listing refinements and clarifications on the Draft EIR, which have been incorporated.

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SECTION 2: RESPONSES TO WRITTEN COMMENTS

2.1 - List of Commenters

A list of public agencies, organizations, and individuals that provided comments on the Villa Siena Residential Project Draft EIR (DEIR) is presented below. Each comment has been assigned a code. Individual comments within each communication have been numbered so comments can be cross-referenced with responses. Following this list, the text of the communication is reprinted and followed by the corresponding response.

Commenter

Commenter Code

State Agencies

California Department of Fish and Wildlife CDFW

California Department of Transportation DOT

Individuals

Martha Bridges, John Burkett & Gerard Ste. Marie..... BRIDGES

2.2 - Responses to Comments

2.2.1 - Introduction

In accordance with the California Environmental Quality Act (CEQA) Guidelines Section 15088, the City of Wildomar, as the lead agency, evaluated the comments received on the Draft EIR (State Clearinghouse No. 2014041075) for the Villa Siena Residential Project, and has prepared the following responses to the comments received. This Response to Comments document becomes part of the Final EIR for the project in accordance with CEQA Guidelines Section 15132.

The purpose of the public review of the Draft EIR (DEIR) is to evaluate the adequacy of the environmental analysis in terms of compliance with CEQA. Section 15151 of the CEQA Guidelines states the following regarding standards from which adequacy is judged:

An EIR should be prepared with a sufficient degree of analysis to provide decision-makers with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among experts. The courts have not looked for perfection but for adequacy, completeness, and a good faith effort at full disclosure.

The purpose of each response to a comment on the Draft EIR is to address the significant environmental issue(s) raised by each comment. This typically requires clarification of points contained in the Draft EIR. Section 15088(c) of the CEQA Guidelines describes the evaluation that CEQA requires in the response to comments:

The written response shall describe the disposition of significant environmental issues raised (e.g., revisions to the proposed project to mitigate anticipated impacts or objections). In particular, the major environmental issues raised when the lead agency's position is at variance with recommendations and objections raised in the comments must be addressed in detail, giving reasons why specific comments and suggestions were not accepted. There must be good faith, reasoned analysis in response. Conclusory statements unsupported by factual information will not suffice.

Section 15204(a) (Focus of Review) of the CEQA Guidelines helps the public and public agencies to focus their review of environmental documents and their comments to lead agencies. Case law has held that the lead agency is not obligated to undertake every suggestion, provided that the agency responds to significant environmental issues and makes a good faith effort at disclosure. Section 15204(a) of the CEQA Guidelines clarifies this for reviewers:

In reviewing draft EIRs, persons and public agencies should focus on the sufficiency of the document in identifying and analyzing the possible impacts on the environment and ways in which the significant effects of the project might be avoided or mitigated. Comments are most helpful when they suggest additional specific alternatives or mitigation measures that would provide better ways to avoid or mitigate the significant environmental effects. At the same time, reviewers should be aware that the adequacy of an EIR is determined in terms of what is reasonably feasible, in light of factors such as the magnitude of the project at issue, the severity of its likely environmental impacts, and the geographic scope of the project. CEQA does not require a lead agency to conduct every test or perform all research, study and experimentation recommended or demanded by commenters. When responding to comments, lead agencies need only respond to significant environmental issues and do not need to provide all information requested by reviewers, as long as a good-faith effort at full disclosure is made in the EIR.

The CEQA Guidelines encourage reviewers to examine the sufficiency of the environmental document, particularly with regard to significant effects, and to suggest specific mitigation measures and project alternatives. Given that an effect is not considered significant in the absence of substantial evidence, Guidelines Section 15204(c) advises reviewers that comments should be accompanied by factual support:

Reviewers should explain the basis for their comments, and, should submit data or references offering facts, reasonable assumptions based on facts, or expert opinion supported by facts in support of the comments. Pursuant to Section

15064, an effect shall not be considered significant in the absence of substantial evidence.

Written comments made during the public review of the Draft EIR intermixed points and opinions relevant to project approval/disapproval with points and opinions relevant to the environmental review. The responses acknowledge comments addressing points and opinions relevant to consideration of project approval, and discuss as necessary the points related to the environmental review under CEQA. The response “comment noted” is often used in cases where the comment does not raise a substantive issue relevant to the review of the CEQA environmental analysis. Such points are usually statements of opinion or preference regarding the project’s design or its presence, as opposed to points within the scope of an EIR, which are limited to environmental impacts and mitigation. These points are relevant for consideration in the subsequent discretionary approval process by the lead agency, rather than within the EIR.

2.2.2 - Comment Letters and Responses

The comment letters reproduced in the following pages follow the same organization as used in the List of Commenters.

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State of California - Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Inland Deserts Region
3602 Inland Empire Blvd., Suite C-220
Ontario, CA 91764
(909) 484-0459
www.wildlife.ca.gov

EDMUND G. BROWN, Jr., Governor
CHARLTON H. BONHAM, Director



California Department of Fish and Wildlife
(CDFW)

June 11, 2015

Mr. Matthew C. Bassi
Planning Director
City of Wildomar
23873 Clinton Keith Road, Suite 101
Wildomar, CA 92595

Subject: Draft Environmental Impact Report
Villa Siena Residential Project
State Clearinghouse No. 2014041075

Dear Mr. Bassi:

The Department of Fish and Wildlife (Department) appreciates the opportunity to comment on the Draft Environmental Impact Report (DEIR) for the Villa Siena Residential Project (project) [State Clearinghouse No. 2014041075]. Pursuant to The Guidelines for the Implementation of CEQA (Cal. Code Regs., tit. 14, § 15000 *et seq.*; hereafter CEQA Guidelines), the Department has reviewed the DEIR and offers comments and recommendations on those activities involved in the project that are within the Department's area of expertise and germane to its statutory responsibilities, and/or which are required to be approved by the Department (CEQA Guidelines, §§ 15086, 15096 & 15204).

CDFW-1

The project proposes to construct nine buildings containing 170 units of rentable apartments, a clubhouse, pool and spa, 368 parking spaces, open space, landscaping, sidewalks, and roadways within 10.02 acres located immediately north of Prielipp Road, east of Elizabeth Lane, and west of Jana Lane, in the City of Wildomar, Riverside County. The proposed project will have a total lot coverage of 400,752 square feet.

CEQA ROLE

The Department has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and the habitat necessary for biologically sustainable populations of those species (i.e., biological resources); and administers the Natural Community Conservation Planning Program (NCCP Program). The Department is a Trustee Agency with responsibility under CEQA for commenting on projects that could affect biological resources. As a Trustee Agency, the Department is responsible for providing, as available, biological expertise to review and comment upon environmental documents and impacts arising from project activities (CEQA Guidelines, § 15386; Fish & G. Code, § 1802).

CDFW-2

The Department will also act as a Responsible Agency based on its discretionary authority regarding project activities that impact streams and lakes (Fish & G. Code, §§ 1600 – 1616), in this case the unnamed ephemeral first order stream, or result in the “take” of any species listed as candidate, threatened, or endangered pursuant to the California Endangered Species Act (CESA; Fish & G. Code, § 2050 et seq.).

CDFW-3

COMMENTS AND RECOMMENDATIONS

The Department offers the comments and recommendations presented below to assist the City of Wildomar (City; the CEQA lead agency) in adequately identifying and/or mitigating the project’s significant, or potentially significant, impacts on biological resources. These comments and recommendations are based on the requirement for the environmental document to include the following information:

- Identification of environmental impacts of the proposed project (CEQA Guidelines, §§ 15063, 15065, 15126, 15126.2, 15126.6 & 15358); and
- A description of feasible mitigation measures to avoid potentially significant impacts, and/or mitigate significant impacts, of the proposed project on the environment (CEQA Guidelines, §§ 15021, 15063, 15071, 15126.2, 15126.4 & 15370).

CDFW-4

Environmental Impacts

The assessment of “CDFW Jurisdictional Areas” included on Page 3.4-2 of the DEIR is inaccurate. Page 3.4-2 of the DEIR states: “There are no areas, which meet the criteria to be under California Department of Wildlife (CDFW) jurisdiction within the project site. The swale does not support any waterfowl use and no federal or state listed species occur on the property or within the drainage swale. Additionally, the swale is about 0.1 acre and does not drain into any large watershed habitat areas in the surrounding area.” The Department requires notification for work undertaken in or near any river, stream, or lake that flows at least episodically, including ephemeral streams, desert washes, and watercourses with a subsurface flow.

CDFW-5

Fish and Game Code section 1602 states, “An entity may not substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake, unless all of the following occur....” Upon receipt of a complete notification, the Department determines if the activities may substantially adversely affect existing fish and wildlife resources. The Department recommends the City condition the applicant to notify the Department.

CDFW-6

Page 3.4-9 of the DEIR also infers that the Department, and the Department’s Lake and Streambed Alteration Program, have adopted the definition of a stream defined in CCR,

CDFW-7

Title 14, Section 1.72. The Fish and Game Commission defines in CCR, Title 14, Section 1.72, Stream (includes Creeks and Rivers) and further describes in Title 14, Section 720, Designation of Waters of Department Interest for the purposes of implementing Section 1601 and 1603 of the Fish and Game Code. The Department recommends the City cite the Fish and Game Code section 1600, et seq. when describing the Department's regulatory authority, which is inclusive of any river, stream, and lake.

CDFW-7
Cont.

The Department does concur with the findings in the General Biological Resources Assessment prepared by RCA Associates LLC, dated September 2014 (Appendix C of the DEIR). Page 10, Section 4.6, Jurisdictional Waters of the General Biological Resources Assessment states that "1600 permit regulations apply..." and page 12, Section 5.5, Jurisdictional Waters, states that "the drainage swale may be considered jurisdictional waters."

CDFW-8

The Department recommends that prior to adoption of the Final EIR (FEIR) the City revise the information pertaining to "CDFW Jurisdictional Areas" contained in the DEIR. The Department also recommends that the City condition the project applicant to submit a Notification of Lake or Streambed Alteration to the Department's Lake and Streambed Alteration Program at the Ontario office, and that Mitigation Measure (MM) BIO-3 be revised to condition Notification submission prior to issuance of a grading permit.

CDFW-9

The Department's issuance of an LSA Agreement is a "project" subject to CEQA (see Pub. Resources Code 21065). To facilitate issuance of an LSA Agreement, if necessary, the DEIR should fully identify the potential impacts to the lake, stream, or riparian resources, and provide adequate avoidance, mitigation, and monitoring and reporting commitments. Early consultation with the Department is recommended, since modification of the proposed project may be required to avoid or reduce impacts to fish and wildlife resources. To obtain a Lake or Streambed Alteration notification package, please go to <http://www.dfg.ca.gov/habcon/1600/forms.html>.

CDFW-10

Mitigation Measures

The Department requests that the City revise the following mitigation measures prior to adoption of the FEIR:

1. Mitigation Measure MM BIO-1. MM BIO-1 provides mitigation measures for impacts to burrowing owl. The Department requests that Mitigation Measure MM BIO-1 be revised to require consultation with the Department for any relocation (passive or active) of burrowing owls. We recommend notification to the Department if owls are found to be present onsite and the development of a conservation strategy in cooperation with the U. S. Fish and Service, the Department, and the Western Riverside County Regional Conservation Authority (RCA).
2. Mitigation Measure MM BIO-2. MM BIO-2 provides mitigation measures for impacts

CDFW-11

to nesting birds. The Department requests that Mitigation Measure MM BIO-2 be revised to require pre-construction surveys no more than three (3) days prior to vegetation clearing or ground disturbance activities, as instances of nesting could be missed if surveys are conducted sooner.

CDFW-11
Cont.

Further Coordination

The Department appreciates the opportunity to comment on the DEIR for the Villa Siena Residential Project (SCH No. 2014041075) and recommends that the City of Wildomar address the Department's comments and concerns prior to adoption of the FEIR. If you should have any questions pertaining to the comments provided in this letter, please contact Joanna Gibson at (909) 987-7449 or at Joanna.Gibson@wildlife.ca.gov.

CDFW-12

Sincerely,


(For)

Leslie MacNair
Acting Regional Manager

cc: State Clearinghouse, Sacramento

State Agencies

California Department of Fish and Wildlife (CDFW)

Response to CDFW-1

The commenter provides introductory remarks to open the letter. No response is necessary.

Response to CDFW-2

The commenter states the CDFW has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and the habitat necessary for biologically sustainable populations of those species (i.e., biological resources); and administers the Natural Community Conservation Planning Program (NCCP Program). The CDFW is a Trustee Agency with responsibility under CEQA for commenting on projects that could affect biological resources. As a Trustee Agency, the CDFW is responsible for providing, as available, biological expertise to review and comment upon environmental documents and impacts arising from project activities (CEQA Guidelines, § 15386; Fish & G. Code, § 1802).

This comment is noted. No additional response is necessary.

Response to CDFW-3

The commenter states the CDFW will also act as a Responsible Agency based on its discretionary authority regarding project activities that impact streams and lakes (Fish & G. Code, §§ 1600- 1616), in this case the unnamed ephemeral first order stream, or result in the "take" of any species listed as candidate, threatened, or endangered pursuant to the California Endangered Species Act (CESA; Fish & G. Code, § 2050 et seq.).

This comment is noted. No additional response is necessary.

Response to CDFW -4

The commenter offers comments and recommendations to assist the City of Wildomar in adequately identifying and/or mitigating the project's significant, or potentially significant, impacts on biological resources. These comments and recommendations are based on the requirement for the environmental document to include the following information:

- Identification of environmental impacts of the proposed project (CEQA Guidelines, §§ 15063, 15065, 15126, 15126.2, 15126.6 & 15358); and
- A description of feasible mitigation measures to avoid potentially significant impacts, and/or mitigate significant impacts, of the proposed project on the environment (CEQA Guidelines, §§ 15021 , 15063, 15071 , 15126.2, 15126.4 & 15370).

This comment is noted. No additional response is necessary.

Response to CDFW -5

The commenter states that the assessment of "CDFW Jurisdictional Areas" included on Page 3.4-2 of the DEIR is inaccurate and requires notification for work undertaken in or near any river, stream, or lake that flows at least episodically, including ephemeral streams, desert washes, and watercourses with a subsurface flow.

This text has been updated in Section 3, Errata of the Final EIR. The requested revisions merely provide additional text to incorporate the suggestions from the commenter (i.e., the additional recommended notification), and the addition of notification is not considerably different from what originally was provided for within the DEIR.

Response to CDFW -6

The commenter states that Fish and Game Code section 1602 states, "An entity may not substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake, unless all of the following occur" Upon receipt of a complete notification, the CDFW determines if the activities may substantially adversely affect existing fish and wildlife resources. The CDFW recommends the City condition the applicant to notify the CDFW.

This text has been updated in Section 3, Errata of the Final EIR. The requested revisions merely provides additional text to incorporate the suggestions from the commenter (i.e., the additional recommended condition the Applicant to notify CDFW), and the addition of the recommended condition is not considerably different from what originally was provided for within the DEIR.

Response to CDFW -7

The commenter states that Page 3.4-9 of the DEIR also infers that the CDFW, and the CDFW's Lake and Streambed Alteration Program, have adopted the definition of a stream defined in CCR, Title 14, Section 1.72. The Fish and Game Commission defines in CCR, Title 14, Section 1.72, Stream (includes Creeks and Rivers) and further describes in Title 14, Section 720, Designation of Waters of CDFW Interest for the purposes of implementing Section 1601 and 1603 of the Fish and Game Code. The CDFW recommends the City cite the Fish and Game Code section 1600, et seq. when describing the CDFW's regulatory authority, which is inclusive of any river, stream, and lake.

This text has been updated in Section 3, Errata of the Final EIR. The original description was adequate in the description of the environment, and the requested revisions merely provides additional text to incorporate the suggestions from the commenter (i.e., the additional recommended citation that the Fish and Game Code section 1600, et seq. be included when describing the CDFW's regulatory authority, which is inclusive of any river, stream, and lake), and the addition of the requested text is not considerably different from what originally was provided for within the DEIR.

Response to CDFW -8

The commenter states the CDFW does concur with the findings in the General Biological Resources Assessment prepared by RCA Associates LLC, dated September 2014 (Appendix C of the DEIR). Page 10, Section 4.6, Jurisdictional Waters of the General Biological Resources Assessment states that "1600 permit regulations apply ..." and page 12, Section 5.5, Jurisdictional Waters, states that "the drainage swale may be considered jurisdictional waters."

This comment is noted. No additional response is necessary.

Response to CDFW -9

The commenter recommends that prior to adoption of the Final EIR (FEIR) the City revise the information pertaining to "CDFW Jurisdictional Areas" contained in the DEIR. The commenter also recommends that the City condition the project applicant to submit a Notification of Lake or Streambed Alteration to the CDFW's Lake and Streambed Alteration Program at the Ontario office, and that Mitigation Measure (MM) BIO-3 be revised to condition Notification submission prior to issuance of a grading permit.

As stated in Response to CDFW-5, this text has been updated in Section 3, Errata of the Final EIR. The original mitigation measure BIO-3 of the DEIR is adequate and protective of the environment, and the requested revisions merely provide revised text to incorporate the suggestions from the commenter (i.e., the additional recommended notification), and the addition of notification is not considerably different from what originally was provided for within the DEIR.

Response to CDFW -10

The commenter states the CDFW's issuance of a Lake and Stream Alteration (LSA) Agreement is a "project" subject to CEQA (see Pub. Resources Code 21065). To facilitate issuance of an LSA Agreement, if necessary, the DEIR should fully identify the potential impacts to the lake, stream, or riparian resources, and provide adequate avoidance, mitigation, and monitoring and reporting commitments. Early consultation with the CDFW is recommended, since modification of the proposed project may be required to avoid or reduce impacts to fish and wildlife resources.

As outlined within Impact BIO-3 of the DEIR, development of the project site will impact a small drainage swale that occupies approximately 0.1 acres, located on the eastern side of the project site. The swale supports riparian/ riverine habitat as described under the MSHCP (RCA Associates 2013). Under the MSHCP, any project-related impact to riparian/riverine habitat is considered significant and requires compensatory mitigation. Therefore, mitigation measures BIO-3 and BIO-4 were required in the DEIR to conduct consultation with the CDFW and to avoid or reduce impacts to fish and wildlife resources.

Response to CDFW -11

The commenter requests that the City revise the following mitigation measures prior to adoption of the FEIR:

1. Mitigation Measure MM BIO-1. MM BIO-1 provides mitigation measures for impacts to burrowing owl. The CDFW requests that Mitigation Measure MM BIO-1 be revised to require consultation with the CDFW for any relocation (passive or active) of burrowing owls. CDFW recommends notification to the CDFW if owls are found to be present onsite and the development of a conservation strategy in cooperation with the U. S. Fish and Service, the CDFW, and the Western Riverside County Regional Conservation Authority (RCA).
2. Mitigation Measure MM BIO-2. MM BIO-2 provides mitigation measures for impacts to nesting birds. The CDFW requests that Mitigation Measure MM 810-2 be revised to require pre-construction surveys no more than three (3) days prior to vegetation clearing or ground

disturbance activities, as instances of nesting could be missed if surveys are conducted sooner.

This text has been updated in Section 3, Errata of the Final EIR. The original mitigation measures BIO-1 and BIO-2 of the DEIR were adequate and protective of burrowing owls and nesting birds, and the requested revisions merely provide revised text to incorporate the suggestions from the commenter (i.e., require consultation with CDFW, as well as conduct pre-construction surveys no more than three days prior to vegetation clearing or ground disturbance activities), and the addition of the requested text is not considerably different from what originally was provided for within the DEIR.

Response to CDFW -12

The commenter provides closing remarks to conclude the letter. No additional response is necessary.

DEPARTMENT OF TRANSPORTATION

DISTRICT 8

PLANNING (MS 722)

464 WEST 4th STREET, 6th Floor

SAN BERNARDINO, CA 92401-1400

PHONE (909) 383-4557

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CITY OF WILDOMAR

May 28, 2015

File: 08-Riv-15-PM 12.59

Matthew C. Bassi
Planning Director
City of Wildomar
Planning Department
23873 Clinton Keith Road, Ste 201
Wildomar, CA 92595

Villa Sienna Residential Project EIR dated 4/27/15; Planning Application No. 13-0089;
SCH 2014041075

Mr. Bassi,

The California Department of Transportation (Caltrans) has completed our review of the Draft Environmental Impact Report (dated 4/27/15) for the above mentioned project site that is bounded by Elizabeth Lane and vacant land to the west, Prielipp Road and multi-use residential properties to the south, two residential properties to the north and Jana Lane, residential properties and vacant land to the east and is located in the City of Wildomar. The project site consists of 10.02 acres and proposes 170 units of apartments within nine separate buildings totaling 250,457 square feet with additional offices, a clubhouse, a pool and spa, and open space.

DOT-1

As the owner and operator of the State Highway System (SHS), it is our responsibility to coordinate and consult with local jurisdictions when proposed development may impact our facilities. As the responsible agency under the California Environmental Quality Act (CEQA), it is also our responsibility to make recommendations to offset associated impacts with the proposed project. Although the project is under the jurisdiction of the City of Wildomar, due to the Project's potential impact to State facilities it is also subject to the policies and regulations that govern the SHS.

We recommend the following:

- Please include ramp merge/diverge analysis at the northbound and southbound directions of the I-15 and Clinton Keith Road interchange to determine impacts of the development at these locations, if any.
- Please include ramp intersection analysis at the northbound and southbound directions of the I-15 and Clinton Keith Road interchange

DOT-2

DOT-3

Mr. Bassi
April 23, 2014
Page 2

We appreciate the opportunity to offer comments concerning this project. If you have any questions regarding this letter, please contact Dustin Foster at (909) 806-3955 or myself at (909) 383-4557 for assistance.

DOT-4

Sincerely,

A handwritten signature in black ink, appearing to read "Mark Roberts". The signature is fluid and cursive, with a long horizontal stroke extending from the end.

Mark Roberts
Office Chief
Community and Regional Planning

California Department of Transportation (DOT)

Response to DOT-1

The commenter provides introductory remarks to open the letter. No response is necessary.

Response to DOT-2

The commenter recommends including a ramp merge/diverge analysis at the northbound and southbound directions of the 1-15 and Clinton Keith Road interchange to determine impacts of the development at these locations, if any.

The requested ramp merge/diverge analysis at the northbound and southbound directions of the 1-15 and Clinton Keith Road interchange has been incorporated and included within Appendix A of this Final EIR (see Section 3, Errata).

The ramp merge/diverge analysis at the northbound and southbound directions of the 1-15 and Clinton Keith Road interchange concluded that implementation of the project will not cause merge/diverge of the northbound and southbound directions of the 1-15 and Clinton Keith Road to operate at an unacceptable level of service. Consequently, the ramp merge/diverge analysis at the northbound and southbound directions of the 1-15 and Clinton Keith Road interchange does not raise a substantive issue relevant to the review of the CEQA environmental analysis. No additional response is necessary.

Response to DOT-3

The commenter recommends including a ramp intersection analysis at the northbound and southbound directions of the 1-15 and Clinton Keith Road interchange.

The requested ramp intersection analysis at the northbound and southbound directions of the 1-15 and Clinton Keith Road interchange has been incorporated and included within Appendix A of this Final EIR (see Section 3, Errata).

The ramp intersection analysis at the northbound and southbound directions of the 1-15 and Clinton Keith Road interchange concluded that implementation of the project will not cause the interchange of the northbound and southbound directions of the 1-15 and Clinton Keith Road to operate at an unacceptable level of service. Consequently, the ramp intersection analysis at the northbound and southbound directions of the 1-15 and Clinton Keith Road interchange does not raise a substantive issue relevant to the review of the CEQA environmental analysis. No additional response is necessary.

Response to DOT-4

The commenter provides closing remarks to conclude the letter. No additional response is necessary.

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June 11, 2015

From: Martha Bridges John Burkett Gerard Ste. Marie
35465 Woshka Lane 32721 Mesa Drive P.O. Box 486
Wildomar, CA 92595 Lake Elsinore, CA 92530 Wildomar, CA 92595

To: City of Wildomar
Attn: Mathew C. Bassi, Planning Director
23873 Clinton Keith Road, Suite 201
Wildomar, CA 92595
[By Email to: mbassi@cityofwildomar.org, dlee@cityofwildomar.org]

Re: **Comments to Villa Sienna Residential Project (Planning Application
No. 13-0089) Draft EIR (SCH No. 2014011081)**

To Director of Planning - Mathew C. Bassi: Please consider the following
comments to the Villa Siena Residential Project Draft Environmental Impact
Report. Please also make this Letter, and all documents referred to in the Letter, a
part of the Administrative Record for this Project.

BRIDGES-1

I. The Draft EIR Fails to Discuss Impacts and Mitigation Associated with
Project Location in a Very High Fire Hazard Severity Zone

While the Draft EIR does acknowledge that the Project is located within a
Very High Fire Hazard Severity Zone as determined by the California Department
of Forestry and Fire Protection based on the map entitled "Very High Fire Hazard
Severity Zones in LRA" for the City of Wildomar, dated December 21, 2009, (see
http://www.fire.ca.gov/fire_prevention/fhsz_maps/FHSZ/riverside/Wildomar.pdf),
as well as in conjunction with Wildomar Ordinance No. 52, the Draft EIR
dismissively concludes that the Project has a "less than significant impact,"
without adequate analysis. However, under established CEQA thresholds of
significance, the Project would have potentially adverse fire safety impacts
because it exposes people or structures to a significant risk of loss, injury or death
involving wildfires. Therefore, in the Final EIR for this Project, please adequately
analyze Project location within a Very High Fire Hazard Severity Zone, and please
discuss the impacts and mitigation measures which would follow as a matter of
course to such analysis.

BRIDGES-2

DATED: June 11, 2015

By: Martha Bridges, John Burkett
& Gerard Ste. Marie

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Individuals

Martha Bridges, John Burkett & Gerard Ste. Marie (BRIDGES)

Response to BRIDGES-1

The commenter provides introductory remarks to open the letter. No response is necessary.

Response to BRIDGES -2

The commenter states the DEIR does acknowledge that the Project is located within a Very High Fire Hazard Severity (VHFHS) Zone; and that the Draft EIR dismissively concludes that the Project has a “less than significant impact,” without adequate analysis. The commenter states that under established CEQA thresholds of significance, the Project would have potentially adverse fire safety impacts because it exposes people or structures to a significant risk of loss, injury or death involving wildfires. The commenter requests that the Final EIR for this Project adequately analyze the Project’s location within a Very High Fire Hazard Severity Zone, and discuss the impacts and mitigation measures which would follow as a matter of course to such analysis.

As outlined within Page 3.7-14 of Section 3.7, Hazards and Hazardous Materials, of the DEIR, the project site does fall within a State of California fire hazard area under the Fire Hazard Severity Zones in an SRA. An SRA is defined in Section 4102 of the Public Resources Code as: areas of the State in which the financial responsibility of preventing and suppressing fires has been determined by the board pursuant to Public Resources Code Section 4125, to be primarily the responsibility of the State.

The project site falls within the Local Responsibility Area (LRA), City of Wildomar within Riverside County. According to the VHFHS Zone LRA map, the project site is within a VHFHS zone under the authority of the City of Wildomar. The project site is adjacent to vacant land and is topographically up gradient and, therefore, is susceptible to wildland fires. The project will include design features that will reduce the project’s susceptibility to fire. The project will be surrounded by roads on three sides (east, west and south), will include hardscapes, and will include a landscape design plan in compliance with the fire department’s safety design elements. The project would be designed to comply with Fire Code and other legal requirements aimed at minimizing fire risks, including safety equipment standards, provide adequate emergency access, and provide sufficient fire hydrants and water flows in compliance with the RCFD. The project would be required to pay its fair share contribution into the City’s development impact fee program and annex into the City’s CFD 2013-1, which funds fire protection and suppression services. Based on the proposed project site’s proximity to a fire station, design features, and the urban characteristics within the project area, the categorization of the project site as a VHFHS zone would not result in any significant exposure of people or structures to the threat of wildfires.

Therefore, the original wildland fire hazards analysis within Section 3.7, Hazards and Hazardous Materials, of the DEIR, is adequate and would not expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands. No additional response is necessary.

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SECTION 3: ERRATA

The following are revisions to the Draft EIR for the Villa Siena Residential Project. These revisions are minor modifications and clarifications to the document, and do not change the significance of any of the environmental issue conclusions within the Draft EIR. The revisions are listed by page number. All additions to the text are underlined (underlined) and all deletions from the text are stricken (~~stricken~~).

3.1 - Changes in Response to Specific Comments

Draft EIR Cover Page

Page i (Cover Page)

The text reference within page (i) of the DEIR references an incorrect State Clearinghouse number. The erroneous text reference has been corrected, below.

“DRAFT
Environmental Impact Report
Villa Siena Residential Project
City of Wildomar, County of Riverside, California
State Clearinghouse Number ~~2014011081~~ 2014041075

Prepared for:



City of Wildomar

23873 Clinton Keith Road, Suite 201
Wildomar, CA 92595
951.677.7751

Contact: Matthew C. Bassi, Planning Director

Prepared by:

FirstCarbon Solutions

621 E. Carnegie Drive, Suite 100
San Bernardino, CA 92408
909.884.2255

Contact: Frank Coyle, Project Director
Charles Holcombe, Project Manager

Date: April 27, 2015”

Section ES, Executive Summary

Page ES-1

The text reference within page ES-1 of the DEIR references an incorrect State Clearinghouse number. The erroneous text reference has been corrected, below.

“The City of Wildomar has received a request to allow for the development of 170 units of rentable apartments contained within nine buildings on a 10.02-acre property. The project will also contain Recreational areas, landscaping, roadway improvements, as well as additional amenities. This Draft Environmental Impact Report (EIR) has been prepared in accordance with the California Environmental Quality Act (Pub. Res. Code Section 21000, et seq. [CEQA]) to evaluate the potential environmental impacts associated with the implementation of the Villa Siena Residential Project (State Clearinghouse No. ~~201404107~~ 2014041075). This document is prepared in conformance with CEQA (California Public Resources Code, Section 21000, et seq.) and the CEQA Guidelines (California Code of Regulations, Title 14, Section 15000, et seq.). This Draft EIR is intended to serve as an informational document for public agency decision-makers and the public regarding the objectives and components of the project. Please refer to Section 2.3.6, Regulatory Authorities, for Responsible and Trustee Agencies, pursuant to CEQA Guidelines Section 15381 and Section 15386, which may be required to grant approvals or facilitate coordination with other agencies, as part of project implementation. This document will address the potentially significant adverse impacts related to construction and long-term operation of the project as well as identify feasible mitigation measures and alternatives that may be adopted to reduce or eliminate these impacts.”

Section 3.1, Aesthetics, Light, and Glare

Page 3.1-11

Additional information regarding the project’s landscaping has been included for further clarification.

“The project will remove existing vegetation and create a residential development in an area in which residential development currently exists. As proposed in the landscape plan, the project site will incorporate a variety of trees totaling approximately 381 assorted trees, approximately 19,283 square feet of shrubs and groundcover, approximately 2,380 square feet of drought tolerant turf, and 5,230 square feet of “no-mow” turf and other vegetation throughout the project site. The project will also include several monumental structures, which includes an entry monument with distinguishing features such as tile roof, manufactured stone veneers, and wood corbels. Because of the proposed project’s similarity to existing land uses, the project would not substantially degrade existing visual character or quality of the site or surrounding areas. Thus, impacts would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation measures are required.

Level of Significance After Mitigation

Less than significant impact.”

Section 3.4, Biological Resources

Page 3.4-2

CDFW commented that the assessment of "CDFW Jurisdictional Areas" included on Page 3.4-2 of the DEIR is inaccurate and requires notification for work undertaken in or near any river, stream, or lake that flows at least episodically, including ephemeral streams, desert washes, and watercourses with a subsurface flow. CDFW recommended that prior to adoption of the Final EIR (FEIR) the City revise the information pertaining to "CDFW Jurisdictional Areas" contained in the DEIR. The requested additional elements have been incorporated, below.

"CDFW Jurisdictional Areas

~~There are no areas, which meet the criteria to be under California Department of Wildlife (CDFW) jurisdiction within the project site. The swale does not support any waterfowl use and no federal or state listed species occur on the property or within the drainage swale. Additionally, the swale is about 0.1 acre and does not drain into any large watershed habitat areas in the surrounding area.~~

Fish and Game Code section 1602 requires an entity to notify the California Department of Fish and Wildlife (CDFW) prior to commencing any activity that may do one or more of the following: Substantially divert or obstruct the natural flow of any river, stream or lake; Substantially change or use any material from the bed, channel or bank of any river, stream, or lake; or Deposit debris, waste or other materials that could pass into any river, stream or lake. "Any river, stream or lake" includes those that are episodic (i.e., those that are dry for periods of time) as well as those that are perennial (i.e., those that flow year round). This includes ephemeral streams, desert washes, and watercourses with a subsurface flow. Project-related impacts to the 0.1 acre swale will require notification to CDFW (see mitigation measure BIO-3)."

Page 3.4-9

CDFW commented that Page 3.4-9 of the DEIR infers that the CDFW, and the CDFW's Lake and Streambed Alteration Program, have adopted the definition of a stream defined in CCR, Title 14, Section 1.72. The Fish and Game Commission defines in CCR, Title 14, Section 1.72, Stream (includes Creeks and Rivers) and further describes in Title 14, Section 720, Designation of Waters of CDFW Interest for the purposes of implementing Section 1601 and 1603 of the Fish and Game Code. The CDFW recommends the City cite the Fish and Game Code section 1600, et seq. when describing the CDFW's regulatory authority, which is inclusive of any river, stream, and lake. The requested additional elements have been incorporated, below.

"Section 1600 to Section 1603 of the State Fish and Game Code

All diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake, or use any material from the streambeds in California are subject to the regulatory authority of the California Department of Fish and Game, and are required to notify the CDFW of such activity.

The Fish and Game Commission defines "stream" (including creeks and rivers) in CCR, Title 14, Section 1.72, and further describes "Designation of Waters of CDFW Interest" in Title 14, Section 720, for the purposes of implementing Section 1601 and 1603 of the Fish and Game Code. Under the Code, a stream is defined as a body of water that flows at least periodically, or intermittently,

through a bed or channel having banks and supporting fish or other aquatic life. Included are watercourses with surface or subsurface flows that support or have supported riparian vegetation.

The California Department of Fish and Game also has jurisdiction within altered or artificial waterways based on the value of those waterways to fish and wildlife, and also has jurisdiction over dry washes that carry water for a short period of time during storm events (also called “ephemeral waters”).

Furthermore, CDFW jurisdiction is often extended to habitats adjacent to watercourses, such as oak woodlands in canyon bottoms or willow woodlands that function as part of the riparian system. Historic court cases have further extended CDFW jurisdiction to include watercourses that seemingly disappear, but re-emerge elsewhere. Under the CDFW definition, a watercourse need not exhibit evidence of an ordinary high water mark (OHWM) to be claimed as jurisdiction. However, CDFW does not regulate isolated wetlands; that is, those that are not associated with a river, stream, or lake (see mitigation measure BIO-3)."

Page 3.4-13

CDFW requested that the City revise the following mitigation measures prior to adoption of the FEIR.

3. Mitigation Measure MM BIO-1. MM BIO-1 provides mitigation measures for impacts to burrowing owl. The CDFW requested that Mitigation Measure MM BIO-1 be revised to require consultation with the CDFW for any relocation (passive or active) of burrowing owls. CDFW recommended notification to the CDFW if owls are found to be present onsite and the development of a conservation strategy in cooperation with the U. S. Fish and Service, the CDFW, and the Western Riverside County Regional Conservation Authority (RCA).
4. Mitigation Measure MM BIO-2. MM BIO-2 provides mitigation measures for impacts to nesting birds. The CDFW requested that Mitigation Measure MM BIO-2 be revised to require pre-construction surveys no more than three (3) days prior to vegetation clearing or ground disturbance activities, as instances of nesting could be missed if surveys are conducted sooner.

The requested additional elements have been incorporated, below.

“Mitigation Measures

MM BIO-1 Pre-construction surveys shall be performed for the burrowing owl as per CDFW survey protocols no more than three (3) ~~thirty (30)~~ days prior to the start of site grading/clearing to verify the presence or absence of the species. A survey report will be prepared within seven days following completion of the survey and will be submitted to the City for review. If the species is observed during the pre-construction surveys, ~~mitigation measures required by CDFW and the MSHCP will be implemented following consultations with CDFW and the City.~~ consultation with the CDFW shall be conducted for any relocation (passive or active) of burrowing owls. Notification to the CDFW shall occur if owls are found to be present onsite and the development of a conservation strategy in cooperation with the U. S. Fish and

Service, the CDFW, and the Western Riverside County Regional Conservation Authority (RCA) shall be conducted.

Timing/Implementation: Prior to the issuance of a grading permit
Enforcement/Monitoring: City of Wildomar Planning Department

- MM BIO-2** If ground or vegetation disturbance occurs between February and August, a preconstruction nesting bird survey shall be conducted by a qualified biologist no more than three (3) ~~thirty (30)~~ days prior to construction, ground disturbance, or vegetation removal. The survey area shall include the project site and a 250-foot buffer around the site. Any active nests identified shall have a buffer area established within a 100-foot radius (200 foot for birds of prey) of the active nest. Construction activities shall not occur within the buffer area until the biologist determines that the young have fledged.

Level of Significance After Mitigation

Less than significant impact.”

Page 3.4-14

CDFW recommended that the City condition the project applicant to submit a Notification of Lake or Streambed Alteration to the CDFW's Lake and Streambed Alteration Program at the Ontario office, and that Mitigation Measure (MM) BIO-3 be revised to condition Notification submission prior to issuance of a grading permit. These requested additional elements have been incorporated, below.

“Mitigation Measures

- MM BIO-3** Prior to issuance of a grading permit, the applicant shall file a Notification of Lake or Streambed Alteration to the CDFW's Lake and Streambed Alteration Program at the Ontario office. The applicant shall coordinate with CDFW in order to provide off-site mitigation for the on-site impacts. Mitigation shall be located off-site because of the limitations on the project site. Specifically, the applicant shall coordinate with the Elsinore Murrieta-Anza Resources Conservation District (EMARCD) to restore and enhance riparian/riverine habitat along existing drainages on a mitigation site owned by EMARCD. Mitigation shall be at a rate of 2:1 and approximately 10,000 square feet of riparian/riverine habitat shall be restored and enhanced. A detailed restoration plan shall be prepared for approval by the City and the resources agencies. The plan shall provide a schedule for site preparation and planting, and shall include a set of performance criteria for percent cover, density, and seed production within the mitigation area. This mitigation measure will ensure a no net loss of riparian/riverine habitat as required under the Multiple Species Habitat Conservation Plan.

Timing/Implementation: Prior to the issuance of a grading permit

Enforcement/Monitoring: City of Wildomar Planning Department

Level of Significance After Mitigation

Less than significant impact.”

Section 3.11, Noise**Page 3.11-16**

Mitigation measure NIO-1 has been modified to reflect on-site interior noise levels during operation of the project.

“Mitigation Measures

MM NOI-1 The developer shall implement all of the following mitigation measures as needed to achieve on-site operational interior noise levels of 45 dBA CNEL at 1st and 2nd story units proposed adjacent to Prielipp Road:

- a. Air conditioning or mechanical ventilation.
- b. Double-paned glass.
- c. Solid core doors with weather stripping and seals.
- d. Stucco or brick veneer exterior walls or wood siding w/one-half inch thick fiberboard under-layer.
- e. Glass portions of windows/doors not to exceed 20 percent.
- f. Exterior vents facing noise source shall be baffled.”

Page 3.11-19

The project’s construction hours have been modified to reflect the City of Wildomar Municipal Code Section 9.48.020, Exemptions.

“MM NOI-8 The construction contractor shall ensure that all on-site noise producing construction activities shall be limited to between the hours of 6:00 a.m. and 6:00 p.m. during the months of June through September or between the hours of ~~6~~7:00 a.m. and ~~7~~6:00 p.m. during the months of October through May.

Timing/Implementation: As a condition of project approval, and implemented during construction

Enforcement/Monitoring: City of Wildomar Building & Safety and Planning Departments”

Page 3.11-23

The project’s construction noise impacts are further clarified to be exempt from the Noise Ordinance 9.48.040. The additional clarification has been incorporated, below.

“According to the thresholds of significance, substantial permanent increase in ambient noise levels for stationary noise sources is defined as an increase of 5 dBA or greater. ~~However, the significance criteria do not define what a substantial temporary or periodic increase in noise levels would be. The EIR prepared for the City's General Plan (2008) indicates that construction noise has the potential to significantly impact off-site sensitive receptors, but that compliance with the City's noise~~

~~ordinance construction hours would be required to reduce construction-related noise impacts to a less than significant level.~~

Specifically, the City of Wildomar General Plan does not set standards for temporary noise impacts like construction. Chapter 9.48 of the Wildomar Municipal Code includes noise standards in addition to the standards contained in the General Plan, but Municipal Code Section 9.48.010 specifically states that the noise standards contained in that chapter are not thresholds of significance for the purposes of CEQA review. In addition, Wildomar Municipal Code Section 9.48.020(I) states that noise emanating from private construction projects located within one-quarter of a mile from an inhabited dwelling is exempt from the noise ordinance, provided that construction does not occur between the hours of 6:00 p.m. and 6:00 a.m. during the months of June through September and between the hours of 6:00 p.m. and 7:00 a.m. during the months of October through May.

To determine a threshold for construction noise, worker noise safety standards of other agencies were reviewed. The rationale is that if a maximum construction noise level is generally safe for construction workers who are exposed to the noise all day, then the noise level should be also be safe for adjacent residents who are typically farther from the noise source and exposed only briefly during the day. Noise standards from the California Department of Transportation (Caltrans), the American National Standards Institute (ANSI), the American Conference of Governmental Industrial Hygienists (ACGIH), the Federal Railroad Administration (FRA), and the California Department of Industrial Relations (DIR) were reviewed. Their limits are as follows:

Caltrans Standard Specifications Section 14-8

Do not exceed 86 dBA LMax at 50 feet from the job site activities from 9 p.m. to 6 a.m.

The American National Standards Institute

A10.46-2007, Hearing Loss Prevention in Construction and Demolition Workers. Applies to all construction and demolition workers with potential noise exposures (continuous, intermittent, and impulse) of 85 dBA and above.

The American Conference of Governmental Industrial Hygienists

The ACGIH has established exposure guidelines for occupational exposure to noise in its Threshold Limit Values (TLVs) (85 dBA PEL with a 3 dBA exchange rate).

Federal Railroad Administration

49 CFR 227, Occupational Noise Exposure for Railroad Operating Employees. Requires railroads to conduct noise monitoring and implement a hearing conservation program for employees whose exposure to cab noise equals or exceeds an 8-hour time-weighted-average of 85 dBA. This final rule became effective February 26, 2007.

California Department of Industrial Relations

Employers shall make hearing protectors available to all employees exposed to an 8-hour time-weighted average of 85 decibels or greater at no cost to the employees. Hearing protectors shall be replaced as necessary. The DIR also establishes time-based exposure limits to different noise levels; however, their table starts at the 90 dBA level.

The policies and guidelines above suggest 85 dBA is a reasonable threshold of noise exposure for construction workers. It should be noted that this threshold is based on worker protection, which assumes continuous exposure for the worker. Construction activities would be intermittent and temporary, and it is unlikely that a noise-sensitive receptor would be exposed to construction-related noise levels above 85 dBA continuously for the length of the project's construction. For purposes of this EIR, the City has determined that exposure of noise-sensitive receptors to construction noise levels above 85 dBA would result in a potentially significant impact.

As outlined within the Noise Impact Analysis (Page 21), construction noise is exempt from the Noise Ordinance 9.48.040 as long as it does not occur between the hours of 6:00 PM and 6:00 AM during the months of June through September or between the hours of 6:00 PM and 7:00 AM during the months of October through May. Project construction will adhere to these hours of operation as outlined within mitigation measure NOI-8. Project construction noise would further reduced with implementation of construction with the incorporation of mitigation measures NOI-3 through NIO-8. Therefore, adherence to City standards for hours of construction would be required and would reduce construction related impacts. Mitigation Measures NOI-3 through NOI-8 (see Impact NOI-2) will require compliance with restrictions on permissible hours of noise producing construction activity, as well as implementation of construction noise reducing best management practices would reduce construction noise impacts to levels of less than significant.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

MM NOI-3 through MM NOI-8 are required.

Level of Significance After Mitigation

Less than significant impact with mitigation incorporated."

Section 3.15, Traffic and Transportation

Page 3.15-13

CalTrans recommended including a ramp merge/diverge analysis at the northbound and southbound directions of the 1-15 and Clinton Keith Road interchange to determine impacts of the development at these locations, if any. CalTrans also recommended including a ramp intersection analysis at the northbound and southbound directions of the 1-15 and Clinton Keith Road interchange. A ramp merge/diverge and an operational analysis has been conducted for the I-15/Clinton Keith Road interchange. Based on the analysis, the ramps and intersections are anticipated to operate at acceptable levels of service during the peak hours for future conditions with the proposed project.

“Existing plus Project Conditions

For existing plus project traffic conditions, the study area intersections are projected to continue to operate at an acceptable LOS during the peak-hours with existing geometry. Refer to Exhibit 3.15-3, which shows the existing plus project trip distribution. Table 3.1-1 shows the intersection analysis for existing plus project conditions.

Table 3.1-1: Intersection Analysis for Existing Plus Project Conditions

Intersection	Delay (seconds)		LOS	
	AM	PM	AM	PM
1. Inland Valley Drive/Clinton Keith Road	17.6	21.8	B	C
2. Inland Valley Drive/Prielipp Road	9.9	13.9	A	B
3. Yamas Drive/Prielipp Road	11.0	11.5	B	B
4. Elizabeth Lane/Clinton Keith Road	17.4	27.4	C	D
5. Elizabeth Lane/Prielipp Road	11.5	12.9	B	B
6. Project main driveway - Gables Oak Creek driveway/Prielipp Road	10.7	11.3	B	B
7. Nutmeg Street/Jackson Avenue	28.2	27.6	C	C
Note: LOS=level of service Source: Trames Solutions, Inc. 2015.				

As shown in Table 3.1-1, the study area intersections are projected to operate at an acceptable LOS (LOS D or better) during the peak-hours.

Ramp Merge/Diverge and Ramp Intersection

The following ramp merge/diverge and ramp intersection conclusions are based on the ramp merge/diverge and ramp intersection analysis located within Appendix A of this FEIR, and is for the northbound and southbound directions of the 1-15 and Clinton Keith Road interchange.

Existing Conditions

For existing conditions (based on 2014 counts), the intersections are operating at LOS B and the ramps are operating at LOS C or better. See Tables 1 and 2 within Appendix A.

Existing Plus Project Conditions

For existing plus project conditions, the intersections are operating at LOS B and the ramps are operating at LOS C or better. See Tables 3 and 4 within Appendix A.

Existing Plus Ambient Plus Cumulative Conditions

For existing plus ambient plus cumulative conditions, the intersections are operating at LOS C or better and the ramps are operating at LOS D or better. See Tables 5 and 6 within Appendix A.

Existing Plus Ambient Plus Cumulative Plus Project Conditions

For existing plus ambient plus cumulative plus project conditions, the intersections are operating at LOS C or better and the ramps are operating at LOS D or better. See Tables 7 and 8 within Appendix A."

Section 5, Alternatives**Page 5-4 through 5-5**

The No Project Alternative's Agricultural and Traffic impacts are further clarified to be consistent with determinations outlined in the Draft EIR. The additional clarification has been incorporated, below.

5.4 "Alternative 1: No Project Alternative

CEQA Guidelines Section 15126.6(e) requires the discussion and evaluation of a No Project Alternative. The No Project Alternative provides a comparison between the environmental impacts of the project in contrast to the environmental impacts that could result from not approving, or denying, the project. Under the No Project Alternative, the site would remain in its existing condition, and no development would occur.

Impacts from the project are compared with the No Project Alternative for each of the 17 topical issue areas discussed in the EIR in the sections that follow.

Table 3-2: Alternatives Comparison

Environmental Issue	Proposed Project	Alternative 1: No Project Alternative	Alternative 2: Reduced Density Alternative	Alternative 3: Reduced Size Alternative
Aesthetics	LTS	L	E	G
Agriculture and Forestry Resources	W LTS w/mit	L	E	E
Air Quality	LTS	L	L	E
Biological Resources	LTS w/mit	L	E	E
Cultural Resources	LTS w/mit	L	E	E
Geology and Soils	LTS w/mit	L	E	E
Greenhouse Gas Emissions	LTS	L	L	E
Hazards and Hazardous Materials	LTS w/mit	L	E	E
Hydrology and Water Quality	LTS w/mit	L	L	L
Land Use and Planning	LTS	L	E	E
Mineral Resources	LTS	E	E	E
Noise	LTS w/mit	L	L	E

Population and Housing	LTS	L	L	E
Public Services	LTS	L	L	E
Recreation	LTS	L	L	L
Transportation and Traffic	SIG	L	L	E
Utilities and Service Systems	LTS	L	L	E
Notes: L = Lesser impact than the proposed project G = Greater impact than the proposed project LTS = Less than significant LTS w/mit= Less than significant with mitigation Source: FCS, 2014. E = Equivalent impact to the proposed project SIG = Significant, adverse and unavoidable NI = No impact				

5.4.1 Aesthetics, Light, and Glare

The EIR concluded that aesthetics and light and glare impacts would be less than significant. The No Project Alternative would allow the site to remain in its current condition. Therefore, the No Project Alternative would have reduced impacts on aesthetics, light, and glare compared with the project, although impacts under the project would also be less than significant.

5.4.2 Agricultural Resources and Forestry Resources

Under the No Project Alternative, the site would remain in its present condition, and there would be no impacts related to agricultural or forestry resources. The Draft EIR determined that the project would have a potentially significant no impacts on agricultural resources, and no impacts to forestry resources. Therefore, impacts in these areas under the No Project Alternative would be the same as what would have reduced impacts on agricultural resources compared with the proposed project, and the same impacts to forestry resources as would occur under the proposed project.

Page 5-8

The No Project Alternative's Traffic impacts are further clarified to be consistent with determinations outlined in the Draft EIR. The additional clarification has been incorporated, below.

5.4.15 "Transportation and Traffic

The No Project Alternative would allow the site to remain in its present condition, resulting in no added traffic impacts on local roads and the I-15 Freeway. The Draft EIR determined that the transportation impacts of the project could be reduced to less than significant levels with implementation of recommended mitigation measures. In addition, there would be a less than significant cumulative traffic impact from the proposed project, because under the Existing + Ambient + Cumulative + Project (2015) traffic conditions, there are no new intersections anticipated to operate at an unacceptable levels of service in addition to the deficient location (Elizabeth Lane (NS)/Clinton Keith Road (EW)) identified under Existing + Ambient + Cumulative (2015) traffic conditions. However, the City cannot be certain that the other projects shown in Table 3.15-6 will be built and that others will pay to address their impacts at the intersection of Elizabeth Lane/Clinton Keith Road. Without certain funding, the City cannot guarantee that the proposed improvement will

be constructed as proposed by MM TRANS-1. Because the City cannot be certain that the improvements will occur, the EIR must assume that the improvement may not occur and that the project impacts would remain as shown in Table 3.15-8. As shown in Table 3.15-8, the intersection analysis for Cumulative 2015 with Project would result in a significant impact to the intersection of Elizabeth Lane/Clinton Keith Road. While the City will collect fees representing the proportionate share of the proposed project's impact at the intersection identified in MM TRANS-1, for the reasons explained in this section, this impact remains significant and unavoidable. The No Project Alternative would avoid the significant traffic impacts that would occur under the proposed project. Therefore, this alternative would not have significant traffic impacts."

Page 5-9

The Reduced Density Alternative's Agricultural impacts are further clarified to be consistent with determinations outlined in the Draft EIR. The additional clarification has been incorporated, below.

4.2 "Alternative 2: Reduced Density Alternative"

Impacts from the project are compared with the Reduced Density Alternative for each of the 17 topical issue areas discussed in the EIR in the sections that follow.

4.2.1 Aesthetics, Light, and Glare

The EIR concluded that the proposed project's aesthetics and light and glare impacts would be less than significant. Under the Reduced Density Alternative, fewer but larger dwelling units are proposed, and the building configurations and lot coverage would remain roughly the same as the proposed project. The Reduced Density Alternative would require less parking than the proposed project, and some of the parking area would instead be dedicated to additional landscaped/open space area. Therefore, the Reduced Density Alternative would have roughly equal impacts on aesthetics, light, and glare compared with the project, which would be less than significant.

4.2.2 Agricultural Resources and Forestry Resources

Under the Reduced Density Alternative, fewer but larger dwelling units are proposed, and the building configurations and lot coverage would remain roughly the same as under the proposed project. Under this alternative, there would be ~~no~~ potentially significant impacts related to ~~agricultural or forestry resources~~ and ~~no impact to forestry resources~~. Likewise, the Draft EIR determined that the project would have no impacts on agricultural resources, and ~~no impacts to~~ potentially significant impacts related to forestry resources. Therefore, impacts in these areas under the Reduced Density Alternative would be the same as what would occur under the proposed project."

Page 5-13 through 5-14

The Reduced Size Alternative's Agricultural impacts are further clarified to be consistent with determinations outlined in the Draft EIR. The additional clarification has been incorporated, below.

5.6 “Alternative 3: Reduced Size Alternative

Impacts from the project are compared with the Reduced Size Alternative for each of the 17 topical issue areas discussed in the EIR in the sections that follow.

5.6.1 Aesthetics, Light, and Glare

The EIR concluded that aesthetics and light and glare impacts would be less than significant under the proposed project. Under the Reduced Size Alternative, the same number of dwelling units would be contained in fewer buildings, resulting in less lot coverage compared with the proposed project. The Reduced Size Alternative would allow development on the project site, but in a design that would result in taller, buildings being developed than would occur under the proposed project. Greater aesthetic and view impacts would be anticipated under this scenario because of the increased building heights of 4 to 5 stories. Therefore, the Reduced Size Alternative would have greater aesthetic impacts compared with the project.

5.6.2 Agricultural Resources and Forestry Resources

Under the Reduced Size Alternative, the same number of dwelling units would be contained in fewer, taller buildings, resulting in less lot coverage compared with the proposed project. The Draft EIR determined that the project would have ~~no impacts on~~ potentially significant impacts on agricultural resources, and no impacts to forestry resources. Therefore, impacts in these areas under the Reduced Size Alternative would be the same as what would occur under the proposed project.”

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Appendix A: Villa Siena Supplemental Traffic Analysis

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June 15, 2015

Mr. James C. Kieckhafer
Golden Eagle Multi-Family Properties, LLC.
6201 Oak Canyon, Suite 250
Irvine, CA 92618

Subject: Villa Siena Supplemental Traffic Analysis (JN 0201-0001)

Dear Mr. Kieckhafer:

Trames Solutions Inc. is pleased to submit the following response to comments for the Villa Siena project traffic study. The comments were provided by Caltrans in their May 28, 2015 letter. The pertinent comments are provided below followed by our responses.

Comment 1

Please include ramp merge/diverge analysis at the northbound and southbound directions of the I-15 and Clinton Keith Road interchange to determine impacts of the development at these locations, if any.

Please include ramp intersection analysis at the northbound and southbound directions of the I-15 and Clinton Keith Road interchange.

Response 1

A ramp merge/diverge and an operational analysis has been conducted for the I-15/Clinton Keith Road interchange. Based on the analysis, the ramps and intersections are anticipated to operate at acceptable levels of service during the peak hours for future conditions with the proposed project.

Existing Conditions

For existing conditions (based on 2014 counts), the intersections are operating at LOS B and the ramps are operating at LOS C or better. See Tables 1 and 2.

Existing Plus Project Conditions

For existing plus project conditions, the intersections are operating at LOS B and the ramps are operating at LOS C or better. See Tables 3 and 4.

Existing Plus Ambient Plus Cumulative Conditions

For existing plus ambient plus cumulative conditions, the intersections are operating at LOS C or better and the ramps are operating at LOS D or better. See Tables 5 and 6.

Existing Plus Ambient Plus Cumulative Plus Project Conditions

Mr. James C. Kieckhafer
Golden Eagle Multi-Family Properties, LLC.
June 15, 2015
Page 2

For existing plus ambient plus cumulative plus project conditions, the intersections are operating at LOS C or better and the ramps are operating at LOS D or better. See Tables 7 and 8.

If you have any questions, please contact me directly at (949) 244-2436.

Respectfully submitted,
Trames Solutions Inc.

A handwritten signature in black ink that reads "Scott Sato". The signature is written in a cursive, flowing style.

Scott Sato, P.E.
Senior Associate

Attachments

- A Traffic Counts
- B Existing Conditions Operational Analysis Worksheets
- C Existing Plus Project Operational Analysis Worksheets
- D Existing Plus Ambient Plus Cumulative Operational Analysis Worksheets
- E Existing Plus Ambient Plus Cumulative Plus Project Operational Analysis Worksheets

TABLE 1
INTERSECTION ANALYSIS FOR
EXISTING CONDITIONS

ID	Intersection	Traffic Control ¹	Intersection Approach Lanes ²												Delay ³ (secs.)		Level of Service ³	
			Northbound			Southbound			Eastbound			Westbound			AM	PM	AM	PM
			L	T	R	L	T	R	L	T	R	L	T	R				
8	I-15 SB Ramps / Clinton Keith Rd.	TS	0	0	0	1.5	0.5	2	0	3	1	2	3	0	18.1	18.1	B	B
9	I-15 NB Ramps / Clinton Keith Rd.	TS	1	1!	1	0	0	0	2	3	0	0	3	1	13.1	16.9	B	B

¹ TS = Traffic Signal; AWS = All Way Stop; CSS = Cross Street Stop

² When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; 1! = Shared Left-Through-Right Lane; 0.5 = Shared Left-Through Lane; d = Defacto

³ Delay and level of service calculated using the following analysis software: Traffix 8.0

TABLE 2
FREEWAY RAMP ANALYSIS FOR
EXISTING CONDITIONS

Freeway	Ramp Location	Lanes on Freeway ¹	Volumes		Density ²		Level of Service ³	
			AM	PM	AM	PM	AM	PM
I-15 Southbound	SB Off Ramp at Clinton Keith Road	3	688	824	20.7	18.5	C	B
	SB On Ramp at Clinton Keith Road	3	971	641	26.5	21.1	C	C
I-15 Northbound	NB Off Ramp at Clinton Keith Road	3	424	885	14.9	24.3	B	C
	NB On Ramp at Clinton Keith Road	3	769	688	20.9	26.4	C	C

¹ Existing ramp locations consist of 2 lanes (on/off ramps).

² Density is measured by passenger cars per lane (pc/mi/ln)

³ Density and level of service calculated using the following analysis software: HCS2010, Version 6.6

TABLE 3
INTERSECTION ANALYSIS FOR
EXISTING PLUS PROJECT CONDITIONS

ID	Intersection	Traffic Control ¹	Intersection Approach Lanes ²												Delay ³ (secs.)		Level of Service ³	
			Northbound			Southbound			Eastbound			Westbound			AM	PM	AM	PM
			L	T	R	L	T	R	L	T	R	L	T	R				
8	I-15 SB Ramps / Clinton Keith Rd.	TS	0	0	0	1.5	0.5	2	0	3	1	2	3	0	18.2	18.1	B	B
9	I-15 NB Ramps / Clinton Keith Rd.	TS	1	1!	1	0	0	0	2	3	0	0	3	1	13.0	16.9	B	B

¹ TS = Traffic Signal; AWS = All Way Stop; CSS = Cross Street Stop

² When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; 1! = Shared Left-Through-Right Lane; 0.5 = Shared Left-Through Lane; d = Defacto; 1 = Improvement (Project Access)

³ Delay and level of service calculated using the following analysis software: Traffix 8.0

TABLE 4
FREEWAY RAMP ANALYSIS FOR
EXISTING PLUS PROJECT CONDITIONS

Freeway	Ramp Location	Lanes on Freeway ¹	Volumes		Density ²		Level of Service ³	
			AM	PM	AM	PM	AM	PM
I-15 Southbound	SB Off Ramp at Clinton Keith Road	3	691	835	20.7	18.6	C	B
	SB On Ramp at Clinton Keith Road	3	982	647	26.6	21.1	C	C
I-15 Northbound	NB Off Ramp at Clinton Keith Road	3	427	896	14.9	24.3	B	C
	NB On Ramp at Clinton Keith Road	3	780	694	21.0	26.4	C	C

¹ Existing ramp locations consist of 2 lanes (on/off ramps).

² Density is measured by passenger cars per lane (pc/mi/ln)

³ Density and level of service calculated using the following analysis software: HCS2010, Version 6.6

TABLE 5
INTERSECTION ANALYSIS FOR
EXISTING PLUS AMBIENT PLUS CUMULATIVE CONDITIONS

ID	Intersection	Traffic Control ¹	Intersection Approach Lanes ²												Delay ³ (secs.)		Level of Service ³	
			Northbound			Southbound			Eastbound			Westbound			AM	PM	AM	PM
			L	T	R	L	T	R	L	T	R	L	T	R				
8	I-15 SB Ramps / Clinton Keith Rd.	TS	0	0	0	1.5	0.5	2	0	3	1	2	3	0	21.6	24.7	C	C
9	I-15 NB Ramps / Clinton Keith Rd.	TS	1	1!	1	0	0	0	2	3	0	0	3	1	14.5	26.9	B	C

¹ TS = Traffic Signal; AWS = All Way Stop; CSS = Cross Street Stop

² When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; 1! = Shared Left-Through-Right Lane; 0.5 = Shared Left-Through Lane; d = Defacto; 1 = Improvement

³ Delay and level of service calculated using the following analysis software: Traffix 8.0

 = Unacceptable level of service (LOS "E" or worse)

TABLE T6
FREEWAY RAMP ANALYSIS FOR
EXISTING PLUS AMBIENT PLUS CUMULATIVE CONDITIONS

Freeway	Ramp Location	Lanes on Freeway ¹	Volumes		Density ²		Level of Service ³	
			AM	PM	AM	PM	AM	PM
I-15 Southbound	SB Off Ramp at Clinton Keith Road	3	804	1,060	21.8	20.6	C	C
	SB On Ramp at Clinton Keith Road	3	1,111	870	28.0	23.3	C	C
I-15 Northbound	NB Off Ramp at Clinton Keith Road	3	534	1,123	15.8	26.0	B	C
	NB On Ramp at Clinton Keith Road	3	905	918	22.3	28.7	C	D

¹ Existing ramp locations consist of 2 lanes (on/off ramps).

² Density is measured by passenger cars per lane (pc/mi/ln)

³ Density and level of service calculated using the following analysis software: HCS2010, Version 6.6

TABLE 7
INTERSECTION ANALYSIS FOR
EXISTING PLUS AMBIENT PLUS CUMULATIVE PLUS PROJECT CONDITIONS

ID	Intersection	Traffic Control ¹	Intersection Approach Lanes ²												Delay ³ (secs.)		Level of Service ³	
			Northbound			Southbound			Eastbound			Westbound			AM	PM	AM	PM
			L	T	R	L	T	R	L	T	R	L	T	R				
8	I-15 SB Ramps / Clinton Keith Rd.	TS	0	0	0	1.5	0.5	2	0	3	1	2	3	0	21.8	24.9	C	C
9	I-15 NB Ramps / Clinton Keith Rd.	TS	1	1!	1	0	0	0	2	3	0	0	3	1	14.6	27.0	B	C

¹ TS = Traffic Signal; AWS = All Way Stop; CSS = Cross Street Stop

² When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; 1! = Shared Left-Through-Right Lane; 0.5 = Shared Left-Through Lane; d = Defacto; 1 = Improvement

³ Delay and level of service calculated using the following analysis software: Traffix 8.0

 = Unacceptable level of service (LOS "E" or worse)

TABLE 8
FREEWAY RAMP ANALYSIS FOR
EXISTING PLUS AMBIENT PLUS CUMULATIVE PLUS PROJECT CONDITIONS

Freeway	Ramp Location	Lanes on Freeway ¹	Volumes		Density ²		Level of Service ³	
			AM	PM	AM	PM	AM	PM
I-15 Southbound	SB Off Ramp at Clinton Keith Road	3	807	1,071	21.8	20.7	C	C
	SB On Ramp at Clinton Keith Road	3	1,122	876	28.1	23.3	D	C
I-15 Northbound	NB Off Ramp at Clinton Keith Road	3	537	1,134	15.9	26.1	B	C
	NB On Ramp at Clinton Keith Road	3	916	924	22.4	28.7	C	D

¹ Existing ramp locations consist of 2 lanes (on/off ramps).

² Density is measured by passenger cars per lane (pc/mi/ln)

³ Density and level of service calculated using the following analysis software: HCS2010, Version 6.6

**ATTACHMENT A
TRAFFIC COUNTS**

City of Murrieta
N/S: I-15 Southbound Ramps
E/W: Clinton Keith Road
Weather: Sunny

File Name : MUR15SCKAM
Site Code : 00000051
Start Date : 5/29/2014
Page No : 1

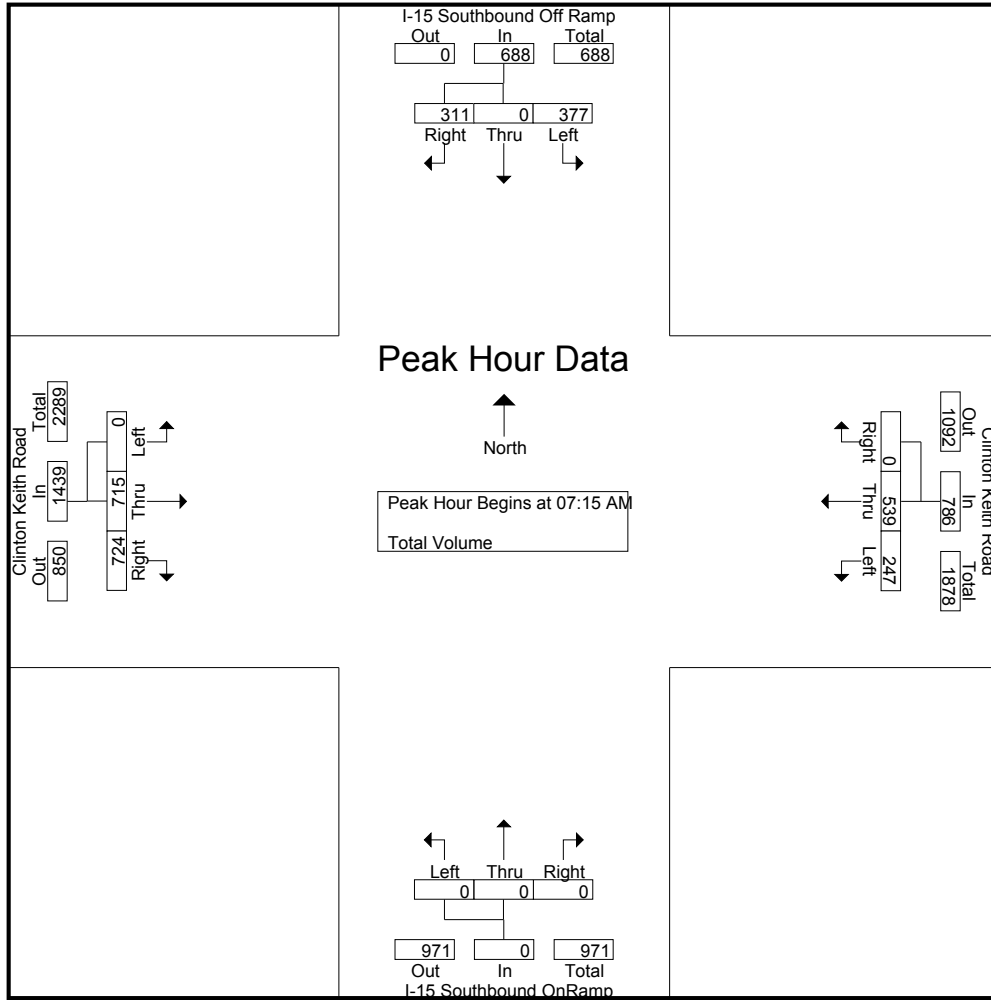
Groups Printed- Total Volume

	I-15 Southbound Off Ramp Southbound				Clinton Keith Road Westbound				I-15 Southbound OnRamp Northbound				Clinton Keith Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	53	6	67	126	45	116	0	161	0	0	0	0	0	146	109	255	542
07:15 AM	76	0	61	137	55	121	0	176	0	0	0	0	0	199	174	373	686
07:30 AM	100	0	82	182	65	129	0	194	0	0	0	0	0	181	198	379	755
07:45 AM	111	0	97	208	53	165	0	218	0	0	0	0	0	177	202	379	805
Total	340	6	307	653	218	531	0	749	0	0	0	0	0	703	683	1386	2788
08:00 AM	90	0	71	161	74	124	0	198	0	0	0	0	0	158	150	308	667
08:15 AM	82	0	56	138	54	137	0	191	0	0	0	0	0	151	144	295	624
08:30 AM	58	0	56	114	67	127	0	194	0	0	0	0	0	150	150	300	608
08:45 AM	87	0	62	149	59	129	0	188	0	0	0	0	0	143	164	307	644
Total	317	0	245	562	254	517	0	771	0	0	0	0	0	602	608	1210	2543
Grand Total	657	6	552	1215	472	1048	0	1520	0	0	0	0	0	1305	1291	2596	5331
Apprch %	54.1	0.5	45.4		31.1	68.9	0		0	0	0		0	50.3	49.7		
Total %	12.3	0.1	10.4	22.8	8.9	19.7	0	28.5	0	0	0	0	0	24.5	24.2	48.7	

	I-15 Southbound Off Ramp Southbound				Clinton Keith Road Westbound				I-15 Southbound OnRamp Northbound				Clinton Keith Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	76	0	61	137	55	121	0	176	0	0	0	0	0	199	174	373	686
07:30 AM	100	0	82	182	65	129	0	194	0	0	0	0	0	181	198	379	755
07:45 AM	111	0	97	208	53	165	0	218	0	0	0	0	0	177	202	379	805
08:00 AM	90	0	71	161	74	124	0	198	0	0	0	0	0	158	150	308	667
Total Volume	377	0	311	688	247	539	0	786	0	0	0	0	0	715	724	1439	2913
% App. Total	54.8	0	45.2		31.4	68.6	0		0	0	0		0	49.7	50.3		
PHF	.849	.000	.802	.827	.834	.817	.000	.901	.000	.000	.000	.000	.000	.898	.896	.949	.905

City of Murrieta
N/S: I-15 Southbound Ramps
E/W: Clinton Keith Road
Weather: Sunny

File Name : MUR15SCKAM
Site Code : 00000051
Start Date : 5/29/2014
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:00 AM				07:15 AM			
+0 mins.	100	0	82	182	65	129	0	194	0	0	0	0	0	199	174	373
+15 mins.	111	0	97	208	53	165	0	218	0	0	0	0	0	181	198	379
+30 mins.	90	0	71	161	74	124	0	198	0	0	0	0	0	177	202	379
+45 mins.	82	0	56	138	54	137	0	191	0	0	0	0	0	158	150	308
Total Volume	383	0	306	689	246	555	0	801	0	0	0	0	0	715	724	1439
% App. Total	55.6	0	44.4		30.7	69.3	0		0	0	0	0	0	49.7	50.3	
PHF	.863	.000	.789	.828	.831	.841	.000	.919	.000	.000	.000	.000	.000	.898	.896	.949

City of Murrieta
N/S: I-15 Southbound Ramps
E/W: Clinton Keith Road
Weather: Sunny

File Name : MUR15SCKPM
Site Code : 00000051
Start Date : 5/29/2014
Page No : 1

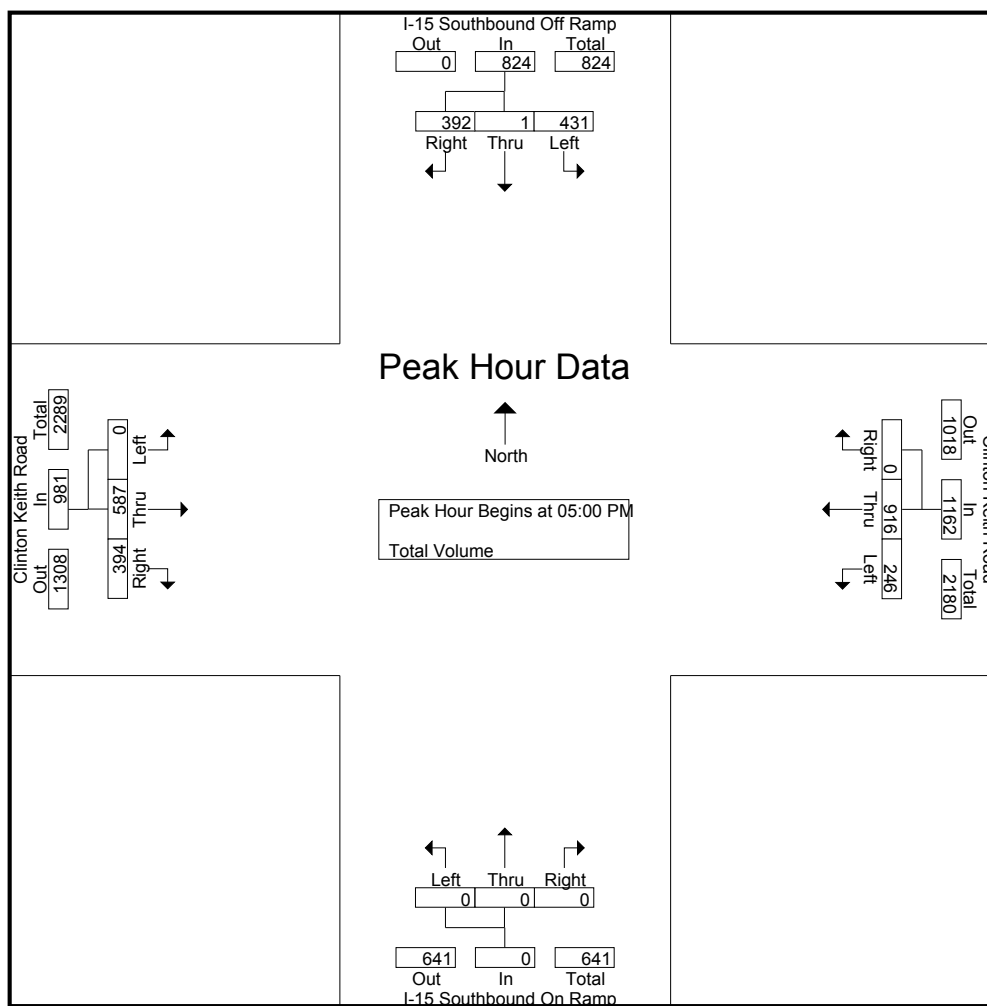
Groups Printed- Total Volume

	I-15 Southbound Off Ramp Southbound				Clinton Keith Road Westbound				I-15 Southbound On Ramp Northbound				Clinton Keith Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	94	2	104	200	65	256	0	321	0	0	0	0	0	164	98	262	783
04:15 PM	98	0	86	184	76	201	0	277	0	0	0	0	0	143	109	252	713
04:30 PM	88	1	81	170	74	215	0	289	0	0	0	0	0	153	117	270	729
04:45 PM	105	6	79	190	53	215	0	268	0	0	0	0	0	155	91	246	704
Total	385	9	350	744	268	887	0	1155	0	0	0	0	0	615	415	1030	2929
05:00 PM	107	1	100	208	66	217	0	283	0	0	0	0	0	151	101	252	743
05:15 PM	100	0	80	180	61	248	0	309	0	0	0	0	0	131	111	242	731
05:30 PM	102	0	107	209	55	230	0	285	0	0	0	0	0	164	89	253	747
05:45 PM	122	0	105	227	64	221	0	285	0	0	0	0	0	141	93	234	746
Total	431	1	392	824	246	916	0	1162	0	0	0	0	0	587	394	981	2967
06:00 PM	102	0	107	209	59	202	0	261	0	0	0	0	0	144	87	231	701
06:15 PM	114	1	81	196	56	191	0	247	0	0	0	0	0	131	78	209	652
06:30 PM	93	0	70	163	35	192	4	231	0	0	0	0	0	162	95	257	651
06:45 PM	110	1	78	189	37	206	0	243	0	0	0	0	0	136	108	244	676
Total	419	2	336	757	187	791	4	982	0	0	0	0	0	573	368	941	2680
Grand Total	1235	12	1078	2325	701	2594	4	3299	0	0	0	0	0	1775	1177	2952	8576
Apprch %	53.1	0.5	46.4		21.2	78.6	0.1		0	0	0		0	60.1	39.9		
Total %	14.4	0.1	12.6	27.1	8.2	30.2	0	38.5	0	0	0	0	0	20.7	13.7	34.4	

	I-15 Southbound Off Ramp Southbound				Clinton Keith Road Westbound				I-15 Southbound On Ramp Northbound				Clinton Keith Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 06:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	107	1	100	208	66	217	0	283	0	0	0	0	0	151	101	252	743
05:15 PM	100	0	80	180	61	248	0	309	0	0	0	0	0	131	111	242	731
05:30 PM	102	0	107	209	55	230	0	285	0	0	0	0	0	164	89	253	747
05:45 PM	122	0	105	227	64	221	0	285	0	0	0	0	0	141	93	234	746
Total Volume	431	1	392	824	246	916	0	1162	0	0	0	0	0	587	394	981	2967
% App. Total	52.3	0.1	47.6		21.2	78.8	0		0	0	0		0	59.8	40.2		
PHF	.883	.250	.916	.907	.932	.923	.000	.940	.000	.000	.000	.000	.000	.895	.887	.969	.993

City of Murrieta
N/S: I-15 Southbound Ramps
E/W: Clinton Keith Road
Weather: Sunny

File Name : MUR15SCKPM
Site Code : 00000051
Start Date : 5/29/2014
Page No : 2



Peak Hour Analysis From 04:00 PM to 06:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:30 PM				05:00 PM				04:00 PM				04:00 PM			
+0 mins.	102	0	107	209	66	217	0	283	0	0	0	0	0	164	98	262
+15 mins.	122	0	105	227	61	248	0	309	0	0	0	0	0	143	109	252
+30 mins.	102	0	107	209	55	230	0	285	0	0	0	0	0	153	117	270
+45 mins.	114	1	81	196	64	221	0	285	0	0	0	0	0	155	91	246
Total Volume	440	1	400	841	246	916	0	1162	0	0	0	0	0	615	415	1030
% App. Total	52.3	0.1	47.6		21.2	78.8	0		0	0	0		0	59.7	40.3	
PHF	.902	.250	.935	.926	.932	.923	.000	.940	.000	.000	.000	.000	.000	.938	.887	.954

City of Murrieta
N/S: I-15 Northbound Ramps
E/W: Clinton Keith Road
Weather: Sunny

File Name : MUR15NCKAM
Site Code : 00000053
Start Date : 5/29/2014
Page No : 1

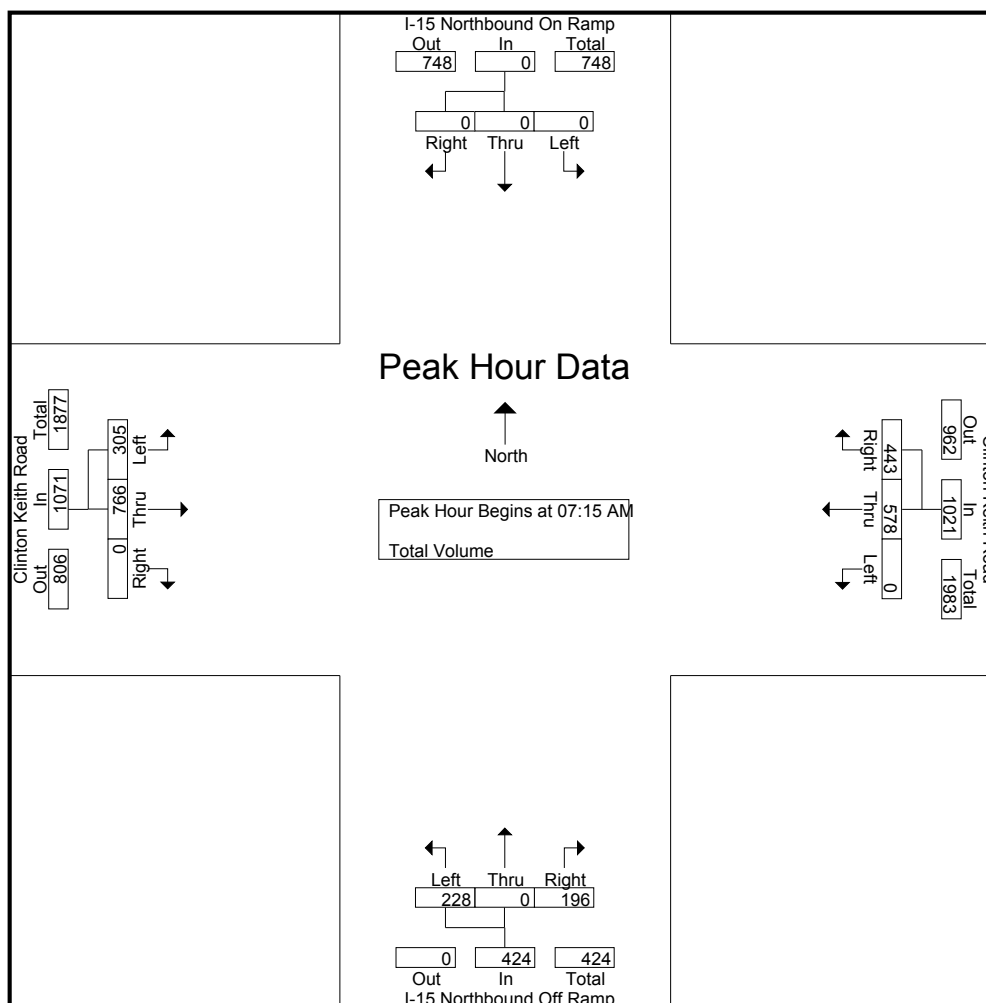
Groups Printed- Total Volume

	I-15 Northbound On Ramp Southbound				Clinton Keith Road Westbound				I-15 Northbound Off Ramp Northbound				Clinton Keith Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	130	106	236	44	0	42	86	78	143	0	221	543
07:15 AM	0	0	0	0	0	132	130	262	53	0	37	90	92	157	0	249	601
07:30 AM	0	0	0	0	0	148	110	258	43	0	55	98	73	202	0	275	631
07:45 AM	0	0	0	0	0	156	98	254	79	0	56	135	67	230	0	297	686
Total	0	0	0	0	0	566	444	1010	219	0	190	409	310	732	0	1042	2461
08:00 AM	0	0	0	0	0	142	105	247	53	0	48	101	73	177	0	250	598
08:15 AM	0	0	0	0	0	145	98	243	58	0	58	116	60	178	0	238	597
08:30 AM	0	0	0	0	0	128	95	223	58	0	64	122	81	139	0	220	565
08:45 AM	0	0	0	0	0	113	103	216	80	0	68	148	67	168	0	235	599
Total	0	0	0	0	0	528	401	929	249	0	238	487	281	662	0	943	2359
Grand Total	0	0	0	0	0	1094	845	1939	468	0	428	896	591	1394	0	1985	4820
Apprch %	0	0	0		0	56.4	43.6		52.2	0	47.8		29.8	70.2	0		
Total %	0	0	0	0	0	22.7	17.5	40.2	9.7	0	8.9	18.6	12.3	28.9	0	41.2	

	I-15 Northbound On Ramp Southbound				Clinton Keith Road Westbound				I-15 Northbound Off Ramp Northbound				Clinton Keith Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	0	0	0	132	130	262	53	0	37	90	92	157	0	249	601
07:30 AM	0	0	0	0	0	148	110	258	43	0	55	98	73	202	0	275	631
07:45 AM	0	0	0	0	0	156	98	254	79	0	56	135	67	230	0	297	686
08:00 AM	0	0	0	0	0	142	105	247	53	0	48	101	73	177	0	250	598
Total Volume	0	0	0	0	0	578	443	1021	228	0	196	424	305	766	0	1071	2516
% App. Total	0	0	0		0	56.6	43.4		53.8	0	46.2		28.5	71.5	0		
PHF	.000	.000	.000	.000	.000	.926	.852	.974	.722	.000	.875	.785	.829	.833	.000	.902	.917

City of Murrieta
N/S: I-15 Northbound Ramps
E/W: Clinton Keith Road
Weather: Sunny

File Name : MUR15NCKAM
Site Code : 00000053
Start Date : 5/29/2014
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:15 AM				08:00 AM				07:15 AM			
+0 mins.	0	0	0	0	0	132	130	262	53	0	48	101	92	157	0	249
+15 mins.	0	0	0	0	0	148	110	258	58	0	58	116	73	202	0	275
+30 mins.	0	0	0	0	0	156	98	254	58	0	64	122	67	230	0	297
+45 mins.	0	0	0	0	0	142	105	247	80	0	68	148	73	177	0	250
Total Volume	0	0	0	0	0	578	443	1021	249	0	238	487	305	766	0	1071
% App. Total	0	0	0	0	0	56.6	43.4		51.1	0	48.9		28.5	71.5	0	
PHF	.000	.000	.000	.000	.000	.926	.852	.974	.778	.000	.875	.823	.829	.833	.000	.902

City of Murrieta
N/S: I-15 Northbound Ramps
E/W: Clinton Keith Road
Weather: Sunny

File Name : MUR15NCKPM
Site Code : 00000051
Start Date : 5/29/2014
Page No : 1

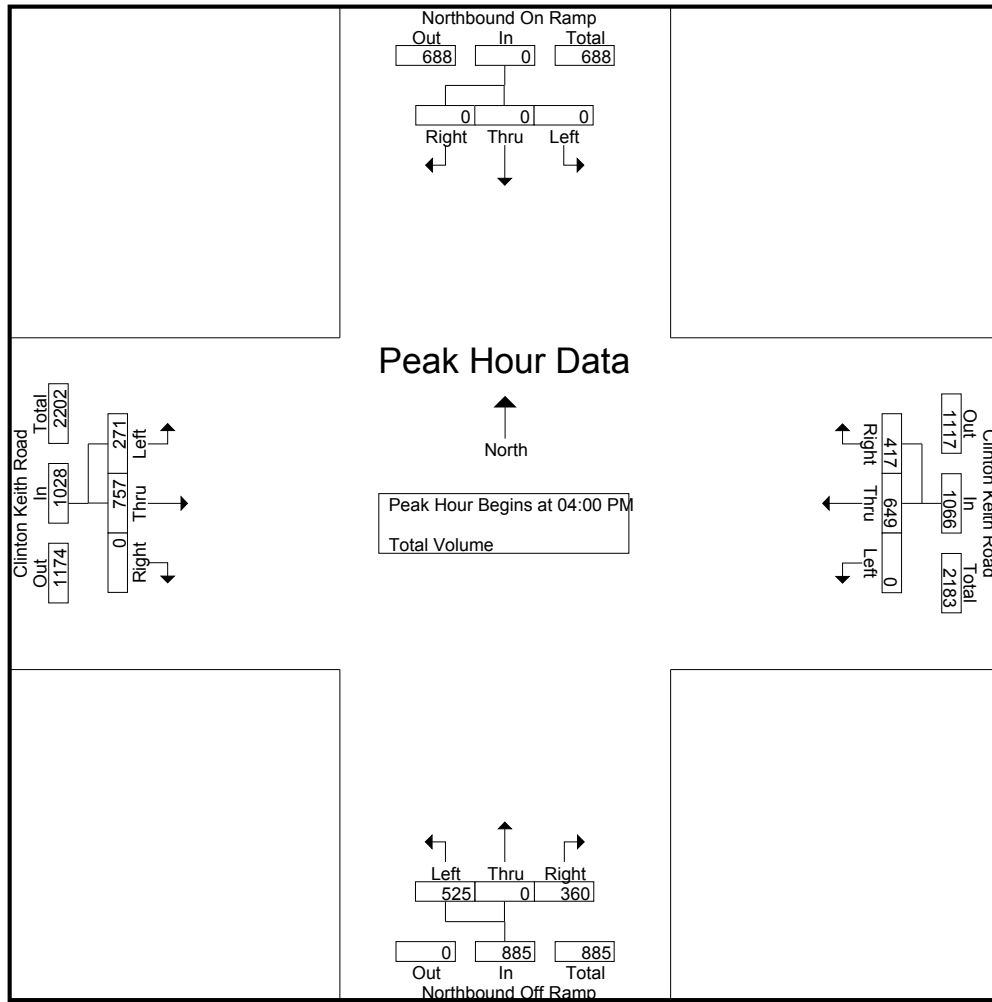
Groups Printed- Total Volume

Start Time	Northbound On Ramp Southbound				Clinton Keith Road Westbound				Northbound Off Ramp Northbound				Clinton Keith Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	0	0	0	0	175	110	285	149	0	82	231	77	181	0	258	774
04:15 PM	0	0	0	0	0	158	106	264	121	0	89	210	57	194	0	251	725
04:30 PM	0	0	0	0	0	168	96	264	134	0	94	228	61	177	0	238	730
04:45 PM	0	0	0	0	0	148	105	253	121	0	95	216	76	205	0	281	750
Total	0	0	0	0	0	649	417	1066	525	0	360	885	271	757	0	1028	2979
05:00 PM	0	0	0	0	0	164	118	282	133	0	70	203	64	192	0	256	741
05:15 PM	0	0	0	0	0	175	108	283	128	0	90	218	59	181	0	240	741
05:30 PM	0	0	0	0	0	154	107	261	134	0	88	222	60	203	0	263	746
05:45 PM	0	0	0	0	0	131	96	227	126	0	72	198	55	205	0	260	685
Total	0	0	0	0	0	624	429	1053	521	0	320	841	238	781	0	1019	2913
06:00 PM	0	0	0	0	0	134	86	220	100	0	95	195	45	192	0	237	652
06:15 PM	0	0	0	0	0	119	96	215	147	0	80	227	61	185	0	246	688
06:30 PM	0	0	0	0	0	119	100	219	127	0	86	213	49	182	0	231	663
06:45 PM	0	0	0	0	0	123	82	205	120	0	92	212	51	181	0	232	649
Total	0	0	0	0	0	495	364	859	494	0	353	847	206	740	0	946	2652
Grand Total	0	0	0	0	0	1768	1210	2978	1540	0	1033	2573	715	2278	0	2993	8544
Apprch %	0	0	0		0	59.4	40.6		59.9	0	40.1		23.9	76.1	0		
Total %	0	0	0		0	20.7	14.2	34.9	18	0	12.1	30.1	8.4	26.7	0	35	

	Northbound On Ramp Southbound				Clinton Keith Road Westbound				Northbound Off Ramp Northbound				Clinton Keith Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 06:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	175	110	285	149	0	82	231	77	181	0	258	774
04:15 PM	0	0	0	0	0	158	106	264	121	0	89	210	57	194	0	251	725
04:30 PM	0	0	0	0	0	168	96	264	134	0	94	228	61	177	0	238	730
04:45 PM	0	0	0	0	0	148	105	253	121	0	95	216	76	205	0	281	750
Total Volume	0	0	0	0	0	649	417	1066	525	0	360	885	271	757	0	1028	2979
% App. Total	0	0	0		0	60.9	39.1		59.3	0	40.7		26.4	73.6	0		
PHF	.000	.000	.000	.000	.000	.927	.948	.935	.881	.000	.947	.958	.880	.923	.000	.915	.962

City of Murrieta
N/S: I-15 Northbound Ramps
E/W: Clinton Keith Road
Weather: Sunny

File Name : MUR15NCKPM
Site Code : 00000051
Start Date : 5/29/2014
Page No : 2



Peak Hour Analysis From 04:00 PM to 06:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:30 PM				04:00 PM				04:45 PM			
+0 mins.	0	0	0	0	0	168	96	264	149	0	82	231	76	205	0	281
+15 mins.	0	0	0	0	0	148	105	253	121	0	89	210	64	192	0	256
+30 mins.	0	0	0	0	0	164	118	282	134	0	94	228	59	181	0	240
+45 mins.	0	0	0	0	0	175	108	283	121	0	95	216	60	203	0	263
Total Volume	0	0	0	0	0	655	427	1082	525	0	360	885	259	781	0	1040
% App. Total	0	0	0	0	0	60.5	39.5		59.3	0	40.7		24.9	75.1	0	
PHF	.000	.000	.000	.000	.000	.936	.905	.956	.881	.000	.947	.958	.852	.952	.000	.925

Caltrans Performance Measurement System (PeMS)
Freeway Mainline Volumes

I-15 Southbound, North of Clinton Keith Road

DAILY				Data Quality	
Time	5/27/2014	5/28/2014	5/29/2014	# Lane Points	% Observed
0:00	572	548	566	108	100.0
1:00	317	373	335	108	100.0
2:00	261	303	281	108	100.0
3:00	376	403	388	108	100.0
4:00	1041	1023	950	108	100.0
5:00	2318	2308	2226	108	100.0
6:00	3196	3279	3063	108	100.0
7:00	4280	4313	4404	108	100.0
8:00	4147	4090	3977	108	100.0
9:00	3501	3608	3443	108	100.0
10:00	3346	3138	3322	108	100.0
11:00	3335	3266	3250	108	100.0
12:00	3099	3276	3373	108	100.0
13:00	3191	3399	3450	108	100.0
14:00	3939	3731	4225	108	92.0
15:00	3879	3849	4056	108	100.0
16:00	3656	4005	3647	108	100.0
17:00	3828	3842	3724	108	100.0
18:00	3383	3468	3518	108	100.0
19:00	2581	2580	2813	108	100.0
20:00	2020	2302	2553	108	100.0
21:00	1611	1738	2094	108	100.0
22:00	1184	1379	1625	108	100.0
23:00	837	927	989	108	100.0
Total	59,898	61,148	62,272	2,592	99.7

Daily Peak	62,272	5/29/2014
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PEAK HOUR				Data Quality	
Time	Minimum	Mean	Maximum	# Lane Points	% Observed
7:00	4280	4332.33	4404	108	100.0
8:00	3977	4071.33	4147	108	100.0
9:00	3443	3517.33	3608	108	100.0
16:00	3647	3769.33	4005	108	100.0
17:00	3724	3798	3842	108	100.0
18:00	3383	3456.33	3518	108	100.0

AM Peak	4,404	7:00
PM Peak	4,005	16:00

I-15 Northbound, South of Clinton Keith Road

DAILY				Data Quality	
Time	5/27/2014	5/28/2014	5/29/2014	# Lane Points	% Observed
0:00	753	558	664	108	100.0
1:00	493	389	447	108	100.0
2:00	488	366	414	108	100.0
3:00	723	593	648	108	100.0
4:00	1541	1280	1323	108	100.0
5:00	1928	1829	1726	108	100.0
6:00	2588	2500	2532	108	100.0
7:00	2902	2932	2884	108	100.0
8:00	2939	3007	3052	108	100.0
9:00	3359	3190	3220	108	100.0
10:00	3337	3175	3281	108	100.0
11:00	3279	3270	3434	108	100.0
12:00	3565	3346	3495	108	100.0
13:00	3669	3599	3808	108	100.0
14:00	3736	3972	3940	108	92.0
15:00	4589	4708	4730	108	100.0
16:00	4843	4835	4744	108	100.0
17:00	5035	5002	4903	108	100.0
18:00	3704	3889	4247	108	100.0
19:00	2699	2714	2952	108	100.0
20:00	2275	2364	2471	108	100.0
21:00	1826	1969	2118	108	100.0
22:00	1330	1383	1520	108	100.0
23:00	823	1007	928	108	100.0
Total	62,424	61,877	63,481	2,592	99.7

Daily Peak	63,481	5/29/2014
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PEAK HOUR				Data Quality	
Time	Minimum	Mean	Maximum	# Lane Points	% Observed
7:00	2884	2906	2932	108	100.0
8:00	2939	2999.33	3052	108	100.0
9:00	3190	3256.33	3359	108	100.0
16:00	4744	4807.33	4843	108	100.0
17:00	4903	4980	5035	108	100.0
18:00	3704	3946.67	4247	108	100.0

AM Peak	3,359	9:00
PM Peak	5,035	17:00

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FREEWAY TO RAMP AM PEAK HOUR VOLUMES

I-15 Southbound						
Location	Existing Total	Project Total	E+P Total	Cumulative Total	EAC (2015) Total	EACP (2015) Total
N of Clinton Keith	4,404	3	4,407	102	4,594	4,597
Off-Ramp	688	3	691	102	804	807
Between	3,716	0	3,716	0	3,790	3,790
On-Ramp	971	11	982	121	1,111	1,122
S of Clinton Keith	4,687	11	4,698	121	4,901	4,912
I-15 Northbound						
Location	Existing Total	Project Total	E+P Total	Cumulative Total	EAC (2015) Total	EACP (2015) Total
S of Clinton Keith	3,359	3	3,362	102	3,528	3,531
Off-Ramp	424	3	427	102	534	537
Between	2,935	0	2,935	0	2,994	2,994
On-Ramp	769	11	780	121	905	916
N of Clinton Keith	3,704	11	3,715	121	3,899	3,910

Note: Freeway Mainline Truck %: 8.7 - Based on 2012 Annual Average Daily Truck Traffic (Source: Caltrans)

XX = PeMS Data for Week of May 27-29, 2014 (consistent with daily count data).

XX = Flow Conserved Volumes.

FREEWAY TO RAMP PM PEAK HOUR VOLUMES

I-15 Southbound						
Location	Existing Total	Project Total	E+P Total	Cumulative Total	EAC (2015) Total	EACP (2015) Total
N of Clinton Keith	4,005	11	4,016	220	4,305	4,316
Off-Ramp	824	11	835	220	1,060	1,071
Between	3,181	0	3,181	0	3,245	3,245
On-Ramp	641	6	647	216	870	876
S of Clinton Keith	3,822	6	3,828	216	4,115	4,121
I-15 Northbound						
Location	Existing Total	Project Total	E+P Total	Cumulative Total	EAC (2015) Total	EACP (2015) Total
S of Clinton Keith	5,035	11	5,046	220	5,356	5,367
Off-Ramp	885	11	896	220	1,123	1,134
Between	4,150	0	4,150	0	4,233	4,233
On-Ramp	688	6	694	216	918	924
N of Clinton Keith	4,838	6	4,844	216	5,151	5,157

Note: Freeway Mainline Truck %: 8.7 - Based on 2012 Annual Average Daily Truck Traffic (Source: Caltrans)

XX = PeMS Data for Week of May 27-29, 2014 (consistent with daily count data).

XX = Flow Conserved Volumes.

ATTACHMENT B
EXISTING CONDITIONS OPERATIONAL ANALYSIS
WORKSHEETS

Siena Apartments Traffic Impact Analysis (#0201-0001)
Existing (2013) Conditions
AM Peak Hour

Level Of Service Computation Report

2000 HCM Operations Method (Base Volume Alternative)

Intersection #8 I-15 SB Ramps / Clinton Keith Rd.

Cycle (sec): 70 Critical Vol./Cap.(X): 0.777
Loss Time (sec): 8 Average Delay (sec/veh): 18.1
Optimal Cycle: 55 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound			
Movement:	L	T	R	L	T	R	L	T	R	L	T	R	
Control:	Split Phase			Split Phase			Permitted			Protected			
Rights:	Include			Include			Include			Include			
Min. Green:	0	0	0	10	10	10	0	19	19	10	19	19	
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lanes:	0	0	0	1	1	0	0	2	0	0	3	0	1

Volume Module:

Base Vol:	0	0	0	377	0	311	0	715	724	247	559	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	377	0	311	0	715	724	247	559	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
PHF Volume:	0	0	0	417	0	344	0	790	800	273	618	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	417	0	344	0	790	800	273	618	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Volume:	0	0	0	417	0	344	0	790	800	273	618	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.95	1.00	0.75	1.00	0.91	0.85	0.92	0.91	1.00
Lanes:	0.00	0.00	0.00	2.00	0.00	2.00	0.00	3.00	1.00	2.00	3.00	0.00
Final Sat.:	0	0	0	3618	0	2842	0	5187	1615	3502	5187	0

Capacity Analysis Module:

Vol/Sat:	0.00	0.00	0.00	0.12	0.00	0.12	0.00	0.15	0.50	0.08	0.12	0.00
Crit Moves:				****				****			****	
Green/Cycle:	0.00	0.00	0.00	0.15	0.00	0.15	0.00	0.60	0.60	0.14	0.74	0.00
Volume/Cap:	0.00	0.00	0.00	0.79	0.00	0.83	0.00	0.26	0.83	0.55	0.16	0.00
Delay/Veh:	0.0	0.0	0.0	36.8	0.0	42.2	0.0	6.7	17.4	29.1	2.7	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	36.8	0.0	42.2	0.0	6.7	17.4	29.1	2.7	0.0
LOS by Move:	A	A	A	D	A	D	A	A	B	C	A	A
HCM2kAvgQ:	0	0	0	7	0	7	0	3	16	3	1	0

Note: Queue reported is the number of cars per lane.

Siena Apartments Traffic Impact Analysis (#0201-0001)
Existing (2013) Conditions
AM Peak Hour

Level Of Service Computation Report

2000 HCM Operations Method (Base Volume Alternative)

Intersection #9 I-15 NB Ramps / Clinton Keith Rd.

Cycle (sec): 70 Critical Vol./Cap.(X): 0.558
Loss Time (sec): 8 Average Delay (sec/veh): 13.1
Optimal Cycle: 43 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	10	10	10	0	0	0	10	15	15	0	15	15
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1	0	0	0	2	0	3	0	0	1

Volume Module:

Base Vol:	228	0	196	0	0	0	326	766	0	0	578	443
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	228	0	196	0	0	0	326	766	0	0	578	443
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	249	0	214	0	0	0	356	835	0	0	630	483
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	249	0	214	0	0	0	356	835	0	0	630	483
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Volume:	249	0	214	0	0	0	356	835	0	0	630	483

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.91	1.00	0.91	1.00	1.00	1.00	0.92	0.91	1.00	1.00	0.91	0.85
Lanes:	1.54	0.00	1.46	0.00	0.00	0.00	2.00	3.00	0.00	0.00	3.00	1.00
Final Sat.:	2649	0	2519	0	0	0	3502	5187	0	0	5187	1615

Capacity Analysis Module:

Vol/Sat:	0.09	0.00	0.08	0.00	0.00	0.00	0.10	0.16	0.00	0.00	0.12	0.30
Crit Moves:	****						****					****
Green/Cycle:	0.17	0.00	0.17	0.00	0.00	0.00	0.18	0.72	0.00	0.00	0.54	0.54
Volume/Cap:	0.56	0.00	0.50	0.00	0.00	0.00	0.56	0.22	0.00	0.00	0.23	0.56
Delay/Veh:	27.6	0.0	26.9	0.0	0.0	0.0	27.2	3.4	0.0	0.0	8.6	11.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	27.6	0.0	26.9	0.0	0.0	0.0	27.2	3.4	0.0	0.0	8.6	11.6
LOS by Move:	C	A	C	A	A	A	C	A	A	A	A	B
HCM2kAvgQ:	4	0	4	0	0	0	4	2	0	0	3	7

Note: Queue reported is the number of cars per lane.

Siena Apartments Traffic Impact Analysis (#0201-0001)
Existing (2013 Conditions)
PM Peak Hour

Level Of Service Computation Report

2000 HCM Operations Method (Base Volume Alternative)

Intersection #8 I-15 SB Ramps / Clinton Keith Rd.

Cycle (sec): 75 Critical Vol./Cap.(X): 0.364
Loss Time (sec): 8 Average Delay (sec/veh): 18.1
Optimal Cycle: 47 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound			
Movement:	L	T	R	L	T	R	L	T	R	L	T	R	
Control:	Split Phase			Split Phase			Permitted			Protected			
Rights:	Include			Include			Include			Include			
Min. Green:	0	0	0	10	10	10	0	19	19	10	19	19	
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lanes:	0	0	0	1	1	0	0	2	0	0	3	0	1

Volume Module:

Base Vol:	0	0	0	431	1	392	0	597	394	246	928	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	431	1	392	0	597	394	246	928	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
PHF Volume:	0	0	0	434	1	395	0	601	397	248	935	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	434	1	395	0	601	397	248	935	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Volume:	0	0	0	434	1	395	0	601	397	248	935	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.92	0.92	0.75	1.00	0.91	0.85	0.92	0.91	1.00
Lanes:	0.00	0.00	0.00	1.99	0.01	2.00	0.00	3.00	1.00	2.00	3.00	0.00
Final Sat.:	0	0	0	3495	8	2842	0	5187	1615	3502	5187	0

Capacity Analysis Module:

Vol/Sat:	0.00	0.00	0.00	0.12	0.12	0.14	0.00	0.12	0.25	0.07	0.18	0.00
Crit Moves:						****		****		****		
Green/Cycle:	0.00	0.00	0.00	0.38	0.38	0.38	0.00	0.32	0.32	0.19	0.51	0.00
Volume/Cap:	0.00	0.00	0.00	0.33	0.33	0.36	0.00	0.36	0.77	0.36	0.35	0.00
Delay/Veh:	0.0	0.0	0.0	16.5	16.5	16.9	0.0	19.9	30.2	26.5	11.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	16.5	16.5	16.9	0.0	19.9	30.2	26.5	11.0	0.0
LOS by Move:	A	A	A	B	B	B	A	B	C	C	B	A
HCM2kAvgQ:	0	0	0	4	4	4	0	4	10	2	5	0

Note: Queue reported is the number of cars per lane.

Siena Apartments Traffic Impact Analysis (#0201-0001)
Existing (2013 Conditions)
PM Peak Hour

Level Of Service Computation Report

2000 HCM Operations Method (Base Volume Alternative)

Intersection #9 I-15 NB Ramps / Clinton Keith Rd.

Cycle (sec): 75 Critical Vol./Cap.(X): 0.612
Loss Time (sec): 8 Average Delay (sec/veh): 16.9
Optimal Cycle: 43 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	10	10	10	0	0	0	10	15	15	0	15	15
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1	0	0	0	2	0	3	0	0	1

Volume Module:

Base Vol:	525	0	360	0	0	0	271	757	0	0	649	417
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	525	0	360	0	0	0	271	757	0	0	649	417
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	546	0	374	0	0	0	282	787	0	0	675	433
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	546	0	374	0	0	0	282	787	0	0	675	433
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Volume:	546	0	374	0	0	0	282	787	0	0	675	433

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.91	1.00	0.91	1.00	1.00	1.00	0.92	0.91	1.00	1.00	0.91	0.85
Lanes:	1.59	0.00	1.41	0.00	0.00	0.00	2.00	3.00	0.00	0.00	3.00	1.00
Final Sat.:	2760	0	2437	0	0	0	3502	5187	0	0	5187	1615

Capacity Analysis Module:

Vol/Sat:	0.20	0.00	0.15	0.00	0.00	0.00	0.08	0.15	0.00	0.00	0.13	0.27
Crit Moves:	****						****					****
Green/Cycle:	0.32	0.00	0.32	0.00	0.00	0.00	0.13	0.57	0.00	0.00	0.44	0.44
Volume/Cap:	0.61	0.00	0.48	0.00	0.00	0.00	0.60	0.27	0.00	0.00	0.30	0.61
Delay/Veh:	22.2	0.0	20.5	0.0	0.0	0.0	32.9	8.2	0.0	0.0	13.7	17.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	22.2	0.0	20.5	0.0	0.0	0.0	32.9	8.2	0.0	0.0	13.7	17.8
LOS by Move:	C	A	C	A	A	A	C	A	A	A	B	B
HCM2kAvgQ:	8	0	5	0	0	0	3	3	0	0	4	8

Note: Queue reported is the number of cars per lane.

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		Freeway/Dir of Travel			I-5 SB				
Agency or Company		Trames Solutions, Inc.			Junction		Clinton Keith Off-Ramp		
Date Performed		6/12/15			Jurisdiction		Caltrans		
Analysis Time Period		AM Peak Hour			Analysis Year		Existing Conditions		
Project Description: Siena Apartments Traffic Impact Analysis									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N				3		Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h	
		Ramp Number of Lanes, N				2			
		Acceleration Lane Length, L_A							
		Deceleration Lane Length L_D				300			
		Freeway Volume, V_F				4404			
		Ramp Volume, V_R				688			
Freeway Free-Flow Speed, S_{FF}				65.0					
Ramp Free-Flow Speed, S_{FR}				35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	4404	0.92	Level	9	0	0.957	1.00	5002	
Ramp	688	0.92	Level	2	0	0.990	1.00	755	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ using Equation (Exhibit 13-6) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ 0.450 using Equation (Exhibit 13-7) $V_{12} =$ 2666 pc/h V_3 or V_{av34} 2336 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2858 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8			V_F	5002	Exhibit 13-8	7050	No
				$V_{FO} = V_F - V_R$	4247	Exhibit 13-8	7050	No	
				V_R	755	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8			V_{12}	2666	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 20.7 (pc/mi/ln) LOS = C (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)					$D_S =$ 0.496 (Exhibit 13-12) $S_R =$ 53.6 mph (Exhibit 13-12) $S_0 =$ 66.8 mph (Exhibit 13-12) $S =$ 58.6 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		Trames Solutions, Inc.		Freeway/Dir of Travel		I-15 SB			
Agency or Company				Junction		Clinton Keith On-Ramp			
Date Performed		6/12/15		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		Existing Conditions			
Project Description Siena Apartments Traffic Impact Analysis									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 3				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h			
		Ramp Number of Lanes, N 2							
		Acceleration Lane Length, L_A 300							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 3716							
		Ramp Volume, V_R 971							
Freeway Free-Flow Speed, S_{FF} 65.0									
Ramp Free-Flow Speed, S_{FR} 35.0									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	3716	0.92	Level	9	0	0.957	1.00	4221	
Ramp	971	0.92	Level	2	0	0.990	1.00	1066	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ 0.555 using Equation (Exhibit 13-6) $P_{FM} =$ 2343 pc/h $V_{12} =$ 1878 pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} 1878 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2412 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ using Equation (Exhibit 13-7) $P_{FD} =$ pc/h $V_{12} =$ pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	5287	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	3478	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 26.5 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.384 (Exhibit 13-11) $S_R =$ 56.2 mph (Exhibit 13-11) $S_0 =$ 60.3 mph (Exhibit 13-11) $S =$ 57.5 mph (Exhibit 13-13)					$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		Trames Solutions, Inc.		Freeway/Dir of Travel		I-5 NB			
Agency or Company		Trames Solutions, Inc.		Junction		Clinton Keith Off-Ramp			
Date Performed		6/12/15		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		Existing Conditions			
Project Description: Siena Apartments Traffic Impact Analysis									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 3				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h			
		Ramp Number of Lanes, N 2							
		Acceleration Lane Length, L_A							
		Deceleration Lane Length L_D 300							
		Freeway Volume, V_F 3359							
		Ramp Volume, V_R 424							
Freeway Free-Flow Speed, S_{FF} 65.0									
Ramp Free-Flow Speed, S_{FR} 35.0									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	3359	0.92	Level	9	0	0.957	1.00	3815	
Ramp	424	0.92	Level	2	0	0.990	1.00	465	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ using Equation (Exhibit 13-6) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ 0.450 using Equation (Exhibit 13-7) $V_{12} =$ 1972 pc/h V_3 or V_{av34} 1843 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2180 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8			V_F	3815	Exhibit 13-8	7050	No
				$V_{FO} = V_F - V_R$	3350	Exhibit 13-8	7050	No	
				V_R	465	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8			V_{12}	1972	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 14.9 (pc/mi/ln) LOS = B (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)					$D_S =$ 0.470 (Exhibit 13-12) $S_R =$ 54.2 mph (Exhibit 13-12) $S_0 =$ 68.8 mph (Exhibit 13-12) $S =$ 59.6 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		Trames Solutions, Inc.		Freeway/Dir of Travel		I-15 NB			
Agency or Company				Junction		Clinton Keith On-Ramp			
Date Performed		6/12/15		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		Existing Conditions			
Project Description Siena Apartments Traffic Impact Analysis									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 3				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h			
		Ramp Number of Lanes, N 2							
		Acceleration Lane Length, L_A 300							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 2935							
		Ramp Volume, V_R 769							
Freeway Free-Flow Speed, S_{FF} 65.0									
Ramp Free-Flow Speed, S_{FR} 35.0									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	2935	0.92	Level	9	0	0.957	1.00	3334	
Ramp	769	0.92	Level	2	0	0.990	1.00	844	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ 0.555 using Equation (Exhibit 13-6) $P_{FM} =$ 1850 pc/h $V_{12} =$ 1484 pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} 17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 1905 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ using Equation (Exhibit 13-7) $P_{FD} =$ pc/h $V_{12} =$ pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} 17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	4178	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	2749	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 20.9 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.319 (Exhibit 13-11) $S_R =$ 57.7 mph (Exhibit 13-11) $S_0 =$ 61.7 mph (Exhibit 13-11) $S =$ 59.0 mph (Exhibit 13-13)					$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		Freeway/Dir of Travel			I-5 SB				
Agency or Company		Trames Solutions, Inc.			Junction		Clinton Keith Off-Ramp		
Date Performed		6/12/15			Jurisdiction		Caltrans		
Analysis Time Period		PM Peak Hour			Analysis Year		Existing Conditions		
Project Description: Siena Apartments Traffic Impact Analysis									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N			3		Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h		
		Ramp Number of Lanes, N			2				
		Acceleration Lane Length, L_A							
		Deceleration Lane Length L_D			300				
		Freeway Volume, V_F			4005				
		Ramp Volume, V_R			824				
Freeway Free-Flow Speed, S_{FF}			65.0						
Ramp Free-Flow Speed, S_{FR}			35.0						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	4005	0.92	Level	9	0	0.957	1.00	4549	
Ramp	824	0.92	Level	2	0	0.990	1.00	905	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ using Equation (Exhibit 13-6) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ 0.450 using Equation (Exhibit 13-7) $V_{12} =$ 2545 pc/h V_3 or V_{av34} 2004 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2599 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8			V_F	4549	Exhibit 13-8	7050	No
				$V_{FO} = V_F - V_R$	3644	Exhibit 13-8	7050	No	
				V_R	905	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8			V_{12}	2545	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 18.5 (pc/mi/ln) LOS = B (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)					$D_S =$ 0.509 (Exhibit 13-12) $S_R =$ 53.3 mph (Exhibit 13-12) $S_0 =$ 67.6 mph (Exhibit 13-12) $S =$ 58.6 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		Trames Solutions, Inc.		Freeway/Dir of Travel		I-15 SB			
Agency or Company				Junction		Clinton Keith On-Ramp			
Date Performed		6/12/15		Jurisdiction		Caltrans			
Analysis Time Period		PM Peak Hour		Analysis Year		Existing Conditions			
Project Description Siena Apartments Traffic Impact Analysis									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 3				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h			
		Ramp Number of Lanes, N 2							
		Acceleration Lane Length, L_A 300							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 3181							
		Ramp Volume, V_R 641							
Freeway Free-Flow Speed, S_{FF} 65.0									
Ramp Free-Flow Speed, S_{FR} 35.0									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	3181	0.92	Level	9	0	0.957	1.00	3613	
Ramp	641	0.92	Level	2	0	0.990	1.00	704	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ 0.555 using Equation (Exhibit 13-6) $P_{FM} =$ 2005 pc/h $V_{12} =$ 1608 pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} 1608 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2064 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ using Equation (Exhibit 13-7) $P_{FD} =$ pc/h $V_{12} =$ pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	4317	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	2768	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 21.1 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.320 (Exhibit 13-11) $S_R =$ 57.6 mph (Exhibit 13-11) $S_0 =$ 61.2 mph (Exhibit 13-11) $S =$ 58.9 mph (Exhibit 13-13)					$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		Freeway/Dir of Travel			I-5 NB				
Agency or Company		Trames Solutions, Inc.			Junction		Clinton Keith Off-Ramp		
Date Performed		6/12/15			Jurisdiction		Caltrans		
Analysis Time Period		AM Peak Hour			Analysis Year		Existing Conditions		
Project Description Siena Apartments Traffic Impact Analysis									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N				3		Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h	
		Ramp Number of Lanes, N				2			
		Acceleration Lane Length, L_A							
		Deceleration Lane Length L_D				300			
		Freeway Volume, V_F				5035			
		Ramp Volume, V_R				885			
Freeway Free-Flow Speed, S_{FF}				65.0					
Ramp Free-Flow Speed, S_{FR}				35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	5035	0.92	Level	9	0	0.957	1.00	5719	
Ramp	885	0.92	Level	2	0	0.990	1.00	972	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ using Equation (Exhibit 13-6) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ 0.450 using Equation (Exhibit 13-7) $V_{12} =$ 3108 pc/h V_3 or V_{av34} 2611 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 3268 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8			V_F	5719	Exhibit 13-8	7050	No
				$V_{FO} = V_F - V_R$	4747	Exhibit 13-8	7050	No	
				V_R	972	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8			V_{12}	3108	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) $LOS =$ (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 24.3 (pc/mi/ln) $LOS =$ C (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)					$D_S =$ 0.515 (Exhibit 13-12) $S_R =$ 53.1 mph (Exhibit 13-12) $S_0 =$ 65.6 mph (Exhibit 13-12) $S =$ 57.9 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		Trames Solutions, Inc.		Freeway/Dir of Travel		I-15 NB			
Agency or Company				Junction		Clinton Keith On-Ramp			
Date Performed		6/12/15		Jurisdiction		Caltrans			
Analysis Time Period		PM Peak Hour		Analysis Year		Existing Conditions			
Project Description Siena Apartments Traffic Impact Analysis									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 3				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h			
		Ramp Number of Lanes, N 2							
		Acceleration Lane Length, L_A 300							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 4150							
		Ramp Volume, V_R 688							
Freeway Free-Flow Speed, S_{FF} 65.0									
Ramp Free-Flow Speed, S_{FR} 35.0									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	4150	0.92	Level	9	0	0.957	1.00	4714	
Ramp	688	0.92	Level	2	0	0.990	1.00	755	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ 0.555 using Equation (Exhibit 13-6) $P_{FM} =$ 2616 pc/h $V_{12} =$ 2098 pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} 2098 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2693 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ using Equation (Exhibit 13-7) $P_{FD} =$ pc/h $V_{12} =$ pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	5469	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	3448	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 26.4 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.381 (Exhibit 13-11) $S_R =$ 56.2 mph (Exhibit 13-11) $S_0 =$ 59.5 mph (Exhibit 13-11) $S =$ 57.4 mph (Exhibit 13-13)					$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

ATTACHMENT C
EXISTING PLUS PROJECT OPERATIONAL ANALYSIS
WORKSHEETS

Siena Apartments Traffic Impact Analysis (#0201-0001)
Existing + Project Conditions
AM Peak Hour

Level Of Service Computation Report

2000 HCM Operations Method (Future Volume Alternative)

Intersection #8 I-15 SB Ramps / Clinton Keith Rd.

Cycle (sec):	70	Critical Vol./Cap.(X):	0.782
Loss Time (sec):	8	Average Delay (sec/veh):	18.2
Optimal Cycle:	56	Level Of Service:	B

Approach:	North Bound			South Bound			East Bound			West Bound			
Movement:	L	T	R	L	T	R	L	T	R	L	T	R	
Control:	Split Phase			Split Phase			Permitted			Protected			
Rights:	Include			Include			Include			Include			
Min. Green:	0	0	0	10	10	10	0	19	19	10	19	19	
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lanes:	0	0	0	1	1	0	0	2	0	0	3	0	1

Volume Module:

Base Vol:	0	0	0	377	0	311	0	715	724	247	559	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	377	0	311	0	715	724	247	559	0
Added Vol:	0	0	0	3	0	0	0	3	0	11	11	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	380	0	311	0	718	724	258	570	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
PHF Volume:	0	0	0	420	0	344	0	793	800	285	630	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	420	0	344	0	793	800	285	630	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	420	0	344	0	793	800	285	630	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.95	1.00	0.75	1.00	0.91	0.85	0.92	0.91	1.00
Lanes:	0.00	0.00	0.00	2.00	0.00	2.00	0.00	3.00	1.00	2.00	3.00	0.00
Final Sat.:	0	0	0	3618	0	2842	0	5187	1615	3502	5187	0

Capacity Analysis Module:

Vol/Sat:	0.00	0.00	0.00	0.12	0.00	0.12	0.00	0.15	0.50	0.08	0.12	0.00
Crit Moves:				****				****			****	
Green/Cycle:	0.00	0.00	0.00	0.15	0.00	0.15	0.00	0.60	0.60	0.14	0.74	0.00
Volume/Cap:	0.00	0.00	0.00	0.80	0.00	0.83	0.00	0.26	0.83	0.57	0.16	0.00
Delay/Veh:	0.0	0.0	0.0	37.2	0.0	42.2	0.0	6.8	17.4	29.6	2.7	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	37.2	0.0	42.2	0.0	6.8	17.4	29.6	2.7	0.0
LOS by Move:	A	A	A	D	A	D	A	A	B	C	A	A
HCM2kAvgQ:	0	0	0	7	0	7	0	3	16	3	1	0

Note: Queue reported is the number of cars per lane.

Siena Apartments Traffic Impact Analysis (#0201-0001)
Existing + Project Conditions
AM Peak Hour

Level Of Service Computation Report

2000 HCM Operations Method (Future Volume Alternative)

Intersection #9 I-15 NB Ramps / Clinton Keith Rd.

Cycle (sec): 70 Critical Vol./Cap.(X): 0.567
Loss Time (sec): 8 Average Delay (sec/veh): 13.0
Optimal Cycle: 43 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	10	10	10	0	0	0	10	15	15	0	15	15
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1	0	0	0	2	0	3	0	0	0

Volume Module:

Base Vol:	228	0	196	0	0	0	326	766	0	0	578	443
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	228	0	196	0	0	0	326	766	0	0	578	443
Added Vol:	0	0	3	0	0	0	0	5	0	0	22	11
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	228	0	199	0	0	0	326	771	0	0	600	454
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	249	0	217	0	0	0	356	841	0	0	654	495
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	249	0	217	0	0	0	356	841	0	0	654	495
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	249	0	217	0	0	0	356	841	0	0	654	495

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.91	1.00	0.91	1.00	1.00	1.00	0.92	0.91	1.00	1.00	0.91	0.85
Lanes:	1.53	0.00	1.47	0.00	0.00	0.00	2.00	3.00	0.00	0.00	3.00	1.00
Final Sat.:	2640	0	2523	0	0	0	3502	5187	0	0	5187	1615

Capacity Analysis Module:

Vol/Sat:	0.09	0.00	0.09	0.00	0.00	0.00	0.10	0.16	0.00	0.00	0.13	0.31
Crit Moves:	****						****					****
Green/Cycle:	0.17	0.00	0.17	0.00	0.00	0.00	0.18	0.72	0.00	0.00	0.54	0.54
Volume/Cap:	0.57	0.00	0.52	0.00	0.00	0.00	0.57	0.23	0.00	0.00	0.23	0.57
Delay/Veh:	27.8	0.0	27.2	0.0	0.0	0.0	27.5	3.3	0.0	0.0	8.5	11.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	27.8	0.0	27.2	0.0	0.0	0.0	27.5	3.3	0.0	0.0	8.5	11.5
LOS by Move:	C	A	C	A	A	A	C	A	A	A	A	B
HCM2kAvgQ:	4	0	4	0	0	0	4	2	0	0	3	8

Note: Queue reported is the number of cars per lane.

Siena Apartments Traffic Impact Analysis (#0201-0001)
Existing + Project Conditions
PM Peak Hour

Level Of Service Computation Report

2000 HCM Operations Method (Future Volume Alternative)

Intersection #8 I-15 SB Ramps / Clinton Keith Rd.

Cycle (sec): 75 Critical Vol./Cap.(X): 0.369
Loss Time (sec): 8 Average Delay (sec/veh): 18.1
Optimal Cycle: 47 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound			
Movement:	L	T	R	L	T	R	L	T	R	L	T	R	
Control:	Split Phase			Split Phase			Permitted			Protected			
Rights:	Include			Include			Include			Include			
Min. Green:	0	0	0	10	10	10	0	19	19	10	19	19	
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lanes:	0	0	0	1	1	0	0	2	0	0	3	0	1

Volume Module:

Base Vol:	0	0	0	431	1	392	0	597	394	246	928	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	431	1	392	0	597	394	246	928	0
Added Vol:	0	0	0	11	0	0	0	11	0	6	6	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	442	1	392	0	608	394	252	934	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
PHF Volume:	0	0	0	445	1	395	0	612	397	254	941	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	445	1	395	0	612	397	254	941	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	445	1	395	0	612	397	254	941	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.92	0.92	0.75	1.00	0.91	0.85	0.92	0.91	1.00
Lanes:	0.00	0.00	0.00	1.99	0.01	2.00	0.00	3.00	1.00	2.00	3.00	0.00
Final Sat.:	0	0	0	3492	8	2842	0	5187	1615	3502	5187	0

Capacity Analysis Module:

Vol/Sat:	0.00	0.00	0.00	0.13	0.13	0.14	0.00	0.12	0.25	0.07	0.18	0.00
Crit Moves:				****			****			****		
Green/Cycle:	0.00	0.00	0.00	0.38	0.38	0.38	0.00	0.32	0.32	0.20	0.52	0.00
Volume/Cap:	0.00	0.00	0.00	0.34	0.34	0.37	0.00	0.37	0.77	0.37	0.35	0.00
Delay/Veh:	0.0	0.0	0.0	16.9	16.9	17.1	0.0	19.8	29.8	26.4	10.8	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	16.9	16.9	17.1	0.0	19.8	29.8	26.4	10.8	0.0
LOS by Move:	A	A	A	B	B	B	A	B	C	C	B	A
HCM2kAvgQ:	0	0	0	4	4	4	0	4	10	3	5	0

Note: Queue reported is the number of cars per lane.

Siena Apartments Traffic Impact Analysis (#0201-0001)
Existing + Project Conditions
PM Peak Hour

Level Of Service Computation Report

2000 HCM Operations Method (Future Volume Alternative)

Intersection #9 I-15 NB Ramps / Clinton Keith Rd.

Cycle (sec): 75 Critical Vol./Cap.(X): 0.617
Loss Time (sec): 8 Average Delay (sec/veh): 16.9
Optimal Cycle: 43 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	10	10	10	0	0	0	10	15	15	0	15	15
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1	0	0	0	2	0	3	0	0	1

Volume Module:

Base Vol:	525	0	360	0	0	0	271	757	0	0	649	417
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	525	0	360	0	0	0	271	757	0	0	649	417
Added Vol:	0	0	11	0	0	0	0	22	0	0	12	6
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	525	0	371	0	0	0	271	779	0	0	661	423
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	546	0	386	0	0	0	282	810	0	0	687	440
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	546	0	386	0	0	0	282	810	0	0	687	440
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	546	0	386	0	0	0	282	810	0	0	687	440

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.91	1.00	0.91	1.00	1.00	1.00	0.92	0.91	1.00	1.00	0.91	0.85
Lanes:	1.59	0.00	1.41	0.00	0.00	0.00	2.00	3.00	0.00	0.00	3.00	1.00
Final Sat.:	2747	0	2450	0	0	0	3502	5187	0	0	5187	1615

Capacity Analysis Module:

Vol/Sat:	0.20	0.00	0.16	0.00	0.00	0.00	0.08	0.16	0.00	0.00	0.13	0.27
Crit Moves:	****						****					****
Green/Cycle:	0.32	0.00	0.32	0.00	0.00	0.00	0.13	0.57	0.00	0.00	0.44	0.44
Volume/Cap:	0.62	0.00	0.49	0.00	0.00	0.00	0.60	0.27	0.00	0.00	0.30	0.62
Delay/Veh:	22.4	0.0	20.7	0.0	0.0	0.0	32.9	8.2	0.0	0.0	13.7	17.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	22.4	0.0	20.7	0.0	0.0	0.0	32.9	8.2	0.0	0.0	13.7	17.9
LOS by Move:	C	A	C	A	A	A	C	A	A	A	B	B
HCM2kAvgQ:	8	0	6	0	0	0	3	3	0	0	4	9

Note: Queue reported is the number of cars per lane.

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		Freeway/Dir of Travel			I-5 SB				
Agency or Company		Trames Solutions, Inc.			Junction			Clinton Keith Off-Ramp	
Date Performed		6/12/15			Jurisdiction			Caltrans	
Analysis Time Period		AM Peak Hour			Analysis Year			E+P Conditions	
Project Description: Siena Apartments Traffic Impact Analysis									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N			3		Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h		
		Ramp Number of Lanes, N			2				
		Acceleration Lane Length, L_A							
		Deceleration Lane Length L_D			300				
		Freeway Volume, V_F			4407				
		Ramp Volume, V_R			691				
Freeway Free-Flow Speed, S_{FF}			65.0						
Ramp Free-Flow Speed, S_{FR}			35.0						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	4407	0.92	Level	9	0	0.957	1.00	5006	
Ramp	691	0.92	Level	2	0	0.990	1.00	759	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ using Equation (Exhibit 13-6) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ 0.450 using Equation (Exhibit 13-7) $V_{12} =$ 2670 pc/h V_3 or V_{av34} 2336 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2860 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8			V_F	5006	Exhibit 13-8	7050	No
				$V_{FO} = V_F - V_R$	4247	Exhibit 13-8	7050	No	
				V_R	759	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8			V_{12}	2670	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 20.7 (pc/mi/ln) LOS = C (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)					$D_S =$ 0.496 (Exhibit 13-12) $S_R =$ 53.6 mph (Exhibit 13-12) $S_0 =$ 66.8 mph (Exhibit 13-12) $S =$ 58.6 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		Trames Solutions, Inc.		Freeway/Dir of Travel		I-15 SB			
Agency or Company				Junction		Clinton Keith On-Ramp			
Date Performed		6/12/15		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		E+P Conditions			
Project Description Siena Apartments Traffic Impact Analysis									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 3				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h			
		Ramp Number of Lanes, N 2							
		Acceleration Lane Length, L_A 300							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 3716							
		Ramp Volume, V_R 982							
Freeway Free-Flow Speed, S_{FF} 65.0									
Ramp Free-Flow Speed, S_{FR} 35.0									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	3716	0.92	Level	9	0	0.957	1.00	4221	
Ramp	982	0.92	Level	2	0	0.990	1.00	1078	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ 0.555 using Equation (Exhibit 13-6) $P_{FM} =$ 2343 pc/h $V_{12} =$ 1878 pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} 1878 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2412 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ using Equation (Exhibit 13-7) $P_{FD} =$ pc/h $V_{12} =$ pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	5299	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	3490	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 26.6 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.386 (Exhibit 13-11) $S_R =$ 56.1 mph (Exhibit 13-11) $S_0 =$ 60.3 mph (Exhibit 13-11) $S =$ 57.5 mph (Exhibit 13-13)					$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		Trames Solutions, Inc.			Freeway/Dir of Travel		I-5 NB		
Agency or Company		Trames Solutions, Inc.			Junction		Clinton Keith Off-Ramp		
Date Performed		6/12/15			Jurisdiction		Caltrans		
Analysis Time Period		AM Peak Hour			Analysis Year		E+P Conditions		
Project Description: Siena Apartments Traffic Impact Analysis									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 3				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h			
		Ramp Number of Lanes, N 2							
		Acceleration Lane Length, L_A							
		Deceleration Lane Length L_D 300							
		Freeway Volume, V_F 3362							
		Ramp Volume, V_R 427							
Freeway Free-Flow Speed, S_{FF} 65.0				Ramp Free-Flow Speed, S_{FR} 35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	3362	0.92	Level	9	0	0.957	1.00	3819	
Ramp	427	0.92	Level	2	0	0.990	1.00	469	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ using Equation (Exhibit 13-6) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ 0.450 using Equation (Exhibit 13-7) $V_{12} =$ 1976 pc/h V_3 or V_{av34} 1843 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2182 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8			V_F	3819	Exhibit 13-8	7050	No
				$V_{FO} = V_F - V_R$	3350	Exhibit 13-8	7050	No	
				V_R	469	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8			V_{12}	1976	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 14.9 (pc/mi/ln) LOS = B (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)					$D_S =$ 0.470 (Exhibit 13-12) $S_R =$ 54.2 mph (Exhibit 13-12) $S_0 =$ 68.8 mph (Exhibit 13-12) $S =$ 59.6 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		Trames Solutions, Inc.		Freeway/Dir of Travel		I-15 NB			
Agency or Company				Junction		Clinton Keith On-Ramp			
Date Performed		6/12/15		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		E+P Conditions			
Project Description Siena Apartments Traffic Impact Analysis									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 3				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h			
		Ramp Number of Lanes, N 2							
		Acceleration Lane Length, L_A 300							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 2935							
		Ramp Volume, V_R 780							
Freeway Free-Flow Speed, S_{FF} 65.0									
Ramp Free-Flow Speed, S_{FR} 35.0									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	2935	0.92	Level	9	0	0.957	1.00	3334	
Ramp	780	0.92	Level	2	0	0.990	1.00	856	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ 0.555 using Equation (Exhibit 13-6) $P_{FM} =$ 1850 pc/h $V_{12} =$ 1484 pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} 17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 1905 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ using Equation (Exhibit 13-7) $P_{FD} =$ pc/h $V_{12} =$ pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} 17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	4190	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	2761	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 21.0 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.320 (Exhibit 13-11) $S_R =$ 57.6 mph (Exhibit 13-11) $S_0 =$ 61.7 mph (Exhibit 13-11) $S =$ 59.0 mph (Exhibit 13-13)					$D_S =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		Trames Solutions, Inc.		Freeway/Dir of Travel		I-5 SB			
Agency or Company		Trames Solutions, Inc.		Junction		Clinton Keith Off-Ramp			
Date Performed		6/12/15		Jurisdiction		Caltrans			
Analysis Time Period		PM Peak Hour		Analysis Year		E+P Conditions			
Project Description: Siena Apartments Traffic Impact Analysis									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N				3		Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h	
		Ramp Number of Lanes, N				2			
		Acceleration Lane Length, L_A							
		Deceleration Lane Length L_D				300			
		Freeway Volume, V_F				4016			
		Ramp Volume, V_R				835			
Freeway Free-Flow Speed, S_{FF}				65.0					
Ramp Free-Flow Speed, S_{FR}				35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	4016	0.92	Level	9	0	0.957	1.00	4562	
Ramp	835	0.92	Level	2	0	0.990	1.00	917	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ using Equation (Exhibit 13-6) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ 0.450 using Equation (Exhibit 13-7) $V_{12} =$ 2557 pc/h V_3 or V_{av34} 2005 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2606 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8			V_F	4562	Exhibit 13-8	7050	No
				$V_{FO} = V_F - V_R$	3645	Exhibit 13-8	7050	No	
				V_R	917	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8			V_{12}	2557	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 18.6 (pc/mi/ln) LOS = B (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)					$D_S =$ 0.511 (Exhibit 13-12) $S_R =$ 53.3 mph (Exhibit 13-12) $S_0 =$ 67.6 mph (Exhibit 13-12) $S =$ 58.6 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		Trames Solutions, Inc.		Freeway/Dir of Travel		I-15 SB			
Agency or Company				Junction		Clinton Keith On-Ramp			
Date Performed		6/12/15		Jurisdiction		Caltrans			
Analysis Time Period		PM Peak Hour		Analysis Year		E+P Conditions			
Project Description Siena Apartments Traffic Impact Analysis									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N				3		Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h	
		Ramp Number of Lanes, N				2			
		Acceleration Lane Length, L_A				300			
		Deceleration Lane Length L_D							
		Freeway Volume, V_F				3181			
		Ramp Volume, V_R				647			
		Freeway Free-Flow Speed, S_{FF}				65.0			
Ramp Free-Flow Speed, S_{FR}				35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	3181	0.92	Level	9	0	0.957	1.00	3613	
Ramp	647	0.92	Level	2	0	0.990	1.00	710	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ 0.555 using Equation (Exhibit 13-6) $P_{FM} =$ 2005 pc/h $V_{12} =$ 1608 pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} 1608 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2064 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ using Equation (Exhibit 13-7) $P_{FD} =$ pc/h $V_{12} =$ pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	4323	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	2774	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 21.1 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.320 (Exhibit 13-11) $S_R =$ 57.6 mph (Exhibit 13-11) $S_0 =$ 61.2 mph (Exhibit 13-11) $S =$ 58.9 mph (Exhibit 13-13)					$D_S =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		Freeway/Dir of Travel			I-5 NB				
Agency or Company		Trames Solutions, Inc.			Junction		Clinton Keith Off-Ramp		
Date Performed		6/12/15			Jurisdiction		Caltrans		
Analysis Time Period		AM Peak Hour			Analysis Year		E+P Conditions		
Project Description: Siena Apartments Traffic Impact Analysis									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N				3		Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h	
		Ramp Number of Lanes, N				2			
		Acceleration Lane Length, L_A							
		Deceleration Lane Length L_D				300			
		Freeway Volume, V_F				5046			
		Ramp Volume, V_R				896			
Freeway Free-Flow Speed, S_{FF}				65.0					
Ramp Free-Flow Speed, S_{FR}				35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	5046	0.92	Level	9	0	0.957	1.00	5732	
Ramp	896	0.92	Level	2	0	0.990	1.00	984	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ using Equation (Exhibit 13-6) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ 0.450 using Equation (Exhibit 13-7) $V_{12} =$ 3121 pc/h V_3 or V_{av34} 2611 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 3275 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8			V_F	5732	Exhibit 13-8	7050	No
				$V_{FO} = V_F - V_R$	4748	Exhibit 13-8	7050	No	
				V_R	984	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8			V_{12}	3121	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 24.3 (pc/mi/ln) LOS = C (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)					$D_S =$ 0.517 (Exhibit 13-12) $S_R =$ 53.1 mph (Exhibit 13-12) $S_0 =$ 65.6 mph (Exhibit 13-12) $S =$ 57.8 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		Trames Solutions, Inc.		Freeway/Dir of Travel		I-15 NB			
Agency or Company				Junction		Clinton Keith On-Ramp			
Date Performed		6/12/15		Jurisdiction		Caltrans			
Analysis Time Period		PM Peak Hour		Analysis Year		E+P Conditions			
Project Description Siena Apartments Traffic Impact Analysis									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 3				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h			
		Ramp Number of Lanes, N 2							
		Acceleration Lane Length, L_A 300							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 4150							
		Ramp Volume, V_R 694							
Freeway Free-Flow Speed, S_{FF} 65.0									
Ramp Free-Flow Speed, S_{FR} 35.0									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	4150	0.92	Level	9	0	0.957	1.00	4714	
Ramp	694	0.92	Level	2	0	0.990	1.00	762	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ 0.555 using Equation (Exhibit 13-6) $P_{FM} =$ 2616 pc/h $V_{12} =$ 2098 pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} 2098 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2693 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ using Equation (Exhibit 13-7) $P_{FD} =$ pc/h $V_{12} =$ pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	5476	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	3455	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 26.4 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.381 (Exhibit 13-11) $S_R =$ 56.2 mph (Exhibit 13-11) $S_0 =$ 59.5 mph (Exhibit 13-11) $S =$ 57.4 mph (Exhibit 13-13)					$D_S =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

ATTACHMENT D
EXISTING PLUS AMBIENT PLUS CUMULATIVE
OPERATIONAL ANALYSIS WORKSHEETS

Siena Apartments Traffic Impact Analysis (#0201-0001)
 E+A+C (2015) Conditions
 AM Peak Hour

Level Of Service Computation Report

2000 HCM Operations Method (Future Volume Alternative)

Intersection #8 I-15 SB Ramps / Clinton Keith Rd.

Cycle (sec): 75 Critical Vol./Cap.(X): 0.871
 Loss Time (sec): 8 Average Delay (sec/veh): 21.6
 Optimal Cycle: OPTIMIZED Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound			
Movement:	L	T	R	L	T	R	L	T	R	L	T	R	
Control:	Split Phase			Split Phase			Permitted			Protected			
Rights:	Include			Include			Include			Include			
Min. Green:	0	0	0	10	10	10	0	19	19	10	19	19	
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lanes:	0	0	0	1	1	0	0	2	0	0	3	0	1

Volume Module:

Base Vol:	0	0	0	385	0	317	0	729	738	252	570	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	385	0	317	0	729	738	252	570	0
Added Vol:	0	0	0	72	0	30	0	187	43	78	164	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	457	0	347	0	916	781	330	734	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
PHF Volume:	0	0	0	505	0	383	0	1012	863	365	811	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	505	0	383	0	1012	863	365	811	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	505	0	383	0	1012	863	365	811	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.95	1.00	0.75	1.00	0.91	0.85	0.92	0.91	1.00
Lanes:	0.00	0.00	0.00	2.00	0.00	2.00	0.00	3.00	1.00	2.00	3.00	0.00
Final Sat.:	0	0	0	3618	0	2842	0	5187	1615	3502	5187	0

Capacity Analysis Module:

Vol/Sat:	0.00	0.00	0.00	0.14	0.00	0.13	0.00	0.20	0.53	0.10	0.16	0.00
Crit Moves:				****				****			****	
Green/Cycle:	0.00	0.00	0.00	0.16	0.00	0.16	0.00	0.60	0.60	0.13	0.74	0.00
Volume/Cap:	0.00	0.00	0.00	0.89	0.00	0.86	0.00	0.32	0.89	0.78	0.21	0.00
Delay/Veh:	0.0	0.0	0.0	46.5	0.0	45.8	0.0	7.4	22.6	39.7	3.1	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	46.5	0.0	45.8	0.0	7.4	22.6	39.7	3.1	0.0
LOS by Move:	A	A	A	D	A	D	A	A	C	D	A	A
HCM2kAvgQ:	0	0	0	9	0	8	0	4	21	5	2	0

Note: Queue reported is the number of cars per lane.

Siena Apartments Traffic Impact Analysis (#0201-0001)
 E+A+C (2015) Conditions
 AM Peak Hour

Level Of Service Computation Report

2000 HCM Operations Method (Future Volume Alternative)

Intersection #9 I-15 NB Ramps / Clinton Keith Rd.

Cycle (sec): 75 Critical Vol./Cap.(X): 0.657
 Loss Time (sec): 8 Average Delay (sec/veh): 14.5
 Optimal Cycle: 43 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	10	10	10	0	0	0	10	15	15	0	15	15
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1	0	0	0	2	0	3	0	0	1

Volume Module:

Base Vol:	233	0	200	0	0	0	333	781	0	0	590	452
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	233	0	200	0	0	0	333	781	0	0	590	452
Added Vol:	30	0	72	0	0	0	43	217	0	0	213	78
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	263	0	272	0	0	0	376	998	0	0	803	530
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	287	0	297	0	0	0	410	1088	0	0	876	578
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	287	0	297	0	0	0	410	1088	0	0	876	578
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	287	0	297	0	0	0	410	1088	0	0	876	578

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	1.00	0.90	1.00	1.00	1.00	0.92	0.91	1.00	1.00	0.91	0.85
Lanes:	1.49	0.00	1.51	0.00	0.00	0.00	2.00	3.00	0.00	0.00	3.00	1.00
Final Sat.:	2556	0	2585	0	0	0	3502	5187	0	0	5187	1615

Capacity Analysis Module:

Vol/Sat:	0.11	0.00	0.11	0.00	0.00	0.00	0.12	0.21	0.00	0.00	0.17	0.36
Crit Moves:	****						****					****
Green/Cycle:	0.17	0.00	0.17	0.00	0.00	0.00	0.18	0.72	0.00	0.00	0.54	0.54
Volume/Cap:	0.65	0.00	0.66	0.00	0.00	0.00	0.66	0.29	0.00	0.00	0.31	0.66
Delay/Veh:	30.5	0.0	30.8	0.0	0.0	0.0	31.4	3.8	0.0	0.0	9.5	14.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	30.5	0.0	30.8	0.0	0.0	0.0	31.4	3.8	0.0	0.0	9.5	14.1
LOS by Move:	C	A	C	A	A	A	C	A	A	A	A	B
HCM2kAvgQ:	5	0	6	0	0	0	5	3	0	0	4	10

Note: Queue reported is the number of cars per lane.

Siena Apartments Traffic Impact Analysis (#0201-0001)
E+A+C (2015) Conditions
PM Peak Hour

Level Of Service Computation Report

2000 HCM Operations Method (Future Volume Alternative)

Intersection #8 I-15 SB Ramps / Clinton Keith Rd.

Cycle (sec): 120 Critical Vol./Cap.(X): 0.624
Loss Time (sec): 8 Average Delay (sec/veh): 24.7
Optimal Cycle: 47 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Permitted			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	10	10	10	0	19	19	10	19	19
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0	0	0	1	1	0	0	2	0	0	3	0

Volume Module:

Base Vol:	0	0	0	440	1	400	0	609	402	251	947	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	440	1	400	0	609	402	251	947	0
Added Vol:	0	0	0	135	0	85	0	343	75	141	373	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	575	1	485	0	952	477	392	1320	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
PHF Volume:	0	0	0	579	1	488	0	959	480	395	1329	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	579	1	488	0	959	480	395	1329	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	579	1	488	0	959	480	395	1329	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.92	0.92	0.75	1.00	0.91	0.85	0.92	0.91	1.00
Lanes:	0.00	0.00	0.00	1.99	0.01	2.00	0.00	3.00	1.00	2.00	3.00	0.00
Final Sat.:	0	0	0	3486	6	2842	0	5187	1615	3502	5187	0

Capacity Analysis Module:

Vol/Sat:	0.00	0.00	0.00	0.17	0.17	0.17	0.00	0.18	0.30	0.11	0.26	0.00
Crit Moves:						****			****	****		
Green/Cycle:	0.00	0.00	0.00	0.28	0.28	0.28	0.00	0.48	0.48	0.18	0.66	0.00
Volume/Cap:	0.00	0.00	0.00	0.60	0.60	0.62	0.00	0.39	0.62	0.62	0.39	0.00
Delay/Veh:	0.0	0.0	0.0	38.8	38.8	39.6	0.0	20.2	25.0	47.3	9.5	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	38.8	38.8	39.6	0.0	20.2	25.0	47.3	9.5	0.0
LOS by Move:	A	A	A	D	D	D	A	C	C	D	A	A
HCM2kAvgQ:	0	0	0	10	10	10	0	8	14	7	8	0

Note: Queue reported is the number of cars per lane.

Siena Apartments Traffic Impact Analysis (#0201-0001)
 E+A+C (2015) Conditions
 PM Peak Hour

Level Of Service Computation Report

2000 HCM Operations Method (Future Volume Alternative)

Intersection #9 I-15 NB Ramps / Clinton Keith Rd.

Cycle (sec): 120 Critical Vol./Cap.(X): 0.760
 Loss Time (sec): 8 Average Delay (sec/veh): 26.9
 Optimal Cycle: 59 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	10	10	10	0	0	0	10	15	15	0	15	15
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1	0	0	0	2	0	3	0	0	1

Volume Module:

Base Vol:	536	0	367	0	0	0	276	772	0	0	662	425
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	536	0	367	0	0	0	276	772	0	0	662	425
Added Vol:	85	0	135	0	0	0	75	403	0	0	429	141
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	621	0	502	0	0	0	351	1175	0	0	1091	566
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	646	0	522	0	0	0	365	1221	0	0	1134	588
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	646	0	522	0	0	0	365	1221	0	0	1134	588
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	646	0	522	0	0	0	365	1221	0	0	1134	588

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.91	1.00	0.91	1.00	1.00	1.00	0.92	0.91	1.00	1.00	0.91	0.85
Lanes:	1.55	0.00	1.45	0.00	0.00	0.00	2.00	3.00	0.00	0.00	3.00	1.00
Final Sat.:	2679	0	2496	0	0	0	3502	5187	0	0	5187	1615

Capacity Analysis Module:

Vol/Sat:	0.24	0.00	0.21	0.00	0.00	0.00	0.10	0.24	0.00	0.00	0.22	0.36
Crit Moves:	****						****					****
Green/Cycle:	0.32	0.00	0.32	0.00	0.00	0.00	0.14	0.62	0.00	0.00	0.48	0.48
Volume/Cap:	0.76	0.00	0.66	0.00	0.00	0.00	0.76	0.38	0.00	0.00	0.46	0.76
Delay/Veh:	39.1	0.0	36.3	0.0	0.0	0.0	56.8	11.6	0.0	0.0	21.0	30.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	39.1	0.0	36.3	0.0	0.0	0.0	56.8	11.6	0.0	0.0	21.0	30.0
LOS by Move:	D	A	D	A	A	A	E	B	A	A	C	C
HCM2kAvgQ:	15	0	12	0	0	0	7	8	0	0	10	19

Note: Queue reported is the number of cars per lane.

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		Freeway/Dir of Travel			I-5 SB				
Agency or Company		Trames Solutions, Inc.			Junction				
Date Performed		6/12/15			Jurisdiction				
Analysis Time Period		AM Peak Hour			Analysis Year				
					EAC (2015) Conditions				
Project Description: Siena Apartments Traffic Impact Analysis									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off L _{up} = ft V _u = veh/h		Freeway Number of Lanes, N			3		Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off L _{down} = ft V _D = veh/h		
		Ramp Number of Lanes, N			2				
		Acceleration Lane Length, L _A							
		Deceleration Lane Length L _D			300				
		Freeway Volume, V _F			4594				
		Ramp Volume, V _R			804				
Freeway Free-Flow Speed, S _{FF}			65.0						
Ramp Free-Flow Speed, S _{FR}			35.0						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	4594	0.92	Level	9	0	0.957	1.00	5218	
Ramp	804	0.92	Level	2	0	0.990	1.00	883	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
V ₁₂ = V _F (P _{FM}) L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☐ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☐ Yes ☐ No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					V ₁₂ = V _R + (V _F - V _R)P _{FD} L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.450 using Equation (Exhibit 13-7) V ₁₂ = 2834 pc/h V ₃ or V _{av34} 2384 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☒ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☒ Yes ☐ No If Yes, V _{12a} = 2981 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	5218	Exhibit 13-8	7050	No
				V _{FO} = V _F - V _R	4335	Exhibit 13-8	7050	No	
				V _R	883	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	2834	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A					D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D				
D _R = (pc/mi/ln)					D _R = 21.8 (pc/mi/ln)				
LOS = (Exhibit 13-2)					LOS = C (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11)					D _S = 0.507 (Exhibit 13-12)				
S _R = mph (Exhibit 13-11)					S _R = 53.3 mph (Exhibit 13-12)				
S ₀ = mph (Exhibit 13-11)					S ₀ = 66.5 mph (Exhibit 13-12)				
S = mph (Exhibit 13-13)					S = 58.3 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		Trames Solutions, Inc.		Freeway/Dir of Travel		I-15 SB			
Agency or Company				Junction		Clinton Keith On-Ramp			
Date Performed		6/12/15		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		EAC (2015) Conditions			
Project Description Siena Apartments Traffic Impact Analysis									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 3				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h			
		Ramp Number of Lanes, N 2							
		Acceleration Lane Length, L_A 300							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 3790							
		Ramp Volume, V_R 1111							
Freeway Free-Flow Speed, S_{FF} 65.0									
Ramp Free-Flow Speed, S_{FR} 35.0									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	3790	0.92	Level	9	0	0.957	1.00	4305	
Ramp	1111	0.92	Level	2	0	0.990	1.00	1220	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ 0.555 using Equation (Exhibit 13-6) $P_{FM} =$ 2389 pc/h $V_{12} =$ 1916 pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} 1916 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2460 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ using Equation (Exhibit 13-7) $P_{FD} =$ pc/h $V_{12} =$ pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	5525	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	3680	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 28.0 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.413 (Exhibit 13-11) $S_R =$ 55.5 mph (Exhibit 13-11) $S_0 =$ 60.2 mph (Exhibit 13-11) $S =$ 57.0 mph (Exhibit 13-13)					$D_S =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		Freeway/Dir of Travel			I-5 NB				
Agency or Company		Trames Solutions, Inc.			Junction				
Date Performed		6/12/15			Jurisdiction				
Analysis Time Period		AM Peak Hour			Analysis Year				
					EAC (2015) Conditions				
Project Description Siena Apartments Traffic Impact Analysis									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off L _{up} = ft V _u = veh/h		Freeway Number of Lanes, N			3		Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off L _{down} = ft V _D = veh/h		
		Ramp Number of Lanes, N			2				
		Acceleration Lane Length, L _A							
		Deceleration Lane Length L _D			300				
		Freeway Volume, V _F			3528				
		Ramp Volume, V _R			534				
Freeway Free-Flow Speed, S _{FF}			65.0						
Ramp Free-Flow Speed, S _{FR}			35.0						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	3528	0.92	Level	9	0	0.957	1.00	4007	
Ramp	534	0.92	Level	2	0	0.990	1.00	586	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☐ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☐ Yes ☐ No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.450 using Equation (Exhibit 13-7) V ₁₂ = 2125 pc/h V ₃ or V _{av34} 1882 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☒ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☒ Yes ☐ No If Yes, V _{12a} = 2289 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	4007	Exhibit 13-8	7050	No
				V _{FO} = V _F - V _R	3421	Exhibit 13-8	7050	No	
				V _R	586	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	2125	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 15.8 (pc/mi/ln) LOS = B (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)					D _S = 0.481 (Exhibit 13-12) S _R = 53.9 mph (Exhibit 13-12) S ₀ = 68.5 mph (Exhibit 13-12) S = 59.4 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		Trames Solutions, Inc.		Freeway/Dir of Travel		I-15 NB			
Agency or Company				Junction		Clinton Keith On-Ramp			
Date Performed		6/12/15		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		EAC (2015) Conditions			
Project Description Siena Apartments Traffic Impact Analysis									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 3				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h			
		Ramp Number of Lanes, N 2							
		Acceleration Lane Length, L_A 300							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 2994							
		Ramp Volume, V_R 905							
Freeway Free-Flow Speed, S_{FF} 65.0				Ramp Free-Flow Speed, S_{FR} 35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	2994	0.92	Level	9	0	0.957	1.00	3401	
Ramp	905	0.92	Level	2	0	0.990	1.00	994	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ 0.555 using Equation (Exhibit 13-6) $V_{12} =$ 1888 pc/h V_3 or V_{av34} 1513 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 1943 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	4395	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	2937	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 22.3 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.332 (Exhibit 13-11) $S_R =$ 57.4 mph (Exhibit 13-11) $S_0 =$ 61.6 mph (Exhibit 13-11) $S =$ 58.7 mph (Exhibit 13-13)					$D_S =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst		Trames Solutions, Inc.		Freeway/Dir of Travel		I-5 SB				
Agency or Company		Trames Solutions, Inc.		Junction		Clinton Keith Off-Ramp				
Date Performed		6/12/15		Jurisdiction		Caltrans				
Analysis Time Period		PM Peak Hour		Analysis Year		EAC (2015) Conditions				
Project Description Siena Apartments Traffic Impact Analysis										
Inputs										
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 3 Ramp Number of Lanes, N 2 Acceleration Lane Length, L_A Deceleration Lane Length L_D 300 Freeway Volume, V_F 4305 Ramp Volume, V_R 1060 Freeway Free-Flow Speed, S_{FF} 65.0 Ramp Free-Flow Speed, S_{FR} 35.0				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h				
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$		
Freeway	4305	0.92	Level	9	0	0.957	1.00	4890		
Ramp	1060	0.92	Level	2	0	0.990	1.00	1164		
UpStream										
DownStream										
Merge Areas					Diverge Areas					
Estimation of v_{12}					Estimation of v_{12}					
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ $P_{FM} =$ using Equation (Exhibit 13-6) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ $P_{FD} =$ 0.450 using Equation (Exhibit 13-7) $V_{12} =$ 2841 pc/h V_3 or V_{av34} 2049 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☒ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V_{FO}		Exhibit 13-8				V_F	4890	Exhibit 13-8	7050	No
					$V_{FO} = V_F - V_R$	3726	Exhibit 13-8	7050	No	
					V_R	1164	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?	
	V_{R12}	Exhibit 13-8				V_{12}	Exhibit 13-8		4400:All No	
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) $LOS =$ (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 20.6 (pc/mi/ln) $LOS =$ C (Exhibit 13-2)					
Speed Determination					Speed Determination					
$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)					$D_s =$ 0.533 (Exhibit 13-12) $S_R =$ 52.7 mph (Exhibit 13-12) $S_0 =$ 67.2 mph (Exhibit 13-12) $S =$ 58.0 mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		Trames Solutions, Inc.		Freeway/Dir of Travel		I-15 SB			
Agency or Company				Junction		Clinton Keith On-Ramp			
Date Performed		6/12/15		Jurisdiction		Caltrans			
Analysis Time Period		PM Peak Hour		Analysis Year		EAC (2015) Conditions			
Project Description Siena Apartments Traffic Impact Analysis									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 3				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h			
		Ramp Number of Lanes, N 2							
		Acceleration Lane Length, L_A 300							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 3245							
		Ramp Volume, V_R 870							
Freeway Free-Flow Speed, S_{FF} 65.0				Ramp Free-Flow Speed, S_{FR} 35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	3245	0.92	Level	9	0	0.957	1.00	3686	
Ramp	870	0.92	Level	2	0	0.990	1.00	955	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ 0.555 using Equation (Exhibit 13-6) $P_{FM} =$ 2046 pc/h $V_{12} =$ 1640 pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} 1640 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2106 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ using Equation (Exhibit 13-7) $P_{FD} =$ pc/h $V_{12} =$ pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	4641	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	3061	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 23.3 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.341 (Exhibit 13-11) $S_R =$ 57.2 mph (Exhibit 13-11) $S_0 =$ 61.1 mph (Exhibit 13-11) $S =$ 58.4 mph (Exhibit 13-13)					$D_S =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		Freeway/Dir of Travel			I-5 NB				
Agency or Company		Trames Solutions, Inc.			Junction		Clinton Keith Off-Ramp		
Date Performed		6/12/15			Jurisdiction		Caltrans		
Analysis Time Period		AM Peak Hour			Analysis Year		EAC (2015) Conditions		
Project Description: Siena Apartments Traffic Impact Analysis									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N				3		Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h	
		Ramp Number of Lanes, N				2			
		Acceleration Lane Length, L_A							
		Deceleration Lane Length L_D				300			
		Freeway Volume, V_F				5356			
		Ramp Volume, V_R				1123			
Freeway Free-Flow Speed, S_{FF}				65.0					
Ramp Free-Flow Speed, S_{FR}				35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	5356	0.92	Level	9	0	0.957	1.00	6084	
Ramp	1123	0.92	Level	2	0	0.990	1.00	1233	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ using Equation (Exhibit 13-6) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ 0.450 using Equation (Exhibit 13-7) $V_{12} =$ 3416 pc/h V_3 or V_{av34} 2668 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 3476 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8			V_F	6084	Exhibit 13-8	7050	No
				$V_{FO} = V_F - V_R$	4851	Exhibit 13-8	7050	No	
				V_R	1233	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8			V_{12}	3416	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 26.0 (pc/mi/ln) LOS = C (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)					$D_S =$ 0.539 (Exhibit 13-12) $S_R =$ 52.6 mph (Exhibit 13-12) $S_0 =$ 65.0 mph (Exhibit 13-12) $S =$ 57.3 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		Trames Solutions, Inc.		Freeway/Dir of Travel		I-15 NB			
Agency or Company				Junction		Clinton Keith On-Ramp			
Date Performed		6/12/15		Jurisdiction		Caltrans			
Analysis Time Period		PM Peak Hour		Analysis Year		EAC (2015) Conditions			
Project Description Siena Apartments Traffic Impact Analysis									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 3				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h			
		Ramp Number of Lanes, N 2							
		Acceleration Lane Length, L_A 300							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 4233							
		Ramp Volume, V_R 918							
Freeway Free-Flow Speed, S_{FF} 65.0									
Ramp Free-Flow Speed, S_{FR} 35.0									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	4233	0.92	Level	9	0	0.957	1.00	4808	
Ramp	918	0.92	Level	2	0	0.990	1.00	1008	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ 0.555 using Equation (Exhibit 13-6) $P_{FM} =$ 2668 pc/h $V_{12} =$ 2140 pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} 2140 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2747 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ using Equation (Exhibit 13-7) $P_{FD} =$ pc/h $V_{12} =$ pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	5816	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	3755	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 28.7 (pc/mi/ln) LOS = D (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.425 (Exhibit 13-11) $S_R =$ 55.2 mph (Exhibit 13-11) $S_0 =$ 59.4 mph (Exhibit 13-11) $S =$ 56.6 mph (Exhibit 13-13)					$D_S =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

ATTACHMENT E
EXISTING PLUS AMBIENT PLUS CUMULATIVE PLUS
PROJECT OPERATIONAL ANALYSIS WORKSHEETS

Siena Apartments Traffic Impact Analysis (#0201-0001)
 E+A+C+P (2015) Conditions
 AM Peak Hour

Level Of Service Computation Report

2000 HCM Operations Method (Future Volume Alternative)

Intersection #8 I-15 SB Ramps / Clinton Keith Rd.

Cycle (sec): 75 Critical Vol./Cap.(X): 0.876
 Loss Time (sec): 8 Average Delay (sec/veh): 21.8
 Optimal Cycle: OPTIMIZED Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound			
Movement:	L	T	R	L	T	R	L	T	R	L	T	R	
Control:	Split Phase			Split Phase			Permitted			Protected			
Rights:	Include			Include			Include			Include			
Min. Green:	0	0	0	10	10	10	0	19	19	10	19	19	
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lanes:	0	0	0	1	1	0	0	2	0	0	3	0	1

Volume Module:

Base Vol:	0	0	0	385	0	317	0	729	738	252	570	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	385	0	317	0	729	738	252	570	0
Added Vol:	0	0	0	75	0	30	0	190	43	89	175	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	460	0	347	0	919	781	341	745	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
PHF Volume:	0	0	0	508	0	383	0	1015	863	377	823	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	508	0	383	0	1015	863	377	823	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	508	0	383	0	1015	863	377	823	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.95	1.00	0.75	1.00	0.91	0.85	0.92	0.91	1.00
Lanes:	0.00	0.00	0.00	2.00	0.00	2.00	0.00	3.00	1.00	2.00	3.00	0.00
Final Sat.:	0	0	0	3618	0	2842	0	5187	1615	3502	5187	0

Capacity Analysis Module:

Vol/Sat:	0.00	0.00	0.00	0.14	0.00	0.13	0.00	0.20	0.53	0.11	0.16	0.00
Crit Moves:				****				****			****	
Green/Cycle:	0.00	0.00	0.00	0.16	0.00	0.16	0.00	0.60	0.60	0.13	0.74	0.00
Volume/Cap:	0.00	0.00	0.00	0.89	0.00	0.85	0.00	0.33	0.89	0.81	0.22	0.00
Delay/Veh:	0.0	0.0	0.0	46.6	0.0	45.2	0.0	7.5	22.8	41.6	3.2	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	46.6	0.0	45.2	0.0	7.5	22.8	41.6	3.2	0.0
LOS by Move:	A	A	A	D	A	D	A	A	C	D	A	A
HCM2kAvgQ:	0	0	0	9	0	8	0	4	21	5	2	0

Note: Queue reported is the number of cars per lane.

Siena Apartments Traffic Impact Analysis (#0201-0001)
E+A+C+P (2015) Conditions
AM Peak Hour

Level Of Service Computation Report

2000 HCM Operations Method (Future Volume Alternative)

Intersection #9 I-15 NB Ramps / Clinton Keith Rd.

Cycle (sec): 75 Critical Vol./Cap.(X): 0.666
Loss Time (sec): 8 Average Delay (sec/veh): 14.6
Optimal Cycle: 43 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	10	10	10	0	0	0	10	15	15	0	15	15
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1	0	0	0	2	0	3	0	0	1

Volume Module:

Base Vol:	233	0	200	0	0	0	333	781	0	0	590	452
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	233	0	200	0	0	0	333	781	0	0	590	452
Added Vol:	30	0	75	0	0	0	43	223	0	0	235	89
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	263	0	275	0	0	0	376	1004	0	0	825	541
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	287	0	300	0	0	0	410	1095	0	0	900	590
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	287	0	300	0	0	0	410	1095	0	0	900	590
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	287	0	300	0	0	0	410	1095	0	0	900	590

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	1.00	0.90	1.00	1.00	1.00	0.92	0.91	1.00	1.00	0.91	0.85
Lanes:	1.49	0.00	1.51	0.00	0.00	0.00	2.00	3.00	0.00	0.00	3.00	1.00
Final Sat.:	2548	0	2587	0	0	0	3502	5187	0	0	5187	1615

Capacity Analysis Module:

Vol/Sat:	0.11	0.00	0.12	0.00	0.00	0.00	0.12	0.21	0.00	0.00	0.17	0.37
Crit Moves:	****						****					****
Green/Cycle:	0.17	0.00	0.17	0.00	0.00	0.00	0.17	0.72	0.00	0.00	0.55	0.55
Volume/Cap:	0.65	0.00	0.67	0.00	0.00	0.00	0.67	0.29	0.00	0.00	0.32	0.67
Delay/Veh:	30.6	0.0	31.0	0.0	0.0	0.0	31.8	3.8	0.0	0.0	9.4	14.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	30.6	0.0	31.0	0.0	0.0	0.0	31.8	3.8	0.0	0.0	9.4	14.2
LOS by Move:	C	A	C	A	A	A	C	A	A	A	A	B
HCM2kAvgQ:	5	0	6	0	0	0	5	3	0	0	4	11

Note: Queue reported is the number of cars per lane.

Siena Apartments Traffic Impact Analysis (#0201-0001)
 E+A+C+P (2015) Conditions
 PM Peak Hour

Level Of Service Computation Report

2000 HCM Operations Method (Future Volume Alternative)

Intersection #8 I-15 SB Ramps / Clinton Keith Rd.

Cycle (sec): 120 Critical Vol./Cap.(X): 0.625
 Loss Time (sec): 8 Average Delay (sec/veh): 24.9
 Optimal Cycle: 47 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound			
Movement:	L	T	R	L	T	R	L	T	R	L	T	R	
Control:	Split Phase			Split Phase			Permitted			Protected			
Rights:	Include			Include			Include			Include			
Min. Green:	0	0	0	10	10	10	0	19	19	10	19	19	
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lanes:	0	0	0	1	1	0	0	2	0	0	3	0	1

Volume Module:

Base Vol:	0	0	0	440	1	400	0	609	402	251	947	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	440	1	400	0	609	402	251	947	0
Added Vol:	0	0	0	146	0	85	0	354	75	147	379	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	586	1	485	0	963	477	398	1326	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
PHF Volume:	0	0	0	590	1	488	0	970	480	401	1335	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	590	1	488	0	970	480	401	1335	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	590	1	488	0	970	480	401	1335	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.92	0.92	0.75	1.00	0.91	0.85	0.92	0.91	1.00
Lanes:	0.00	0.00	0.00	1.99	0.01	2.00	0.00	3.00	1.00	2.00	3.00	0.00
Final Sat.:	0	0	0	3482	6	2842	0	5187	1615	3502	5187	0

Capacity Analysis Module:

Vol/Sat:	0.00	0.00	0.00	0.17	0.17	0.17	0.00	0.19	0.30	0.11	0.26	0.00
Crit Moves:						****			****	****		
Green/Cycle:	0.00	0.00	0.00	0.27	0.27	0.27	0.00	0.48	0.48	0.18	0.66	0.00
Volume/Cap:	0.00	0.00	0.00	0.62	0.62	0.63	0.00	0.39	0.63	0.63	0.39	0.00
Delay/Veh:	0.0	0.0	0.0	39.2	39.2	39.7	0.0	20.4	25.1	47.2	9.5	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	39.2	39.2	39.7	0.0	20.4	25.1	47.2	9.5	0.0
LOS by Move:	A	A	A	D	D	D	A	C	C	D	A	A
HCM2kAvgQ:	0	0	0	10	10	10	0	8	14	7	8	0

Note: Queue reported is the number of cars per lane.

Siena Apartments Traffic Impact Analysis (#0201-0001)
 E+A+C+P (2015) Conditions
 PM Peak Hour

Level Of Service Computation Report

2000 HCM Operations Method (Future Volume Alternative)

Intersection #9 I-15 NB Ramps / Clinton Keith Rd.

Cycle (sec): 120 Critical Vol./Cap.(X): 0.765
 Loss Time (sec): 8 Average Delay (sec/veh): 27.0
 Optimal Cycle: 60 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	10	10	10	0	0	0	10	15	15	0	15	15
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1	0	0	0	2	0	3	0	0	1

Volume Module:

Base Vol:	536	0	367	0	0	0	276	772	0	0	662	425
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	536	0	367	0	0	0	276	772	0	0	662	425
Added Vol:	85	0	146	0	0	0	75	425	0	0	441	147
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	621	0	513	0	0	0	351	1197	0	0	1103	572
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	646	0	533	0	0	0	365	1244	0	0	1147	595
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	646	0	533	0	0	0	365	1244	0	0	1147	595
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	646	0	533	0	0	0	365	1244	0	0	1147	595

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.91	1.00	0.91	1.00	1.00	1.00	0.92	0.91	1.00	1.00	0.91	0.85
Lanes:	1.55	0.00	1.45	0.00	0.00	0.00	2.00	3.00	0.00	0.00	3.00	1.00
Final Sat.:	2667	0	2502	0	0	0	3502	5187	0	0	5187	1615

Capacity Analysis Module:

Vol/Sat:	0.24	0.00	0.21	0.00	0.00	0.00	0.10	0.24	0.00	0.00	0.22	0.37
Crit Moves:	****						****					****
Green/Cycle:	0.32	0.00	0.32	0.00	0.00	0.00	0.14	0.62	0.00	0.00	0.48	0.48
Volume/Cap:	0.77	0.00	0.67	0.00	0.00	0.00	0.77	0.39	0.00	0.00	0.46	0.77
Delay/Veh:	39.4	0.0	36.7	0.0	0.0	0.0	57.3	11.7	0.0	0.0	20.9	30.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	39.4	0.0	36.7	0.0	0.0	0.0	57.3	11.7	0.0	0.0	20.9	30.2
LOS by Move:	D	A	D	A	A	A	E	B	A	A	C	C
HCM2kAvgQ:	15	0	13	0	0	0	7	8	0	0	10	19

Note: Queue reported is the number of cars per lane.

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		Freeway/Dir of Travel			I-5 SB				
Agency or Company		Trames Solutions, Inc.			Junction		Clinton Keith Off-Ramp		
Date Performed		6/12/15			Jurisdiction		Caltrans		
Analysis Time Period		AM Peak Hour			Analysis Year		EACP (2015) Conditions		
Project Description: Siena Apartments Traffic Impact Analysis									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off L _{up} = ft V _u = veh/h		Freeway Number of Lanes, N				3		Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off L _{down} = ft V _D = veh/h	
		Ramp Number of Lanes, N				2			
		Acceleration Lane Length, L _A							
		Deceleration Lane Length L _D				300			
		Freeway Volume, V _F				4597			
		Ramp Volume, V _R				807			
Freeway Free-Flow Speed, S _{FF}				65.0					
Ramp Free-Flow Speed, S _{FR}				35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	4597	0.92	Level	9	0	0.957	1.00	5222	
Ramp	807	0.92	Level	2	0	0.990	1.00	886	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
V ₁₂ = V _F (P _{FM}) L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☐ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☐ Yes ☐ No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					V ₁₂ = V _R + (V _F - V _R)P _{FD} L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.450 using Equation (Exhibit 13-7) V ₁₂ = 2837 pc/h V ₃ or V _{av34} 2385 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☒ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☒ Yes ☐ No If Yes, V _{12a} = 2984 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	5222	Exhibit 13-8	7050	No
				V _{FO} = V _F - V _R	4336	Exhibit 13-8	7050	No	
				V _R	886	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	2837	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D D _R = 21.8 (pc/mi/ln) LOS = C (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)					D _S = 0.508 (Exhibit 13-12) S _R = 53.3 mph (Exhibit 13-12) S ₀ = 66.5 mph (Exhibit 13-12) S = 58.3 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		Trames Solutions, Inc.		Freeway/Dir of Travel		I-15 SB			
Agency or Company				Junction		Clinton Keith On-Ramp			
Date Performed		6/12/15		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		EACP (2015) Conditions			
Project Description Siena Apartments Traffic Impact Analysis									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 3				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h			
		Ramp Number of Lanes, N 2							
		Acceleration Lane Length, L_A 300							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 3790							
		Ramp Volume, V_R 1122							
Freeway Free-Flow Speed, S_{FF} 65.0									
Ramp Free-Flow Speed, S_{FR} 35.0									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	3790	0.92	Level	9	0	0.957	1.00	4305	
Ramp	1122	0.92	Level	2	0	0.990	1.00	1232	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ 0.555 using Equation (Exhibit 13-6) $P_{FM} =$ 2389 pc/h $V_{12} =$ 1916 pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} 1916 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2460 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ using Equation (Exhibit 13-7) $P_{FD} =$ pc/h $V_{12} =$ pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	5537	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	3692	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 28.1 (pc/mi/ln) LOS = D (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.414 (Exhibit 13-11) $S_R =$ 55.5 mph (Exhibit 13-11) $S_0 =$ 60.2 mph (Exhibit 13-11) $S =$ 56.9 mph (Exhibit 13-13)					$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		Trames Solutions, Inc.			Freeway/Dir of Travel		I-5 NB		
Agency or Company		Trames Solutions, Inc.			Junction		Clinton Keith Off-Ramp		
Date Performed		6/12/15			Jurisdiction		Caltrans		
Analysis Time Period		AM Peak Hour			Analysis Year		EACP (2015) Conditions		
Project Description: Siena Apartments Traffic Impact Analysis									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 3				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h			
		Ramp Number of Lanes, N 2							
		Acceleration Lane Length, L_A							
		Deceleration Lane Length L_D 300							
		Freeway Volume, V_F 3531							
		Ramp Volume, V_R 537							
Freeway Free-Flow Speed, S_{FF} 65.0				Ramp Free-Flow Speed, S_{FR} 35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	3531	0.92	Level	9	0	0.957	1.00	4011	
Ramp	537	0.92	Level	2	0	0.990	1.00	590	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ using Equation (Exhibit 13-6) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ 0.450 using Equation (Exhibit 13-7) $V_{12} =$ 2129 pc/h V_3 or V_{av34} 1882 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2292 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8			V_F	4011	Exhibit 13-8	7050	No
				$V_{FO} = V_F - V_R$	3421	Exhibit 13-8	7050	No	
				V_R	590	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8			V_{12}	2129	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 15.9 (pc/mi/ln) LOS = B (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)					$D_S =$ 0.481 (Exhibit 13-12) $S_R =$ 53.9 mph (Exhibit 13-12) $S_0 =$ 68.5 mph (Exhibit 13-12) $S =$ 59.3 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		Trames Solutions, Inc.		Freeway/Dir of Travel		I-15 NB			
Agency or Company				Junction		Clinton Keith On-Ramp			
Date Performed		6/12/15		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		EACP (2015) Conditions			
Project Description Siena Apartments Traffic Impact Analysis									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 3				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h			
		Ramp Number of Lanes, N 2							
		Acceleration Lane Length, L_A 300							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 2994							
		Ramp Volume, V_R 916							
Freeway Free-Flow Speed, S_{FF} 65.0									
Ramp Free-Flow Speed, S_{FR} 35.0									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	2994	0.92	Level	9	0	0.957	1.00	3401	
Ramp	916	0.92	Level	2	0	0.990	1.00	1006	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ 0.555 using Equation (Exhibit 13-6) $V_{12} =$ 1888 pc/h V_3 or V_{av34} 1513 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 1943 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	4407	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	2949	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 22.4 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.332 (Exhibit 13-11) $S_R =$ 57.4 mph (Exhibit 13-11) $S_0 =$ 61.6 mph (Exhibit 13-11) $S =$ 58.7 mph (Exhibit 13-13)					$D_S =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst		Trames Solutions, Inc.		Freeway/Dir of Travel		I-5 SB				
Agency or Company		Trames Solutions, Inc.		Junction		Clinton Keith Off-Ramp				
Date Performed		6/12/15		Jurisdiction		Caltrans				
Analysis Time Period		PM Peak Hour		Analysis Year		EACP (2015) Conditions				
Project Description Siena Apartments Traffic Impact Analysis										
Inputs										
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 3 Ramp Number of Lanes, N 2 Acceleration Lane Length, L_A Deceleration Lane Length L_D 300 Freeway Volume, V_F 4316 Ramp Volume, V_R 1071 Freeway Free-Flow Speed, S_{FF} 65.0 Ramp Free-Flow Speed, S_{FR} 35.0				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h				
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$		
Freeway	4316	0.92	Level	9	0	0.957	1.00	4902		
Ramp	1071	0.92	Level	2	0	0.990	1.00	1176		
UpStream										
DownStream										
Merge Areas					Diverge Areas					
Estimation of v_{12}					Estimation of v_{12}					
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ using Equation (Exhibit 13-6) $P_{FM} =$ pc/h $V_{12} =$ pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} pc/h Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ using Equation (Exhibit 13-7) $P_{FD} =$ 0.450 $V_{12} =$ 2853 pc/h V_3 or V_{av34} 2049 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☒ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V_{FO}		Exhibit 13-8				V_F	4902	Exhibit 13-8	7050	No
					$V_{FO} = V_F - V_R$	3726	Exhibit 13-8	7050	No	
					V_R	1176	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?	
	V_{R12}	Exhibit 13-8				V_{12}	Exhibit 13-8		4400:All No	
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) $LOS =$ (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 20.7 (pc/mi/ln) $LOS =$ C (Exhibit 13-2)					
Speed Determination					Speed Determination					
$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)					$D_s =$ 0.534 (Exhibit 13-12) $S_R =$ 52.7 mph (Exhibit 13-12) $S_0 =$ 67.2 mph (Exhibit 13-12) $S =$ 57.9 mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		Trames Solutions, Inc.		Freeway/Dir of Travel		I-15 SB			
Agency or Company				Junction		Clinton Keith On-Ramp			
Date Performed		6/12/15		Jurisdiction		Caltrans			
Analysis Time Period		PM Peak Hour		Analysis Year		EACP (2015) Conditions			
Project Description Siena Apartments Traffic Impact Analysis									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 3				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h			
		Ramp Number of Lanes, N 2							
		Acceleration Lane Length, L_A 300							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 3245							
		Ramp Volume, V_R 876							
		Freeway Free-Flow Speed, S_{FF} 65.0							
Ramp Free-Flow Speed, S_{FR} 35.0									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	3245	0.92	Level	9	0	0.957	1.00	3686	
Ramp	876	0.92	Level	2	0	0.990	1.00	962	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ 0.555 using Equation (Exhibit 13-6) $P_{FM} =$ 2046 pc/h $V_{12} =$ 1640 pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} 1640 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2106 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ using Equation (Exhibit 13-7) $P_{FD} =$ pc/h $V_{12} =$ pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	4648	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	3068	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 23.3 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.342 (Exhibit 13-11) $S_R =$ 57.1 mph (Exhibit 13-11) $S_0 =$ 61.1 mph (Exhibit 13-11) $S =$ 58.4 mph (Exhibit 13-13)					$D_S =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		Trames Solutions, Inc.			Freeway/Dir of Travel		I-5 NB		
Agency or Company		Trames Solutions, Inc.			Junction		Clinton Keith Off-Ramp		
Date Performed		6/12/15			Jurisdiction		Caltrans		
Analysis Time Period		AM Peak Hour			Analysis Year		EACP (2015) Conditions		
Project Description: Siena Apartments Traffic Impact Analysis									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 3				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h			
		Ramp Number of Lanes, N 2							
		Acceleration Lane Length, L_A							
		Deceleration Lane Length L_D 300							
		Freeway Volume, V_F 5367							
		Ramp Volume, V_R 1134							
Freeway Free-Flow Speed, S_{FF} 65.0				Ramp Free-Flow Speed, S_{FR} 35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	5367	0.92	Level	9	0	0.957	1.00	6096	
Ramp	1134	0.92	Level	2	0	0.990	1.00	1245	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ using Equation (Exhibit 13-6) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ 0.450 using Equation (Exhibit 13-7) $V_{12} =$ 3428 pc/h V_3 or V_{av34} 2668 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 3483 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8			V_F	6096	Exhibit 13-8	7050	No
				$V_{FO} = V_F - V_R$	4851	Exhibit 13-8	7050	No	
				V_R	1245	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8			V_{12}	3428	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 26.1 (pc/mi/ln) LOS = C (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)					$D_S =$ 0.540 (Exhibit 13-12) $S_R =$ 52.6 mph (Exhibit 13-12) $S_0 =$ 65.0 mph (Exhibit 13-12) $S =$ 57.3 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		Trames Solutions, Inc.		Freeway/Dir of Travel		I-15 NB			
Agency or Company				Junction		Clinton Keith On-Ramp			
Date Performed		6/12/15		Jurisdiction		Caltrans			
Analysis Time Period		PM Peak Hour		Analysis Year		EACP (2015) Conditions			
Project Description Siena Apartments Traffic Impact Analysis									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 3				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h			
		Ramp Number of Lanes, N 2							
		Acceleration Lane Length, L_A 300							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 4233							
		Ramp Volume, V_R 924							
		Freeway Free-Flow Speed, S_{FF} 65.0							
Ramp Free-Flow Speed, S_{FR} 35.0									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	4233	0.92	Level	9	0	0.957	1.00	4808	
Ramp	924	0.92	Level	2	0	0.990	1.00	1014	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ 0.555 using Equation (Exhibit 13-6) $P_{FM} =$ 2668 pc/h $V_{12} =$ 2140 pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} 2140 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2747 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ using Equation (Exhibit 13-7) $P_{FD} =$ pc/h $V_{12} =$ pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	5822	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	3761	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 28.7 (pc/mi/ln) LOS = D (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.426 (Exhibit 13-11) $S_R =$ 55.2 mph (Exhibit 13-11) $S_0 =$ 59.4 mph (Exhibit 13-11) $S =$ 56.6 mph (Exhibit 13-13)					$D_S =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				