CA Review AJG

CITY COUNCIL

Staff Report

Meeting Date:	Nov. 19, 2019
To:	Mayor and City Council
From:	Scott Chadwick, City Manager
Staff Contact:	Jonathan Schauble, Senior Engineer jonathan.schauble@carlsbadca.gov, 760-602-2762
Subject:	Plans and specifications and authorization for the city clerk to advertise for bids for the traffic signal at Poinsettia Lane and Cassia Road and the traffic signal at Poinsettia Lane and Oriole Court/Skimmer Court, Capital Improvement Program Project Nos. 6329 and 6330.

Recommended Action

Adopt a Resolution approving the plans and specifications and authorizing the city clerk to advertise for bids for the traffic signal at Poinsettia Lane and Cassia Road and the traffic signal at Poinsettia Lane and Oriole Court/Skimmer Court, Capital Improvement Program (CIP) Project Nos. 6329 and 6330 (Project).

Executive Summary

Reach E of Poinsettia Lane is currently being constructed by the developer (Lennar Homes of California, Inc.) of a certain real property commonly known as Poinsettia 61. The Poinsettia 61 project, associated with Carlsbad Tract 14-10, is located within the boundaries of Bridge and Thoroughfare District No. 2 and was approved by the City Council on March 14, 2017. The developer was required to design and construct Reach E of Poinsettia Lane and a traffic signal at the intersection of the new residential road, Artemisia Court, and Poinsettia Lane.

This project will construct two traffic signals on Poinsettia Lane: one at Cassia Road and one at Oriole Court/Skimmer Court. Section 3.28.080 of the Carlsbad Municipal Code requires the City Council to approve plans and specifications for all construction projects that are to be formally bid when the value exceeds the limits established by the Public Contract Code, including the alternative provisions of the Uniform Public Construction Cost Accounting Act. The Public Contract Code limit is $200,000. The construction cost estimate for the Project is $350,000, and therefore the Project is subject to this requirement.

Discussion

This item was previously on the agenda for the Sept. 24, 2019 City Council meeting. At City Council briefings on Sept. 23, 2019, a request was made to include technical justification for the traffic signals as requested by the Planning Commission. This item was returned to staff by the city manager for further analysis to address the Planning Commission's request.

At the Planning Commission meeting of Feb. 1, 2017, a motion was made to recommend to the City Council consideration of "traffic safety implementation" at the intersection of Oriole Court/Skimmer Court and Poinsettia Lane that benefits pedestrian crossing, and "safety measures" at Cassia Road and Poinsettia Lane to be implemented as part of a CIP project.

As part of the traffic study titled *"Poinsettia Lane Gap Closure,"* a traffic engineering consultant, LSA, has completed a traffic study which analyzed traffic conditions along Poinsettia Lane. LSA's analysis shows that traffic signals are warranted at the intersections of Poinsettia Lane with Cassia Road and Oriole Court/Skimmer Court. Location maps for the two traffic signals are shown in Exhibit 2.

Fiscal Analysis

The Project is financed by the Gas Tax Fund and sufficient funds are currently available to complete the Project. A summary of the estimated construction costs and available funds for the Project are shown in the following table. Remaining Gas Tax funds will be available for future projects.

TRAFFIC SIGNALS AT POINSETTIA LANE AND CASSIA ROAD AND AT POINSETTIA LANE AND ORIOLE COURT/SKIMMER CORT, CIP PROJECT NOS. 6329 AND 6330	
Current Appropriation – Gas Tax Fund	$500,000
Current Expenditures/Encumbrances	$16,334
TOTAL AVAILABLE FUNDING	**$483,666**
Construction Contract (Estimated)	$350,000
Construction Contingency (Estimated)	$66,000
Construction Management, Inspection and Material Testing (Estimated)	$66,000
TOTAL ESTIMATED CONSTRUCTION COSTS	**$482,000**
REMAINING BALANCE	**$1,666**
ADDITIONAL APPROPRIATION NEEDED	**$0**

Next Steps

A request for bids to construct the Project will be advertised. Responses will be evaluated and the lowest responsive and responsible bidder will be identified by city staff. Staff will then return to the City Council with a recommendation to award the contract to the identified bidder.

Environmental Evaluation (CEQA)

The Project is exempt from the California Environmental Quality Act (CEQA) per State CEQA Guidelines Section 15301(c) – minor alteration of existing facilities including streets, sidewalks, gutters, and similar facilities involving negligible or no expansion.

Public Notification

This item was noticed in accordance with the Ralph M. Brown Act and was available for public viewing and review at least 72 hours prior to the scheduled meeting date. The public will be notified in advance of construction activities using multiple methods such as signage, email, website and other city communication channels, as necessary.

Exhibits

1. City Council Resolution
2. Location Maps
3. Contract documents, including plans and specifications, are on file at the city clerk's office

RESOLUTION NO. 2019-239

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF CARLSBAD, CALIFORNIA, APPROVING THE PLANS AND SPECIFICATIONS AND AUTHORIZING THE CITY CLERK TO ADVERTISE FOR BIDS FOR THE TRAFFIC SIGNAL AT POINSETTIA LANE AND CASSIA ROAD AND THE TRAFFIC SIGNAL AT POINSETTIA LANE AND ORIOLE COURT/SKIMMER COURT, CAPITAL IMPROVEMENT PROGRAM (CIP) PROJECT NOS. 6329 AND 6330.

WHEREAS, the City Council of the City of Carlsbad, California, has determined it necessary, desirable and in the public interest to install traffic signals at the intersections of Poinsettia Lane and Cassia Road, and Poinsettia Lane and Oriole Court/Skimmer Court; and

WHEREAS, Section 3.28.080 of the Carlsbad Municipal Code requires the City Council to adopt a Resolution approving the plans and specifications for all construction projects that are to be formally bid when the value exceeds the limits established by the Public Contract Code; and

WHEREAS, the plans, specifications and contract documents for the traffic signal at Poinsettia Lane and Cassia Road, and the traffic signal at Poinsettia Lane and Oriole Court/Skimmer Court, CIP Project Nos. 6329 and 6330 (Project), have been prepared and are on file at the city clerk's office and are incorporated herein by reference; and

WHEREAS, sufficient Gas Tax funds are available to complete the Project; and

WHEREAS, the Project is exempt from the California Environmental Quality Act (CEQA) review pursuant to CEQA Guidelines Section 15301(c) - minor alteration of existing facilities including streets, sidewalks, gutters and similar facilities involving negligible or no expansion.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Carlsbad, California, as follows:

1. That the above recitations are true and correct.

2. That the plans, specifications and contract documents for the Project are hereby approved and are on file at the city clerk's office.

3. The city clerk of the City of Carlsbad is hereby authorized and directed to publish in accordance with State law, a Notice to Contractors inviting bids for the construction of the Project, in accordance with the plans, specifications and contract documents referred to herein.

PASSED, APPROVED AND ADOPTED at a Regular Meeting of the City Council of the City of Carlsbad on the 19th day of November 2019, by the following vote, to wit:

AYES: Hall, Blackburn, Bhat-Patel, Schumacher.

NAYS: None.

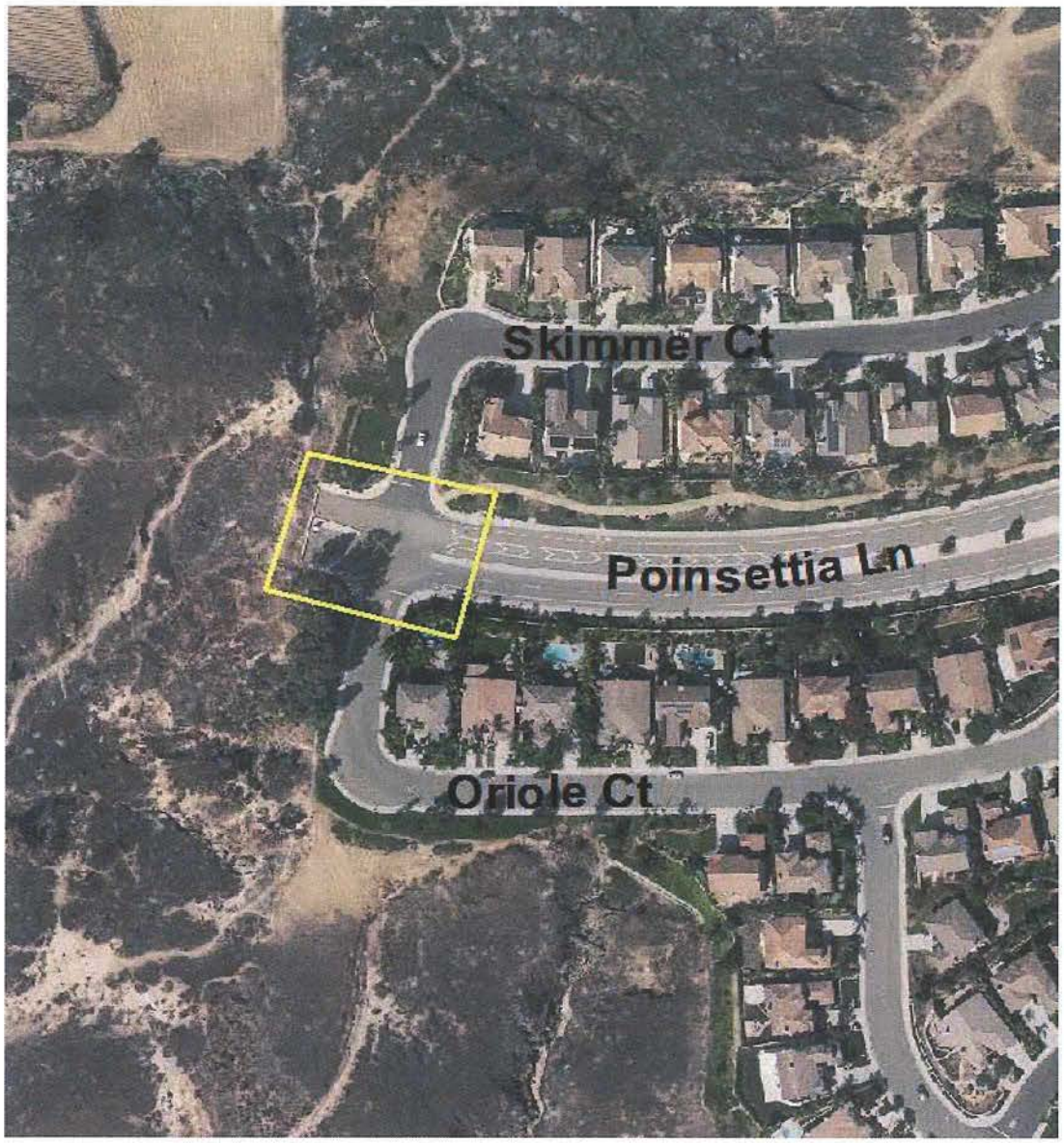
ABSENT: None.

MATT HALL, Mayor

for Hector Gomez, Deputy City Clerk
BARBARA ENGLESON, City Clerk

(SEAL)

Location Map – Poinsettia Lane and Cassia Road



Location Map – Poinsettia Lane and Oriole Court/Skimmer Court

CITY OF CARLSBAD

San Diego County

California

CONTRACT DOCUMENTS, GENERAL PROVISIONS, SUPPLEMENTAL PROVISIONS, AND TECHNICAL SPECIFICATIONS

FOR

TRAFFIC SIGNALS AT POINSETTIA LANE, CASSIA ROAD AND SKIMMER COURT

CONTRACT NO. 6329/6330

PWS20-904TRAN

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GENERAL PROVISIONS

SUPPLEMENTAL PROVISIONS TO PARTS 2, 3, 6 OF THE SSPWC AND TECHNICAL SPECIFICATIONS

CITY OF CARLSBAD, CALIFORNIA
NOTICE INVITING BIDS

Until 11 a.m. on December 17, 2019, the City shall accept sealed bids, clearly marked as such, at the Faraday Center, 1635 Faraday Avenue, Carlsbad, CA 92008-7314, Attn: Purchasing Officer, by mail, delivery service or by deposit in the Bid Box located in the first floor lobby, at which time they will be opened and read, for performing the work as follows: The Traffic Signals at Poinsettia Lane, Cassia Road and Skimmer Court project consists of installing two traffic signals: 1) at the intersection of Poinsettia Lane and Cassia Road and 2) at the intersection of Poinsettia Lane and Skimmer Court/Oriole Court.

TRAFFIC SIGNALS AT POINSETTIA LANE, CASSIA ROAD AND SKIMMER COURT
CONTRACT NO. 6329/6330
PWS19-904TRAN

INSTRUCTIONS TO BIDDERS AND BID REQUIREMENTS
This bid and the terms of the Contract Documents and General Provisions constitute an irrevocable offer that shall remain valid and in full force for a period of 90 days and such additional time as may be mutually agreed upon by the City of Carlsbad and the Bidder.

No bid will be received unless it is made on a proposal form furnished by the Purchasing Department. Each bid must be accompanied by security in a form and amount required by law. The bidder's security of the second and third next lowest responsive bidders may be withheld until the Contract has been fully executed. The security submitted by all other unsuccessful bidders shall be returned to them, or deemed void, within ten (10) days after the Contract is awarded. Pursuant to the provisions of law (Public Contract Code section 10263), appropriate securities may be substituted for any obligation required by this notice or for any monies withheld by the City to ensure performance under this Contract. Section 10263 of the Public Contract Code requires monies or securities to be deposited with the City or a state or federally chartered bank in California as the escrow agent. The escrow agent shall maintain insurance to cover negligent acts and omissions of the agent in connection with the handling of retentions under this section in an amount not less than $100,000 per contract.

The City of Carlsbad may disqualify a contractor or subcontractor from participating in bidding when a contractor or subcontractor has been debarred by the City of Carlsbad or another jurisdiction in the State of California as an irresponsible bidder.

The work shall be performed in strict conformity with the plans, provisions, and specifications as approved by the City Council of the City of Carlsbad on file with the City Clerk's Office. The specifications for the work include City of Carlsbad Technical Specifications and the **Standard Specifications for Public Works Construction, 2018 edition and the supplements thereto as published by the "Greenbook" Committee of Public Works Standards, Inc.** all hereinafter designated "SSPWC", as amended. Specification Reference is hereby made to the plans and specifications for full particulars and description of the work. The General Provisions (Part 1) to the SSPWC do not apply.

The City of Carlsbad encourages the participation of minority and women-owned businesses.

The City of Carlsbad encourages all bidders, suppliers, manufacturers, fabricators and contractors to utilize recycled and recyclable materials when available, appropriate and approved by the Engineer.

BID DOCUMENTS

The bid documents comprise the following documents which must be completed and properly executed including notarization, where indicated.

1. Contractor's Proposal
2. Bidder's Bond
3. Noncollusion Declaration
4. Designation of Subcontractor and Amount of Subcontractor's Bid
5. Bidder's Statement of Technical Ability and Experience
6. Acknowledgement of Addendum(a)
7. Certificate of Insurance. The riders covering the City, its officials, employees and volunteers may be omitted at the time of bid submittal but shall be provided by the Bidder prior to award of this contract.
8. Bidder's Statement Re Debarment
9. Bidder's Disclosure of Discipline Record
10. Escrow Agreement for Security Deposits - (optional, must be completed if the Bidder wishes to use the Escrow Agreement for Security)

ENGINEER'S ESTIMATE:

All bids will be compared on the basis of the Engineer's Estimate. The estimated quantities are approximate and serve solely as a basis for the comparison of bids. The Engineer's Estimate is one hundred and fifty thousand dollars ($350,000).

TIME OF COMPLETION:

The contractor shall complete the Work within the time set in the contract as defined in the General Provisions Section 6-7.

SPECIALTY CONTRACTORS:
ACCEPTABLE LICENSE TYPES

Except as provided herein a bid submitted to the City by a Contractor who is not licensed as a contractor pursuant to the Business and Professions Code shall be considered nonresponsive and shall be rejected by the City. In all contracts where federal funds are involved, no bid submitted shall be invalidated by the failure of the bidder to be licensed in accordance with California law. Where federal funds are involved the contractor shall be properly licensed at the time the contract is awarded. In all other cases the contractor shall state their license number, expiration date and classification in the proposal, under penalty of perjury. This invitation to bid does not involve federal funds. The following classifications are acceptable for this contract:
A - General Engineering or C10 - General Electrical.

ESCROW AGREEMENT

If the Contractor intends to utilize the escrow agreement included in the contract documents in lieu of the usual 5% retention from each payment, these documents must be completed and submitted with the signed contract. The escrow agreement may not be substituted at a later date.

OBTAINING PLANS AND SPECIFICATIONS

Sets of plans, various supplemental provisions, and Contract documents may be obtained from the City's website http://www.carlsbadca.gov/services/depts/finance/contracting/bids.asp. Paper copies will not be sold.

INTENT OF PLANS AND SPECIFICATIONS

Any prospective bidder who is in doubt as to the intended meaning of any part of the drawings, specifications or other contract documents, or finds discrepancies in or omissions from the drawings and specifications may submit to the Engineer a written request for clarification or correction. Any response will be made only by a written addendum duly issued by the Engineer a copy of which will be mailed or delivered to each person receiving a set of the contract documents. No oral response will be made to such inquiry. **Prior to the award of the contract, no addition to, modification of or interpretation of any provision in the contract documents will be given by any agent, employee or contractor of the City of Carlsbad except as hereinbefore specified. No bidder may rely on directions given by any agent, employee or contractor of the City of Carlsbad except as hereinbefore specified.**

REJECTION OF BIDS

The City of Carlsbad reserves the right to reject any or all bids and to waive any minor irregularity or informality in such bids.

PREVAILING WAGE TO BE PAID

The general prevailing rate of wages for each craft or type of worker needed to execute the Contract shall be those as determined by the Director of Industrial Relations pursuant to the sections 1770, 1773, and 1773.1 of the Labor Code. Pursuant to section 1773.2 of the Labor Code, a current copy of applicable wage rates is on file in the Office of the City Engineer. The Contractor to whom the Contract is awarded shall not pay less than the said specified prevailing rates of wages to all workers employed by him or her in the execution of the Contract.

The Prime Contractor shall be responsible for insuring compliance with provisions of section 1777.5 of the Labor Code and section 4100 et seq. of the Public Contracts Code, "Subletting and Subcontracting Fair Practices Act." The City Engineer is the City's "duly authorized officer" for the purposes of section 4107 and 4107.5.

The provisions of Part 7, Chapter 1, of the Labor Code commencing with section 1720 shall apply to the Contract for work.

A contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of any contract for public work, unless currently registered and qualified to perform public work pursuant to Section 1725.5. This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

The Prime Contractor and all subcontractors shall comply with Section 1776 of the Labor Code, which generally requires keeping accurate payroll records, verifying and certifying payroll records, and making them available for inspection. Contractor shall require all subcontractors to comply with Section 1776.

PRE-BID MEETING

A pre-bid meeting will not be held.

UNIT PRICES AND COMPUTATION OF BIDS

All bids are to be computed on the basis of the given estimated quantities of work, as indicated in this proposal, times the unit price as submitted by the bidder. In case of a discrepancy between words and figures, the words shall prevail. In case of an error in the extension of a unit price, the corrected extension shall be calculated and the bids will be computed as indicated above and compared on the basis of the corrected totals.

All prices must be in ink or typewritten. Changes or corrections may be crossed out and typed or written in with ink and must be initialed in ink by a person authorized to sign for the Contractor.

ADDENDA

Bidders are advised to verify the issuance of all addenda and receipt thereof one day prior to bidding. Submission of bids without acknowledgment of addenda may be cause of rejection of bid.

BOND AND INSURANCE REQUIREMENTS

The Contractor shall provide bonds to secure faithful performance and warranty of the work in an amount equal to one hundred percent (100%) of the Contract price on this project. The Contractor shall provide bonds to secure payment of laborers and materials suppliers, in an amount equal to one hundred percent (100%) of the total amount payable by the terms of the contract. These bonds shall be kept in full force and effect during the course of this project and shall extend in full force and effect and be retained by the City until they are released as stated in the General Provisions section of this contract. All bonds are to be placed with a surety insurance carrier admitted and authorized to transact the business of insurance in California and whose assets exceed their liabilities in an amount equal to or in excess of the amount of the bond. The bonds are to be accompanied by the following documents:

1) An original, or a certified copy, of the unrevoked appointment, power of attorney, by laws, or other instrument entitling or authorizing the person who executed the bond to do so.
2) A certified copy of the certificate of authority of the insurer issued by the insurance commissioner.

If the bid is accepted, the City may require copies of the insurer's most recent annual statement and quarterly statement filed with the Department of Insurance pursuant to Article 10 (commencing with section 900) of Chapter 1 of Part 2 of Division 1 of the Insurance Code, within 10 calendar days of the insurer's receipt of a request to submit the statements.

Insurance is to be placed with insurers that:

1) Have a rating in the most recent Best's Key Rating Guide of at least A-:VII
2) Are admitted and authorized to transact the business of insurance in the State of California by the Insurance Commissioner.

Auto policies offered to meet the specification of this contract must:

1) Meet the conditions stated above for all insurance companies.
2) Cover any vehicle used in the performance of the contract, used onsite or offsite, whether owned, non-owned or hired, and whether scheduled or non-scheduled.

Workers' compensation insurance required under this contract must be offered by a company meeting the above standards with the exception that the Best's rating condition is waived. The City does accept policies issued by the State Compensation Fund meeting the requirement for workers' compensation insurance.

The Contractor shall be required to maintain insurance as specified in the Contract. Any additional cost of said insurance shall be included in the bid price.

The award of the contract by the City Council is contingent upon the Contractor submitting the required bonds and insurance, as described in the contract, within twenty days of bid opening. If the Contractor fails to comply with these requirements, the City may award the contract to the second or third lowest bidder and the bid security of the lowest bidder may be forfeited.

BUSINESS LICENSE

The prime contractor and all subcontractors are required to have and maintain a valid City of Carlsbad Business License for the duration of the contract.

Approved by the City Council of the City of Carlsbad, California, by Resolution No. _____, adopted on the 19th day of November 2019.

November 20, 2019
Date

Graham Jordan, Deputy Clerk

CITY OF CARLSBAD

TRAFFIC SIGNAL AT POINSETTIA LANE, CASSIA ROAD AND SKIMMER COURT
CONTRACT NO. 6329/6330

CONTRACTOR'S PROPOSAL

City Council
City of Carlsbad
1200 Carlsbad Village Drive
Carlsbad, California 92008

The undersigned declares he/she has carefully examined the location of the work, read the Notice Inviting Bids, examined the Plans, Specifications, General Provisions, Contract Documents, Bid Item Descriptions and addenda thereto, and hereby proposes to furnish all labor, materials, equipment, transportation, and services required to do all the work to complete CONTRACT NO.6329/6330 in accordance with the Plans, Specifications, General Provisions, Contract Documents, Bid Item Descriptions and addenda thereto and that he/she will take in full payment therefore the following unit prices for each item complete, to wit:

SCHEDULE "A" POINSETTIA LANE AND CASSIA ROAD

Item No.	Description	Approximate Quantity And Unit	Unit Price (Figures)	Total Amount (Figures)
1	Remove Sign at _____ _____ (Unit Price in Words)	4 each	$_____	$_____
2	Install Pavement Legend - Thermoplastic (SF) at _____ _____ (Unit Price in Words)	550 SF	$_____	$_____
3	Remove Pavement Legend (SF) at _____ _____ (Unit Price in Words)	50 SF	$_____	$_____
4	Install Stripe - Paint (LF) at _____ _____ (Unit Price in Words)	250 LF	$_____	$_____

Item No.	Description	Approximate Quantity And Unit	Unit Price (Figures)	Total Amount (Figures)
5	Install Stripes - Thermoplastic (LF) at _____ _____ (Unit Price in Words)	250 LF	$ _____	$ _____
6	Furnish and Install McCain 352i ATC Cabinet and Trafficware 2070LX Controller with battery backup system Alpha _____ _____ (Lump Sum Price in Words)	LS		$ _____
7	Install Roadside Sign _____ _____ (Unit Price in Words)	9 each	$ _____	$ _____
8	Pedestrian Barricade _____ _____ (Unit Price in Words)	2 each	$ _____	$ _____
9	Remove Existing Striping (LF) at _____ _____ (Unit Price in Words)	250 LF	$ _____	$ _____
10	2" Conduit Installation (LF) at _____ _____ (Unit Price in Words)	250 LF	$ _____	$ _____
11	3" Conduit Installation (LF) at _____ _____ (Unit Price in Words)	400 LF	$ _____	$ _____
12	4" Conduit Installation (LF) at _____ _____ (Unit Price in Words)	115 LF	$ _____	$ _____

Item No.	Description	Approximate Quantity And Unit	Unit Price (Figures)	Total Amount (Figures)
13	Pull Box (No. 6) at _____ _____ (Unit Price in Words)	8 each	$ _____	$ _____
14	#6 & #8 Conductors (LF) at _____ _____ (Unit Price in Words)	765 LF	$ _____	$ _____
15	#10, #12, and #14 Conductors (LF) at _____ _____ (Unit Price in Words)	2,110 LF	$ _____	$ _____
16	EVP Cable at _____ _____ (Unit Price in Words)	440 LF	$ _____	$ _____
17	Interconnect Cable at _____ _____ (Unit Price in Words)	750 LF	$ _____	$ _____
18	12 Conductor Cable at _____ _____ (Unit Price in Words)	840 LF	$ _____	$ _____
19	3 Conductor Cable _____ _____ (Unit Price in Words)	355 LF	$ _____	$ _____
20	Radar Detection System at _____ _____ (Lump Sum Price in Words)	LS		$ _____
21	Pedestrian Signal Head-LED at _____ _____ (Unit Price in Words)	4 each	$ _____	$ _____

Item No.	Description	Approximate Quantity And Unit	Unit Price (Figures)	Total Amount (Figures)
22	Pedestrian Push Button at _____ _____ (Unit Price in Words)	4 each	$_____	$_____
23	Type III Service with Foundation at _____ _____ (Lump Sum Price in Words)	LS		$_____
24	EVP Detector at _____ _____ (Unit Price in Words)	3 each	$_____	$_____
25	Vehicular Signal Head - 3 Section (12") at _____ _____ (Unit Price in Words)	11 each	$_____	$_____
26	Type 1-A Pole at _____ _____ (Unit Price in Words)	2 each	$_____	$_____
27	Type 15TS with mast arm at _____ _____ (Unit Price in Words)	1 each	$_____	$_____
28	Type 19 Pole with mast arms at _____ _____ (Unit Price in Words)	2 each	$_____	$_____
29	Type 26 Pole with mast arms at _____ _____ (Unit Price in Words)	1 each	$_____	$_____
30	PPB Post with mast arm at _____ _____ (Unit Price in Words)	1 each	$_____	$_____

Item No.	Description	Approximate Quantity And Unit	Unit Price (Figures)	Total Amount (Figures)
31	Install Mast Arm Mounted Sign at _____ _____ (Unit Price in Words)	3 each	$_____	$_____
32	LED cobra head Luminaire with mast arm at _____ _____ (Unit Price in Words)	4 each	$_____	$_____
33	PEU at _____ _____ (Unit Price in Words)	1 each	$_____	$_____
34	Pothole Foundation Locations _____ _____ (Lump Sum Price in Words)	LS		$_____
35	Traffic Control during construction at _____ _____ (Lump Sum Price in Words)	LS		$_____
36	Install Curb Ramp per San Diego Regional Standard Drawing (SDRSD) at _____ _____ (Unit Price in Words)	2 each	$_____	$_____
37	Curb and Gutter Removal at _____ _____ (Unit Price in Words)	26 LF	$_____	$_____
38	Remove Existing sidewalk and/or curb ramp at _____ _____ (Unit Price in Words)	260 SF	$_____	$_____

Item No.	Description	Approximate Quantity And Unit	Unit Price (Figures)	Total Amount (Figures)
39	Install Sidewalk per SDRSD at _____ _____ (Unit Price in Words)	144 SF	$_____	$_____
40	Install 6-in Type G Curb and Gutter per SDRSD at _____ _____ (Unit Price in Words)	26 LF	$_____	$_____

SCHEDULE "B" POINSETTIA LANE AND SKIMMER COURT

Item No.	Description	Approximate Quantity And Unit	Unit Price (Figures)	Total Amount (Figures)
1	Remove Sign at _____ _____ (Unit Price in Words)	2 each	$_____	$_____
2	Install Pavement Legend - Thermoplastic (SF) at _____ _____ (Unit Price in Words)	1,440 SF	$_____	$_____
3	Remove Pavement Legend (SF) at _____ _____ (Unit Price in Words)	15 SF	$_____	$_____
4	Install Stripe - Paint (LF) at _____ _____ (Unit Price in Words)	240 LF	$_____	$_____
5	Install Stripes - Thermoplastic (LF) at _____ _____ (Unit Price in Words)	130 LF	$_____	$_____

Item No.	Description	Approximate Quantity And Unit	Unit Price (Figures)	Total Amount (Figures)
6	Furnish and Install McCain 352i ATC Cabinet and Trafficware 2070LX Controller with battery backup system alpha _____ _____ (Lump Sum Price in Words)	LS		$_____
7	Remove Existing Striping (LF) at _____ _____ (Unit Price in Words)	240 LF	$_____	$_____
8	2" Conduit Installation (LF) at _____ _____ (Unit Price in Words)	575 LF	$_____	$_____
9	3" Conduit Installation (LF) at _____ _____ (Unit Price in Words)	210 LF	$_____	$_____
10	4" Conduit Installation (LF) at _____ _____ (Unit Price in Words)	380 LF	$_____	$_____
11	Pull Box (No. 5) at _____ _____ (Unit Price in Words)	14 each	$_____	$_____
12	Pull Box (No. 6) at _____ _____ (Unit Price in Words)	8 each	$_____	$_____
13	#6 & #8 Conductors (LF) at _____ _____ (Unit Price in Words)	885 LF	$_____	$_____

Item No.	Description	Approximate Quantity And Unit	Unit Price (Figures)	Total Amount (Figures)
14	#10, #12, and #14 Conductors (LF) at _____ _____ (Unit Price in Words)	2,695 LF	$ _____	$ _____
15	EVP Cable at _____ _____ (Unit Price in Words)	720 LF	$ _____	$ _____
16	Interconnect Cable at _____ _____ (Unit Price in Words)	500 LF	$ _____	$ _____
17	12 Conductor Cable at _____ _____ (Unit Price in Words)	1,275 LF	$ _____	$ _____
18	3 Conductor Cable _____ _____ (Unit Price in Words)	1,025 LF	$ _____	$ _____
19	Radar Detection System at _____ _____ (Lump Sum Price in Words)	LS		$ _____
20	Pedestrian Signal Head-LED at _____ _____ (Unit Price in Words)	8 each	$ _____	$ _____
21	Pedestrian Push Button at _____ _____ (Unit Price in Words)	8 each	$ _____	$ _____
22	Type III Service with Foundation at _____ _____ (Lump Sum Price in Words)	LS		$ _____

Item No.	Description	Approximate Quantity And Unit	Unit Price (Figures)	Total Amount (Figures)
23	EVP Detector at _____ _____ (Unit Price in Words)	4 each	$_____	$_____
24	Vehicular Signal Head - 3 Section (12") at _____ _____ (Unit Price in Words)	10 each	$_____	$_____
25	Type 1-A Pole at _____ _____ (Unit Price in Words)	4 each	$_____	$_____
26	Type 17 Pole with mast arms at _____ _____ (Unit Price in Words)	2 each	$_____	$_____
27	Type 26 Pole with mast arms at _____ _____ (Unit Price in Words)	2 each	$_____	$_____
28	Remove and Salvage Existing Pole/Foundation at _____ _____ (Unit Price in Words)	2 each	$_____	$_____
29	Install Mast Arm Mounted Sign at _____ _____ (Unit Price in Words)	2 each	$_____	$_____
30	LED cobra Luminaire with mast arm at _____ _____ (Unit Price in Words)	4 each	$_____	$_____

Item No.	Description	Approximate Quantity And Unit	Unit Price (Figures)	Total Amount (Figures)
31	PEU at _____ _____ (Unit Price in Words)	1 each	$_____	$_____
32	Traffic Control during construction at _____ _____ (Lump Sum Price in Words)	LS		$_____
33	Install Curb Ramp per San Diego Regional Standard Drawing (SDRSD) at _____ _____ (Unit Price in Words)	4 each	$_____	$_____
34	Curb and Gutter Removal at _____ _____ (Unit Price in Words)	52 LF	$_____	$_____
35	Remove Existing sidewalk and/or curb ramp at _____ _____ (Unit Price in Words)	520 SF	$_____	$_____
36	Install Sidewalk per SDRSD at _____ _____ (Unit Price in Words)	288 SF	$_____	$_____
37	Install 6-in Type G Curb and Gutter per SDRSD at _____ _____ (Unit Price in Words)	52 LF	$_____	$_____
38	Install Roadside Signs at _____ _____ (Unit Price in Words)	6 each	$_____	$_____

Item No.	Description	Approximate Quantity And Unit	Unit Price (Figures)	Total Amount (Figures)
39	Pothole Foundation Locations	1 LS	$_____	$_____

_____

_____

(Lump Sum Price in Words)

Total amount of bid in words for Schedule "A": _____

_____

Total amount of bid in numbers for Schedule "A": $_____

Total amount of bid in words for Schedule "B": _____

_____

Total amount of bid in numbers for Schedule "B": $_____

Total amount of bid in words including Schedule "A" and Schedule "B": _____

_____

Total amount of bid in numbers including Schedule "A" and Schedule "B": $_____

The City shall determine the low bid based on the sum of Schedule "A" and Schedule "B".

Price(s) given above are firm for 90 days after date of bid opening.

Addendum(a) No(s). _____ has/have been received and is/are included in this proposal.

The Undersigned has carefully checked all of the above figures and understands that the City will not be responsible for any error or omission on the part of the Undersigned in preparing this bid.

The Undersigned agrees that in case of default in executing the required Contract with necessary bonds and insurance policies within twenty (20) days from the date of award of Contract by the City Council of the City of Carlsbad, the City may administratively authorize award of the contract to the second or third lowest bidder and the bid security of the lowest bidder may be forfeited.

The Undersigned bidder declares, under penalty of perjury, that the undersigned is licensed to do business or act in the capacity of a contractor within the State of California, validly licensed under license number _____, classification _____ which expires on _____and Department of Industrial Relations PWC registration number

_____ which expires on _____, and that this statement is true and correct and has the legal effect of an affidavit.

A bid submitted to the City by a Contractor who is not licensed as a contractor pursuant to the Business and Professions Code shall be considered nonresponsive and shall be rejected by the City § 7028.15(e). In all contracts where federal funds are involved, no bid submitted shall be invalidated by the failure of the bidder to be licensed in accordance with California law. However, at the time the contract is awarded, the contractor shall be properly licensed.

The Undersigned bidder hereby represents as follows:

1. That no Council member, officer agent, or employee of the City of Carlsbad is personally interested, directly or indirectly, in this Contract, or the compensation to be paid hereunder; that no representation, oral or in writing, of the City Council, its officers, agents, or employees has inducted him/her to enter into this Contract, excepting only those contained in this form of Contract and the papers made a part hereof by its terms; and

2. That this bid is made without connection with any person, firm, or corporation making a bid for the same work, and is in all respects fair and without collusion or fraud.

Accompanying this proposal is _____ (Cash, Certified Check, Bond or Cashier's Check) for ten percent (10%) of the amount bid.

The Undersigned is aware of the provisions of section 3700 of the Labor Code which requires every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and agrees to comply with such provisions before commencing the performance of the work of this Contract and continue to comply until the contract is complete.

The Undersigned is aware of the provisions of the Labor Code, Part 7, Chapter 1, Article 2, relative to the general prevailing rate of wages for each craft or type of worker needed to execute the Contract and agrees to comply with its provisions.

IF A SOLE OWNER OR SOLE CONTRACTOR SIGN HERE:

(1) Name under which business is conducted _____

(2) Signature (given and surname) of proprietor _____

(3) Place of Business _____
(Street and Number)
City and State _____

(4) Zip Code _____ Telephone No. _____

(5) E-Mail _____

IF A PARTNERSHIP, SIGN HERE:

(1) Name under which business is conducted _____

(2) Signature (given and surname and character of partner) (Note: Signature must be made by a general partner)

_____

_____

(3) Place of Business _____
(Street and Number)
City and State _____

(4) Zip Code _____ Telephone No. _____

(5) E-Mail _____

IF A CORPORATION, SIGN HERE:

(1) Name under which business is conducted _____

_____

(2) _____
(Signature)

_____
(Title)

Impress Corporate Seal here

(3) Incorporated under the laws of the State of _____

(4) Place of Business _____
(Street and Number)
City and State _____

(5) Zip Code _____ Telephone No. _____

(6) E-Mail _____

NOTARIAL ACKNOWLEDGMENT OF EXECUTION BY ALL SIGNATORIES MUST BE ATTACHED

List below names of president, vice president, secretary and assistant secretary, if a corporation; if a partnership, list names of all general partners, and managing partners:

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

BID SECURITY FORM

(Check to Accompany Bid)

TRAFFIC SIGNALS AT POINSETTIA LANE, CASSIA ROAD AND SKIMMER COURT
CONTRACT NO. 6329/6330

(NOTE: The following form shall be used if check accompanies bid.)

Accompanying this proposal is a *Certified *Cashiers check payable to the order of CITY OF CARLSBAD, in the sum of _____

_____ dollars ($_____),
this amount being ten percent (10%) of the total amount of the bid. The proceeds of this check shall become the property of the City provided this proposal shall be accepted by the City through action of its legally constituted contracting authorities and the undersigned shall fail to execute a contract and furnish the required Performance, Warranty and Payment Bonds and proof of insurance coverage within the stipulated time; otherwise, the check shall be returned to the undersigned. The proceeds of this check shall also become the property of the City if the undersigned shall withdraw his or her bid within the period of fifteen (15) days after the date set for the opening thereof, unless otherwise required by law, and notwithstanding the award of the contract to another bidder.

_____

_____
BIDDER

*Delete the inapplicable word.

(NOTE: If the Bidder desires to use a bond instead of check, the Bid Bond form on the following pages shall be executed--the sum of this bond shall be not less than ten percent (10%) of the total amount of the bid.)

BIDDER'S BOND TO ACCOMPANY PROPOSAL

TRAFFIC SIGNALS AT POINSETTIA LANE, CASSIA ROAD AND SKIMMER COURT
CONTRACT NO. 6329/6330

KNOW ALL PERSONS BY THESE PRESENTS:

That we, _____, as Principal, and _____, as Surety are held and firmly bound unto the City of Carlsbad, California, in an amount as follows: (must be at least ten percent (10%) of the bid amount) _____ for which payment, well and truly made, we bind ourselves, our heirs, executors and administrators, successors or assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THE FOREGOING OBLIGATION IS SUCH that if the proposal of the above-bounden Principal for:

TRAFFIC SIGNALS AT POINSETTIA LANE, CASSIA ROAD AND SKIMMER COURT
CONTRACT NO. 6329/6330

in the City of Carlsbad, is accepted by the City Council, and if the Principal shall duly enter into and execute a Contract including required bonds and insurance policies within twenty (20) days from the date of award of Contract by the City Council of the City of Carlsbad, being duly notified of said award, then this obligation shall become null and void; otherwise, it shall be and remain in full force and effect, and the amount specified herein shall be forfeited to the said City.

In the event Principal executed this bond as an individual, it is agreed that the death of Principal shall not exonerate the Surety from its obligations under this bond.

SIGNED AND SEALED, this _____ day of _____, 20____

_____(SEAL) _____(SEAL)
(Principal) (Surety)

By: _____ By: _____
(Signature) (Signature)

_____ _____
(Print Name/Title) (Print Name/Title)

(SEAL AND NOTARIAL ACKNOWLEDGEMENT OF SURETY – ATTACH ATTORNEY-IN-FACT CERTIFICATE)

APPROVED AS TO FORM:

CELIA A. BREWER
City Attorney

By: _____
Deputy City Attorney

GUIDE FOR COMPLETING
THE "DESIGNATION OF SUBCONTRACTORS" FORM

REFERENCES Prior to preparation of the following "Subcontractor Disclosure Form" Bidders are urged to review the definitions in section 1-2 of the General Provisions to this Contract, especially, "Bid", "Bidder", "Contract", "Contractor", "Contract Price", "Contract Unit Price", "Engineer", "Own Organization", "Subcontractor", and "Work". Bidders are further urged to review sections 2-3 SUBCONTRACTS of the General Provisions.

CAUTIONS This form will be used by the Agency to determine the percentage of work that the Bidder proposes to perform. Bidders are cautioned that failure to provide complete and correct information may result in rejection of the bid as non-responsive. Any bid that proposes performance of more than 50 percent of the work by subcontractors or otherwise to be performed by forces other than the Bidder's own organization will be rejected as non-responsive. Specialty items of work that may be so designated by the Engineer on the "Contractor's Proposal" are not included in computing the percentage of work proposed to be performed by the Bidder.

INSTRUCTIONS The Bidder shall set forth the name and location of business of each and every subcontractor whom the Bidder proposes to perform work or labor or render service in or about the work or improvement, and every subcontractor licensed as a contractor by the State of California whom the Bidder proposes to specially fabricate and install any portion of the work or improvement according to detailed drawings contained in the plans and specifications in excess of one-half of one percent (0.5%) of the Bidder's total bid or, in the case of bids or offers for the construction of streets and highways, including bridges, in excess of one-half of one percent (0.5%) or ten thousand dollars ($10,000) whichever is greater. Said name(s) and location(s) of business of subcontractor(s) shall be set forth and included as an integral part of the bid offer.

The Designation of Subcontractors form must be submitted as a part of the Bidder's sealed bid. Failure to provide complete and correct information may result in rejection of the bid as non-responsive.

Suppliers of materials from sources outside the limits of work are not subcontractors. The value of materials and transport of materials from sources outside the limits of work, as shown on the plans, shall be assigned to the Contractor or the Subcontractor as the case may be, that the Bidder proposes as installer of said materials. The value of material incorporated in any Subcontractor-installed bid item that is supplied by the Bidder shall be included as a part of the work that the Bidder proposes to be performed by the Subcontractor installing said item.

When a Subcontractor has a Carlsbad business license, the number must be entered on the proper form. If the Subcontractor does not have a valid business license, enter "NONE" in the appropriate space.

When the Bidder proposes using a Subcontractor to construct or install less than 100 percent of a bid item, the Bidder shall attach an explanation sheet to the Designation of Subcontractor form. The explanation sheet shall clearly apprise the City of the specific facts that show the Bidder proposes to perform no less than fifty percent (50%) of the work with its own forces.

Determination of the subcontract amounts for purposes of award of the contract shall be determined by the City Council in conformance with the provisions of the contract documents and the various supplemental provisions. The decision of the City Council shall be final.

Contractor is prohibited from performing any work on this project with a subcontractor who is ineligible to perform work on a public works project pursuant to Labor Code Sections 1771.1 or 1777.7.

Bidders shall make any additional copies of the disclosure forms as may be necessary to provide the required information. The page number and total number of additional form pages shall be entered in the location provided on each type of form so duplicated.

DESIGNATION OF SUBCONTRACTOR AND AMOUNT OF SUBCONTRACTOR'S BID ITEMS

(To Accompany Proposal)

TRAFFIC SIGNALS AT POINSETTIA LANE, CASSIA ROAD AND SKIMMER COURT
CONTRACT NO. 6329/6330

The Bidder certifies that it has used the sub-bid of the following listed subcontractors in preparing this bid for the Work and that the listed subcontractors will be used to perform the portions of the Work as designated in this list in accordance with applicable provisions of the specifications and section 4100 et seq. of the Public Contract Code, "Subletting and Subcontracting Fair Practices Act." The Bidder further certifies that no additional subcontractor will be allowed to perform any portion of the Work in excess of one-half of one percent (0.5%) of the Bidder's total bid, or in the case of bids or offers for construction of streets and highways, including bridges, in excess of one-half of one percent (0.5%) or ten thousand dollars ($10,000), whichever is greater, and that no changes in the subcontractors listed work will be made except upon the prior approval of the Agency.

SUBCONTRACTOR'S BID ITEMS

Portion of Work	Subcontractor Name and Location of Business	Phone No. and Email Address	DIR Registration No.	Subcontractor's License No. and Classification	Amount of Work by Subcontractor in Dollars*

Page _____ of _____ pages of this Subcontractor Designation form

* Pursuant to section 4104 (a)(3)(A) California Public Contract Code, receipt of the information preceded by an asterisk may be submitted by the Bidder up to 24 hours after the deadline for submitting bids contained in the "Notice Inviting Bids."

BIDDER'S STATEMENT OF TECHNICAL ABILITY AND EXPERIENCE

(To Accompany Proposal)

TRAFFIC SIGNALS AT POINSETTIA LANE, CASSIA ROAD AND SKIMMER COURT
CONTRACT NO. 6329/6330

The Bidder is required to state what work of a similar character to that included in the proposed Contract he/she has successfully performed and give references, with telephone numbers, which will enable the City to judge his/her responsibility, experience and skill. An attachment can be used.

Date Contract Completed	Name and Address of the Employer	Name and Phone No. of Person to Contract	Type of Work	Amount of Contract

BIDDER'S CERTIFICATE OF INSURANCE FOR GENERAL LIABILITY, EMPLOYERS' LIABILITY, AUTOMOTIVE LIABILITY AND WORKERS' COMPENSATION

(To Accompany Proposal)

TRAFFIC SIGNALS AT POINSETTIA LANE, CASSIA ROAD AND SKIMMER COURT
CONTRACT NO. 6329/6330

As a required part of the Bidder's proposal the Bidder must attach either of the following to this page.

1) Certificates of insurance showing conformance with the requirements herein for each of:

   - ☐ Comprehensive General Liability
   - ☐ Automobile Liability
   - ☐ Workers Compensation
   - ☐ Employer's Liability

2) Statement with an insurance carrier's notarized signature stating that the carrier can, and upon payment of fees and/or premiums by the Bidder, will issue to the Bidder Policies of insurance for Comprehensive General Liability, Automobile Liability, Workers Compensation and Employer's Liability in conformance with the requirements herein and Certificates of insurance to the Agency showing conformance with the requirements herein.

All certificates of insurance and statements of willingness to issue insurance for auto policies offered to meet the specification of this contract must:

1) Meet the conditions stated in The Notice Inviting Bids and the General Provisions for this project for each insurance company that the Contractor proposes.

2) Cover any vehicle used in the performance of the contract, used onsite or offsite, whether owned, non-owned or hired, and whether scheduled or non-scheduled.

BIDDER'S STATEMENT RE DEBARMENT

(To Accompany Proposal)

TRAFFIC SIGNALS AT POINSETTIA LANE, CASSIA ROAD AND SKIMMER COURT
CONTRACT NO. 6329/6330

1) Have you or any of your subcontractors ever been debarred as an irresponsible bidder by another jurisdiction in the State of California?

_____ yes _____ no

2) If yes, what was/were the name(s) of the agency(ies) and what was/were the period(s) of debarment(s)? Attach additional copies of this page to accommodate more than two debarments.

_____ party debarred	_____ party debarred
_____ agency	_____ agency
_____ period of debarment	_____ period of debarment

BY CONTRACTOR:

_____
(name of Contractor)

By: _____
(sign here)

_____
(print name/title)

Page _____ of _____ pages of this Re Debarment form

BIDDER'S DISCLOSURE OF DISCIPLINE RECORD

(To Accompany Proposal)

TRAFFIC SIGNALS AT POINSETTIA LANE, CASSIA ROAD AND SKIMMER COURT
CONTRACT NO. 6329/6330

Contractors are required by law to be licensed and regulated by the Contractors' State License Board which has jurisdiction to investigate complaints against contractors if a complaint regarding a patent act or omission is filed within four years of the date of the alleged violation. A complaint regarding a latent act or omission pertaining to structural defects must be filed within 10 years of the date of the alleged violation. Any questions concerning a contractor may be referred to the Registrar, Contractors' State License board, P.O. Box 26000, Sacramento, California 95826.

1) Have you ever had your contractor's license suspended or revoked by the California Contractors' State license Board two or more times within an eight year period?

_____ yes _____ no

2) Has the suspension or revocation of your contractor's license ever been stayed?

_____ yes _____ no

3) Have any subcontractors that you propose to perform any portion of the Work ever had their contractor's license suspended or revoked by the California Contractors' State license Board two or more times within an eight year period?

_____ yes _____ no

4) Has the suspension or revocation of the license of any subcontractor's that you propose to perform any portion of the Work ever been stayed?

_____ yes _____ no

5) If the answer to either of 1. or 3. above is yes fully identify, in each and every case, the party disciplined, the date of and violation that the disciplinary action pertain to, describe the nature of the violation and the disciplinary action taken therefore.

_____

_____

_____

_____

_____

(If needed attach additional sheets to provide full disclosure.)

Page _____ of _____ pages of this Disclosure of Discipline form

BIDDER'S DISCLOSURE OF DISCIPLINE RECORD
(CONTINUED)
(To Accompany Proposal)

TRAFFIC SIGNALS AT POINSETTIA LANE, CASSIA ROAD AND SKIMMER COURT
CONTRACT NO. 6329/6330

6) If the answer to either of 2. or 4. above is yes fully identify, in each and every case, the party who's discipline was stayed, the date of the violation that the disciplinary action pertains to, describe the nature of the violation and the condition (if any) upon which the disciplinary action was stayed.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

(If needed attach additional sheets to provide full disclosure.)

BY CONTRACTOR:

_____
(name of Contractor)

By: _____
(sign here)

_____
(print name/title)

Page _____ of _____ pages of this Disclosure of Discipline form

NONCOLLUSION DECLARATION TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

PUBLIC CONTRACT CODE SECTION 7106

TRAFFIC SIGNALS AT POINSETTIA LANE, CASSIA ROAD AND SKIMMER COURT
CONTRACT NO. 6329/6330

The undersigned declares:

I am the _____ of _____, the party making the foregoing bid.

The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. The bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder. All statements contained in the bid are true. The bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, to effectuate a collusive or sham bid, and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on _____, 20____ at _____ [city], _____ [state].

_____
Signature of Bidder

CONTRACT
PUBLIC WORKS

This agreement is made this _____ day of _____, 2019, by and between the City of Carlsbad, California, a municipal corporation, (hereinafter called "City"), and Just Construction, Inc., a California corporation whose principal place of business is 3103 Market Street, San Diego, CA 92102 (hereinafter called "Contractor").

City and Contractor agree as follows:

1. Description of Work. Contractor shall perform all work specified in the Contract documents for:

TRAFFIC SIGNALS AT POINSETTIA LANE, CASSIA ROAD AND SKIMMER COURT
CONTRACT NO. 6329/6330

(hereinafter called "project")

2. Provisions of Labor and Materials. Contractor shall provide all labor, materials, tools, equipment, and personnel to perform the work specified by the Contract Documents.

3. Contract Documents. The Contract Documents consist of this Contract, Notice Inviting Bids, Contractor's Proposal, Bidder's Bond, Noncollusion Declaration, Designation of Subcontractors, Technical Ability and Experience, Bidder's Statement Re Debarment, Escrow Agreement, Release Form, the Plans and Specifications, the General Provisions, addendum(s) to said Plans and Specifications and General Provisions, and all proper amendments and changes made thereto in accordance with this Contract or the Plans and Specifications, and all bonds for the project; all of which are incorporated herein by this reference.

Contractor, her/his subcontractors, and materials suppliers shall provide and install the work as indicated, specified, and implied by the Contract Documents. Any items of work not indicated or specified, but which are essential to the completion of the work, shall be provided at the Contractor's expense to fulfill the intent of said documents. In all instances through the life of the Contract, the City will be the interpreter of the intent of the Contract Documents, and the City's decision relative to said intent will be final and binding. Failure of the Contractor to apprise subcontractors and materials suppliers of this condition of the Contract will not relieve responsibility of compliance.

4. Payment. For all compensation for Contractor's performance of work under this Contract, City shall make payment to the Contractor per section 9-3 PAYMENT of the General Provisions section of this contract. The Engineer will close the estimate of work completed for progress payments on the last working day of each month. The City shall withhold retention as required by Public Contract Code Section 9203.

5. Independent Investigation. Contractor has made an independent investigation of the jobsite, the soil conditions at the jobsite, and all other conditions that might affect the progress of the work, and is aware of those conditions. The Contract price includes payment for all work that may be done by Contractor, whether anticipated or not, in order to overcome underground conditions. Any information that may have been furnished to Contractor by City about underground

conditions or other job conditions is for Contractor's convenience only, and City does not warrant that the conditions are as thus indicated. Contractor is satisfied with all job conditions, including underground conditions and has not relied on information furnished by City.

6. Hazardous Waste or Other Unusual Conditions. If the contract involves digging trenches or other excavations that extend deeper than four feet below the surface Contractor shall promptly, and before the following conditions are disturbed, notify City, in writing, of any:

A. Hazardous Waste. Material that Contractor believes may be material that is hazardous waste, as defined in section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law.

B. Differing Conditions. Subsurface or latent physical conditions at the site differing from those indicated.

C. Unknown Physical Conditions. Unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the contract.

City shall promptly investigate the conditions, and if it finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in contractor's costs of, or the time required for, performance of any part of the work shall issue a change order under the procedures described in this contract.

In the event that a dispute arises between City and Contractor whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the contractor's cost of, or time required for, performance of any part of the work, contractor shall not be excused from any scheduled completion date provided for by the contract, but shall proceed with all work to be performed under the contract. Contractor shall retain any and all rights provided either by contract or by law which pertain to the resolution of disputes and protests between the contracting parties.

7. Immigration Reform and Control Act. Contractor certifies it is aware of the requirements of the Immigration Reform and Control Act of 1986 (8 USC sections 1101-1525) and has complied and will comply with these requirements, including, but not limited to, verifying the eligibility for employment of all agents, employees, subcontractors, and consultants that are included in this Contract.

8. Prevailing Wage. Pursuant to the California Labor Code, the director of the Department of Industrial Relations has determined the general prevailing rate of per diem wages in accordance with California Labor Code, section 1773 and a copy of a schedule of said general prevailing wage rates is on file in the office of the City Engineer, and is incorporated by reference herein. Pursuant to California Labor Code, section 1775, Contractor shall pay prevailing wages. Contractor shall post copies of all applicable prevailing wages on the job site. Contractor shall comply with California Labor Code, section 1776, which generally requires keeping accurate payroll records, verifying and certifying payroll records, and making them available for inspection. Contractor shall require all subcontractors to comply with Section 1776.

9. Indemnification. Contractor shall assume the defense of, pay all expenses of defense, and indemnify and hold harmless the City, and its officers and employees, from all claims, loss, damage, injury and liability of every kind, nature and description, directly or indirectly arising from or in connection with the performance of the Contract or work; or from any failure or alleged failure

of Contractor to comply with any applicable law, rules or regulations including those relating to safety and health; and from any and all claims, loss, damages, injury and liability, howsoever the same may be caused, resulting directly or indirectly from the nature of the work covered by the Contract, except for loss or damage caused by the sole or active negligence or willful misconduct of the City. The expenses of defense include all costs and expenses including attorneys' fees for litigation, arbitration, or other dispute resolution method.

Contractor shall also defend and indemnify the City against any challenges to the award of the contract to Contractor, and Contractor will pay all costs, including defense costs for the City. Defense costs include the cost of separate counsel for City, if City requests separate counsel.

Contractor shall also defend and indemnify the City against any challenges to the award of the contract to Contractor, arising in whole or in part from alleged inaccuracies or misrepresentation by the Contractor, whether intentional or otherwise, and Contractor will pay all costs, including defense costs for the City. Defense costs include the cost of separate counsel for City, if City requests separate counsel.

10. Insurance. Contractor shall procure and maintain for the duration of the contract insurance against claims for injuries to persons or damage to property which may arise from or in connection with the performance of the work hereunder by the Contractor, his or her agents, representatives, employees or subcontractors. Said insurance shall meet the City's policy for insurance as stated in City Council Policy # 70.

(A) Coverages and Limits Contractor shall maintain the types of coverages and minimum limits indicted herein:

a. **Commercial General Liability (CGL) Insurance**: Insurance written on an "occurrence" basis, including products-completed operations, personal & advertising injury, with limits no less than **$2,000,000** per occurrence. If a general aggregate limit applies, either the general aggregate limit shall apply separately to this project/location or the general aggregate limit shall be twice the required occurrence limit.

b. **Business Automobile Liability Insurance**: $2,000,000 combined single limit per accident for bodily injury and property damage. In addition, the auto policy must cover any vehicle used in the performance of the contract, used onsite or offsite, whether owned, non-owned or hired, and whether scheduled or non-scheduled.

c. **Workers' Compensation and Employers' Liability Insurance:** Workers' compensation limits as required by the Labor Code of the State of California and Employers' Liability limits of $1,000,000 per incident. Workers' compensation offered by the State Compensation Insurance Fund is acceptable to the City.

(B) Additional Provisions: Contractor shall ensure that the policies of insurance required under this agreement with the exception of Workers' Compensation and Business Automobile Liability Insurance contain, or are endorsed to contain, the following provisions.

a. The City, its officials, employees and volunteers are to be covered as additional insured as respects: liability arising out of activities performed by or on behalf of the Contractor; products and completed operations of the contractor; premises owned, leased, hired or borrowed by the contractor. The coverage shall contain no special limitations on the scope of protection afforded to the City, its officials, employees or volunteers. All additional insured endorsements must be

evidenced using separate documents attached to the certificate of insurance; one for each company affording general liability, and employers' liability coverage.

b. The Contractor's insurance coverage shall be primary insurance as respects the City, its officials, employees and volunteers. Any insurance or self-insurance maintained by the City, its officials, employees or volunteers shall be in excess of the contractor's insurance and shall not contribute with it.

c. Any failure to comply with reporting provisions of the policies shall not affect coverage provided to the City, its officials, employees or volunteers.

d. Coverage shall state that the contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

(C) Notice of Cancellation. Each insurance policy required by this agreement shall be endorsed to state that coverage shall not be nonrenewed, suspended, voided, canceled, or reduced in coverage or limits except after ten (10) days' prior written notice has been sent to the City by certified mail, return receipt requested.

(D) Deductibles and Self-Insured Retention (S.I.R.) Levels. Any deductibles or self-insured retention levels must be declared to and approved by the City. At the option of the City, either: the insurer shall reduce or eliminate such deductibles or self-insured retention levels as respects the City, its officials and employees; or the contractor shall procure a bond guaranteeing payment of losses and related investigation, claim administration and defense expenses.

(E) Waiver of Subrogation. All policies of insurance required under this agreement shall contain a waiver of all rights of subrogation the insurer may have or may acquire against the City or any of its officials or employees.

(F) Subcontractors. Contractor shall include all subcontractors as insured under its policies or shall furnish separate certificates and endorsements for each subcontractor. Coverages for subcontractors shall be subject to all of the requirements stated herein.

(G) Acceptability of Insurers. Insurance is to be placed with insurers that have a rating in Best's Key Rating Guide of at least A-:VII. Insurers must also be authorized to transact the business of insurance by the State of California Insurance Commissioner as admitted carriers as evidenced by a listing in the official publication of the Department of Insurance of the State of California and/or under the standards specified by City Council Policy # 70.

(H) Verification of Coverage. Contractor shall furnish the City with certificates of insurance and original endorsements affecting coverage required by this clause. The certificates and endorsements for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. The certificates and endorsements are to be in forms approved by the City and are to be received and approved by the City before the Contract is executed by the City.

(I) Cost of Insurance. The Cost of all insurance required under this agreement shall be included in the Contractor's bid.

11. Claims and Lawsuits. All claims by Contractor shall be resolved in accordance with Public Contract Code section 9204, which is incorporated by reference. A copy of Section 9204 is included in Section 3 of the General Provisions. In addition, all claims by Contractor for $375,000 or less shall be resolved in accordance with the provisions in the Public Contract Code, Division 2, Part 3, Chapter 1, Article 1.5 (commencing with section 20104) which are incorporated by reference. A copy of Article 1.5 is included in Section 3 of the General Provisions. In the event of a conflict between Section 9204 and Article 1.5, Section 9204 shall apply. Notwithstanding the provisions of this section of the contract, all claims shall comply with the Government Tort Claim Act (section 900 et seq., of the California Government Code) for any claim or cause of action for money or damages prior to filing any lawsuit for breach of this agreement.

(A) Assertion of Claims. Contractor hereby agrees that any contract claim submitted to the City must be asserted as part of the contract process as set forth in this agreement and not in anticipation of litigation or in conjunction with litigation.

(B) False Claims. Contractor acknowledges that if a false claim is submitted to the City, it may be considered fraud and the Contractor may be subject to criminal prosecution.

(C) Government Code. Contractor acknowledges that California Government Code sections 12650 et seq., the False Claims Act, provides for civil penalties where a person knowingly submits a false claim to a public entity. These provisions include false claims made with deliberate ignorance of the false information or in reckless disregard of the truth or falsity of the information.

(D) Penalty Recovery. If the City of Carlsbad seeks to recover penalties pursuant to the False Claims Act, it is entitled to recover its litigation costs, including attorney's fees.

(E) Debarment for False Claims. Contractor hereby acknowledges that the filing of a false claim may subject the Contractor to an administrative debarment proceeding wherein the Contractor may be prevented from further bidding on public contracts for a period of up to five years.

(F) Carlsbad Municipal Code. The provisions of Carlsbad Municipal Code sections 3.32.025, 3.32.026, 3.32.027 and 3.32.028 pertaining to false claims are incorporated herein by reference.

(G) Debarment from Other Jurisdictions. Contractor hereby acknowledges that debarment by another jurisdiction is grounds for the City of Carlsbad to disqualify the Contractor or subcontractor from participating in future contract bidding.

(H) Jurisdiction. Contractor agrees and hereby stipulates that the proper venue and jurisdiction for resolution of any disputes between the parties arising out of this agreement is San Diego County, California.

I have read and understand all provisions of Section 11 above. _____ init _____ init

12. Maintenance of Records. Contractor shall maintain and make available at no cost to the City, upon request, records in accordance with sections 1776 and 1812 of Part 7, Chapter 1, Article 2, of the Labor Code. If the Contractor does not maintain the records at Contractor's principal place of business as specified above, Contractor shall so inform the City by certified letter accompanying the return of this Contract. Contractor shall notify the City by certified mail of any change of address of such records.

13. Labor Code Provisions. The provisions of Part 7, Chapter 1, commencing with section 1720 of the Labor Code are incorporated herein by reference.

14. Security. Securities in the form of cash, cashier's check, or certified check may be substituted for any monies withheld by the City to secure performance of this contract for any obligation established by this contract. Any other security that is mutually agreed to by the Contractor and the City may be substituted for monies withheld to ensure performance under this Contract.

15. Unfair Business Practices. In entering into a public works contract or a subcontract to supply goods, services, or materials pursuant to a public works contract, the contractor or subcontractor offers and agrees to assign to the awarding body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services, or materials pursuant to the public works contract or the subcontract. This assignment shall be made and become effective at the time the awarding body tenders final payment to the contractor, without further acknowledgment by the parties.

16. Provisions Required by Law Deemed Inserted. Each and every provision of law and clause required by law to be inserted in this Contract shall be deemed to be inserted herein and included herein, and if, through mistake or otherwise, any such provision is not inserted, or is not correctly inserted, then upon application of either party, the Contract shall forthwith be physically amended to make such insertion or correction.

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17. Additional Provisions. Any additional provisions of this agreement are set forth in the "General Provisions" or "Supplemental Provisions" attached hereto and made a part hereof.

NOTARIAL ACKNOWLEDGMENT OF EXECUTION BY ALL SIGNATORIES MUST BE ATTACHED

(CORPORATE SEAL)

CONTRACTOR:

_____
(name of Contractor)

By: _____
(sign here)

_____
(print name and title)

By: _____
(sign here)

_____
(print name and title)

CITY OF CARLSBAD a municipal corporation of the State of California

By:

_____
Matt Hall, Mayor

ATTEST:

_____
Barbara Engleson, City Clerk

President or vice-president **and** secretary or assistant secretary must sign for corporations. If only one officer signs, the corporation must attach a resolution certified by the secretary or assistant secretary under the corporate seal empowering that officer to bind the corporation.

APPROVED AS TO FORM:

CELIA A. BREWER
City Attorney

By: _____
Deputy City Attorney

LABOR AND MATERIALS BOND

WHEREAS, the City Council of the City of Carlsbad, State of California, has awarded to _____, (hereinafter designated as the "Principal"), a Contract for:

TRAFFIC SIGNALS AT POINSETTIA LANE, CASSIA ROAD AND SKIMMER COURT
CONTRACT NO. 6329/6330

in the City of Carlsbad, in strict conformity with the drawings and specifications, and other Contract Documents now on file in the Office of the City Clerk of the City of Carlsbad and all of which are incorporated herein by this reference.

WHEREAS, Principal has executed or is about to execute said Contract and the terms thereof require the furnishing of a bond, providing that if Principal or any of their subcontractors shall fail to pay for any materials, provisions, provender or other supplies or teams used in, upon or about the performance of the work agreed to be done, or for any work or labor done thereon of any kind, the Surety on this bond will pay the same to the extent hereinafter set forth.

NOW, THEREFORE, WE, _____, as Principal, (hereinafter designated as the "Contractor"), and _____ as Surety, are held firmly bound unto the City of Carlsbad in the sum of _____ Dollars ($_____), said sum being an amount equal to: One hundred percent (100%) of the total amount payable under the terms of the contract by the City of Carlsbad, and for which payment well and truly to be made we bind ourselves, our heirs, executors and administrators, successors, or assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that if the Contractor or his/her subcontractors fail to pay for any materials, provisions, provender, supplies, or teams used in, upon, for, or about the performance of the work contracted to be done, or for any other work or labor thereon of any kind, consistent with California Civil Code section 9100, or for amounts due under the Unemployment Insurance Code with respect to the work or labor performed under this Contract, or for any amounts required to be deducted, withheld, and paid over to the Employment Development Department from the wages of employees of the contractor and subcontractors pursuant to section 13020 of the Unemployment Insurance Code with respect to the work and labor, that the Surety will pay for the same, and, also, in case suit is brought upon the bond, reasonable attorney's fees, to be fixed by the court consistent with California Civil Code section 9554.

This bond shall inure to the benefit of any of the persons named in California Civil Code section 9100, so as to give a right of action to those persons or their assigns in any suit brought upon the bond.

Surety stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract, or to the work to be performed hereunder or the specifications accompanying the same shall affect its obligations on this bond, and it does hereby waive notice of any change, extension of time, alterations or addition to the terms of the contract or to the work or to the specifications.

In the event that Contractor is an individual, it is agreed that the death of any such Contractor shall not exonerate the Surety from its obligations under this bond.

SIGNED AND SEALED, this _____ day of _____, 20____

_____(SEAL) _____(SEAL)
(Principal) (Surety)

By: _____ By: _____
(Signature) (Signature)

(SEAL AND NOTARIAL ACKNOWLEDGEMENT OF SURETY – ATTACH ATTORNEY-IN-FACT CERTIFICATE)

APPROVED AS TO FORM:

CELIA A. BREWER
City Attorney

By: _____
Deputy City Attorney

FAITHFUL PERFORMANCE/WARRANTY BOND

WHEREAS, the City Council of the City of Carlsbad, State of California, has awarded to _____, (hereinafter designated as the "Principal"), a Contract for:

TRAFFIC SIGNALS AT POINSETTIA LANE, CASSIA ROAD AND SKIMMER COURT
CONTRACT NO. 6329/6330

in the City of Carlsbad, in strict conformity with the contract, the drawings and specifications, and other Contract Documents now on file in the Office of the City Clerk of the City of Carlsbad, all of which are incorporated herein by this reference.

WHEREAS, Principal has executed or is about to execute said Contract and the terms thereof require the furnishing of a bond for the faithful performance and warranty of said Contract;

NOW, THEREFORE, WE, _____, as Principal, (hereinafter designated as the "Contractor"), and _____, as Surety, are held and firmly bound unto the City of Carlsbad, in the sum of_____Dollars ($_____), said sum being equal to one hundred percent (100%) of the estimated amount of the Contract, to be paid to City or its certain attorney, its successors and assigns; for which payment, well and truly to be made, we bind ourselves, our heirs, executors and administrators, successors or assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that if the above bounden Contractor, their heirs, executors, administrators, successors or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions, and agreements in the Contract and any alteration thereof made as therein provided on their part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless the City of Carlsbad, its officers, employees and agents, as therein stipulated, then this obligation shall become null and void; otherwise it shall remain in full force and effect.

As a part of the obligation secured hereby and in addition to the face amount specified therefore, there shall be included costs and reasonable expenses and fees, including reasonable attorney's fees, incurred by the City in successfully enforcing such obligation, all to be taxed as costs and included in any judgment rendered.

Surety stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract, or to the work to be performed there under or the specifications accompanying the same shall affect its obligations on this bond, and it does hereby waive notice of any change, extension of time, alterations or addition to the terms of the contract or to the work or to the specifications.

In the event that Contractor is an individual, it is agreed that the death of any such Contractor shall not exonerate the Surety from its obligations under this bond.

SIGNED AND SEALED, this _____ day of _____, 20____

_____(SEAL) _____(SEAL)
(Principal) (Surety)

By: _____ By: _____
(Signature) (Signature)

(SEAL AND NOTARIAL ACKNOWLEDGEMENT OF SURETY – ATTACH ATTORNEY-IN-FACT CERTIFICATE)

APPROVED AS TO FORM:

CELIA A. BREWER
City Attorney

By: _____
Deputy City Attorney

OPTIONAL ESCROW AGREEMENT FOR SECURITY DEPOSITS IN LIEU OF RETENTION

This Escrow Agreement is made and entered into by and between the City of Carlsbad whose address is 1200 Carlsbad Village Drive, Carlsbad, California, 92008, hereinafter called "City" and _____ whose address is _____ hereinafter called "Contractor" and _____ whose address is _____ hereinafter called "Escrow Agent."

For the consideration hereinafter set forth, the City, Contractor and Escrow Agent agree as follows:

1. Pursuant to section 22300 of the Public Contract Code of the State of California, the Contractor has the option to deposit securities with the Escrow Agent as a substitute for retention earnings required to be withheld by the City pursuant to the Construction Contract entered into between the City and Contractor for

TRAFFIC SIGNALS AT POINSETTIA LANE, CASSIA ROAD AND SKIMMER COURT
CONTRACT NO. 6329/6330

in the amount of _____ dated _____ (hereinafter referred to as the "Contract"). Alternatively, on written request of the Contractor, the City shall make payments of the retention earnings directly to the Escrow Agent. When the Contractor deposits the securities as a substitute for Contract earnings, the Escrow Agent shall notify the City within 10 days of the deposit. The market value of the securities at the time of the substitution shall be a least equal to the cash amount then required to be withheld as retention under the terms of the contract between the City and Contractor. Securities shall be held in the name of the City and shall designate the Contractor as the beneficial owner.

2. The City shall make progress payments to the Contractor for such funds which otherwise would be withheld from progress payments pursuant to the Contract provisions, provided that the Escrow Agent holds securities in the form and amount specified above.

3. When the City makes payment of retentions earned directly to the Escrow Agent, the Escrow Agent shall hold them for the benefit of the Contractor until such time as the escrow created under this contract is terminated. The Contractor may direct the investment of the payments into securities. All terms and conditions of this agreement and the rights and responsibilities of the parties shall be equally applicable and binding when the City pays the Escrow Agent directly.

4. The Contractor shall be responsible for paying all fees for the expenses incurred by the Escrow Agent in administering the Escrow Account and all expenses of the City. These expenses and payment terms shall be determined by the City, Contractor and Escrow Agent.

5. The interest earned on the securities or the money market accounts held in escrow and all interest earned on that interest shall be for the sole account of Contractor and shall be subject to withdrawal by Contractor at any time and from time to time without notice to the City.

6. Contractor shall have the right to withdraw all or any part of the principal in the Escrow Account only by written notice to Escrow Agent accompanied by written authorization from City to the Escrow Agent that City consents to the withdrawal of the amount sought to be withdrawn by Contractor.

7. The City shall have a right to draw upon the securities in the event of default by the Contractor. Upon seven days' written notice to the Escrow Agent from the City of the default, the Escrow Agent shall immediately convert the securities to cash and shall distribute the cash as instructed by the City.

8. Upon receipt of written notification from the City certifying that the Contract is final and complete and that the Contractor has complied with all requirements and procedures applicable to the Contract, the Escrow Agent shall release to Contractor all securities and interest on deposit less escrow fees and charges of the Escrow Account. The escrow shall be closed immediately upon disbursement of all moneys and securities on deposit and payments of fees and charges.

9. The Escrow Agent shall rely on the written notifications from the City and the Contractor pursuant to sections (1) to (8), inclusive, of this agreement and the City and Contractor shall hold Escrow Agent harmless from Escrow Agent's release, conversion and disbursement of the securities and interest as set forth above.

10. The names of the persons who are authorized to give written notices or to receive written notice on behalf of the City and on behalf of Contractor in connection with the foregoing, and exemplars of their respective signatures are as follows:

For City:

Title FINANCE DIRECTOR

Name _____

Signature _____

Address 1635 Faraday Avenue, Carlsbad, CA 92008

For Contractor:

Title _____

Name _____

Signature _____

Address _____

For Escrow Agent:

Title _____

Name _____

Signature _____

Address _____

At the time the Escrow Account is opened, the City and Contractor shall deliver to the Escrow Agent a fully executed counterpart of this Agreement.

IN WITNESS WHEREOF, the parties have executed this Agreement by their proper officers on the date first set forth above.

For City:

Title MAYOR

Name _____

Signature _____

Address 1200 Carlsbad Village Drive, Carlsbad, CA 92008

For Contractor:

Title _____

Name _____

Signature _____

Address _____

For Escrow Agent:

Title _____

Name _____

Signature _____

Address _____

GENERAL PROVISIONS FOR TRAFFIC SIGNALS AT POINSETTIA LANE, CASSIA ROAD AND SKIMMER COURT

CONTRACT NO. 6329/6330

SECTION 1 - TERMS, DEFINITIONS, ABBREVIATIONS, AND SYMBOLS

1-1 TERMS – Unless otherwise stated, the words *directed, required, permitted, ordered, instructed, designated, considered necessary, prescribed, approved, acceptable, satisfactory,* or words of like meaning, refer to actions, expressions, and prerogatives of the Engineer.

1-1.1 Reference to Drawings. Where words "shown", "indicated", "detailed", "noted", "scheduled", or words of similar import are used, it shall be understood that reference is made to the plans accompanying these provisions, unless stated otherwise.

1-1.2 Directions. Where words "directed", "designated", "selected", or words of similar import are used, it shall be understood that the direction, designation or selection of the Engineer is intended, unless stated otherwise. The word "required" and words of similar import shall be understood to mean "as required to properly complete the work as required and as approved by the Engineer," unless stated otherwise.

1-1.3 Equals and Approvals. Where the words "equal", "approved equal", "equivalent", and such words of similar import are used, it shall be understood such words are followed by the expression "in the opinion of the Engineer", unless otherwise stated. Where the words "approved", "approval", "acceptance", or words of similar import are used, it shall be understood that the approval, acceptance, or similar import of the Engineer is intended.

1-1.4 Perform. The word "perform" shall be understood to mean that the Contractor, at its expense, shall perform all operations, labor, tools and equipment, and further, including the furnishing and installing of materials that are indicated, specified or required to mean that the Contractor, at its expense, shall furnish and install the work, complete in place and ready to use, including furnishing of necessary labor, materials, tools, equipment, and transportation.

1-2 DEFINITIONS. The following words, or groups of words, shall be exclusively defined by the definitions assigned to them herein.

Addendum – Written or graphic instrument issued prior to the opening of Bids which clarifies, corrects, or changes the bidding or Contract Documents. The term Addendum shall include bulletins and all other types of written notices issued to potential bidders prior to opening of Bids.

Agency – The City of Carlsbad, California.

Agreement – See Contract.

Assessment Act Contract – A Contract financed by special assessments authorized under a State Act or procedural ordinance of a City or County.

Base – A layer of specified material of planned thickness placed immediately below the pavement or surfacing.

Bid – The offer or proposal of the Bidder submitted on the prescribed form setting forth the prices for the Work.

Bidder – Any individual, firm, partnership, corporation, or combination thereof, submitting a Bid for the Work, acting directly or through a duly authorized representative.

Board – The officer or body constituting the awarding authority of the Agency, which is the City Council for the City of Carlsbad or the Board of Directors of Carlsbad Municipal Water District.

Bond – Bid, performance, and payment bond or other instrument of security.

City Council – the City Council of the City of Carlsbad.

City Manager – the City Manager of the City of Carlsbad or his/her approved representative.

Cash Contract – A Contract financed by means other than special assessments.

Change Order – A written order to the Contractor signed by the Agency directing an addition, deletion, or revision in the Work, or an adjustment in the Contract Price or the Contract time issued after the effective date of the Contract. A Change Order may or may not also be signed by the Contractor.

Code – The terms *Government Code, Labor Code*, etc., refer to codes of the State of California.

Construction Manager– the Project Inspector's immediate supervisor and first level of appeal for informal dispute resolution.

Contract – The written agreement between the Agency and the Contractor covering the Work.

Contract Documents – Including but not limited to; the Contract, any Addendum (which pertain to the contract documents), Notice Inviting Bids, Instructions to Bidders; Bid (including documentation accompanying the Bid and any post-bid documentation submitted prior to the Notice of Award) when attached as an exhibit to the Contract, the Bonds, the General Provisions, permits from other agencies, the Technical Specifications, the Supplemental Provisions, the Plans, Standard Plans, Standard Specifications, Reference Specifications, and all Modifications issued after the execution of the Contract.

Contractor – The individual, partnership, corporation, joint venture, or other legal entity having a Contract with the Agency to perform the Work. In the case of work being done under permit issued by the Agency, the permittee shall be constructed to be the Contractor. The term "prime contractor" shall mean Contractor.

Contract Price – The total amount of money for which the Contract is awarded.

Contract Unit Price – The amount stated in the Bid for a single unit of an item of work.

County Sealer – The Sealer of Weights and Measures of the county in which the Contract is let.

Days – Days shall mean consecutive calendar's days unless otherwise specified.

Deputy City Engineer, Construction Management & Inspection – The Construction Manager's immediate supervisor and second level of appeal for informal dispute resolution.

Dispute Board – Persons designated by the City Manager of the City of Carlsbad or Executive Manager of the Carlsbad Municipal Water District, to hear and advise the City Manager on claims submitted by the Contractor. The City Manager for the City of Carlsbad or the Executive Manager for the Carlsbad Municipal Water District is the last appeal level for informal dispute resolution.

Electrolier – Street light assembly complete, including foundation, standard, luminaire arm, luminaire, etc.

Engineer – The City Engineer of the City of Carlsbad or his/her approved representative. The Engineer is the third level of appeal for informal dispute resolution.

Geotextile – Synthetic fiber used in civil engineering applications, serving the primary functions of separation and filtration.

House Connection Sewer – A sewer, within a public street or right-of-way, proposed to connect any parcel, lot, or part of a lot with a mainline sewer.

House Sewer – A sewer, wholly within private property, proposed to connect any building to a house connection sewer.

Luminaire – The lamp housing including the optical and socket assemblies (and ballast if so specified).

Luminaire Arm – The structural member, bracket, or mast arm, which, mounted on the standard, supports the luminaire.

Minor Bid Item – A single contract item constituting less than 10 percent (10%) of the original Contract Price bid.
Modification – Includes Change Orders and Supplemental Agreements. A Modification may only be used after the effective date of the Contract.

Notice of Award – The written notice by the Agency to the successful Bidder stating that upon compliance by it with the required conditions, the Agency will execute the Contract.

Notice to Proceed – A written notice given by the Agency to the Contractor fixing the date on which the Contract time will start.

Own Organization - When used in Section 2-3.1 – Employees of the Contractor who are hired, directed, supervised and paid by the Contractor to accomplish the completion of the Work. Further, such employees have their employment taxes, State disability insurance payments, State and Federal income taxes paid and administered, as applicable, by the Contractor. When used in Section 2-3.1 "own organization" means construction equipment that the Contractor owns or leases and uses to accomplish the Work. Equipment that is owner operated or leased equipment

with an operator is not part of the Contractor's Own Organization and will not be included for the purpose of compliance with Section 2-3.1.

Person – Any individual, firm, association, partnership, corporation, trust, joint venture, or other legal entity.

Plans – The drawings, profiles, cross sections, working drawings, and supplemental drawings, or reproductions thereof, approved by the Engineer, which show the location, character, dimensions, or details of the Work.

Private Contract – Work subject to Agency inspection, control, and approval, involving private funds, not administered by the Agency.

Project Inspector – The Engineer's designated representative for inspection, contract administration and first level for informal dispute resolution.

Proposal – See Bid.

Reference Specifications – Those bulletins, standards, rules, methods of analysis or test, codes, and specifications of other agencies, engineering societies, or industrial associations referred to in the Contract Documents. These refer to the latest edition, including amendments in effect and published at the time of advertising the project or issuing the permit, unless specifically referred to by edition, volume, or date.

Roadway – The portion of a street reserved for vehicular use.

Service Connection – Service connections are all or any portion of the conduit, cable, or duct, including meter, between a utility distribution line and an individual consumer.

Sewer – Any conduit intended for the reception and transfer of sewage and fluid industrial waste.

Specifications – General Provisions, Standard Specifications, Technical Specifications, Reference Specifications, Supplemental Provisions, and specifications in Supplemental Agreements between the Contractor and the Board.

Standard – The shaft or pole used to support street lighting luminaire, traffic signal heads, mast arms, etc.

Standard Plans – Details of standard structures, devices, or instructions referred to on the Plans or in Specifications by title or number.

Standard Specifications – The Standard Specifications for Public Works Construction (SSPWC), the "Greenbook".

State – State of California.

Storm Drain – Any conduit and appurtenances intended for the reception and transfer of storm water.

Street – Any road, highway, parkway, freeway, alley, walk, or way.

Subbase – A layer of specified material of planned thickness between a base and the subgrade.

Subcontractor – An individual, firm, or corporation having a direct contract with the Contractor or with any other Subcontractor for the performance of a part of the Work.

Subgrade – For roadways, that portion of the roadbed on which pavement, surfacing, base, subbase, or a layer of other material is placed. For structures, the soil prepared to support a structure.

Supervision – Supervision, where used to indicate supervision by the Engineer, shall mean the performance of obligations, and the exercise of rights, specifically imposed upon and granted to the Agency in becoming a party to the Contract. Except as specifically stated herein, supervision by the Agency shall not mean active and direct superintendence of details of the Work.

Supplemental Agreement – A written amendment of the Contract Documents signed by both parties.

Supplemental Provisions – Additions and revisions to the Standard Specifications setting forth conditions and requirements peculiar to the work.

Surety – Any individual, firm, or corporation, bound with and for the Contractor for the acceptable performance, execution, and completion of the Work, and for the satisfaction of all obligations incurred.

Tonne – Also referred to as "metric ton". Represents a unit of measure in the International System of Units equal to 1,000 kilograms.

Utility – Tracks, overhead or underground wires, pipeline, conduits, ducts, or structures, sewers, or storm drains owned, operated, or maintained in or across a public right of way or private easement.

Work – That which is proposed to be constructed or done under the Contract or permit, including the furnishing of all labor, materials, equipment, and services.

1-3 ABBREVIATIONS

1-3.1 General. The abbreviation herein, together with others in general use, are applicable to these Standard Specifications and to project Plans or other Contract Documents.

All abbreviations and symbols used on Plans for structural steel construction shall conform to those given by the "Manual of Steel Construction" published by the American Institute of Steel Construction, Inc.

1-3.2 Common Usage

Abbreviation	Word or Words
ABAN	Abandon
ABAND	Abandoned
ABS	Acrylonitrile – butadiene – styrene
AC	Asphalt Concrete
ACP	Asbestos cement pipe
ACWS	Asphalt concrete wearing surface
ALT	Alternate
APTS	Apartment and Apartments
AMER STD	American Standard
AWG	American Wire Gage (nonferrous wire)
BC	Beginning of curve
BCR	Beginning of curb return
BDRY	Boundary
BF	Bottom of footing
BLDG	Building and Buildings
BM	Bench mark
BVC	Beginning of vertical curve
B/W	Back of wall
C/C	Center to center
CAB	Crushed aggregate base
CAL/OSHA	California Occupational Safety and Health Administration
CalTrans	California Department of Transportation
CAP	Corrugated aluminum pipe
CB	Catch Basin
Cb	Curb
CBP	Catch Basin Connection Pipe
CBR	California Bearing Ratio
CCR	California Code of Regulations
CCTV	Closed Circuit TV
CES	Carlsbad Engineering Standards
CF	Curb face
CF	Cubic foot
C&G	Curb and gutter
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
CIP	Cast iron pipe
CIPP	Cast-in place pipe
CL	Clearance, center line
CLF	Chain link fence
CMB	Crushed miscellaneous base
CMC	Cement mortar-coated
CML	Cement mortar-lined
CMWD	Carlsbad Municipal Water District
CO	Cleanout (Sewer)
COL	Column
COMM	Commercial
CONC	Concrete
CONN	Connection
CONST	Construct, Construction
COORD	Coordinate
CSP	Corrugated steel pipe
CSD	Carlsbad Standard Drawings
CTB	Cement treated base
CV	Check valve
CY	Cubic yard
D	Load of pipe
dB	Decibels
DBL	Double
DF	Douglas fir
DIA	Diameter
DIP	Ductile iron pipe
DL	Dead load
DR	Dimension Ratio
DT	Drain Tile
DWG	Drawing
DWY	Driveway
DWY APPR	Driveway approach
E	Electric
EA	Each
EC	End of curve
ECR	End of curb return
EF	Each face
EG	Edge of gutter
EGL	Energy grade line
EL	Elevation
ELC	Electrolier lighting conduit
ELT	Extra long ton
ENGR	Engineer, Engineering
EP	Edge of pavement
ESMT	Easement
ETB	Emulsion-treated base
EVC	End of vertical curb
EWA	Encina Wastewater Authority
EXC	Excavation
EXP JT	Expansion joint
EXST	Existing
F	Fahrenheit
F&C	Frame and cover
F&I	Furnish and install
FAB	Fabricate
FAS	Flashing arrow sign
FD	Floor drain
FDN	Foundation
FED SPEC	Federal Specification
FG	Finished grade
FH	Fire hydrant
FL	Flow line
FS	Finished surface
FT-LB	Foot-pound
FTG	Footing
FW	Face of wall
G	Gas
GA	Gauge
GAL	Gallon and Gallons
GALV	Galvanized
GAR	Garage and Garages
GIP	Galvanized iron pipe
GL	Ground line or grade line
GM	Gas meter
GNV	Ground Not Visible
GP	Guy pole
GPM	gallons per minute
GR	Grade
GRTG	Grating
GSP	Galvanized steel pipe

H ..... High or height
HB ..... Hose bib
HC ..... House connection
HDWL ..... Headwall
HGL ..... Hydraulic grade line
HORIZ ..... Horizontal
HP ..... Horsepower
HPG ..... High pressure gas
HPS ..... High pressure sodium (Light)
HYDR ..... Hydraulic
IE ..... Invert Elevation
ID ..... Inside diameter
INCL ..... Including
INSP ..... Inspection
INV ..... Invert
IP ..... Iron pipe
JC ..... Junction chamber
JCT ..... Junction
JS ..... Junction structure
JT ..... Joint
L ..... Length
LAB ..... Laboratory
LAT ..... Lateral
LB ..... Pound
LD ..... Local depression
LF ..... Linear foot
LH ..... Lamp hole
LL ..... Live load
LOL ..... Layout line
LONG ..... Longitudinal
LP ..... Lamp post
LPS ..... Low pressure sodium (Light)
LS ..... Lump sum
LTS ..... Lime treated soil
LWD ..... Leucadia Wastewater District
MAINT ..... Maintenance
MAX ..... Maximum
MCR ..... Middle of curb return
MEAS ..... Measure
MH ..... Manhole, maintenance hole
MIL SPEC ..... Military specification
MISC ..... Miscellaneous
MOD ..... Modified, modify
MON ..... Monument
MSL .. Mean Sea Level (Reg. Standard Drawing M-12)
MTBM ..... Microtunneling Boring Machine
MULT ..... Multiple
MUTCD ..... Manual on Uniform Traffic Control Devices
MVL ..... Mercury vapor light
NCTD ..... North County Transit District
NRCP ..... Nonreinforced concrete pipe
OBS ..... Obsolete
OC ..... On center
OD ..... Outside diameter
OE ..... Outer edge
OHE ..... Overhead Electric
OMWD ..... Olivenhain Municipal Water District
OPP ..... Opposite
ORIG ..... Original
PB ..... Pull box
PC ..... Point of curvature
PCC ..... Portland cement concrete or point of compound curvature
PCVC ..... Point of compound vertical curve
PE ..... Polyethylene
PI ..... Point of intersection
PL ..... Property line
PMB ..... Processed miscellaneous base
POC ..... Point on curve
POT ..... Point on tangent
PP ..... Power pole
PRC ..... Point of reverse curve
PRVC ..... Point of reverse vertical curve
PSI ..... Pounds per square inch
PT ..... Point of tangency
PVC ..... Polyvinyl chloride
PVMT ..... Pavement
PVT R/W ..... Private right-of-way
Q ..... Rate of flow in cubic feet per second
QUAD ..... Quadrangle, Quadrant
R ..... Radius
R&O ..... Rock and oil
R/W ..... Right-of-way
RA ..... Recycling agent
RAC ..... Recycled asphalt concrete
RAP ..... Reclaimed asphalt pavement
RBAC ..... Rubberized asphalt concrete
RC ..... Reinforced concrete
RCB ..... Reinforced concrete box
RCE ..... Registered civil engineer
RCP ..... Reinforced concrete pipe
RCV ..... Remote control valve
REF ..... Reference
REINF ..... Reinforced or reinforcement
RES ..... Reservoir
RGE ..... Registered geotechnical engineer
ROW ..... Right-of-Way
RR ..... Railroad
RSE ..... Registered structural engineer
RTE ..... Registered traffic engineer
S ..... Sewer or Slope, as applicable
SCCP ..... Steel cylinder concrete pipe
SD ..... Storm drain
SDNR ..... San Diego Northern Railway
SDR ..... Standard thermoplastic pipe dimension ratio (ratio of pipe O.D. to minimum wall thickness)
SDRSD ..... San Diego Regional Standard Drawings
SE ..... Sand Equivalent
SEC ..... Section
SF ..... Square foot
SFM ..... Sewer Force Main
SI ..... International System of Units (Metric)
SPEC ..... Specifications
SPPWC ..... Standard Plans for Public Works Construction
SSPWC ..... Standard Specifications for Public Works Construction
ST HWY ..... State highway
STA ..... Station
STD ..... Standard
STR ..... Straight
STR GR ..... Straight grade
STRUC ..... Structural/Structure
SW ..... Sidewalk
SWD ..... Sidewalk drain
SY ..... Square yard
T ..... Telephone
TAN ..... Tangent
TC ..... Top of curb
TEL ..... Telephone

TF ..... Top of footing
TOPO ..... Topography
TR ..... Tract
TRANS ..... Transition
TS ..... Traffic signal or transition structure
TSC ..... Traffic signal conduit
TSS ..... Traffic signal standard
TW ..... Top of wall
TYP ..... Typical
UE ..... Underground Electric
USA ..... Underground Service Alert
VAR ..... Varies, Variable
VB ..... Valve box
VC ..... Vertical curve
VCP ..... Vitrified clay pipe
VERT ..... Vertical
VOL ..... Volume
VWD ..... Vallecitos Water District
W ..... Water, Wider or Width, as applicable
WATCH ..... Work Area Traffic Control Handbook
WI ..... Wrought iron
WM ..... Water meter
WPJ ..... Weakened plane joint
XCONN ..... Cross connection
XSEC ..... Cross section

1-3.3 Institutions.

Abbreviation	Word or Words
AASHTO	American Association of State Highway and Transportation Officials
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute
API	American Petroleum Institute
AREA	American Railway Engineering Association
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Association
AWS	American Welding Society
AWWA	American Water Works Association
FHWA	Federal Highway Administration
GRI	Geosynthetic Research Institute
NEMA	National Electrical Manufacturers Association
NOAA	National Oceanic and Atmospheric Administration (Dept. of Commerce)
UL	Underwriters' Laboratories Inc.
USGS	United States Geological Survey

1-4 UNITS OF MEASURE.

1-4.1 General. U.S. Standard Measures, also called U.S. Customary System, are the principal measurement system in these specifications. However, certain material specifications and test requirements contained herein use SI units specifically and conversions to U.S. Standard Measures may or may not have been included in these circumstances. When U.S. Standard Measures are not included in parenthesis, then the SI units shall control. S.I. units and U.S. Standard Measures in parenthesis may or may not be exactly equivalent.

Reference is also made to ASTM E 380 for definitions of various units of the SI system and a more extensive set of conversion factors.

1-4.2 Units of Measure and Their Abbreviations.

U.S. Customary Unit (Abbreviations)	(Equal To)	SI Unit (Abbreviations)
1 mil (=0.001 in)		25.4 micrometer (μm)
1 inch (in)		25.4 millimeter (mm)
1 inch (in)		2.54 centimeter (cm)
1 foot (ft)		0.3048 meter (m)
1 yard (yd)		0.9144 meter (m)
1 mile (mi)		1.6093 kilometer (km)
1 square foot (ft^2)		0.0929 square meter (m^2)
1 square yard (yd^2)		0.8361 square meter (m^2)
1 cubic foot (ft^3)		0.0283 cubic meter (m^3)
1 cubic yard (yd^3)		0.7646 cubic meter (m^3)
1 acre		0.4047 hectare (ha)
1 U.S. gallon (gal)		3.7854 Liter (L)
1 fluid ounce (fl. oz.)		29.5735 millileter (mL)
1 pound mass (lb) (avoirdupois)		0.4536 kilogram (kg)
1 ounce mass (oz)		0.02835 kilogram (kg)
1 Ton (=2000 lb avoirdupois)		0.9072 Tonne (= 907 kg)
1 Poise		0.1 pascal · second (Pa · s)
1 centistoke (cs)		1 square millimeters per second (mm^2/s)
1 pound force (lbf)		4.4482 Newton (N)
1 pounds per square inch (psi)		6.8948 Kilopascal (kPa)
1 pound force per foot (lbf/ft)		1.4594 Newton per meter (N/m)
1 foot-pound force (ft-lbf)		1.3558 Joules (J)
1 foot-pound force per second ([ft-lbf]/s)		1.3558 Watt (W)
1 part per million (ppm)		1 milligram/liter (mg/L)

Temperature Units and Abbreviations

Degree Fahrenheit (°F):	Degree Celsius (°C):
°F = (1.8 x °C) + 32	°C = (°F – 32)/1.8

SI Units (abbreviation) Commonly Used in Both Systems

1 Ampere (A)
1 Volt (V)
1 Candela (cd)
1 Lumen (lm)
1 second (s)

Common Metric Prefixes

kilo (k)	10^3
centi (c)	10^{-2}
milli (m)	10^{-3}
micro (μ)	10^{-6}
nano (n)	10^{-9}
pico (p)	10^{-12}

1-5 SYMBOLS

Δ	Delta, the central angle or angle between tangents
∠	Angle
%	Percent
'	Feet or minutes
"	Inches or seconds
#	Number
/	per or (between words)
°	Degree
PL	Property line
CL	Centerline
SL	Survey line or station line

SECTION 2 – SCOPE AND CONTROL OF WORK

2-1 AWARD AND EXECUTION OF CONTRACT. Award and execution of Contract will be as provided for in the Specifications, Instruction to Bidders, or Notice Inviting Bids.

2-2 ASSIGNMENT. No Contract or portion thereof may be assigned without consent of the Board, except that the Contractor may assign money due or which will accrue to it under the Contract. If given written notice, such assignment will be recognized by the Board to the extent permitted by law. Any assignment of money shall be subject to all proper withholdings in favor of the Agency and to all deductions provided for in the Contract. All money withheld, whether assigned or not, shall be subject to being used by the Agency for completion of the Work, should the Contractor be in default.

2-3 SUBCONTRACTS.

2-3.1 General. Each Bidder shall comply with the Chapter of the Public Contract Code including Sections 4100 through 4113. The following excerpts or summaries of some of the requirements of this Chapter are included below for information:

The Bidder shall set forth in the Bid, as provided in 4104:

> "(a) The name and location of the place of business of each subcontractor who will perform work or labor or render service to the prime contractor in or about the construction of the work or improvements, or a subcontractor licensed by the State of California who, under subcontract to the prime contractor, specially fabricates and installs a portion of the work or improvement according to detailed drawings contained in the plans and specifications, in an amount in excess of one-half of 1 percent of the prime contractor's total bid, or, in the case of bids or offers for the construction of streets or highways, including bridges, in excess of one-half of 1 percent of the prime contractor's total bid or ten thousand dollars ($10,000), whichever is greater."
>
> "(b) The portion of the work which will be done by each such subcontractor under this act. The prime contractor shall list only one subcontractor for each such portion as is defined by the prime contractor in his bid."

If the Contractor fails to specify a Subcontractor or specifies more than one Subcontractor for the same portion of the work to be performed under the Contract (in excess of one-half of 1 percent of the Contractor's total Bid), the Contractor shall be qualified to perform that portion itself, and shall perform that portion itself, except as otherwise provided in the Code.

As provided in Section 4107, no Contractor whose Bid is accepted shall substitute any person as Subcontractor in place of the Subcontractor listed in the original Bid, except for causes and by procedures established in Section 4107.5. This section provides procedures to correct a clerical error in the listing of a Subcontractor.

Section 4110 provides that a Contractor violating any of the provisions of the Chapter violates the Contract and the Board may exercise the option either to cancel the Contract or assess the Contractor a penalty in an amount of not more than 10 percent of the subcontract involved, after a public hearing.

Should the Contractor fail to adhere to the provisions requiring the Contractor to complete **50 percent** of the contract price with its own organization, the Agency may at its sole discretion elect to cancel the contract or deduct an amount equal to 10 percent of the value of the work performed in excess of **50 percent** of the contract price by other than the Contractor's own organization. The Board shall be the sole body for determination of a violation of these provisions. In any proceedings under this section, the prime contractor shall be entitled to a public hearing before the Board and shall be notified ten (10) days in advance of the time and location of said hearing. The determination of the City Council shall be final.

2-3.2 Additional Responsibility. The Contractor shall give personal attention to the fulfillment of the Contract and shall keep the Work under its control. The Contractor shall perform, with its own organization, Contract work amounting to at least 50 percent of the Contract Price except that any designated "Specialty Items" may be performed by subcontract, and the amount of any such "Specialty Items" so performed may be deducted from the Contract Price before computing the amount required to be performed by the Contractor with its own organization. "Specialty Items" will be identified by the Agency in the Bid or Proposal. Where an entire item is subcontracted, the value of work subcontracted will be based on the Contract Unit Price. When a portion of an item is subcontracted, the value of work subcontracted will be based on the estimated percentage of the Contract Unit Price. This will be determined from information submitted by the Contractor, and subject to approval by the Engineer.

Before the work of any Subcontractor is started, the Contractor shall submit to the Engineer for approval a written statement showing the work to be subcontracted giving the name and business of each Subcontractor and description and value of each portion of the work to be so subcontracted.

2-3.3 Status of Subcontractors. Subcontractors shall be considered employees of the Contractor, and the Contractor shall be responsible for their work.

2-4 CONTRACT BONDS. Before execution of the Contract, the Bidder shall file surety bonds with the Agency to be approved by the Board in the amounts and for the purposes noted below. Bonds issued by a surety, who is authorized to issue bonds in California, and whose bonding limitation shown in said circular is sufficient to provide bonds in the amount required by the Contract shall be deemed to be approved unless specifically rejected by the Agency. Bonds from all other sureties shall be accompanied by all of the documents enumerated in Code of Civil Procedure 995.660 (a). The Bidder shall pay all bond premiums, costs, and incidentals.

Each bond shall incorporate, by reference, the Contract and be signed by both the Bidder and Surety and the signature of the authorized agent of the Surety shall be notarized.

The Contractor shall provide a faithful performance/warranty bond and payment bond (labor and materials bond) for this contract. The faithful performance/warranty bond shall be in a sum not less than one hundred percent of the total amount payable by the terms of this contract. The Contractor shall provide bonds to secure payment of laborers and materials suppliers in a sum not less than one hundred percent of the total amount payable by the terms of this contract.

Both bonds shall extend in full force and effect and be retained by the Agency during this project until they are released according to the provisions of this section.

The faithful performance/warranty bond will be reduced to 25 percent of the original amount 30 days after recordation of the Notice of Completion and will remain in full force and effect for the one year warranty period and until all warranty repairs are completed to the satisfaction of the Engineer. The bonds to secure payment of laborers and materials suppliers shall be released six months plus 30 days after recordation of the Notice of Completion if all claims have been paid.

All bonds are to be placed with a surety insurance carrier admitted and authorized to transact the business of insurance in California and whose assets exceed their liabilities in an amount equal to or in excess of the amount of the bond. The bonds are to contain the following documents:

1) An original, or a certified copy, of the un-revoked appointment, power of attorney, by laws, or other instrument entitling or authorizing the person who executed the bond to do so.
2) A certified copy of the certificate of authority of the insurer issued by the insurance commissioner.

If the bid is accepted, the Agency may require a financial statement of the assets and liabilities of the insurer at the end of the quarter calendar year prior to 30 days next preceding the date of the execution of the bond. The financial statement shall be made by an officer's certificate as defined in Section 173 of the Corporations Code. In the case of a foreign insurer, the financial statement may be verified by the oath of the principal officer or manager residing within the United States.

Should any bond become insufficient, the Contractor shall renew the bond within 10 days after receiving notice from the Agency.

Should any Surety at any time be unsatisfactory to the Board, notice will be given the Contractor to that effect. No further payments shall be deemed due or will be made under the contract until a new Surety shall qualify and be accepted by the Board.

Changes in the Work or extensions of time, made pursuant to the Contract, shall in no way release the Contractor or Surety from its obligations. Notice of such changes or extensions shall be waived by the Surety.

2-5 PLANS AND SPECIFICATIONS.

2-5.1 General. The Contractor shall keep at the Work site a copy of the Plans and Specifications, to which the Engineer shall have access at all times.

The specifications for the work include the General Provisions, project technical specifications, Carlsbad Engineering Standards (CES), Standard Specifications for Public Works Construction, (SSPWC), and the latest supplements thereto, **2018 edition** as published by the "Greenbook" Committee of Public Works Standards, Inc., hereinafter designated "SSPWC", as amended.

The construction plans consist of TWO (2) sets of drawings. The construction plan sets are designated as City of Carlsbad Drawing Nos. 519-9 and 520-1 and each set consists of two (2) sheets. The standard drawings used for this project are the latest edition of the San Diego Area Regional Standard Drawings, hereinafter designated SDRSD, as issued by the San Diego County Department of Public Works, and California Department of Transportation, CALTRANS, standard drawings, together with the most recent editions of the City of Carlsbad Engineering Standards and Carlsbad Standard Drawings, as issued by the City of Carlsbad and the Carlsbad Municipal Water District, hereinafter designated as CES and CSD, respectively.

The Plans, Specifications, and other Contract Documents shall govern the Work. The Contract Documents are intended to be complementary and cooperative. Anything specified in the Specifications and not shown on the Plans, or shown on the Plans and not specified in the Specifications, shall be as though shown on or specified in both.

The Plans shall be supplemented by such working drawings and shop drawings as are necessary to adequately control the Work.

The Contractor shall ascertain the existence of any conditions affecting the cost of the Work through a reasonable examination of the Work site prior to submitting the Bid.

Existing improvements visible at the Work site, for which no specific disposition is made on the Plans, but which interfere with the completion of the Work, shall be removed and disposed of by the Contractor.

The Contractor shall, upon discovering any error or omission in the Plans or Specifications, immediately call it to the attention of the Engineer.

2-5.2 Precedence of Contract Documents.

If there is a conflict between Contract Documents, the document highest in precedence shall control. The precedence shall be the most recent edition of the following documents listed in order of highest to lowest precedence:

1) Permits from other agencies as may be required by law.
2) Change orders, whichever occurs last.
3) Contract addenda, whichever occurs last.
4) Contract
5) Carlsbad General Provisions.
6) Drawings (Plans)
7) Technical Specifications.
8) Supplemental Provisions.
9) Standards plans.
   a) City of Carlsbad Standard Drawings.
   b) Carlsbad Municipal Water District Standard Drawings.
   c) City of Carlsbad modifications to the San Diego Area Regional Standard Drawings.
   d) San Diego Area Regional Standard Drawings.
   e) Traffic Signal Design Guidelines and Standards.
   f) State of California Department of Transportation Standard Plans.
   g) State of California Department of Transportation Standard Specifications.
   h) California Manual on Uniform Traffic Control Devices (CA MUTCD).
10) Standard Specifications for Public Works Construction, as amended.
11) Reference Specifications.
12) Manufacturer's Installation Recommendations

Detail drawings shall take precedence over general drawings.

Change Orders, Supplemental Agreements and approved revisions to Plans and Specifications will take precedence over items 2) through 9) above. Detailed plans and plan views shall have precedence over general plans.

2-5.2.1 Precedence of Contract Documents: Where CALTRANS specifications are used to modify the SSPWC or added to the SSPWC by any of the contract documents the CALTRANS specifications shall have precedence only in reference to the materials and construction materials referred to in the CALTRANS specifications. The Invitation to Bid, Contract for Public Works, Part 1 of these Supplemental Provisions and Part 1 of the SSPWC, in the order of precedence in Section 2-5.2 of the SSPWC, shall prevail over the CALTRANS specifications in all other matters.

2-5.3 Submittals.

2-5.3.1 General. Submittals shall be provided, at the Contractor's expense, as required in 2-5.3.2, 2-5.3.3 and 2-5.3.4, when required by the Plans or Special Provisions, or when requested by the Engineer.

Materials shall neither be furnished nor fabricated, nor shall any work for which submittals are required by performed, before the required submittals have been reviewed and accepted by the Engineer. Neither review nor acceptance of submittals by the Engineer shall relieve the Contractor from responsibility for errors, omissions, or deviations from the Contract Documents, unless such deviations were specifically called to the attention of the Engineer in the letter of transmittal. The Contractor shall be responsible for the correctness of the submittals.

The Contractor shall allow a minimum of 15 working days for review of submittals unless otherwise specified in the Special Provisions. Each submittal shall be accompanied by a letter of transmittal.

Each submittal shall be consecutively numbered. Resubmittals shall be labeled with the number of the original submittal followed by an ascending alphabetical designation (e.g. The label '4-C' would indicate the third instance that the fourth submittal had been given to the Engineer). Each sheet of each submittal shall be consecutively numbered. Each set of shop drawings and submittals shall be accompanied by a letter of transmittal on the Contractor's letterhead. The Letter of Transmittal shall contain the following:

1) Project title and Agency contract number.
2) Number of complete sets.
3) Contractor's certification statement.
4) Specification section number(s) pertaining to material submitted for review.
5) Submittal number (Submittal numbers shall be consecutive including subsequent submittals for the same materials.)
6) Description of the contents of the submittal.
7) Identification of deviations from the contract documents.

When submitted for the Engineer's review, Shop Drawings shall bear the Contractor's certification that the Contractor has reviewed, checked, and approved the Shop Drawings and that they are in conformance with the requirements of the Contract Documents. The Contractor shall subscribe to and shall place the following certification on all submittals:

"I hereby certify that the (equipment, material) shown and marked in this submittal is that proposed to be incorporated into this Project, is in compliance with the Contract Documents, can be installed in the allocated spaces, and is submitted for approval."

By: _____ Title: _____

Date: _____

Company Name: _____

2-5.3.2 Working Drawings. Working drawings are drawings showing details not shown on the Plans which are required to be designed by the Contractor. Working drawings shall be of a size and scale to clearly show all necessary details.

Six copies and one reproducible shall be submitted. If no revisions are required, three of the copies will be returned to the Contractor. If revisions are required, the Engineer will return one copy along with the reproducible for resubmission. Upon acceptance, the Engineer will return two of the copies to the Contractor and retain the remaining copies and the reproducible.

Working drawings are required in the following sections:

TABLE 2-5.3.2 (A)

Item	Section Number	Title	Subject
1	7-10.4.1	Safety Orders	Trench Shoring
2	207-2.5	Joints	Reinforced Concrete Pipe
3	207-8.4	Joints	Vitrified Clay Pipe
4	209-2.1	General	Fabricated Steel Pipe
5	300-3.2	Cofferdams	Structure Excavation & Backfill
6	303-1.6	General	Falsework
7	303-1.7	General	Placing Reinforcement
8	303-3.1	General	Prestressed Concrete Construction
9	304-1.1.1	Shop Drawings	Structural Steel
10	304-1.1.2	Falsework Plans	Structural Steel
11	304-2.1	General	Metal Hand Railings
12	306-2.7.3	General	Temporary Bypasses
13	307-1.1	General	Jacking Operations
14	307-2.1	General	Tunneling Operations
15	307-2.4	Tunnel Supports	Tunneling Operations
16	306-8.2.2.3	Remodeling Existing Sewer Facilities	Polyethylene Liner Installation
17	308-3	Microtunneling	Microtunneling Operations
18	701-17.2.2	Controller Cabinet Wiring Diagrams	Traffic Signal Construction

Working drawings listed above as Items 1, 5, 6, 8, 9, 10, 12, 13, 14, 15 and 17 shall be prepared by a Civil or Structural Engineer registered by the State of California.

2-5.3.3 Shop Drawings. Shop drawings are drawings showing details of manufactured or assembled products proposed to be incorporated into the Work. Shop drawings required shall be as specified in the Special Provisions.

2-5.3.4 Supporting Information. Supporting information is information required by the Specifications for the purposes of administration of the Contract, analysis for verification of conformance with the Specifications, the operation and maintenance of a manufactured product or system to

be constructed as part of the Work, and other information as may be required by the Engineer. Six copies of the supporting information shall be submitted to the Engineer prior to the start of the Work unless otherwise specified in the Special Provisions or directed by the Engineer. Supporting information for systems shall be bound together and include all manufactured items for the system. If resubmittal is not required, three copies will be returned to the Contractor. Supporting information shall consist of the following and is required unless otherwise specified in the Special Provisions:

1) List of Subcontractors per 2-3.2.
2) List of Materials per 4-1.4.
3) Certifications per 4-1.5.
4) Construction Schedule per 6-1.
5) Confined Space Entry Program per 7-10.4.4.
6) Concrete mix designs per 201-1.1.
7) Asphalt concrete mix designs per 203-6.3.1.
8) Request for Permission of Laydown or staging area (if within City ROW)
9) Data, including, but not limited to, catalog sheets, manufacturer's brochures, technical bulletins, specifications, diagrams, product samples, and other information necessary to describe a system, product or item. This information is required for irrigation systems, street lighting systems, and traffic signals, and may also be required for any product, manufactured item, or system.

2-5.4 Record Drawings. The Contractor shall provide and keep an up-to-date record set of drawings "as-built", which shall be corrected in red daily and show every change from the original drawings and specifications and the exact "as-built" locations, sizes and kinds of equipment, underground piping, valves, and all other work not visible at surface grade. Prints for this purpose may be obtained from the Agency at cost. The official record drawing shall accurately reflect all changes and modifications to the original plan. The Contractor shall formally submit the final record drawing at the final walkthrough meeting. At the direction of the engineer, the Contractor shall correct and revise the Record Drawings to accurately reflect field conditions. Re-submittal of the Record Drawings shall be completed within ten (10) working days of the final walkthrough meeting date and shall reflect any additional punch list items. Payment for the upkeep, revision, and submittal of the record drawings shall be included in the lump sum price for this bid item.

2-6 WORK TO BE DONE. The Contractor shall perform all work necessary to complete the Contract in a satisfactory manner. Unless otherwise provided, the Contractor shall furnish all materials, equipment, tools, labor, and incidentals necessary to complete the Work.

2-7 SUBSURFACE DATA. All soil and test hole data, water table elevations, and soil analyses shown on the drawings or included in the Specifications apply only at the location of the test holes and to the depths indicated. Soil test reports for test holes which have been drilled are available for inspection at the office of the Engineer. Any additional subsurface exploration shall be done by Bidders or the Contractor at their own expense.

The indicated elevation of the water table is that which existed on the date when test hole data was determined. It is the Contractor's responsibility to determine and allow for the elevation of groundwater at the date of project construction. A difference in elevation between groundwater shown in soil boring logs and groundwater actually encountered during construction will not be considered as a basis for extra work.

2-8 RIGHT-OF-WAY. Rights-of-way, easements, or rights-of-entry for the Work will be provided by the Agency. Unless otherwise provided, the Contractor shall make arrangements, pay for, and assume all responsibility for acquiring, using, and disposing of additional work areas and facilities temporarily required. The Contractor shall indemnify and hold the Agency harmless from all claims for damages caused by such actions.

2-9 SURVEYING

2-9.1 Permanent Survey Markers. The Contractor shall not cover or disturb permanent survey monuments or benchmarks without the consent of the Engineer. Where the Engineer concurs, in writing, with the Contractor that protecting an existing monument in place is impractical, the Contractor shall employ a licensed land surveyor or a registered civil engineer authorized to practice land surveying within the State of California, hereinafter Surveyor, to establish the location of the monument before it is disturbed. The Contractor shall have the monument replaced by the Surveyor no later than thirty (30) days after construction at the site of the replacement is completed. The Surveyor shall file corner record(s) as required by §§ 8772 and 8773, et seq. of the California Business and Professions Code.

When a change is made in the finished elevation of the pavement of any roadway in which a permanent survey monument is located, the Contractor shall adjust the monument frame and cover to the new grade within 7 days of paving unless the Engineer shall approve otherwise. Monument frames and covers shall be protected during street sealing or painting projects or be cleaned to the satisfaction of the Engineer.

2-9.2 Survey Service. The Contractor shall hire and pay for the services of a Surveyor, hereinafter Surveyor to perform all work necessary for establishing control, construction staking, records research and all other surveying work necessary to construct the work, provide surveying services as required herein and provide surveying, drafting and other professional services required to satisfy the requirements of the Land Surveyors Act. Surveyor shall be resident on the site during all surveying operations and shall personally supervise and certify the surveying work.

2-9.2.3 Payment for Survey, Payment for work performed to satisfy the requirements of Sections 2-9.1 through 2-9.2.2 shall be included in the actual bid items requiring the survey work and no additional payment will be made. Extension of unit prices for extra work shall include full compensation for attendant survey work and no additional payment will be made. Payment for the replacement of disturbed monuments and the filing of records of survey and/or corner records, including filing fees, shall be incidental to the work necessitating the disturbance of said monuments and no additional payment will be made.

2-9.3 Private Engineers. Surveying by private engineers on the Work shall conform to the quality and practice required by the Engineer.

2-9.4 Line and Grade. All work shall conform to the lines, elevations, and grades shown on the Plans.

Three consecutive points set on the same slope shall be used together so that any variation from a straight grade can be detected. Any such variation shall be reported to the Engineer. In the absence of such report, the Contractor shall be responsible for any error in the grade of the finished work.

Grades for underground conduits will be set at the surface of the ground. The Contractor shall transfer them to the bottom of the trench.

2-10 AUTHORITY OF BOARD AND ENGINEER. The Board has the final authority in all matters affecting the Work. Within the scope of the Contract, the Engineer has the authority to enforce compliance with the Plans and Specifications. The Contractor shall promptly comply with instructions from the Engineer or an authorized representative.

The decision of the Engineer is final and binding on all questions relating to: quantities; acceptability of material, equipment, or work; execution, progress or sequence of work; and interpretation of the Plans, Specifications, or other drawings. This shall be precedent to any payment under the Contract, unless otherwise ordered by the Board.

2-10.1 Availability of Records, The Contractor shall, at no charge to the Agency, provide copies of all records in the Contractor's or subcontractor's possession pertaining to the work that the Engineer may request.

2-10.2 Audit and Inspection, Contractor agrees to maintain and/or make available, to the Engineer, within San Diego County, accurate books and accounting records relative to all its activities and to contractually require all subcontractors to this Contract to do the same. The Engineer shall have the right to monitor, assess, and evaluate Contractor's and its subcontractors' performance pursuant to this Agreement, said monitoring, assessments, and evaluations to include, but not be limited to, audits, inspection of premises, reports, contracts, subcontracts and interviews of Contractor's staff and the staff of all subcontractors to this contract. At any time during normal business hours and as often as the Engineer may deem necessary, upon reasonable advance notice, Contractor shall make available to the Engineer for examination, all of its, and all subcontractors to this contract, records with respect to all matters covered by this Contract and will permit the Engineer to audit, examine, copy and make excerpts or transcripts from such data and records, and to make audits of all invoices, materials, payrolls, records of personnel, and other data relating to all matters covered by this Contract. However, any such activities shall be carried out in a manner so as to not unreasonably interfere with Contractor's ongoing business operations. Contractor and all subcontractors to this contract shall maintain such data and records for as long as may be required by applicable laws and regulations.

2-11 INSPECTION. The Work is subject to inspection and approval by the Engineer. The Contractor shall notify the Engineer before noon of the working day before inspection is required. Work shall be done only in the presence of the Engineer, unless otherwise authorized. Any work done without proper inspection will be subject to rejection. The Engineer and any authorized representatives shall at all times have access to the Work during its construction at shops and yards as well as the project site. The Contractor shall provide every reasonable facility for ascertaining that the materials and workmanship are in accordance with these specifications. Inspection of the Work shall not relieve the Contractor of the obligation to fulfill all conditions of the Contract.

SECTION 3 – CHANGES IN WORK

3-1 CHANGES REQUESTED BY THE CONTRACTOR.

3-1.1 General. Changes in the Plans and Specifications, requested in writing by the Contractor, which do not materially affect the Work and which are not detrimental to the Work or to the interests of the Agency, may be granted by the Engineer. Nothing herein shall be construed as granting a right to the Contractor to demand acceptance of such changes.

3-1.2 Payment for Changes Requested by the Contractor. If such changes are granted, they shall be made at a reduction in cost or no additional cost to the Agency.

3-2 CHANGES INITIATED BY THE AGENCY.

3-2.1 General. The Agency may change the Plans, Specifications, character of the work, or quantity of work provided the total arithmetic dollar value of all such changes, both additive and deductive, does not exceed 25 percent of the Contract Price. Should it become necessary to exceed this limitation, the change shall be by written Supplemental Agreement between the Contractor and Agency, unless both parties agree to proceed with the change by Change Order.

Change Orders shall be in writing and state the dollar value of the change or established method of payment, any adjustment in contract time of completion, and when negotiated prices are involved, shall provide for the Contractor's signature indicating acceptance.

3-2.2 Payment.

3-2.2.1 Contract Unit Prices. If a change is ordered in an item of work covered by a Contract Unit Price, and such change does not involve substantial change in character of the work from that shown on the Plans or specified in the Specifications, then an adjustment in payment will be made. This adjustment will be based upon the increase or decrease in quantity and the Contract Unit Price.

If the actual quantity of an item of work covered by a Contract Unit Price and constructed in conformance with the Plans and Specifications varies from the Bid quantity by 50 percent or less, payment will be made at the Contract Unit Price. If the actual quantity of said item of work varies from the Bid quantity by more than 50 percent, payment will be made per Section 3-2.2.2 or 3-2.2.3 as appropriate.

If a change is ordered in an item of work covered by a Contract Unit Price, and such change does involve a substantial change in the character of the work from that shown on the Plans or specified in the Specifications, an adjustment in payment will be made per Section 3-2.4.

3-2.2.2 Increases of More Than 50 Percent. Should the actual quantity of an item of work covered by a Contract Unit Price and constructed in conformance with the Plans and Specifications, exceed the Bid quantity by more than 50 percent, payment for the quantity in excess of 150 percent of the Bid quantity will be made on the basis of an adjustment in the Contract Unit Price mutually agreed to by the Contractor and the Agency, or at the option of the Engineer, on the basis of Extra Work per Section 3-3. The Extra Work per Section 3-3, basis of payment, shall not include fixed costs. Fixed costs shall be deemed to have been recovered by the Contractor through payment for 150 percent of the Bid quantity at the Contract Unit Price.

3-2.2.3 Decreases of More Than 50 Percent. Should the actual quantity of an item of work covered by a Contract Unit Price, and constructed in conformance with the Plans and Specifications, be less than 50 percent of the Bid quantity, an adjustment in payment will not be made unless so requested in writing by the Contractor. If the Contractor so requests, payment will be made on the basis of an adjustment in the Contract Unit Price mutually agreed to by the Contractor and the Agency, or at the option of the Engineer, on the basis of Extra Work per Section 3-3; however, in no case will payment be less than would be made for the actual quantity at the Contract Unit Price nor more than would be made for 50 percent of the Bid quantity at the Contract Unit Price.

3-2.3 Stipulated Unit Prices. Stipulated Unit Prices are unit prices established by the Agency in the Contract Documents as distinguished from Contract Unit Prices submitted by the Contractor. Stipulated Unit Prices may be used for the adjustment of Contract changes when so specified in the Special Provisions.

3-2.4 Agreed Prices. Agreed Prices are prices for new or unforeseen work, or adjustments in Contract Unit Prices per Section 3-2.2, established by mutual agreement between the Contractor and the Agency. If mutual agreement cannot be reached, the Engineer may direct the Contractor to proceed on the basis of Extra Work in accordance per Section 3-3, except as otherwise specified in Sections 3-2.2.2 and 3-2.2.3.

3.2.4.1 Schedule of Values. Prior to construction, Contractor shall provide a schedule of values for all lump sum bid items that shall be used for the purpose of progress payments. The prices shall be valid for the purpose of change orders to the project.

3.2.5 Eliminated Items. Should any Bid item be eliminated in its entirety, payment will be made to the Contractor for its actual costs incurred in connection with the eliminated item prior to notification in writing from the Engineer so stating its elimination. If material conforming to the Plans and Specifications is ordered by the Contractor for use in the eliminated item prior to the date of notification of elimination by the Engineer, and if the order for that material cannot be canceled, payment will be made to the Contractor for the actual cost of the material. In this case, the material shall become the property of the Agency. Payment will be made to the Contractor for its actual costs for any further handling. If the material is returnable, the material shall be returned and payment will be made to the Contractor for the actual cost of charges made by the supplier for returning the material and for handling by the Contractor. Actual costs, as used herein, shall be computed on the basis of Extra Work per Section 3-3.

3-3 EXTRA WORK.

3-3.1 General. New or unforeseen work will be classified as "extra work" when the Engineer determines that it is not covered by Contract Unit Prices or stipulated unit prices.

3-3.2 Payment.

3-3.2.1 General. When the price for the extra work cannot be agreed upon, the Agency will pay for the extra work based on the accumulation of costs as provided herein.

3-3.2.2 Basis for Establishing Costs.

(a) **Labor.** The costs of labor will be the actual cost for wages of workers performing the extra work at the time the extra work is done, plus employer payments of payroll taxes, workers compensation insurance, liability insurance, health and welfare, pension, vacation, apprenticeship funds, and other direct costs, resulting from Federal, State, or local laws, as well as assessments or benefits required by lawful collective bargaining agreements.

The use of a labor classification which would increase the extra work cost will not be permitted unless the Contractor establishes the necessity for such additional costs. Labor costs for equipment operators and helpers shall be reported only when such costs are not included in the invoice for equipment rental. The labor cost for foremen shall be proportioned to all of their assigned work and only that applicable to extra work will be paid.

Nondirect labor costs, including superintendence, shall be considered part of the markup of Section 3-3.2.3 (a).

(b) **Materials.** The cost of materials reported shall be at invoice or lowest current price at which such materials are locally available and delivered to the job site in the quantities involved, plus sales tax, freight, and delivery.

The Agency reserves the right to approve materials and sources of supply, or to supply materials to the Contractor if necessary for the progress of the Work. No markup shall be applied to any material provided by the Agency.

(c) **Tool and Equipment Rental.** No payment will be made for the use of tools which have a replacement value of $200 or less.

Regardless of ownership, the rates and right-of-way delay factors to be used in determining rental and delay costs shall be the edition of the, "Labor Surcharge and Equipment Rental Rates" published by CALTRANS, current at the time of the actual use of the tool or equipment. The right-of-way delay factors therein shall be used as multipliers of the rental rates for determining the value of costs for delay to the Contractor and subcontractors, if any. The labor surcharge rates published therein are not a part of this contract.

The rental rates paid shall include the cost of fuel, oil, lubrication, supplies, small tools, necessary attachments, repairs and maintenance of any kind, depreciation, storage, insurance, and all incidentals. Necessary loading and transportation costs for equipment used on the extra work shall be included.

If equipment is used intermittently and, when not in use, could be returned to its rental source at less expense to the Agency than holding it at the Work site, it shall be returned, unless the Contractor elects to keep it at the Work site, at no expense to the Agency.

All equipment shall be acceptable to the Engineer, in good working condition, and suitable for the purpose for which it is to be used. Manufacturer's ratings and approved modifications shall be used to classify equipment and it shall be powered by a unit of at least the minimum rating recommended by the manufacturer.

The reported rental time for equipment already at the Work site shall be the duration of its use on the extra work. This time begins when equipment is first put into actual operation on the extra work, plus the time required to move it from its previous site and back, or to a closer site.

(d) **Other Items.** The Agency may authorize other items which may be required on the extra work, including labor, services, material, and equipment. These items must be different in their nature from those required for the Work, and be of a type not ordinarily available from the Contractor or Subcontractors.

Invoices covering all such items in detail shall be submitted with the request for payment.

(e) **Invoices.** Vendors' invoices for material, equipment rental and other expenditures shall be submitted with the request for payment. If the request for payment is not substantiated by invoices or other documentation, the Agency may establish the cost of the item involved at the lowest price which was current at the time of the report.

3-3.2.3 Markup.

(a) **Work by Contractor.** The following percentages shall be added to the Contractor's costs and shall constitute the markup for all overhead and profits:

1) Labor 20
2) Materials 15
3) Equipment Rental 15
4) Other Items and Expenditures ... 15

To the sum of the costs and markups provided for in this section, 1 percent shall be added as compensation for bonding.

(b) **Work by Subcontractor.** When all or any part of the extra work is performed by a Subcontractor, the markup established in Section 3-3.2.3(a) shall be applied to the Subcontractor's actual cost of such work. A markup of 10 percent on the first $5,000 of the subcontracted portion of the extra work and a markup of 5 percent on work added in excess of $5,000 of the subcontracted portion of the extra work may be added by the Contractor.

3-3.3 Daily Reports by Contractor. When the price for the extra work cannot be agreed upon, the Contractor shall submit a daily report to the Engineer on forms approved by the Agency. Included are applicable delivery tickets, listing all labor, materials, and equipment involved for that day, and other services and expenditures when authorized. Payment for extra work will not be made until such time that the Contractor submits completed daily reports and all supporting documents to the Engineer. Failure to submit the daily report by the close of the next working day may waive any rights for that day. An attempt shall be made to reconcile the report daily, and it shall be signed by the Engineer and the Contractor. In the event of disagreement, pertinent notes shall be entered by each party to explain points which cannot be resolved immediately. Each party shall retain a signed copy of the report. Reports by Subcontractors or others shall be submitted through the Contractor.

The report shall:

1. Show names of workers, classifications, and hours worked.
2. Describe and list quantities of materials used.

3. Show type of equipment, size, identification number, and hours of operation, including loading and transportation, if applicable.
4. Describe other services and expenditures in such detail as the Agency may require.

3-4 CHANGED CONDITIONS. The Contractor shall promptly notify the Engineer of the following Work site conditions (hereinafter called changed conditions), in writing, upon their discovery and before they are disturbed:

1. Subsurface or latent physical conditions differing materially from those represented in the Contract;
2. Unknown physical conditions of an unusual nature differing materially from those ordinarily encountered and generally recognized as inherent in work of the character being performed; and
3. Material differing from that represented in the Contract which the Contractor believes may be hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law.

The Engineer will promptly investigate conditions which appear to be changed conditions. If the Engineer determines that conditions are changed conditions and they will materially affect performance time, the Contractor, upon submitting a written request, will be granted an extension of time subject to the provisions of 6-6.

If the Engineer determines that the conditions do not justify an adjustment in compensation, the Contractor will be notified in writing. This notice will also advise the Contractor of its obligation to notify the Engineer in writing if the Contractor disagrees.

The Contractor's failure to give notice of changed conditions promptly upon their discovery and before they are disturbed shall constitute a waiver of all claims in connection therewith.

The Contractor shall not be entitled to the payment of any additional compensation for any act, or failure to act, by the Engineer, including failure or refusal to issue a change order, or for the happening of any event, thing, occurrence, or other cause, unless the Contractor shall have first given the Engineer due written notice of potential claim as hereinafter specified. Compliance with this section shall not be required as a prerequisite to notice provisions in Section 6-7.3 Contract Time Accounting, nor to any claim that is based on differences in measurement or errors of computation as to contract quantities. The written notice of potential claim for changed conditions shall be submitted by the Contractor to the Engineer upon their discovery and prior to the time that the Contractor performs the work giving rise to the potential claim. The Contractor's failure to give written notice of potential claim for changed conditions to the agency upon their discovery and before they are disturbed shall constitute a waiver of all claims in connection therewith.

The Contractor shall provide the City with a written document containing a description of the particular circumstances giving rise to the potential claim, the reasons for which the Contractor believes additional compensation may be due and nature of any and all costs involved within 20 working days of the date of service of the written notice of potential claim for changed conditions. Verbal notifications are disallowed.

The potential claim shall include the following certification relative to the California False Claims Act, Government Code Sections 12650-12655.

"The undersigned certifies that the above statements are made in full cognizance of the California False Claims Act, Government Code Sections 12650-12655. The undersigned further understands and agrees that this potential claim, unless resolved, must be restated as a claim in response to the City's proposed final estimate in order for it to be further considered."

By: _____ Title: _____

Date: _____

Company Name: _____

The Contractor's estimate of costs may be updated when actual costs are known. The Contractor shall submit substantiation of its actual costs to the Engineer within 20 working days after the affected work is completed. Failure to do so shall be sufficient cause for denial of any claim subsequently filed on the basis of said notice of potential claim.

It is the intention of this section that differences between the parties arising under and by virtue of the contract be brought to the attention of the Engineer at the earliest possible time in order that such matters be settled, if possible, or other appropriate action promptly taken.

3-5 DISPUTED WORK. The Contractor shall give the agency written notice of potential claim prior to commencing any disputed work. Failure to give said notice shall constitute a waiver of all claims in connection therewith. If the contractor and the agency are unable to reach agreement on disputed work, the Agency may direct the contractor to proceed with the work.

Prior to proceeding with dispute resolution pursuant to Public Contract Code provisions specified hereinafter, the contractor shall attempt to resolve all disputes informally through the following dispute resolution chain of command:

1. Project Inspector
2. Construction Manager
3. Deputy City Engineer, Construction Management & Inspection
4. City Engineer
5. City Manager

The Contractor shall submit a complete report within 20 working days after completion of the disputed work stating its position on the claim, the contractual basis for the claim, along with all documentation supporting the costs and all other evidentiary materials. At each level of claim or appeal of claim the City will, within 10 working days of receipt of said claim or appeal of claim, review the Contractor's report and respond with a position, request additional information or request that the Contractor meet and present its report. When additional information or a meeting is requested the City will provide its position within 10 working days of receipt of said additional information or Contractor's presentation of its report. The Contractor may appeal each level's position up to the City Manager after which the Contractor may proceed under the provisions of the Public Contract Code.

The authority within the dispute resolution chain of command is limited to recommending a resolution to a claim to the City Manager. Actual approval of the claim is subject to the change order provisions in the contract.

All claims by the -Contractor shall be resolved in accordance with Public Contract Code section 9204, which is set forth below:

9204. (a) The Legislature finds and declares that it is in the best interests of the state and its citizens to ensure that all construction business performed on a public works project in the state that is complete and not in dispute is paid in full and in a timely manner.

(b) Notwithstanding any other law, including, but not limited to, Article 7.1 (commencing with Section 10240) of Chapter 1 of Part 2, Chapter 10 (commencing with Section 19100) of Part 2, and Article 1.5 (commencing with Section 20104) of Chapter 1 of Part 3, this section shall apply to any claim by a contractor in connection with a public works project.

(c) For purposes of this section:
(1) "Claim" means a separate demand by a contractor sent by registered mail or certified mail with return receipt requested, for one or more of the following:
(A) A time extension, including, without limitation, for relief from damages or penalties for delay assessed by a public entity under a contract for a public works project.
(B) Payment by the public entity of money or damages arising from work done by, or on behalf of, the contractor pursuant to the contract for a public works project and payment for which is not otherwise expressly provided or to which the claimant is not otherwise entitled.
(C) Payment of an amount that is disputed by the public entity.
(2) "Contractor" means any type of contractor within the meaning of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code who has entered into a direct contract with a public entity for a public works project.
(3) (A) "Public entity" means, without limitation, except as provided in subparagraph (B), a state agency, department, office, division, bureau, board, or commission, the California State University, the University of California, a city, including a charter city, county, including a charter county, city and county, including a charter city and county, district, special district, public authority, political subdivision, public corporation, or nonprofit transit corporation wholly owned by a public agency and formed to carry out the purposes of the public agency.
(B) "Public entity" shall not include the following:
(i) The Department of Water Resources as to any project under the jurisdiction of that department.
(ii) The Department of Transportation as to any project under the jurisdiction of that department.
(iii) The Department of Parks and Recreation as to any project under the jurisdiction of that department.
(iv) The Department of Corrections and Rehabilitation with respect to any project under its jurisdiction pursuant to Chapter 11 (commencing with Section 7000) of Title 7 of Part 3 of the Penal Code.
(v) The Military Department as to any project under the jurisdiction of that department.
(vi) The Department of General Services as to all other projects.
(vii) The High-Speed Rail Authority.
(4) "Public works project" means the erection, construction, alteration, repair, or improvement of any public structure, building, road, or other public improvement of any kind.
(5) "Subcontractor" means any type of contractor within the meaning of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code who either is in direct contract with a contractor or is a lower tier subcontractor.

(d) (1) (A) Upon receipt of a claim pursuant to this section, the public entity to which the claim applies shall conduct a reasonable review of the claim and, within a period not to exceed 45 days, shall provide the claimant a written statement identifying what portion of the claim is disputed and what portion is undisputed. Upon receipt of a claim, a public entity and a contractor may, by mutual agreement, extend the time period provided in this subdivision.
(B) The claimant shall furnish reasonable documentation to support the claim.
(C) If the public entity needs approval from its governing body to provide the claimant a written statement identifying the disputed portion and the undisputed portion of the claim, and the governing body does not meet within the 45 days or within the mutually agreed to extension of time following receipt of a claim sent by registered mail or certified mail, return receipt requested, the public entity shall have up to three days following the next duly publicly noticed meeting of the governing body after the 45-day period, or extension, expires to provide the claimant a written statement identifying the disputed portion and the undisputed portion.
(D) Any payment due on an undisputed portion of the claim shall be processed and made within 60 days after the public entity issues its written statement. If the public entity fails to issue a written statement, paragraph (3) shall apply.
(2) (A) If the claimant disputes the public entity's written response, or if the public entity fails to respond to a claim issued pursuant to this section within the time prescribed, the claimant may demand in writing an informal conference to meet and confer for settlement of the issues in dispute. Upon receipt of a demand in writing sent by registered mail or certified mail, return receipt requested, the public entity shall schedule a meet and confer conference within 30 days for settlement of the dispute.
(B) Within 10 business days following the conclusion of the meet and confer conference, if the claim or any portion of the claim remains in dispute, the public entity shall provide the claimant a written statement identifying the portion of the claim that remains in dispute and the portion that is undisputed. Any payment due on an undisputed portion of the claim shall be processed and made within 60 days after the public entity issues its written statement. Any disputed portion of the claim, as identified by the contractor in writing, shall be submitted to nonbinding mediation, with the public entity and the claimant sharing the associated costs equally. The public entity and claimant shall mutually agree to a mediator within 10 business days after the disputed portion of the claim has been identified in writing. If the parties cannot agree upon a mediator, each party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the claim. Each party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator. If mediation is unsuccessful, the parts of the claim remaining in dispute shall be subject to applicable procedures outside this section.
(C) For purposes of this section, mediation includes any nonbinding process, including, but not limited to, neutral evaluation or a dispute review board, in which an independent third party or board assists the parties in dispute resolution through negotiation or by issuance of an evaluation. Any mediation utilized shall conform to the timeframes in this section.
(D) Unless otherwise agreed to by the public entity and the contractor in writing, the mediation conducted pursuant to this section shall excuse any further obligation under Section 20104.4 to mediate after litigation has been commenced.
(E) This section does not preclude a public entity from requiring arbitration of disputes under private arbitration or the Public Works Contract Arbitration Program, if mediation under this section does not resolve the parties' dispute.
(3) Failure by the public entity to respond to a claim from a contractor within the time periods described in this subdivision or to otherwise meet the time requirements of this section shall result in the claim being deemed rejected in its entirety. A claim that is denied by reason of the public entity's failure to have responded to a claim, or its failure to otherwise meet the time requirements

of this section, shall not constitute an adverse finding with regard to the merits of the claim or the responsibility or qualifications of the claimant.
(4) Amounts not paid in a timely manner as required by this section shall bear interest at 7 percent per annum.
(5) If a subcontractor or a lower tier subcontractor lacks legal standing to assert a claim against a public entity because privity of contract does not exist, the contractor may present to the public entity a claim on behalf of a subcontractor or lower tier subcontractor. A subcontractor may request in writing, either on his or her own behalf or on behalf of a lower tier subcontractor, that the contractor present a claim for work which was performed by the subcontractor or by a lower tier subcontractor on behalf of the subcontractor. The subcontractor requesting that the claim be presented to the public entity shall furnish reasonable documentation to support the claim. Within 45 days of receipt of this written request, the contractor shall notify the subcontractor in writing as to whether the contractor presented the claim to the public entity and, if the original contractor did not present the claim, provide the subcontractor with a statement of the reasons for not having done so.

(e) The text of this section or a summary of it shall be set forth in the plans or specifications for any public works project that may give rise to a claim under this section.

(f) A waiver of the rights granted by this section is void and contrary to public policy, provided, however, that (1) upon receipt of a claim, the parties may mutually agree to waive, in writing, mediation and proceed directly to the commencement of a civil action or binding arbitration, as applicable; and (2) a public entity may prescribe reasonable change order, claim, and dispute resolution procedures and requirements in addition to the provisions of this section, so long as the contractual provisions do not conflict with or otherwise impair the timeframes and procedures set forth in this section.

(g) This section applies to contracts entered into on or after January 1, 2017.

(h) Nothing in this section shall impose liability upon a public entity that makes loans or grants available through a competitive application process, for the failure of an awardee to meet its contractual obligations.

(i) This section shall remain in effect only until January 1, 2020, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2020, deletes or extends that date.

In addition, all claims by Contractor for $375,000 or less shall be resolved in accordance with the procedures in the Public Contract Code, Division 2, Part 3, Chapter 1, Article 1.5 (commencing with Section 20104) which is set forth below

ARTICLE 1.5 RESOLUTION OF CONSTRUCTION CLAIMS

20104. (a)(1) This article applies to all public works claims of three hundred seventy-five thousand dollars ($375,000) or less which arise between a contractor and a local agency.
(2) This article shall not apply to any claims resulting from a contract between a contractor and a public agency when the public agency has elected to resolve any disputes pursuant to Article 7.1 (commencing with Section 10240) of Chapter 1 of Part 2.
(b)(1) "Public work" has the same meaning as in Sections 3100 and 3106 of the Civil Code, except that "public work" does not include any work or improvement contracted for by the state or the Regents of the University of California.

(2) "Claim" means a separate demand by the contractor for (A) a time extension, (B) payment of money or damages arising from work done by, or on behalf of, the contractor pursuant to the contract for a public work and payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled to, or (C) an amount the payment of which is disputed by the local agency.
(c) The provisions of this article or a summary thereof shall be set forth in the plans or specifications for any work which may give rise to a claim under this article.
(d) This article applies only to contracts entered into on or after January 1, 1991.

20104.2. For any claim subject to this article, the following requirements apply:
(a) The claim shall be in writing and include the documents necessary to substantiate the claim. Claims must be filed on or before the date of final payment. Nothing in this subdivision is intended to extend the time limit or supersede notice requirements otherwise provided by contract for the filing of claims.
(b)(1) For claims of less than fifty thousand dollars ($50,000), the local agency shall respond in writing to any written claim within 45 days of receipt of the claim, or may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses to the claim the local agency may have against the claimant.
(2) If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the local agency and the claimant.
(3) The local agency's written response to the claim, as further documented, shall be submitted to the claimant within 15 days after receipt of the further documentation or within a period of time no greater than that taken by the claimant in producing the additional information, whichever is greater.
(c)(1) For claims of over fifty thousand dollars ($50,000) and less than or equal to three hundred seventy-five thousand dollars ($375,000), the local agency shall respond in writing to all written claims within 60 days of receipt of the claim, or may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses to the claim the local agency may have against the claimant.
(2) If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the local agency and the claimant.
(3) The local agency's written response to the claim, as further documented, shall be submitted to the claimant within 30 days after receipt of the further documentation, or within a period of time no greater than that taken by the claimant in producing the additional information or requested documentation, whichever is greater.
(d) If the claimant disputes the local agency's written response, or the local agency fails to respond within the time prescribed, the claimant may so notify the local agency, in writing, either within 15 days of receipt of the local agency's response or within 15 days of the local agency's failure to respond within the time prescribed, respectively, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon a demand, the local agency shall schedule a meet and confer conference within 30 days for settlement of the dispute.
(e) Following the meet and confer conference, if the claim or any portion remains in dispute, the claimant may file a claim as provided in Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code. For purposes of those provisions, the running of the period of time within which a claim must be filed shall be tolled from the time the claimant submits his or her written claim pursuant to subdivision (a) until the time that claim is denied as a result of the meet and confer process, including any period of time utilized by the meet and confer process.

(f) This article does not apply to tort claims and nothing in this article is intended nor shall be construed to change the time periods for filing tort claims or actions specified by Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code.

20104.4. The following procedures are established for all civil actions filed to resolve claims subject to this article:
(a) Within 60 days, but no earlier than 30 days, following the filing or responsive pleadings, the court shall submit the matter to non-binding mediation unless waived by mutual stipulation of both parties. The mediation process shall provide for the selection within 15 days by both parties of a disinterested third person as mediator, shall be commenced within 30 days of the submittal, and shall be concluded within 15 days from the commencement of the mediation unless a time requirement is extended upon a good cause showing to the court or by stipulation of both parties. If the parties fail to select a mediator within the 15-day period, any party may petition the court to appoint the mediator.
(b)(1) If the matter remains in dispute, the case shall be submitted to judicial arbitration pursuant to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, notwithstanding Section 1141.11 of that code. The Civil Discovery Act of 1986 (Article 3 (commencing with Section 2016) of Chapter 3 of Title 3 of Part 4 of the Code of Civil procedure) shall apply to any proceeding brought under the subdivision consistent with the rules pertaining to judicial arbitration.
(2) Notwithstanding any other provision of law, upon stipulation of the parties, arbitrators appointed for purposes of this article shall be experienced in construction law, and, upon stipulation of the parties, mediators and arbitrators shall be paid necessary and reasonable hourly rates of pay not to exceed their customary rate, and such fees and expenses shall be paid equally by the parties, except in the case of arbitration where the arbitrator, for good cause, determines a different division. In no event shall these fees or expenses be paid by state or county funds.
(3) In addition to Chapter 2.5 (commencing with Section 1141.10) Title 3 of Part 3 of the Code of Civil Procedure, any party who after receiving an arbitration award requests a trial de novo but does not obtain a more favorable judgment shall, in addition to payment of costs and fees under that chapter, pay the attorney's fees of the other party arising out of the trial de novo.
(c) The court may, upon request by any party, order any witnesses to participate in the mediation or arbitration process.

20104.6. (a) No local agency shall fail to pay money as to any portion of a claim which is undisputed except as otherwise provided in the contract.
(b) In any suit filed under Section 20104.4, the local agency shall pay interest at the legal rate on any arbitration award or judgment. The interest shall begin to accrue on the date the suit is filed in a court of law.

Although not to be construed as proceeding under extra work provisions, the Contractor shall keep and furnish records of disputed work in accordance with Section 3-3.

SECTION 4 – CONTROL OF MATERIALS

4-1 MATERIALS AND WORKMANSHIP.

4-1.1. General. All materials, parts, and equipment furnished by the Contractor in the Work shall be new, high grade, and free from defects. Quality of work shall be in accordance with the generally accepted standards. Material and work quality shall be subject to the Engineer's approval.

Materials and work quality not conforming to the requirements of the Specifications shall be considered defective and will be subject to rejection. Defective work or material, whether in place or not, shall be removed immediately from the site by the Contractor, at its expense, when so directed by the Engineer.

If the Contractor fails to replace any defective or damaged work or material after reasonable notice, the Engineer may cause such work or materials to be replaced. The replacement expense will be deducted from the amount to be paid to the Contractor.

Used or secondhand materials, parts, and equipment may be used only if permitted by the Specifications.

4-1.2 Protection of Work and Materials. The Contractor shall provide and maintain storage facilities and employ such measures as will preserve the specified quality and fitness of materials to be used in the Work. Stored materials shall be reasonably accessible for inspection. The Contractor shall also adequately protect new and existing work and all items of equipment for the duration of the Contract.

The Contractor shall not, without the Agency's consent, assign, sell, mortgage, hypothecate, or remove equipment or materials which have been installed or delivered and which may be necessary for the completion of the Contract.

4-1.3 Inspection Requirements.

4-1.3.1 General. Unless otherwise specified, inspection is required at the source for such typical materials and fabricated items as bituminous paving mixtures, structural concrete, metal fabrication, metal casting, welding, concrete pipe manufacture, protective coating application, and similar shop or plant operations.

Steel pipe in sizes less than 18 inches and vitrified clay and cast-iron pipe in all sizes are acceptable upon certification as to compliance with the Specifications, subject to sampling and testing by the Agency. Standard items of equipment such as electric motors, conveyors, elevators, plumbing fixtures, etc., are subject to inspection at the job site only. Special items of equipment such as designed electrical panel boards, large pumps, sewage plant equipment, etc., are subject to inspection at the source, normally only for performance testing. The Specifications may require inspection at the source for other items not typical of those listed in this section.

The Contractor shall provide the Engineer free and safe access to any and all parts of work at any time. Such free and safe access shall include means of safe access and egress, ventilation, lighting, shoring, dewatering and all elements pertaining to the safety of persons as contained in the State of California, California Code of Regulations, Title 8, Industrial Relations, Chapter 4, Division of Industrial Safety, Subchapter 4, Construction Safety Orders and such other safety

regulations as may apply. Contractor shall furnish Engineer with such information as may be necessary to keep the Engineer fully informed regarding progress and manner of work and character of materials. Inspection or testing of the whole or any portion of the work or materials incorporated in the work shall not relieve Contractor from any obligation to fulfill this Contract.

4-1.3.2 Inspection of Materials Not Locally Produced. When the Contractor intends to purchase materials, fabricated products, or equipment from sources located more than 50 miles outside the geographical limits of the Agency, an inspector or accredited testing laboratory (approved by the Engineer), shall be engaged by the Contractor at its expense, to inspect the materials, equipment or process. This approval shall be obtained before producing any material or equipment. The inspector or representative of the testing laboratory shall judge the materials by the requirements of the Plans and Specifications. The Contractor shall forward reports required by the Engineer. No material or equipment shall be shipped nor shall any processing, fabrication or treatment of such materials be done without proper inspection by the approved agent. Approval by said agent shall not relieve the Contractor of responsibility for complying with the Contract requirements.

4-1.3.3 Inspection by the Agency. The Agency will provide all inspection and testing laboratory services within 50 miles of the geographical limits of the Agency. For private contracts, all costs of inspection at the source, including salaries and mileage costs, shall be paid by the permittee.

4-1.4 Test of Material. Before incorporation in the Work, the Contractor shall submit samples of materials, as the Engineer may require, at no cost to the Agency. The Contractor, at its expense, shall deliver the materials for testing to the place and at the time designated by the Engineer. Unless otherwise provided, all initial testing will be performed under the direction of the Engineer, and at no expense to the Contractor. If the Contractor is to provide and pay for testing, it will be stated in the Specifications. For private contracts, the testing expense shall be borne by the permittee.

The Contractor shall notify the Engineer in writing, at least 15 days in advance, of its intention to use materials for which tests are specified, to allow sufficient time to perform the tests. The notice shall name the proposed supplier and source of material.

If the notice of intent to use is sent before the materials are available for testing or inspection, or is sent so far in advance that the materials on hand at the time will not last but will be replaced by a new lot prior to use on the Work, it will be the Contractor's responsibility to renotify the Engineer when samples which are representative may be obtained.

Except as specified in these Provisions, the Agency will bear the cost of testing of locally produced materials and/or on-site workmanship where the results of such tests meet or exceed the requirements indicated in the Standard Specifications, Technical Specification, and any Supplemental Provisions. The cost of all other tests shall be borne by the Contractor.

At the option of the Engineer, the source of supply of each of the materials shall be approved by the Engineer before the delivery is started. All materials proposed for use may be inspected or tested at any time during their preparation and use. If, after incorporating such materials into the Work, it is found that sources of supply that have been approved do not furnish a uniform product, or if the product from any source proves unacceptable at any time, the Contractor shall furnish approved material from other approved sources. If any product proves unacceptable after improper storage, handling or for any other reason it shall be rejected, not incorporated into the work and shall be removed from the project site all at the Contractor's expense.

Compaction tests may be made by the Engineer and all costs for tests that meet or exceed the requirements of the specifications shall be borne by the Agency. Said tests may be made at any place along the work as deemed necessary by the Engineer. The costs of any retests made necessary by noncompliance with the specifications shall be borne by the Contractor.

4-1.5 Certification. The Engineer may waive materials testing requirements of the Specifications and accept the manufacturer's written certification that the materials to be supplied meet those requirements. Material test data may be required as part of the certification.

4-1.6 Trade Names or Equals. The Contractor may supply any of the materials specified or offer an equivalent. The Engineer shall determine whether the material offered is equivalent to that specified. Adequate time shall be allowed for the Engineer to make this determination.

Whenever any particular material, process, or equipment is indicated by patent, proprietary or brand name, or by name of manufacturer, such wording is used for the purpose of facilitating its description and shall be deemed to be followed by the words **or equal**. A listing of materials is not intended to be comprehensive, or in order of preference. The Contractor may offer any material, process, or equipment considered to be equivalent to that indicated. The substantiation of offers shall be submitted as provided in the contract documents.

The Contractor shall, at its expense, furnish data concerning items offered by it as equivalent to those specified. The Contractor shall have the material tested as required by the Engineer to determine that the quality, strength, physical, chemical, or other characteristics, including durability, finish, efficiency, dimensions, service, and suitability are such that the item will fulfill its intended function.

Test methods shall be subject to the approval of the Engineer. Test results shall be reported promptly to the Engineer, who will evaluate the results and determine if the substitute item is equivalent. The Engineer's findings shall be final. Installation and use of a substitute item shall not be made until approved by the Engineer.

If a substitute offered by the Contractor is not found to be equal to the specified material, the Contractor shall furnish and install the specified material.

The specified Contract completion time shall not be affected by any circumstance developing from the provisions of this section.

The Contractor is responsible for the satisfactory performance of substituted items. If, in the sole opinion of the Engineer, the substitution is determined to be unsatisfactory in performance, appearance, durability, compatibility with associated items, availability of repair parts and suitability of application the Contractor shall remove the substituted item and replace it with the originally specified item at no cost to the Agency.

4-1.7 Weighing and Metering Equipment. All scales and metering equipment used for proportioning materials shall be inspected for accuracy and certified within the past 12 months by the State of California Bureau of Weights and Measures, by the County Director or Sealer of Weights and Measures, or by a scale mechanic registered with or licensed by the County.

The accuracy of the work of a scale service agency, except as stated herein, shall meet the standards of the California Business and Professions Code and the California Code of Regulations pertaining to weighing devices. A certificate of compliance shall be presented, prior to operation, to the Engineer for approval and shall be renewed whenever required by the Engineer at no cost to the Agency.

All scales shall be arranged so they may be read easily from the operator's platform or area. They shall indicate the true net weight without the application of any factor. The figures of the scales shall be clearly legible. Scales shall be accurate to within 1 percent when tested with the plant shut down. Weighing equipment shall be so insulated against vibration or moving of other operating equipment in the plant area that the error in weighing with the entire plant running will not exceed 2 percent for any setting nor 1.5 percent for any batch.

4-1.8 Calibration of Testing Equipment. Testing equipment, such as, but not limited to pressure gages, metering devices, hydraulic systems, force (load) measuring instruments, and strain-measuring devices shall be calibrated by a testing agency acceptable to the Engineer at intervals not to exceed 12 months and following repairs, modification, or relocation of the equipment. Calibration certificates shall be provided when requested by the Engineer.

4-1.9 Construction Materials Dispute Resolution (Soils, Rock Materials, Concrete, Mortar and Related Materials, Masonry Materials, Bituminous Materials, Rock Products, and Modified Asphalts). In the interest of safety and public value, whenever credible evidence arises to contradict the test values of materials, the Agency and the Contractor will initiate an immediate and cooperative investigation. Test values of materials are results of the materials' tests, as defined by these Specifications or by the special provisions, required to accept the Work. Credible evidence is process observations or test values gathered using industry accepted practices. A contradiction exists whenever test values or process observations of the same or similar materials are diverse enough such that the work acceptance or performance becomes suspect. The investigation shall allow access to all test results, procedures, and facilities relevant to the disputed work and consider all available information and, when necessary, gather new and additional information in an attempt to determine the validity, the cause, and if necessary, the remedy to the contradiction. If the cooperative investigation reaches any resolution mechanism acceptable to both the Agency and the Contractor, the contradiction shall be considered resolved and the cooperative investigation concluded. Whenever the cooperative investigation is unable to reach resolution, the investigation may then either conclude without resolution or continue by written notification of one party to the other requesting the implementation of a resolution process by committee. The continuance of the investigation shall be contingent upon recipient's agreement and acknowledged in writing within 3 calendar days after receiving a request. Without acknowledgement, the investigation shall conclude without resolution. The committee shall consist of three State of California Registered Civil Engineers. Within 7 calendar days after the written request notification, the Agency and the Contractor will each select one engineer. Within 14 calendar days of the written request notification, the two selected engineers will select a third engineer. The goal in selection of the third member is to complement the professional experience of the first two engineers. Should the two engineers fail to select the third engineer, the Agency and the Contractor shall each propose 2 engineers to be the third member within 21 calendar days after the written request notification. The first two engineers previously selected shall then select one of the four proposed engineers in a blind draw. The committee shall be a continuance of the cooperative investigation and will re-consider all available information and if necessary gather new and additional information to determine the validity, the cause, and if necessary, the remedy to the contradiction. The committee will focus upon the performance adequacy of the material(s) using standard engineering principles and practices and to ensure public value, the committee may

provide engineering recommendations as necessary. Unless otherwise agreed, the committee will have 30 calendar days from its formation to complete their review and submit their findings. The final resolution of the committee shall be by majority opinion, in writing, stamped and signed. Should the final resolution not be unanimous, the dissenter may attach a written, stamped, and signed minority opinion. Once started, the resolution process by committee shall continue to full conclusion unless:

1. Within 7 days of the formation of the committee, the Agency and the Contractor reach an acceptable resolution mechanism; or
2. Within 14 days of the formation of the committee, the initiating party withdraws its written notification and agrees to bear all investigative related costs thus far incurred; or
3. At any point by the mutual agreement of the Agency and the Contractor. Unless otherwise agreed, the Contractor shall bear and maintain a record for all the investigative costs until resolution. Should the investigation discover assignable causes for the contradiction, the assignable party, the Agency or the Contractor, shall bear all costs associated with the investigation. Should assignable causes for the contradiction extended to both parties, the investigation will assign costs cooperatively with each party or when necessary, equally. Should the investigation substantiate a contradiction without assignable cause, the investigation will assign costs cooperatively with each party or when necessary, equally. Should the investigation be unable to substantiate a contradiction, the initiator of the investigation shall bear all investigative costs. All claim notification requirements of the contract pertaining to the contradiction shall be suspended until the investigation is concluded.

4-2 MATERIALS TRANSPORTATION, HANDLING AND STORAGE. The Contractor shall order, purchase, transport, coordinate delivery, accept delivery, confirm the quantity and quality received, prepare storage area(s), store, handle, protect, move, relocate, remove and dispose excess of all materials used to accomplish the Work. Materials shall be delivered to the site of the work only during working hours, as defined in Section 6-7.2, and shall be accompanied by bills of lading that shall clearly state for each delivery: the name of the Contractor as consignee, the project name and number, address of delivery and name of consignor and a description of the material(s) shipped. Prior to storage of any materials which have been shipped to or by the Contractor to any location within the Agency's boundaries the Contractor shall provide the Engineer a copy of lease agreements for each property where such materials are stored. The lease agreement shall clearly state the term of the lease, the description of materials allowed to be stored and shall provide for the removal of the materials and restoration of the storage site within the time allowed for the Work. All such storage shall conform to all laws and ordinances that may pertain to the materials stored and to preparation of the storage site and the location of the site on which the materials are stored. Loss, damage or deterioration of all stored materials shall be the Contractor's responsibility. Conformance to the requirements of this section, both within and outside the limits of work are a part of the Work. The Engineer shall have the right to verify the suitability of materials and their proper storage at any time during the Work.

SECTION 5 – UTILITIES

5-1 LOCATION. The Agency and affected utility companies have, by a search of known records, endeavored to locate and indicate on the Plans, all utilities which exist within the limits of the work. However, the accuracy and/or completeness of the nature, size and/or location of utilities indicated on the Plans is not guaranteed.

Where underground main distribution conduits such as water, gas, sewer, electric power, telephone, or cable television are shown on the Plans, the Contractor shall assume that every property parcel will be served by a service connection for each type of utility.

As provided in Section 4216 of the California Government Code, at least 2 working days prior to commencing any excavation, the Contractor shall contact the regional notification center (Underground Service Alert of Southern California) and obtain an inquiry identification number.

The California Department of Transportation is not required by Section 4216 to become a member of the regional notification center. The Contractor shall contact it for location of its subsurface installations.

The Contractor shall determine the location and depth of all utilities, including service connections, which have been marked by the respective owners and which may affect or be affected by its operations. If no pay item is provided in the Contract for this work, full compensation for such work shall be considered as included in the prices bid for other items of work.

5-2 PROTECTION. The Contractor shall not interrupt the service function or disturb the support of any utility without authority from the owner or order from the Agency. All valves, switches, vaults, and meters shall be maintained readily accessible for emergency shutoff.

Where protection is required to ensure support of utilities located as shown on the Plans or in accordance with Section 5-1, the Contractor shall, unless otherwise provided, furnish and place the necessary protection at its expense.

Upon learning of the existence and location of any utility omitted from or shown incorrectly on the Plans, the Contractor shall immediately notify the Engineer in writing. When authorized by the Engineer, support or protection of the utility will be paid for as provided in Section 3-2.2.3 or 3-3.

The Contractor shall immediately notify the Engineer and the utility owner if any utility is disturbed or damaged. The Contractor shall bear the costs of repair or replacement of any utility damaged if located as noted in Section 5-1.

When placing concrete around or contiguous to any non-metallic utility installation, the Contractor shall at its expense:

1. Furnish and install a 2 inch cushion of expansion joint material or other similar resilient material; or

2. Provide a sleeve or other opening which will result in a 2 inch minimum-clear annular space between the concrete and the utility; or

3. Provide other acceptable means to prevent embedment in or bonding to the concrete.

Where concrete is used for backfill or for structures which would result in embedment, or partial embedment, of a metallic utility installation; or where the coating, bedding or other cathodic protection system is exposed or damaged by the Contractor's operations, the Contractor shall notify the Engineer and arrange to secure the advice of the affected utility owner regarding the procedures required to maintain or restore the integrity of the system.

5-3 REMOVAL. Unless otherwise specified, the Contractor shall remove all interfering portions of utilities shown on the Plans or indicated in the Bid documents as "abandoned" or "to be abandoned in place". Before starting removal operations, the Contractor shall ascertain from the Agency whether the abandonment is complete, and the costs involved in the removal and disposal shall be included in the Bid for the items of work necessitating such removals.

5-4 RELOCATION. When feasible, the owners responsible for utilities within the area affected by the Work will complete their necessary installations, relocations, repairs, or replacements before commencement of work by the Contractor. When the Plans or Specifications indicate that a utility installation is to be relocated, altered, or constructed by others, the Agency will conduct all negotiations with the owners and work will be done at no cost to the Contractor, except for manhole frame and cover sets to be brought to grade. Utilities which are relocated in order to avoid interference shall be protected in their position and the cost of such protection shall be included in the Bid for the items of work necessitating such relocation.

After award of the Contract, portions of utilities which are found to interfere with the Work will be relocated, altered or reconstructed by the owners, or the Engineer may order changes in the Work to avoid interference. Such changes will be paid for in accordance with Section 3-2.

When the Plans or Specifications provide for the Contractor to alter, relocate, or reconstruct a utility, all costs for such work shall be included in the Bid for the items of work necessitating such work. Temporary or permanent relocation or alteration of utilities requested by the Contractor for its convenience shall be its responsibility and it shall make all arrangements and bear all costs.

The utility owner will relocate service connections as necessary within the limits of the Work or within temporary construction or slope easements. When directed by the Engineer, the Contractor shall arrange for the relocation of service connections as necessary between the meter and property line, or between a meter and the limits of temporary construction or slope easements. The relocation of such service connections will be paid for in accordance with provisions of Section 3-3. Payment will include the restoration of all existing improvements which may be affected thereby. The Contractor may agree with the owner of any utility to disconnect and reconnect interfering service connections. The Agency will not be involved in any such agreement.

In conformance with Section 5-6 the Contractor shall coordinate the work with utility agencies and companies. Prior to the installation of any and all utility structures within the limits of work by any utility agency or company, or its contractor, the Contractor shall place all curb or curb and gutter that is a part of the work and adjacent to the location where such utility structures are shown on the plans and are noted as being located, relocated or are otherwise shown as installed by others. In order to minimize delays to the Contractor caused by the failure of other parties to relocate utilities that interfere with the construction, the Contractor, upon the Engineer's approval, may be permitted to temporarily omit the portion of work affected by the utility. If such temporary omission is approved by the Engineer the Contractor shall place survey or other physical control markers sufficient to locate the curb or curb and gutter to the satisfaction of the utility agency or company. Such temporary omission shall be for the Contractor's convenience and no additional compensa-

tion will be allowed therefore or for additional work, materials or delay associated with the temporary omission. The portion thus omitted shall be constructed by the Contractor immediately following the relocation of the utility involved unless otherwise directed by the Engineer.

5-5 DELAYS. The Contractor shall notify the Engineer of its construction schedule insofar as it affects the protection, removal, or relocation of utilities. Said notification shall be included as a part of the construction schedule required in Section 6-1. The Contractor shall notify the Engineer in writing of any subsequent changes in the construction schedule which will affect the time available for protection, removal, or relocation of utilities.

The Contractor will not be entitled to damages or additional payment for delays attributable to utility relocations or alterations if correctly located, noted, and completed in accordance with Section 5-1.

The Contractor may be given an extension of time for unforeseen delays attributable to unreasonably protracted interference by utilities in performing work correctly shown on the Plans.

The Agency will assume responsibility for the timely removal, relocation, or protection of existing main or trunkline utility facilities within the area affected by the Work if such utilities are not identified in the Contract Documents. The Contractor will not be assessed liquidated damages for any delay caused by failure of Agency to provide for the timely removal, relocation, or protection of such existing facilities.

If the Contractor sustains loss due to delays attributable to interferences, relocations, or alterations not covered by Section 5-1, which could not have been avoided by the judicious handling of forces, equipment, or plant, there shall be paid to the Contractor such amount as the Engineer may find to be fair and reasonable compensation for such part of the Contractor's actual loss as was unavoidable and the Contractor may be granted an extension of time.

5-6 COOPERATION. When necessary, the Contractor shall so conduct its operations as to permit access to the Work site and provide time for utility work to be accomplished during the progress of the Work.

SECTION 6 – PROSECUTION, PROGRESS, AND ACCEPTANCE OF THE WORK

6-1 CONSTRUCTION SCHEDULE AND COMMENCEMENT OF WORK. Except as otherwise provided herein and unless otherwise prohibited by permits from other agencies as may be required by law the Contractor shall begin work within **five (5)** calendar days after receipt of the "Notice to Proceed".

6-1.1 Pre-Construction Meeting. After, or upon, notification of contract award, the Engineer will set the time and location for the Preconstruction Meeting. Attendance of the Contractor's management personnel responsible for the management, administration, and execution of the project is mandatory for the meeting to be convened. Failure of the Contractor to have the Contractor's responsible project personnel attend the Preconstruction Meeting will be grounds for default by Contractor per Section 6-4. No separate payment will be made for the Contractor's attendance at the meeting. The notice to proceed will only be issued on or after the completion of the preconstruction meeting.

6-1.2 Baseline Construction Schedule Submittal. The Contractor shall submit the Baseline Construction Schedule per the submittal requirements of Section 2-5.3. The submittal of the Baseline Construction Schedule shall include each item and element described in this section and shall be provided on a physical (paper) copy and electronic media copy.

6-1.2.1 Bar Chart. As a part of the Baseline Construction Schedule the Contractor shall prepare and submit to the Engineer a chart showing individual tasks and their durations arranged with the tasks on the vertical axis and duration on the horizontal axis. The schedule shall include, but is not limited to, submittal dates for working drawings and shop drawings, critical path milestones, start and end dates for each bid item and traffic control phases, utility and traffic signal shutdowns, supporting information, and the critical path to project completion, the bar chart shall use differing texture patterns or distinctive line types to show the critical path.

The construction schedule shall display project specific information including the start and end dates of start and end dates of Phase 1, 2, and 3 of the project, as defined in Section 6-2.1 *Order of Work*, and the critical path of work activities through these phases.

6-1.2.2 Engineer's Review. The Construction Schedule is subject to the review of the Engineer. The Engineer's determination that the Baseline Construction Schedule proposed by the Contractor complies with the requirements of these supplemental provisions shall be a condition precedent to issuance of the Notice to Proceed by the Engineer. If the Engineer determines that the Construction Schedule does not meet the requirements of these specifications the Contractor shall correct the Construction Schedule to meet these specifications and resubmit it to the Engineer. Failure of the Contractor to obtain the Engineer's determination that the initial Construction Schedule proposed by the Contractor complies with the requirements of these supplemental provisions within ten (10) working days after the date of the preconstruction meeting shall be grounds for termination of the contract per Section 6-4. Days used by the Engineer to review the initial Construction Schedule will not be included in the 30 working days.

The Engineer will review and return to the Contractor, with any comments, the Baseline Construction Schedule within ten (10) working days of submittal. The Baseline Construction Schedule will be returned marked as per Sections 6-1.2.2.1 through 6-1.2.2.3.

6-1.2.2.1 "Accepted." The Contractor may proceed with the project work upon issuance of the Notice to Proceed.

6-1.2.2.2 "Accepted with Comments." The Contractor may proceed with the project work upon issuance of the Notice to Proceed. The Contractor must resubmit the schedule incorporating the comments prior to submitting any additional submittals to the City.

6-1.2.2.3 "Not Accepted." The Contractor must resubmit the schedule incorporating the corrections and changes. The Notice to Proceed will not be issued by the Engineer if the changes of the comments are not submitted as required hereinbefore and marked "Accepted" or "Accepted with Comments" by the Engineer. The Contractor, at the sole option of the Engineer, may be considered as having defaulted the contract under the provisions of Section 6-4 *DEFAULT BY CONTRACTOR* if the changes of the comments are not submitted as required hereinbefore and marked "Accepted" by the Engineer.

6-1.2.3 Maintenance of Construction Schedule. The Contractor's schedule shall be updated on a weekly basis and presented at progress meetings per Section 6-2.3. The updated schedule shall display start/early finish dates for critical milestones, percent completed for each work item, lag time, delays, and the number of working days exhausted at the time of progress meeting.

6-1.2.4 Measurement and Payment of Construction Schedule. The Contractor's preparation, revision and maintenance of the Construction Schedule are incidental to the work and no separate payment will be made therefore.

6-2 PROSECUTION OF WORK. To minimize public inconvenience and possible hazard and to restore street and other work areas to their original condition and state of usefulness as soon as practicable, the Contractor shall diligently prosecute the Work to completion. If the Engineer determines that the Contractor is failing to prosecute the Work to the proper extent, the Contractor shall, upon orders from the Engineer, immediately take steps to remedy the situation. All costs of prosecuting the Work as described herein shall be included in the Contractor's Bid. Should the Contractor fail to take the necessary steps to fully accomplish said purposes, after orders of the Engineer, the Engineer may suspend the work in whole or part, until the Contractor takes said steps.

As soon as possible under the provisions of the Specifications, the Contractor shall backfill all excavations and restore to usefulness all improvements existing prior to the start of the Work.

If Work is suspended through no fault of the Agency, all expenses and losses incurred by the Contractor during such suspensions shall be borne by the Contractor. If the Contractor fails to properly provide for public safety, traffic, and protection of the Work during periods of suspension, the Agency may elect to do so, and deduct the cost thereof from monies due the Contractor. Such actions will not relieve the Contractor from liability.

6-2.1 Order of Work. The work to be done shall consist of furnishing all labor, equipment and materials, and performing all operations necessary to complete the Project Work as shown on the Project Plans and as specified in the Specifications.

6-2.2 Project Meetings. The Engineer will establish the time and location of weekly Project Meetings. The Contractor's Representative shall attend each Project Meeting. The Project Rep-

resentative shall be the individual determined under Section 7-6, "The Contractor's Representative". No separate payment for attendance of the Contractor, the Contractor's Representative or any other employee or subcontractor or subcontractor's employee at these meetings will be made.

6-3 SUSPENSION OF WORK.

6-3.1 General. The Work may be suspended in whole or in part when determined by the Engineer that the suspension is necessary in the interest of the Agency. The Contractor shall comply immediately with any written order of the Engineer. Such suspension shall be without liability to the Contractor on the part of the Agency except as otherwise specified in Section 6-6.3.

6-3.2 Archaeological and Paleontological Discoveries. If discovery is made of items of archaeological or paleontological interest, the Contractor shall immediately cease excavation in the area of discovery and shall not continue until ordered by the Engineer. When resumed, excavation operations within the area of discovery shall be as directed by the Engineer.

Discoveries which may be encountered may include, but not be limited to, dwelling sites, stone implements or other artifacts, animal bones, human bones, and fossils.

The Contractor shall be entitled to an extension of time and compensation in accordance with the provisions of Section 6-6.

6-4 DEFAULT BY CONTRACTOR. If the Contractor fails to begin delivery of material and equipment, to commence the Work within the time specified, to maintain the rate of delivery of material, to execute the Work in the manner and at such locations as specified, or fails to maintain the Work schedule which will insure the Agency's interest, or, if the Contractor is not carrying out the intent of the Contract, the Agency may serve written notice upon the Contractor and the Surety on its Faithful Performance Bond demanding satisfactory compliance with the Contract.

The Contract may be canceled by the Board without liability for damage, when in the Board's opinion the Contractor is not complying in good faith, has become insolvent, or has assigned or subcontracted any part of the Work without the Board's consent. In the event of such cancellation, the Contractor will be paid the actual amount due based on Contract Unit Prices or lump sums bid and the quantity of the Work completed at the time of cancellation, less damages caused to the Agency by acts of the Contractor. The Contractor, in having tendered a Bid, shall be deemed to have waived any and all claims for damages because of cancellation of Contract for any such reason. If the Agency declares the Contract canceled for any of the above reasons, written notice to that effect shall be served upon the Surety. The Surety shall, within five (5) days, assume control and perform the Work as successor to the Contractor.

If the Surety assumes any part of the Work, it shall take the Contractor's place in all respects for that part, and shall be paid by the Agency for all work performed by it in accordance with the Contract. If the Surety assumes the entire Contract, all money due the Contractor at the time of its default shall be payable to the Surety as the Work progresses, subject to the terms of the Contract.

If the Surety does not assume control and perform the Work within 5 days after receiving notice of cancellation, or fails to continue to comply, the Agency may exclude the Surety from the premises. The Agency may then take possession of all material and equipment and complete the Work by Agency forces, by letting the unfinished Work to another Contractor, or by a combination of

such methods. In any event, the cost of completing the Work shall be charged against the Contractor and its Surety and may be deducted from any money due or becoming due from the Agency. If the sums due under the Contract are insufficient for completion, the Contractor or Surety shall pay to the Agency within 5 days after the completion, all costs in excess of the sums due.

The provisions of this section shall be in addition to all other rights and remedies available to the Agency under law.

6-5 TERMINATION OF CONTRACT. The City may terminate the Contract at its own discretion or when conditions encountered during the Work make it impossible or impracticable to proceed, or when the Agency is prevented from proceeding with the Contract by act of God, by law, or by official action of a public authority.

6-6 DELAYS AND EXTENSIONS OF TIME.

6-6.1 General. If delays are caused by unforeseen events beyond the control of the Contractor, such delays will entitle the Contractor to an extension of time as provided herein, but the Contractor will not be entitled to damages or additional payment due to such delays, except as provided in 6-6.3. Such unforeseen events may include: war, government regulations, labor disputes, strikes, fires, floods, adverse weather or elements necessitating cessation of work, inability to obtain materials, labor or equipment, required extra work, or other specific events as may be further described in the Specifications.

No extension of time will be granted for a delay caused by the Contractor's inability to obtain materials unless the Contractor furnishes to the Engineer documentary proof. the proof must be provided in a timely manner in accordance with the sequence of the Contractor's operations and the approved construction schedule.

If delays beyond the Contractor's control are caused by events other than those mentioned above, the Engineer may deem an extension of time to be in the best interests of the Agency. The Contractor will not be entitled to damages or additional payment due to such delays, except as provided in Section 6-6.3.

If delays beyond the Contractor's control are caused solely by action or inaction by the Agency, such delays will entitle the Contractor to an extension of time as provided in Section 6-6.2.

6-6.2 Extensions of Time. Extensions of time, when granted, will be based upon the effect of delays to the Work. They will not be granted for noncontrolling delays to minor portions of the Work unless it can be shown that such delays did or will delay the progress of the Work.

6-6.3 Payment for Delays to Contractor. The Contractor will be compensated for damages incurred due to delays for which the Agency is responsible. Such actual costs will be determined by the Engineer. The Agency will not be liable for damages which the Contractor could have avoided by any reasonable means, such as judicious handling of forces, equipment, or plant. The determination of what damages the Contractor could have avoided will be made by the Engineer.

6-6.4 Written Notice and Report. The Contractor shall provide written notice to the Engineer within two hours of the beginning of any period that the Contractor has placed any workers or equipment on standby for any reason that the Contractor has determined to be caused by the Agency or by any organization that the Agency may otherwise be obligated by. The Contractor

shall provide continuing daily written notice to the Engineer, each working day, throughout the duration of such period of delay. The initial and continuing written notices shall include the classification of each workman and supervisor and the make and model of each piece of equipment placed on standby, the cumulative duration of the standby, the Contractor's opinion of the cause of the delay and a cogent explanation of why the Contractor could not avoid the delay by reasonable means. Should the Contractor fail to provide the notice(s) required by this section the Contractor agrees that no delay has occurred and that it will not submit any claim(s) therefore.

6-7 TIME OF COMPLETION.

6-7.1 General. The Contractor shall complete the Work within the time set forth in the Contract. The Contractor shall complete each portion of the Work within such time as set forth in the Contract for such portion. The time of completion of the Contract shall be expressed in workdays. The Contractor shall diligently prosecute the work to completion within 45 working days after the starting date specified in the Notice to Proceed.

6-7.2 Working Day. A working day is any day within the period between the start of the Contract time as defined in Section 6-1 and the date provided for completion, or upon field acceptance by the Engineer for all work provided for in the Contract, whichever occurs first, other than:

1. Saturdays and Sundays
2. Any day designated as a holiday by the Agency,
3. Any other day designated as a holiday in a Master Labor Agreement entered into by the Contractor or on behalf of the Contractor as an eligible member of a contractor association,
4. Any day the Contractor is prevented from working at the beginning of the workday for cause as defined in Section 6-6.1,
5. Any day the Contractor is prevented from working during the first 5 hours with at least 60 percent of the normal work force for cause as defined in Section 6-6.1.

Unless otherwise approved in writing by the Engineer, the hours of work shall be between the hours of **8 a.m. and 4 p.m., Monday through Friday**. These times exclude Agency holidays. The Contractor shall obtain the written approval of the Engineer if the Contractor desires daytime work or to work outside said hours or at any time during weekends and/or holidays. This written permission must be obtained at least 48 hours prior to such work The Engineer may approve work outside the hours and/or days stated herein when, in his/her sole opinion, such work conducted by the Contractor is beneficial to the best interests of the Agency. The Contractor shall pay the inspection costs of such work.

6-7.3 Contract Time Accounting. The Engineer will make a daily determination of each working day to be charged against the Contract time. These determinations will be discussed and the Contractor will be furnished a periodic statement showing allowable number of working days of Contract time, as adjusted, at the beginning of the reporting period. The statement will also indicate the number of working days charged during the reporting period and the number of working days of Contract time remaining. If the Contractor does not agree with the statement, it shall file a written protest within 15 days after receipt, setting forth the facts of the protest. Otherwise, the statement will be deemed to have been accepted.

6-8 COMPLETION, ACCEPTANCE, AND WARRANTY. The Work will be inspected by the Engineer for acceptance upon receipt of the Contractor's written assertion that the Work has been completed.

The Engineer will not accept the Work or any portion of the Work before all of the Work is completed and all outstanding deficiencies that may exist are corrected by the Contractor and the Engineer is satisfied that all the materials and workmanship, and all other features of the Work, meet the requirements of all of the specifications for the Work. Use, temporary, interim or permanent, of all, or portions of, the Work does not constitute acceptance of the Work. If, in the Engineer's judgment, the Work has been completed and is ready for acceptance the Engineer will so certify to the Board. Upon such certification by the Engineer the Board may accept the completed Work. Upon the Board's acceptance of the Work the Engineer will cause a "Notice of Completion" to be filed in the office of the San Diego County Recorder. The date of recordation shall be the date of completion of the Work.

All work shall be warranted for one (1) year after recordation of the "Notice of Completion" and any faulty work or materials discovered during the warranty period shall be repaired or replaced by the Contractor, at its expense. Twenty-five percent of the faithful performance bond shall be retained as a warranty bond for the one year warranty period. The Contractor shall replace or repair any such defective work in a manner satisfactory to the Engineer, after notice to do so from the Engineer, and within the time specified in the notice. If the Contractor fails to make such replacement or repairs within the time specified in the notice, the Agency may perform this work and the Contractor's sureties shall be liable for the cost thereof.

6-9 LIQUIDATED DAMAGES. Failure of the Contractor to complete the Work within the time allowed will result in damages being sustained by the Agency. For each consecutive calendar day in excess of the time specified for completion of Work, as adjusted in accordance with Section 6-6, the Contractor shall pay the Agency, or have withheld monies due it, the sum of $2,000. Such sum is liquidated damages and shall not be construed as a penalty, and may be deducted from payments due the Contractor if such delay occurs. Execution of the Contract shall constitute agreement by the Agency and Contractor that $2,000 per day is the minimum value of costs and actual damages caused by the Contractor to complete the Work within the allotted time. Any progress payments made after the specified completion date shall not constitute a waiver of this paragraph or of any damages.

With respect to the public right-of-way, failure of the Contractor to restore and open all travel lanes within designated working hours shall result in damages being sustained by the Agency. For every 15 minutes increment (or portion of time thereof) beyond the hours of work stated in the contract documents, the Contractor Shall pay to the Agency, or have monies due to it, the sum of five hundred dollars ($500). Such sum is liquidated damages and shall not be construed as a penalty, and will be deducted from monthly progress payments due to the Contractor if such delay occurs.

6-10 USE OF IMPROVEMENT DURING CONSTRUCTION. The Agency reserves the right to take over and utilize all or part of any completed facility or appurtenance. The Contractor will be notified in writing in advance of such action. Such action by the Agency will relieve the Contractor of responsibility for injury or damage to said completed portions of the improvement resulting from use by public traffic or from the action of the elements or from any other cause, except Contractor operations or negligence. The Contractor will not be required to reclean such portions of the improvement before field acceptance, except for cleanup made necessary by its

operations. Nothing in this section shall be construed as relieving the Contractor from full responsibility for correcting defective work or materials.

In the event the Agency exercises its right to place into service and utilize all or part of any completed facility or appurtenance, the Agency will assume the responsibility and liability for injury to persons or property resulting from the utilization of the facility or appurtenance so placed into service, except for any such injury to persons or property caused by any willful or negligent act or omission by the Contractor, Subcontractor, their officers, employees, or agents.

SECTION 7 – RESPONSIBILITIES OF THE CONTRACTOR

7-1 CONTRACTOR'S EQUIPMENT AND FACILITIES. The Contractor shall furnish and maintain in good condition all equipment and facilities as required for the proper execution and inspection of the Work. Such equipment and facilities shall meet all requirements of applicable ordinances and laws.

7-2 LABOR.

7-2.1 General. Only competent workers shall be employed on the Work. Any person employed who is found to be incompetent, intemperate, troublesome, disorderly, or otherwise objectionable, or who fails or refuses to perform work properly and acceptably, shall be immediately removed from the Work by the Contractor and not be reemployed on the Work.

7-2.2 Laws. The Contractor, its agents, and employees shall be bound by and comply with applicable provisions of the Labor Code and Federal, State, and local laws related to labor.

The Contractor shall strictly adhere to the provisions of the Labor Code regarding minimum wages; the 8-hour day and 40-hour week; overtime; Saturday, Sunday, and holiday work; and nondiscrimination because of race, color, national origin, sex, or religion. The Contractor shall forfeit to the Agency the penalties prescribed in the Labor Code for violations.

In accordance with the Labor Code, the Board has on file and will publish a schedule of prevailing wage rates for the types of work to be done under the Contract. The Contractor shall not pay less than these rates.

Each worker shall be paid subsistence and travel as required by the collective bargaining agreement on file with the State of California Department of Industrial Relations.

The Contractor's attention is directed to Section 1776 of the Labor Code which imposes responsibility upon the Contractor for the maintenance, certification, and availability for inspection of such records for all persons employed by the Contractor or Subcontractor in connection with the project. The Contractor shall agree through the Contract to comply with this Section and the remaining provisions of the Labor Code.

7-3 LIABILITY INSURANCE. Insurance shall be required as specified in section 10 of the Public Works Contract.

The cost of this insurance shall be included in the Contractor's Bid.

7-4 WORKERS' COMPENSATION INSURANCE. Before execution of the Contract by the Board, the Contractor shall file with the Engineer the following signed certification:

> "I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract."

The Contractor shall also comply with Section 3800 of the Labor Code by securing, paying for, and maintaining in full force and effect for the duration of the contract, complete Workers' Compensation Insurance, and shall furnish a Certificate of Insurance to the Engineer before execution of the Contract. The Agency, its officers, or employees, will not be responsible for any claims in law or equity occasioned by failure of the Contractor to comply with this paragraph.

All compensation insurance policies shall bear an endorsement or shall have attached a rider whereby it is provided that, in the event of expiration or proposed cancellation of such policies for any reason whatsoever, the Agency shall be notified by registered mail not less than 30 days before expiration or cancellation is effective.

All insurance is to be placed with insurers that are admitted and authorized to conduct business in the state of California and are listed in the official publication of the Department of Insurance of the State of California. Policies issued by the State Compensation Fund meet the requirement for workers' compensation insurance.

7-5 PERMITS. Except as specified herein the Contractor will obtain, at no cost to the Contractor all City of Carlsbad encroachment, right-of-way, grading and building permits necessary to perform work for this contract on Agency property, streets, or other rights-of-way. Contractor shall not begin work until all permits incidental to the work are obtained. The Contractor shall obtain and pay for all permits for the disposal of all materials removed from the project. The cost of said permit(s) shall be included in the price bid for the appropriate bid item and no additional compensation will be allowed therefore. The Contractor shall obtain and pay for all costs incurred for permits necessitated by its operations such as, but not limited to, those permits required for night work, overload, blasting, and demolition. For private contracts, the Contractor shall obtain all permits incidental to the Work or made necessary by its operations, and pay all costs incurred by the permit requirements.

The Contractor shall pay all business taxes or license fees that are required for the work.

7-6 THE CONTRACTOR'S REPRESENTATIVE. Before starting work, the Contractor shall designate in writing a representative who shall have complete authority to act for it. An alternative representative may be designated as well. The representative or alternate shall be present at the Work site whenever work is in progress or whenever actions of the elements necessitate its presence to take measures necessary to protect the Work, persons, or property. Any order or communication given to this representative shall be deemed delivered to the Contractor. A joint venture shall designate only one representative and alternate. In the absence of the Contractor or its representative, instructions or directions may be given by the Engineer to the superintendent or person in charge of the specific work to which the order applies. Such order shall be complied with promptly and referred to the Contractor or its representative.

In order to communicate with the Agency, the Contractor's representative, superintendent, or person in charge of specific work shall be able to speak, read, and write the English language.

7-7 COOPERATION AND COLLATERAL WORK. The Contractor shall be responsible for ascertaining the nature and extent of any simultaneous, collateral, and essential work by others. The Agency, its workers and contractors and others, shall have the right to operate within or adjacent to the Work site during the performance of such work.

The Agency, the Contractor, and each of such workers, contractors and others, shall coordinate their operations and cooperate to minimize interference.

The Contractor shall include in its Bid all costs involved as a result of coordinating its work with others. the Contractor will not be entitled to additional compensation from the Agency for damages resulting from such simultaneous, collateral, and essential work. If necessary to avoid or minimize such damage or delay, the Contractor shall redeploy its work force to other parts of the Work.

Should the Contractor be delayed by the Agency, and such delay could not have been reasonably foreseen or prevented by the Contractor, the Engineer will determine the extent of the delay, the effect on the project, and any extension of time.

7-7.1 Coordination. The Contractor shall coordinate and cooperate with all the utility companies during the relocation or construction of their lines. The Contractor may be granted a time extension if, in the opinion of the Engineer, a delay is caused by the utility company. No additional compensation will be made to the Contractor for any such delay.

7-8 PROJECT SITE MAINTENANCE.

7-8.1 Cleanup and Dust Control. Throughout all phases of construction, including suspension of work, and until the final acceptance, the Contractor shall keep the site clean and free from rubbish and debris. The Contractor shall also abate dust nuisance by cleaning, sweeping and sprinkling with water, or other means as necessary. The use of water resulting in mud on public streets will not be permitted as a substitute for sweeping or other methods.

When required by the Plans or Specifications, the Contractor shall furnish and operate a self-loading motor sweeper with spray nozzles at the end of each working day at the minimum, for the purpose of keeping paved areas acceptably clean wherever construction, including restoration, is incomplete.

Materials and equipment shall be removed from the site as soon as they are no longer necessary. Before the final inspection, the site shall be cleared of equipment, unused materials, and rubbish so as to present a satisfactory clean and neat appearance. All cleanup costs shall be included in the Contractor's Bid.

Care shall be taken to prevent spillage on haul routes. Any such spillage shall be removed immediately and the area cleaned.

Excess excavation material from catch basins or similar structures shall be removed from the site immediately. Sufficient material may remain for use as backfill if permitted by the Specifications. Forms and form lumber shall be removed from the site as soon as practicable after stripping.

Failure of the Contractor to comply with the Engineer's cleanup orders may result in an order to suspend work until the condition is corrected. No additional compensation will be allowed as a result of such suspension.

Cleanup and dust control required herein shall also be executed on weekends and other non-working days when needed to preserve the health safety or welfare of the public. The Contractor shall conduct effective cleanup and dust control throughout the duration of the Contract.

The Engineer may require increased levels of cleanup and dust control that, in his/her sole discretion, are necessary to preserve the health, safety and welfare of the public. Cleanup and dust control shall be considered incidental to the items of work that they are associated with and no additional payment will be made therefore.

7-8.2 Air Pollution Control. The Contractor shall not discharge smoke, dust, or any other air contaminants into the atmosphere in such quantity as will violate the regulations of any legally constituted authority.

7-8.3 Vermin Control. At the time of acceptance, structures entirely constructed under the Contract shall be free of rodents, insects, vermin, and pests. Necessary extermination work shall be arranged and paid for by the Contractor as part of the Work within the Contract time, and shall be performed by a licensed exterminator in accordance with requirements of governing authorities. The Contractor shall be liable for injury to persons or property and responsible for the elimination of offensive odors resulting from extermination operations.

7-8.4 Sanitation. The Contractor shall provide and maintain enclosed toilets for the use of employees engaged in the Work. These accommodations shall be maintained in a neat and sanitary condition. They shall also comply with all applicable laws, ordinances, and regulations pertaining to public health and sanitation of dwellings and camps.

Wastewater shall not be interrupted. Should the Contractor disrupt existing sewer facilities, sewage shall be conveyed in closed conduits and disposed of in a sanitary sewer system. Sewage shall not be permitted to flow in trenches or be covered by backfill.

7-8.5 Temporary Light, Power, and Water. The Contractor shall furnish, install, maintain, and remove all temporary light, power, and water at its own expense. These include piping, wiring, lamps, and other equipment necessary for the Work. The Contractor shall not draw water from any fire hydrant (except to extinguish a fire), without obtaining permission from the water agency concerned. The Contractor shall obtain a construction meter for water used for the construction, plant establishment, maintenance, cleanup, testing and all other work requiring water related to this contract. The Contractor shall contact the appropriate water agency for requirements. The Contractor shall pay all costs of temporary light, power and water including hookup, service, meter and any, and all, other charges, deposits and/or fees therefore. Said costs shall be considered incidental to the items of work that they are associated with and no additional payment will be made therefore.

7-8.6 Water Pollution Control. The Contractor shall exercise every reasonable precaution to protect channels, storm drains, and bodies of water from pollution. It shall conduct and schedule operations so as to minimize or avoid muddying and silting of said channels, drains, and waters. Water pollution control work shall consist of constructing those facilities which may be required to provide prevention, control, and abatement of water pollution.

The Contractor shall comply with the California State Water Resources Control Board (SWRCB) Order Number R-9-2015-0100, Construction General Permit and amendments thereto, Waste Discharge Requirements (WDR's) for Discharges of Stormwater Runoff associated with Construction Activity (General Permit) and subsequent adopted modifications and with all requirements of the Storm Water Pollution Prevention and Monitoring Plans for this project in accordance with these regulations.

The Contractor shall comply with the City SWPPP Manual for Construction BMP's (2016 Edition). The Contractor shall be responsible for implementing and maintaining construction BMPs. All costs for water pollution control is incidental to the work and no payment shall be made for water pollution control or utilizing construction BMPs.

7-8.7 Drainage Control. The Contractor shall maintain drainage within and through the work areas. Earth dams will not be permitted in paved areas. Temporary dams of sandbags, asphaltic concrete, or other acceptable material will be permitted when necessary. Such dams shall be removed from the site as soon as their use is no longer necessary.

7-8.8 Noise Control. All internal combustion engines used in the construction shall be equipped with mufflers in good repair when in use on the project with special attention to the City Noise Control Ordinance, Carlsbad Municipal Code Chapter 8.48.

7-9 PROTECTION AND RESTORATION OF EXISTING IMPROVEMENTS. The Contractor shall be responsible for the protection of public and private property adjacent to the Work and shall exercise due caution to avoid damage to such property.

The Contractor shall repair or replace all existing improvements within the right-of-way which are not designated for removal (e.g., curbs, sidewalks, driveways, fences, walls, signs, utility installations, pavement, structures, etc.) which are damaged or removed as a result of its operations. When a portion of a sprinkler system within the right-of-way must be removed, the remaining lines shall be capped. Repairs and replacements shall be at least equal to existing improvements and shall match them in finish and dimension.

Maintenance of street and traffic signal systems that are damaged, temporarily removed or relocated shall be done in conformance with Part 7 *Street Lighting and Traffic Signal Systems* of the SSPWC and Appendix C - *City of Carlsbad Traffic Signal and Street Lighting Notes.*

Trees, lawns, and shrubbery that are not to be removed shall be protected from damage or injury. If damaged or removed due to Contractor's operations, they shall be restored or replaced in as nearly the original condition and location as is reasonably possible. Lawns shall be reseeded and covered with suitable mulch.

The Contractor shall give reasonable notice to occupants or owners of adjacent property to permit them to salvage or relocate plants, trees, fences, sprinklers, and other improvements, within the right-of-way which are designated for removal and would be destroyed because of the Work.

All costs to the Contractor for protecting, removing, and restoring existing improvements shall be included in the Bid.

7-10 PUBLIC CONVENIENCE AND SAFETY.

7-10.1 Traffic and Access. The Contractor's operations shall cause no unnecessary inconvenience. The access rights of the public shall be considered at all times. Unless otherwise authorized, traffic shall be permitted to pass through the Work, or an approved detour shall be provided.

Safe and adequate pedestrian and vehicular access shall be provided and maintained to: fire hydrants; commercial and industrial establishments; churches, schools and parking lots; service

stations and motels; hospitals; police and fire stations; and establishments of similar nature. Access to these facilities shall be continuous and unobstructed unless otherwise approved by the Engineer.

Safe and adequate pedestrian zones and public transportation stops, as well as pedestrian crossings of the Work at intervals not exceeding 90 m (300 feet), shall be maintained unless otherwise approved by the Engineer.

Vehicular access to residential driveways shall be maintained to the property line except when necessary construction precludes such access for reasonable periods of time. If backfill has been completed to the extent that safe access may be provided, and the street is opened to local traffic, the Contractor shall immediately clear the street and driveways and provide and maintain access.

The Contractor shall cooperate with the various parties involved in the delivery of mail and the collection and removal of trash and garbage to maintain existing schedules for these services.

Grading operations, roadway excavation and fill construction shall be conducted by the Contractor in a manner to provide a reasonably satisfactory surface for traffic. When rough grading is completed, the roadbed surface shall be brought to a smooth, even condition satisfactory for traffic. Unless otherwise authorized, work shall be performed in only one-half the roadway at one time. One half shall be kept open and unobstructed until the opposite side is ready for use. If one-half a street only is being improved, the other half shall be conditioned and maintained as a detour.

The Contractor shall schedule the work so as to prevent damage by all traffic, including but not limited to mail delivery. The Contractor shall not schedule work so as to conflict with trash pickup. The trash hauling schedule can be obtained by calling the City's contracted waste disposal company, Coast Waste Management at 929-9417.

During overlay operations, the Contractors schedule for overlay application shall be designated to provide residents and business owners whose streets are to be overlaid sufficient paved parking within an 800 feet distance from their homes or businesses.

Seventy-two hours prior to the start of any construction in the public right-of-way that affects vehicular traffic and/or parking or pedestrian routes, the Contractor shall give written notification of the impending disruption. For a full street closure, all residences and/or businesses on the affected street or alley shall be notified. For partial street closures, or curb, sidewalk and driveway repairs, the residences and/or businesses directly affected by the work shall be notified.

The notification shall be hand delivered and shall state the date and time the work will begin and its anticipated duration. The notification shall list two telephone numbers that may be called to obtain additional information. One number shall be the Contractor's permanent office or field office and the other number shall be a 24-hour number answered by someone who is knowledgeable about the project. At least one of the phone numbers shall be in the (760) area code. An answering machine shall not be connected to either number. The notification shall also give a brief description of the work and simple instructions to the home or business owner on what they need to do to facilitate the construction. The Contractor shall submit the contents of the notification to the Engineer for approval. Notices shall not be distributed until approved by the Engineer.

In addition to the notifications, the contractor shall post no parking signs 72 hours in advance of the work being performed. The no parking signs shall state the date and time of parking restriction for a duration not to exceed the time necessary to complete the work at that location. Failure of

the contractor to meet the posted date requires re-posting the no parking signs 72 hours in advance of the rescheduled work. If the work is delayed or rescheduled the no parking signs shall be removed and re-posted 72 hours in advance of the rescheduled work.

The contractor shall replace all street markings and striping damaged by construction activities.

The Contractor shall include in its Bid all costs for the above requirements.

7-10.2 Storage of Equipment and Materials in Public Streets. Construction materials shall not be stored in streets, roads, or highways for more than 5 days after unloading. All materials or equipment not installed or used in construction within 5 days after unloading shall be stored elsewhere by the Contractor at its expense unless authorized additional storage time.

Construction equipment shall not be stored at the Work site before its actual use on the Work nor for more than 5 days after it is no longer needed. Time necessary for repair or assembly of equipment may be authorized by the Engineer.

Excavated material, except that which is to be used as backfill in the adjacent trench, shall not be stored in public streets unless otherwise permitted. After placing backfill, all excess material shall be removed immediately from the site.

7-10.3 Street Closures, Detours, Barricades. The Contractor shall comply with all applicable State, County, and City requirements for closure of streets. The Contractor shall provide barriers, guards, lights, signs, temporary bridges, flagpersons, and watchpersons. The Contractor shall be responsible for compliance with additional public safety requirements which may arise. The Contractor shall furnish and install signs and warning devices and promptly remove them upon completion of the Work.

After obtaining the Engineers approval and at least 5 working days before closing, detouring, partially closing or reopening any street, alley or other public thoroughfare the Contractor shall notify the following:

1) The Engineer	760-602-2720
2) Carlsbad Fire Department Dispatch	760-931-2197
3) Carlsbad Police Department Dispatch	760-931-2197
4) Carlsbad Traffic Signals Maintenance (extension 2937)	760-438-2980
5) Carlsbad Traffic Signals Operations	760-602-2752
6) North County Transit District	760-967-2828
7) Waste Management	760-929-9400
8) Islands Restaurant	760-602-9898
9) Mobil Gas	760-438-2141
10) The Coast News Group	760-436-9737

The Contractor shall comply with their requirements. The Contractor shall obtain the Engineer's written approval prior to deviating from the requirements of 2) through, and including, 7) above. The Contractor shall obtain the written approval no less than five working days prior to placing any traffic control that affects bus stops.

The Contractor shall secure approval, in advance, from authorities concerned for the use of any bridges proposed by it for public use. Temporary bridges shall be clearly posted as to load limit, with signs and posting conforming to current requirements covering "signs" as set forth in the

Traffic Manual published by the California Department of Transportation. This manual shall also apply to the street closures, barricades, detours, lights, and other safety devices required.

All costs involved shall be included in the Bid.

Traffic controls shall be in accordance with the California Manual on Uniform Traffic Control Devices (FHWA MUTCD 2009 Revision 1 and 2, as amended for use in California) and these provisions. If any component in the traffic control system is damaged, displaced, or ceases to operate or function as specified, from any cause, during the progress of the work, the Contractor shall immediately repair said component to its original condition or replace said component and shall restore the component to its original location. In the event that the Contractor fails to install and/or maintain barricades or such other traffic signs, markings, delineation or devices as may be required herein, the Engineer may, at his/her sole option, install the traffic signs, markings, delineation or devices and charge the Contractor twenty dollars ($25.00) per day per traffic sign or device, or the actual cost of providing such traffic control facility, whichever is the greater.

7-10.3.1 Construction Area Signs and Control Devices. All construction traffic signs and control devices shall be maintained throughout the duration of work in good order and according to the approved traffic control plan. All construction area signs shall conform to the provisions of Section 206-7.2 et seq. All temporary reflective pavement markers shall conform to the provisions of Section 214-5.1.et seq. All temporary reflective channelizers shall conform to the provisions of Section 214-5.2 et seq. All paint for temporary traffic striping, pavement marking, and curb marking shall conform to the provisions of Section 210-1.6 et seq. except that all temporary paint shall be rapid dry water borne conforming to Section 210-1.6 for materials and Section 310-5 et seq. For workmanship. Warning and advisory signs, lights and devices installed or placed to provide traffic control, direction and/or warning shall be furnished, installed and maintained by the Contractor. Warning and advisory signs, lights and devices shall be promptly removed by the Contractor when no longer required. Warning and advisory signs that remain in place overnight shall be stationary mounted signs. Stationary signs that warn of non-existent conditions shall be removed from the traveled way and from the view of motorists in the traveled way or shielded from the view of the traveling public during such periods that their message does not pertain to existing conditions. Care shall be used in performing excavation for signs in order to protect underground facilities. All excavation required to install stationary construction area signs shall be performed by hand methods without the use of power equipment. Warning and advisory signs that are used only during working hours may be portable signs. Portable signs shall be removed from the traveled way and shielded from the view of the traveling public during non-working hours. During the hours of darkness, as defined in Division 1, Section 280, of the California Vehicle Code, portable signs shall be illuminated or, at the option of the Contractor, shall be in conformance with the provisions in Section 206-7.2 et seq. If illuminated traffic cones rather than post-type delineators are used during the hours of darkness, they shall be affixed or covered with reflective cone sleeves as specified in CALTRANS "Standard Specifications", except the sleeves shall be 7" long. Personal vehicles of the Contractor's employees shall not be parked within the traveled way, including any Section closed to public traffic. Whenever the Contractor's vehicles or equipment are parked on the shoulder within 6' of a traffic lane, the shoulder area shall be closed with fluorescent traffic cones or portable delineators placed on a taper in advance of the parked vehicles or equipment and along the edge of the pavement at not less than 25' intervals to a point not less than 25' past the last vehicle or piece of equipment. A minimum of nine (9) cones or portable delineators shall be used for the taper. A W20-1 (Road Work Ahead) or C24 (Shoulder Work Ahead) sign shall be mounted, as required herein, on a signpost or telescoping flag tree with flags. The signpost or flag tree shall be placed where directed by the Engineer.

7-10.3.2 Maintaining Traffic. The Contractor's personnel shall not work closer than 2', nor operate equipment within 10' from any traffic lane occupied by traffic. For equipment, the 10' shall be measured from the closest approach of any part of the equipment as it is operated and/or maneuvered in performing the work. This requirement may be waived when the Engineer has given written authorization to the reduction in clearance that is specific to the time, duration and location of such waiver, when such reduction is shown on the traffic control plans included in these contract documents, when such reduction is shown on the traffic control plans prepared by the Contractor and approved by the Engineer or for the work of installing, maintaining and removing traffic control devices. As a condition of such waiver the Engineer may require the Contractor to detour traffic, adjust the width of, or realign the adjacent traffic lane, close the adjacent traffic lane or provide barriers.

7-10.3.3 Traffic Control System for Lane Closure. A traffic control system consists of closing traffic lanes or pedestrian walkways in accordance with the details shown on the plans, California Manual on Uniform Traffic Control Devices (FHWA MUTCD 2009 Revision 1 and 2, as amended for use in California) and provisions under "Maintaining Traffic" elsewhere in these Provisions. The provisions in this section will not relieve the Contractor from its responsibility to provide such additional devices or take such measures as may be necessary to maintain public safety.

When lanes are closed for only the duration of work periods, all components of the traffic control system, except portable delineators placed along open trenches or excavation adjacent to the traveled way, shall be removed from the traveled way and shoulder at the end work period. If the Contractor so elects, said components may be stored at selected central locations, approved by the Engineer, within the limits of the right-of-way.

7-10.3.4 Traffic Control for Permanent and Temporary Traffic Striping. During traffic stripe operations, traffic shall be controlled with lane closures, as provided for under "Traffic Control System for Lane Closure" of these Supplemental Provisions or by use of an alternative traffic control plan proposed by the Contractor and approved by the Engineer. The Contractor shall not start traffic striping operations using an alternative plan until the Contractor has submitted its plan to the Engineer and has received the Engineer's written approval of said plan.

7-10.3.5 Temporary Pavement Delineation. Temporary pavement delineation shall be furnished, placed, maintained and removed in accordance with the minimum standards specified in the California Manual on Uniform Traffic Control Devices (FHWA MUTCD 2009 Revisions 1 and 2, as amended for use in California) published by CALTRANS. Whenever the work causes obliteration of pavement delineation, temporary or permanent pavement delineation shall be in place prior to opening the traveled way to public traffic. Lane line or centerline pavement delineation shall be provided at all times for traveled ways open to public traffic. All work necessary, including any required lines or marks, to establish the alignment of temporary pavement delineation shall be performed by the Contractor. When temporary pavement delineation is removed, all lines and marks used to establish the alignment of the temporary pavement delineation shall be removed by grinding.

Surfaces to receive temporary pavement delineation shall be dry and free of dirt and loose material. Temporary pavement delineation shall not be applied over existing pavement delineation or other temporary pavement delineation. Temporary pavement delineation shall be maintained until superseded or replaced with permanent pavement delineation.

Temporary pavement delineation shall be removed when, as determined by the Engineer, the temporary pavement delineation conflicts with the permanent pavement delineation or with a new

traffic pattern for the area and is no longer required for the direction of public traffic. When temporary pavement delineation is required to be removed, all lines and marks used to establish the alignment of the temporary pavement delineation shall be removed.

7-10.3.6 Preparation of New, or Modifications and Additions to Existing, Traffic Control Plan Sheets. The contractor shall submit a TCP for all work. The Contractor shall have such new or modified TCP prepared and submitted as a part of the Work for any and all construction activities that are located within the traveled way. The Contractor shall have TCP prepared and submitted as a part of the Work for any construction activities that are a part of this project that are not included in the project plans. The minimum 15-day review period specified in Section 2-5.3.1 for shop drawings and submittals shall pertain to each submittal of TCP, new, modified or added to, for the Engineer's review. New or revised TCP submittals shall include all TCP needed for the entire duration of the Work. Each phase of the TCP shall be shown in sufficient scale and detail to show the lane widths, transition lengths, curve radii, stationing of features affecting the traffic control plan and the methodology proposed to transition to the subsequent TCP phase. When the vertical alignment of the traveled surface differs from the finished pavement elevation vertical curves must also be shown.

Such modifications, supplements and/or new design of TCP shall meet the requirements of the Engineer and California Manual on Uniform Traffic Control Devices (FHWA MUTCD 2009 Revisions 1 and 2, as amended for use in California) published by CALTRANS as published by CALTRANS. Such modification, addition, supplement, and/or new design of TCP shall be prepared by a registered professional engineer appropriately registered in the State of California. The Engineer shall be the sole judge of the suitability and quality of any such modifications, supplements, and/or new designs to TCP. The Engineer may approve any such modifications, supplements, and/or new designs to the TCP when, in the Engineer's sole opinion, such modifications, supplements, and/or new designs to the TCP prepared by the registered professional engineer retained by the Contractor will be beneficial to the best interests of the Agency. Such modification, addition, supplement, and/or new design shall not be implemented and no work shall be commenced that is contingent on such approval until the changed TCP are approved by the Engineer. The preparation of such modification, addition, supplement, and/or new designs of TCP shall not presuppose their approval or obligate the Agency in any fashion. Submittal and review requirements for such modifications, supplements, and/or new designs to TCP shall conform to the requirements of Section 2-5.3 *Shop Drawings* and Submittals.

7-10.3.7 Payment. Design of the traffic control plan, submittal of TCP, revisions to TCP, and implementation of traffic control for this project shall be considered incidental to the work and no extra payment shall be made for traffic control.

7-10.4 Safety.

7-10.4.1 Safety Orders. The Contractor shall have at the Work site, copies or suitable extracts of: Construction Safety Orders, Tunnel Safety Orders and General Industry Safety Orders issued by the State Division of Industrial Safety. The Contractor shall comply with provisions of these and all other applicable laws, ordinances, and regulations.

Before excavating any trench 5 feet or more in depth, the Contractor shall submit a detailed plan to the Agency showing the design of shoring, bracing, sloping, or other provisions to be made for the workers' protection from the hazard of caving ground during the excavation of such trench. If the plan varies from the shoring system standards, the plan shall be prepared by a registered

Civil Engineer. No excavation shall start until the Engineer has accepted the plan and the Contractor has obtained a permit from the State Division of Industrial Safety. A copy of the permit shall be submitted to the Engineer.

Payment for performing all work necessary to provide safety measures shall be included in the prices bid for other items of work except where separate bid items for excavation safety are provided, or required by law.

7-10.4.2 Use of Explosives. Explosives may be used only when authorized in writing by the Engineer, or as otherwise stated in the Specifications. Explosives shall be handled, used, and stored in accordance with all applicable regulations.

The Engineer's approval of the use of explosives shall not relieve the Contractor from liability for claims caused by blasting operations.

7-10.4.3 Special Hazardous Substances and Processes. Materials that contain hazardous substances or mixtures may be required on the Work. A Material Safety Data Sheet as described in Section 5194 of the California Code of Regulations shall be requested by the Contractor from the manufacturer of any hazardous products used.

Material usage shall be accomplished with strict adherence to California Division of Industrial Safety requirements and all manufacturer warnings and application instructions listed on the Material Safety Data Sheet and on the product container label.

The Contractor shall notify the Engineer if a specified product cannot be used under safe conditions.

7-10.4.4 Confined Spaces.

(a) Confined Space Entry Program. The Contractor shall be responsible for implementing, administering and maintaining a confined space entry program (CSEP) in accordance with Sections 5156, 5157 and 5158, Title 8, CCR.

Prior to starting the Work, the Contractor shall prepare and submit its comprehensive CSEP to the Engineer. The CSEP shall address all potential physical and environmental hazards and contain procedures for safe entry into confined spaces, including, but not limited to the following:

1. Training of personnel
2. Purging and cleaning the space of materials and residue
3. Potential isolation and control of energy and material inflow
4. Controlled access to the space
5. Atmospheric testing of the space
6. Ventilation of the space
7. Special hazards consideration
8. Personal protective equipment
9. Rescue plan provisions

The Contractor's submittal shall include the names of its personnel, including subcontractor personnel, assigned to the project who will have CSEP responsibilities, their CSEP training, and their specific assignment and responsibility in carrying out the CSEP.

(b) Permit-Required Confined Spaces. Entry into permit-required confined spaces as defined in Section 5157, Title 8, CCR may be required as a part of the Work. All manholes, tanks, vaults, pipelines, excavations, or other enclosed or partially enclosed spaces shall be considered permit-required confined spaces until the pre-entry procedures demonstrate otherwise. The Contractor shall implement a permit space program prior to performing any work in a permit-required confined space. A copy of the permit shall be available at all times for review by Contractor and Agency personnel at the Work site.

(c) Payment. Payment for implementing, administering, and providing all equipment and personnel to perform the CSEP shall be included in the bid items for which the CSEP is required.

7-10.4.5 Safety and Protection of Workers and Public. The Contractor shall take all necessary precautions for the safety of employees on the work and shall comply with all applicable provisions of Federal, State and Municipal safety laws and building codes to prevent accidents or injury to persons on, about, or adjacent to the premises where the work is being performed. The Contractor shall erect and properly maintain at all times, as required by the conditions and progress of the work, all necessary safeguards for the protection of workers and public and shall use danger signs warning against hazards created by such features of construction as protruding nails, hoists, well holes, and falling materials.

7-11 PATENT FEES OR ROYALTIES. The Contractor shall absorb in its Bid the patent fees or royalties on any patented article or process furnished or used in the Work. The Contractor shall indemnify and hold the Agency harmless from any legal action that may be brought for infringement of patents.

7-12 ADVERTISING. The names, addresses and specialties of Contractors, Subcontractors, architects, or engineers may be displayed on removable signs. The size and location shall be subject to the Engineer's approval.

Commercial advertising matter shall not be attached to or painted on the surfaces of buildings, fences, canopies, or barricades.

7-13 LAWS TO BE OBSERVED. The Contractor shall keep fully informed of State and National laws and County and Municipal ordinances and regulations which in any manner affect those employed in the Work or the materials used in the Work or in any way affect the conduct of the Work. The Contractor shall at all times observe and comply with such laws, ordinances, and regulations. Municipal ordinances that affect this work include Chapter 11.06. Excavation and Grading. If this notice specifies locations or possible materials, such as borrow pits or gravel beds, for use in the proposed construction project which would be subject to Section 1601 or Section 1603 of the Fish and Game Code, the conditions established pursuant to Section 1601 et seq. of the Fish and Game Code shall become conditions of the contract.

7-14 ANTITRUST CLAIMS. Section 7103.5 of the Public Contract Code provides:

> "In entering into a public works contract or a subcontract to supply goods, services, or materials pursuant to a public works contract, the contractor or subcontractor offers and agrees to assign to the awarding body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec 15) or Cartwright Act (Chapter 2 [commencing with Section 16700] of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of

goods, services, or materials pursuant to the public works contract or subcontract. The assignment shall be made and become effective at the time the awarding body tenders final payment to the contractor, without further acknowledgment of the parties."

SECTION 8 – FACILITIES FOR AGENCY PERSONNEL

8-1 GENERAL. Field facilities for Agency personnel are not required.

SECTION 9 – MEASUREMENT AND PAYMENT

9-1 MEASUREMENT OF QUANTITIES FOR UNIT PRICE WORK.

9-1.1 General. Unless otherwise specified, quantities of work shall be determined from measurements or dimensions in horizontal planes. However, linear quantities of pipe, piling, fencing and timber shall be considered as being the true length measured along longitudinal axis.

Unless otherwise provided in Specifications, volumetric quantities shall be the product of the mean area of vertical or horizontal sections and the intervening horizontal or vertical dimension. The planimeter shall be considered an instrument of precision adapted to measurement of all areas.

9-1.2 Methods of Measurement. Materials and items of work which are to be paid for on basis of measurement shall be measured in accordance with methods stipulated in the particular sections involved.

9-1.3 Certified Weights. When payment is to be made on the basis of weight, the weighing shall be done on certified platform scales or, when approved by the Engineer, on a completely automated weighing and recording system. The Contractor shall furnish the Engineer with duplicate licensed weighmaster's certificates showing actual net weights. The Agency will accept the certificates as evidence of weights delivered.

9-1.4 Units of Measurement. The system of measure for this contract shall be the U.S. Standard Measures.

9-2 LUMP SUM WORK. Items for which quantities are indicated "Lump Sum", "L.S.", or "Job", shall be paid for at the price indicated in the Bid. Such payment shall be full compensation for the items of work and all work appurtenant thereto.

When required by the Specifications or requested by the Engineer, the Contractor shall submit to the Engineer within 15 days after award of Contract, a detailed schedule in triplicate, to be used only as a basis for determining progress payments on a lump sum contract or designated lump sum bid item. This schedule shall equal the lump sum bid and shall be in such form and sufficiently detailed as to satisfy the Engineer that it correctly represents a reasonable apportionment of the lump sum.

9-3 PAYMENT

9-3.1 General. The quantities listed in the Bid schedule will not govern final payment. Payment to the Contractor will be made only for actual quantities of Contract items constructed in accordance with the Plans and Specifications. Upon completion of construction, if the actual quantities show either an increase or decrease from the quantities given in the Bid schedule, the Contract Unit Prices will prevail subject to the provisions of Section 3-2.2.1.

The unit and lump sum prices to be paid shall be full compensation for the items of work and all appurtenant work, including furnishing all materials, labor, equipment, tools, and incidentals.

Payment will not be made for materials wasted or disposed of in a manner not called for under the Contract. This includes rejected material not unloaded from vehicles, material rejected after it

has been placed, and material placed outside of the Plan lines. No compensation will be allowed for disposing of rejected or excess material.

Payment for work performed or materials furnished under an Assessment Act Contract will be made as provided in particular proceedings or legislative act under which such contract was awarded.

Whenever any portion of the Work is performed by the Agency at the Contractor's request, the cost thereof shall be charged against the Contractor, and may be deducted from any amount due or becoming due from the Agency.

Whenever immediate action is required to prevent injury, death, or property damage, and precautions which are the Contractor's responsibility have not been taken and are not reasonably expected to be taken, the Agency may, after reasonable attempt to notify the Contractor, cause such precautions to be taken and shall charge the cost thereof against the Contractor, or may deduct such cost from any amount due or becoming due from the Agency. Agency action or inaction under such circumstances shall not be construed as relieving the Contractor or its Surety from liability.

Payment shall not relieve the Contractor from its obligations under the Contract; nor shall such payment be construed to be acceptance of any of the Work. Payment shall not be construed as the transfer of ownership of any equipment or materials to the Agency. Responsibility of ownership shall remain with the Contractor who shall be obligated to store any fully or partially completed work or structure for which payment has been made; or replace any materials or equipment required to be provided under the Contract which may be damaged, lost, stolen or otherwise degraded in any way prior to acceptance of the Work, except as provided in Section 6-10 *Use of Improvement During Construction*.

Guarantee periods shall not be affected by any payment but shall commence on the date of recordation of the "Notice of Completion."

If, within the time fixed by law, a properly executed notice to stop payment is filed with the Agency, due to the Contractor's failure to pay for labor or materials used in the Work, all money due for such labor or materials will be withheld from payment to the Contractor in accordance with applicable laws.

At the expiration of 35 days from the date of acceptance of the Work by the Board, or as prescribed by law, the amount deducted from the final estimate and retained by the Agency will be paid to the Contractor except such amounts as are required by law to be withheld by properly executed and filed notices to stop payment, or as may be authorized by the Contract to be further retained.

9-3.2 Partial and Final Payment. The Engineer will, after award of Contract, establish a closure date for the purpose of making monthly progress payments. The Contractor may request in writing that such monthly closure date be changed. The Engineer may approve such request when it is compatible with the Agency's payment procedure.

Each month, the Engineer will make an approximate measurement of the work performed to the closure date as basis for making monthly progress payments. The estimated value will be based on contract unit prices, completed change order work and as provided for in Section 9-2 *Lump Sum Work* of these General Provisions. Progress payments shall be made no later than thirty (30)

calendar days after the closure date. Five (5) working days following the closure date, the Engineer shall complete the detailed progress pay estimate and submit it to the Contractor for the Contractor's information. Should the Contractor assert that additional payment is due, the Contractor shall within ten (10) days of receipt of the progress estimate, submit a supplemental payment request to the Engineer with adequate justification supporting the amount of supplemental payment request. Upon receipt of the supplemental payment request, the Engineer shall, as soon as practicable after receipt, determine whether the supplemental payment request is a proper payment request. If the Engineer determines that the supplemental payment request is not proper, then the request shall be returned to the Contractor as soon as practicable, but not later than seven (7) days after receipt. The returned request shall be accompanied by a document setting forth in writing the reasons why the supplemental payment request was not proper. In conformance with Public Contract Code Section 20104.50, the City shall make payments within thirty (30) days after receipt of an undisputed and properly submitted supplemental payment request from the Contractor. If payment of the undisputed supplemental payment request is not made within thirty (30) days after receipt by the Engineer, then the City shall pay interest to the Contractor equivalent to the legal rate set forth in subdivision (a) of Section 685.010 of the Code of Civil Procedure.

From each progress estimate, 10 percent will be deducted and retained by the Agency, and the remainder less the amount of all previous payments will be paid. After 50 percent of the Work has been completed and if progress on the Work is satisfactory, the deduction to be made from remaining progress estimates and from the final estimate may be limited to $500 or 10 percent of the first half of total Contract amount, whichever is greater.

No progress payment made to the Contractor or its sureties will constitute a waiver of the liquidated damages under Section 6-9 *Liquidated Damages*.

As provided in Section 22300 of the California Public Contract Code, the Contractor may substitute securities for any monies withheld by the Agency to ensure performance under the Contract.

After final inspection, the Engineer will make a Final Payment Estimate and process a corresponding payment. This estimate will be in writing and shall be for the total amount owed the Contractor as determined by the Engineer and shall be itemized by the contract bid item and change order item with quantities and payment amounts and shall show all deductions made or to be made for prior payments and amounts to be deducted under provisions of the contract. All prior estimates and progress payments shall be subject to correction in the Final Payment Estimate.

The Contractor shall have 30 calendar days from receipt of the Final Payment Estimate to make written statement disputing any bid item or change order item quantity or payment amount. The Contractor shall provide all documentation at the time of submitting the statement supporting its position. Should the Contractor fail to submit the statement and supporting documentation within the time specified, the Contractor acknowledges that full and final payment has been made for all contract bid items and change order items.

If the Contractor submits a written statement with documentation in the aforementioned time, the Engineer will review the disputed item within 30 calendar days and make any appropriate adjustments on the Final Payment. Remaining disputed quantities or amounts not approved by the Engineer will be subject to resolution as specified in Section 3-5 *Disputed Work*.

The written statement filed by the Contractor shall be in sufficient detail to enable the Engineer to

ascertain the basis and amount of said disputed items. The Engineer will consider the merits of the Contractor's claims. It will be the responsibility of the Contractor to furnish within a reasonable time such further information and details as may be required by the Engineer to determine the facts or contentions involved in its claims. Failure to submit such information and details will be sufficient cause for denying payment for the disputed items.

9-3.2.1 Payment for Claims. Except for those final payment items disputed in the written statement required in Section 9-3.2 all claims of any dollar amount shall be submitted in a written statement by the Contractor no later than the date of receipt of the final payment estimate. Those final payment items disputed in the written statement required in Section 9-3.2 shall be submitted no later than 30 days after receipt of the Final Payment estimate. No claim will be considered that was not included in this written statement, nor will any claim be allowed for which written notice or protest is required under any provision of this contract including Sections 3-*4 Changed Conditions*, 3-5 *Disputed Work*, 6-6.3 Payment for Delays to Contractor, 6-6.4 Written Notice and Report, or 6-7.3 Contract Time Accounting, unless the Contractor has complied with notice or protest requirements.

The claims filed by the Contractor shall be in sufficient detail to enable the Engineer to ascertain the basis and amount of said claims. The Engineer will consider and determine the Contractor's claims and it will be the responsibility of the Contractor to furnish within a reasonable time such further information and details as may be required by the Engineer to determine the facts or contentions involved in its claims. Failure to submit such information and details will be sufficient cause for denying the claims.

Payment for claims shall be processed within 30 calendar days of their resolution for those claims approved by the Engineer. The Contractor shall proceed with informal dispute resolution under Section 3-5 *Disputed Work* for those claims remaining in dispute.

9-3.3 Delivered Materials. When provided for in the Specifications, and subject to the limitation and conditions therein, the cost of materials and equipment delivered but not incorporated into the Work will be included in the progress estimate.

9-3.3.1 Delivered Materials. The cost of materials and equipment delivered but not incorporated into the work will not be included in the progress estimate.

9-3.4 Mobilization. Payment for mobilization will be included in the various bid items of work and no other payment will be made for mobilization.

9-3.4.1 Mobilization and Preparatory Work. Payment for mobilization and preparatory Work will be included in the various bid items of work and no other payment will be made.

9-4 BID ITEMS. Payment for each Bid Item shall be made at the quantity and type as listed in the Contractor's Proposal. All work shown or mentioned on the plans, in the Contract Documents, General Provisions, or Technical Provisions/Specifications shall be considered as included in the Bid Items. Contractor must protect existing utilities, improvements, landscaping, irrigation systems, and vegetation in place. If damaged during the work, the Contractor is responsible to repair or replace any utilities, improvements, landscaping, irrigation systems, and vegetation at their expense.

SUPPLEMENTAL PROVISIONS TO STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION PART 2, CONSTRUCTION MATERIALS

SECTION 201 - CONCRETE, MORTAR, AND RELATED MATERIALS

201-1 PORTLAND CEMENT CONCRETE

TABLE 201-1.1.2(A) Modify as follows:

TABLE 201-1.1.2(A) [3]
PORTLAND CEMENT CONCRETE

Type of Construction	Concrete Class	Maximum Slump mm (Inches)
All Concrete Used Within the Right-of-Way	330-C-23 (560-C-3250) [1]	[2]
Trench Backfill Slurry	115-E-3 (190-E-400)	200 (8")
Street Light Foundations and Survey Monuments	330-C-23 (560-C-3250)	100 (4")
Traffic Signal Foundations	385-C-28 (660-CW-4000)	100 (4")
Concreted-Rock Erosion Protection	310-C-17 (520-C-2500P)	per Table 300-11.3.1

(1) Except that concrete required to be of higher strength by Table 201-1.1.2(A) SSPWC shall be as per Table 201-1.1.2(A) SSPWC.
(2) As per Table 201-1.1.2(A) SSPWC.
(3) Portions of Table 201-1.1.2(A) of the Standard Specifications for Public Works Construction not shown herein as changed are not affected by this table.

201-1.2.1 Cement. Substitute the following:
a) **Portland Cement.** Portland Cement shall be Type II or V Portland cement conforming to ASTM C150 and the optional requirements of ASTM C150, Table 2 for maximum equivalent alkalis (Na2O + 0.658K2O) of 0.60 percent.

SECTION 206 – MISCELLANEOUS METAL ITEMS

206-1 STRUCTURAL STEEL, RIVETS, BOLTS, PINS, AND ANCHOR BOLTS

Add the following section:
206-1.6 Stainless Steel Fasteners. Stainless steel fasteners for general applications shall be Type 304 or Type 316. Bolts, screws, studs, threaded rods, and non-headed anchor bolts shall conform to ASTM F593 or F738M. Nuts shall conform to ASTM F594 or F836M.

Add the following section:

206-7 TRAFFIC SIGNS

206-7.1.1 Roadside Signs. This work shall consist of furnishing and installing roadside signs in accordance with details shown on the plans, the California Sign Specifications and these special provisions. Permanent and temporary signs shall be free from blemishes that may affect the serviceability and detract from the general sign color and appearance when viewing during daytime and nighttime from a distance of 25 feet. The face of each finished sign shall be uniform, flat, smooth, and free of defects, scratches, wrinkles, gel, hard spots, streaks, extrusion marks, and air bubbles. The front, back and edges of the sign panels shall be free of router chatter marks, burns, sharp edges, loose rivets, delaminated skins, excessive adhesive overspray, and aluminum marks.

206-7.1.2 Sign Identification. The following notation shall be placed on the lower right side of the back of each sign where the notation shall not be blocked by the sign post or frame:

A. **PROPERTY OF THE CITY OF CARLSBAD**,
B. Name of the sign manufacturer,
C. Month and year of fabrication,
D. Type of retroreflective sheeting, and
E. Manufacturer's identification and lot number of retroreflective sheeting.

The above notation shall be applied directly to the aluminum sign panels in 1/4-inch upper case letters and numerals by die-stamp and applied by similar method to the fiberglass reinforced plastic signs. Painting, screening, or engraving of the notation will not be allowed. The notation shall be applied without damaging the finish of the sign.

206-7.1.3 Drawings. Standard signs shall be as per the most recently approved California Sign Specifications. The date of approval shall be the date most closely preceding the date of manufacture of the sign(s) or the date of the "Notice to Proceed" of this contract, whichever is most recent.

206-7.1.4 Reflective Sheeting. All advisory signs, warning signs and all regulatory signs shall be fabricated with Type IV prismatic sheeting (High Intensity Prismatic or equivalent) or Type IX prismatic cube lens sheeting (Diamond Grade VIP or equivalent) in accordance to ASTM Designation D4956 and conforming to the requirements of these special provisions.

206-7.1.5 Sign Panel. Sign panels shall be fabricated from sheet aluminum in accordance with ASTM Designation B209. Sheet aluminium shall be pretreated in accordance to ASTM Designation B449. The surface of sheet aluminum shall be cleaned, deoxidized, and coated with a light and tightly adherent chromate conversion coating free of powdery residue. The conversion coating shall be Class 2 with a mass between 10 milligrams per square foot. Following the cleaning and coating process, the sheet aluminum shall be protected from exposure to grease, oils, dust, and contaminants. Sheet aluminum shall be free of buckles, warps, dents, cockles, burrs, and defects resulting from fabrication.

206-7.1.6 Mounting Traffic Signs. Traffic signs shall be installed on 10-gage or 12-gage cold-rolled steel perforated tubing posts as shown on San Diego Regional Standard drawing M-45 or, when the sign area exceeds the maximum area allowed for on that drawing, on multiple 10-gage or 12-gage cold-rolled steel perforated tubing posts. The number of posts shall be determined by

the parameters in SDRS drawing M-45 or as approved by the Engineer. Traffic signs will be provided with back braces and mounting blocks as approved by the Engineer consisting of 10-gage or 12-gage cold-rolled steel perforated tubing when multiple posts are used.

206-7.1.7 Traffic Sign Posts. Posts shall be constructed of 10-gage or 12-gage cold-rolled steel perforated tubing posts as shown on San Diego Regional Standard drawing M-45.

206-7.2 Temporary Traffic Signs. Temporary traffic signs shall consist of all signs used for the direction, warning, and regulation of vehicle (including bicycle) and pedestrian traffic during the Contractor's performance of the Work. Temporary traffic signs include both stationary and portable signs.

206-7.2.1 General. This work shall consist of furnishing and installing temporary signs in accordance with details shown on the plans, the California Sign Specifications and these special provisions. Permanent and temporary signs shall be free from blemishes that may affect the serviceability and detract from the general sign color and appearance when viewing during daytime and nighttime from a distance of 25 feet. The face of each finished sign shall be uniform, flat, smooth, and free of defects, scratches, wrinkles, gel, hard spots, streaks, extrusion marks, and air bubbles. The front, back and edges of the sign panels shall be free of router chatter marks, burns, sharp edges, loose rivets, delaminated skins, excessive adhesive overspray, and aluminum marks.

206-7.2.2 Drawings. Standard signs shall be as per the most recently approved California Sign Specifications. The date of approval shall be the date most closely preceding the date of manufacture of the sign(s) or the date of the "Notice to Proceed" of this contract, whichever is most recent.

206-7.2.3 Reflective Sheeting. All advisory signs, warning signs and all regulatory signs shall be fabricated with Type IV prismatic sheeting (High Intensity Prismatic or equivalent) or Type IX prismatic cube lens sheeting (Diamond Grade VIP or equivalent) in accordance to ASTM Designation D4956 and conforming to the requirements of these special provisions.

206-7.2.4 Sign Panel. Sign panels shall be fabricated from sheet aluminum in accordance with ASTM Designation B209. Sheet aluminum shall be pretreated in accordance to ASTM Designation B449. The surface of sheet aluminum shall be cleaned, deoxidized, and coated with a light and tightly adherent chromate conversion coating free of powdery residue. The conversion coating shall be Class 2 with a mass between 10 milligrams per square foot. Following the cleaning and coating process, the sheet aluminum shall be protected from exposure to grease, oils, dust, and contaminants. Sheet aluminum shall be free of buckles, warps, dents, cockles, burrs, and defects resulting from fabrication.

206-7.2.5 Stationary Mounted Temporary Traffic Signs. Stationary mounted temporary traffic signs shall be installed on 10-gage and 12-gage cold-rolled steel perforated tubing posts in the same manner shown on the State of California, Department of Transportation Standard Plans RS1, RS2, RS3 and RS4 for installation of roadside signs, except as follows:

a) Wood posts shall not be used.
b) Back braces and blocks for sign panels will not be required.
c) The height to the bottom of the sign panel above the edge of traveled way shall be at least 2.1 m (7').
d) Unless otherwise shown on the plans traffic sign posts shall conform in materials and installation to SDRS drawing M-45 and shall have one post provided for each 0.48 m^2

(5 ft^2)of sign area, or the signs may be installed on existing lighting standards when approved by the Engineer.

e) Sign panels mounted on temporary traffic sign posts shall conform to the requirements of these special provisions.

206-7.2.6 Temporary Traffic Sign Posts. Posts shall be 10-gage or 12-gage cold-rolled steel perforated tubing used for the support and stabilization of stationary mounted temporary signs. Post size and number of posts shall be as shown on the plans, except that when stationary mounted signs are installed and the type of sign installation is not shown on the plans, post size and the number of posts will be determined by the Engineer. Sign panels for stationary mounted signs shall consist of reflective sheeting applied to a sign substrate.

206-7.2.7 Portable Temporary Traffic Signs. Each portable temporary traffic sign shall consist of a base, standard or framework and a sign panel. The units shall be capable of being delivered to the site of use and placed in immediate operation. Sign panels for portable signs shall conform to the requirements of these special provisions, or shall be cotton drill fabric, flexible industrial nylon fabric, or other approved fabric. Fabric signs shall not be used during the hours of darkness. Size, color, and legend requirements for portable signs shall be as described for stationary mounted sign panels in section 206-7.2 of these special provisions. The height to the bottom of the sign panel above the edge of traveled way shall be at least 0.3-m (12"). All parts of the sign standard or framework shall be finished with 2 applications of orange enamel which will match the color of the sign panel background. Testing of paint will not be required.

Add the following section:
206-8 LIGHT GAGE STEEL TUBING AND CONNECTORS

Add the following section:
206-8.1 General. This Section pertains to 10-gage and 12-gage cold-rolled steel perforated tubing used for the support and stabilization of signs. All shapes shall have a galvanized finish and shall be cold-roll-formed steel conforming to ASTM Designation A-446, Grade A. Galvanizing shall conform to ASTM A-525, Designation G-90. Galvanizing shall be performed after all forming and punching operations have been completed. Cold-rolled steel perforated tubing shall be perforated on all four faces with 11mm (7/16") holes on 25 mm (1") centers.

Add the following section:
206-8.2 Tolerances. Wall thickness tolerance shall not exceed +0.28 mm, -0.13 mm (+0.011", -0.005"). Convexity and concavity measured in the center of the flat side shall not exceed a tolerance of +0.25 mm (+0.010") applied to the specific size determined at the corner. Straightness tolerance variation shall not exceed 1.6 mm in 1 m (1/16 " in 3'). Tolerance for corner radius is 4.0mm (5/32"), plus or minus 0.40 mm (1/64"). Weld flash on corner-welded square tubing shall permit 3.60 mm (9/64") radius gage to be placed in the corner. Using 10-gage or 12-gage square tube, consecutive size tubes shall telescope freely for 3.1m (10'). Tolerance on hole size is plus or minus 0.40 mm (1/64") on a size. Tolerance on hole spacing is plus or minus 3.2 mm in 6.1 m (1/8" in 20'). In addition, for the following specific sizes of light gage steel tubing, dimensional tolerances shall not exceed those listed in tables 206-8.2 (A) and 206-8.2(B).

TABLE 206-8.2(A)
LIGHT GAGE STEEL TUBING SIZE TOLERANCE

Nominal Outside Dimensions mm	(inches)	Outside Tolerance for All Sides at Corners mm	(inches)
25 x 25	(1 x 1)	0.13	0.005
32 x 32	($1^1/_4$ x $1^1/_4$)	0.15	0.006
38 x 38	($1^1/_2$ x $1^1/_2$)	0.15	0.006
44 x 44	($1^3/_4$ x $1^3/_4$)	0.20	0.008
51 x 51	(2 x 2)	0.20	0.008
56 x 56	($2^3/_{16}$ x $2^3/_{16}$)	0.25	0.010
57 x 57	($2^1/_4$ x $2^1/_4$)	0.25	0.010
64 x 64	($2^1/_2$ x $2^1/_2$)	0.25	0.010
51 x 76	(2 x 3)	0.25	0.010

TABLE 206-8.2(B)
LIGHT GAGE STEEL TUBING SQUARENESS OF SIDES AND TWIST

Nominal Outside Dimension mm	(Inches)	Squareness[1] mm	(Inches)	Twist Permissible in 900 mm (3") mm[2]	(Inches)[2]
25 x 25	(1 x 1)	0.15	0.006	1.3	0.050
32 x 32	($1-^1/_4$ x $1-^1/_4$)	0.18	0.007	1.3	0.050
38 x 38	($1-^1/_2$ x $1-^1/_2$)	0.20	0.009	1.3	0.050
44 x 44	($1-^3/_4$ x $1-^3/_4$)	0.25	0.010	1.6	0.062
51 x 51	(2 x 2)	0.30	0.012	1.6	0.062
56 x 56	($2-^3/_{16}$ x $2-^3/_{16}$)	0.36	0.014	1.6	0.062
57 x 57	($2-^1/_4$ x $2-^1/_4$)	0.36	1.014	1.6	0.062
64 x 64	($2-^1/_2$ x $2-^1/_2$)	0.38	0.015	1.9	0.075
51 x 76	(2 x 3)	0.46	0.018	1.9	0.075

(1) Tubing may have its sides failing to be 90 degrees to each other by the tolerance listed.

(2) Twist is measured by holding down the edge of one end of a square tube on a surface plate with the bottom side of the tube parallel to the surface plate and noting the height that either corner on the opposite end of the bottom side is above the surface plate.

Add the following section:

206-8.3 Fasteners. Fasteners used to assemble cold-rolled steel perforated tubing shall be steel "pull-through" electrogalvanized rivets with 9.5 mm (3/8") diameter shank, 22 mm (7/8") diameter head, and a grip range of from 5 mm (0.200") to 0.90 mm (0.356"). The fasteners shall conform to ASTM B-633, Type III.

SECTION 210 - PAINT AND PROTECTIVE COATINGS

210-1 PAINT

210-1.6 Paint for Traffic Striping, Pavement Marking, and Curb Marking. Modify as follows: Paint for traffic lane lines, turn pocket lines, edge lines, channelizing lines, bike lane lines, chevrons, and curbs shall be rapid dry water borne conforming to CALTRANS Specification No. PTWB-01. Paint for pavement legends, pavement symbols, pavement arrows, cross walks, parking stall markings and stop bars shall be alkyd thermoplastic conforming to CALTRANS Specification No. 8010-19A. Glass beads shall be applied to the surface of the rapid dry water borne

paint and the molten thermoplastic material and shall conform to the requirements of CALTRANS Specification No. 8010-004 (Type II). CALTRANS Specifications for water borne paint, thermoplastic material and glass beads may be obtained from the CALTRANS Transportation Laboratory, P.O. Box 19128, Sacramento, CA 95819, telephone number (916) 227-7000.

210-3 GALVANIZING

Add the following section:

210-3.6 Galvanizing for Traffic Signal Facilities. The requirements of this section shall pertain only to the preparation and galvanizing of traffic signal facilities. Galvanizing of products fabricated from rolled, pressed and forged steel shapes, plates, bars and strip 3.2 mm (1/8") thick or thicker, shall conform to the specifications of ASTM Designation: A 123, except that complete seal welding of tightly contacting surfaces of these products prior to galvanizing is required only where seal welding is shown on the plans or specified in these special provisions. Except for pre-galvanized standard pipe, galvanizing of material 3.2 mm (1/8") thick or thicker shall be performed after fabrication into the largest practical sections.

At the option of the Contractor, material thinner than 3.2 mm (1/8") shall be galvanized either before fabrication in conformance with the requirements of ASTM Designation: A 525M, Coating Designation Z600, or after fabrication in conformance with the requirements of ASTM Designation: A 123, except that the weight of zinc coating shall average not less than 365 g per square meter (1.2 oz. per ft^2) of actual surface area with no individual specimen having a coating weight of less than 305 g per square meter (1.0 oz. per ft^2).

Galvanizing of standard pipe shall conform to the requirements of ASTM Designation: A 53. Galvanizing will not be required for stainless steel, monel metal and similar corrosion resistant parts.

Fabrication shall include all operations such as shearing, cutting, punching, forming, drilling, milling, bending, welding and riveting. All welded areas shall be thoroughly cleaned prior to galvanizing to remove all slab or other material that would interfere with the adherence of the zinc. When it is necessary to straighten any sections after galvanizing, the work shall be performed without damage to the zinc coating.

Galvanizing of iron and steel hardware and nuts and bolts, when specified or shown on the plans, shall conform to the specifications of ASTM Designation: A 153, except whenever threaded studs, bolts, nuts, and washers are specified to conform to ASTM Designation: A 307, A 325, A 325M, A 449, A 563, A 563M, or F 436 and zinc coating is required, they shall be hot-dip zinc coated or mechanically zinc coated in accordance with the requirements of the ASTM Designations. Unless otherwise specified, galvanizing shall be performed after fabrication. Components of bolted assemblies shall be galvanized separately before assembly. Tapping of nuts or other internally threaded parts to be used with zinc coated bolts, anchor bars or studs shall be done after galvanizing and shall conform to the requirements for thread dimensions and overtapping allowances in ASTM Designation: A 563 or A 563M. When specified, painting of zinc coated surfaces shall be in accordance with the procedures in Section 210.1 *Paint*. Galvanized surfaces that are abraded or damaged at any time after the application of the zinc coating shall be repaired by thoroughly wire brushing the damaged areas and removing all loose and cracked coating, after which the cleaned areas shall be painted with two applications of unthinned zinc-rich primer (organic vehicle type) conforming to the provisions in Section 210-3.5 *Repair of Damaged Zinc Coating* Aerosol cans shall not be used.

SECTION 214 – TRAFFIC STRIPING, CURB AND PAVEMENT MARKINGS, AND PAVEMENT MARKERS

214-4 PAINT FOR STRIPING AND MARKINGS

214-4.1 General - Modify as follows: Paint for traffic lane lines, turn pocket lines, edge lines, channelizing lines, bike lane lines, chevrons, and curbs shall be rapid dry water borne conforming to CALTRANS Specification No. PTWB-01. Paint for pavement legends, pavement symbols, pavement arrows, cross walks, parking stall markings and stop bars shall be alkyd thermoplastic conforming to CALTRANS Specification No. 8010-19A. Glass beads shall be applied to the surface of the rapid dry water borne paint and the molten thermoplastic material and shall conform to the requirements of CALTRANS Specification No. 8010-004 (Type II). CALTRANS Specifications for water borne paint, thermoplastic material and glass beads may be obtained from the CALTRANS Transportation Laboratory, P.O. Box 19128, Sacramento, CA 95819, telephone number (916) 227-7000.

214-6 PAVEMENT MARKERS

Add the following section:
214-6.4.3.1 Temporary Reflective Pavement Markers. Temporary pavement markers shown on the plans and required in the specifications shall be one of the types shown in Table 214-6.4.3.1, or equal thereto.

TABLE 214-6.4.3.1
TEMPORARY REFLECTIVE PAVEMENT MARKERS

Type	Manufacturer of Distributor
TOM- Temporary Overlay Markers	Davidson Traffic Control Products, 3110 70th Avenue East, Tacoma, WA 98424, (877) 335-4638

Add the following section:
214-6.4.3.2 Permanent Reflective Channelizer. Reflective Channelizer shall be new surface-mounted type and shall be furnished, placed, and maintained at the locations shown on the plans. Reflective channelizer posts shall be orange in color. Reflective channelizers shall have affixed white reflective sheeting as specified in the special provisions. The reflective sheeting shall be 75 mm x 300 mm in size. The reflective sheeting shall be visible at 300 m at night under illumination of legal high beam headlights, by persons with vision of or corrected to 20/20. Reflective channelizer shall be one of the types shown in Table 214-6.4.3.2, or equal thereto.

TABLE 214-6.4.3.2
REFLECTIVE CHANNELIZER

Type	Manufacturer of Distributor
Safe-Hit SH336SMA	Safe-Hit, A Division of Energy Absorption Systems, Inc. 35 East Wacker Drive, Suite 1100 Chicago, IL 60602 (800) 537-8958
Carsonite "Super Duck" SDR3036	Carsonite Composites, LLC 605 Bob Gifford Boulevard Early Branch, SC 29916 (800) 648-7916
Repo "The Replaceable Post"	Western Highway Products 10680 Fern Avenue Stanton, CA 90680 (800) 854-3360

The Contractor shall provide the Engineer with a Certificate of Compliance in accordance with the provisions of Section 2-5.3 "Submittals". Said certificate shall certify that the permanent reflective channelizers comply with the plans and specifications and conform to the prequalified design and material requirements approved by the engineer and were manufactured in accordance with the approved quality control program.

SUPPLEMENTAL PROVISIONS TO STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION PART 3, CONSTRUCTION METHODS

SECTION 306 – OPEN TRENCH CONDUIT CONSTRUCTION

306-3 TRENCH EXCAVATION

306-3.1 General. Add the following: When the actual elevation or position of any existing pipe, conduit, or other underground appurtenances cannot be determined without excavation, the Contractor shall excavate and expose the existing improvement at the location shown on the Plans and any other locations deemed necessary by the Engineer. Such excavation shall be considered as part of the excavation necessary for the work. The Engineer shall be given the opportunity to inspect the existing improvements when it is exposed. Any adjustments in line or grade which may be necessary to accomplish the intent of the plans shall be made at no additional costs.

306-3.2 Removal of Surface Improvements. Add the following: Bituminous pavement, concrete pavement, curbs, sidewalks, or driveways removed in connection with construction shall be removed in accordance with Subsection 401 of the Standard Specifications and these Special Provisions.

306-3.5 Maximum Length of Open Trench. Add the following: The first sentence for the first paragraph is hereby deleted and replaced with the following: Except by permission of the Engineer, the maximum length of open trench where prefabricated pipe is used shall be the distance necessary to accommodate the amount of pipe installed in a single day.

Add the following section:
306-3.7 Steel Plate Bridging - With a Non-Skid Surface. This section covers the use of steel plate bridging. The Contractor shall not employ the use or use steel plate bridging or trench plate that does not meet the requirements of this section both in application and circumstance of use.

Add the following section:
306-3.7.1 Requirements for Use. Alternate construction methods that avoid the use of steel plate bridging shall be used by the Contractor unless otherwise approved by the Engineer. It is recognized that to accommodate excavation work, steel plate bridging may be necessary. All conditions for use of steel plate bridging set forth in the following requirements must be fulfilled as conditions of approval of the use of steel plate bridging. Consideration of steel plate bridging in the review process will take into account the following factors:

1. Traffic volume and composition.
2. Duration of use of the steel plate bridging.
3. Size of the proposed excavation.
4. Weather conditions.

The following formula shall be used to score the permitted use of steel plate bridging:

$$PS = \left[\frac{ADT + EWL}{1000} + DAYS + 10 \times WEEKEND + 5 \times NIGHTS + 20 \times WEATHER + \frac{SPEED\ (kmh)}{8} + SLOPE \times 100 \right] \times LANES$$

$$PS = \left[\frac{ADT + EWL}{1000} + DAYS + 10 \times WEEKEND + 5 \times NIGHTS + 20 \times WEATHER + \frac{SPEED\ (mph)}{5} + SLOPE \times 100 \right] \times LANES$$

where:

PS	=	plate score.
ADT	=	average daily traffic as defined in the Federal Highway Administration (FHWA) Manual on Uniform Traffic Control Devices (MUTCD) 2009 Edition as amended by Supplements 1 and 2.
EWL	=	equivalent wheel loads as defined in the Federal Highway Administration (FHWA) Manual on Uniform Traffic Control Devices (MUTCD) 2009 Edition as amended by Supplements 1 and 2.
DAYS	=	total number of 24 hour periods during which the plates will be utilized at the site being considered.
WEEKEND	=	total number of Saturdays, Sundays and holidays that the plates will be utilized at the site being considered.
NIGHTS	=	total number of overnight periods that the plates will be in place, exclusive of Saturday, Sunday and holiday nights.
WEATHER	=	total number of 24-hour periods that the plates will be utilized at the site being considered when the possibility of rain exceeds 40 percent.
SPEED	=	the design speed in kilometers per hour or miles per hour, as applicable in the formulae above, of the street where the plates are to be installed. This number shall not be reduced for construction zone speed reductions.
SLOPE	=	the quotient of the vertical differential divided by the horizontal distance. The vertical and horizontal dimensions shall be measured at the locations spanning a distance of 15 m (50') up and downstream of the position of the proposed steel plate bridging.
LANES	=	the number of lanes where plates will be used.

When the computed value of the plate score exceeds 50, steel plate bridging shall not be used unless, and at the sole discretion of the Engineer, the Engineer determines that no alternative method of construction is possible in lieu of using steel plate bridging or that other overriding considerations make the use of steel plate bridging acceptable. Alternatives considered to bridging shall include, but not be limited to, detouring traffic, construction detour routes, tunneling, boring and other methods of trenchless construction. Unless specifically noted in the provisions of the Engineer's approval, the use of steel plate bridging at each location so approved shall not exceed four (4) consecutive working days in any given week.

Add the following section:

306-3.7.2 Additional Requirements. In all cases when the depth of the trench exceeds the width of the steel plate bridging resting on each side of the pavement adjacent to the trench, safety regulations require or the Engineer determines that shoring is necessary to protect the health or safety of workers or the public the Contractor shall install shoring conforming to Section 7-10.4.1 of the Standard Specifications. The trench shoring shall be designed and installed to support the steel plate bridging and traffic loads. All approvals for design, substitution of materials or methods shall be submitted by the Contractor in accordance with all provisions of section 2-5.3 Shop Drawings and Submittals. The Contractor shall backfill and resurface excavations in accordance with section 306-1.5.

Add the following section:
306-3.7.3 Installation. When backfilling operations of an excavation in the traveled way, whether transverse or longitudinal cannot be properly completed within a work day, steel plate bridging with a non-skid surface and shoring may be required to preserve unobstructed traffic flow. In such cases, the following conditions shall apply:

a) Steel plate bridging when the plate score exceeds 50 is not allowed except when, at the sole discretion of the Engineer, it is approved as specified hereinbefore.
b) Steel plates used for bridging must extend a minimum of 610 mm (2') beyond the edges of the trench.
c) Steel plate bridging shall be installed to operate with minimum noise.

When the use of steel plate bridging and shoring is approved by the Engineer, the Contractor shall install using either Method (1) or (2) depending on the design speed of the portion of street where the steel plate bridging is proposed for use.

Method 1 [For speeds more than 70 Km/hr (45 MPH)]: The pavement shall be cold planed to a depth equal to the thickness of the plate and to a width and length equal to the dimensions of the plate. The cold milling shall produce a flat surface that the plate shall rest on with no horizontal or vertical movement. Horizontal gaps between the unmilled pavement and the plate shall not exceed 25 mm (1") and shall be filled with elastomeric sealant material which may, at the contractor's option, be mixed with no more that 50%, by volume, of Type I aggregate conforming to the requirements of tables 203-5.2(B) and 203-5.3(A).

Method 2 [For speeds 70 Km/hr (45 MPH) or less]: Approach plate(s) and ending plate (if longitudinal placement) shall be attached to the roadway and shall be secured against displacement by using two adjustable cleats that are no less than 50 mm (2") shorter than the width of the trench bolted to the underside of each plate and located within 150 mm (6") of the beginning and end of the trench for plates at the beginning and end of the trench, a minimum of two 300 mm long by 19 mm diameter (12" x ¾") steel bolts placed through the plate and driven into holes drilled 300 mm (12") into the pavement section, or other devices approved by the Engineer. Subsequent plates shall be butted to each other. Fine graded asphalt concrete shall be compacted to form ramps, maximum slope 8.5% with a minimum 300 mm (12") taper to cover all edges of the steel plates. When steel plates are removed, the dowel holes in the pavement section shall be completely filled with elastomeric sealant material. At the Contractor's option, the methods required for Method 1 may be used. If the Contractor so elects, all requirements of Method 1 shall be used. The Contractor shall maintain the steel plates, shoring, and asphalt concrete ramps and maintain and restore the street surface during and after their use.

Add the following section:
306-3.7.4 Materials. The minimal thickness of steel plate bridging shall be as shown in Table 306-3.7.4 (A)

TABLE 306-3.7.4(A)
REQUIRED PLATE THICKNESS FOR A GIVEN TRENCH WIDTH

Maximum Trench Width (1)	Minimum Plate Thickness
0.3 m (10")	13 mm (1/2")
0.6 m (23")	19 mm (3/4")
0.8 m (31")	22 mm (7/8")
1.0 m (41")	25 mm (1")
1.6 m (63")	32 mm (1 1/4")

(1) For spans greater than 1.6 m (5'), a structural design shall be prepared by a registered civil engineer and submitted to the Engineer for review and approval in accordance with section 2-5.3.

Steel plate bridging shall be steel plate designed to support the HS20-44 truck loading per CALTRANS Bridge Design Specifications Manual. The Contractor shall maintain a non-skid surface on the steel plate with no less than a coefficient of friction of 0.35 as determined by California Test Method 342. If a different test method is used, the Contractor may utilize standard test plates with known coefficients of friction available from the CALTRANS District 11 Materials Engineer to correlate skid resistance results to California Test Method 342. In addition to all other required construction signing, the Contractor shall install Rough Road (W33) sign with black lettering on an orange background in advance of steel plate bridging.

Add the following section:
306-3.7.5 Measurement and Payment. Steel plate bridge materials including, but not limited to: steel plates, anchoring devices, cold milling, elastomeric sealant material, asphalt ramping and padding, signage, placing, installation, removal, relocation, preparation and processing of shop drawings and submittals to support the use of steel plate bridging and all other materials, labor, supervision, overhead of any type or description will be paid for as an incidental to the work that the bridging is installed to facilitate. No separate payment for steel plate bridging will be made. No extension to contract time will be allowed for, or because of, the use of steel plate bridging.

306-12 BACKFILL.

306-12.1 General. Add the following: The Contractor shall install detectable underground utility marking tape 230 mm x75 mm (9" x 3") above each or, in the case of bundled underground conduit of the same type, the upper underground conduit being installed by the open trench method. The type and color of detectable underground utility marking tape shall conform to the requirements of Section 209-7.3.2 of the Supplemental Specifications.

306-12.3.2 Compaction Requirements. Delete Section 306-12.3.2 and replace with the following: The Contractor shall densify trench backfill to a minimum of 90 percent relative compaction except that in the top 915 mm (36") of the street right-of-way, compaction shall be 95 percent.

306-12.3.2 Compaction Requirements. Delete Section 306-12.3.2 and replace with the following: The Contractor shall densify trench backfill to a minimum of 90 percent relative compaction except that in the top 300 mm (12") of the street right-of-way, compaction shall be 95 percent, in accordance with Carlsbad Standard Drawings S-5 and W-2.

306-13 TRENCH RESURFACING.

306-13.1 Temporary Resurfacing. Add the following: Temporary bituminous resurfacing materials which are placed by the Contractor are for its convenience and shall be at no cost to the

Agency. Temporary bituminous resurfacing materials shall be used in lieu of permanent resurfacing only when approved by the Engineer. When temporary bituminous resurfacing materials are used in lieu of permanent resurfacing it shall be removed and replaced with permanent resurfacing within 7 days of placement. No additional payment will be made for temporary bituminous resurfacing materials. The price bid for the associated conduit or structure shall include full compensation for furnishing, placing, maintaining, removing, and disposing of such temporary resurfacing materials.

306-13.2 Permanent Resurfacing. Add the following: Except as provided in section 306-13.1, "Temporary Resurfacing," the Contractor shall perform permanent trench resurfacing within 24 hours after the completion of backfill and densification of backfill and aggregate base materials in accordance with Carlsbad Standard Drawings GS-24 through GS-29.

306-15 PAYMENT.

306-15.1 General. This section is hereby deleted and replaced with the following:

Trench resurfacing shall be incidental to the respective bid item requiring the trench to be excavated and shall be considered full compensation for sawcut, removal and disposal of existing PCC and AC pavement, trench excavation, removal of existing pipeline as specified, over excavation of trench as needed, preparation of bedding material, furnishing and installation of pipe or conduit, backfill per Carlsbad Standard Drawing W-2 and S-5, compaction, trench plates, bedding and protection for crossing utilities, aggregate road base to match existing depth, trench resurfacing per Carlsbad Standard Drawing GS-24, removal of spoils, import of fill material, and all other work necessary to install or remove conduit, complete and in place and no additional compensation shall be allowed therefor.

SECTION 314 – TRAFFIC STRIPING, CURB AND PAVEMENT MARKINGS, AND PAVEMENT MARKERS

314-4 APPLICATION OF TRAFFIC STRIPING AND CURB AND PAVEMENT MARKINGS

314-4.3.1 General. Add the following: The Contractor shall furnish all equipment, materials, labor, and supervision necessary for painting traffic lanes, directional arrows, guidelines, curbs, parking lines, crosswalks, and other designated markings in accordance with the Striping Plans, or for approved temporary traffic control essential for safe control of traffic through and around the construction site. The Contractor shall remove by wet grinding all existing or temporary traffic markings and lines that may confuse the public. When temporary detour striping or markings are no longer required, they shall be removed prior to painting the new traffic stripes or markings.

314-4.3.4.1 General. Add the following: The Contractor shall provide a wet grinding machine with sufficient capacity to completely remove all existing or temporary traffic striping or markings that conflict with the striping plan, or are contrary to the Traffic Manual, or that may be confusing to the public. The surface produced by grinding the existing or temporary traffic striping or markings on pavement shall not exceed variations from a uniform plane more than 3 mm ($^1/_8$") in 3 m (10') when measured parallel to the centerline of the street or more than 6 mm ($^1/_4$") in 3 m (10') when

measured perpendicular to the centerline of the street. The use of any equipment that leaves ridges, indentations or other objectionable marks in the pavement shall be discontinued, and equipment capable of providing acceptable surface shall be furnished by the Contractor. This equipment shall meet all requirements of the air pollution control district having jurisdiction.

Add the following section:
314-4.3.5.1 Preparation of Existing Surfaces. The Contractor shall remove all existing markings and striping, either permanent or temporary, which are to be abandoned, obliterated or that conflict with the plans by wet grinding methods. Removal of striping by high velocity water jet may be permitted when there is neither potential of the water and detritus from the high velocity water jetting to damage vehicles or private property nor to flow from the street into any storm drain or water course and when approved by the Engineer. The Contractor shall vacuum all water and detritus resulting from high velocity water jet striping removal from the pavement immediately after the water jetting and shall not allow such materials to flow in the gutter, enter the storm drain system or to leave the pavement surface. Surface variation limitations for high velocity water jet striping removal shall be the same as for grinding. The Contractor shall not use dry or wet sandblasting in any areas. Alternate methods of paint removal require prior approval of the Engineer. Obliteration of traffic striping with black paint, light emulsion oil or any other masking method other than a minimum 30mm (0.10') thick asphalt concrete overlay is not permitted.

Add the following section:
314-4.3.5.2 Layout, Alignment, and Spotting. The Contractor shall establish the necessary control points for all required pavement striping and markings by surveying methods. No layout of traffic striping shall be performed by the Contractor before establishment of the necessary control points. The Contractor shall establish all traffic striping between these points by string line or other method to provide striping that will vary less than 80mm per 100m (1/2 inch in 50 feet) from the specified alignment. The Contractor shall obliterate, straight stripes deviating more than 80mm per 100mm (1/ 2 inch in 50 feet) by wet grinding, and then correcting the markings. The Contractor shall lay out (cat track) immediately behind installation of surface course asphalt and as the work progresses.

Add the following section:
314-4.3.5.3 Application of Paint. The Contractor shall apply the first coat of paint immediately upon approval of striping layout by the Engineer and within 72 hours of pavement resurfacing. After one week, a second coat of paint shall be applied to all final, approved striping. The Contractor shall paint the ends of each median nose yellow. If required by the approved traffic control plans, the Contractor shall apply temporary traffic stripes in one coat. Temporary traffic stripes shall be maintained by the Contractor so that the stripes are clearly visible both day and night.

314-4.3.6 Payment. Delete this Section and add the following: The contract lump sum price shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for the installation and replacement of all final and temporary striping, pavement markers, inlet stenciling, signing, and refreshing all striping within 200 feet in each direction of the project limits of work per this section, the plan, and contract documents. Reapplication of temporary stripes and markings shall be repainted at the Contractor's expense, and no additional compensation will be allowed therefore.

314-5 PAVEMENT MARKERS

314-5.4 Placement. Add the following: When being installed on asphalt concrete pavement sooner than 14 days after placement of the asphalt concrete pavement course on which the pavement markers are to be placed.

Add the following section:
314-5.4.1 Reflective Channelizer Placement and Removal. The Contractor shall place and remove reflective channelizers the same as for pavement marker placement and removal. The Contractor shall place the channelizers uniformly, straight on tangent alignment and on a true arc on curved alignment to the same tolerances of position as for application of paint in Section 310-5. The Contractor shall perform all layout work necessary to place the channelizers to the proper alignment. If the channelizers are displaced or fail to remain in an upright position, from any cause, the channelizers shall immediately be replaced or restored to their original location, by the Contractor. When reflective channelizers are removed the pavement surface shall be restored to the same color and surface finish as the adjacent pavement.

SUPPLEMENTAL PROVISIONS TO STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION PART 6 TEMPORARY TRAFFIC CONTROL

SECTION 601 - TEMPORARY TRAFFIC CONTROL FOR CONSTRUCTION AND MAINTENANCE WORK ZONES

601-2 TEMPORARY TRAFFIC CONTROL PLAN (TCP).

601-2.2 Payment. Replace this section with the following: design of the traffic control plan, submittal of TCP, revisions to TCP, and implementation of traffic control for this project shall be considered incidental to the work and no extra payment shall be made for traffic control.

601-3 TEMPORARY TRAFFIC CONTROL (TTC) ZONE DEVICES.

601-3.1 General. ADD the following: The Contractor shall supply and install temporary traffic pavement markers, channelizers, signing, railing (type K), crash cushions and appurtenances at the locations shown on the plans and as required in the specifications, complete in place prior to opening the traveled way served by said final and temporary traffic pavement markers, signing, railing (type K) and appurtenances to public traffic.

Add the following section:

601-3.4.1 General. Add the following If temporary traffic signs are displaced or overturned, from any cause, during the progress of the work, the Contractor shall immediately replace the signs in their original approved locations. The Contractor shall maintain all temporary traffic signs used in the Work in a clean, reflective and readable condition. The Contractor shall replace or restore graffiti marked temporary traffic signs and posts used in the Work within 18 hours of such marking being discovered during non-working hours or, when the marking is discovered during working hours, within 2 hours of such discovery of marking.

601-3.5 Signs and Signage

601-3.5.1 General. Add the following to the first paragraph: The Contractor shall provide and install all temporary traffic control signs, markers, markings, and delineators at locations shown on plans and specified herein.

Modify the last paragraph as follows: Public notification signs of temporary no parking restriction shall be installed at least 72 hours before enforcement of the "No Park" zone.

601-3.5.2 Payment. Modify this section as follows: Payment for signs and signage is incidental to the temporary traffic control plan as specified in Section 601-2.2.

601-3.6 Channelizing Devices

601-3.6.1 General. Replace this section with the following: Channelizers shall be new surface-mounted type and shall be furnished, placed, and maintained at the locations shown on the plans.

Channelizer posts shall be orange in color. Channelizers shall have affixed white reflective sheeting as specified in the special provisions. The reflective sheeting shall be 75 mm x 300 mm (3" x 12") in size. The reflective sheeting shall be visible at 300 m (1000') at night under illumination of legal high beam headlights, by persons with vision of or corrected to 20/20. The channelizer bases shall be cemented to the pavement in the same manner as provided for cementing pavement markers to pavement in Section 314-5.4, "Placement." Channelizers shall be applied only on a clean, dry surface. Channelizers shall be placed on the alignment and location shown on the plans and as directed by the Engineer. The channelizers shall be placed uniformly, straight on tangent alignment and on a true arc on curved alignment. All layout work necessary to place the channelizers to the proper alignment shall be performed by the Contractor. If the channelizers are displaced or fail to remain in an upright position, from any cause, the channelizers shall immediately be replaced or restored to their original location, by the Contractor. The Contractor shall provide the Engineer with a Certificate of Compliance in accordance with the provisions of Section 4-1.5, "Certification". Said certificate shall certify that the channelizers comply with the plans and specifications and conform to the prequalified design and material requirements approved by the Engineer and were manufactured in accordance with a quality control program approved by the Engineer.

601-4 TEMPORARY TRAFFIC STRIPING AND PAVEMENT MARKINGS

Add the following section:

601-4.2.1 Application of Temporary Pavement Markers. Temporary reflective raised pavement markers shall be placed in accordance with the manufacturer's instructions. Temporary reflective raised pavement markers shall be cemented to the surfacing with the adhesive recommended by the manufacturer, except epoxy adhesive shall not be used to place temporary reflective raised pavement markers in areas where removal of the markers will be required. Pavement striping, legends and markers which conflict with any traffic pattern shall be removed by grinding as determined by the Engineer. The Contractor shall use temporary reflective raised pavement markers for temporary pavement marking, except when the temporary pavement markers are used to replace patterns of temporary traffic stripe that will be in place for less than 30 days. Reflective pavement markers used in place of the removable-type pavement markers shall conform to the Section 314-3 *Removal of Pavement Markers* and Section 314-5 *Pavement Markers*, except the 14-day waiting period before placing the pavement markers on new asphalt concrete surfacing as specified in Section 314-5.4 *Placement*, shall not apply; and epoxy adhesive shall not be used to place pavement markers in areas where removal of the markers will be required. Temporary Pavement Markers shall be replaced within the same work day upon discovery of missing markers.

Technical Specifications

CITY OF CARLSBAD TRAFFIC SIGNAL SPECIFICATIONS
(May 24, 2018)

GENERAL

Summary

All traffic signal improvements constructed within the City of Carlsbad shall conform to the requirements as contained herein. Traffic signal equipment and improvements not otherwise identified within this document shall be in accordance with the Caltrans Standard Plans and Standard Specifications.

All references to the Caltrans Standard Plans shall be the 2018 Caltrans Standard Plans, including all Revised Standard Plans (RSP) as posted through April 19, 2019.

All references to "Caltrans Standard Specifications" shall be considered to refer to the 2018 Caltrans Standard Specifications, including the Revised Standard Specifications, dated April 19, 2019.

All poles and mast arms shall be furnished and installed by Contractor and shall include installation of pole foundations per Caltrans Standard Plans and Caltrans Standard Specifications.

Submittals

The Contractor shall submit all proposed equipment and materials to the City of Carlsbad for review and approval prior to ordering. Submitted materials shall conform to the requirements of the Caltrans specifications, these specifications, the plans, and special provisions. Proposed use and submittal of equipment different than equipment where the vendor and/or model has been specifically identified shall conform to all features and functions of the specified equipment. Where applicable the proposed equipment shall demonstrate support of full functionality within existing City of Carlsbad operational software.

Requirements

The Contractor shall obtain the appropriate permits and shall conduct a field walk through of the project site with City of Carlsbad prior to the start of work.

The Contractor shall contact the City of Carlsbad to schedule the field walk a minimum of 5 working days in advance.

The Contractor shall be responsible to coordinate with the City of Carlsbad for project approval and acceptance.

Warranty Requirements

The Contractor shall warranty all work, labor, equipment, cabling, and appurtenances from defects, malfunctions, and failures for a minimum of one year from the date of acceptance by the City of Carlsbad Traffic Engineer and/or TSOS. This warranty shall include all labor, materials, equipment, shipping, handling, and miscellaneous work necessary to remedy defects, malfunctions, and failures to the satisfaction of the City.

Testing Requirements

The Contractor shall be responsible for testing of all installed traffic signal system equipment and components; including, but not limited to, fiber optic cables, traffic signal controller, input/output

cards, and cabling, to ensure a fully functional system. The Contractor shall prepare a test plan for review and approval by the City prior to conducting the test.

TRAFFIC SIGNAL SYSTEM IMPROVEMENTS

The Contractor shall be responsible to furnish and install all traffic signal equipment and materials except for those items specifically identified on the project plans and special provisions to be furnished by the City of Carlsbad. The Contractor shall provide all traffic control, configuration, and testing necessary to install or modify the traffic signalized intersection as identified in the project plans and special provisions.

Conduits

Traffic signal, lighting, and interconnect conduit and accessories shall conform to the requirements of Sections 86-1.02B and 87-1.03B of the Caltrans Standard Specifications except as modified herein.

Materials

Underground conduit shall be Schedule 80 PVC conduit complying with UL 651, or Schedule 80 HDPE complying with the requirements of UL 651A.

Galvanized rigid steel conduit shall be utilized in all exposed above ground installations; within structures; and, between a structure or exposed location and the nearest pull box. Rigid steel conduit shall comply with UL 6 and ANSI C80.1. The zinc galvanizing must comply with UL 6 copper sulfate test requirements. Rigid steel conduit fittings shall be electrogalvanized and certified under UL 514B.

Conduit sweeps shall be factory manufactured bends with a maximum angle of 30-degrees; radius of bends shall be a minimum of ten times the outside diameter of the nominal conduit cross-section. Total bends between pull boxes shall not exceed a total of 360-degrees, in horizontal and vertical directions combined.

All conduit shall have a #14 tracer wire and a pull rope installed. The #14 tracer wire and pull rope shall be separate materials (not combined into a single detectable pull rope).

All service conduits between San Diego Gas and Electric (SDG&E) service points and meter pedestals shall comply with SDG&E conduit size and material requirements.

A minimum of two four-inch conduits shall be installed between the controller cabinet and the adjacent traffic signal pull box. All conduits shall be a minimum three-inch conduit unless otherwise identified on the plans.

Construction of a new traffic signal or new conduit installed at an existing traffic signal shall have a minimum of one three-inch conduit crossing each leg of the intersection. Each conduit crossing shall terminate into a traffic signal pull box.

Construction Requirements

Conduit installation shall be by trenching or directional drilling method as identified in the plans or specified herein. Conduit installation under existing pavement, sidewalk, driveways, and pedestrian ramps shall be by directional drilling unless previously approved by the City of Carlsbad Traffic Engineer.

The Contractor shall not be allowed to dig under existing curb and gutter for conduit installation. All curb and gutter removed shall be restored within 48 hours of demolition.

All new conduit shall be installed with a minimum of 30 inches of cover. Conduit with less than 30 inches of covers shall be concrete encased with a minimum of 18 inches of cover. Fiber optic conduit installed by trenching shall be marked with a yellow underground warning tape installed 6 inches below grade. The installed yellow underground marking tape must be marked to identify "CAUTION FIBER OPTIC."

Measurement and Payment
Conduit shall be measured and paid per lineal foot for each size and type of conduit furnished and installed.

Pull Boxes and Vaults
Pull boxes for traffic signal, lighting, and interconnect conduit systems and facilities shall conform to the requirements of Sections 86-1.02C and 87-1.03C of the Caltrans Standard Specifications except as modified herein.

Materials
All new pull boxes for traffic signal systems shall be No. 6, unless otherwise identified on the project plans or special provisions. The traffic signal pull box adjacent to the traffic signal controller cabinet shall be No. 6E. Pull box covers shall be marked "CARLSBAD TRAFFIC SIGNAL."

All new fiber optic pull boxes, at locations along or at the intersection of a major/collector arterial, shall be a 36"x36"x36" splice vault unless otherwise identified on the project plans or special provisions. The splice vault lid shall be lockable and have a lift assist. The splice vault shall be furnished with racks and hooks installed in the walls of the vault. For fiber optic pull box locations along or at the intersection of a local street or in areas where space is confined, a No. 6E pull box shall be used at the discretion of the City of Carlsbad. Splice vault and pull box covers shall be marked "CARLSBAD FIBER OPTIC."

All new lighting pull boxes shall be a No. 3.5 pull box, unless otherwise identified on the project plans or special provisions. The lighting pull boxes shall be marked "CARLSBAD LIGHTING."

All pull boxes shall be concrete.

Covers for No. 3.5 and No. 5 pull boxes installed in non-traffic areas shall be concrete. Covers for No. 6 pull boxes installed in non-traffic areas shall be concrete or polymer. Non-traffic pull boxes and covers must comply with ANSI/SCTE 77, "Specification for Underground Enclosure Integrity," for Tier 22 load rating and must be gray.

Covers for No. 3.5 pull boxes, No. 5 pull boxes, No. 6 and 6E pull boxes, and splice vaults installed in traffic areas shall be a metal (cast iron or steel) cover complying with AASHTO HS20- 44 and AASHTO M 306. All metal components shall be grounded as specified in the Caltrans Standard Specifications Section 86-1.02C(3).

Construction Requirements
All pull box locations shall be considered approximate. The Contractor shall stake the proposed location of the pull boxes after verification of underground utilities and obtain approval of the location by the Engineer prior to construction.

All pull boxes shall be placed behind the sidewalk, or if the preceding is impractical, in the sidewalk adjacent to the right-of-way. Pull boxes shall not be installed within pedestrian or driveway ramps.

Any pull boxes installed along a roadway without curb and sidewalk shall be installed adjacent to, but not within, the shoulder. All pull boxes adjacent to the shoulder, or other drivable areas, shall be traffic rated.

Traffic signal pull boxes shall have a maximum spacing of 200 feet.

Fiber optic communication pull boxes shall have a maximum spacing of 1,000 feet with no more than 180 degrees of total bends, or as approved by the City.

Clean crushed rock shall be placed in the bottom of all pull boxes extending a minimum of 6 inches below and around the pull box. Pull boxes shall not be grouted.

Measurement and Payment
Pull Boxes will be measured and paid for each type of Pull Box or Splice Vault installed in accordance with the project plans.

Conductors, Cabling, and Wiring
Traffic signal system conductors and cabling shall conform to the requirements of Sections 86-1.02F, 86- 1.02H, 86-1.02I, 87-1.03F, 87-1.03H, and 87-1.03I of the Caltrans Standard Specifications except as modified herein.

Materials
Copper Conductors and Traffic Signal Cabling
Conductors and cabling for traffic signal systems, lighting, and miscellaneous electrical connections shall be in accordance with the Caltrans Standard Specifications.

Loop Lead-ins

Conductors for loop detector lead-ins shall be Type B.

Signal Interconnect Cabling
New traffic signal interconnect cabling (SIC) shall be a six (6) paired-conductor communications cable (total 12 conductors) and shall conform to the requirements of REA specification PE-39 (gel-filled cable, solid copper conductors). The conductor gauge shall be 19 AWG.

Communication Cabling
The Contractor shall furnish Category 5e or Category 6 communications cabling has identified on the project plans. The furnished CAT 5e or CAT 6 cabling shall be outdoor rated, and shielded, conforming to the requirements of Telecommunications Industry Association (TIA) Standard 568 C.2.

CAT 5e or CAT 6 cables must not exceed 300 feet in finished length. Check each cable for pin-to- pin termination of each conductor.

The finished outside diameter of the cable must not exceed 1/2-inch.

Fiber Optic Cabling

Each fiber optic (FO) outside plant cable must be all dielectric, non-gel water blocking materials, duct type, with loose buffer tubes and must conform to the special provisions. Cables must contain single mode (SM) (1310 nm and 1550 nm) fibers in the quantities as shown on the plans; if not shown on the plans the following fiber counts will apply:

Quantity	Cable	Purpose
12	SMFO	Branch Cable
144	SMFO	Trunkline Cable

The optical fibers must be contained within loose buffer tubes. The loose buffer tubes must be stranded around an all dielectric central member. Aramid yarn or fiberglass must be used as a primary strength member, and a polyethylene outside jacket must provide for overall protection.

All FO cable must be from a manufacturer who is regularly engaged in the production of this material.

The cable must comply with all the requirements of RUS-Chapter XVII, Title 7, Section 1755.900 and as specified in the special provisions.

Each optical fiber must be glass and consist of a doped silica core surrounded by concentric silica cladding. All fibers in the buffer tube must be usable fibers, and must be sufficiently free of surface imperfections and inclusions to meet the optical, mechanical, and environmental requirements of these specifications. The required fiber grade SM must reflect the maximum individual fiber attenuation, to guarantee the required performance of each and every fiber in the cable.

The coating must be a dual layered, UV cured acrylate. The coating must be mechanically or chemically strippable without damaging the fiber.

The cable must comply with the optical and mechanical requirements over an operating temperature range from -40 to +70 °C. The change in attenuation at extreme operational temperatures (from -40 to +70 °C) for single mode fiber must not be greater than 0.20 dB/km, with 80 percent of the measured values no greater than 0.10 dB/km. The single mode fiber measurement is made at 1550 nm.

For all fibers, the attenuation specification must be a maximum attenuation for each fiber over the entire operating temperature range of the cable.

Single mode fibers within the finished cable must meet the requirements in the following table:

Parameter	Singlemode
Type	Step Index
Core diameter	8.3 µm (nominal)
Cladding diameter	125 µm ±1.0 µm
Core to Cladding Offset	≤1.0µm
Coating Diameter	250 µm ±15 µm
Cladding Non-circularity defined as: [1-(Min cladding Dia ÷Max cladding Dia.)]x100	≤2.0 percent
Proof/Tensile Test	
Attenuation: (-40 to +70 □C)	

@1310 nm @1550 nm	≤0.4 dB/km ≤0.3 dB/km
Attenuation at the Water Peak	≤2.1 dB/km @ 1383 ±3 nm
Chromatic Dispersion: Zero Dispersion Wavelength Zero Dispersion Slope	 1301.5 to 1321.5 nm ≤0.092 ps/(nm^2*km)
Maximum Dispersion:	≤3.3 ps/(nm*km) for 1285 – 1330 nm <18 ps/(nm*km) for 1550 nm
Cut-Off Wavelength	<1260 nm
Mode Field Diameter (Petermann II)	9.3 ±0.5 µm at 1300 nm 10.5 ±1.0 µm at 1550 nm

Fiber Color Coding

Optical fibers must be distinguishable from others in the same buffer tube by means of color coding according to the following:

Blue (BL)	Red (RD)
Orange (OR)	Black (BK)
Green (GR)	Yellow (YL)
Brown (BR)	Violet (VL)
Slate (SL)	Rose (RS)
White (WT)	Aqua (AQ)

The colors must be targeted in accordance with the Munsell color shades and must meet EIA/TIA-598 "Color Coding of Fiber Optic Cables."

Buffer tubes containing fibers must also be color coded with distinct and recognizable colors according to the same table listed above for fibers.

The color formulation must be compatible with the fiber coating and the buffer tube filling compound, and be heat stable. It must not fade or smear or be susceptible to migration and it must not affect the transmission characteristics of the optical fibers and must not cause fibers to stick together.

Cable Construction

The fiber optic cable must consist of, but not be limited to, the following components:

1. Buffer tubes
2. Central member
3. Filler rods
4. Stranding
5. Core and cable flooding
6. Tensile strength member
7. Ripcord
8. Outer jacket

Buffer Tubes. - Loose buffer tubes must provide clearance between the fibers and the inside of the tube to allow for expansion without constraining the fiber. The fibers must be loose or suspended within the tubes and must not adhere to the inside of the tube. Each buffer tube must contain 6 or 12 fibers.

The loose buffer tubes must be extruded from a material having a coefficient of friction sufficiently low to allow free movement of the fibers. The material must be tough and abrasion resistant to provide mechanical and environmental protection of the fibers, yet designed to permit safe intentional "scoring" and breakout, without damaging or degrading the internal fibers.

Buffer tube must have a non-gel water-blocking material used to prevent water intrusion and migration. The filling compound must be non-toxic and dermatologically safe to exposed skin. It must be chemically and mechanically compatible with all cable components, non-nutritive to fungus, non-hygroscopic and electrically non-conductive. The filling compound must be free from dirt and foreign matter and must be readily removable with conventional nontoxic solvents.

Buffer tubes must be stranded around a central member by a method that will prevent stress on the fibers when the cable jacket is placed under strain, such as the reverse oscillation stranding process.

Central Member. - The central member which functions as an anti-buckling element must be a glass reinforced plastic rod with similar expansion and contraction characteristics as the optical fibers and buffer tubes. A linear overcoat of low density polyethylene must be applied to the central member to achieve the optimum diameter to provide the proper spacing between buffer tubes during stranding.

Filler Rods. - Filler rods may be included in the cable to lend symmetry to the cable cross-section where needed. Filler rods must be solid medium or high, density polyethylene. The diameter of filler rods must be the same as the outer diameter of the buffer tubes.

Stranding. - Completed buffer tubes must be stranded around the overcoated central member using stranding methods, lay lengths and positioning such that the cable must meet mechanical, environmental and performance specifications. A polyester binding must be applied over the stranded buffer tubes to hold them in place. Binders must be applied using tension sufficient to secure the buffer tubes to the central member without crushing the buffer tubes. The binders must be non-hygroscopic, non-wicking (or rendered so by the flooding compound), and dielectric with low shrinkage.

Core and Cable Flooding. - The cable core interstices must be filled with a polyolefin based compound to prevent water ingress and migration. The flooding compound must be homogeneous, non-hygroscopic, electrically non-conductive, and non-nutritive to fungus. The compound must also be nontoxic, dermatologically safe and compatible with all other cable components.

Tensile Strength Member. - Tensile strength must be provided by high tensile strength aramid yarns or fiberglass which must be helically stranded evenly around the cable core and must not adhere to other cable components.

Ripcord. - The cable must contain at least one ripcord under the jacket for easy sheath removal.

Outer Jacket. - The jacket must be free of holes, splits, and blisters and must be medium or high,.density polyethylene (PE), or medium density cross-linked polyethylene with minimum nominal jacket thickness of 40.0 ± 3 mil1000 ±76 µm. Jacketing material must be applied directly over the tensile strength members and flooding compound and must not adhere to the aramid strength material. The polyethylene must contain carbon black to provide ultraviolet light protection and must not promote the growth of fungus.

The jacket or sheath must have clear, distinctive and permanent markings showing the manufacturer's name, the words "Optical Cable", the number of fibers, "SM", year of manufacture, and sequential measurement markings every 3 feet. The actual length of the cable must be within -/+1 percent of the length marking. The marking must be in a contrasting color to the cable jacket. The height of the marking must be approximately 0.1-inch.

Functional Requirements
The FO cable must meet the current requirements of the Energy Information Administration (EIA) and TIA fiber optic test procedures; EIA-TIA 455-x.

Packaging and Shipping Requirements
The completed cable must be packaged for shipment on reels. The cable must be wrapped in a weather and temperature resistant covering and sealed to prevent the ingress of moisture. Each end of the cable must be securely fastened to the reel to prevent the cable from coming loose during transit. Ten feet of cable length on each end of the cable must be accessible for testing. Each cable reel must have a durable weatherproof label or tag showing the manufacturer's name, the cable type, the actual length of cable on the reel, your name, the contract number, and the reel number. A shipping record must also be included in a weatherproof envelope showing the above information and also include the date of manufacture, cable characteristics (size, attenuation, bandwidth, etc.), factory test results, and cable identification number.

The FO cable must be in one continuous length per reel with no factory splices in the fiber. Each reel must be marked to indicate the direction the reel should be rolled to prevent loosening of the cable.

Construction Requirements
All cabling in pull boxes and cabinets shall be labeled.

Communication Cabling

At all locations where twisted pairs are separated out from the cable for field termination, maintain the cable manufacturer's twist pattern and ratio throughout the exposed portion of the twisted pair up to the connector or termination.

The communication cable running between equipment or components must be continuous without splices.

Surge suppression shall be required for all communication cables which run from the traffic signal cabinet to an external facility (i.e. traffic signal pole, secondary cabinet, pull box, etc.)

Fiber Optic Cabling
Installation of FO cabling shall conform to the cable manufacturers procedures for tensioning and bend radius. Fiber optic cabling shall be installed unspliced except for the splice locations specifically identified on the project plans.

Splicing of the fiber optic cable shall be fusion splices and shall be limited to only those fibers specifically identified to be spliced. Full cable splice for ease of installation shall not be permitted. A minimum of 10 feet of slack shall be provided in each pull box the fiber optic cable passes through. At splice vaults, with or without splices identified, a minimum of 50 feet of slack shall be provided.

Fiber optic cable splices must be housed with splice trays in a fiber termination panel or splice enclosure and must be protected with a metal reinforced thermal shrink sleeve.

Measurement and Payment
Conductors, Cabling, and Wiring for traffic signal installations and modifications will be measured and paid per linear foot in accordance with the project plans and specifications.

Conductors, Cabling, and Wiring for communications, fiber optic, and street lighting systems will be measured and paid per lineal foot for each type of conductor or cable installed in accordance with the project plans and specifications.

Fiber Optic Termination Unit
The Contractor shall furnish and install a 19-inch rack mountable fiber optic termination unit capable of terminating a minimum of 24 fiber strands or the number of fiber strands as identified in the project plans. The rack mountable termination unit shall house, organize, manage, and protect fiber optic cable, splices, and connectors; and shall include integral cable management.

Materials
The Fiber Optic Termination Unit fiber trays shall be constructed of steel material. Steel cover shall be removable for cabling and connector access during installation. Enclosure shall have multiple knockouts for a variety of trunk cable entry points. Termination connector type shall be SC/UPC connectors.

Construction Requirements
Fiber Optic Termination Unit shall be installed within the traffic signal controller cabinet.

Measurement and Payment
Fiber Optic Termination Unit shall be measured and paid per each unit furnished and installed in accordance with the project plans.

Fiber Optic Splice Enclosure
The Contractor shall furnish and install a fiber optic splice enclosure complete with splice organizer trays, brackets, clips, cable ties, and sealants. The splice enclosure shall be securely fastened to the wall of the splice vault or No. 6E pull box, and be capable of enclosing 288 splices as identified in the project plans.

Materials
Each splice shall be individually mounted and mechanically protected in the splice tray and shall be protected with heat-shrink splice protector sleeves.

Construction Requirements
Fiber Optic Splice Enclosure shall be installed within a splice vault or No. 6E pull box and mounted horizontally in a manner that allows the cables to enter at the end of the splice enclosure. Not less than 50 feet of each cable entering the splice enclosure shall be coiled in vault or pull box to allow the fiber splice closure to be removed for future splicing.

Measurement and Payment
Fiber Optic Splice Enclosure shall be measured and paid per each unit furnished and installed in accordance with the project plans.

Electrical Service
Contractor shall coordinate with SDG&E to obtain electrical service to the cabinets and signal equipment for the project.

Electrical service cabinets shall conform to the requirements of Section 86-1.02P of the Caltrans Standard Specifications and SDG&E requirements except as modified herein.

Materials
Electrical service cabinets shall be foundation mounted enclosures conforming to the requirements of the Caltrans Standard Plans for a Type III, single meter enclosure.

Electrical services, unless otherwise specified on the plans, shall include at a minimum, the following circuit breakers:

- 1 – 100 Amp Main Breaker
- 1 – 30 Amp Traffic Signal Breaker
- 1 – 20 Amp Safety Lighting Breaker

Construction Requirements
Electrical service cabinets shall be placed a minimum of ten feet from the traffic signal cabinet. The Contractor shall stake proposed cabinet locations.

Measurement and Payment
Type III Electrical Service with Foundation will be measured and paid for each electrical service installed which shall include cabinet, foundation, conduit, circuit breakers, pull rope, and all associated equipment as discussed on the plans and specifications. This bid item shall also include applying for and coordinating the establishment of a new electrical service in accordance with SDG&E requirements.

Battery Back-up System
The Battery Back-up System (BBS) shall be capable of providing complete emergency battery back-up for use at a traffic signal utilizing LED traffic signals and pedestrian heads for a minimum of 8 hours. The BBS shall have the capability of notifying Operations, Maintenance or transportation management center via e-mail of any alarms, faults or events, user selectable. E-mail set up must allow for different levels of notifications based on the criticalness of the alarms.

Materials
Transfer Time. The maximum transfer time allowed, from disruption of normal utility line voltage to stabilized inverter line voltage from batteries, shall be 5 milliseconds (ms). The same maximum allowable time shall also apply when switching from the inverter line voltage to utility- line voltage. Transfers to and from battery operation shall not interfere with the operation of the other equipment in the intersection.

AC Feedback. The BBS shall prevent a malfunction feedback to the cabinet or from feeding back to the utility service.

Destructive Discharge or Overcharge. The BBS shall be equipped with an integral system to prevent the battery from destructive discharge or overcharge.

Circuit Breakers. The BBS shall be equipped with an AC Input circuit breaker that protects both the UPS and the loads connected to the output. Should the AC Input breaker on the UPS trip, it shall allow the UPS to go to inverter mode to power the intersection from the batteries. Should an

overload condition still exist when the inverter is energized the inverter will revert to its internal electronic protection, preventing damage to the inverter due to the overload or short circuit condition, on the output. Once this overload condition is cleared the inverter will energize and power the intersection utilizing the available battery power. If the condition does not clear itself, the inverter will stay in the standby mode until manually cleared by a technician.

The BBS shall have a flush mounted Battery circuit breaker installed on the front panel of the BBS inverter module.

Battery Charger. The BBS shall have an integral charger that is compatible with Gel and AGM battery topology. The charger shall be an intelligent charger with control systems that automatically incorporates bulk, absorption and float charging modes.

Battery Temperature Compensation. The integral Intelligent Charger shall use temperature compensation. The charging system shall compensate over a range of 2.5 - 6.0mV/°C per cell, user adjustable when required.

Recharge Time. The recharge time for the batteries from "protective low-cutoff" to 90 percent or more of full charge capacity shall not exceed 12 hours. The BBS charger shall be capable of providing 15 amps at 54VDC.

Self-Testing. The BBS Inverter Module shall be programmable to perform automatic self-testing, programmed in weekly intervals and programmed by the user to meet their specific requirements or manufacturer's recommendation. During self-test the BBS Inverter Module shall identify a weak battery or multiple batteries in the string that have reached a weak state and notify maintenance by initiating a Weak Battery Alarm.

Remote Battery Monitoring Specifications. Provide a remote battery monitor system (RBMS) in the UPS/Battery cabinet to monitor the four UPS batteries (4-12V battery blocks). The RBMS shall have the ability to monitor, read and record both the battery string and individual battery voltages, admittance (internal battery resistance), individual battery temperatures and to provide a real-time evaluation of the battery bank health.

The RBMS shall have a built-in web interface for communications over Ethernet. The device shall be hardened and operate at a temperature range of -40C to +65C. The device shall include individual 12volt battery sensors and operate in the range of -40C to +80C. Communications shall be SNMP via TCP/IP.

The RBMS shall include software to automatically poll each intersection, up to 100 per software program, reading individual battery voltage, admittance and temperature, confirming each is within its user programmable parameters. The system shall have the ability to program the intervals as to when each reading is taken, by days, weeks or months. The software shall be provided as part of the system cost.

The RBMS shall also perform as a battery balancer, continuously monitoring all batteries in the string and to interface with the UPSs charger voltage/current so to keep the batteries equal with all batteries within the battery string. The RBMS shall allow for any single 12V battery within the battery string to be replaced without replacing all batteries in the string during the battery warranty period.

Construction Requirements

The BBS shall be housed in a corrosion resistant outdoor BBS enclosure side-mounted to the traffic signal controller cabinet. The foundation from the traffic signal controller cabinet shall extended to include the BBS enclosure.

Warranty
Battery Back-up System. The BBS System shall include a 3-year warranty on parts and labor on the BBS System electronics.

Batteries. The BBS Manufacturer must provide a 5-year unconditional full replacement warranty. Under the warranty time period, the battery must provide a minimum of 70% of its original capacity; otherwise it will be considered to be non-compliant to the warranty and replaced at no cost to the City of Carlsbad by the BBS manufacturer.

Measurement and Payment
Battery Back-up Systems will be included in the bid item for Traffic Signal Controller and Cabinet and no other payment will be made for battery back-up systems.

Traffic Signal Cabinet
Traffic Signal Cabinet shall be McCain 352i ATC Cabinet or City-approved equivalent.

Materials
Traffic Signal Cabinet housing requirements shall conform to the Caltrans TEES (2009) Chapter 6, Section 2 and Section 86-1.02Q of the Caltrans Standard Specifications.

Traffic Signal Controller
Traffic Signal Controller shall be a 2070 ATC controller as directed by the City of Carlsbad.

Conflict Monitor
Conflict Monitor shall be EDI 2010ECL or City approved equivalent for existing 332 controller cabinets with 170E controllers.

Conflict Monitor shall be EDI CMUip-2212-HV series or City approved equivalent for 352i ATC cabinet.

Construction Requirements
Traffic Signal Cabinet shall be positioned so that when facing the front door of the cabinet, at least one leg of the intersection signal faces is visible.

Traffic Signal Cabinet foundation shall be sized to include the projected depth of the BBS enclosure side-mounted to the traffic signal cabinet.

The Contractor shall furnish the traffic signal cabinet and/or controller to the City of Carlsbad for bench testing a minimum of 30 days prior to scheduled field installation. Following successful bench testing by the City of Carlsbad the Contractor shall pickup and transport the traffic signal cabinet and/or controller from City of Carlsbad facilities to the project site. The Contractor shall be responsible for providing all equipment and labor necessary for loading and offloading the traffic signal cabinet and/or controller.

Measurement and Payment
Traffic Signal Cabinet, Foundation, and Traffic Signal Controller will be measured and paid for per bid item "Furnish and Install McCain 352i ATC Cabinet and Trafficware 2070LX Controller with

battery backup system alpha." This bid item shall include furnishing, installing the cabinet, foundation, and signal controller with two detector files, in accordance with the project plans and specifications. This bid item shall also include any coordination, wiring and related work in order to furnish a working traffic control system to the city.

Vehicle Signals
Vehicle signal indications shall be 12" LED type for all indications and shall comply with Section 86-1.02R of the Caltrans Standard Specifications except as modified herein.

Each vehicle signal face must:

1. Be adjustable and allow for 360-degree rotation about the vertical axis.
2. Comply with ITE publication ST-017B, "Vehicle Traffic Control Signal Heads".
3. Comply with California Test 604, except for arrow and "X" faces.
4. Have 3 sections arranged vertically: red at top, yellow at center, and green at bottom.
5. Be of the same manufacturer and material, if more than 1 is installed at an intersection, except for programmed visibility type.
6. Be sealed with neoprene gasket at top opening.
7. Signal indications shall have clear lenses.

Materials
Materials requirements shall be consistent with the ITE requirements for LED vehicular signal indications, housing, and backplate requirements. The material requirements will define the housings to be black polycarbonate or metal with a black powder coated finish.

Construction Requirements
Installation of vehicle heads shall be installed in accordance with Caltrans Standard Plans.

Measurement and Payment
Vehicle Signals shall be measured and paid for each vehicular signal head furnished and installed in accordance with the project plans.

Pedestrian Signals
Pedestrian signal indications shall be LED type for all indications and shall comply with Section 86-4.03 of the Caltrans Standard Specifications except as modified herein. All indications shall comply with current Federal ADA requirements.

Materials
Material requirements shall be consistent with the ITE requirements for LED pedestrian signal indications with a count-down timer, indication housing, indication shield, etc. Pedestrian signal housing shall be identified as metal, with a black finish.

Construction Requirements
Installation of pedestrian signal heads shall be in accordance with Caltrans Standard Plans.

Measurement and Payment
Pedestrian Signals shall be measured and paid for each pedestrian signal head furnished and installed in accordance with the project plans and specifications.

Vehicle Detection

Vehicle detection shall be fully functional for detecting vehicles and bicycles, where applicable, and shall terminate into a two-channel or four-channel detector card in the controller cabinet. Vehicle detection shall be comprised of two categories: presence and advance.

Presence detection shall be capable of vehicle presence, passage, count, and occupancy. Advance detection shall be capable of both vehicle speed and advance detection.

Materials
Inductive loops for use as presence or advance detection as identified on the project plans, shall conform to Section 86-1.02F(c)(iii) of the Caltrans Standard Specifications.

Over-roadway detection technologies are detection solutions that provide the capability to perform presence and/or advance detection without requiring the need of installing the detection onto, inside, or beneath the roadway. Over-roadway detection equipment furnished for the purpose of presence or advance detection shall include all mounting hardware, cabling, and input cards as required by the equipment manufacturer.

Construction Requirements
Installation of inductive loop detectors for presence or advance detection, as identified on the project plans, shall conform to Section 87-1.03F(3)(c)(ii) of the Caltrans Standard Specifications.

Over-roadway detection technology cabling shall run unspliced from the traffic signal controller cabinet to the equipment installed on poles and/or other supports over the roadway. Equipment and cabling installation shall be in accordance with manufacturer recommendations. Over- roadway detection shall input detection calls to the traffic signal controller via the traffic signal cabinet input assembly.

Measurement and Payment
Inductive loop detectors shall be measured and paid for each type of loop detector installed in accordance with the project plans.

Radar detection equipment shall be measured and paid for per lump sum bid item for "Radar Detection System" furnished and installed in accordance with the project plans and specifications. No separate measurement or payment will be made for cables, input cards, or other appurtenances required to provide the intended operation.

Pedestrian Push Button Assemblies
Pedestrian push button assemblies shall be accessible pedestrian signals (APS), have a minimum actuator size of 2", and be compatible for mounting on all Caltrans approved standards, poles, and posts. Location and placement of pedestrian push buttons in relation to pedestrian crosswalks shall comply with CA MUTCD guidelines and Public Rights-of-Way Accessibility Guidelines (PROWAG).

Materials
Pedestrian push button assemblies shall be a 2-wire system comprised of a single unit with the pedestrian push button, accessible pedestrian signal (APS), and a R10 series sign.

The pedestrian push button assembly housing shall be yellow.

Construction Requirements

Installation requirements for APS pedestrian push button assemblies shall conform to Section 87-1.03U of the Caltrans Standard Specifications.

Measurement and Payment
Pedestrian Push Button Assemblies will be measured and paid for each APS push button assembly installed.

Emergency Vehicle Pre-emption
The emergency vehicle pre-emption detection system must be compatible with the traffic signal controller and the existing City of Carlsbad Fire Department emergency vehicle pre-emption emitters and radios.

The system shall be capable of receiving a signal from an emergency vehicle (emitter and radio) and placing a request for priority to the traffic signal controller.

Materials
For each intersection, an emergency vehicle preemption GPS radio and all associated appurtenances and cabling shall be installed in accordance with manufacturer requirements. The furnished emergency vehicle preemption GPS radio shall be GTT Opticom, or City approved equal.

For each leg of the intersection an emergency vehicle preemption optical detector and all associated appurtenances and cabling shall be installed in accordance with manufacturer requirements. The furnished emergency vehicle preemption optical detector shall be GTT Opticom, or City approved equal.

Construction Requirements
Installation of EVPE equipment shall be in accordance with the Caltrans Standard Plans and manufacturer requirements.

All appurtenances within the cabinet shall be affixed the 19-inch rack.

Measurement and Payment
Emergency Vehicle Pre-Emption will be measured and paid for each type of EVPE detector (single channel optical, dual channel optical, or GPS) furnished and installed in accordance with the project plans and specifications.

Traffic Signal Safety Lighting
Traffic Signal Safety Lighting shall meet or exceed the minimum intersection lighting requirements set forth in the Caltrans Traffic Manual, Section 9 for signalized intersections.

Materials
Traffic signal safety lighting shall be LED luminaires conforming to the requirements of the City of Carlsbad Engineering Standards and Lighting Specifications.

Each safety lighting luminaire shall be furnished and installed with a photocell compatible to the NEMA 7 pin socket as identified in the City of Carlsbad Lighting Specifications.

Construction Requirements
Installation of traffic signal safety lighting luminaires shall be in accordance with the Caltrans Standard Plans.

Measurement and Payment
Traffic Signal Safety Lighting will be measured and paid for each luminaire furnished and installed in accordance with the project plans and specifications and City Engineering Standards.

Communication Equipment
All Communication Equipment shall be compatible with the existing City of Carlsbad communications network, traffic signal controller, locally installed equipment, and central traffic signal software system. The equipment type shall comply with the type shown on the plans unless directed otherwise by the Engineer.

Materials
All communication equipment shall be Ethernet, field hardened devices, manufactured by a company regularly engaged in the production of Ethernet communications devices.

Ethernet Switch (Copper)
Ethernet switches supporting backbone communications over copper media shall be Etherwan model E78802 switch or approved equal in all features and functions.

Ethernet Switch (Copper) shall be a hardened, managed, Layer 3 switch complying to NEMA TS2 requirements. The furnished and installed switch shall include eight 10/100BASE-TX PoE ports, and two 10/100/1000Base-TX ports (SFP) for backbone communications.

Ethernet Switch (Fiber)
Ethernet switches supporting backbone communications over fiber optic cabling shall be Etherwan model E78822 switch or approved equal in all features and functions.

Ethernet Switch (Fiber) shall be a hardened, managed, Layer 3 switch complying to NEMA TS2 requirements. The furnished and installed switch shall include eight 10/100BASE-TX PoE ports, two 100Base-FX ports (single mode) with SC connections, and two 1000Base-SX (SFP) (single mode) with SC connections for backbone communications.

Construction Requirements
The Contractor shall deliver all Ethernet Switches to be provided by the project to the City of Carlsbad for configuration and bench testing prior to field installation.

The Contractor shall provide a minimum of 10 working days for the City staff to complete the configuration and testing of each Ethernet switch prior to field installation. Following configuration by City staff the Contractor shall pick-up, transport, and install the Ethernet switches in the traffic signal cabinet as identified on the project plans.

Following field installation, the City of Carlsbad shall perform communications network testing. The Contractor shall be onsite during communications network testing to assist with troubleshooting as directed by the City of Carlsbad.

Measurement and Payment
Communication Equipment will be measured and paid for each type of Ethernet Switch furnished and installed in accordance with the project plans and specifications.

TRAFFIC INVESTIGATION

POINSETTIA LANE GAP CLOSURE

CARLSBAD, CALIFORNIA

LSA

November 2019

TRAFFIC INVESTIGATION

POINSETTIA LANE GAP CLOSURE

CARLSBAD, CALIFORNIA

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Project No. HCR1803

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LIST OF ABBREVIATIONS AND ACRONYMS

CEQA	California Environmental Quality Act
City	City of Carlsbad
HCM	Highway Capacity Manual
HMP	(City of Carlsbad) Habitat Management Plan for Natural Communities
ICU	Intersection Capacity Utilization
ITE	Institute of Transportation Engineers
LOS	level(s) of service
MMLOS	Multimodal Level of Service
mph	miles per hour
MUTCD	California Manual on Uniform Traffic Control Devices
N/A	not applicable
NDS	National Data and Surveying Services
SANDAG	San Diego Association of Governments
SANTEC	San Diego Traffic Engineers' Council
V/C	volume-to-capacity

INTRODUCTION

Poinsettia Lane from Carlsbad Boulevard to Melrose Drive has been a part of the Carlsbad planned roadway network since at least 1994. Poinsettia Lane is completed except for an approximately 1,800-foot segment between Aviara Parkway and Black Rail Road (where three of the planned four lanes are constructed) and an approximately 1,500-foot gap between Cassia Road and Oriole Court-Skimmer Court. Completion of Poinsettia Lane (including closure of the gap between Cassia Road and Oriole Court-Skimmer Court) was included in the Carlsbad General Plan Update adopted by the City Council on September 22, 2015, and had been included in previous General Plans. The General Plan Mobility Element section titled "Future Operations and Street Improvements" states the following:

> Most of the envisioned Carlsbad street system is built out. The remaining planned street improvements are summarized in Table 3-2; these facilities serve the needs of land uses identified in the Land Use and Community Design Element. The planned streets are identified on the Street Network map, Figure 3-1.

One of the projects included in the referenced table and figure is Poinsettia Lane, which is described as "Complete improvements between Cassia Road and El Camino Real to connector street typology standards."

Completion of the Poinsettia Lane gap closure is funded in part from the Bridge and Thoroughfare District Fee Program. The proposed Poinsettia 61 residential development within and adjacent to the roadway gap provided additional funding. At this time, the City of Carlsbad (City) is preparing to close the gap in Poinsettia Lane.

Although the completion of Poinsettia Lane has been planned for some time, the existing conditions have prevailed for so long so as to seem permanent. Residents of the Viadana and Pavoreal neighborhoods have also raised concerns regarding future cut-through traffic through the residential neighborhoods. This traffic investigation considers the potential effects of the gap closure on the surrounding roadway system and adjacent intersections and provides potential strategies for limiting the intrusion of cut-through traffic into the Viadana and Pavoreal neighborhoods. Importantly, this traffic investigation also establishes baseline conditions for the surrounding roadway network that can be used to determine the extent of intrusion if requests for additional intervention are pursued through the Carlsbad Residential Traffic Management Program.

METHODOLOGY

Study Area

Approximately 1,000 feet west of the gap closure, Poinsettia Lane intersects Ambrosia Lane. Ambrosia Lane provides a connection to Aviara Parkway and a travel path around the current gap in Poinsettia Lane. About 0.25 mile east of the gap closure, Poinsettia Lane intersects El Camino Real, just north (0.50 mile) of the El Camino Real/Aviara Parkway intersection. These connections to Aviara Parkway and a path around the current gap were chosen as the bookends of the study area. Within this study area are the following intersections and roadway segments:

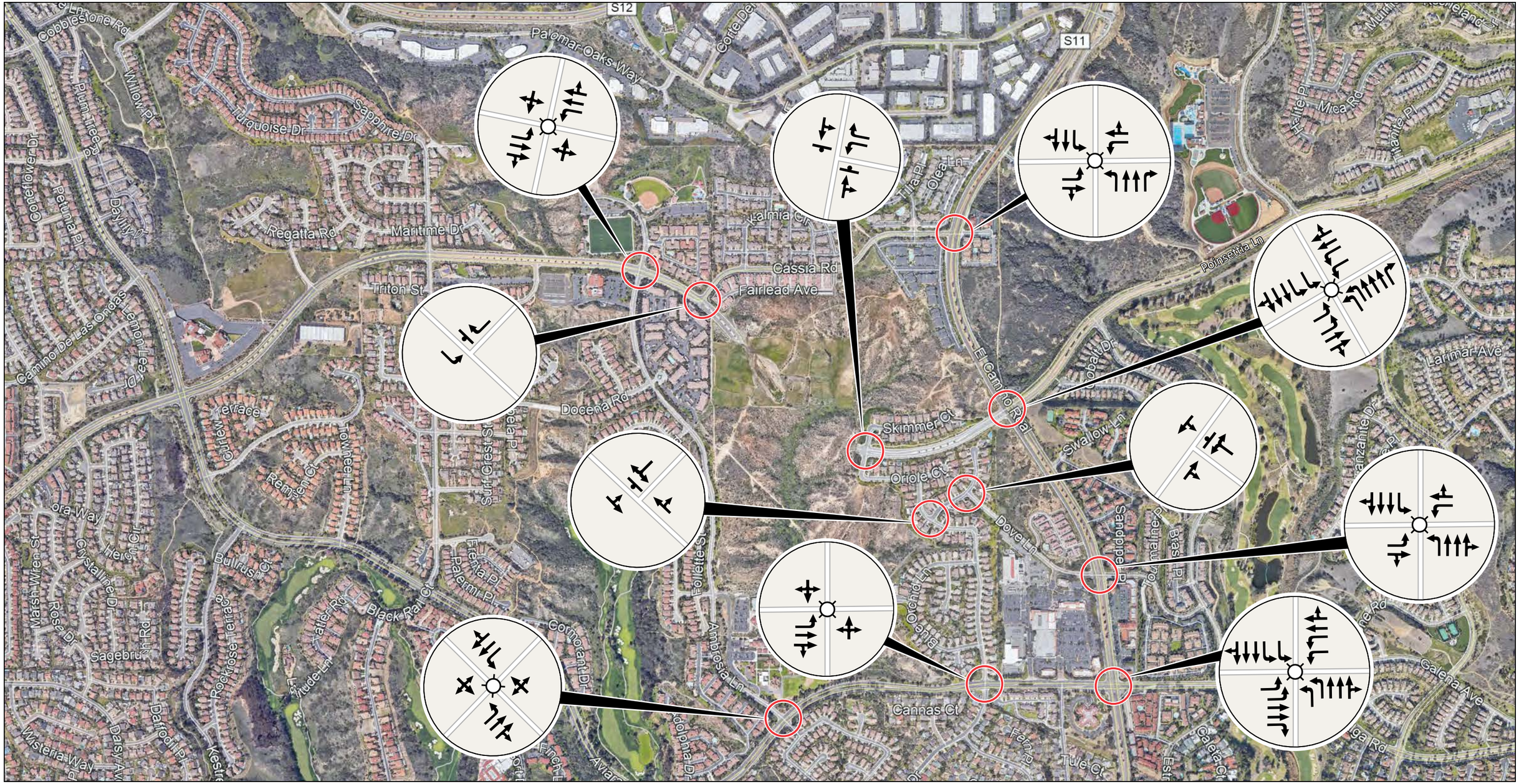
Study Area Intersections

1. Ambrosia Lane/Poinsettia Lane
2. Ambrosia Lane/Aviara Parkway
3. Poinsettia Lane/Cassia Road
4. Oriole Court-Skimmer Court/Poinsettia Lane
5. Mimosa Drive/Moorhen Place
6. Dove Lane/Moorhen Place
7. Mimosa Drive/Aviara Parkway
8. El Camino Real/Cassia Road
9. El Camino Real/Poinsettia Lane
10. El Camino Real/Dove Lane
11. El Camino Real/Aviara Parkway

Study Area Roadway Segments (Classification and Priority Travel Modes)

1. Poinsettia Lane between Aviara Parkway and Ambrosia Lane (Arterial Connector: vehicle, pedestrian, and bicycle)
2. Poinsettia Lane between Ambrosia Lane and Cassia Road (Arterial Connector: vehicle, pedestrian, and bicycle)
3. Poinsettia Lane between Cassia Road and El Camino Real (Arterial Connector: vehicle, pedestrian, and bicycle)
4. El Camino Real between Cassia Road and Poinsettia Lane (Arterial Street: vehicle and transit)
5. El Camino Real between Poinsettia Lane and Aviara Parkway (Arterial Street: vehicle and transit)
6. Cassia Road between Poinsettia Lane and El Camino Real (Local/Neighborhood Street: pedestrian and bicycle)
7. Ambrosia Lane between Poinsettia Lane and Aviara Parkway (School Street: pedestrian and bicycle)
8. Mimosa Drive between Oriole Court and Aviara Parkway (Local/Neighborhood Street: pedestrian and bicycle)
9. Dove Lane between Moorhen Place and Black Skimmer Road (Local/Neighborhood Street: pedestrian and bicycle)

Figure 1 illustrates the study area and the existing geometrics and traffic control for each study area intersection.



LSA

LEGEND

- Directional Travel Lane
- Signal
- Stop Sign

0 500 1000
FEET

SOURCE: Google Earth, 2018

I:\HCR1803\G\Geometrics&Traffic Control.cdr (3/19/2019)

FIGURE 1

Poinsettia Lane Gap Closure

Study Area and Existing Geometrics/Traffic Control

Intersection LOS Methodology

In April 2018, the City adopted the *City of Carlsbad Transportation Impact Analysis Guidelines*. These new guidelines reduce the emphasis of vehicle level of service (LOS) analysis at intersections. Traffic analyses are to consider the ability for existing and future roadways to carry through traffic. For the study area, the guidelines specify the following: corridor analyses based on roadway capacity, turning-movement needs assessments for signalized intersections, and signal warrant analyses for degraded unsignalized intersections. Because the report audience may be familiar with the previous analysis methodology of assigning performance letter grades, this traffic investigation includes intersection LOS for informational purposes.

Roadway Corridor Capacity

In February 2019, the City released the *Roadway Capacity Tables Report* for use in evaluating traffic conditions in environmental documents and monitoring transportation facilities consistent with the Growth Management Program. For 10 corridors within the City (including Poinsettia Lane and El Camino Real), the report includes roadway capacity specific to the physical conditions of those roadways, including the number of lanes, speed limit, and intersection spacing. The report also includes general capacity values that can be applied to other corridors. General roadway capacity values are provided in the table below. The analysis in this report applies the specific capacity values for Poinsettia Lane and El Camino Real, which have specific capacity values published in the *Roadway Capacity Tables Report.*

Lanes	Speed Limit (mph)	Daily Street Segment Capacity			Peak- Hour Single- Direction Capacity		
		LOS C	LOS D	LOS E	LOS C	LOS D	LOS E
2	35 (undivided)	4,200	13,700	17,200	180	590	740
	35 (divided)	4,400	14,600	18,100	190	630	780
4	35	12,100	32,200	35,800	520	1,390	1,540
	45	13,900	36,200	40,800	600	1,560	1,760
	50	19,700	39,200	42,200	850	1,690	1,820
	55	24,400	41,700	43,800	1,050	1,800	1,890
6	35	15,800	41,700	59,000	680	2,230	2,540
	45	-	-	-	2,040	26,660	2,700
	50	54,700	63,900	64,800	2,360	2,760	2,800
	55	60,200	66,500	67,000	2,600	2,870	2,900
8	45	-	-	-	2,780	3,560	3,620

Source: Table 2, *Roadway Capacity Tables Report* (City of Carlsbad 2019).
LOS = level of service
mph = miles per hour

Intersection Turning Movement Needs Assessments

The *City of Carlsbad Transportation Impact Analysis Guidelines* explicitly define intersection turning-movement needs:

> **Left turn queue assessment:** Compare the left-turn volume with the length of the left turn pocket(s). A general rule of thumb of one foot per left turning vehicle per lane may be used for this analysis.

Left-turn volume: If the left-turn volume exceeds 250 vehicles per hour, a second left-turn lane is recommended.

Right-turn volume: If the right-turn volume exceeds 150 vehicles per hour, a dedicated right-turn lane is recommended.

To enhance the criteria provided above, this traffic investigation also examined the turning-movement queues predicted by the traffic analysis software.

Vehicle Level of Service

Prior to the April 2018 adoption of the *City of Carlsbad Transportation Impact Analysis Guidelines*, traffic studies in Carlsbad included calculations of intersection LOS. Two methodologies were used to calculate intersection performance. The Intersection Capacity Utilization (ICU) methodology compares the amount of traffic an intersection is able to process (capacity) to the level of traffic during peak hours (volume). The resulting volume-to-capacity ratio (v/c) is expressed in terms of LOS. Highway Capacity Manual (HCM) methodology calculates the average delay experienced by vehicles at intersections. The resulting calculation of average delay experienced by vehicles at the intersection is then used to determine the LOS at that location. LOS A represents free-flow activity, and LOS F represents overcapacity operation. LOS is a qualitative assessment of the quantitative effects of such factors as traffic volume, roadway geometrics, speed, delay, and maneuverability on roadway and intersection operations. LOS criteria are presented below.

LOS Descriptions

- **LOS A** represents free flow travel for vehicles. Individual users are virtually unaffected by other vehicles in the traffic stream.
- **LOS B** represents stable flow, but the presence of other users in the traffic stream begins to be noticeable.
- **LOS C** represents a range in which the influence of traffic density on operations becomes noticeable. The ability to maneuver within the traffic stream and to select an operating speed is now clearly affected by the presence of other vehicles.
- **LOS D** borders on unstable flow. Speeds and ability to maneuver are severely restricted because of traffic congestion.
- **LOS E** represents unstable operating conditions at or near the capacity level where maneuverability is severely limited.
- **LOS F** is used to define forced or breakdown traffic flow.

The relationship between LOS and the delay (in seconds) or v/c ratio at signalized intersections is as follows:

Level of Service	Signalized Intersection Volume-to-Capacity (ICU Methodology)	Signalized Intersection Delay in seconds (HCM Methodology)	Unsignalized Intersection Delay in seconds (HCM Methodology)
A	≤ 0.60	≤ 10.0	≤10.0
B	0.61–0.70	> 10.0 and ≤ 20.0	>10.0 and ≤15.0
C	0.71–0.80	> 20.0 and ≤ 35.0	>15.0 and ≤25.0
D	0.81–0.90	> 35.0 and ≤ 55.0	>25.0 and ≤35.0
E	0.91–1.00	> 55.0 and ≤ 80.0	>35.0 and ≤50.0
F	> 1.00	> 80.0	>50.0

HCM = Highway Capacity Manual
ICU = intersection capacity utilization

Carlsbad Multimodal Level of Service The City's General Plan Mobility Element developed the Carlsbad Multimodal Level of Service (MMLOS) that is used to evaluate the transportation facilities in the City. The City's MMLOS methodology provides a qualitative grade assigned to prioritized travel modes in different street typologies, as identified in the City's General Plan. The LOS ranges from LOS A to LOS F. The City General Plan requires LOS D or better for the travel modes prioritized on that street's typology. The four travel modes the MMLOS evaluates are vehicles, pedestrians, bicycles, and transit. Vehicle LOS is determined by comparing roadway volume to capacity, as stated previously. Pedestrian, bicycle, and transit LOS are determined by using the City MMLOS criteria.

The Carlsbad MMLOS evaluates pedestrian, bicycle, and transit LOS by assessing the attributes of the pedestrian, bicycle, or transit facility. Each attribute corresponds to a point system that adds together to correspond to an LOS grade, as summarized in the following table.

Level of Service	Point Score
A	9.0–10.0
B	8.0–8.99
C	7.0–7.99
D	6.0–6.99
E	5.0–5.99
F	0–4.99

EXISTING TRAFFIC CONDITIONS

Roadway Volume

Roadway segment volumes were collected by National Data and Surveying Services (NDS), an independent survey company, on Tuesday, May 22, 2018, by pneumatic tube. Traffic data are provided in Appendix A. Data were collected for each direction of travel over a 24-hour period. Table A presents the existing daily traffic volume for each of the study roadway segments and compares that volume to the daily roadway capacity. As Table A shows, the roadway segments of Poinsettia Lane west of El Camino Real, Mimosa Drive between Oriole Court and Aviara Parkway, and Dove Lane between Moorhen Place and El Camino Real have existing traffic volumes that are a particularly low percent of the roadway capacity.

Table A: Existing Daily Roadway Volume and Capacity

Roadway Segment	Lanes	Capacity at LOS D	Existing Volume	V/C	Existing LOS D or Better
Poinsettia Lane (Aviara Parkway to Ambrosia Lane)	4	39,200	10,330	0.26	Yes
Poinsettia Lane (Ambrosia Lane to Cassia Road)	4	39,200	9,789	0.25	Yes
Poinsettia Lane (Cassia Road to El Camino Real)	4	39,200	851	0.02	Yes
El Camino Real (Cassia Road to Poinsettia Lane)	5	54,100	33,236	0.61	Yes
El Camino Real (Poinsettia Lane to Aviara Parkway)	6	54,100	38,647	0.71	Yes
Cassia Road (Poinsettia Lane to El Camino Real)	4	32,200	9,290	0.29	Yes
Ambrosia Lane (Poinsettia Lane to Aviara Parkway)	2	13,700	3,321	0.24	Yes
Mimosa Drive (Oriole Court to Aviara Parkway)	2	13,700	679	0.05	Yes
Dove Lane (Moorhen Place to Black Skimmer Road)	2	13,700	368	0.02	Yes

LOS = level of service
V/C = volume-to-capacity

Because traffic volumes were collected for each direction of travel, the volume of vehicles in each direction during the morning and afternoon peak commute hours could be determined. Table B presents the peak hour roadway link analysis. Similar to the analysis of daily traffic, Table B shows the roadway segments of Poinsettia Lane west of El Camino Real, Mimosa Drive between Oriole Court and Aviara Parkway, and Dove Lane between Moorhen Place and El Camino Real have existing traffic volumes that are a particularly low percent of the roadway capacity during the peak commute hours. For example, the portion of Poinsettia Lane west of El Camino Real has been built to arterial standards in preparation for the gap closure, but has no more than one vehicle per minute traveling in either direction during the busiest hour.

Table B: Existing Peak-Hour Link Roadway LOS Summary

Roadway Segment	Direction	Lanes	Capacity at LOS D	AM Peak Hour			PM Peak Hour		
				Volume	V/C	LOS D or Better	Volume	V/C	LOS D or Better
Poinsettia Lane (Aviara Parkway to Ambrosia Lane)	Eastbound	2	1,700	385	0.22	Yes	460	0.26	Yes
	Westbound	2	1,700	350	0.20	Yes	445	0.25	Yes
Poinsettia Lane (Ambrosia Lane to Cassia Road)	Eastbound	2	1,700	514	0.29	Yes	397	0.22	Yes
	Westbound	2	1,700	422	0.24	Yes	463	0.26	Yes
Poinsettia Lane (Cassia Road to El Camino Real)	Eastbound	2	1,700	44	0.02	Yes	35	0.02	Yes
	Westbound	2	1,700	26	0.01	Yes	62	0.04	Yes
El Camino Real (Cassia Road to Poinsettia Lane)	Northbound	2	2,100	1,620	0.77	Yes	1,336	0.64	Yes
	Southbound	3	2,900	1,026	0.35	Yes	1,714	0.59	Yes
El Camino Real (Poinsettia Lane to Aviara Parkway)	Northbound	3	2,580	1,782	0.69	Yes	1,709	0.66	Yes
	Southbound	3	1,920	1,408	0.73	Yes	1,854	0.97	Yes
Cassia Road (Poinsettia Lane to El Camino Real)	Eastbound	2	1,540	515	0.33	Yes	356	0.23	Yes
	Westbound	2	1,540	331	0.21	Yes	456	0.30	Yes
Ambrosia Lane (Poinsettia Lane to Aviara Parkway)	Northbound	1	590	424	0.72	Yes	122	0.21	Yes
	Southbound	1	590	356	0.60	Yes	104	0.18	Yes
Mimosa Drive (Oriole Court to Aviara Parkway)	Northbound	1	590	34	0.06	Yes	28	0.05	Yes
	Southbound	1	590	60	0.10	Yes	35	0.06	Yes
Dove Lane (Moorhen Place to Black Skimmer Road)	Eastbound	1	590	22	0.04	Yes	19	0.03	Yes
	Westbound	1	590	8	0.01	Yes	23	0.04	Yes

LOS = level of service
V/C = volume-to-capacity

Vehicle Speed

For five of the roadway segments included in the study, traffic survey data included collection of vehicle speed for 2 days. Vehicle speed surveys are provided in Appendix A. Table C summarizes the existing traffic speeds observed on the survey days. Because the 85th percentile speed (the speed not exceeded by 85th percent of vehicles) is used to set the speed limit for a street, Table C provides the 85th percentile speed. Table C also indicates whether vehicles were observed excessively exceeding this typical speed. Below is a brief discussion of the speed observations for each surveyed roadway.

Table C: Existing Travel Speed

Roadway Segment	Posted Speed Limit	85th Percentile Speed	Observations Exceeding 85th Percentile by mph			
			10 mph	15 mph	20 mph	25 mph
Poinsettia Lane (Ambrosia Lane to Cassia Road)						
Day 1	50	33	4	0	0	0
Day 2		33	4	0	0	0
Cassia Road (Poinsettia Lane to El Camino Real)						
Day 1	35	29	30	16	5	0
Day 2		29	29	12	3	0
Ambrosia Lane (Poinsettia Lane to Aviara Parkway)						
Day 1	40	33	5	0	0	0
Day 2		34	0	0	0	0
Mimosa Drive (Oriole Court to Aviara Parkway)						
Day 1	25	25	0	0	0	0
Day 2		25	0	0	0	0
Dove Lane (Moorhen Place to El Camino Real)						
Day 1	35	29	0	0	0	0
Day 2		30	0	0	0	0

mph = miles per hour

Poinsettia Lane between Ambrosia Lane and Cassia Road

The posted speed limit (west of Ambrosia Lane) is 50 miles per hour (mph). The observed 85th percentile speed was 33 mph. Of the 19,442 vehicles using this link over 2 days, eight were observed to exceed 45 mph. The highest speed vehicles were evenly spread between 6:00 a.m. and 9:00 p.m.

Cassia Road

The posted speed limit is 35 mph. The observed 85th percentile speed was 29 mph. However, of the 18,234 vehicles using this link over 2 days, 28 were observed to exceed 45 mph (of which 8 exceeded 50 mph). It should be noted that the 8 vehicles exceeding 50 mph were all traveling in the eastbound direction, which is downhill. The highest speed vehicles appear to be more common in the early evening hours.

Ambrosia Lane

While Ambrosia Lane is classified as a School Street in the Mobility Element, the speed limit of 25 mph is only in effect near the school when children are present. In the northern portion of Ambrosia Lane, where surveys were conducted, the posted speed limit is 40 mph. The observed 85th

percentile speed was 34 mph. Of the 6,609 vehicles using this link over 2 days, 5 were observed to exceed 45 mph, all of which were traveling in the southbound direction (downhill). These were evenly spread between 7:00 a.m. and 9:00 p.m.

Mimosa Drive

The posted speed limit is 25 mph. The observed 85th percentile speed was 25 mph, consistent with the prima facie speed limit of a residential street. Of the 1,344 vehicles observed over 2 days, 10 were observed exceeding 30 mph. No vehicles were observed exceeding 35 mph.

Dove Lane

The posted speed limit is 35 mph. The observed 85th percentile speed was 30 mph. Of the 721 vehicles observed over 2 days, 6 were observed exceeding 35 mph. No vehicles were observed exceeding 40 mph. This is consistent with the posted 35 mph speed limit signs.

Existing speed data for most of the surveyed roadways appear consistent with expectations based on posted speed limits and the prevailing speed of most vehicles. The exception is Cassia Road., which is the only surveyed roadway where vehicles were observed in excess of 5 mph over the posted speed limit on both surveyed days. Although a small percent of the total traffic volume, the presence of any vehicles traveling in excess of 20 mph faster than 85 percent of the other vehicles raises potential safety concerns. Strategies for addressing excessive speeding on Cassia Road will be discussed later in this report.

Intersection Volume

The independent survey company that collected roadway volume data also collected intersection turn-movement volumes at the 11 study intersections on Tuesday, May 22, 2018. Traffic volume data are provided in Appendix A. Figure 2 illustrates the existing turn volumes. These turning volumes were analyzed consistent with the Intersection Turning Movement Needs Assessment in the *City of Carlsbad Transportation Impact Analysis Guidelines.* Table D examines whether right-turn volumes meet the City's 150 vehicles per hour threshold for recommending a dedicated right-turn lane, whether left-turn volumes meet the City's 250 vehicles per hour threshold for recommending dual left-turn lanes, and whether the left-turn queue is anticipated to exceed the available turn pocket.

As Table D shows, right-turn volume at many of the intersections meets the threshold for recommending dedicated right-turn lanes. Four left-turn movements have single left-turn lanes but meet the threshold for recommending dual left-turn lanes. However, three of these movements could experience lower traffic volume with completion of the Poinsettia Lane gap closure. Six left-turn movements are estimated to have peak queues exceeding the turn pocket. Again, three of these movements may have lower traffic volume with completion of the Poinsettia Lane gap closure.

LSA

LEGEND

XX/YY - AM/PM Peak Hour Volumes

FIGURE 2

0 500 1000

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SOURCE: Google Earth, 2018

Poinsettia Lane Gap Closure

Existing (2018) Peak Hour Traffic Volumes

I:\HCR1803\G\Existing Volumes.cdr (3/19/2019)

Table D: Intersection Turning Movement Needs Assessment

Intersection		Right-Turn Volume[1]	Existing Dedicated Right?[2]	Left-Turn Volume[1]	Existing Dual Left?[3]	Calculated Queue Length[1]	Left-Turn Storage
1. Ambrosia Lane/Poinsettia Lane (s)	NB	216	**No**	364	**No**	471	N/A
	SB	63	No	44	No	74	N/A
	EB	184	**No**	46	No	47	265
	WB	63	No	168	No	197	265
2. Ambrosia Lane/Aviara Parkway (s)	NB	13	No	10	No	178	N/A
	SB	158	**No**	210	No	504	N/A
	EB	29	No[4]	268	**No**	386	**130**
	WB	256	**No[4]**	49	No	48	125
3. Poinsettia Lane/Cassia Road (u)	NB	0	No	0	No	-	N/A
	SB	0	No	495	**No**	-	**160**
	WB	444	**No**	0	No	-	N/A
4. Skimmer Court/Poinsettia Lane/ Oriole Court (u)	NB	27	No	0	No	3	N/A
	SB	0	No	6	No	2	N/A
	EB	0	No	0	No	0	N/A
	WB	13	Yes	39	No	2	300
5. Mimosa Drive/Moorhen Place (u)	NB	9	No	0	No	0	N/A
	SB	0	No	7	No	0	N/A
	WB	5	No	10	No	0	N/A
6. Dove Lane/Moorhen Place (u)	NB	4	No	9	No	3	N/A
	EB	16	No	0	No	0	N/A
	WB	0	No	6	No	0	N/A
7. Mimosa Drive/Aviara Parkway (s)	NB	42	No	28	No	34	N/A
	SB	69	No	16	No	28	N/A
	EB	23	No[4]	26	No	24	135
	WB	24	No	65	No	46	195
8. El Camino Real/Cassia Road (s)	NB	14	Yes	198	No	229	250
	SB	404	**No[4]**	15	No	24	260
	EB	187	**No**	418	**No**	538	**270**
	WB	19	No	17	No	39	100
9. El Camino Real/Poinsettia Lane (s)	NB	492	Yes	23	Yes	15	250
	SB	14	No	243	Yes	98	250
	EB	5	No	17	Yes	12	315
	WB	234	**No**	438	Yes	187	380
10. El Camino Real/Dove Lane (s)	NB	56	No[4]	90	No	101	190
	SB	225	**No[4]**	87	No	120	235
	EB	79	No	156	No	252	**60**
	WB	69	No	72	No	105	**80**
11. El Camino Real/Aviara Parkway (s)	NB	536	**No**	450	Yes	239	265
	SB	131	No	191	Yes	148	310
	EB	330	Yes	178	Yes	114	150
	WB	103	No	664	Yes	409	**200**

Note: Shaded cells do not meet guidelines.

[1] Higher volume of either a.m. or p.m. peak hour

[2] *City of Carlsbad Transportation Impact Analysis Guidelines* state that a dedicated right-turn lane is recommended when volume exceeds 150.

[3] *City of Carlsbad Transportation Impact Analysis Guidelines* state that dual left-turn lanes are recommended when volume exceeds 250.

[4] Dashed bicycle lane provides for a lane width of at least 19 feet indicating vehicles may treat this as a right-turn lane.

(s) = signalized intersection
(u) = unsignalized intersection
EB = eastbound
N/A = not applicable
NB = northbound
SB = southbound
WB = westbound

Intersection Performance

The traffic volumes illustrated on Figure 2 were analyzed using both the ICU and HCM methodologies at signalized intersections. Only the HCM methodology applies at unsignalized intersections. Table E presents the results of the intersection performance analysis. Analysis worksheets are provided in Appendix B.

Table E: Existing Intersection LOS Summary

Study Area No.	Intersection	Methodology	AM Peak Hour		PM Peak Hour	
			V/C Ratio or Delay	LOS	V/C Ratio or Delay	LOS
1	Ambrosia Lane/Poinsettia Lane	ICU	0.68	B	0.36	A
		HCM	27.7 sec	D	13.3 sec	B
2	Ambrosia Lane/Aviara Parkway	ICU	0.72	C	0.35	A
		HCM	**75.8 sec**	**E**	13.2 sec	B
3	Poinsettia Lane/Cassia Road (u)	HCM	0.0 sec	A	0.0 sec	A
4	Oriole Court-Skimmer Court/ Poinsettia Lane (u)	HCM	7.9 sec	A	6.7 sec	A
5	Mimosa Drive/Moorhen Place (u)	HCM	8.9 sec	A	8.7 sec	A
6	Dove Lane/Moorhen Place (u)	HCM	8.7 sec	A	8.6 sec	A
7	Mimosa Drive/Aviara Parkway	ICU	0.30	A	0.34	A
		HCM	9.3 sec	A	9.3 sec	A
8	El Camino Real/Cassia Road	ICU	0.76	C	0.77	C
		HCM	34.4 sec	C	34.5 sec	C
9	El Camino Real/Poinsettia Lane	ICU	0.52	A	0.53	A
		HCM	24.1 sec	C	20.7 sec	C
10	El Camino Real/Dove Lane	ICU	0.48	A	0.57	A
		HCM	17.3 sec	B	33.6 sec	C
11	El Camino Real/Aviara Parkway	ICU	0.78	C	0.72	C
		HCM	50.1 sec	D	45.9 sec	D

Note = Shaded cells exceed LOS D.
(u) = unsignalized intersection
HCM = Highway Capacity Manual
ICU = Intersection Capacity Utilization
LOS = level of service
sec = seconds
V/C = volume-to-capacity

Table E shows that most of the study intersections deliver a satisfactory LOS. Although, as shown in Table D, some individual movements may experience delay and queueing, overall the intersections are capable of accommodating the peak hour traffic volume. The exception is the intersection of Ambrosia Lane/Aviara Parkway in the a.m. peak hour. This intersection is used to access both Aviara Oaks Elementary School and Aviara Oaks Middle School. As such, traffic volume during the morning drop-off period is high and places strains on the intersection during the brief duration of school traffic.

Multi-Modal Level of Service

As described in the methodology section, the City's Mobility Element identifies different travel modes that should be accommodated by different street types. Existing physical conditions were entered into the City's multi-modal level of service (MMLOS) worksheets for each of the study roadways. Table F displays the resulting MMLOS for the modes applicable for each roadway

Table F: Existing Multi-Modal LOS Summary

Roadway Segment	Street Typology	LOS for Accommodated Modes			
		Vehicle	Pedestrian	Bicycle	Transit
Poinsettia Lane (Aviara Parkway to Ambrosia Lane)	Arterial Connector	A	A	B	
Poinsettia Lane (Ambrosia Lane to Cassia Road)	Arterial Connector	A	A	A	
Poinsettia Lane (Cassia Road to El Camino Real)	Arterial Connector	A	A	B	
El Camino Real (Cassia Road to Poinsettia Lane)	Arterial Street	C			C
El Camino Real (Poinsettia Lane to Aviara Parkway)	Arterial Street	C			C
Cassia Road (Poinsettia Lane to El Camino Real)	Neighborhood/ Local Street		A	A	
Ambrosia Lane (Poinsettia Lane to Aviara Parkway)	School Street		A	C	
Mimosa Drive (Oriole Court to Aviara Parkway)	Neighborhood/ Local Street		A	A	
Dove Lane (Moorhen Place to Black Skimmer Road)	Neighborhood/ Local Street		A	A	

LOS = level of service

segment. MMLOS worksheets are included in Appendix C. As Table F shows, all of the study roadway segments achieve the City's LOS D or better target for their accommodated travel modes.

Collision Locations

The City Public Works Department/Traffic & Mobility Division provided collision data for Poinsettia Lane, Cassia Road, El Camino Real, Ambrosia Lane, Dove Lane, and Mimosa Drive. These collision data were provided over a period of 10 years from January 1, 2008, to April 12, 2018. Figure 3 displays the locations of collisions in the study area over the last 10 years. As expected, collisions are clustered near intersections. Table G summarizes the collisions reported to the Carlsbad Police Department in the study area in the past 10 years. It should be noted that over half of the collisions in the study area occurred along El Camino Real (131 of 204). Of the 204 reported collisions, the most common (40 percent of the total) have been rear-end collisions. The second most common are broadside collisions (27 percent) followed by hit objects (15 percent). A total of four collisions involving pedestrians have been reported in the study area over the past 10 years.

Statements regarding the frequency of broadside and hit objects collisions may be a little misleading because of the concentrations of this type of collision at specific intersections. In total, 28 percent of the broadside collisions occur at the intersection of El Camino Real/Cassia Road where that type of collision represents over half of the total collisions. In total, 40 percent of hit object collisions occur at the intersection of Poinsettia Lane/Cassia Road where that type of collision represents two thirds of the total collisions. At both of these locations, the Poinsettia Lane gap closure has the potential to alter traffic volumes and patterns, potentially affecting the number and types of collisions. The Poinsettia Lane gap closure will construct a traffic signal at the intersection of Poinsettia Lane/Cassia Road, which is likely to reduce the number of vehicles hitting objects at the intersection as it was recently configured.

LSA

LEGEND

Type of Collision:

- Rear-End
- Sideswipe
- Hit-Object
- Other
- Broadside
- Pedestrian
- Overturned
- Head-On
- Not Stated

Crash Factor:

- Unsafe Speed
- Wrong Side of Road
- Unsafe Starting & Backing
- Improper Turning
- D.U.I.
- Other Than Driver
- Unknown
- Unsafe Lane Change
- Other Hazardous Movement
- Auto/Ped R/W Violation
- Following Too Closely
- Traffic Signal and Signs

0 500 1000

FEET

SOURCE: Google Earth, 2018

I:\HCR1803\G\Collision_Data_Map_v2.cdr (3/14/2019)

FIGURE 3

Poinsettia Lane Gap Closure

Collision Data (1/1/2008 to 4/12/2018)

Table G: Collison Data 2008–2018

Location	Rear End	Sideswipe	Broadside	Head On	Hit Object	Overturned	Pedestrian	Other	Total
Aviara Pkwy/ Poinsettia Ln	8	2	6	1	-	1	-	-	18
Black Rail Ct/ Poinsettia Ln	-	1	5	1	-	-	-	-	7
Ambrosia Ln/ Poinsettia Ln	2	-	-	-	-	1	-	-	3
Poinsettia Ln/ Cassia Rd	-	-	1	-	12	1	-	4	18
El Camino Real/ Cassia Rd	7	-	15	2	-	2	1	-	27
El Camino Real/ Poinsettia Ln	13	3	11	1	4	-	-	-	32
El Camino Real/ Swallow Ln	8	-	-	-	2	-	-	-	10
El Camino Real/ Dove Ln	11	2	4	-	3	-	-	1	21
El Camino Real/ Aviara Pkwy	15	1	9	1	1	-	2	-	29
Ambrosia Ln / Aviara Pkwy	1	-	-	-	1	-	-	-	2
Mimosa Dr/ Aviara Pkwy	-	-	2	1	-	-	-	-	3
Along Poinsettia	1	-	-	-	2	-	-	-	3
Along Cassia	2	-	1	-	1	-	1	1	6
Along El Camino Real	11	1	-	-	-	-	-	-	12
Along Ambrosia	3	4	-	-	4	-	-	1	12
Along Mimosa Dr	-	-	-	-	-	1	-	-	1
Total	**80**	**14**	**54**	**7**	**30**	**6**	**4**	**7**	**204**
Percent	**40%**	**7%**	**27%**	**3%**	**15%**	**3%**	**2%**	**3%**	**100%**

Of note in the data is that only one reported collision occurred within the Viadana and Pavoreal neighborhoods. On a Saturday morning in March 2015, a vehicle traveling north on Mimosa Drive hit two parked vehicles and overturned. The police report indicates that the driver was under the influence of drugs or alcohol.

The frequency of rear-end collisions at the southbound approach to El Camino Real/Poinsettia Lane was also examined. Two collisions of this type occurred in 2008, two in 2009, and one in 2011. From the collision data, it does not appear that rear-end collisions have increased since the southbound right-turn lane was converted to a through/right-turn lane.

VEHICLE MILES TRAVELED

On December 28, 2018, the California Office of Administrative Law cleared revised California Environmental Quality Act (CEQA) guidelines for use. Among the changes to the guidelines was the removal of vehicle delay and level of service from consideration under CEQA. With the adopted guidelines, transportation impacts are to be evaluated based on a project's effect on vehicle miles traveled. Lead agencies are allowed to opt-in to the revised transportation guidelines, but the new guidelines must be used starting July 1, 2020.

As discussed above, the *City of Carlsbad Transportation Impact Analysis Guidelines* has eliminated vehicle delay from consideration, but the City has not yet established thresholds related to vehicle miles of travel. However, the State law provides sufficient guidance to evaluate the Poinsettia Lane gap closure impacts related to vehicles miles traveled.

California Public Resources Code Section 15064.3(b)(2) states that:

> Transportation projects that decrease vehicle miles traveled in the project area compared to existing conditions should be presumed to have a less than significant transportation impact.

LSA measured the travel distances associated with the alternative paths used to divert around the gap in Poinsettia Lane. To travel from the intersection of Aviara Parkway/Poinsettia Lane to the intersection of El Camino Real/Poinsettia Lane using existing Poinsettia Lane, Cassia Road, and El Camino Real requires 1.9 miles of travel. To travel from the intersection of Aviara Parkway/ Poinsettia Lane to the intersection of El Camino Real/Poinsettia Lane using Aviara Parkway and El Camino Real requires 2.7 miles of travel. Upon completion of Poinsettia Lane, the distance required is 1.7 miles.

For each vehicle taking a diverted route today, completion of the Poinsettia Lane gap closure results in 0.2 to 1.0 fewer miles traveled. Because the Poinsettia Lane gap closure decreases vehicle miles traveled in the project area compared to existing conditions, the project would be presumed to have a less than significant transportation impact under the revised CEQA guidelines.

GENERAL PLAN BUILDOUT (2035) TRAFFIC CONDITIONS WITHOUT POINSETTIA LANE GAP CLOSURE

The San Diego Association of Governments (SANDAG) Transportation Forecast Information Center provides traffic forecast data using the regional travel demand model. Traffic projections using the Series 12 (land use based) model were compared between 2008 (without the gap closure), 2020 (with the gap closure), and 2035 (with the gap closure) to determine an annual traffic growth rate in the study area and the effect of the gap closure. Table H provides the raw traffic model data and calculations of annual growth rate.

Table H: Traffic Model Data and Traffic Growth Rates

Roadway Segment	2020 Model Projection (1,000s)	2035 Model Projection (1,000s)	Annual Growth Rate	Existing (2018) Traffic Volume	Projected 2035 No Gap Closure Volume
Poinsettia Lane (Aviara Parkway to Ambrosia Lane)	8.5	9.7	0.9%	10,330	11,983
Poinsettia Lane (Ambrosia Lane to Cassia Road)	4.6	5.8	1.7%	9,789	12,683
Poinsettia Lane (Cassia Road to El Camino Real)	5.1	6.2	1.4%	851	1,059
El Camino Real (Cassia Road to Poinsettia Lane)	31.2	33.8	0.6%	33,236	36,375
El Camino Real (Poinsettia Lane to Aviara Parkway)	34.0	39.5	1.1%	38,647	45,732
Cassia Road (Poinsettia Lane to El Camino Real)	6.1	6.8	0.8%	9,290	10,498
Ambrosia Lane (Poinsettia Lane to Aviara Parkway)	2.4	2.7	0.8%	3,321	3,791
Mimosa Drive (Oriole Court to Aviara Parkway)	1.3	1.6	1.5%	679	857
Dove Lane (Moorhen Place to Black Skimmer Road)	2.4	3.5	3.1%	368	559

Roadway Volume

Model data in 2020 and 2035 were compared for each roadway segment to determine the annual growth rate. This annual growth rate was applied to existing traffic volumes collected in 2018 to estimate 2035 traffic volumes without the Poinsettia Lane gap closure (i.e., 2018 volume x [1 + annual growth rate x 17 years]). Table I analyzes the resulting 2035 roadway traffic volume.

Table I: General Plan Buildout (2035) Without Poinsettia Lane Gap Closure Daily Roadway Volume and Capacity

Roadway Segment	Lanes	Capacity at LOS D	2035 No Gap Closure Volume	V/C	LOS D or Better
Poinsettia Lane (Aviara Parkway to Ambrosia Lane)	4	39,200	11,983	0.31	Yes
Poinsettia Lane (Ambrosia Lane to Cassia Road)	4	39,200	12,683	0.32	Yes
Poinsettia Lane (Cassia Road to El Camino Real)	4	39,200	1,059	0.03	Yes
El Camino Real (Cassia Road to Poinsettia Lane)	5	54,100	36,375	0.67	Yes
El Camino Real (Poinsettia Lane to Aviara Parkway)	6	54,100	45,732	0.85	Yes
Cassia Road (Poinsettia Lane to El Camino Real)	4	32,200	10,498	0.33	Yes
Ambrosia Lane (Poinsettia Lane to Aviara Parkway)	2	13,700	3,791	0.28	Yes
Mimosa Drive (Oriole Court to Aviara Parkway)	2	13,700	857	0.06	Yes
Dove Lane (Moorhen Place to Black Skimmer Road)	2	13,700	559	0.04	Yes

LOS = level of service
V/C = volume-to-capacity

As Table I shows, the roadway segments of Poinsettia Lane west of El Camino Real, Mimosa Drive between Oriole Court and Aviara Parkway, and Dove Lane between Moorhen Place and El Camino Real would still have traffic volumes that are a particularly low percent of the roadway capacity in 2035 without the proposed Poinsettia Lane gap closure.

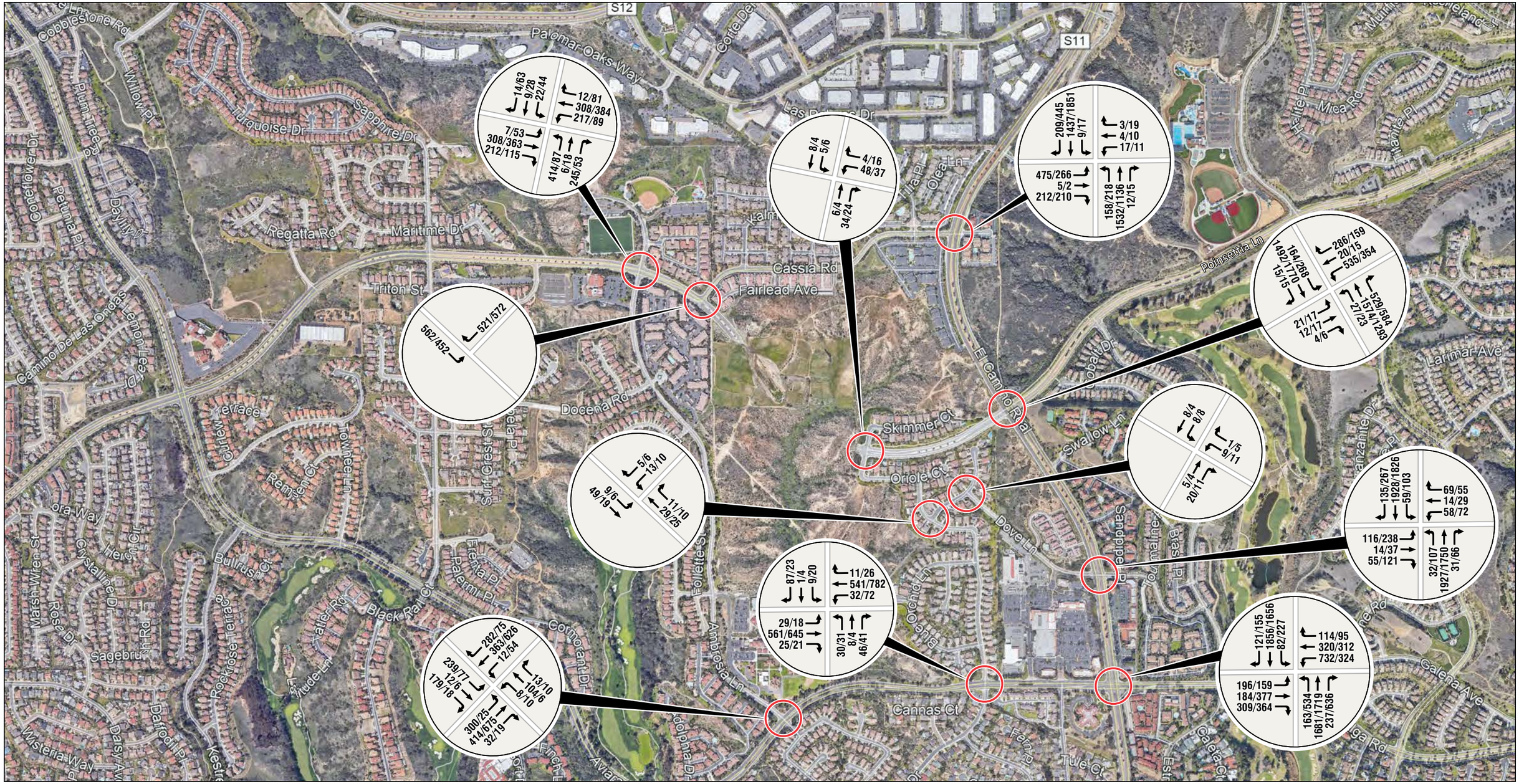
Intersection Volume

Annual growth rates calculated in Table H for roadway segments were applied to the corresponding approach for the study intersections. Figure 4 illustrates the resulting projected intersection turn volumes in 2035 without the Poinsettia Lane gap closure. These turning volumes were analyzed consistent with the Intersection Turning Movement Needs Assessment in the *City of Carlsbad Transportation Impact Analysis Guidelines*. Table J examines whether right-turn volumes meet the City's 150 vehicles per hour threshold for recommending a dedicated right-turn lane, whether left-turn volumes meet the City's 250 vehicles per hour threshold for recommending dual left-turn lanes, and whether the left-turn queue is anticipated to exceed the available turn pocket.

As Table J shows, right-turn volume at many of the intersections meets the threshold for recommending dedicated right-turn lanes. Compared to existing conditions, one additional movement (southbound right turns at El Camino Real/Aviara Parkway) would meet the City's criteria for a dedicated right-turn lane. Four left-turn movements have single left-turn lanes but meet the threshold for recommending dual left-turn lanes, which is the same as existing conditions.

Intersection Performance

The traffic volumes illustrated on Figure 4 were analyzed using both the ICU and HCM methodologies at signalized intersections. Only the HCM methodology applies at unsignalized intersections. Table K presents the results of the intersection performance analysis. Analysis worksheets are provided in Appendix D.



LSA

LEGEND

XX/YY - AM/PM Peak Hour Volumes

0 500 1000
FEET

SOURCE: Google Earth, 2018

I:\HCR1803\G\2035-No Gap Closure Volumes.cdr (3/14/2019)

FIGURE 4

Poinsettia Lane Gap Closure
General Plan Buildout (2035)
Without Poinsettia Lane Gap Closure
Peak Hour Traffic Volumes

Table J: 2035 Without Poinsettia Lane Gap Closure Intersection Turning Movement Needs Assessment

Intersection		Right Turn Volume[1]	Existing Dedicated Right?[2]	Left Turn Volume[1]	Existing Dual Left?[3]	Calculated Queue Length[1]	Left Turn Storage
1. Ambrosia Lane/Poinsettia Lane (s)	NB	245	**No**	414	**No**	594	N/A
	SB	63	No	44	No	50	N/A
	EB	212	**No**	46	No	42	265
	WB	81	No	168	No	260	265
2. Ambrosia Lane/Aviara Parkway (s)	NB	13	No	10	No	137	N/A
	SB	179	**No**	239	No	516	N/A
	EB	32	No[4]	300	**No**	392	**130**
	WB	282	**No[4]**	54	No	51	125
3. Poinsettia Lane/Cassia Road (u)	NB	0	No	0	No	-	N/A
	SB	0	No	562	**No**	-	**160**
	WB	572	**No**	0	No	-	N/A
4. Skimmer Court/Poinsettia Lane/Oriole Court (u)	NB	34	No	0	No	3	N/A
	SB	0	No	6	No	1	N/A
	EB	0	No	0	No	0	N/A
	WB	16	Yes	48	No	2	300
5. Mimosa Drive/Moorhen Place (u)	NB	11	No	0	No	3	N/A
	SB	0	No	14	No	0	N/A
	WB	6	No	13	No	0	N/A
6. Dove Lane/Moorhen Place (u)	NB	5	No	11	No	3	N/A
	EB	20	No	0	No	0	N/A
	WB	0	No	8	No	0	N/A
7. Mimosa Drive/Aviara Parkway(s)	NB	46	No	31	No	36	N/A
	SB	87	No	20	No	30	N/A
	EB	29	No[4]	25	No	26	135
	WB	26	No	72	No	49	195
8. El Camino Real/Cassia Road(s)	NB	15	Yes	218	No	492	**250**
	SB	445	**No[4]**	17	No	40	260
	EB	212	**No**	475	**No**	600	**270**
	WB	19	No	17	No	41	100
9. El Camino Real/Poinsettia Lane(s)	NB	584	Yes	27	Yes	21	250
	SB	15	No	268	Yes	119	250
	EB	6	No	21	Yes	18	315
	WB	286	**No**	535	Yes	218	380
10. El Camino Real/Dove Lane(s)	NB	66	No[4]	107	No	122	190
	SB	267	**No[4]**	103	No	166	235
	EB	121	No	238	No	428	**60**
	WB	69	No	72	No	125	**80**
11. El Camino Real/Aviara Parkway(s)	NB	636	**No**	534	Yes	409	**265**
	SB	155	**No**	227	Yes	201	310
	EB	364	Yes	196	Yes	120	150
	WB	114	No	732	Yes	516	**200**

Note: Shaded cells do not meet guidelines

[1] Higher volume of either a.m. or p.m. peak hour

[2] *City of Carlsbad Transportation Impact Analysis Guidelines* state that a dedicated right-turn lane is recommended when volume exceeds 150.

[3] *City of Carlsbad Transportation Impact Analysis Guidelines* state that dual left-turn lanes are recommended when volume exceeds 250.

[4] Dashed bicycle lane provides for a lane width of at least 19 feet indicating vehicles may treat this as a right-turn lane.

(s) = signalized intersection N/A = not applicable WB = westbound
(u) = unsignalized intersection NB = northbound
EB = eastbound SB = southbound

Table K: 2035 Without Poinsettia Lane Gap Closure Intersection LOS

Study Area No.	Intersection	Methodology	AM Peak Hour		PM Peak Hour	
			V/C Ratio or Delay	LOS	V/C Ratio or Delay	LOS
1	Ambrosia Lane/Poinsettia Lane	ICU	0.78	C	0.39	A
		HCM	43.4 sec	D	12.5 sec	B
2	Ambrosia Lane/Aviara Parkway	ICU	0.79	C	0.38	A
		HCM	**124.5 sec**	**F**	13.7 sec	B
3	Poinsettia Lane/Cassia Road (u)	HCM	0.0 sec	A	0.0 sec	A
4	Oriole Court-Skimmer Court/Poinsettia Lane (u)	HCM	7.9 sec	B	6.6 sec	A
5	Mimosa Drive/Moorhen Place (u)	HCM	9.0 sec	A	8.8 sec	A
6	Dove Lane/Moorhen Place (u)	HCM	8.7 sec	A	8.6 sec	A
7	Mimosa Drive/Aviara Parkway	ICU	0.33	A	0.37	A
		HCM	10.0 sec	A	10.1 sec	B
8	El Camino Real/Cassia Road	ICU	0.84	D	0.85	D
		HCM	43.8 sec	D	50.4 sec	D
9	El Camino Real/Poinsettia Lane	ICU	0.61	B	0.62	B
		HCM	27.1 sec	C	24.1 sec	C
10	El Camino Real/Dove Lane	ICU	0.57	A	0.70	C
		HCM	30.0 sec	C	44.8 sec	D
11	El Camino Real/Aviara Parkway	ICU	0.88	D	0.83	D
		HCM	**70.2 sec**	**E**	**60.7 sec**	**E**

Note: Shaded cells exceed LOS D.
(u) = unsignalized intersection
HCM = Highway Capacity Manual
ICU = intersection capacity utilization
LOS = level of service
sec = seconds
V/C = volume-to-capacity

Table K shows that most of the study intersections are anticipated to continue to deliver a satisfactory LOS. Although, as shown in Table J, some individual movements may experience delay and queueing, overall the intersections are capable of accommodating the peak hour traffic volume. The intersection of Ambrosia Lane/Aviara Parkway would continue to be impacted by school traffic in the a.m. peak hour. The intersection of El Camino Real/Aviara Parkway is anticipated to degrade with increased traffic volumes in the future.

GENERAL PLAN BUILDOUT (2035) TRAFFIC CONDITIONS WITH POINSETTIA LANE GAP CLOSURE

Comparisons between traffic projections using the SANDAG Series 12 (land use based) model were again used to project traffic conditions with the Poinsettia Lane gap closure. The annual growth rate calculated in Table H was applied to 2008 (without the gap closure) model data to determine the potential model data in the future without the Poinsettia Lane gap closure. These potential model data were compared to the model predicted traffic data in the same future year to identify the redistribution of traffic calculated by the traffic model. These calculations are shown in Table L.

Table L: Traffic Model Data and Traffic Growth Rates

Roadway Segment	2008 Model Projection (1,000s)	Annual Growth Rate	2020 Volume Based on Growth	2020 Model Projection (1,000s)	Effect of Gap Closure	
Poinsettia Lane (Aviara Parkway to Ambrosia Lane)	8.8	0.9%	9.8	8.5	(1.3)	(13.2%)
Poinsettia Lane (Ambrosia Lane to Cassia Road)	4.8	1.7%	5.8	4.6	(1.2)	(20.7%)
Poinsettia Lane (Cassia Road to El Camino Real)	1.6	1.4%	1.9	5.1	3.2	171.8%
El Camino Real (Cassia Road to Poinsettia Lane)	28.9	0.6%	30.8	31.2	0.4	1.2%
El Camino Real (Poinsettia Lane to Aviara Parkway)	28.7	1.1%	32.4	34.0	1.6	4.9%
Cassia Road (Poinsettia Lane to El Camino Real)	7.8	0.8%	8.5	6.1	(2.4)	(28.4%)
Ambrosia Lane (Poinsettia Lane to Aviara Parkway)	2.5	0.8%	2.8	2.4	(0.4)	(12.7%)
Mimosa Drive (Oriole Court to Aviara Parkway)	1.8	1.5%	2.1	1.3	(0.8)	(39.0%)
Dove Lane (Moorhen Place to Black Skimmer Road)	1.6	3.1%	2.2	2.4	0.2	9.8%

As Table L shows, the traffic model predicts that the completion of the Poinsettia Lane gap closure would reduce traffic volumes on Cassia Road (28.4 percent lower) and Ambrosia Lane (12.7 percent lower) as using these routes around the existing gap will no longer be necessary. The traffic model similarly predicts that the Poinsettia Lane gap closure will reduce daily traffic volume along Mimosa Drive (specifically, south of Moorhen Place) possibly because access to Poinsettia Lane would have greater utility. The traffic model also predicts that traffic volumes along Dove Lane would increase by 9.8 percent, which is likely to mean that traffic volumes along Moorhen Place and Oriole Court would also increase. This could be due to either redistribution of neighborhood traffic or cut-through traffic. Although not included in Table L, the same exercise was conducted for Aviara Parkway. The traffic model predicts that the Poinsettia Lane gap closure would redistribute approximately 10 percent of traffic along Aviara Parkway.

Roadway Volume

The percent of change in traffic volume with the gap closure calculated in Table L was applied to the projected 2035 traffic volumes without the gap closure previously described in the report. For the segment of Dove Lane where traffic volumes are projected to increase, 55 additional daily trips are anticipated, which equates to 5 additional vehicles during a peak hour or 1 additional car every 12 minutes.

In the case of the segment of Poinsettia Lane between Cassia Road and El Camino Real, traffic volumes were smoothed by applying the ratio of model data provided for the segments of Poinsettia Lane between Cassia Road and El Camino Real and Poinsettia Lane between Ambrosia Lane and Cassia Road. In other words, because the model predicted that the segment between Cassia Road and El Camino Real would have a higher traffic volume, this relationship was maintained when projecting future traffic volumes. Table M analyzes the resulting 2035 roadway traffic volume.

Intersection Volume

The effect of the gap closure identified in Table L was applied to the 2035 intersection turn volumes displayed on Figure 4. For intersections immediately adjacent to the gap closure, turning movements were directly shifted to account for new and potentially shorter travel paths.

Table M: General Plan Buildout (2035) Daily Roadway Volume and Capacity

Roadway Segment	Lanes	Capacity at LOS D	2035 With Gap Closure Volume	V/C	LOS D or Better
Poinsettia Lane (Aviara Parkway to Ambrosia Lane)	4	39,200	10,400	0.27	Yes
Poinsettia Lane (Ambrosia Lane to Cassia Road)	4	39,200	10,056	0.26	Yes
Poinsettia Lane (Cassia Road to El Camino Real)	4	39,200	10,750	0.27	Yes
El Camino Real (Cassia Road to Poinsettia Lane)	5	54,100	36,815	0.68	Yes
El Camino Real (Poinsettia Lane to Aviara Parkway)	6	54,100	47,970	0.89	Yes
Cassia Road (Poinsettia Lane to El Camino Real)	4	32,200	7,520	0.23	Yes
Ambrosia Lane (Poinsettia Lane to Aviara Parkway)	2	13,700	3,309	0.24	Yes
Mimosa Drive (Oriole Court to Aviara Parkway)	2	13,700	522	0.04	Yes
Dove Lane (Moorhen Place to Black Skimmer Road)	2	13,700	614	0.04	Yes

LOS = level of service
V/C = volume-to-capacity

Figure 5 illustrates the resulting projected intersection turn volumes in 2035 with the Poinsettia Lane gap closure. These turning volumes were analyzed consistent with the Intersection Turning Movement Needs Assessment in the *City of Carlsbad Transportation Impact Analysis Guidelines*. Table N examines whether right-turn volumes meet the City's 150 vehicles per hour threshold for recommending a dedicated right-turn lane, whether left-turn volumes meet the City's 250 vehicles per hour threshold for recommending dual left-turn lanes, and whether the left-turn queue is anticipated to exceed the available turn pocket.

As Table N shows, right-turn volume at many of the intersections meets the threshold for recommending dedicated right-turn lanes. One of the movements where a right-turn lane would be recommended is southbound El Camino Real at Poinsettia Lane. Compared to without the gap closure, two fewer right-turn lanes would be deficient by this measure. Two left-turn movements have single left-turn lanes but meet the threshold for recommending dual left-turn lanes, which is two fewer than without the gap closure. More intersections comply with the City's turning-movement needs assessment with the Poinsettia Lane gap closure.

Intersection Performance

The traffic volumes illustrated on Figure 5 were analyzed using both the ICU and HCM methodologies at signalized intersections. Only the HCM methodology applies at unsignalized intersections. Table O presents the results of the intersection performance analysis. Analysis worksheets are provided in Appendix E.

As described in detail in the following section, concurrent with construction of the Poinsettia Lane gap closure, traffic signals would be constructed at the currently unsignalized intersections of Poinsettia Lane/Cassia Road and Oriole Court-Skimmer Court/Poinsettia Lane. The analysis presented in Table O reflects the future traffic signals at these locations.

LSA

LEGEND

XX/YY - AM/PM Peak Hour Volumes

0 500 1000
FEET

SOURCE: Google Earth, 2018

I:\HCR1803\G\2035-With Gap Closure Volumes.cdr (3/19/2019)

FIGURE 5

Poinsettia Lane Gap Closure
General Plan Buildout (2035)
With Poinsettia Lane Gap Closure
Peak Hour Traffic Volumes

Table N: 2035 With Poinsettia Lane Gap Closure Intersection Turning Movement Needs Assessment

Intersection		Right Turn Volume[1]	Existing Dedicated Right?[2]	Left Turn Volume[1]	Existing Dual Left?[3]	Calculated Queue Length[1]	Left Turn Storage
1. Ambrosia Lane/Poinsettia Lane (s)	NB	214	**No**	414	**No**	477	N/A
	SB	63	No	44	No	58	N/A
	EB	184	**No**	46	No	54	265
	WB	64	No	168	No	188	265
2. Ambrosia Lane/Aviara Parkway (s)	NB	13	No	10	No	174	N/A
	SB	156	**No**	239	No	483	N/A
	EB	28	No[4]	300	**No**	366	**130**
	WB	245	**No[4]**	54	No	59	125
3. Poinsettia Lane/Cassia Road (u)	NB	15	No	0	No	95	N/A
	SB	0	No	197	No	108	160
	WB	222	**No**	20	No	56	N/A
4. Skimmer Court/Poinsettia Lane/ Oriole Court (u)	NB	41	No	34	No	34	N/A
	SB	6	No	6	No	11	N/A
	EB	20	No	8	No	11	50
	WB	8	Yes	39	No	26	300
5. Mimosa Drive/Moorhen Place (u)	NB	7	No	0	No	0	N/A
	SB	0	No	20	No	0	N/A
	WB	4	No	8	No	0	N/A
6. Dove Lane/Moorhen Place (u)	NB	5	No	12	No	3	N/A
	EB	22	No	0	No	0	N/A
	WB	0	No	9	No	0	N/A
7. Mimosa Drive/Aviara Parkway (s)	NB	46	No	31	No	37	N/A
	SB	53	No	12	No	23	N/A
	EB	22	No[4]	25	No	23	135
	WB	23	No	62	No	44	195
8. El Camino Real/Cassia Road (s)	NB	15	Yes	40	No	69	250
	SB	112	No[4]	17	No	35	260
	EB	38	No	85	No	68	270
	WB	19	No	17	No	25	100
9. El Camino Real/Poinsettia Lane (s)	NB	592	Yes	221	Yes	151	250
	SB	364	**No**	271	Yes	136	250
	EB	114	No	255	Yes	80	315
	WB	286	**No**	519	Yes	201	380
10. El Camino Real/Dove Lane (s)	NB	69	No[4]	112	No	185	190
	SB	280	**No[4]**	108	No	178	235
	EB	122	No	241	No	320	**60**
	WB	69	No	72	No	107	**80**
11. El Camino Real/Aviara Parkway (s)	NB	667	**No**	464	Yes	317	**265**
	SB	135	No	238	Yes	220	310
	EB	316	Yes	170	Yes	130	150
	WB	99	No	635	Yes	472	**200**

Note: Shaded cells do not meet guidelines.

1 Higher volume of either a.m. or p.m. peak hour

2 *City of Carlsbad Transportation Impact Analysis Guidelines* state that a dedicated right-turn lane is recommended when volume exceeds 150.

3 *City of Carlsbad Transportation Impact Analysis Guidelines* state that dual left-turn lanes are recommended when volume exceeds 250.

4 Dashed bicycle lane provides for a lane width of at least 19 feet indicating vehicles may treat this as a right-turn lane.

(s) = signalized intersection
(u) = unsignalized intersection
EB = eastbound
N/A = not applicable
NB = northbound
SB = southbound
WB = westbound

Table O: 2035 With Poinsettia Lane Gap Closure Intersection LOS

Study Area No.	Intersection	Methodology	AM Peak Hour		PM Peak Hour	
			V/C Ratio or Delay	LOS	V/C Ratio or Delay	LOS
1	Ambrosia Lane/Poinsettia Lane	ICU	0.68	B	0.36	A
		HCM	27.7 sec	C	23.8 sec	C
2	Ambrosia Lane/Aviara Parkway	ICU	0.70	B	0.34	A
		HCM	**70.4 sec**	**E**	13.7 sec	B
3	Poinsettia Lane/Cassia Road (u)	ICU	0.44	A	0.40	A
		HCM	10.5 sec	B	26.8 sec	C
4	Oriole Court-Skimmer Court/Poinsettia Lane (u)	ICU	0.26	A	0.27	A
		HCM	8.9 sec	A	8.8 sec	A
5	Mimosa Drive/Moorhen Place (u)	HCM	9.2 sec	A	8.8 sec	A
6	Dove Lane/Moorhen Place (u)	HCM	8.8 sec	A	8.7 sec	A
7	Mimosa Drive/Aviara Parkway	ICU	0.28	A	0.33	A
		HCM	9.2 sec	A	9.3 sec	A
8	El Camino Real/Cassia Road	ICU	0.60	A	0.61	B
		HCM	12.5 sec	B	13.5 sec	B
9	El Camino Real/Poinsettia Lane	ICU	0.72	C	0.74	C
		HCM	40.3 sec	D	35.7 sec	D
10	El Camino Real/Dove Lane	ICU	0.60	A	0.73	C
		HCM	24.8 sec	C	39.2 sec	D
11	El Camino Real/Aviara Parkway	ICU	0.84	D	0.83	D
		HCM	**59.5 sec**	**E**	54.3 sec	D

Note: Shaded cells exceed LOS D.
(u) = unsignalized intersection
HCM = Highway Capacity Manual
ICU = intersection capacity utilization
LOS = level of service
sec = seconds
V/C = volume-to-capacity

Table O shows that most of the study intersections are anticipated to continue to deliver a satisfactory level of service. No additional intersections would exceed LOS D compared to the scenario without the gap closure. Although the two intersections previously identified as exceeding LOS D (Ambrosia Lane/Aviara Parkway and El Camino Real/Aviara Parkway) would continue to exceed LOS D, the performance of these intersections is somewhat improved by the redistribution of traffic resulting from completion of the Poinsettia Lane gap closure.

SIGNAL WARRANT ANALYSIS

Section 4C of the *California Manual on Uniform Traffic Control Devices* (MUTCD) establishes a framework for traffic control signal needs studies. These guidelines help to identify areas of consideration but do not establish mandates. The MUTCD specifically states, "The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal." The reverse is also true. Ultimately, the decision on control and operation of an intersection lies with the engineering judgment of the local jurisdiction. The local jurisdiction is most familiar with circumstances not captured by the guidelines in the MUTCD. The nine areas identified in the MUTCD are the following:

- Warrant 1, Eight-Hour Vehicular Volume
- Warrant 2, Four-Hour Vehicular Volume
- Warrant 3, Peak Hour
- Warrant 4, Pedestrian Volume
- Warrant 5, School Crossing
- Warrant 6, Coordinated Signal System
- Warrant 7, Crash Experience
- Warrant 8, Roadway Network
- Warrant 9, Intersection Near a [Railroad] Grade Crossing

Other factors such as road grade, sight distance, the number of lanes crossed by vehicles exiting the minor street, and driver behavior may be extenuating circumstances. LSA considered traffic control options, the MUTCD signal warrants, and potential circumstances for the two intersections immediately adjacent to the Poinsettia Lane Gap Closure: Poinsettia Lane/Cassia Road and Oriole Court-Skimmer Court/Poinsettia Lane.

Poinsettia Lane/Cassia Road

At the time existing conditions were collected for this report, this intersection was unsignalized with a stop sign on the Cassia Road approach. Completion of the Poinsettia Lane Gap Closure would result in a third leg at this intersection and introduce conflicting movements. Table P uses the traffic volume displayed in Figure 5 and identifies the intersection performance under different traffic control options. As Table P shows, any form of traffic control would result in a satisfactory level of service.

Table P: Poinsettia Lane/Cassia Road Traffic Control Comparison

	AM Peak Hour		PM Peak Hour	
	Delay (seconds)	LOS	Delay (seconds)	LOS
Roundabout	6.6	A	8.0	A
Two-Way Stop Control	14.5	B	27.1	D
All-Way Stop Control	12.8	B	34.3	D
Traffic Signal	10.5	B	26.8	C

LOS = level of service

LSA used the gap closure growth rates identified in the traffic model data comparison above and applied it to existing intersection and roadway data to develop Existing plus Gap Closure traffic volumes for Signal Warrants 1, 2, and 3. This data set, existing pedestrian volumes, and the collision history displayed on Figure 3 were evaluated against the MUCTD signal warrants. Signal warrant worksheets are provided in Appendix F. The MUTCD establishes different thresholds for urban and rural settings. The rural setting may be used in the built-up area of an isolated community with a population of less than 10,000 or where the speed limit on a major street is greater than 40 mph. Although the City is an urban setting, the speed limit on Poinsettia Lane is 50 mph. Therefore, the rural settings were examined for Warrants 1, 2, and 3.

Warrant 1: Eight-Hour Vehicle Volume

This warrant considers whether a large volume of minor street traffic is the principal reason to consider installing a traffic signal or whether traffic volume on the major street is so heavy that minor street traffic suffers extensive delay or conflict. The MUTCD states that this warrant is met if thresholds are exceeded for each of any 8 hours of a typical day. For the intersection of Poinsettia Lane/Cassia Road, this warrant is satisfied.

Warrant 2: Four-Hour Vehicle Volume

This warrant considers whether the total volume of intersecting (i.e., conflicting) traffic is the principal reason to consider installing a traffic signal. The MUTCD states that this warrant is met if thresholds are exceeded for each of any 4 hours of a typical day. For the intersection of Poinsettia Lane/Cassia Road, this warrant is satisfied.

Warrant 3: Peak-Hour Vehicle Volume

This warrant considers whether undue delay on the minor street during the busiest hour of the day is the principal reason to consider installing a traffic signal. This warrant is met applying either delay or volume thresholds. For the intersection of Poinsettia Lane/Cassia Road, this warrant is satisfied based on volume.

Warrant 4: Pedestrian Volume

This warrant considers whether pedestrian volume is sufficiently high to be the sole reason for installing a traffic signal. In order to meet this warrant, pedestrian volume would have to exceed at least 93 crossings of the major street in an hour. For the intersection of Poinsettia Lane/Cassia Road, no pedestrian crossings were recorded when surveys of the intersection were completed, and this warrant is not satisfied.

Warrant 5: School Crossing

The School Crossing warrant is intended for application where the need for schoolchildren to cross the major street is the principal reason in considering the installation of a traffic control signal. While some children may walk to school from these residential neighborhoods, the intersection of Poinsettia Lane/Cassia Road is not part of a designated school route (identified by the use of yellow crosswalk markings); therefore, this warrant does not apply.

Warrant 6: Coordinated Signal System

This warrant may apply where maintaining platooning of vehicles through a coordinated system necessitates installing traffic control signals at intersections where other conditions would not otherwise meet warrants. The MUTCD specifies that this warrant should not be applied where the resultant spacing of signals would be less than 1,000 feet. Currently, the spacing between Poinsettia Lane/Cassia Road and Oriole Court-Skimmer Court/Poinsettia Lane is approximately 2,175 feet (with the gap closure). An additional traffic control signal will be constructed with the gap closure approximately 1,065 feet from the Poinsettia Lane/Cassia Road intersection at Artemisia Court. However, spacing between the Poinsettia Lane/Cassia Road intersection and the existing traffic

control signal at Ambrosia Lane/Poinsettia Lane is approximately 640 feet. Therefore, this warrant does not apply.

Warrant 7: Crash Experience

If an intersection experiences a high frequency and severity of collisions that could be alleviated by the installation of a traffic signal, then this warrant may apply. The threshold established in the MUTCD is a minimum of five collisions resulting in injury occurring within a 12-month period. The collision history illustrated in Figure 3 is for a 10-year period. The collision data shows no more than two collisions in a 12-month period. For the intersection of Poinsettia Lane/Cassia Road, this warrant is not satisfied.

Warrant 8: Roadway Network

Installing a traffic control signal at some intersections might be justified to encourage concentration and organization of traffic flow on a roadway network. Examples given include the intersection of two major routes, locations with entering volume of more than 1,000 vehicles per hour for 5 hours outside of normal business hours, and rural highways entering or traversing a city. This warrant does not apply.

Warrant 9: Intersection Near a [Railroad] Grade Crossing

This warrant could be considered if an intersection is located near an at-grade crossing of railroad tracks. The intersection of Poinsettia Lane/Cassia Road is not located near railroad tracks, and this warrant does not apply.

While unsignalized traffic control could provide a satisfactory LOS, traffic volumes at the intersection of Poinsettia Lane/Cassia Road meet Warrants 1, 2, and 3. Traffic signal control at Poinsettia Lane/Cassia Road is recommended.

Oriole Court-Skimmer Court/Poinsettia Lane

At the time existing conditions were collected for this report, this intersection was unsignalized with stop signs on the Oriole Court and Skimmer Court approaches. Completion of the Poinsettia Lane Gap Closure would result in a fourth leg at this intersection. Table Q uses the traffic volume displayed in Figure 5 and identifies the intersection performance under different traffic control options. As Table Q shows, any form of traffic control would result in a satisfactory level of service.

Table Q: Oriole Court-Skimmer Court/Poinsettia Lane Traffic Control Comparison

	AM Peak Hour		PM Peak Hour	
	Delay (seconds)	LOS	Delay (seconds)	LOS
Roundabout	5.1	A	4.4	A
Two-Way Stop Control	15.4	C	18.8	C
All-Way Stop Control	10.6	B	11.3	B
Traffic Signal	8.9	A	8.8	A

LOS = level of service

Signal warrant worksheets for this intersection are provided in Appendix F.

Warrant 1: Eight-Hour Vehicle Volume

This warrant considers whether a large volume of minor street traffic is the principal reason to consider installing a traffic signal or whether traffic volume on the major street is so heavy that minor street traffic suffers extensive delay or conflict. The MUTCD states that this warrant is met if thresholds are exceeded for each of any 8 hours of a typical day. For the intersection of Oriole Court-Skimmer Court/Poinsettia Lane, the threshold is met for some, but not for 8 hours of the day, and the warrant is not satisfied.

Warrant 2: Four-Hour Vehicle Volume

This warrant considers whether the total volume of intersecting (i.e., conflicting) traffic is the principal reason to consider installing a traffic signal. The MUTCD states that this warrant is met if thresholds are exceeded for each of any 4 hours of a typical day. For the intersection of Oriole Court-Skimmer Court/Poinsettia Lane, the threshold is met for 1 hour but not for 4 hours of the day, and the warrant is not satisfied.

Warrant 3: Peak-Hour Vehicle Volume

This warrant considers whether undue delay on the minor street during the busiest hour of the day is the principal reason to consider installing a traffic signal. This warrant is met applying either delay or volume thresholds. For the intersection of Oriole Court-Skimmer Court/Poinsettia Lane, this warrant is not satisfied.

Warrant 4: Pedestrian Volume

This warrant considers whether pedestrian volume is sufficiently high to be the sole reason for installing a traffic signal. In order to meet this warrant, pedestrian volume would have to exceed at least 93 crossings of the major street in an hour. For the intersection of Oriole Court-Skimmer Court/Poinsettia Lane, six pedestrian crossings were recorded when surveys of the intersection were completed, which does not satisfy this warrant.

Warrant 5: School Crossing

The School Crossing warrant is intended for application where the need for schoolchildren to cross the major street is the principal reason in considering the installation of a traffic control signal. While some children may walk to school from these residential neighborhoods, the intersection of Oriole Court-Skimmer Court/Poinsettia Lane is not part of a designated school route (identified by the use of yellow crosswalk markings); therefore, this warrant does not apply.

Warrant 6: Coordinated Signal System

This warrant may apply where maintaining platooning of vehicles through a coordinated system necessitates installing traffic control signals at intersections where other conditions would not otherwise meet warrants. The MUTCD specifies that this warrant should not be applied where the resultant spacing of signals would be less than 1,000 feet. Currently, the spacing between Poinsettia Lane/Cassia Road and Oriole Court-Skimmer Court/Poinsettia Lane is approximately 2,175 feet (with the gap closure). An additional traffic control signal will be constructed at Artemisia Court

approximately 1,110 feet from the Oriole Court-Skimmer Court/Poinsettia Lane intersection. This spacing would leave 1,065 feet between the Artemisia Court traffic signal and the intersection of Poinsettia Lane/Cassia Road where this report recommends a traffic signal. The distance between the intersection of Oriole Court-Skimmer Court/Poinsettia Lane and the existing traffic signal at El Camino Real/Poinsettia Lane is approximately 1,400 feet. Therefore, this warrant could be considered at the intersection of Oriole Court-Skimmer Court/Poinsettia Lane. The appropriate infrastructure is present along Poinsettia Lane for interconnection and coordination of traffic signals between Ambrosia Lane and El Camino Real. A traffic signal at the Oriole Court-Skimmer Court/Poinsettia Lane intersection would maintain platooning of vehicles to facilitate this coordinated system. Therefore, this warrant is satisfied at the intersection of Oriole Court-Skimmer Court/Poinsettia Lane.

Warrant 7: Crash Experience

If an intersection experiences a high frequency and severity of collisions that could be alleviated by the installation of a traffic signal, then this warrant may apply. The threshold established in the MUTCD is a minimum of five collisions resulting in injury occurring within a 12-month period. For the intersection of Oriole Court-Skimmer Court/Poinsettia Lane, this warrant is not satisfied based on past collision history.

Warrant 8: Roadway Network

Installing a traffic control signal at some intersections might be justified to encourage concentration and organization of traffic flow on a roadway network. Examples given include the intersection of two major routes, locations with entering volume of more than 1,000 vehicles per hour for 5 hours outside of normal business hours, and rural highways entering or traversing a city. This warrant does not apply.

Warrant 9: Intersection Near a [Railroad] Grade Crossing

This warrant could be considered if an intersection is located near an at-grade crossing of railroad tracks. The intersection of Oriole Court-Skimmer Court/Poinsettia Lane is not located near railroad tracks, and this warrant does not apply.

While unsignalized traffic control could provide a satisfactory LOS, delay would be experienced by vehicles entering Poinsettia Lane from the adjacent residential neighborhoods. Traffic volumes exceed thresholds for some, but not all, of the hours specified in the signal warrants. Pedestrians cross Poinsettia Lane at this intersection, but not in sufficient quantity to meet the pedestrian signal warrant. The intersection has not been the location of traffic collisions, but the width and grade of the major roadway could contribute to increased collisions when paired with driver error.

An additional factor that should be taken into consideration is driver expectation. The new intersection at Artemisia Court will be signalized, although the thresholds of the signal warrants are partially, but not fully, met. The only full-access unsignalized intersection along Poinsettia Lane would be at Brigantine Drive, and the neighborhood accessed by Brigantine Drive also has the option of using the signalized intersection at Black Rails Road to exit the neighborhood. Drivers on Poinsettia Lane may not be prepared for cross traffic at an unsignalized Oriole Court-Skimmer Court/Poinsettia Lane intersection. Additionally, Warrant 6 is satisfied based on the distances

between signalized intersections and the necessity to maintain vehicle platooning through the coordinated traffic signal system. Based on these factors, a traffic signal at Oriole Court-Skimmer Court/Poinsettia Lane is recommended.

EL CAMINO REAL/POINSETTIA LANE

In 2012 El Camino Real was widened to provide three southbound lanes between Cassia Road and Aviara Parkway. Prior to this project, the intersection of El Camino Real/Poinsettia Lane provided two left-turn lanes, two through lanes, and one right-turn lane at the southbound approach. As part of the expansion, the exclusive right-turn lane was converted to a through lane. Right-turning vehicles share the outside lane with vehicles traveling through the intersection. In the existing condition, 14 vehicles make the southbound right-turn in either peak hour, which means that the outside lane primarily functions as a through lane.

As Table N shows, the southbound right-turn meets the City's intersection turning-movement needs assessment for a dedicated right-turn lane with the traffic volumes redistributed at completion of the Poinsettia Lane gap closure. This section examines the potential benefits and constraints of adding an exclusive southbound right-turn lane.

Collision Potential

As a further complication, El Camino Real slopes downhill as people travel south. The public has raised a concern that vehicles traveling straight through the intersection will require longer to stop if approaching a vehicle slowing to turn right – and that a higher risk of collision is present without an exclusive turn lane.

Analysis of collision data from 2008 to 2018 indicated that southbound rear-end collisions have not increased since the southbound right-turn lane at this intersection was converted to a through/ right-turn lane. In fact, all five southbound rear-end collisions occurred prior to the 2012 conversion of the right-turn lane.

It should be noted that El Camino Real provides a bicycle lane. At other intersections along El Camino Real with an exclusive right-turn lane, a bicycle lane is provided at the intersection with an appropriate transition in advance of the intersection. A similar treatment would be required if an exclusive right-turn lane were added at the southbound approach of El Camino Real/Poinsettia Lane. This transition, however, requires bicycles to cross the vehicle path to remain in the bicycle lane.

Other than collision history, concern regarding the potential for collisions should be tempered by the fact that turning vehicles likely have to slow when entering an exclusive turn lane. Drivers of through vehicles traveling in the outside lane always have to consider the potential that vehicles in front of them may desire to turn. The speed of vehicles traveling in the outside lane should take these possibilities into account.

Intersection Performance

Table E shows that the intersection of El Camino Real/Poinsettia Lane functions at LOS D or better in existing conditions with the current lane configuration. Table O shows that the intersection of El Camino Real/Poinsettia Lane is anticipated to continuing functioning at LOS D or better without the

addition of a southbound right-turn lane. However, to demonstrate the potential benefit of adding a southbound right-turn lane, the intersection was reanalyzed with that configuration. Table R displays a summary of previously disclosed intersection performance data and compares that to intersection performance with a dedicated southbound right-turn lane.

Table R: El Camino Real/Poinsettia Lane Intersection Performance Comparison

Scenario	Shared SBR		Dedicated SBR		Effect of Adding SBR Lane
	V/C Ratio or Delay	LOS	V/C Ratio or Delay	LOS	
Existing AM					
ICU	0.52	A	0.52	A	0.00
HCM	24.1 sec	C	23.8 sec	C	0.3 sec
Queue in Southbound Through Lanes	234 feet		231 feet		3 feet
Existing PM					
ICU	0.53	A	0.53	A	0.00
HCM	20.7 sec	C	20.3 sec	C	0.4 sec
Queue in Southbound Through Lanes	297 feet		293 feet		4 feet
2035 With Poinsettia Lane Gap Closure AM					
ICU	0.72	C	0.69	B	0.03
HCM	45.3 sec	D	43.3 sec	D	2.0 sec
Queue in Southbound Through Lanes	407 feet		345 feet		62 feet
2035 With Poinsettia Lane Gap Closure AM					
ICU	0.74	C	0.68	B	0.06
HCM	35.7 sec	D	31.6 sec	C	4.1 sec
Queue in Southbound Through Lanes	542 feet		397 feet		145 feet

Note: Shaded cells exceed LOS D.
(u) = unsignalized intersection
HCM = Highway Capacity Manual
ICU = intersection capacity utilization
LOS = level of service
SBR = southbound right-turn
sec = seconds
V/C = volume-to-capacity

As Table R shows, adding a southbound right-turn lane would have minimal effect on the performance of the intersection in existing conditions. If southbound right-turn volume increases with the completion of Poinsettia Lane as anticipated, then adding a dedicated turn lane would provide some benefit to the intersection. It should be noted, however, that the benefit to the intersection does not improve any deficiency. The intersection is forecast to function at a satisfactory level of service with or without a dedicated southbound right-turn lane.

Engineering Constraints

The addition of an exclusive right-turn lane would require widening of El Camino Real by approximately 12 feet on the west side of the intersection. In order to accommodate the maximum anticipated queue, the turn pocket should provide approximately 80 to 100 feet of storage. While the west side of the intersection appears to be vacant land, some of the facilities near the roadway may present constraints. Some of the items needing relocation present a typical amount of effort for this type of widening project. These include the traffic signal controller, recycled water irrigation lines (and valves located approximately 110 feet from the back of curb return), and the cathodoic protection testing station for the in-street petroleum line.

Widening the roadway by 12 feet will extend beyond the currently graded area. An elevation difference of as much as 12 feet will require construction of a retaining wall as part of adding the right-turn lane. A retaining wall like the one required at this location is not unusual for this type of widening project in a hilly area.

Also located on the west side of El Camino Real is an underground SDG&E natural gas line and a vault, which does not appear to have a traffic-rated lid. This vault will have to be rebuilt or relocated to complete the widening. The cost of addressing the vault depends on the whether SDG&E has an easement or prior rights associated with the natural gas line. The range in cost for the vault could be from $100,000–$500,000, bringing the total construction cost of adding an exclusive southbound right-turn lane at El Camino Real/Poinsettia Lane to potentially $1.35 million.

Biological Constraints

Perhaps more significant than the engineering constraints are the biological constraints in the area west of El Camino Real that would be disturbed by the project adding a right-turn lane. A memorandum detailing existing conditions in that area is included as Appendix G. According to the Habitat Management Plan for Natural Communities in the City of Carlsbad (HMP), the area that would be disturbed by the addition of the southbound right-turn lane is within an existing hardline preserve (Preserve Number P/A#705) and is within the Coastal Zone.

Because the area is within a hardline preserve, impacts to biological resources (such as the southern maritime chaparral that occurs on the site) are not allowed unless: (a) they are associated with a covered project as defined by the HMP, (b) an equivalency finding results in a minor amendment and adjustment to the hardline boundary, or (c) a major amendment to the HMP is approved. Approval of impacts to southern maritime chaparral within a hardline boundary requires 3:1 mitigation. Special-status species have the potential to occur in the area, and focused surveys for Orcutt's brodiaea, Del Mar Mesa sand aster, and coastal California gnatcatcher would need to be performed (likely between May and July) to confirm the initial assessment that these species are absent from the site. The HMP provides additional conservation standards related to areas subject to the constraints of being within the California Coastal Zone. Permitting through the resource agencies will add to the total cost of adding an exclusive southbound right-turn lane at El Camino Real/Poinsettia Lane.

CUT-THROUGH TRAFFIC EVALUATION

The Carlsbad General Plan Mobility Element defines the uses of different street classifications. Arterial Streets and Arterial Connectors connect people to different areas of the City and to different land uses. Local/neighborhood streets connect people to residential neighborhoods and local areas. This section examines the potential for cut-through traffic, which is arterial traffic using local streets. The section following provides options for reducing cut-through traffic.

In the existing condition, the gap in Poinsettia Lane results in arterial traffic using Cassia Road (a Local/Neighborhood Street) and Ambrosia Lane (a School Street). This is cut-through traffic that occurs because the arterial connector is not yet available. As noted earlier, the Poinsettia Lane gap closure has the potential to redistribute traffic in the vicinity of the project. Traffic currently using Ambrosia Lane or Cassia Road to travel around the gap would be able to stay on Poinsettia Lane to

complete their trip. Analysis of traffic model data shows that the completion of Poinsettia Lane is anticipated to reduce traffic on Cassia Road (28.4 percent lower) and Ambrosia Lane (12.7 percent lower). The traffic model also predicts that traffic volumes along Dove Lane could increase by 9.8 percent, which is likely to mean that traffic volumes along Moorhen Place and Oriole Court would also increase. The traffic model data indicate the potential for cut-through traffic in the Viadana neighborhood.

Cut-through traffic occurs where a local street provides time savings compared to remaining on the arterial network. Time savings is affected by distance, speed, and delay at intersections. These factors were measured to determine which cut-through routes may be attractive. Travel speeds were surveyed and reported in Table C. The speed data are summarized as follows:

- **Poinsettia Lane:** 50 mph posted speed limit; 33 mph typical speed
- **Cassia Road:** 35 mph posted speed limit; 29 mph typical speed
- **Ambrosia Lane:** 40 mph posted speed limit; 34 mph typical speed
- **Mimosa Drive:** 25 mph posted speed limit; 25 mph typical speed
- **Dove Lane:** 35 mph posted speed limit; 30 mph typical speed
- **Aviara Parkway:** 40 mph posted speed limit
- **El Camino Real:** 55 mph posted speed limit

Not all possible routes have the potential to be attractive. Vehicles on Aviara Parkway can enter the Post Office/Library/Shopping Center area from a signalized driveway on Aviara Parkway or a right-in/right-out driveway. Vehicles on El Camino Real can enter the Post Office/Library/Shopping Center area from a signalized intersection with Dove Lane. Diverting from these direct paths and traveling through neighborhoods would not be attractive. Indeed, these alternatives are available today and cut-through traffic is not present.

Many potential routes through the study area were evaluated in a screening process that considered distance and speed. Routes that far exceeded the travel time of direct routes were eliminated from consideration. Routes examined in detail due to their cut-through potential include the following:

- From the west on Poinsettia Lane to the Post Office/Library/Shopping Center along Oriole Court, Mimosa Drive, Moorhen Place, and Dove Lane instead of Poinsettia Lane, El Camino Real, and Dove Lane

- From the Cassia neighborhoods to the Post Office/Library/Shopping Center along Cassia Road, Poinsettia Lane, Oriole Court, Mimosa Drive, Moorhen Place, and Dove Lane instead of Cassia Road, El Camino Real, and Dove Lane

- From the north on El Camino Real to westbound Poinsettia Lane along Cassia Road and Poinsettia Lane instead of directly to Poinsettia Lane

The analysis of route travel time included the distance and typical travel speed along each roadway on the route and average delay for each movement needed at intersections along the route. Calculations of intersection turning-movement delay come from the HCM analysis of future traffic

conditions. Therefore, the analysis presents a worst-case accounting for the potential for cut-through routes to increase in attractiveness as arterial traffic volumes increase. It should be noted that delay to vehicles traveling through the new traffic signal on Poinsettia Lane at the entry to the Poinsettia 61 residential project is accounted for in the analysis.

Table S provides a summary of travel time for routes from West Poinsettia Lane to the Post Office/ Library/Shopping Center and the reverse trip. As Table S shows, the cut-through route is about 0.10 of a mile shorter and anticipated to save 1 minute of travel time. The reverse trip leaving the shopping center is anticipated to save 2 minutes of travel time due to the increased delay for making left turns at El Camino Real and Poinsettia Lane. This is sufficient time savings that some of the vehicles traveling between the shopping center and Poinsettia Lane to the west may desire to cut through the local streets.

Table S: Route Options from West Poinsettia Lane to Shopping Center

Route	Segment	Speed (mph)	Distance (miles)	Time (minutes)	Intersection Delay (minutes)
To Shopping Center on Arterials	Poinsettia Lane	33	0.27	0.49	0.86
	El Camino Real	55	0.32	0.35	0.78
	Dove Lane	30	0.06	0.13	0.17
	Total		**0.65**	**2.78**	
To Shopping Center through Neighborhood	Oriole Court-Mimosa Drive-Moorhen Place	25	0.31	0.74	0.42
	Dove Lane	30	0.21	0.42	0.12
	Total		**0.52**	**1.70**	
From Shopping Center on Arterials	Dove Lane	30	0.06	0.13	0.17
	El Camino Real	55	0.32	0.35	1.56
	Poinsettia Lane	33	0.27	0.49	1.29
	Total		**0.65**	**3.99**	
From Shopping Center through Neighborhood	Dove Lane	30	0.21	0.42	0.25
	Oriole Court-Mimosa Drive-Moorhen Place	25	0.31	0.74	0.57
	Total		**0.52**	**1.98**	

mph = miles per hour

Table T provides a summary of travel time for routes from the neighborhoods around Cassia Road to the Post Office/Library/Shopping Center and the reverse trip. As Table T shows, the cut-through route is about 0.10 of a mile longer and anticipated to require about 15 seconds more to get to the shopping center. The reverse trip leaving the shopping center is anticipated to save 10 seconds of travel time due to the increased delay for making left turns at El Camino Real and Cassia Road. Some of the vehicles leaving the shopping center to go back to the neighborhoods along Cassia Road may choose to cut through the local streets rather than wait to turn left from Dove Lane to El Camino Real.

Table U provides a summary of travel time for routes from El Camino Real north of Cassia Road to Poinsettia Lane west of Cassia Road and the reverse trip. As Table U shows, the cut-through route is about 0.50 mile shorter and anticipated to require about 1.4 minutes less time. The reverse trip traveling east on Poinsettia Lane and eventually north on El Camino Real is anticipated to save less

Table T: Route Options from Cassia Neighborhoods to Shopping Center

Route	Segment	Speed (mph)	Distance (miles)	Time (minutes)	Intersection Delay (minutes)
To Shopping Center on Arterials	Cassia Road	29	0.27	0.55	0.76
	El Camino Real	55	0.67	0.73	0.78
	Dove Lane	30	0.06	0.13	0.17
	Total		**1.00**	**3.12**	
To Shopping Center through Neighborhood	Cassia Road	29	0.21	0.44	0.49
	Poinsettia Lane	33	0.40	0.73	0.13
	Oriole Court-Mimosa Drive-Moorhen Place	25	0.31	0.74	0.29
	Dove Lane	30	0.21	0.42	0.12
	Total		**1.13**	**3.36**	
From Shopping Center on Arterials	Dove Lane	30	0.06	0.13	0.17
	El Camino Real	55	0.67	0.73	1.56
	Cassia Road	29	0.27	0.54	0.87
	Total		**1.00**	**4.00**	
From Shopping Center through Neighborhood	Dove Lane	30	0.21	0.42	0.25
	Oriole Court-Mimosa Drive-Moorhen Place	25	0.31	0.74	0.41
	Poinsettia Lane	33	0.40	0.73	0.29
	Cassia Road	29	0.21	0.44	0.55
	Total		**1.13**	**3.83**	

mph = miles per hour

Table U: Route Options from North El Camino Real to West Poinsettia Lane

Route	Segment	Speed (mph)	Distance (miles)	Time (minutes)	Intersection Delay (minutes)
North to West on Arterials	El Camino Real	55	0.32	0.35	0.87
	Poinsettia Lane	33	0.67	1.23	0.55
	Total		**0.99**	**3.00**	
North to West through Neighborhood	El Camino Real	55	0	0	0.25
	Cassia Road	29	0.49	1.00	0.35
	Poinsettia Lane	33	0	0	0
	Total		**0.49**	**1.60**	
West to North on Arterials	Poinsettia Lane	33	0.67	1.22	1.13
	El Camino Real	55	0.32	0.35	0.14
	Total		**0.99**	**2.84**	
West to North through Neighborhood	Poinsettia Lane	33	0	0	0.38
	Cassia Road	29	0.49	1.00	0.77
	El Camino Real	55	0	0	0
	Total		**0.49**	**2.15**	

mph = miles per hour

time (about 40 seconds) due to the increased delay for making left turns at Cassia Road and El Camino Real. Because the route is obviously shorter and drivers have been accustomed to traveling this route around the gap in Poinsettia Lane, many of the vehicles making this trip may choose to cut through Cassia Road.

Traffic model data reveal that cut-through traffic could increase traffic volumes along Oriole Court, Mimosa Drive, Moorhen Place, and Dove Lane by 10 percent. Cut through traffic on Cassia Road between El Camino Real and Poinsettia Lane occurs today due to the gap in Poinsettia Lane. Vehicles to/from South El Camino Real will use Poinsettia Lane, but vehicles to/from North El Camino Real may continue to use Cassia Road resulting in up to 400 vehicles per peak hour cutting through on Cassia Road.

CARLSBAD RESIDENTIAL TRAFFIC MANAGEMENT PROGRAM

The Carlsbad Residential Traffic Management Program (Carlsbad, May 2011) was created to provide a process for minimizing disruptions to residential neighborhoods from excessive speeds and high volumes. The program only applies to residential streets and should not be directly applied to non-residential streets. No residential homes take access from Cassia Road. However, upon completion of the Poinsettia Lane Gap Closure, regional traffic will have alternative connections not relying on Cassia Road. At that time, the City may determine that traffic calming solutions outside of the Carlsbad Residential Traffic Management Program could apply to Cassia Road.

As stated previously, the Carlsbad General Plan Mobility Element defines the purposes of different roadway classifications. Cassia Road, Oriole Court, Mimosa Drive, Moorhen Place, and Dove Lane are classified as Local/Neighborhood Streets and should be connecting people to residential neighborhoods. Connections to different areas and land uses of the City should occur on Arterial Streets or Arterial Connectors.

This report identifies three potential disruptions to residential neighborhoods in the study area:

- Speeding issues on Cassia Road, particularly westbound (downhill) traffic
- Potential for cut-through traffic along Oriole Court-Moorhen Place-Dove Lane by vehicles traveling between the Post Office/Library/Shopping Center and Poinsettia Lane to the west
- Potential for cut-through traffic along Cassia Road by vehicles traveling from eastbound Poinsettia Lane to northbound El Camino Real and from southbound El Camino Real to westbound Poinsettia Lane

This section describes potential measures to minimize neighborhood disruption. The Carlsbad Residential Traffic Management Program requires a high level of resident involvement to ensure that the measures being implemented are desired and accepted by a majority of the residents. Potential measures to be taken can fall into the categories of Education, Engineering, Enforcement, or Enhancement. The Carlsbad Residential Traffic Management Program defines these as:

> **Education:** Providing resource materials and information to residents to inform them about all aspects of traffic calming.
>
> **Engineering:** Physical measures and other techniques utilized in the traffic calming program that are based upon input and concurrence by residents, engineering principles, financial and environmental considerations.

Enforcement: Police presence and selective enforcement of vehicle code violations.

Enhancement: Using special treatments in the physical measures through design and/or landscaping features to improve livability, aesthetics, community pride.

A traffic calming toolbox is provided describing various strategies within these categories.

Speeding On Cassia Road

The posted speed limit is 35 mph, which is reinforced by four speed feedback signs. If vehicles are traveling at this speed, adequate sight distance (250 feet at 35 mph) is provided at intersections along Cassia Road. Most drivers are complying with the posted speed limit in the existing condition (the observed 85th percentile speed was 29 mph). However, many vehicles were observed exceeding the posted speed limit by 10 mph (with a few exceeding 15 mph over the posted speed limit). At these speeds, intersections on Cassia Road do not have sufficient stopping sight distance (430 feet at 50 mph). This pattern of majority compliance and several extreme outliers is consistent with observed patterns of cut-through traffic.

The Carlsbad Residential Traffic Management Program lists several measures for reducing traffic speeds. Narrowing on Cassia Road (for the addition of bike lanes) has already been applied. Vertical traffic control measures, such as speed tables, work best when they are needed for speed reduction at a particular location, such as a pedestrian crossing. The downside is an increase in noise at the location of the vertical traffic control measure as vehicles brake and then accelerate to gain back the lost speed. Traffic Calming State of the Practice, (ITE 1999) describes many of the measures contained within the Carlsbad Residential Traffic Management Program toolbox. The Carlsbad Residential Traffic Management Program recommends 300 feet to 700 feet spacing between speed control devices for residential streets with a 25 mph speed limit. As each of these locations would generate increased noise, the most residents along Cassia Road would experience increased noise. Therefore, vertical traffic control measures are not recommended. The MUTCD provides warrants for the placement of stop signs and discourages use where warrants are not met. Traffic Calming State of the Practice discourages the addition of unwarranted stop signs to residential streets as compliance with these signs is low, an undeserved expectation of safety is introduced, and collisions increase as a result.

The surveys taken for this report showed that outlying non-compliant speeds were most common traveling westbound (downhill) in the early evening hours of 4:00 p.m. to 7:00 p.m. Targeted police enforcement (Measure TB-5) during these times may have a positive influence on driver behavior. As the Carlsbad Residential Traffic Management Program reports, benefits are sometimes short-term without regular periodic enforcement.

A new traffic signal at Poinsettia Lane/Cassia Road may assist to reduce the number of vehicles exceeding the speed limit on Cassia Road. In the existing condition, vehicles traveling westbound (downhill) do not have opposing traffic at and might not comply with the stop sign at the intersection of Poinsettia Lane/Cassia Road. Without an expectation of having to stop, some vehicles allow for the steady increase in speed as they travel downhill. This likely contributes to the concentration of hit object collisions at this intersection. The future traffic signal will require a complete stop on a red signal indication, which may moderate the number of vehicles traveling at

excessive speed. To that end, it is recommended that the traffic signal phasing defaults to green for through traffic on Poinsettia Lane and that detectors on Cassia be spaced so that vehicles traveling in excess of 35 mph would have to stop before the light turns green.

Cut-Through Traffic on Oriole Court, Moorhen Place, and Dove Lane

Upon completion of the Poinsettia Lane gap closure, cut-through traffic from the west on Poinsettia Lane to the Post Office/Library/Shopping Center is possible because of a moderate time savings while traveling to the shopping center and a greater time savings returning from the shopping center. Successful implementation of traffic volume-reducing measures is difficult due to the desire to maintain network connectivity.

As the Oriole Court approach at the Oriole Court-Skimmer Court/Poinsettia Lane is the entry into a residential area, the application of an Entry Treatment (TB-19) may be appropriate. The Entry Treatment is a combination of Textured Pavement (TB-18) and Center Island Narrowing (TB-20). By itself, textured pavement can provide a visual cue to drivers that they are entering a residential neighborhood. The narrower lanes resulting from adding the center island can reduce speeds upon entry to the neighborhood. Exhibit 1 provides an example of an Entry Treatment in the City of Carlsbad. To further support the Entry Treatment, it is possible to place a structure within the center island imitating a guard house for a private gated community. In combination, these features can present a less inviting entry at the beginning of the cut-through route.

Source: Google Street View

Exhibit 1: Example of Entry Treatment

The City, through the Carlsbad Residential Traffic Management Program, can evaluate Oriole Court, and Moorhen Place to determine whether the criteria threshold for critical speed (i.e., 32 mph) is met or whether traffic volumes significantly exceed baseline volumes. If so, the public input steps outlined in the Carlsbad Residential Traffic Management Program can be followed to develop a traffic calming plan that could include measures such as speed cushions.

Dove Lane could be evaluated outside of the Carlsbad Residential Traffic Management Program process if traffic volumes significantly exceed baseline volumes. Given the increased time savings for

vehicles leaving the shopping center, cut-through deterrents at the Dove Lane entry to the neighborhood are perhaps even more important than at the Oriole Court entry. Speed Cushions (TB-13) are a vertical traffic control device designed to reduce vehicle speeds, but can also lead to traffic volume reductions. Traffic Calming State of the Practice provides data that indicates these devices can reduce traffic volume by 20 percent. The deterrent effect of these devices would be enhanced by placing the first set of speed cushions just west of the intersection with Black Skimmer Drive and pairing it with a warning sign that would be visible to drivers exiting the shopping center intersection with Dove Lane.

The City could explore signal-timing changes at the intersection of El Camino Real/Dove Lane that could reduce delay along the arterial route and thereby reduce the incentive to cut-through local roads. The westbound approach of Dove Lane has lower volume than the eastbound approach of Dove Lane. The City could consider either protected left-turn signal phasing that would reservice eastbound left turns and the end of the east-west phase or east-west split phasing with restriping to allow left turns from either eastbound lane. Either of these changes would increase the number of eastbound left turns per cycle, decrease delay for eastbound left turns, and reduce the incentive to cut through local roads.

Cut-Through Traffic on Cassia Road

Given the shorter distance and time savings for vehicles traveling between North El Camino Real and West Poinsettia Lane, Cassia Road is likely to continue to be used by drivers completing this trip. Because cut-through traffic is a possible source of existing speeding problems, measures that reduce cut-through traffic have the potential to reduce speeding concerns as well.

For traffic traveling eastbound on Poinsettia Lane to northbound on El Camino Real, the time savings of the cut-through route is less than one minute. Changes to the delay experienced at the traffic signals along the route could impact the time-savings advantage and alter driver behavior. Specifically, if the delays experienced when making eastbound left turns at Cassia Road and at El Camino Real are less than the delay making an eastbound left-turn at El Camino Real/Poinsettia Lane, than the time savings of the shorter travel path might be eliminated.

As mentioned previously, the traffic signal at Poinsettia Lane/Cassia Road should prioritize a green light for through traffic on Poinsettia Lane. In this configuration, vehicles approaching Cassia Road from eastbound Poinsettia Lane would encounter a red light for the left-turn lane. If the traffic signal changes westbound Poinsettia Lane to a red light so a green arrow can be provided to left turns onto Cassia Road, then delay is reduced. If the traffic signal is programmed to provide a green left-turn arrow only after the Cassia Road green light phase, then delay to the Poinsettia left turns is increased and this cut-through movement would be discouraged. Indeed, some drivers intending to cut through Cassia Road may give up on waiting for a green arrow and merge back into Poinsettia Lane through traffic.

The time savings for cut-through traffic for southbound El Camino Real to westbound Poinsettia Lane is about 1.5 minutes. This advantage could not be overcome solely through signal timing, but traffic signal timing can moderate the time-savings advantage. It is possible that grade differences and a curve in Poinsettia Lane may prevent sufficient corner sight distance (550 feet at 50 mph). If a traffic signal is constructed at Poinsettia Lane/Cassia Road, the City should investigate whether

sufficient corner sight distance is provided from Cassia Road to permit right turns on red. Since the traffic signal would default to a green light for Poinsettia Lane east-west traffic, if right turns on red are prohibited for Poinsettia Lane, then delay along the cut-through route would be increased and the attractiveness of the route would be somewhat reduced.

Enhanced Measures

While the Carlsbad Residential Traffic Management Program states that road closures are not recommended for use, the traffic calming toolbox includes many forms of road closure for traffic volume reduction such as Forced Turn Channelization, Median Barrier, Semi-Diverter, Partial Diverter, and Diagonal Diverter. If cut-through traffic continues to use Oriole Court-Moorhen Place-Dove Lane and Cassia Road, then road closures are an enhanced traffic-calming measure that would effectively eliminate the disruption to the residential neighborhoods. Road closures may be considered following the procedures found in the Carlsbad Residential Traffic Management Program if all other measures have failed to achieve their goals.

Road closures could be designed to only prevent vehicle trips. Pedestrian and bicycle access could be maintained as in the example provided in Exhibit 2 from a road closure in Fullerton, California. There is a potential that access for fire trucks could also be maintained. Speed cushions facilitate fire truck access because fire trucks have a wider wheel base that can straddle a speed cushion while passenger vehicles roll over a speed cushion on at least one side. Instead of one bicycle access as shown in Exhibit 2, a road closure with two bicycle access lanes (spaced at the width of a fire truck axle) could facilitate through access by fire trucks in an emergency.

Source: Google Street View

Exhibit 2: Example of Road Closure

SUMMARY, RECOMMENDATIONS, AND MONITORING

Poinsettia Lane from Carlsbad Boulevard to Melrose Drive has been a part of the Carlsbad planned roadway network since at least 1994. A project to complete Poinsettia Lane between Cassia Road and El Camino Real was included in the Carlsbad General Plan Mobility Element when it was adopted by the City Council in September 2015. At this time, the City is preparing to complete the gap closure of Poinsettia Lane.

This traffic investigation considered the potential effects of the gap closure on the surrounding roadway system and adjacent intersections and provided potential strategies for limiting the intrusion of cut-through traffic into the Viadana and Pavoreal neighborhoods. Baseline conditions were also established that can be used to determine the extent of intrusion if requests for additional intervention are pursued through the Carlsbad Residential Traffic Management Program.

Table V summarizes the baseline roadway volume, travel speed, and collision history for local/ neighborhood roads near the Poinsettia Lane gap closure. These data can be monitored to determine the effects of the Poinsettia Lane gap closure.

Table V: Before Gap Closure (2018) Traffic Condition Summary

Roadway Segment	Roadway Volume	Typical Speed	>5 mph over Speed Limit?	Collisions over Past 10 Years
Poinsettia Lane (Ambrosia Lane to Cassia Road)	9,789	33	N	3
Cassia Road (Poinsettia Lane to El Camino Real)	9,290	30	Y	6
Ambrosia Lane (Poinsettia Lane to Aviara Parkway)	3,321	34	N	12
Mimosa Drive (Oriole Court to Aviara Parkway)	679	25	N	1
Dove Lane (Moorhen Place to Black Skimmer Road)	368	30	N	0

mph = miles per hour

This traffic investigation found that the Poinsettia Lane gap closure is not expected to alter travel patterns in a way that would cause a currently functioning intersection to operate at an unsatisfactory level of service. It is anticipated that the Poinsettia Lane gap closure will reduce some traffic on Ambrosia Lane, Aviara Parkway, and Cassia Road. However, not all cut-through traffic currently using Cassia Road would be removed after the Poinsettia Lane gap closure (while traffic to/from the south on El Camino Real would find Poinsettia Lane a shorter route, traffic to/from the north on El Camino Real would still find Cassia Road a shorter route). In addition, the Poinsettia Lane gap closure opens an opportunity for some traffic to cut through the Viadana neighborhood on their way to and from the shopping center at the northwest corner of El Camino Real/Aviara Parkway.

A number of recommendations are made for consideration by the City.

- A speeding issue is present on Cassia Road which could be addressed with directed police enforcement focusing on westbound (downhill) traffic between 4:00 p.m. and 7:00 p.m.

- If constructed, a traffic signal at Poinsettia Lane/Cassia Road should have signal timing supportive of the goals of deterring cut-through traffic and excessive speed:

- The signal should default to providing a green light for east-west traffic on Poinsettia Lane;
- The delay between detection of vehicles approaching on Cassia Road and a green light for Cassia Road should be timed so that vehicles approaching at a speed greater than 35 mph would be required to stop for the red light;
- A green arrow for left turns from Poinsettia Lane to Cassia Road should be provided only after the Cassia Road phase; and
- The City should consider whether sufficient corner sight distance is available to allow right turns on red from Cassia Road to Poinsettia Lane.

- Traffic calming features such as entry treatments (TB-19) and speed cushions (TB-13) may be considered based on the monitoring of traffic after completion of the Poinsettia Lane Gap Closure.

- Signal timing or striping at El Camino Real/Dove Lane could be modified to increase the number of eastbound left turns per cycle thereby reducing delay to vehicles traveling on arterials rather than cutting through local roads.

This traffic investigation also examined the intersection of El Camino Real/Poinsettia Lane to determine the following: how the operation of the intersection would be affected by the addition of a dedicated southbound right-turn lane, whether engineering constraints to adding a dedicated southbound right-turn lane are present, and whether constraints to adding a dedicated southbound right-turn lane are present.

The traffic investigation found that adding a southbound right-turn lane would have minimal effect on the performance of the intersection in existing conditions and only some benefit after completion of Poinsettia Lane. The benefit to the intersection does not improve any deficiency. The intersection is forecast to function at a satisfactory level of service with or without a dedicated southbound right-turn lane.

Construction of the southbound right-turn lane would face some ordinary engineering constraints and an additional constraint for reconstructing or relocating an SDG&E vault for a natural gas line. This portion of the construction could cost anywhere from $100,000–$500,000, bringing the total cost of construction to potentially $1.35 million.

Construction of the southbound right-turn lane at El Camino Real/Poinsettia Lane would also face constraints due to biological resources. The area of roadway widening is within a hardline preserve in the Habitat Management Plan for Natural Communities in the City of Carlsbad (HMP) and is within the Coastal Zone. Resource agency approval of impacts within a hardline boundary requires 3:1 mitigation. Permitting through the resource agencies will add to the total cost of adding an exclusive southbound right-turn lane at El Camino Real/Poinsettia Lane.

APPENDIX A

TRAFFIC VOLUME DATA AND SPEED SURVEYS

Prepared by NDS/ATD

VOLUME

Poinsettia Ln Bet. Aviara Pkwy & Ambrosia Ln

Day: Tuesday
Date: 5/22/2018

City: Carlsbad
Project #: CA18_4193_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	5,073	5,257	10,330

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			9		8		17		12:00			79		65		144	
00:15			6		1		7		12:15			62		53		115	
00:30			9		3		12		12:30			77		80		157	
00:45			3	27	3	15	6	42	12:45			83	301	60	258	143	559
01:00			4		0		4		13:00			76		74		150	
01:15			4		3		7		13:15			84		58		142	
01:30			5		1		6		13:30			55		60		115	
01:45			7	20	1	5	8	25	13:45			95	310	71	263	166	573
02:00			1		1		2		14:00			90		80		170	
02:15			1		2		3		14:15			84		164		248	
02:30			2		0		2		14:30			84		111		195	
02:45			1	5	2	5	3	10	14:45			116	374	108	463	224	837
03:00			1		0		1		15:00			101		109		210	
03:15			2		2		4		15:15			90		110		200	
03:30			0		0		0		15:30			76		124		200	
03:45			0	3	4	6	4	9	15:45			113	380	105	448	218	828
04:00			0		5		5		16:00			99		95		194	
04:15			1		7		8		16:15			75		86		161	
04:30			6		10		16		16:30			89		106		195	
04:45			8	15	15	37	23	52	16:45			105	368	81	368	186	736
05:00			7		20		27		17:00			108		109		217	
05:15			12		20		32		17:15			133		143		276	
05:30			13		22		35		17:30			114		103		217	
05:45			19	51	35	97	54	148	17:45			98	453	100	455	198	908
06:00			27		41		68		18:00			100		82		182	
06:15			22		40		62		18:15			95		70		165	
06:30			42		60		102		18:30			104		81		185	
06:45			60	151	82	223	142	374	18:45			111	410	67	300	178	710
07:00			51		99		150		19:00			102		82		184	
07:15			99		115		214		19:15			69		62		131	
07:30			109		161		270		19:30			51		47		98	
07:45			74	333	131	506	205	839	19:45			56	278	43	234	99	512
08:00			103		137		240		20:00			54		29		83	
08:15			84		125		209		20:15			66		32		98	
08:30			75		88		163		20:30			52		49		101	
08:45			117	379	78	428	195	807	20:45			51	223	55	165	106	388
09:00			75		96		171		21:00			40		17		57	
09:15			68		77		145		21:15			38		20		58	
09:30			56		78		134		21:30			30		17		47	
09:45			60	259	60	311	120	570	21:45			25	133	16	70	41	203
10:00			57		72		129		22:00			25		14		39	
10:15			54		64		118		22:15			12		16		28	
10:30			56		59		115		22:30			16		8		24	
10:45			66	233	43	238	109	471	22:45			16	69	6	44	22	113
11:00			73		56		129		23:00			19		13		32	
11:15			53		63		116		23:15			13		9		22	
11:30			66		86		152		23:30			7		8		15	
11:45			62	254	78	283	140	537	23:45			5	44	5	35	10	79
TOTALS				1730		2154		**3884**	**TOTALS**				3343		3103		**6446**
SPLIT %				44.5%		55.5%		**37.6%**	**SPLIT %**				51.9%		48.1%		**62.4%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	5,073	5,257	10,330

AM Peak Hour			07:15	07:30	**07:15**	**PM Peak Hour**			16:45	14:15	**17:00**
AM Pk Volume			385	554	**929**	**PM Pk Volume**			460	492	**908**
Pk Hr Factor			0.883	0.860	**0.860**	**Pk Hr Factor**			0.865	0.750	**0.822**
7 - 9 Volume	0	0	712	934	**1646**	**4 - 6 Volume**	0	0	821	823	**1644**
7 - 9 Peak Hour			07:15	07:30	**07:15**	**4 - 6 Peak Hour**			16:45	17:00	**17:00**
7 - 9 Pk Volume	0	0	385	554	**929**	**4 - 6 Pk Volume**	0	0	460	455	**908**
Pk Hr Factor	0.000	0.000	0.883	0.860	**0.860**	**Pk Hr Factor**	0.000	0.000	0.865	0.795	**0.822**

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Poinsettia Ln Bet. Ambrosia Ln & Cassia Rd

Day: Tuesday
Date: 5/22/2018

City: Carlsbad
Project #: CA18_4192_002

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	4,979	4,810	9,789

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00	0	0	4		3		7		12:00	0	0	84		62		146	
00:15	0	0	5		1		6		12:15	0	0	63		45		108	
00:30	0	0	4		2		6		12:30	0	0	66		68		134	
00:45	0	0	2	15	1	7	3	22	12:45	0	0	75	288	74	249	149	537
01:00	0	0	4		0		4		13:00	0	0	89		62		151	
01:15	0	0	1		2		3		13:15	0	0	69		46		115	
01:30	0	0	5		0		5		13:30	0	0	64		56		120	
01:45	0	0	4	14	0	2	4	16	13:45	0	0	67	289	77	241	144	530
02:00	0	0	1		2		3		14:00	0	0	63		91		154	
02:15	0	0	1		1		2		14:15	0	0	146		108		254	
02:30	0	0	2		1		3		14:30	0	0	111		100		211	
02:45	0	0	0	4	3	7	3	11	14:45	0	0	118	438	100	399	218	837
03:00	0	0	3		1		4		15:00	0	0	108		97		205	
03:15	0	0	1		1		2		15:15	0	0	83		110		193	
03:30	0	0	0		0				15:30	0	0	81		127		208	
03:45	0	0	0	4	4	6	4	10	15:45	0	0	85	357	121	455	206	812
04:00	0	0	1		2		3		16:00	0	0	78		105		183	
04:15	0	0	1		3		4		16:15	0	0	76		60		136	
04:30	0	0	5		4		9		16:30	0	0	93		83		176	
04:45	0	0	9	16	11	20	20	36	16:45	0	0	88	335	98	346	186	681
05:00	0	0	10		12		22		17:00	0	0	85		136		221	
05:15	0	0	18		14		32		17:15	0	0	111		106		217	
05:30	0	0	16		11		27		17:30	0	0	113		100		213	
05:45	0	0	19	63	27	64	46	127	17:45	0	0	77	386	100	442	177	828
06:00	0	0	30		21		51		18:00	0	0	72		106		178	
06:15	0	0	34		27		61		18:15	0	0	74		96		170	
06:30	0	0	48		49		97		18:30	0	0	83		118		201	
06:45	0	0	78	190	53	150	131	340	18:45	0	0	81	310	73	393	154	703
07:00	0	0	57		57		114		19:00	0	0	110		80		190	
07:15	0	0	96		128		224		19:15	0	0	55		55		110	
07:30	0	0	139		126		265		19:30	0	0	48		60		108	
07:45	0	0	153	445	91	402	244	847	19:45	0	0	29	242	53	248	82	490
08:00	0	0	115		77		192		20:00	0	0	34		36		70	
08:15	0	0	107		95		202		20:15	0	0	61		35		96	
08:30	0	0	91		60		151		20:30	0	0	74		30		104	
08:45	0	0	88	401	114	346	202	747	20:45	0	0	46	215	43	144	89	359
09:00	0	0	102		72		174		21:00	0	0	25		24		49	
09:15	0	0	74		70		144		21:15	0	0	30		22		52	
09:30	0	0	70		83		153		21:30	0	0	21		22		43	
09:45	0	0	65	311	56	281	121	592	21:45	0	0	25	101	17	85	42	186
10:00	0	0	62		58		120		22:00	0	0	18		16		34	
10:15	0	0	62		53		115		22:15	0	0	14		16		30	
10:30	0	0	59		47		106		22:30	0	0	15		4		19	
10:45	0	0	49	232	36	194	85	426	22:45	0	0	12	59	6	42	18	101
11:00	0	0	70		62		132		23:00	0	0	9		7		16	
11:15	0	0	48		57		105		23:15	0	0	4		9		13	
11:30	0	0	60		65		125		23:30	0	0	6		8		14	
11:45	0	0	57	235	72	256	129	491	23:45	0	0	10	29	7	31	17	60
TOTALS				1930		1735		3665	TOTALS				3049		3075		6124
SPLIT %				52.7%		47.3%		37.4%	SPLIT %				49.8%		50.2%		62.6%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	4,979	4,810	9,789

AM Peak Hour				07:30		07:15		07:15	PM Peak Hour				14:15		15:15			14:15
AM Pk Volume				514		422		925	PM Pk Volume				483		463			888
Pk Hr Factor				0.840		0.824		0.873	Pk Hr Factor				0.827		0.911			0.874
7 - 9 Volume	0	0		846		748		1594	4 - 6 Volume	0	0		721		788			1509
7 - 9 Peak Hour				07:30		07:15		07:15	4 - 6 Peak Hour				16:45		17:00			16:45
7 - 9 Pk Volume	0	0		514		422		925	4 - 6 Pk Volume	0	0		397		442			837
Pk Hr Factor	0.000	0.000		0.840		0.824		0.873	Pk Hr Factor	0.000	0.000		0.878		0.813			0.947

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Poinsettia Ln Bet. Ambrosia Ln & Cassia Rd

Day: Wednesday
Date: 5/23/2018

City: Carlsbad
Project #: CA18_4192_002

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	4,985	4,668	9,653

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00	0	0	8		5		13		12:00	0	0	58		67		125	
00:15	0	0	10		4		14		12:15	0	0	82		59		141	
00:30	0	0	4		3		7		12:30	0	0	60		55		115	
00:45	0	0	0	22	3	15	3	37	12:45	0	0	62	262	77	258	139	520
01:00	0	0	1		3		4		13:00	0	0	88		57		145	
01:15	0	0	2		0		2		13:15	0	0	68		49		117	
01:30	0	0	0		2		2		13:30	0	0	75		62		137	
01:45	0	0	3	6	2	7	5	13	13:45	0	0	77	308	86	254	163	562
02:00	0	0	1		0		1		14:00	0	0	64		82		146	
02:15	0	0	1		0		1		14:15	0	0	142		100		242	
02:30	0	0	3		0		3		14:30	0	0	106		94		200	
02:45	0	0	1	6	1	1	2	7	14:45	0	0	126	438	99	375	225	813
03:00	0	0	2		1		3		15:00	0	0	94		82		176	
03:15	0	0	3		1		4		15:15	0	0	72		94		166	
03:30	0	0	1		2		3		15:30	0	0	81		81		162	
03:45	0	0	1	7	1	5	2	12	15:45	0	0	85	332	101	358	186	690
04:00	0	0	2		2		4		16:00	0	0	75		96		171	
04:15	0	0	4		3		7		16:15	0	0	81		101		182	
04:30	0	0	11		4		15		16:30	0	0	84		93		177	
04:45	0	0	6	23	8	17	14	40	16:45	0	0	100	340	112	402	212	742
05:00	0	0	6		12		18		17:00	0	0	83		109		192	
05:15	0	0	19		11		30		17:15	0	0	93		124		217	
05:30	0	0	21		12		33		17:30	0	0	100		109		209	
05:45	0	0	24	70	25	60	49	130	17:45	0	0	60	336	89	431	149	767
06:00	0	0	26		21		47		18:00	0	0	72		115		187	
06:15	0	0	40		37		77		18:15	0	0	84		94		178	
06:30	0	0	58		45		103		18:30	0	0	77		91		168	
06:45	0	0	78	202	60	163	138	365	18:45	0	0	88	321	68	368	156	689
07:00	0	0	61		66		127		19:00	0	0	66		62		128	
07:15	0	0	95		99		194		19:15	0	0	46		60		106	
07:30	0	0	159		101		260		19:30	0	0	54		49		103	
07:45	0	0	124	439	80	346	204	785	19:45	0	0	46	212	50	221	96	433
08:00	0	0	103		95		198		20:00	0	0	73		54		127	
08:15	0	0	125		77		202		20:15	0	0	66		65		131	
08:30	0	0	86		62		148		20:30	0	0	56		44		100	
08:45	0	0	112	426	102	336	214	762	20:45	0	0	37	232	35	198	72	430
09:00	0	0	111		69		180		21:00	0	0	35		34		69	
09:15	0	0	71		52		123		21:15	0	0	20		38		58	
09:30	0	0	78		55		133		21:30	0	0	28		21		49	
09:45	0	0	71	331	71	247	142	578	21:45	0	0	19	102	28	121	47	223
10:00	0	0	69		51		120		22:00	0	0	19		18		37	
10:15	0	0	49		56		105		22:15	0	0	15		11		26	
10:30	0	0	62		50		112		22:30	0	0	16		13		29	
10:45	0	0	62	242	42	199	104	441	22:45	0	0	17	67	2	44	19	111
11:00	0	0	61		57		118		23:00	0	0	10		8		18	
11:15	0	0	61		48		109		23:15	0	0	12		6		18	
11:30	0	0	55		59		114		23:30	0	0	10		6		16	
11:45	0	0	49	226	55	219	104	445	23:45	0	0	3	35	3	23	6	58
TOTALS				2000		1615		3615	TOTALS				2985		3053		6038
SPLIT %				55.3%		44.7%		37.4%	SPLIT %				49.4%		50.6%		62.6%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	4,985	4,668	9,653

AM Peak Hour			07:30	07:15	07:30	PM Peak Hour			14:15	16:45	14:15
AM Pk Volume			511	375	864	PM Pk Volume			468	454	843
Pk Hr Factor			0.803	0.928	0.831	Pk Hr Factor			0.824	0.915	0.871
7 - 9 Volume	0	0	865	682	1547	4 - 6 Volume	0	0	676	833	1509
7 - 9 Peak Hour			07:30	07:15	07:30	4 - 6 Peak Hour			16:45	16:45	16:45
7 - 9 Pk Volume	0	0	511	375	864	4 - 6 Pk Volume	0	0	376	454	830
Pk Hr Factor	0.000	0.000	0.803	0.928	0.831	Pk Hr Factor	0.000	0.000	0.940	0.915	0.956

SPEED

Poinsettia Ln Bet. Ambrosia Ln & Cassia Rd

Day: Tuesday
Date: 5/22/2018

City: Carlsbad
Project #: CA18_4192_002

Summary

Time	< 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 +	Total
00:00 AM	0	0	3	9	9	1	0	0	0	0	0	0	0	22
01:00	0	0	3	3	8	1	1	0	0	0	0	0	0	16
02:00	0	0	1	5	5	0	0	0	0	0	0	0	0	11
03:00	0	0	5	1	4	0	0	0	0	0	0	0	0	10
04:00	0	0	9	15	11	1	0	0	0	0	0	0	0	36
05:00	0	1	20	42	42	16	6	0	0	0	0	0	0	127
06:00	0	11	78	139	85	24	3	0	0	0	0	0	0	340
07:00	5	58	253	446	71	11	3	0	0	0	0	0	0	847
08:00	0	38	210	353	120	22	3	1	0	0	0	0	0	747
09:00	1	25	150	248	145	17	6	0	0	0	0	0	0	592
10:00	1	11	88	196	96	33	1	0	0	0	0	0	0	426
11:00	0	5	112	237	100	31	6	0	0	0	0	0	0	491
12:00 PM	1	14	111	250	128	32	1	0	0	0	0	0	0	537
13:00	0	17	141	222	117	27	5	1	0	0	0	0	0	530
14:00	2	32	281	405	103	14	0	0	0	0	0	0	0	837
15:00	4	43	222	356	155	29	3	0	0	0	0	0	0	812
16:00	3	18	142	275	192	46	4	1	0	0	0	0	0	681
17:00	2	37	196	383	176	31	3	0	0	0	0	0	0	828
18:00	1	33	179	324	141	23	2	0	0	0	0	0	0	703
19:00	0	22	128	220	100	16	4	0	0	0	0	0	0	490
20:00	0	14	77	149	91	26	1	1	0	0	0	0	0	359
21:00	0	6	29	65	71	13	2	0	0	0	0	0	0	186
22:00	1	1	18	37	34	9	1	0	0	0	0	0	0	101
23:00	0	3	8	22	18	9	0	0	0	0	0	0	0	60
Totals	21	389	2464	4402	2022	432	55	4						9789
% of Totals	0%	4%	25%	45%	21%	4%	1%	0%						100%

AM Volumes	7	149	932	1694	696	157	29	1	0	0	0	0	0	3665
% AM	0%	2%	10%	17%	7%	2%	0%	0%						37%
AM Peak Hour	07:00	07:00	07:00	07:00	09:00	10:00	05:00	08:00						07:00
Volume	5	58	253	446	145	33	6	1						847
PM Volumes	14	240	1532	2708	1326	275	26	3	0	0	0	0	0	6124
% PM	0%	2%	16%	28%	14%	3%	0%	0%						63%
PM Peak Hour	15:00	15:00	14:00	14:00	16:00	16:00	13:00	13:00						14:00
Volume	4	43	281	405	192	46	5	1						837

Directional Peak Periods All Speeds	AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes	
	Volume	%	Volume	%	Volume	%	Volume	%
	1594	16%	1067	11%	1509	15%	5619	57%

Street Name	Direction	Percentiles					
		15th	50th	Average	85th	95th	ADT
Poinsettia Ln	Summary	22	27	27	33	35	9789

SPEED

Poinsettia Ln Bet. Ambrosia Ln & Cassia Rd

Day: Wednesday
Date: 5/23/2018

City: Carlsbad
Project #: CA18_4192_002

Summary

Time	< 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 +	Total
00:00 AM	0	1	3	15	11	6	1	0	0	0	0	0	0	37
01:00	0	0	3	5	2	3	0	0	0	0	0	0	0	13
02:00	0	0	2	0	3	2	0	0	0	0	0	0	0	7
03:00	0	0	4	6	1	1	0	0	0	0	0	0	0	12
04:00	0	2	4	17	12	4	1	0	0	0	0	0	0	40
05:00	0	4	14	55	37	16	4	0	0	0	0	0	0	130
06:00	0	7	70	164	88	33	2	1	0	0	0	0	0	365
07:00	10	34	271	363	86	19	2	0	0	0	0	0	0	785
08:00	1	30	201	345	143	36	6	0	0	0	0	0	0	762
09:00	0	25	103	243	156	45	6	0	0	0	0	0	0	578
10:00	0	14	79	205	118	25	0	0	0	0	0	0	0	441
11:00	2	14	113	193	97	23	2	1	0	0	0	0	0	445
12:00 PM	1	17	113	245	110	30	4	0	0	0	0	0	0	520
13:00	1	18	138	264	114	23	4	0	0	0	0	0	0	562
14:00	3	34	276	377	105	15	3	0	0	0	0	0	0	813
15:00	2	16	171	336	138	25	2	0	0	0	0	0	0	690
16:00	2	45	180	309	171	31	3	1	0	0	0	0	0	742
17:00	9	35	192	365	138	24	4	0	0	0	0	0	0	767
18:00	3	30	186	331	120	18	1	0	0	0	0	0	0	689
19:00	1	17	85	204	93	27	6	0	0	0	0	0	0	433
20:00	2	13	114	194	87	19	1	0	0	0	0	0	0	430
21:00	0	1	48	86	66	17	4	1	0	0	0	0	0	223
22:00	0	4	12	47	33	14	1	0	0	0	0	0	0	111
23:00	0	2	5	24	16	9	2	0	0	0	0	0	0	58
Totals	37	363	2387	4393	1945	465	59	4						9653
% of Totals	0%	4%	25%	46%	20%	5%	1%	0%						100%

AM Volumes	13	131	867	1611	754	213	24	2	0	0	0	0	0	3615
% AM	0%	1%	9%	17%	8%	2%	0%	0%						37%
AM Peak Hour	07:00	07:00	07:00	07:00	09:00	09:00	08:00	06:00						07:00
Volume	10	34	271	363	156	45	6	1						785
PM Volumes	24	232	1520	2782	1191	252	35	2	0	0	0	0	0	6038
% PM	0%	2%	16%	29%	12%	3%	0%	0%						63%
PM Peak Hour	17:00	16:00	14:00	14:00	16:00	16:00	19:00	16:00						14:00
Volume	9	45	276	377	171	31	6	1						813

Directional Peak Periods All Speeds	AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes	
	Volume	%	Volume	%	Volume	%	Volume	%
	1547	16%	1082	11%	1509	16%	5515	57%

Street Name	Direction	Percentiles					
		15th	50th	Average	85th	95th	ADT
Poinsettia Ln	Summary	22	27	27	33	35	9653

Prepared by NDS/ATD

VOLUME

Poinsettia Ln Bet. El Camino Real & Cassia Rd

Day: Tuesday
Date: 5/22/2018

City: Carlsbad
Project #: CA18_4193_003

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	392	459	851

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			0		1		1		12:00			4		6		10	
00:15			1		0		1		12:15			5		9		14	
00:30			0		0		0		12:30			5		1		6	
00:45			0	1	0	1	0	2	12:45			4	18	5	21	9	39
01:00			0		1		1		13:00			3		7		10	
01:15			0		0		0		13:15			9		8		17	
01:30			0		0		0		13:30			3		3		6	
01:45			0		0	1	0	1	13:45			7	22	6	24	13	46
02:00			0		0		0		14:00			11		6		17	
02:15			0		0		0		14:15			16		17		33	
02:30			0		0		0		14:30			27		31		58	
02:45			0		0		0		14:45			5	59	15	69	20	128
03:00			0		0		0		15:00			8		10		18	
03:15			0		0		0		15:15			7		11		18	
03:30			1		1		2		15:30			6		15		21	
03:45			0	1	1	2	1	3	15:45			8	29	10	46	18	75
04:00			1		0		1		16:00			8		7		15	
04:15			0		0		0		16:15			5		11		16	
04:30			0		1		1		16:30			10		11		21	
04:45			2	3	0	1	2	4	16:45			10	33	9	38	19	71
05:00			1		0		1		17:00			7		12		19	
05:15			3		0		3		17:15			8		7		15	
05:30			1		0		1		17:30			7		6		13	
05:45			0	5	0		0	5	17:45			6	28	10	35	16	63
06:00			2		0		2		18:00			4		10		14	
06:15			1		0		1		18:15			0		3		3	
06:30			4		2		6		18:30			4		8		12	
06:45			14	21	1	3	15	24	18:45			3	11	6	27	9	38
07:00			12		3		15		19:00			3		5		8	
07:15			7		20		27		19:15			4		7		11	
07:30			11		9		20		19:30			4		8		12	
07:45			8	38	6	38	14	76	19:45			1	12	4	24	5	36
08:00			8		8		16		20:00			3		4		7	
08:15			4		5		9		20:15			2		6		8	
08:30			11		4		15		20:30			1		5		6	
08:45			7	30	3	20	10	50	20:45			3	9	6	21	9	30
09:00			11		8		19		21:00			0		4		4	
09:15			3		3		6		21:15			1		5		6	
09:30			8		5		13		21:30			2		3		5	
09:45			4	26	8	24	12	50	21:45			1	4	3	15	4	19
10:00			7		5		12		22:00			1		0		1	
10:15			4		2		6		22:15			0		2		2	
10:30			2		9		11		22:30			1		0		1	
10:45			4	17	4	20	8	37	22:45			0	2	0	2	0	4
11:00			2		5		7		23:00			1		3		4	
11:15			3		4		7		23:15			0		2		2	
11:30			10		5		15		23:30			2		1		3	
11:45			5	20	6	20	11	40	23:45			0	3	1	7	1	10
TOTALS				162		130		**292**	**TOTALS**				230		329		**559**
SPLIT %				55.5%		44.5%		**34.3%**	**SPLIT %**				41.1%		58.9%		**65.7%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	392	459	851

AM Peak Hour			06:45	07:15	**06:45**	**PM Peak Hour**			13:45	14:15	**14:15**
AM Pk Volume			44	43	**77**	**PM Pk Volume**			61	73	**129**
Pk Hr Factor			0.786	0.538	**0.713**	**Pk Hr Factor**			0.565	0.589	**0.556**
7 - 9 Volume	0	0	68	58	**126**	**4 - 6 Volume**	0	0	61	73	**134**
7 - 9 Peak Hour			07:00	07:15	**07:15**	**4 - 6 Peak Hour**			16:30	16:15	**16:15**
7 - 9 Pk Volume	0	0	38	43	**77**	**4 - 6 Pk Volume**	0	0	35	43	**75**
Pk Hr Factor	0.000	0.000	0.792	0.538	**0.713**	**Pk Hr Factor**	0.000	0.000	0.875	0.896	**0.893**

Prepared by NDS/ATD

VOLUME

El Camino Real Bet. Cassia Rd & Poinsettia Ln

Day: Tuesday
Date: 5/22/2018

City: Carlsbad
Project #: CA18_4193_004

DAILY TOTALS	NB	SB	EB	WB	Total
	16,228	17,008	0	0	33,236

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	19		12				31		12:00	233		239				472	
00:15	6		14				20		12:15	220		251				471	
00:30	8		10				18		12:30	255		297				552	
00:45	4	37	8	44			12	81	12:45	297	1005	257	1044			554	2049
01:00	8		6				14		13:00	258		258				516	
01:15	8		2				10		13:15	259		204				463	
01:30	4		4				8		13:30	242		253				495	
01:45	3	23	0	12			3	35	13:45	258	1017	218	933			476	1950
02:00	6		4				10		14:00	271		293				564	
02:15	4		6				10		14:15	173		264				437	
02:30	1		1				2		14:30	175		283				458	
02:45	2	13	4	15			6	28	14:45	351	970	336	1176			687	2146
03:00	5		4				9		15:00	317		294				611	
03:15	4		5				9		15:15	339		284				623	
03:30	15		6				21		15:30	342		323				665	
03:45	8	32	9	24			17	56	15:45	348	1346	302	1203			650	2549
04:00	12		11				23		16:00	346		381				727	
04:15	15		13				28		16:15	365		410				775	
04:30	20		17				37		16:30	347		409				756	
04:45	40	87	40	81			80	168	16:45	318	1376	423	1623			741	2999
05:00	41		29				70		17:00	306		496				802	
05:15	51		33				84		17:15	327		458				785	
05:30	63		45				108		17:30	275		451				726	
05:45	99	254	74	181			173	435	17:45	256	1164	427	1832			683	2996
06:00	114		77				191		18:00	255		300				555	
06:15	124		113				237		18:15	252		311				563	
06:30	189		151				340		18:30	209		294				503	
06:45	214	641	251	592			465	1233	18:45	186	902	227	1132			413	2034
07:00	241		324				565		19:00	171		195				366	
07:15	278		315				593		19:15	173		162				335	
07:30	309		447				756		19:30	147		141				288	
07:45	439	1267	364	1450			803	2717	19:45	108	599	126	624			234	1223
08:00	433		367				800		20:00	121		116				237	
08:15	396		332				728		20:15	98		117				215	
08:30	352		295				647		20:30	110		111				221	
08:45	380	1561	284	1278			664	2839	20:45	88	417	105	449			193	866
09:00	298		292				590		21:00	82		75				157	
09:15	290		244				534		21:15	73		77				150	
09:30	290		208				498		21:30	76		65				141	
09:45	246	1124	249	993			495	2117	21:45	60	291	59	276			119	567
10:00	238		227				465		22:00	62		43				105	
10:15	194		202				396		22:15	45		32				77	
10:30	194		224				418		22:30	52		47				99	
10:45	236	862	206	859			442	1721	22:45	29	188	30	152			59	340
11:00	211		251				462		23:00	41		28				69	
11:15	218		230				448		23:15	39		17				56	
11:30	251		211				462		23:30	21		29				50	
11:45	251	931	248	940			499	1871	23:45	20	121	21	95			41	216
TOTALS		6832		6469				13301	TOTALS		9396		10539				19935
SPLIT %		51.4%		48.6%				40.0%	SPLIT %		47.1%		52.9%				60.0%

DAILY TOTALS	NB	SB	EB	WB	Total
	16,228	17,008	0	0	33,236

AM Peak Hour	07:45	07:30			07:30	PM Peak Hour	15:45	17:00			16:30
AM Pk Volume	1620	1510			3087	PM Pk Volume	1406	1832			3084
Pk Hr Factor	0.923	0.845			0.961	Pk Hr Factor	0.963	0.923			0.961
7 - 9 Volume	2828	2728	0	0	5556	4 - 6 Volume	2540	3455	0	0	5995
7 - 9 Peak Hour	07:45	07:30			07:30	4 - 6 Peak Hour	16:00	17:00			16:30
7 - 9 Pk Volume	1620	1510	0	0	3087	4 - 6 Pk Volume	1376	1832	0	0	3084
Pk Hr Factor	0.923	0.845	0.000	0.000	0.961	Pk Hr Factor	0.942	0.923	0.000	0.000	0.961

Prepared by NDS/ATD

VOLUME

El Camino Real Bet. Poinsettia Ln & Aviara Pkwy

Day: Tuesday
Date: 5/22/2018

City: Carlsbad
Project #: CA18_4193_005

DAILY TOTALS	NB	SB	EB	WB	Total
	19,255	19,392	0	0	38,647

AM Period	NB		SB		EB		WB		TOTAL	
00:00	21		15						36	
00:15	8		11						19	
00:30	7		10						17	
00:45	6	42	7	43					13	85
01:00	13		5						18	
01:15	10		3						13	
01:30	6		5						11	
01:45	5	34	1	14					6	48
02:00	7		3						10	
02:15	4		7						11	
02:30	1		1						2	
02:45	3	15	5	16					8	31
03:00	3		4						7	
03:15	6		7						13	
03:30	15		10						25	
03:45	8	32	12	33					20	65
04:00	13		17						30	
04:15	16		17						33	
04:30	20		22						42	
04:45	39	88	56	112					95	200
05:00	41		40						81	
05:15	49		49						98	
05:30	75		65						140	
05:45	90	255	111	265					201	520
06:00	118		112						230	
06:15	134		174						308	
06:30	207		216						423	
06:45	220	679	342	844					562	1523
07:00	266		401						667	
07:15	311		438						749	
07:30	416		523						939	
07:45	509	1502	440	1802					949	3304
08:00	458		407						865	
08:15	399		427						826	
08:30	385		364						749	
08:45	390	1632	364	1562					754	3194
09:00	331		286						617	
09:15	300		297						597	
09:30	296		275						571	
09:45	278	1205	276	1134					554	2339
10:00	237		267						504	
10:15	206		264						470	
10:30	236		257						493	
10:45	243	922	235	1023					478	1945
11:00	247		270						517	
11:15	239		254						493	
11:30	272		257						529	
11:45	261	1019	283	1064					544	2083
TOTALS		7425		7912						**15337**
SPLIT %		48.4%		51.6%						**39.7%**

PM Period	NB		SB		EB		WB		TOTAL	
12:00	265		259						524	
12:15	249		305						554	
12:30	296		339						635	
12:45	348	1158	280	1183					628	2341
13:00	301		265						566	
13:15	312		257						569	
13:30	288		278						566	
13:45	336	1237	248	1048					584	2285
14:00	353		341						694	
14:15	355		293						648	
14:30	370		307						677	
14:45	404	1482	374	1315					778	2797
15:00	375		350						725	
15:15	372		341						713	
15:30	414		382						796	
15:45	402	1563	340	1413					742	2976
16:00	386		406						792	
16:15	459		418						877	
16:30	420		441						861	
16:45	396	1661	458	1723					854	3384
17:00	434		494						928	
17:15	361		453						814	
17:30	385		515						900	
17:45	352	1532	415	1877					767	3409
18:00	314		353						667	
18:15	331		310						641	
18:30	294		289						583	
18:45	242	1181	242	1194					484	2375
19:00	214		222						436	
19:15	199		183						382	
19:30	175		166						341	
19:45	141	729	158	729					299	1458
20:00	160		112						272	
20:15	133		118						251	
20:30	135		115						250	
20:45	119	547	110	455					229	1002
21:00	119		79						198	
21:15	95		85						180	
21:30	87		61						148	
21:45	76	377	61	286					137	663
22:00	72		41						113	
22:15	61		38						99	
22:30	52		47						99	
22:45	35	220	37	163					72	383
23:00	51		29						80	
23:15	44		20						64	
23:30	26		28						54	
23:45	22	143	17	94					39	237
TOTALS		11830		11480						**23310**
SPLIT %		50.8%		49.2%						**60.3%**

DAILY TOTALS	NB	SB	EB	WB	Total
	19,255	19,392	0	0	38,647

AM Peak Hour	07:30	07:15			**07:30**	**PM Peak Hour**	16:15	16:45			**16:15**
AM Pk Volume	1782	1808			**3579**	**PM Pk Volume**	1709	1920			**3520**
Pk Hr Factor	0.875	0.864			**0.943**	**Pk Hr Factor**	0.931	0.932			**0.948**
7 - 9 Volume	3134	3364	0	0	**6498**	**4 - 6 Volume**	3193	3600	0	0	**6793**
7 - 9 Peak Hour	07:30	07:15			**07:30**	**4 - 6 Peak Hour**	16:15	16:45			**16:15**
7 - 9 Pk Volume	1782	1808	0	0	**3579**	**4 - 6 Pk Volume**	1709	1920	0	0	**3520**
Pk Hr Factor	0.875	0.864	0.000	0.000	**0.943**	**Pk Hr Factor**	0.931	0.932	0.000	0.000	**0.948**

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Cassia Rd Bet. Poinsettia Ln & El Camino Real

Day: Tuesday
Date: 5/22/2018

City: Carlsbad
Project #: CA18_4192_006

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	4,620	4,324	8,944

AM Period	NB		SB		EB		WB		TOTAL	
00:00	0		0		5		6		11	
00:15	0		0		3		1		4	
00:30	0		0		4		2		6	
00:45	0		0		1	13	1	10	2	23
01:00	0		0		4		1		5	
01:15	0		0		1		1		2	
01:30	0		0		4		0		4	
01:45	0		0		4	13	1	3	5	16
02:00	0		0		1		1		2	
02:15	0		0		1		2		3	
02:30	0		0		2		0		2	
02:45	0		0		0	4	3	6	3	10
03:00	0		0		2		1		3	
03:15	0		0		3		1		4	
03:30	0		0		0		0			
03:45	0		0		0	5	3	5	3	10
04:00	0		0		1		2		3	
04:15	0		0		1		1		2	
04:30	0		0		6		4		10	
04:45	0		0		11	19	12	19	23	38
05:00	0		0		12		11		23	
05:15	0		0		18		11		29	
05:30	0		0		16		12		28	
05:45	0		0		22	68	23	57	45	125
06:00	0		0		29		15		44	
06:15	0		0		39		26		65	
06:30	0		0		53		34		87	
06:45	0		0		81	202	46	121	127	323
07:00	0		0		60		59		119	
07:15	0		0		90		75		165	
07:30	0		0		150		89		239	
07:45	0		0		131	431	71	294	202	725
08:00	0		0		116		87		203	
08:15	0		0		118		84		202	
08:30	0		0		93		50		143	
08:45	0		0		111	438	76	297	187	735
09:00	0		0		107		56		163	
09:15	0		0		77		68		145	
09:30	0		0		72		70		142	
09:45	0		0		71	327	58	252	129	579
10:00	0		0		61		54		115	
10:15	0		0		61		42		103	
10:30	0		0		53		46		99	
10:45	0		0		60	235	39	181	99	416
11:00	0		0		61		58		119	
11:15	0		0		52		61		113	
11:30	0		0		53		59		112	
11:45	0		0		56	222	69	247	125	469
TOTALS						1977		1492		**3469**
SPLIT %						57.0%		43.0%		**38.8%**

PM Period	NB		SB		EB		WB		TOTAL	
12:00	0		0		79		54		133	
12:15	0		0		60		38		98	
12:30	0		0		67		68		135	
12:45	0		0		69	275	78	238	147	513
13:00	0		0		81		53		134	
13:15	0		0		69		47		116	
13:30	0		0		60		53		113	
13:45	0		0		70	280	72	225	142	505
14:00	0		0		55		83		138	
14:15	0		0		126		104		230	
14:30	0		0		108		93		201	
14:45	0		0		96	385	94	374	190	759
15:00	0		0		85		78		163	
15:15	0		0		66		90		156	
15:30	0		0		90		88		178	
15:45	0		0		101	342	85	341	186	683
16:00	0		0		72		100		172	
16:15	0		0		58		89		147	
16:30	0		0		84		82		166	
16:45	0		0		74	288	112	383	186	671
17:00	0		0		77		117		194	
17:15	0		0		94		131		225	
17:30	0		0		111		89		200	
17:45	0		0		69	351	119	456	188	807
18:00	0		0		45		103		148	
18:15	0		0		53		83		136	
18:30	0		0		63		75		138	
18:45	0		0		66	227	84	345	150	572
19:00	0		0		73		46		119	
19:15	0		0		49		64		113	
19:30	0		0		31		61		92	
19:45	0		0		26	179	37	208	63	387
20:00	0		0		35		36		71	
20:15	0		0		41		40		81	
20:30	0		0		32		33		65	
20:45	0		0		26	134	35	144	61	278
21:00	0		0		19		26		45	
21:15	0		0		17		17		34	
21:30	0		0		21		11		32	
21:45	0		0		19	76	13	67	32	143
22:00	0		0		38		13		51	
22:15	0		0		19		10		29	
22:30	0		0		12		8		20	
22:45	0		0		9	78	6	37	15	115
23:00	0		0		7		3		10	
23:15	0		0		5		2		7	
23:30	0		0		7		3		10	
23:45	0		0		9	28	6	14	15	42
TOTALS						2643		2832		**5475**
SPLIT %						48.3%		51.7%		**61.2%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	4,620	4,324	8,944

AM Peak Hour			07:30	07:30	**07:30**
AM Pk Volume			515	331	**846**
Pk Hr Factor			0.858	0.930	**0.885**
7 - 9 Volume	0	0	869	591	**1460**
7 - 9 Peak Hour			07:30	07:30	**07:30**
7 - 9 Pk Volume	0	0	515	331	**846**
Pk Hr Factor	0.000	0.000	0.858	0.930	**0.885**

PM Peak Hour			14:15	17:00	**17:00**
PM Pk Volume			415	456	**807**
Pk Hr Factor			0.823	0.870	**0.897**
4 - 6 Volume	0	0	639	839	**1478**
4 - 6 Peak Hour			16:45	17:00	**17:00**
4 - 6 Pk Volume	0	0	356	456	**807**
Pk Hr Factor	0.000	0.000	0.802	0.870	**0.897**

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Cassia Rd Bet. Poinsettia Ln & El Camino Real

Day: Wednesday
Date: 5/23/2018

City: Carlsbad
Project #: CA18_4192_006

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	4,812	4,478	9,290

AM Period	NB		SB		EB		WB		TOTAL	
00:00	0		0		9		7		16	
00:15	0		0		10		3		13	
00:30	0		0		4		4		8	
00:45	0		0		0	23	3	17	3	40
01:00	0		0		1		2		3	
01:15	0		0		2		0		2	
01:30	0		0		0		3		3	
01:45	0		0		2	5	2	7	4	12
02:00	0		0		1		0		1	
02:15	0		0		1		0		1	
02:30	0		0		4		0		4	
02:45	0		0		1	7	1	1	2	8
03:00	0		0		2		1		3	
03:15	0		0		2		1		3	
03:30	0		0		3		2		5	
03:45	0		0		2	9	3	7	5	16
04:00	0		0		2		0		2	
04:15	0		0		5		2		7	
04:30	0		0		12		4		16	
04:45	0		0		7	26	10	16	17	42
05:00	0		0		7		8		15	
05:15	0		0		18		11		29	
05:30	0		0		23		12		35	
05:45	0		0		21	69	22	53	43	122
06:00	0		0		31		16		47	
06:15	0		0		45		30		75	
06:30	0		0		56		38		94	
06:45	0		0		78	210	51	135	129	345
07:00	0		0		72		62		134	
07:15	0		0		94		82		176	
07:30	0		0		141		79		220	
07:45	0		0		124	431	62	285	186	716
08:00	0		0		98		82		180	
08:15	0		0		133		70		203	
08:30	0		0		94		53		147	
08:45	0		0		108	433	94	299	202	732
09:00	0		0		111		54		165	
09:15	0		0		72		43		115	
09:30	0		0		74		52		126	
09:45	0		0		73	330	68	217	141	547
10:00	0		0		73		46		119	
10:15	0		0		54		51		105	
10:30	0		0		67		54		121	
10:45	0		0		63	257	42	193	105	450
11:00	0		0		52		59		111	
11:15	0		0		61		50		111	
11:30	0		0		61		54		115	
11:45	0		0		48	222	59	222	107	444
TOTALS						2022		1452		**3474**
SPLIT %						58.2%		41.8%		**37.4%**

PM Period	NB		SB		EB		WB		TOTAL	
12:00	0		0		65		65		130	
12:15	0		0		72		58		130	
12:30	0		0		63		57		120	
12:45	0		0		60	260	77	257	137	517
13:00	0		0		85		60		145	
13:15	0		0		60		49		109	
13:30	0		0		80		70		150	
13:45	0		0		81	306	79	258	160	564
14:00	0		0		61		82		143	
14:15	0		0		127		97		224	
14:30	0		0		106		90		196	
14:45	0		0		114	408	100	369	214	777
15:00	0		0		84		74		158	
15:15	0		0		70		101		171	
15:30	0		0		67		79		146	
15:45	0		0		77	298	88	342	165	640
16:00	0		0		73		92		165	
16:15	0		0		83		95		178	
16:30	0		0		75		90		165	
16:45	0		0		78	309	103	380	181	689
17:00	0		0		94		117		211	
17:15	0		0		78		116		194	
17:30	0		0		88		102		190	
17:45	0		0		65	325	90	425	155	750
18:00	0		0		53		117		170	
18:15	0		0		85		96		181	
18:30	0		0		68		100		168	
18:45	0		0		84	290	69	382	153	672
19:00	0		0		50		55		105	
19:15	0		0		48		62		110	
19:30	0		0		52		49		101	
19:45	0		0		39	189	53	219	92	408
20:00	0		0		64		63		127	
20:15	0		0		65		59		124	
20:30	0		0		50		43		93	
20:45	0		0		37	216	44	209	81	425
21:00	0		0		33		33		66	
21:15	0		0		18		41		59	
21:30	0		0		27		23		50	
21:45	0		0		21	99	25	122	46	221
22:00	0		0		16		13		29	
22:15	0		0		11		12		23	
22:30	0		0		14		11		25	
22:45	0		0		15	56	2	38	17	94
23:00	0		0		11		8		19	
23:15	0		0		10		6		16	
23:30	0		0		10		6		16	
23:45	0		0		3	34	5	25	8	59
TOTALS						2790		3026		**5816**
SPLIT %						48.0%		52.0%		**62.6%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	4,812	4,478	9,290

AM Peak Hour			07:30	07:15	**07:30**
AM Pk Volume			496	305	**789**
Pk Hr Factor			0.879	0.930	**0.897**
7 - 9 Volume	0	0	864	584	**1448**
7 - 9 Peak Hour			07:30	07:15	**07:30**
7 - 9 Pk Volume	0	0	496	305	**789**
Pk Hr Factor	0.000	0.000	0.879	0.930	**0.897**

PM Peak Hour			14:15	16:45	**14:15**
PM Pk Volume			431	438	**792**
Pk Hr Factor			0.848	0.936	**0.884**
4 - 6 Volume	0	0	634	805	**1439**
4 - 6 Peak Hour			16:45	16:45	**16:45**
4 - 6 Pk Volume	0	0	338	438	**776**
Pk Hr Factor	0.000	0.000	0.899	0.936	**0.919**

SPEED

Cassia Rd Bet. Poinsettia Ln & El Camino Real

Day: Tuesday
Date: 5/22/2018

City: Carlsbad
Project #: CA18_4192_006

Summary

Time	< 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 +	Total
00:00 AM	0	0	10	10	3	0	0	0	0	0	0	0	0	23
01:00	0	1	7	7	1	0	0	0	0	0	0	0	0	16
02:00	0	1	5	3	0	1	0	0	0	0	0	0	0	10
03:00	0	3	4	1	2	0	0	0	0	0	0	0	0	10
04:00	0	3	11	22	2	0	0	0	0	0	0	0	0	38
05:00	0	5	35	67	17	1	0	0	0	0	0	0	0	125
06:00	0	14	128	162	15	2	1	1	0	0	0	0	0	323
07:00	3	34	383	283	19	1	1	0	1	0	0	0	0	725
08:00	6	29	355	324	18	1	1	0	1	0	0	0	0	735
09:00	2	12	272	273	17	1	1	0	1	0	0	0	0	579
10:00	1	11	185	192	25	1	1	0	0	0	0	0	0	416
11:00	1	21	215	218	10	2	0	2	0	0	0	0	0	469
12:00 PM	4	21	214	248	20	4	1	1	0	0	0	0	0	513
13:00	2	17	237	221	23	3	1	1	0	0	0	0	0	505
14:00	4	39	331	351	27	2	3	1	1	0	0	0	0	759
15:00	0	8	304	341	28	2	0	0	0	0	0	0	0	683
16:00	1	22	308	310	26	3	1	0	0	0	0	0	0	671
17:00	6	35	352	376	32	1	2	3	0	0	0	0	0	807
18:00	0	20	253	279	18	1	0	1	0	0	0	0	0	572
19:00	0	7	167	185	22	3	1	1	1	0	0	0	0	387
20:00	0	12	127	131	8	0	0	0	0	0	0	0	0	278
21:00	1	8	54	72	7	1	0	0	0	0	0	0	0	143
22:00	0	7	53	49	6	0	0	0	0	0	0	0	0	115
23:00	0	6	21	15	0	0	0	0	0	0	0	0	0	42
Totals	31	336	4031	4140	346	30	14	11	5					8944
% of Totals	0%	4%	45%	46%	4%	0%	0%	0%	0%					100%

AM Volumes	13	134	1610	1562	129	10	5	3	3	0	0	0	0	3469
% AM	0%	1%	18%	17%	1%	0%	0%	0%	0%					39%
AM Peak Hour	08:00	07:00	07:00	08:00	10:00	06:00	06:00	11:00	07:00					08:00
Volume	6	34	383	324	25	2	1	2	1					735
PM Volumes	18	202	2421	2578	217	20	9	8	2	0	0	0	0	5475
% PM	0%	2%	27%	29%	2%	0%	0%	0%	0%					61%
PM Peak Hour	17:00	14:00	17:00	17:00	17:00	12:00	14:00	17:00	14:00					17:00
Volume	6	39	352	376	32	4	3	3	1					807

Directional Peak Periods All Speeds	AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes	
	Volume	%	Volume	%	Volume	%	Volume	%
	1460	16%	1018	11%	1478	17%	4988	56%

Street Name	Direction	Percentiles					
		15th	50th	Average	85th	95th	ADT
Cassia Rd	Summary	21	25	25	29	30	8944

SPEED

Cassia Rd Bet. Poinsettia Ln & El Camino Real

Day: Wednesday
Date: 5/23/2018

City: Carlsbad
Project #: CA18_4192_006

Summary

Time	< 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 +	Total
00:00 AM	0	0	17	17	5	0	0	1	0	0	0	0	0	40
01:00	0	1	3	5	2	0	1	0	0	0	0	0	0	12
02:00	0	2	2	4	0	0	0	0	0	0	0	0	0	8
03:00	0	2	9	5	0	0	0	0	0	0	0	0	0	16
04:00	0	2	15	24	1	0	0	0	0	0	0	0	0	42
05:00	0	0	31	72	18	1	0	0	0	0	0	0	0	122
06:00	0	9	133	178	22	1	1	1	0	0	0	0	0	345
07:00	27	45	318	302	21	2	1	0	0	0	0	0	0	716
08:00	0	23	329	356	22	2	0	0	0	0	0	0	0	732
09:00	0	12	254	259	19	2	0	1	0	0	0	0	0	547
10:00	0	18	190	223	17	0	1	1	0	0	0	0	0	450
11:00	6	15	160	235	22	1	3	1	1	0	0	0	0	444
12:00 PM	0	15	221	256	22	1	0	2	0	0	0	0	0	517
13:00	0	17	245	276	25	0	1	0	0	0	0	0	0	564
14:00	0	40	322	387	22	5	0	1	0	0	0	0	0	777
15:00	0	8	258	339	31	2	2	0	0	0	0	0	0	640
16:00	2	17	262	378	26	0	2	1	1	0	0	0	0	689
17:00	0	9	286	421	27	2	4	0	1	0	0	0	0	750
18:00	0	12	246	393	18	2	1	0	0	0	0	0	0	672
19:00	0	9	147	235	16	1	0	0	0	0	0	0	0	408
20:00	0	10	203	196	15	1	0	0	0	0	0	0	0	425
21:00	0	16	79	111	14	1	0	0	0	0	0	0	0	221
22:00	0	4	32	47	10	1	0	0	0	0	0	0	0	94
23:00	1	4	22	27	5	0	0	0	0	0	0	0	0	59
Totals	36	290	3784	4746	380	25	17	9	3					9290
% of Totals	0%	3%	41%	51%	4%	0%	0%	0%	0%					100%

AM Volumes	33	129	1461	1680	149	9	7	5	1	0	0	0	0	3474
% AM	0%	1%	16%	18%	2%	0%	0%	0%	0%					37%
AM Peak Hour	07:00	07:00	08:00	08:00	06:00	07:00	11:00		11:00					08:00
Volume	27	45	329	356	22	2	3	1	1					732
PM Volumes	3	161	2323	3066	231	16	10	4	2	0	0	0	0	5816
% PM	0%	2%	25%	33%	2%	0%	0%	0%	0%					63%
PM Peak Hour	16:00	14:00	14:00	17:00	15:00	14:00	17:00	12:00	16:00					14:00
Volume	2	40	322	421	31	5	4	2	1					777

Directional Peak Periods All Speeds	AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes	
	Volume	%	Volume	%	Volume	%	Volume	%
	1448	16%	1081	12%	1439	15%	5322	57%

Street Name	Direction	Percentiles					
		15th	50th	Average	85th	95th	ADT
Cassia Rd	Summary	21	26	25	29	30	9290

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Ambrosia Ln Bet. Poinsettia Ln & Aviara Pkwy

Day: Tuesday
Date: 5/22/2018

City: Carlsbad
Project #: CA18_4192_007

DAILY TOTALS	NB	SB	EB	WB	Total
	1,825	1,463	0	0	3,288

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	0		1		0	0	1		12:00	9		16		0	0	25	
00:15	0		0		0	0			12:15	19		10		0	0	29	
00:30	0		0		0	0			12:30	13		12		0	0	25	
00:45	0		0	1	0	0		1	12:45	15	56	17	55	0	0	32	111
01:00	0		0		0	0			13:00	13		30		0	0	43	
01:15	0		0		0	0			13:15	29		23		0	0	52	
01:30	0		0		0	0			13:30	23		28		0	0	51	
01:45	0		0		0	0			13:45	19	84	54	135	0	0	73	219
02:00	0		0		0	0			14:00	35		57		0	0	92	
02:15	0		0		0	0			14:15	145		51		0	0	196	
02:30	0		1		0	0	1		14:30	104		55		0	0	159	
02:45	0		0	1	0	0		1	14:45	68	352	34	197	0	0	102	549
03:00	0		1		0	0	1		15:00	50		20		0	0	70	
03:15	0		0		0	0			15:15	42		18		0	0	60	
03:30	0		0		0	0			15:30	24		19		0	0	43	
03:45	0		0	1	0	0		1	15:45	29	145	22	79	0	0	51	224
04:00	1		0		0	0	1		16:00	26		16		0	0	42	
04:15	0		0		0	0			16:15	17		18		0	0	35	
04:30	0		0		0	0			16:30	27		17		0	0	44	
04:45	1	2	1	1	0	0	2	3	16:45	21	91	18	69	0	0	39	160
05:00	0		0		0	0			17:00	20		27		0	0	47	
05:15	2		0		0	0	2		17:15	33		18		0	0	51	
05:30	0		4		0	0	4		17:30	31		32		0	0	63	
05:45	3	5	8	12	0	0	11	17	17:45	19	103	20	97	0	0	39	200
06:00	4		5		0	0	9		18:00	18		13		0	0	31	
06:15	4		3		0	0	7		18:15	19		15		0	0	34	
06:30	3		17		0	0	20		18:30	31		28		0	0	59	
06:45	8	19	12	37	0	0	20	56	18:45	36	104	12	68	0	0	48	172
07:00	37		40		0	0	77		19:00	25		13		0	0	38	
07:15	133		119		0	0	252		19:15	21		5		0	0	26	
07:30	155		108		0	0	263		19:30	14		10		0	0	24	
07:45	85	410	48	315	0	0	133	725	19:45	8	68	5	33	0	0	13	101
08:00	78		75		0	0	153		20:00	7		2		0	0	9	
08:15	58		13		0	0	71		20:15	8		6		0	0	14	
08:30	15		12		0	0	27		20:30	8		22		0	0	30	
08:45	21	172	10	110	0	0	31	282	20:45	5	28	6	36	0	0	11	64
09:00	11		14		0	0	25		21:00	3		3		0	0	6	
09:15	10		20		0	0	30		21:15	1		10		0	0	11	
09:30	8		16		0	0	24		21:30	4		4		0	0	8	
09:45	10	39	18	68	0	0	28	107	21:45	3	11	2	19	0	0	5	30
10:00	23		14		0	0	37		22:00	3		2		0	0	5	
10:15	14		19		0	0	33		22:15	3		2		0	0	5	
10:30	10		11		0	0	21		22:30	1		0		0	0	1	
10:45	8	55	19	63	0	0	27	118	22:45	2	9	2	6	0	0	4	15
11:00	10		10		0	0	20		23:00	4		5		0	0	9	
11:15	14		18		0	0	32		23:15	0		0		0	0		
11:30	28		14		0	0	42		23:30	0		0		0	0		
11:45	16	68	10	52	0	0	26	120	23:45	0	4	3	8	0	0	3	12
TOTALS		770		661				1431	TOTALS		1055		802				1857
SPLIT %		53.8%		46.2%				43.5%	SPLIT %		56.8%		43.2%				56.5%

DAILY TOTALS	NB	SB	EB	WB	Total
	1,825	1,463	0	0	3,288

AM Peak Hour	07:15	07:15						07:15	PM Peak Hour	14:15	13:45						14:00
AM Pk Volume	451	350						801	PM Pk Volume	367	217						549
Pk Hr Factor	0.727	0.735						0.761	Pk Hr Factor	0.633	0.952						0.700
7 - 9 Volume	582	425	0	0				1007	4 - 6 Volume	194	166	0	0				360
7 - 9 Peak Hour	07:15	07:15						07:15	4 - 6 Peak Hour	16:45	17:00						16:45
7 - 9 Pk Volume	451	350	0	0				801	4 - 6 Pk Volume	105	97	0	0				200
Pk Hr Factor	0.727	0.735	0.000	0.000				0.761	Pk Hr Factor	0.795	0.758	0.000	0.000				0.794

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Ambrosia Ln Bet. Poinsettia Ln & Aviara Pkwy

Day: Wednesday
Date: 5/23/2018

City: Carlsbad
Project #: CA18_4192_007

DAILY TOTALS	NB	SB	EB	WB	Total
	1,856	1,465	0	0	3,321

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	1		2		0	0	3		12:00	16		16		0	0	32	
00:15	1		1		0	0	2		12:15	12		11		0	0	23	
00:30	0		0		0	0			12:30	17		13		0	0	30	
00:45	1	3	0	3	0	0	1	6	12:45	16	61	10	50	0	0	26	111
01:00	0		0		0	0			13:00	16		22		0	0	38	
01:15	2		0		0	0	2		13:15	42		18		0	0	60	
01:30	1		0		0	0	1		13:30	23		32		0	0	55	
01:45	0	3	2	2	0	0	2	5	13:45	14	95	55	127	0	0	69	222
02:00	0		0		0	0			14:00	30		65		0	0	95	
02:15	0		0		0	0			14:15	161		60		0	0	221	
02:30	0		1		0	0	1		14:30	100		48		0	0	148	
02:45	0		1	2	0	0	1	2	14:45	72	363	29	202	0	0	101	565
03:00	0		0		0	0			15:00	51		10		0	0	61	
03:15	0		0		0	0			15:15	28		16		0	0	44	
03:30	0		0		0	0			15:30	28		18		0	0	46	
03:45	0		0		0	0			15:45	28	135	18	62	0	0	46	197
04:00	1		0		0	0	1		16:00	33		31		0	0	64	
04:15	0		0		0	0			16:15	33		22		0	0	55	
04:30	2		0		0	0	2		16:30	23		23		0	0	46	
04:45	0	3	1	1	0	0	1	4	16:45	22	111	18	94	0	0	40	205
05:00	1		0		0	0	1		17:00	25		30		0	0	55	
05:15	0		0		0	0			17:15	32		33		0	0	65	
05:30	2		6		0	0	8		17:30	33		12		0	0	45	
05:45	0	3	5	11	0	0	5	14	17:45	22	112	16	91	0	0	38	203
06:00	2		2		0	0	4		18:00	16		17		0	0	33	
06:15	2		8		0	0	10		18:15	28		19		0	0	47	
06:30	2		12		0	0	14		18:30	26		16		0	0	42	
06:45	12	18	27	49	0	0	39	67	18:45	12	82	22	74	0	0	34	156
07:00	25		29		0	0	54		19:00	22		18		0	0	40	
07:15	92		135		0	0	227		19:15	27		7		0	0	34	
07:30	149		98		0	0	247		19:30	13		11		0	0	24	
07:45	97	363	57	319	0	0	154	682	19:45	15	77	5	41	0	0	20	118
08:00	86		66		0	0	152		20:00	17		17		0	0	34	
08:15	50		24		0	0	74		20:15	10		6		0	0	16	
08:30	19		14		0	0	33		20:30	12		15		0	0	27	
08:45	16	171	10	114	0	0	26	285	20:45	10	49	5	43	0	0	15	92
09:00	13		16		0	0	29		21:00	7		3		0	0	10	
09:15	10		11		0	0	21		21:15	4		3		0	0	7	
09:30	11		10		0	0	21		21:30	5		2		0	0	7	
09:45	14	48	20	57	0	0	34	105	21:45	2	18	3	11	0	0	5	29
10:00	18		12		0	0	30		22:00	4		4		0	0	8	
10:15	11		10		0	0	21		22:15	1		0		0	0	1	
10:30	15		14		0	0	29		22:30	2		2		0	0	4	
10:45	11	55	15	51	0	0	26	106	22:45	6	13	2	8	0	0	8	21
11:00	17		15		0	0	32		23:00	2		0		0	0	2	
11:15	15		13		0	0	28		23:15	1		2		0	0	3	
11:30	21		10		0	0	31		23:30	0		1		0	0	1	
11:45	16	69	11	49	0	0	27	118	23:45	1	4	1	4	0	0	2	8
TOTALS		736		658				**1394**	**TOTALS**		1120		807				**1927**
SPLIT %		52.8%		47.2%				**42.0%**	**SPLIT %**		58.1%		41.9%				**58.0%**

DAILY TOTALS	NB	SB	EB	WB	Total
	1,856	1,465	0	0	3,321

AM Peak Hour	07:15	07:15			**07:15**	**PM Peak Hour**	14:15	13:45			**14:00**
AM Pk Volume	424	356			**780**	**PM Pk Volume**	384	228			**565**
Pk Hr Factor	0.711	0.659			**0.789**	**Pk Hr Factor**	0.596	0.877			**0.639**
7 - 9 Volume	534	433	0	0	**967**	**4 - 6 Volume**	223	185	0	0	**408**
7 - 9 Peak Hour	07:15	07:15			**07:15**	**4 - 6 Peak Hour**	16:45	16:30			**16:30**
7 - 9 Pk Volume	424	356	0	0	**780**	**4 - 6 Pk Volume**	112	104	0	0	**206**
Pk Hr Factor	0.711	0.659	0.000	0.000	**0.789**	**Pk Hr Factor**	0.848	0.788	0.000	0.000	**0.792**

SPEED

Ambrosia Ln Bet. Poinsettia Ln & Aviara Pkwy

Day: Tuesday
Date: 5/22/2018

City: Carlsbad
Project #: CA18_4192_007

Summary

Time	< 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 +	Total
00:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	1
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1
03:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1
04:00	0	0	1	2	0	0	0	0	0	0	0	0	0	3
05:00	0	1	2	6	6	1	1	0	0	0	0	0	0	17
06:00	0	0	1	21	29	3	2	0	0	0	0	0	0	56
07:00	0	3	106	443	159	13	0	1	0	0	0	0	0	725
08:00	0	1	21	141	106	13	0	0	0	0	0	0	0	282
09:00	0	0	14	50	38	5	0	0	0	0	0	0	0	107
10:00	0	0	13	55	45	4	0	1	0	0	0	0	0	118
11:00	0	0	12	53	47	7	1	0	0	0	0	0	0	120
12:00 PM	0	0	4	50	45	10	2	0	0	0	0	0	0	111
13:00	0	4	18	111	80	6	0	0	0	0	0	0	0	219
14:00	2	27	138	262	108	10	1	1	0	0	0	0	0	549
15:00	0	3	6	99	98	18	0	0	0	0	0	0	0	224
16:00	0	2	9	64	69	16	0	0	0	0	0	0	0	160
17:00	0	0	6	81	96	13	3	1	0	0	0	0	0	200
18:00	0	1	12	71	76	12	0	0	0	0	0	0	0	172
19:00	0	0	7	42	47	4	1	0	0	0	0	0	0	101
20:00	0	0	8	20	31	5	0	0	0	0	0	0	0	64
21:00	0	1	6	9	10	3	0	1	0	0	0	0	0	30
22:00	0	0	3	6	6	0	0	0	0	0	0	0	0	15
23:00	0	0	0	5	4	3	0	0	0	0	0	0	0	12
Totals	2	43	387	1594	1100	146	11	5						3288
% of Totals	0%	1%	12%	48%	33%	4%	0%	0%						100%

AM Volumes	0	5	170	774	430	46	4	2	0	0	0	0	0	1431
% AM		0%	5%	24%	13%	1%	0%	0%						44%
AM Peak Hour		07:00	07:00	07:00	07:00	07:00	06:00	07:00						07:00
Volume		3	106	443	159	13	2	1						725
PM Volumes	2	38	217	820	670	100	7	3	0	0	0	0	0	1857
% PM	0%	1%	7%	25%	20%	3%	0%	0%						56%
PM Peak Hour	14:00	14:00	14:00	14:00	14:00	15:00	17:00	14:00						14:00
Volume	2	27	138	262	108	18	3	1						549

Directional Peak Periods All Speeds	AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes	
	Volume	%	Volume	%	Volume	%	Volume	%
	1007	31%	330	10%	360	11%	1591	48%

Street Name	Direction	Percentiles					
		15th	50th	Average	85th	95th	ADT
Ambrosia Ln	Summary	25	29	29	33	35	3288

SPEED

Ambrosia Ln Bet. Poinsettia Ln & Aviara Pkwy

Day: Wednesday
Date: 5/23/2018

City: Carlsbad
Project #: CA18_4192_007

Summary

Time	< 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 +	Total
00:00 AM	0	0	1	2	2	1	0	0	0	0	0	0	0	6
01:00	0	0	1	1	3	0	0	0	0	0	0	0	0	5
02:00	0	0	1	0	1	0	0	0	0	0	0	0	0	2
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	3	0	1	0	0	0	0	0	0	0	4
05:00	0	0	2	4	7	1	0	0	0	0	0	0	0	14
06:00	0	0	4	32	29	1	1	0	0	0	0	0	0	67
07:00	1	1	115	404	144	12	5	0	0	0	0	0	0	682
08:00	0	2	15	142	111	14	1	0	0	0	0	0	0	285
09:00	0	0	15	44	39	4	3	0	0	0	0	0	0	105
10:00	0	0	14	45	46	1	0	0	0	0	0	0	0	106
11:00	0	0	17	50	47	3	1	0	0	0	0	0	0	118
12:00 PM	0	1	7	42	54	6	1	0	0	0	0	0	0	111
13:00	0	1	15	104	84	17	1	0	0	0	0	0	0	222
14:00	8	17	145	258	124	11	2	0	0	0	0	0	0	565
15:00	0	0	9	76	94	16	2	0	0	0	0	0	0	197
16:00	0	1	6	68	109	20	1	0	0	0	0	0	0	205
17:00	0	1	10	79	100	11	2	0	0	0	0	0	0	203
18:00	0	1	7	67	67	12	2	0	0	0	0	0	0	156
19:00	0	1	7	57	46	7	0	0	0	0	0	0	0	118
20:00	0	1	9	38	39	4	1	0	0	0	0	0	0	92
21:00	0	0	4	14	7	3	1	0	0	0	0	0	0	29
22:00	0	0	1	10	7	3	0	0	0	0	0	0	0	21
23:00	0	1	0	3	4	0	0	0	0	0	0	0	0	8
Totals	9	28	405	1543	1164	148	24							3321
% of Totals	0%	1%	12%	46%	35%	4%	1%							100%

AM Volumes	1	3	185	727	429	38	11	0	0	0	0	0	0	1394
% AM	0%	0%	6%	22%	13%	1%	0%							42%
AM Peak Hour	07:00	08:00	07:00	07:00	07:00	08:00	07:00							07:00
Volume	1	2	115	404	144	14	5							682
PM Volumes	8	25	220	816	735	110	13	0	0	0	0	0	0	1927
% PM	0%	1%	7%	25%	22%	3%	0%							58%
PM Peak Hour	14:00	14:00	14:00	14:00	14:00	16:00	14:00							14:00
Volume	8	17	145	258	124	20	2							565

Directional Peak Periods All Speeds	AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes	
	Volume	%	Volume	%	Volume	%	Volume	%
	967	29%	333	10%	408	12%	1613	49%

Street Name	Direction	Percentiles					
		15th	50th	Average	85th	95th	ADT
Ambrosia Ln	Summary	25	29	29	34	35	3321

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Mimosa Dr Bet. Oriole Ct & Aviara Pkwy

Day: Tuesday
Date: 5/22/2018

City: Carlsbad
Project #: CA18_4192_008

DAILY TOTALS	NB	SB	EB	WB	Total
	309	356	0	0	665

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	0		0		0	0			12:00	3		6		0	0	9	
00:15	0		0		0	0			12:15	4		3		0	0	7	
00:30	0		0		0	0			12:30	4		3		0	0	7	
00:45	0		0		0	0			12:45	3	14	4	16	0	0	7	30
01:00	0		0		0	0			13:00	6		10		0	0	16	
01:15	0		0		0	0			13:15	5		5		0	0	10	
01:30	0		0		0	0			13:30	6		3		0	0	9	
01:45	0		0		0	0			13:45	3	20	6	24	0	0	9	44
02:00	1		0		0	0	1		14:00	4		8		0	0	12	
02:15	0		0		0	0			14:15	11		9		0	0	20	
02:30	0		0		0	0			14:30	10		18		0	0	28	
02:45	0	1	0		0	0		1	14:45	14	39	9	44	0	0	23	83
03:00	1		0		0	0	1		15:00	6		11		0	0	17	
03:15	0		0		0	0			15:15	6		8		0	0	14	
03:30	0		0		0	0			15:30	2		5		0	0	7	
03:45	0	1	0		0	0		1	15:45	7	21	6	30	0	0	13	51
04:00	1		1		0	0	2		16:00	5		0		0	0	5	
04:15	0		0		0	0			16:15	7		8		0	0	15	
04:30	0		0		0	0			16:30	4		7		0	0	11	
04:45	1	2	0	1	0	0	1	3	16:45	8	24	4	19	0	0	12	43
05:00	0		2		0	0	2		17:00	4		5		0	0	9	
05:15	1		1		0	0	2		17:15	5		5		0	0	10	
05:30	0		0		0	0			17:30	8		6		0	0	14	
05:45	0	1	1	4	0	0	1	5	17:45	6	23	6	22	0	0	12	45
06:00	2		3		0	0	5		18:00	4		5		0	0	9	
06:15	2		4		0	0	6		18:15	6		3		0	0	9	
06:30	1		8		0	0	9		18:30	4		3		0	0	7	
06:45	2	7	4	19	0	0	6	26	18:45	4	18	3	14	0	0	7	32
07:00	1		5		0	0	6		19:00	6		1		0	0	7	
07:15	6		20		0	0	26		19:15	1		3		0	0	4	
07:30	6		16		0	0	22		19:30	2		2		0	0	4	
07:45	9	22	10	51	0	0	19	73	19:45	2	11	6	12	0	0	8	23
08:00	13		14		0	0	27		20:00	3		0		0	0	3	
08:15	0		3		0	0	3		20:15	1		2		0	0	3	
08:30	10		3		0	0	13		20:30	4		5		0	0	9	
08:45	3	26	4	24	0	0	7	50	20:45	1	9	1	8	0	0	2	17
09:00	7		3		0	0	10		21:00	0		2		0	0	2	
09:15	4		6		0	0	10		21:15	1		1		0	0	2	
09:30	5		4		0	0	9		21:30	1		0		0	0	1	
09:45	8	24	6	19	0	0	14	43	21:45	2	4	0	3	0	0	2	7
10:00	9		11		0	0	20		22:00	0		0		0	0		
10:15	7		4		0	0	11		22:15	1		1		0	0	2	
10:30	3		6		0	0	9		22:30	0		0		0	0		
10:45	3	22	5	26	0	0	8	48	22:45	1	2	0	1	0	0	1	3
11:00	4		6		0	0	10		23:00	0		0		0	0		
11:15	5		5		0	0	10		23:15	0		1		0	0	1	
11:30	4		6		0	0	10		23:30	1		0		0	0	1	
11:45	4	17	1	18	0	0	5	35	23:45	0	1	0	1	0	0		2
TOTALS		123		162				285	TOTALS		186		194				380
SPLIT %		43.2%		56.8%				42.9%	SPLIT %		48.9%		51.1%				57.1%

DAILY TOTALS	NB	SB	EB	WB	Total
	309	356	0	0	665

AM Peak Hour	07:15	07:15			07:15	PM Peak Hour	14:15	14:15			14:15
AM Pk Volume	34	60			94	PM Pk Volume	41	47			88
Pk Hr Factor	0.654	0.750			0.870	Pk Hr Factor	0.732	0.653			0.786
7 - 9 Volume	48	75	0	0	123	4 - 6 Volume	47	41	0	0	88
7 - 9 Peak Hour	07:15	07:15			07:15	4 - 6 Peak Hour	16:45	16:15			16:15
7 - 9 Pk Volume	34	60	0	0	94	4 - 6 Pk Volume	25	24	0	0	47
Pk Hr Factor	0.654	0.750	0.000	0.000	0.870	Pk Hr Factor	0.781	0.750	0.000	0.000	0.783

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Mimosa Dr Bet. Oriole Ct & Aviara Pkwy

Day: Wednesday
Date: 5/23/2018

City: Carlsbad
Project #: CA18_4192_008

DAILY TOTALS	NB	SB	EB	WB	Total
	320	359	0	0	679

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	0		0		0	0			12:00	6		8		0	0	14	
00:15	1		0		0	0	1		12:15	6		3		0	0	9	
00:30	0		0		0	0			12:30	3		7		0	0	10	
00:45	0	1	0		0	0		1	12:45	8	23	9	27	0	0	17	50
01:00	0		0		0	0			13:00	7		4		0	0	11	
01:15	0		0		0	0			13:15	6		6		0	0	12	
01:30	0		0		0	0			13:30	7		7		0	0	14	
01:45	0		0		0	0			13:45	4	24	10	27	0	0	14	51
02:00	0		0		0	0			14:00	2		9		0	0	11	
02:15	0		0		0	0			14:15	14		12		0	0	26	
02:30	0		0		0	0			14:30	12		15		0	0	27	
02:45	0		0		0	0			14:45	10	38	4	40	0	0	14	78
03:00	0		0		0	0			15:00	6		10		0	0	16	
03:15	0		0		0	0			15:15	5		5		0	0	10	
03:30	0		0		0	0			15:30	6		5		0	0	11	
03:45	1	1	0		0	0	1	1	15:45	5	22	5	25	0	0	10	47
04:00	0		1		0	0	1		16:00	8		7		0	0	15	
04:15	1		1		0	0	2		16:15	3		6		0	0	9	
04:30	0		0		0	0			16:30	8		4		0	0	12	
04:45	1	2	0	2	0	0	1	4	16:45	6	25	7	24	0	0	13	49
05:00	0		0		0	0			17:00	4		12		0	0	16	
05:15	2		1		0	0	3		17:15	6		10		0	0	16	
05:30	0		1		0	0	1		17:30	12		6		0	0	18	
05:45	0	2	1	3	0	0	1	5	17:45	4	26	6	34	0	0	10	60
06:00	0		2		0	0	2		18:00	8		4		0	0	12	
06:15	0		6		0	0	6		18:15	13		3		0	0	16	
06:30	1		1		0	0	2		18:30	3		4		0	0	7	
06:45	1	2	9	18	0	0	10	20	18:45	4	28	3	14	0	0	7	42
07:00	0		4		0	0	4		19:00	6		3		0	0	9	
07:15	5		24		0	0	29		19:15	3		4		0	0	7	
07:30	5		13		0	0	18		19:30	2		2		0	0	4	
07:45	8	18	10	51	0	0	18	69	19:45	3	14	2	11	0	0	5	25
08:00	8		9		0	0	17		20:00	5		1		0	0	6	
08:15	5		2		0	0	7		20:15	2		4		0	0	6	
08:30	4		3		0	0	7		20:30	6		3		0	0	9	
08:45	5	22	3	17	0	0	8	39	20:45	0	13	1	9	0	0	1	22
09:00	3		1		0	0	4		21:00	4		0		0	0	4	
09:15	5		3		0	0	8		21:15	2		5		0	0	7	
09:30	6		6		0	0	12		21:30	1		0		0	0	1	
09:45	4	18	8	18	0	0	12	36	21:45	2	9	2	7	0	0	4	16
10:00	3		2		0	0	5		22:00	1		1		0	0	2	
10:15	3		2		0	0	5		22:15	3		0		0	0	3	
10:30	1		3		0	0	4		22:30	1		0		0	0	1	
10:45	3	10	4	11	0	0	7	21	22:45	1	6	0	1	0	0	1	7
11:00	1		1		0	0	2		23:00	0		0		0	0		
11:15	3		5		0	0	8		23:15	0		0		0	0		
11:30	5		6		0	0	11		23:30	1		1		0	0	2	
11:45	6	15	7	19	0	0	13	34	23:45	0	1	0	1	0	0		2
TOTALS		91		139				230	TOTALS		229		220				449
SPLIT %		39.6%		60.4%				33.9%	SPLIT %		51.0%		49.0%				66.1%

DAILY TOTALS	NB	SB	EB	WB	Total
	320	359	0	0	679

AM Peak Hour	07:15	07:15			07:15	PM Peak Hour	14:15	13:45			14:15
AM Pk Volume	26	56			82	PM Pk Volume	42	46			83
Pk Hr Factor	0.813	0.583			0.707	Pk Hr Factor	0.750	0.767			0.769
7 - 9 Volume	40	68	0	0	108	4 - 6 Volume	51	58	0	0	109
7 - 9 Peak Hour	07:15	07:15			07:15	4 - 6 Peak Hour	16:45	16:45			16:45
7 - 9 Pk Volume	26	56	0	0	82	4 - 6 Pk Volume	28	35	0	0	63
Pk Hr Factor	0.813	0.583	0.000	0.000	0.707	Pk Hr Factor	0.583	0.729	0.000	0.000	0.875

SPEED

Mimosa Dr Bet. Oriole Ct & Aviara Pkwy

Day: Tuesday
Date: 5/22/2018

City: Carlsbad
Project #: CA18_4192_008

Summary

Time	< 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 +	Total
00:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
03:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
04:00	2	0	0	0	1	0	0	0	0	0	0	0	0	3
05:00	1	1	2	1	0	0	0	0	0	0	0	0	0	5
06:00	3	14	6	2	1	0	0	0	0	0	0	0	0	26
07:00	6	17	38	12	0	0	0	0	0	0	0	0	0	73
08:00	3	18	21	8	0	0	0	0	0	0	0	0	0	50
09:00	6	18	17	2	0	0	0	0	0	0	0	0	0	43
10:00	7	20	18	2	1	0	0	0	0	0	0	0	0	48
11:00	6	11	16	2	0	0	0	0	0	0	0	0	0	35
12:00 PM	4	7	16	3	0	0	0	0	0	0	0	0	0	30
13:00	6	17	18	3	0	0	0	0	0	0	0	0	0	44
14:00	5	20	48	9	1	0	0	0	0	0	0	0	0	83
15:00	3	16	25	7	0	0	0	0	0	0	0	0	0	51
16:00	3	16	18	4	2	0	0	0	0	0	0	0	0	43
17:00	3	11	27	4	0	0	0	0	0	0	0	0	0	45
18:00	0	11	17	4	0	0	0	0	0	0	0	0	0	32
19:00	0	5	15	3	0	0	0	0	0	0	0	0	0	23
20:00	2	8	6	1	0	0	0	0	0	0	0	0	0	17
21:00	0	1	5	0	1	0	0	0	0	0	0	0	0	7
22:00	0	1	0	2	0	0	0	0	0	0	0	0	0	3
23:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
Totals	60	213	316	69	7									665
% of Totals	9%	32%	48%	10%	1%									100%

AM Volumes	34	99	120	29	3	0	0	0	0	0	0	0	0	285
% AM	5%	15%	18%	4%	0%									43%
AM Peak Hour	10:00	10:00	07:00	07:00	04:00									07:00
Volume	7	20	38	12	1									73
PM Volumes	26	114	196	40	4	0	0	0	0	0	0	0	0	380
% PM	4%	17%	29%	6%	1%									57%
PM Peak Hour	13:00	14:00	14:00	14:00	16:00									14:00
Volume	6	20	48	9	2									83

Directional Peak Periods All Speeds	AM 7-9			NOON 12-2			PM 4-6			Off Peak Volumes		
	Volume	↔	%	Volume	↔	%	Volume	↔	%	Volume	↔	%
	123	↔	18%	74	↔	11%	88	↔	13%	380	↔	57%

Street Name	Direction	Percentiles					
		15th	50th	Average	85th	95th	ADT
Mimosa Dr	Summary	16	21	20	25	28	665

SPEED

Mimosa Dr Bet. Oriole Ct & Aviara Pkwy

Day: Wednesday
Date: 5/23/2018

City: Carlsbad
Project #: CA18_4192_008

Summary

Time	< 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 +	Total
00:00 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	1
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
04:00	2	1	0	1	0	0	0	0	0	0	0	0	0	4
05:00	2	2	0	1	0	0	0	0	0	0	0	0	0	5
06:00	1	5	10	4	0	0	0	0	0	0	0	0	0	20
07:00	2	19	38	10	0	0	0	0	0	0	0	0	0	69
08:00	1	11	19	7	1	0	0	0	0	0	0	0	0	39
09:00	2	11	15	8	0	0	0	0	0	0	0	0	0	36
10:00	1	8	9	3	0	0	0	0	0	0	0	0	0	21
11:00	3	9	17	5	0	0	0	0	0	0	0	0	0	34
12:00 PM	8	23	14	5	0	0	0	0	0	0	0	0	0	50
13:00	4	25	18	4	0	0	0	0	0	0	0	0	0	51
14:00	4	32	34	7	1	0	0	0	0	0	0	0	0	78
15:00	2	17	24	4	0	0	0	0	0	0	0	0	0	47
16:00	1	12	32	4	0	0	0	0	0	0	0	0	0	49
17:00	1	20	31	7	1	0	0	0	0	0	0	0	0	60
18:00	3	19	16	4	0	0	0	0	0	0	0	0	0	42
19:00	1	8	13	3	0	0	0	0	0	0	0	0	0	25
20:00	2	8	11	1	0	0	0	0	0	0	0	0	0	22
21:00	0	7	9	0	0	0	0	0	0	0	0	0	0	16
22:00	0	2	3	2	0	0	0	0	0	0	0	0	0	7
23:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
Totals	40	240	316	80	3									679
% of Totals	6%	35%	47%	12%	0%									100%

AM Volumes	14	66	110	39	1	0	0	0	0	0	0	0	0	230
% AM	2%	10%	16%	6%	0%									34%
AM Peak Hour	11:00	07:00	07:00	07:00	08:00									07:00
Volume	3	19	38	10	1									69
PM Volumes	26	174	206	41	2	0	0	0	0	0	0	0	0	449
% PM	4%	26%	30%	6%	0%									66%
PM Peak Hour	12:00	14:00	14:00	14:00	14:00									14:00
Volume	8	32	34	7	1									78

Directional Peak Periods All Speeds	AM 7-9			NOON 12-2			PM 4-6			Off Peak Volumes		
	Volume	↔	%	Volume	↔	%	Volume	↔	%	Volume	↔	%
	108		16%	101		15%	109		16%	361		53%

Street Name	Direction	Percentiles					
		15th	50th	Average	85th	95th	ADT
Mimosa Dr	Summary	16	21	21	25	28	679

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Dove Ln Bet. Moorhen Pl & El Camino Real

Day: Tuesday
Date: 5/22/2018

City: Carlsbad
Project #: CA18_4192_009

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	186	167	353

AM Period	NB		SB		EB		WB		TOTAL	
00:00	0		0		0		0			
00:15	0		0		0		0			
00:30	0		0		0		0			
00:45	0		0		0		0			
01:00	0		0		0		0			
01:15	0		0		0		0			
01:30	0		0		0		0			
01:45	0		0		0		0			
02:00	0		0		1		0		1	
02:15	0		0		0		0			
02:30	0		0		0		0			
02:45	0		0		0	1	0			1
03:00	0		0		0		0			
03:15	0		0		1		0		1	
03:30	0		0		0		0			
03:45	0		0		0	1	0			1
04:00	0		0		1		1		2	
04:15	0		0		0		0			
04:30	0		0		0		0			
04:45	0		0		0	1	0	1		2
05:00	0		0		1		0		1	
05:15	0		0		0		0			
05:30	0		0		0		0			
05:45	0		0		1	2	0		1	2
06:00	0		0		3		1		4	
06:15	0		0		2		1		3	
06:30	0		0		3		2		5	
06:45	0		0		3	11	2	6	5	17
07:00	0		0		1		1		2	
07:15	0		0		4		3		7	
07:30	0		0		5		1		6	
07:45	0		0		5	15	0	5	5	20
08:00	0		0		8		3		11	
08:15	0		0		1		0		1	
08:30	0		0		5		3		8	
08:45	0		0		4	18	1	7	5	25
09:00	0		0		4		2		6	
09:15	0		0		1		1		2	
09:30	0		0		8		1		9	
09:45	0		0		3	16	3	7	6	23
10:00	0		0		5		5		10	
10:15	0		0		2		1		3	
10:30	0		0		2		0		2	
10:45	0		0		3	12	6	12	9	24
11:00	0		0		3		4		7	
11:15	0		0		2		1		3	
11:30	0		0		6		4		10	
11:45	0		0		5	16	1	10	6	26
TOTALS						93		48		141
SPLIT %						66.0%		34.0%		39.9%

PM Period	NB		SB		EB		WB		TOTAL	
12:00	0		0		2		6		8	
12:15	0		0		3		0		3	
12:30	0		0		2		3		5	
12:45	0		0		1	8	3	12	4	20
13:00	0		0		4		0		4	
13:15	0		0		6		4		10	
13:30	0		0		1		3		4	
13:45	0		0		1	12	2	9	3	21
14:00	0		0		1		3		4	
14:15	0		0		5		4		9	
14:30	0		0		1		3		4	
14:45	0		0		6	13	5	15	11	28
15:00	0		0		2		5		7	
15:15	0		0		3		4		7	
15:30	0		0		0		3		3	
15:45	0		0		2	7	2	14	4	21
16:00	0		0		7		7		14	
16:15	0		0		2		3		5	
16:30	0		0		2		3		5	
16:45	0		0		4	15	4	17	8	32
17:00	0		0		1		2		3	
17:15	0		0		2		6		8	
17:30	0		0		4		2		6	
17:45	0		0		7	14	3	13	10	27
18:00	0		0		3		3		6	
18:15	0		0		2		4		6	
18:30	0		0		2		3		5	
18:45	0		0		1	8	4	14	5	22
19:00	0		0		2		2		4	
19:15	0		0		2		4		6	
19:30	0		0		0		3		3	
19:45	0		0		0	4	3	12	3	16
20:00	0		0		1		3		4	
20:15	0		0		4		0		4	
20:30	0		0		0		0			
20:45	0		0		0	5	2	5	2	10
21:00	0		0		2		0		2	
21:15	0		0		1		1		2	
21:30	0		0		0		1		1	
21:45	0		0		0	3	1	3	1	6
22:00	0		0		0		0			
22:15	0		0		0		0			
22:30	0		0		0		1		1	
22:45	0		0		0		1	2	1	2
23:00	0		0		0		0			
23:15	0		0		2		2		4	
23:30	0		0		2		1		3	
23:45	0		0		0	4	0	3		7
TOTALS						93		119		212
SPLIT %						43.9%		56.1%		60.1%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	186	167	353

AM Peak Hour			07:15	10:45	07:15
AM Pk Volume			22	15	29
Pk Hr Factor			0.688	0.625	0.659
7 - 9 Volume	0	0	33	12	45
7 - 9 Peak Hour			07:15	07:15	07:15
7 - 9 Pk Volume	0	0	22	7	29
Pk Hr Factor	0.000	0.000	0.688	0.583	0.659

PM Peak Hour			17:15	14:15	16:00
PM Pk Volume			16	17	32
Pk Hr Factor			0.571	0.850	0.571
4 - 6 Volume	0	0	29	30	59
4 - 6 Peak Hour			16:00	16:00	16:00
4 - 6 Pk Volume	0	0	15	17	32
Pk Hr Factor	0.000	0.000	0.536	0.607	0.571

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Dove Ln Bet. Moorhen Pl & El Camino Real

Day: Wednesday
Date: 5/23/2018

City: Carlsbad
Project #: CA18_4192_009

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	188	180	368

AM Period	NB		SB		EB		WB		TOTAL	
00:00	0		0		0		1		1	
00:15	0		0		1		0		1	
00:30	0		0		1		0		1	
00:45	0		0	2	0	1				3
01:00	0		0		0		0			
01:15	0		0		0		0			
01:30	0		0		0		0			
01:45	0		0		0		0			
02:00	0		0		0		0			
02:15	0		0		0		0			
02:30	0		0		0		0			
02:45	0		0		0		0			
03:00	0		0		0		0			
03:15	0		0		0		0			
03:30	0		0		0		0			
03:45	0		0		0		0			
04:00	0		0		0		0			
04:15	0		0		1		1		2	
04:30	0		0		0		0			
04:45	0		0	1	0	1				2
05:00	0		0		0		0			
05:15	0		0		0		1		1	
05:30	0		0		1		0		1	
05:45	0		0	2	0	1	1			3
06:00	0		0		0		1		1	
06:15	0		0		2		2		4	
06:30	0		0		3		1		4	
06:45	0		0	7	2	5	1	12		
07:00	0		0		2		2		4	
07:15	0		0		3		4		7	
07:30	0		0		0		3		3	
07:45	0		0	9	4	11	2	20		
08:00	0		0		7		3		10	
08:15	0		0		0		1		1	
08:30	0		0		3		2		5	
08:45	0		0	13	3	7	1	20		
09:00	0		0		8		1		9	
09:15	0		0		2		1		3	
09:30	0		0		4		2		6	
09:45	0		0	22	8	7	3	29		
10:00	0		0		3		2		5	
10:15	0		0		4		1		5	
10:30	0		0		1		1		2	
10:45	0		0	11	3	8	4	19		
11:00	0		0		3		1		4	
11:15	0		0		2		2		4	
11:30	0		0		0		2		2	
11:45	0		0	6	1	7	2	13		
TOTALS				73		48				121
SPLIT %				60.3%		39.7%				32.9%

PM Period	NB		SB		EB		WB		TOTAL	
12:00	0		0		2		2		4	
12:15	0		0		5		2		7	
12:30	0		0		1		1		2	
12:45	0		0	4	12	5	10			9
13:00	0		0		7		1		8	
13:15	0		0		3		3		6	
13:30	0		0		2		5		7	
13:45	0		0	7	19	5	14			12
14:00	0		0		3		2		5	
14:15	0		0		4		1		5	
14:30	0		0		0		0			
14:45	0		0	6	13	7	10			13
15:00	0		0		4		8		12	
15:15	0		0		4		1		5	
15:30	0		0		2		2		4	
15:45	0		0	4	14	3	14			7
16:00	0		0		3		5		8	
16:15	0		0		2		3		5	
16:30	0		0		3		5		8	
16:45	0		0	3	11	5	18			8
17:00	0		0		4		8		12	
17:15	0		0		4		5		9	
17:30	0		0		8		5		13	
17:45	0		0	5	21	2	20			7
18:00	0		0		2		5		7	
18:15	0		0		3		3		6	
18:30	0		0		2		5		7	
18:45	0		0	3	10	6	19			9
19:00	0		0		2		1		3	
19:15	0		0		0		5		5	
19:30	0		0		1		2		3	
19:45	0		0	2	5	1	9			3
20:00	0		0		0		3		3	
20:15	0		0		0		2		2	
20:30	0		0		2		4		6	
20:45	0		0	1	3	1	10			2
21:00	0		0		1		4		5	
21:15	0		0		1		0		1	
21:30	0		0		1		0		1	
21:45	0		0	1	4	1	5			2
22:00	0		0		0		0			
22:15	0		0		0		1		1	
22:30	0		0		1		1		2	
22:45	0		0	0	1	0	2			3
23:00	0		0		0		0			
23:15	0		0		0		0			
23:30	0		0		1		1		2	
23:45	0		0	1	2	0	1		1	3
TOTALS					115		132			247
SPLIT %					46.6%		53.4%			67.1%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	188	180	368

AM Peak Hour			09:00	07:15	09:00
AM Pk Volume			22	12	29
Pk Hr Factor			0.688	0.750	0.659
7 - 9 Volume	0	0	22	18	40
7 - 9 Peak Hour			07:15	07:15	07:15
7 - 9 Pk Volume	0	0	14	12	26
Pk Hr Factor	0.000	0.000	0.500	0.750	0.650

PM Peak Hour			17:00	16:30	16:45
PM Pk Volume			21	23	42
Pk Hr Factor			0.656	0.719	0.808
4 - 6 Volume	0	0	32	38	70
4 - 6 Peak Hour			17:00	16:30	16:45
4 - 6 Pk Volume	0	0	21	23	42
Pk Hr Factor	0.000	0.000	0.656	0.719	0.808

SPEED

Dove Ln Bet. Moorhen Pl & El Camino Real

Day: Tuesday
Date: 5/22/2018

City: Carlsbad
Project #: CA18_4192_009

Summary

Time	< 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 +	Total
00:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1
04:00	1	1	0	0	0	0	0	0	0	0	0	0	0	2
05:00	0	0	0	0	2	0	0	0	0	0	0	0	0	2
06:00	0	1	5	9	1	1	0	0	0	0	0	0	0	17
07:00	0	1	5	8	6	0	0	0	0	0	0	0	0	20
08:00	0	6	6	7	5	1	0	0	0	0	0	0	0	25
09:00	2	1	8	11	1	0	0	0	0	0	0	0	0	23
10:00	1	4	8	9	2	0	0	0	0	0	0	0	0	24
11:00	1	4	8	10	3	0	0	0	0	0	0	0	0	26
12:00 PM	0	2	10	7	1	0	0	0	0	0	0	0	0	20
13:00	1	2	10	6	2	0	0	0	0	0	0	0	0	21
14:00	1	2	9	13	3	0	0	0	0	0	0	0	0	28
15:00	0	1	7	12	1	0	0	0	0	0	0	0	0	21
16:00	2	1	14	12	3	0	0	0	0	0	0	0	0	32
17:00	0	2	12	11	2	0	0	0	0	0	0	0	0	27
18:00	0	3	6	11	2	0	0	0	0	0	0	0	0	22
19:00	1	2	9	4	0	0	0	0	0	0	0	0	0	16
20:00	0	2	3	5	0	0	0	0	0	0	0	0	0	10
21:00	0	1	2	1	1	1	0	0	0	0	0	0	0	6
22:00	0	0	0	2	0	0	0	0	0	0	0	0	0	2
23:00	0	1	4	2	0	0	0	0	0	0	0	0	0	7
Totals	10	38	126	141	35	3								353
% of Totals	3%	11%	36%	40%	10%	1%								100%

AM Volumes	5	19	40	55	20	2	0	0	0	0	0	0	0	141
% AM	1%	5%	11%	16%	6%	1%								40%
AM Peak Hour	09:00	08:00	09:00	09:00	07:00	06:00								11:00
Volume	2	6	8	11	6	1								26
PM Volumes	5	19	86	86	15	1	0	0	0	0	0	0	0	212
% PM	1%	5%	24%	24%	4%	0%								60%
PM Peak Hour	16:00	18:00	16:00	14:00	14:00	21:00								16:00
Volume	2	3	14	13	3	1								32

Directional Peak Periods All Speeds	AM 7-9			NOON 12-2			PM 4-6			Off Peak Volumes		
	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%
	45		13%	41		12%	59		17%	208		59%

Street Name	Direction	Percentiles					
		15th	50th	Average	85th	95th	ADT
Dove Ln	Summary	20	25	25	29	33	353

SPEED

Dove Ln Bet. Moorhen Pl & El Camino Real

Day: Wednesday
Date: 5/23/2018

City: Carlsbad
Project #: CA18_4192_009

Summary

Time	< 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 +	Total
00:00 AM	0	0	0	3	0	0	0	0	0	0	0	0	0	3
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
05:00	0	1	0	2	0	0	0	0	0	0	0	0	0	3
06:00	1	0	7	2	2	0	0	0	0	0	0	0	0	12
07:00	0	0	11	6	3	0	0	0	0	0	0	0	0	20
08:00	0	3	4	12	1	0	0	0	0	0	0	0	0	20
09:00	1	1	8	13	6	0	0	0	0	0	0	0	0	29
10:00	0	1	5	9	4	0	0	0	0	0	0	0	0	19
11:00	0	0	3	10	0	0	0	0	0	0	0	0	0	13
12:00 PM	2	1	8	8	2	1	0	0	0	0	0	0	0	22
13:00	3	7	5	15	3	0	0	0	0	0	0	0	0	33
14:00	0	4	4	12	3	0	0	0	0	0	0	0	0	23
15:00	0	1	10	10	6	1	0	0	0	0	0	0	0	28
16:00	0	6	11	12	0	0	0	0	0	0	0	0	0	29
17:00	0	2	15	20	4	0	0	0	0	0	0	0	0	41
18:00	0	1	11	15	2	0	0	0	0	0	0	0	0	29
19:00	1	2	7	3	1	0	0	0	0	0	0	0	0	14
20:00	0	4	3	5	1	0	0	0	0	0	0	0	0	13
21:00	0	1	4	2	2	0	0	0	0	0	0	0	0	9
22:00	0	0	3	0	0	0	0	0	0	0	0	0	0	3
23:00	0	1	1	0	1	0	0	0	0	0	0	0	0	3
Totals	8	38	120	159	41	2								368
% of Totals	2%	10%	33%	43%	11%	1%								100%

AM Volumes	2	8	38	57	16	0	0	0	0	0	0	0	0	121
% AM	1%	2%	10%	15%	4%									33%
AM Peak Hour	06:00	08:00	07:00	09:00	09:00									09:00
Volume	1	3	11	13	6									29
PM Volumes	6	30	82	102	25	2	0	0	0	0	0	0	0	247
% PM	2%	8%	22%	28%	7%	1%								67%
PM Peak Hour	13:00	13:00	17:00	17:00	15:00	12:00								17:00
Volume	3	7	15	20	6	1								41

Directional Peak Periods All Speeds	AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes	
	Volume	%	Volume	%	Volume	%	Volume	%
	40 ⟷	11%	55 ⟷	15%	70 ⟷	19%	203 ⟷	55%

Street Name	Direction	Percentiles					
		15th	50th	Average	85th	95th	ADT
Dove Ln	Summary	20	26	25	30	33	368

APPENDIX B

EXISTING INTERSECTION LEVEL OF SERVICE WORKSHEETS

APPENDIX B

EXISTING INTERSECTION LEVEL OF SERVICE WORKSHEETS

ICU Worksheets

Poinsettia Reach E (LSA Project No. HCR1803)
Existing
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #1 Ambrosia Ln / Poinsettia Ln

Cycle (sec):	100	Critical Vol./Cap.(X):	0.675
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	35	Level Of Service:	B

Street Name:	Ambrosia Ln						Poinsettia Ln					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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	1! 0	0	0	1! 0	1	0	1 1 0	1	0	1 1 0
Volume Module:												
Base Vol:	364	5	216	22	9	14	6	267	184	168	239	9
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:	364	5	216	22	9	14	6	267	184	168	239	9
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:	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 Volume:	364	5	216	22	9	14	6	267	184	168	239	9
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	364	5	216	22	9	14	6	267	184	168	239	9
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:	364	5	216	22	9	14	6	267	184	168	239	9
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.62	0.01	0.37	0.49	0.20	0.31	1.00	1.18	0.82	1.00	1.93	0.07
Final Sat.:	996	14	591	782	320	498	1600	1894	1306	1600	3084	116
Capacity Analysis Module:												
Vol/Sat:	0.23	0.37	0.37	0.01	0.03	0.03	0.00	0.14	0.14	0.11	0.08	0.08
Crit Moves:	****			****				****		****		

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Poinsettia Reach E (LSA Project No. HCR1803)
Existing
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #2 Ambrosia Ln / Aviara Pkwy

Cycle (sec):	100	Critical Vol./Cap.(X):	0.715
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	39	Level Of Service:	C

Street Name:	Ambrosia Ln						Aviara Pkwy					
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			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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 1! 0		0	0 1! 0		1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	8	104	13	210	11	158	268	370	29	11	329	256
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:	8	104	13	210	11	158	268	370	29	11	329	256
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:	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 Volume:	8	104	13	210	11	158	268	370	29	11	329	256
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	8	104	13	210	11	158	268	370	29	11	329	256
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:	8	104	13	210	11	158	268	370	29	11	329	256
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.06	0.84	0.10	0.55	0.03	0.42	1.00	1.85	0.15	1.00	1.12	0.88
Final Sat.:	102	1331	166	887	46	667	1600	2967	233	1600	1800	1400
Capacity Analysis Module:												
Vol/Sat:	0.08	0.08	0.08	0.24	0.24	0.24	0.17	0.12	0.12	0.01	0.18	0.18
Crit Moves:	****			****			****				****	

Poinsettia Reach E (LSA Project No. HCR1803)
Existing
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #7 Mimosa Dr / Aviara Pkwy

Cycle (sec):	100	Critical Vol./Cap.(X):	0.299
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	17	Level Of Service:	A

Street Name:	Mimosa Dr						Aviara Pkwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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	1! 0	0	0	1! 0	1	0	1 1 0	1	0	1 1 0
Volume Module:												
Base Vol:	27	7	42	7	1	69	26	509	23	29	491	10
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:	27	7	42	7	1	69	26	509	23	29	491	10
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:	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 Volume:	27	7	42	7	1	69	26	509	23	29	491	10
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	27	7	42	7	1	69	26	509	23	29	491	10
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:	27	7	42	7	1	69	26	509	23	29	491	10
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.36	0.09	0.55	0.09	0.01	0.90	1.00	1.91	0.09	1.00	1.96	0.04
Final Sat.:	568	147	884	145	21	1434	1600	3062	138	1600	3136	64
Capacity Analysis Module:												
Vol/Sat:	0.02	0.05	0.05	0.00	0.05	0.05	0.02	0.17	0.17	0.02	0.16	0.16
Crit Moves:	****				****			****			****	

Poinsettia Reach E (LSA Project No. HCR1803)
Existing
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #8 El Camino Real / Cassia Rd

Cycle (sec):	100	Critical Vol./Cap.(X):	0.755
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	44	Level Of Service:	C

Street Name:	El Camino Real						Cassia Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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	2 0	1	1 0	2 1	0	1 0	0 1	0	1 0	0 1	0
Volume Module:												
Base Vol:	143	1390	11	8	1304	190	418	4	187	17	4	3
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:	143	1390	11	8	1304	190	418	4	187	17	4	3
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:	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 Volume:	143	1390	11	8	1304	190	418	4	187	17	4	3
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	143	1390	11	8	1304	190	418	4	187	17	4	3
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:	143	1390	11	8	1304	190	418	4	187	17	4	3
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.62	0.38	1.00	0.02	0.98	1.00	0.57	0.43
Final Sat.:	1600	3200	1600	1600	4190	610	1600	34	1566	1600	914	686
Capacity Analysis Module:												
Vol/Sat:	0.09	0.43	0.01	0.01	0.31	0.31	0.26	0.12	0.12	0.01	0.00	0.00
Crit Moves:	****			****			****			****		

Poinsettia Reach E (LSA Project No. HCR1803)
Existing
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #9 El Camino Real / Poinsettia Ln

Cycle (sec):	100	Critical Vol./Cap.(X):	0.524
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	25	Level Of Service:	A

Street Name:	El Camino Real						Poinsettia Ln					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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:	2 0	3 0	1	2 0	2 1	0	2 0	1 1	0	2 0	1 1	0
Volume Module:												
Base Vol:	23	1326	446	149	1354	14	17	10	3	438	16	234
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:	23	1326	446	149	1354	14	17	10	3	438	16	234
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:	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 Volume:	23	1326	446	149	1354	14	17	10	3	438	16	234
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	23	1326	446	149	1354	14	17	10	3	438	16	234
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:	23	1326	446	149	1354	14	17	10	3	438	16	234
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	3.00	1.00	2.00	2.97	0.03	2.00	1.54	0.46	2.00	1.00	1.00
Final Sat.:	3200	4800	1600	3200	4751	49	3200	2462	738	3200	1600	1600
Capacity Analysis Module:												
Vol/Sat:	0.01	0.28	0.28	0.05	0.29	0.28	0.01	0.00	0.00	0.14	0.01	0.15
Crit Moves:		****			****			****				****

Poinsettia Reach E (LSA Project No. HCR1803)
Existing
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #10 El Camino Real / Dove Ln

Cycle (sec):	100	Critical Vol./Cap.(X):	0.478
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	44	Level Of Service:	A

Street Name:	El Camino Real						Dove Ln					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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	2	1 0	1 0	2	1 0	1 0	0	1 0	1 0	0	1 0
Volume Module:												
Base Vol:	27	1623	26	50	1624	114	76	9	36	58	14	69
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:	27	1623	26	50	1624	114	76	9	36	58	14	69
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:	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 Volume:	27	1623	26	50	1624	114	76	9	36	58	14	69
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	27	1623	26	50	1624	114	76	9	36	58	14	69
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:	27	1623	26	50	1624	114	76	9	36	58	14	69
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.95	0.05	1.00	2.80	0.20	1.00	0.20	0.80	1.00	0.17	0.83
Final Sat.:	1600	4724	76	1600	4485	315	1600	320	1280	1600	270	1330
Capacity Analysis Module:												
Vol/Sat:	0.02	0.34	0.34	0.03	0.36	0.36	0.05	0.03	0.03	0.04	0.05	0.05
Crit Moves:	****				****		****				****	

Poinsettia Reach E (LSA Project No. HCR1803)
Existing
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #11 El Camino Real / Aviara Pkwy

Cycle (sec):	100	Critical Vol./Cap.(X):	0.780
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	48	Level Of Service:	C

Street Name:	El Camino Real						Aviara Pkwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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:	2 0	2	1 0	2 0	2	1 0	2 0	2	0 1	2 0	1	1 0
Volume Module:												
Base Vol:	137	1416	200	69	1564	102	178	167	280	664	290	103
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:	137	1416	200	69	1564	102	178	167	280	664	290	103
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:	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 Volume:	137	1416	200	69	1564	102	178	167	280	664	290	103
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	137	1416	200	69	1564	102	178	167	280	664	290	103
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:	137	1416	200	69	1564	102	178	167	280	664	290	103
OvlAdjVol:									211			
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	2.63	0.37	2.00	2.82	0.18	2.00	2.00	1.00	2.00	1.48	0.52
Final Sat.:	3200	4206	594	3200	4506	294	3200	3200	1600	3200	2361	839
Capacity Analysis Module:												
Vol/Sat:	0.04	0.34	0.34	0.02	0.35	0.35	0.06	0.05	0.17	0.21	0.12	0.12
OvlAdjV/S:									0.13			
Crit Moves:	****			****					****	****		

Poinsettia Reach E (LSA Project No. HCR1803)
Existing
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #1 Ambrosia Ln / Poinsettia Ln

Cycle (sec):	100	Critical Vol./Cap.(X):	0.355
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	19	Level Of Service:	A

Street Name:	Ambrosia Ln						Poinsettia Ln					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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	1! 0	0	0	1! 0	1	0	1 1 0	1	0	1 1 0
Volume Module:												
Base Vol:	77	16	47	44	28	63	46	315	100	69	298	63
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:	77	16	47	44	28	63	46	315	100	69	298	63
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:	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 Volume:	77	16	47	44	28	63	46	315	100	69	298	63
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	77	16	47	44	28	63	46	315	100	69	298	63
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:	77	16	47	44	28	63	46	315	100	69	298	63
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.55	0.11	0.34	0.32	0.21	0.47	1.00	1.52	0.48	1.00	1.65	0.35
Final Sat.:	880	183	537	521	332	747	1600	2429	771	1600	2642	558
Capacity Analysis Module:												
Vol/Sat:	0.05	0.09	0.09	0.03	0.08	0.08	0.03	0.13	0.13	0.04	0.11	0.11
Crit Moves:	****			****			****			****		

Poinsettia Reach E (LSA Project No. HCR1803)
Existing
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #2 Ambrosia Ln / Aviara Pkwy

Cycle (sec):	100	Critical Vol./Cap.(X):	0.346
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	18	Level Of Service:	A

Street Name:	Ambrosia Ln						Aviara Pkwy					
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			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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	1! 0	0	0 0	1! 0	0	1 0	1	0	1 0	1	1 0
Volume Module:												
Base Vol:	10	6	10	68	5	16	22	603	17	49	568	68
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:	10	6	10	68	5	16	22	603	17	49	568	68
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:	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 Volume:	10	6	10	68	5	16	22	603	17	49	568	68
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	10	6	10	68	5	16	22	603	17	49	568	68
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:	10	6	10	68	5	16	22	603	17	49	568	68
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.39	0.23	0.38	0.76	0.06	0.18	1.00	1.95	0.05	1.00	1.79	0.21
Final Sat.:	615	369	615	1222	90	288	1600	3112	88	1600	2858	342
Capacity Analysis Module:												
Vol/Sat:	0.02	0.02	0.02	0.06	0.06	0.06	0.01	0.19	0.19	0.03	0.20	0.20
Crit Moves:	****			****				****		****		

Poinsettia Reach E (LSA Project No. HCR1803)
Existing
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #7 Mimosa Dr / Aviara Pkwy

Cycle (sec):	100	Critical Vol./Cap.(X):	0.343
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	18	Level Of Service:	A

Street Name:	Mimosa Dr						Aviara Pkwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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	1! 0	0	0	1! 0	1	0	1 1 0	1	0	1 1 0
Volume Module:												
Base Vol:	28	4	37	16	3	18	16	585	19	65	710	24
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:	28	4	37	16	3	18	16	585	19	65	710	24
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:	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 Volume:	28	4	37	16	3	18	16	585	19	65	710	24
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	28	4	37	16	3	18	16	585	19	65	710	24
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:	28	4	37	16	3	18	16	585	19	65	710	24
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.40	0.06	0.54	0.43	0.08	0.49	1.00	1.94	0.06	1.00	1.93	0.07
Final Sat.:	649	93	858	692	130	778	1600	3099	101	1600	3095	105
Capacity Analysis Module:												
Vol/Sat:	0.02	0.04	0.04	0.01	0.02	0.02	0.01	0.19	0.19	0.04	0.23	0.23
Crit Moves:	****			****			****				****	

Poinsettia Reach E (LSA Project No. HCR1803)
Existing
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #8 El Camino Real / Cassia Rd

Cycle (sec):	100	Critical Vol./Cap.(X):	0.772
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	47	Level Of Service:	C

Street Name:	El Camino Real						Cassia Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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	2 0	1	1 0	2 1	0	1 0	0 1	0	1 0	0 1	0
Volume Module:												
Base Vol:	198	1031	14	15	1680	404	234	2	185	11	10	19
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:	198	1031	14	15	1680	404	234	2	185	11	10	19
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:	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 Volume:	198	1031	14	15	1680	404	234	2	185	11	10	19
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	198	1031	14	15	1680	404	234	2	185	11	10	19
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:	198	1031	14	15	1680	404	234	2	185	11	10	19
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.42	0.58	1.00	0.01	0.99	1.00	0.34	0.66
Final Sat.:	1600	3200	1600	1600	3869	931	1600	17	1583	1600	552	1048
Capacity Analysis Module:												
Vol/Sat:	0.12	0.32	0.01	0.01	0.43	0.43	0.15	0.12	0.12	0.01	0.02	0.02
Crit Moves:	****				****		****				****	

Poinsettia Reach E (LSA Project No. HCR1803)
Existing
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #9 El Camino Real / Poinsettia Ln

Cycle (sec):	100	Critical Vol./Cap.(X):	0.530
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	25	Level Of Service:	A

Street Name:	El Camino Real						Poinsettia Ln					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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:	2 0	3 0	1	2 0	2 1	0	2 0	1 1	0	2 0	1 1	0
Volume Module:												
Base Vol:	19	1089	492	243	1606	14	14	14	5	290	12	130
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:	19	1089	492	243	1606	14	14	14	5	290	12	130
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:	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 Volume:	19	1089	492	243	1606	14	14	14	5	290	12	130
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	19	1089	492	243	1606	14	14	14	5	290	12	130
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:	19	1089	492	243	1606	14	14	14	5	290	12	130
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	3.00	1.00	2.00	2.97	0.03	2.00	1.47	0.53	2.00	1.00	1.00
Final Sat.:	3200	4800	1600	3200	4759	41	3200	2358	842	3200	1600	1600
Capacity Analysis Module:												
Vol/Sat:	0.01	0.23	0.31	0.08	0.34	0.34	0.00	0.01	0.01	0.09	0.01	0.08
Crit Moves:			****	****				****		****		

Poinsettia Reach E (LSA Project No. HCR1803)
Existing
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #10 El Camino Real / Dove Ln

Cycle (sec):	100	Critical Vol./Cap.(X):	0.574
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	53	Level Of Service:	A

Street Name:	El Camino Real						Dove Ln					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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	2	1 0	1 0	2	1 0	1 0	0	1 0	1 0	0	1 0
Volume Module:												
Base Vol:	90	1474	56	87	1538	225	156	24	79	72	29	55
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:	90	1474	56	87	1538	225	156	24	79	72	29	55
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:	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 Volume:	90	1474	56	87	1538	225	156	24	79	72	29	55
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	90	1474	56	87	1538	225	156	24	79	72	29	55
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:	90	1474	56	87	1538	225	156	24	79	72	29	55
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.89	0.11	1.00	2.62	0.38	1.00	0.23	0.77	1.00	0.35	0.65
Final Sat.:	1600	4624	176	1600	4187	613	1600	373	1227	1600	552	1048
Capacity Analysis Module:												
Vol/Sat:	0.06	0.32	0.32	0.05	0.37	0.37	0.10	0.06	0.06	0.05	0.05	0.05
Crit Moves:	****				****		****				****	

Poinsettia Reach E (LSA Project No. HCR1803)
Existing
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #11 El Camino Real / Aviara Pkwy

Cycle (sec):	100	Critical Vol./Cap.(X):	0.722
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	40	Level Of Service:	C

Street Name:	El Camino Real						Aviara Pkwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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:	2 0	2	1 0	2 0	2	1 0	2 0	2	0 1	2 0	1	1 0
Volume Module:												
Base Vol:	450	1448	536	191	1395	131	144	342	330	294	283	86
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:	450	1448	536	191	1395	131	144	342	330	294	283	86
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:	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 Volume:	450	1448	536	191	1395	131	144	342	330	294	283	86
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	450	1448	536	191	1395	131	144	342	330	294	283	86
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:	450	1448	536	191	1395	131	144	342	330	294	283	86
OvlAdjVol:									105			
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	2.19	0.81	2.00	2.74	0.26	2.00	2.00	1.00	2.00	1.53	0.47
Final Sat.:	3200	3503	1297	3200	4388	412	3200	3200	1600	3200	2454	746
Capacity Analysis Module:												
Vol/Sat:	0.14	0.41	0.41	0.06	0.32	0.32	0.05	0.11	0.21	0.09	0.12	0.12
OvlAdjV/S:									0.07			
Crit Moves:	****			****				****		****		

APPENDIX B

EXISTING INTERSECTION LEVEL OF SERVICE WORKSHEETS

HCM Worksheets

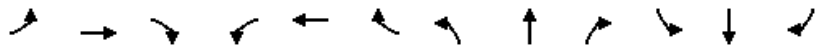
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	267	184	168	239	9	364	5	216	22	9	14
Future Volume (veh/h)	6	267	184	168	239	9	364	5	216	22	9	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	6	281	194	177	252	9	383	5	227	23	9	15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	14	420	282	218	1124	40	507	6	253	380	154	216
Arrive On Green	0.01	0.21	0.21	0.12	0.32	0.32	0.47	0.47	0.47	0.47	0.47	0.47
Sat Flow, veh/h	1781	2037	1364	1781	3500	125	914	12	542	657	330	463
Grp Volume(v), veh/h	6	244	231	177	128	133	615	0	0	47	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1625	1781	1777	1848	1468	0	0	1450	0	0
Q Serve(g_s), s	0.2	9.2	9.6	7.1	3.8	3.9	26.9	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.2	9.2	9.6	7.1	3.8	3.9	28.0	0.0	0.0	1.1	0.0	0.0
Prop In Lane	1.00		0.84	1.00		0.07	0.62		0.37	0.49		0.32
Lane Grp Cap(c), veh/h	14	367	335	218	570	593	766	0	0	751	0	0
V/C Ratio(X)	0.43	0.67	0.69	0.81	0.22	0.22	0.80	0.00	0.00	0.06	0.00	0.00
Avail Cap(c_a), veh/h	122	367	335	295	570	593	1039	0	0	1008	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	36.1	26.7	26.9	31.3	18.2	18.2	17.7	0.0	0.0	10.7	0.0	0.0
Incr Delay (d2), s/veh	19.5	9.2	11.0	11.7	0.9	0.9	3.3	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	4.7	4.6	3.6	1.6	1.7	9.1	0.0	0.0	0.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.6	35.9	37.9	42.9	19.1	19.1	21.0	0.0	0.0	10.7	0.0	0.0
LnGrp LOS	E	D	D	D	B	B	C	A	A	B	A	A
Approach Vol, veh/h		481			438			615			47	
Approach Delay, s/veh		37.1			28.7			21.0			10.7	
Approach LOS		D			C			C			B	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	38.7	13.2	21.3	38.7	4.8	29.7
Change Period (Y+Rc), s	4.5	* 4.2	6.2	4.5	* 4.2	* 6.2
Max Green Setting (Gmax), s	47.9	* 12	15.1	47.9	* 5	* 23
Max Q Clear Time (g_c+I1), s	30.0	9.1	11.6	3.1	2.2	5.9
Green Ext Time (p_c), s	4.2	0.1	1.0	0.3	0.0	1.3

Intersection Summary	
HCM 6th Ctrl Delay	27.7
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	268	370	29	11	329	256	8	104	13	210	11	158
Future Volume (veh/h)	268	370	29	11	329	256	8	104	13	210	11	158
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	357	493	39	15	439	341	11	139	17	280	15	211
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	381	1401	111	29	423	327	13	167	20	286	15	215
Arrive On Green	0.21	0.42	0.42	0.02	0.22	0.22	0.11	0.11	0.11	0.30	0.30	0.30
Sat Flow, veh/h	1781	3337	263	1781	1908	1474	121	1524	186	939	50	707
Grp Volume(v), veh/h	357	262	270	15	409	371	167	0	0	506	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1823	1781	1777	1605	1831	0	0	1696	0	0
Q Serve(g_s), s	25.7	13.1	13.2	1.1	29.0	29.0	11.7	0.0	0.0	38.7	0.0	0.0
Cycle Q Clear(g_c), s	25.7	13.1	13.2	1.1	29.0	29.0	11.7	0.0	0.0	38.7	0.0	0.0
Prop In Lane	1.00		0.14	1.00		0.92	0.07		0.10	0.55		0.42
Lane Grp Cap(c), veh/h	381	746	765	29	394	356	201	0	0	516	0	0
V/C Ratio(X)	0.94	0.35	0.35	0.52	1.04	1.04	0.83	0.00	0.00	0.98	0.00	0.00
Avail Cap(c_a), veh/h	403	746	765	75	394	356	378	0	0	516	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	50.5	25.8	25.8	63.8	50.9	50.9	57.0	0.0	0.0	45.1	0.0	0.0
Incr Delay (d2), s/veh	28.5	0.3	0.3	14.1	55.2	59.2	8.6	0.0	0.0	34.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	5.6	5.8	0.6	18.9	17.5	5.9	0.0	0.0	21.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	79.0	26.1	26.1	77.9	106.0	110.1	65.6	0.0	0.0	79.3	0.0	0.0
LnGrp LOS	E	C	C	E	F	F	E	A	A	E	A	A
Approach Vol, veh/h		889			795			167			506	
Approach Delay, s/veh		47.3			107.4			65.6			79.3	
Approach LOS		D			F			E			E	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	18.9	6.3	61.1	44.4	32.2	35.2
Change Period (Y+Rc), s	4.6	* 4.2	6.2	4.6	* 4.2	6.2
Max Green Setting (Gmax), s	27.0	* 5.5	53.1	39.8	* 30	29.0
Max Q Clear Time (g_c+I1), s	13.7	3.1	15.2	40.7	27.7	31.0
Green Ext Time (p_c), s	0.7	0.0	3.6	0.0	0.2	0.0

Intersection Summary	
HCM 6th Ctrl Delay	75.8
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	39	0	3	0	5	27	5	8	0
Future Volume (Veh/h)	0	0	0	39	0	3	0	5	27	5	8	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	0	41	0	3	0	5	28	5	8	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		1			1							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	3			0			86	85	0	112	82	0
vC1, stage 1 conf vol							0	0		82	82	
vC2, stage 2 conf vol							86	85		30	0	
vCu, unblocked vol	3			0			86	85	0	112	82	0
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			100	99	97	99	99	100
cM capacity (veh/h)	1619			1623			811	731	1085	790	732	1085

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	41	3	33	13
Volume Left	41	0	0	5
Volume Right	0	3	28	0
cSH	1623	1700	1011	753
Volume to Capacity	0.03	0.00	0.03	0.02
Queue Length 95th (ft)	2	0	3	1
Control Delay (s)	7.3	0.0	8.7	9.9
Lane LOS	A		A	A
Approach Delay (s)	6.8		8.7	9.9
Approach LOS			A	A

Intersection Summary				
Average Delay	7.9			
Intersection Capacity Utilization	14.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	1.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	4	23	9	7	39
Future Vol, veh/h	10	4	23	9	7	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	4	24	9	7	41

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	84	29	0	0	33	0
Stage 1	29	-	-	-	-	-
Stage 2	55	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	918	1046	-	-	1579	-
Stage 1	994	-	-	-	-	-
Stage 2	968	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	913	1046	-	-	1579	-
Mov Cap-2 Maneuver	913	-	-	-	-	-
Stage 1	989	-	-	-	-	-
Stage 2	968	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	1.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	947	1579	-
HCM Lane V/C Ratio	-	-	0.016	0.005	-
HCM Control Delay (s)	-	-	8.9	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	4	16	6	6	7	1
Future Vol, veh/h	4	16	6	6	7	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	17	6	6	7	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	21	0	31	13
Stage 1	-	-	-	-	13	-
Stage 2	-	-	-	-	18	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1595	-	983	1067
Stage 1	-	-	-	-	1010	-
Stage 2	-	-	-	-	1005	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1595	-	979	1067
Mov Cap-2 Maneuver	-	-	-	-	979	-
Stage 1	-	-	-	-	1006	-
Stage 2	-	-	-	-	1005	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.6	8.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	989	-	-	1595	-
HCM Lane V/C Ratio	0.009	-	-	0.004	-
HCM Control Delay (s)	8.7	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

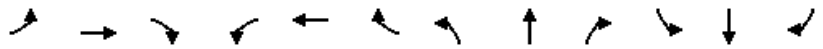
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	509	23	29	491	10	27	7	42	7	1	69
Future Volume (veh/h)	26	509	23	29	491	10	27	7	42	7	1	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	27	536	24	31	517	11	28	7	44	7	1	73
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	58	1573	70	66	1631	35	181	27	98	114	7	155
Arrive On Green	0.03	0.45	0.45	0.04	0.46	0.46	0.11	0.11	0.11	0.11	0.11	0.11
Sat Flow, veh/h	1781	3464	155	1781	3558	76	467	252	904	88	69	1433
Grp Volume(v), veh/h	27	275	285	31	258	270	79	0	0	81	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1842	1781	1777	1857	1622	0	0	1590	0	0
Q Serve(g_s), s	0.6	3.7	3.7	0.6	3.4	3.5	0.0	0.0	0.0	0.2	0.0	0.0
Cycle Q Clear(g_c), s	0.6	3.7	3.7	0.6	3.4	3.5	1.6	0.0	0.0	1.8	0.0	0.0
Prop In Lane	1.00		0.08	1.00		0.04	0.35		0.56	0.09		0.90
Lane Grp Cap(c), veh/h	58	807	837	66	814	851	306	0	0	277	0	0
V/C Ratio(X)	0.46	0.34	0.34	0.47	0.32	0.32	0.26	0.00	0.00	0.29	0.00	0.00
Avail Cap(c_a), veh/h	257	807	837	257	814	851	1250	0	0	1261	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	17.8	6.6	6.6	17.7	6.4	6.4	15.6	0.0	0.0	15.7	0.0	0.0
Incr Delay (d2), s/veh	5.6	1.1	1.1	5.2	1.0	1.0	0.4	0.0	0.0	0.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.2	1.2	0.3	1.1	1.1	0.6	0.0	0.0	0.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.4	7.7	7.7	22.9	7.4	7.4	16.0	0.0	0.0	16.2	0.0	0.0
LnGrp LOS	C	A	A	C	A	A	B	A	A	B	A	A
Approach Vol, veh/h		587			559			79			81	
Approach Delay, s/veh		8.4			8.3			16.0			16.2	
Approach LOS		A			A			B			B	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	8.7	5.6	23.2	8.7	5.4	23.4
Change Period (Y+Rc), s	4.6	* 4.2	6.2	4.6	* 4.2	6.2
Max Green Setting (Gmax), s	27.6	* 5.4	17.0	27.6	* 5.4	17.0
Max Q Clear Time (g_c+I1), s	3.6	2.6	5.7	3.8	2.6	5.5
Green Ext Time (p_c), s	0.4	0.0	2.6	0.4	0.0	2.4

Intersection Summary	
HCM 6th Ctrl Delay	9.3
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	418	4	187	17	4	3	143	1390	11	8	1304	190
Future Volume (veh/h)	418	4	187	17	4	3	143	1390	11	8	1304	190
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	440	4	197	18	4	3	151	1463	12	8	1373	200
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	480	9	419	43	24	18	180	1833	818	18	1913	279
Arrive On Green	0.27	0.27	0.27	0.02	0.02	0.02	0.10	0.52	0.52	0.01	0.42	0.42
Sat Flow, veh/h	1781	32	1558	1781	992	744	1781	3554	1585	1781	4501	655
Grp Volume(v), veh/h	440	0	201	18	0	7	151	1463	12	8	1038	535
Grp Sat Flow(s),veh/h/ln	1781	0	1590	1781	0	1736	1781	1777	1585	1781	1702	1752
Q Serve(g_s), s	27.0	0.0	11.9	1.1	0.0	0.4	9.4	38.2	0.4	0.5	28.5	28.5
Cycle Q Clear(g_c), s	27.0	0.0	11.9	1.1	0.0	0.4	9.4	38.2	0.4	0.5	28.5	28.5
Prop In Lane	1.00		0.98	1.00		0.43	1.00		1.00	1.00		0.37
Lane Grp Cap(c), veh/h	480	0	428	43	0	42	180	1833	818	18	1446	745
V/C Ratio(X)	0.92	0.00	0.47	0.42	0.00	0.17	0.84	0.80	0.01	0.46	0.72	0.72
Avail Cap(c_a), veh/h	537	0	480	537	0	524	216	1833	818	79	1446	745
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.0	0.0	34.5	54.2	0.0	53.9	49.8	22.4	13.3	55.5	26.8	26.8
Incr Delay (d2), s/veh	19.6	0.0	0.8	6.4	0.0	1.9	21.4	3.7	0.0	17.4	3.1	5.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.3	0.0	4.7	0.6	0.0	0.2	5.2	16.2	0.2	0.3	11.9	12.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.6	0.0	35.3	60.6	0.0	55.8	71.2	26.2	13.3	73.0	29.9	32.7
LnGrp LOS	E	A	D	E	A	E	E	C	B	E	C	C
Approach Vol, veh/h		641			25			1626			1581	
Approach Delay, s/veh		51.9			59.3			30.3			31.1	
Approach LOS		D			E			C			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.3	64.7		35.4	15.6	54.4		7.3
Change Period (Y+Rc), s	* 4.2	6.5		5.1	* 4.2	6.5		4.6
Max Green Setting (Gmax), s	* 5	56.6		34.0	* 14	47.9		34.0
Max Q Clear Time (g_c+I1), s	2.5	40.2		29.0	11.4	30.5		3.1
Green Ext Time (p_c), s	0.0	10.0		1.3	0.1	10.4		0.1

Intersection Summary	
HCM 6th Ctrl Delay	34.4
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	10	3	438	16	234	23	1326	446	149	1354	14
Future Volume (veh/h)	17	10	3	438	16	234	23	1326	446	149	1354	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	18	11	3	461	17	246	24	1396	469	157	1425	15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	73	219	57	497	358	319	93	2032	631	241	2297	24
Arrive On Green	0.02	0.08	0.08	0.14	0.20	0.20	0.03	0.40	0.40	0.07	0.44	0.44
Sat Flow, veh/h	3456	2789	728	3456	1777	1585	3456	5106	1585	3456	5210	55
Grp Volume(v), veh/h	18	7	7	461	17	246	24	1396	469	157	931	509
Grp Sat Flow(s),veh/h/ln	1728	1777	1739	1728	1777	1585	1728	1702	1585	1728	1702	1860
Q Serve(g_s), s	0.3	0.2	0.3	9.0	0.5	10.0	0.5	15.4	17.2	3.0	14.3	14.3
Cycle Q Clear(g_c), s	0.3	0.2	0.3	9.0	0.5	10.0	0.5	15.4	17.2	3.0	14.3	14.3
Prop In Lane	1.00		0.42	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	73	140	137	497	358	319	93	2032	631	241	1501	820
V/C Ratio(X)	0.25	0.05	0.05	0.93	0.05	0.77	0.26	0.69	0.74	0.65	0.62	0.62
Avail Cap(c_a), veh/h	254	835	817	497	960	856	254	2032	631	254	1501	820
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.8	29.0	29.0	28.8	21.9	25.7	32.5	17.0	17.5	30.9	14.7	14.7
Incr Delay (d2), s/veh	1.7	0.1	0.2	23.7	0.1	4.0	1.5	1.9	7.8	5.4	1.9	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.1	0.1	5.2	0.2	3.9	0.2	5.8	7.0	1.4	5.3	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.5	29.2	29.2	52.5	22.0	29.7	33.9	18.9	25.3	36.3	16.6	18.2
LnGrp LOS	C	C	C	D	C	C	C	B	C	D	B	B
Approach Vol, veh/h		32			724			1889			1597	
Approach Delay, s/veh		32.2			44.0			20.7			19.0	
Approach LOS		C			D			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	33.6	14.0	11.6	6.0	36.5	5.6	19.9
Change Period (Y+Rc), s	* 4.2	6.5	* 4.2	6.2	* 4.2	6.5	* 4.2	6.2
Max Green Setting (Gmax), s	* 5	27.1	* 9.8	32.0	* 5	27.1	* 5	36.8
Max Q Clear Time (g_c+I1), s	5.0	19.2	11.0	2.3	2.5	16.3	2.3	12.0
Green Ext Time (p_c), s	0.0	6.0	0.0	0.0	0.0	6.8	0.0	1.7

Intersection Summary	
HCM 6th Ctrl Delay	24.1
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

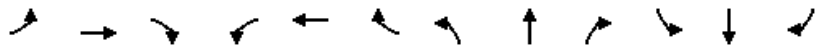
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	9	36	58	14	69	27	1623	26	50	1624	114
Future Volume (veh/h)	76	9	36	58	14	69	27	1623	26	50	1624	114
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	80	9	38	61	15	73	28	1708	27	53	1709	120
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	103	29	124	88	24	116	53	2714	43	82	2471	173
Arrive On Green	0.06	0.09	0.09	0.05	0.09	0.09	0.03	0.52	0.52	0.05	0.51	0.51
Sat Flow, veh/h	1781	313	1320	1781	277	1350	1781	5178	82	1781	4871	342
Grp Volume(v), veh/h	80	0	47	61	0	88	28	1123	612	53	1193	636
Grp Sat Flow(s),veh/h/ln	1781	0	1633	1781	0	1627	1781	1702	1856	1781	1702	1809
Q Serve(g_s), s	3.1	0.0	1.9	2.4	0.0	3.6	1.1	16.3	16.4	2.0	18.6	18.6
Cycle Q Clear(g_c), s	3.1	0.0	1.9	2.4	0.0	3.6	1.1	16.3	16.4	2.0	18.6	18.6
Prop In Lane	1.00		0.81	1.00		0.83	1.00		0.04	1.00		0.19
Lane Grp Cap(c), veh/h	103	0	153	88	0	140	53	1784	973	82	1726	917
V/C Ratio(X)	0.78	0.00	0.31	0.69	0.00	0.63	0.52	0.63	0.63	0.65	0.69	0.69
Avail Cap(c_a), veh/h	143	0	805	133	0	793	128	1784	973	133	1726	917
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.5	0.0	29.5	32.6	0.0	30.8	33.4	11.8	11.8	32.7	13.1	13.1
Incr Delay (d2), s/veh	16.5	0.0	1.1	9.1	0.0	4.6	7.7	1.7	3.1	8.3	2.3	4.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.0	0.8	1.2	0.0	1.6	0.6	5.7	6.6	1.0	6.7	7.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.0	0.0	30.6	41.8	0.0	35.5	41.1	13.5	14.9	41.0	15.3	17.4
LnGrp LOS	D	A	C	D	A	D	D	B	B	D	B	B
Approach Vol, veh/h		127			149			1763			1882	
Approach Delay, s/veh		42.2			38.1			14.4			16.7	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.4	43.1	7.7	11.6	8.6	41.9	8.2	11.1
Change Period (Y+Rc), s	* 4.2	6.5	* 4.2	5.1	6.5	* 6.5	* 4.2	5.1
Max Green Setting (Gmax), s	* 5.2	35.2	* 5.2	34.4	5.0	* 35	* 5.6	34.0
Max Q Clear Time (g_c+I1), s	4.1	18.4	4.4	3.9	3.1	20.6	5.1	5.6
Green Ext Time (p_c), s	0.0	11.1	0.0	0.2	0.0	10.6	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	17.3
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	178	167	280	664	290	103	137	1416	200	69	1564	102
Future Volume (veh/h)	178	167	280	664	290	103	137	1416	200	69	1564	102
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	187	176	295	699	305	108	144	1491	0	73	1646	107
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	244	703	397	742	885	307	181	1861		127	1797	117
Arrive On Green	0.07	0.20	0.20	0.21	0.34	0.34	0.05	0.36	0.00	0.04	0.37	0.37
Sat Flow, veh/h	3456	3554	1585	3456	2587	898	3456	5274	0	3456	4899	318
Grp Volume(v), veh/h	187	176	295	699	208	205	144	1491	0	73	1143	610
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1709	1728	1702	0	1728	1702	1813
Q Serve(g_s), s	6.7	5.3	21.5	25.0	10.9	11.3	5.2	32.9	0.0	2.6	40.2	40.3
Cycle Q Clear(g_c), s	6.7	5.3	21.5	25.0	10.9	11.3	5.2	32.9	0.0	2.6	40.2	40.3
Prop In Lane	1.00		1.00	1.00		0.53	1.00		0.00	1.00		0.18
Lane Grp Cap(c), veh/h	244	703	397	742	608	585	181	1861		127	1249	665
V/C Ratio(X)	0.77	0.25	0.74	0.94	0.34	0.35	0.79	0.80		0.58	0.92	0.92
Avail Cap(c_a), veh/h	344	877	474	742	643	619	181	1861		140	1249	665
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.4	42.5	43.4	48.6	30.8	30.9	58.9	35.8	0.0	59.6	37.9	37.9
Incr Delay (d2), s/veh	6.5	0.2	5.1	20.1	0.3	0.4	21.0	3.7	0.0	4.7	11.9	19.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	2.3	9.0	12.8	4.8	4.7	2.8	14.2	0.0	1.2	18.6	21.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.9	42.7	48.5	68.7	31.1	31.3	79.9	39.6	0.0	64.2	49.8	57.5
LnGrp LOS	E	D	D	E	C	C	E	D		E	D	E
Approach Vol, veh/h		658			1112			1635	A		1826	
Approach Delay, s/veh		51.3			54.7			43.1			52.9	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.1	52.3	31.2	31.1	10.8	52.6	13.1	49.2
Change Period (Y+Rc), s	6.5	* 6.5	* 4.2	6.2	* 4.2	6.5	* 4.2	6.2
Max Green Setting (Gmax), s	5.5	* 46	* 27	31.0	* 6.6	44.3	* 13	45.5
Max Q Clear Time (g_c+I1), s	4.6	34.9	27.0	23.5	7.2	42.3	8.7	13.3
Green Ext Time (p_c), s	0.0	7.3	0.0	1.3	0.0	1.7	0.2	2.7

Intersection Summary	
HCM 6th Ctrl Delay	50.1
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

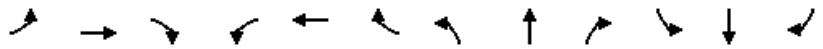
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	315	100	69	298	63	77	16	47	44	28	63
Future Volume (veh/h)	46	315	100	69	298	63	77	16	47	44	28	63
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	48	332	105	73	314	66	81	17	49	46	29	66
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	84	1429	445	109	1610	334	209	36	71	143	61	102
Arrive On Green	0.05	0.54	0.54	0.06	0.55	0.55	0.13	0.13	0.13	0.13	0.13	0.13
Sat Flow, veh/h	1781	2668	830	1781	2930	608	821	280	551	430	472	794
Grp Volume(v), veh/h	48	219	218	73	189	191	147	0	0	141	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1721	1781	1777	1761	1652	0	0	1695	0	0
Q Serve(g_s), s	1.4	3.6	3.7	2.2	2.9	3.0	0.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.4	3.6	3.7	2.2	2.9	3.0	4.2	0.0	0.0	4.0	0.0	0.0
Prop In Lane	1.00		0.48	1.00		0.35	0.55		0.33	0.33		0.47
Lane Grp Cap(c), veh/h	84	952	922	109	977	968	316	0	0	307	0	0
V/C Ratio(X)	0.57	0.23	0.24	0.67	0.19	0.20	0.47	0.00	0.00	0.46	0.00	0.00
Avail Cap(c_a), veh/h	354	952	922	452	977	968	1068	0	0	1113	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	25.4	6.7	6.7	25.0	6.2	6.2	22.5	0.0	0.0	22.4	0.0	0.0
Incr Delay (d2), s/veh	5.9	0.6	0.6	6.8	0.4	0.5	1.1	0.0	0.0	1.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	1.2	1.2	1.1	0.9	1.0	1.7	0.0	0.0	1.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.2	7.3	7.3	31.8	6.6	6.6	23.5	0.0	0.0	23.5	0.0	0.0
LnGrp LOS	C	A	A	C	A	A	C	A	A	C	A	A
Approach Vol, veh/h		485			453			147			141	
Approach Delay, s/veh		9.7			10.7			23.5			23.5	
Approach LOS		A			B			C			C	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	11.5	7.5	35.3	11.5	6.8	36.1
Change Period (Y+Rc), s	4.5	* 4.2	6.2	4.5	* 4.2	* 6.2
Max Green Setting (Gmax), s	35.5	* 14	25.8	35.5	* 11	* 30
Max Q Clear Time (g_c+I1), s	6.2	4.2	5.7	6.0	3.4	5.0
Green Ext Time (p_c), s	0.9	0.1	2.6	0.8	0.0	2.3

Intersection Summary	
HCM 6th Ctrl Delay	13.3
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	603	17	49	568	68	10	6	10	68	5	16
Future Volume (veh/h)	22	603	17	49	568	68	10	6	10	68	5	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	23	635	18	52	598	72	11	6	11	72	5	17
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	51	1025	29	100	1015	122	23	12	23	112	8	27
Arrive On Green	0.03	0.29	0.29	0.06	0.32	0.32	0.03	0.03	0.03	0.08	0.08	0.08
Sat Flow, veh/h	1781	3529	100	1781	3194	384	674	368	674	1338	93	316
Grp Volume(v), veh/h	23	320	333	52	332	338	28	0	0	94	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1852	1781	1777	1801	1715	0	0	1747	0	0
Q Serve(g_s), s	0.5	5.7	5.7	1.0	5.7	5.8	0.6	0.0	0.0	1.9	0.0	0.0
Cycle Q Clear(g_c), s	0.5	5.7	5.7	1.0	5.7	5.8	0.6	0.0	0.0	1.9	0.0	0.0
Prop In Lane	1.00		0.05	1.00		0.21	0.39		0.39	0.77		0.18
Lane Grp Cap(c), veh/h	51	516	538	100	565	573	58	0	0	147	0	0
V/C Ratio(X)	0.45	0.62	0.62	0.52	0.59	0.59	0.48	0.00	0.00	0.64	0.00	0.00
Avail Cap(c_a), veh/h	243	874	911	248	879	891	1233	0	0	1241	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	17.5	11.2	11.2	16.8	10.5	10.5	17.4	0.0	0.0	16.2	0.0	0.0
Incr Delay (d2), s/veh	6.2	1.2	1.2	4.1	1.0	1.0	6.1	0.0	0.0	4.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.9	1.9	0.5	1.8	1.8	0.3	0.0	0.0	0.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.7	12.5	12.4	20.9	11.4	11.4	23.4	0.0	0.0	20.8	0.0	0.0
LnGrp LOS	C	B	B	C	B	B	C	A	A	C	A	A
Approach Vol, veh/h		676			722			28			94	
Approach Delay, s/veh		12.8			12.1			23.4			20.8	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	5.8	6.3	16.8	7.7	5.2	17.8
Change Period (Y+Rc), s	4.6	* 4.2	6.2	4.6	* 4.2	6.2
Max Green Setting (Gmax), s	26.3	* 5.1	18.0	26.0	* 5	18.1
Max Q Clear Time (g_c+I1), s	2.6	3.0	7.7	3.9	2.5	7.8
Green Ext Time (p_c), s	0.1	0.0	2.9	0.4	0.0	3.0

Intersection Summary	
HCM 6th Ctrl Delay	13.2
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	30	0	13	0	3	19	6	4	0
Future Volume (Veh/h)	0	0	0	30	0	13	0	3	19	6	4	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	0	32	0	14	0	3	20	6	4	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		1			1							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	14			0			66	78	0	86	64	0
vC1, stage 1 conf vol							0	0		64	64	
vC2, stage 2 conf vol							66	78		22	0	
vCu, unblocked vol	14			0			66	78	0	86	64	0
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			100	100	98	99	99	100
cM capacity (veh/h)	1604			1623			840	740	1085	823	750	1085

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	32	14	23	10
Volume Left	32	0	0	6
Volume Right	0	14	20	0
cSH	1623	1700	1023	792
Volume to Capacity	0.02	0.01	0.02	0.01
Queue Length 95th (ft)	2	0	2	1
Control Delay (s)	7.3	0.0	8.6	9.6
Lane LOS	A		A	A
Approach Delay (s)	5.1		8.6	9.6
Approach LOS			A	A

Intersection Summary				
Average Delay	6.7			
Intersection Capacity Utilization	15.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	2.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	5	20	8	5	15
Future Vol, veh/h	8	5	20	8	5	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	5	21	8	5	16

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	51	25	0	0	29	0
Stage 1	25	-	-	-	-	-
Stage 2	26	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	958	1051	-	-	1584	-
Stage 1	998	-	-	-	-	-
Stage 2	997	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	955	1051	-	-	1584	-
Mov Cap-2 Maneuver	955	-	-	-	-	-
Stage 1	995	-	-	-	-	-
Stage 2	997	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	1.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	990	1584	-
HCM Lane V/C Ratio	-	-	0.014	0.003	-
HCM Control Delay (s)	-	-	8.7	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	4.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	3	9	6	3	9	4
Future Vol, veh/h	3	9	6	3	9	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	9	6	3	9	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	12	0	23	8
Stage 1	-	-	-	-	8	-
Stage 2	-	-	-	-	15	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1607	-	993	1074
Stage 1	-	-	-	-	1015	-
Stage 2	-	-	-	-	1008	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1607	-	989	1074
Mov Cap-2 Maneuver	-	-	-	-	989	-
Stage 1	-	-	-	-	1011	-
Stage 2	-	-	-	-	1008	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.8	8.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1014	-	-	1607	-
HCM Lane V/C Ratio	0.013	-	-	0.004	-
HCM Control Delay (s)	8.6	-	-	7.2	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

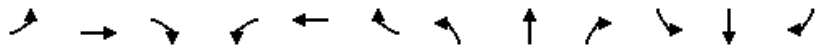
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	585	19	65	710	24	28	4	37	16	3	18
Future Volume (veh/h)	16	585	19	65	710	24	28	4	37	16	3	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	17	616	20	68	747	25	29	4	39	17	3	19
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	38	1603	52	119	1760	59	182	13	77	186	23	72
Arrive On Green	0.02	0.46	0.46	0.07	0.50	0.50	0.09	0.09	0.09	0.09	0.09	0.09
Sat Flow, veh/h	1781	3513	114	1781	3509	117	574	148	853	584	253	795
Grp Volume(v), veh/h	17	311	325	68	378	394	72	0	0	39	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1850	1781	1777	1849	1575	0	0	1632	0	0
Q Serve(g_s), s	0.4	4.5	4.5	1.4	5.2	5.2	0.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.4	4.5	4.5	1.4	5.2	5.2	1.6	0.0	0.0	0.8	0.0	0.0
Prop In Lane	1.00		0.06	1.00		0.06	0.40		0.54	0.44		0.49
Lane Grp Cap(c), veh/h	38	811	844	119	892	928	272	0	0	280	0	0
V/C Ratio(X)	0.44	0.38	0.38	0.57	0.42	0.42	0.26	0.00	0.00	0.14	0.00	0.00
Avail Cap(c_a), veh/h	230	811	844	234	892	928	1196	0	0	1195	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	18.7	6.9	7.0	17.6	6.1	6.1	16.8	0.0	0.0	16.4	0.0	0.0
Incr Delay (d2), s/veh	7.8	1.4	1.3	4.2	1.5	1.4	0.5	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.4	1.5	0.6	1.6	1.6	0.6	0.0	0.0	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.5	8.3	8.3	21.8	7.6	7.5	17.3	0.0	0.0	16.7	0.0	0.0
LnGrp LOS	C	A	A	C	A	A	B	A	A	B	A	A
Approach Vol, veh/h		653			840			72			39	
Approach Delay, s/veh		8.8			8.7			17.3			16.7	
Approach LOS		A			A			B			B	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	8.1	6.8	23.9	8.1	5.0	25.7
Change Period (Y+Rc), s	4.6	* 4.2	6.2	4.6	* 4.2	6.2
Max Green Setting (Gmax), s	27.2	* 5.1	17.7	27.2	* 5	17.8
Max Q Clear Time (g_c+I1), s	3.6	3.4	6.5	2.8	2.4	7.2
Green Ext Time (p_c), s	0.3	0.0	3.0	0.1	0.0	3.6

Intersection Summary	
HCM 6th Ctrl Delay	9.3
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



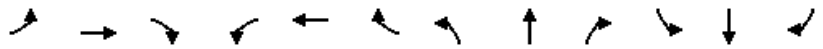
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	234	2	185	11	10	19	198	1031	14	15	1680	404
Future Volume (veh/h)	234	2	185	11	10	19	198	1031	14	15	1680	404
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	246	2	195	12	11	20	208	1085	15	16	1768	425
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	304	3	268	61	20	37	221	2060	919	32	1953	460
Arrive On Green	0.17	0.17	0.17	0.03	0.03	0.03	0.12	0.58	0.58	0.02	0.47	0.47
Sat Flow, veh/h	1781	16	1571	1781	595	1081	1781	3554	1585	1781	4127	973
Grp Volume(v), veh/h	246	0	197	12	0	31	208	1085	15	16	1452	741
Grp Sat Flow(s),veh/h/ln	1781	0	1588	1781	0	1676	1781	1777	1585	1781	1702	1695
Q Serve(g_s), s	13.7	0.0	12.1	0.7	0.0	1.9	11.9	19.1	0.4	0.9	40.4	42.2
Cycle Q Clear(g_c), s	13.7	0.0	12.1	0.7	0.0	1.9	11.9	19.1	0.4	0.9	40.4	42.2
Prop In Lane	1.00		0.99	1.00		0.65	1.00		1.00	1.00		0.57
Lane Grp Cap(c), veh/h	304	0	271	61	0	58	221	2060	919	32	1611	802
V/C Ratio(X)	0.81	0.00	0.73	0.20	0.00	0.54	0.94	0.53	0.02	0.50	0.90	0.92
Avail Cap(c_a), veh/h	587	0	523	587	0	553	221	2060	919	86	1611	802
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.2	0.0	40.5	48.4	0.0	49.0	44.8	13.1	9.2	50.2	24.9	25.4
Incr Delay (d2), s/veh	5.2	0.0	3.7	1.5	0.0	7.6	44.1	1.0	0.0	11.8	8.6	17.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	0.0	5.0	0.3	0.0	0.9	7.9	7.4	0.1	0.5	17.4	20.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.3	0.0	44.2	49.9	0.0	56.6	88.9	14.1	9.2	62.0	33.5	43.2
LnGrp LOS	D	A	D	D	A	E	F	B	A	E	C	D
Approach Vol, veh/h		443			43			1308			2209	
Approach Delay, s/veh		45.4			54.7			25.9			37.0	
Approach LOS		D			D			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.0	66.3		22.7	17.0	55.3		8.1				
Change Period (Y+Rc), s	* 4.2	6.5		5.1	* 4.2	6.5		4.6				
Max Green Setting (Gmax), s	* 5	56.6		34.0	* 13	48.8		34.0				
Max Q Clear Time (g_c+I1), s	12.9	21.1		15.7	13.9	44.2		3.9				
Green Ext Time (p_c), s	0.0	10.0		1.9	0.0	4.2		0.2				

Intersection Summary	
HCM 6th Ctrl Delay	34.5
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



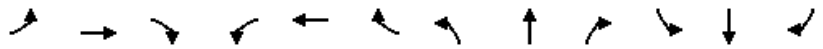
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	14	5	290	12	130	19	1089	492	243	1606	14
Future Volume (veh/h)	14	14	5	290	12	130	19	1089	492	243	1606	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	15	15	5	305	13	137	20	1146	518	256	1691	15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	62	178	56	401	294	262	79	2167	673	354	2631	23
Arrive On Green	0.02	0.07	0.07	0.12	0.17	0.17	0.02	0.42	0.42	0.10	0.50	0.50
Sat Flow, veh/h	3456	2656	840	3456	1777	1585	3456	5106	1585	3456	5220	46
Grp Volume(v), veh/h	15	10	10	305	13	137	20	1146	518	256	1103	603
Grp Sat Flow(s),veh/h/ln	1728	1777	1719	1728	1777	1585	1728	1702	1585	1728	1702	1862
Q Serve(g_s), s	0.3	0.4	0.4	6.2	0.4	5.7	0.4	12.1	20.3	5.2	17.3	17.3
Cycle Q Clear(g_c), s	0.3	0.4	0.4	6.2	0.4	5.7	0.4	12.1	20.3	5.2	17.3	17.3
Prop In Lane	1.00		0.49	1.00		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	62	119	115	401	294	262	79	2167	673	354	1716	939
V/C Ratio(X)	0.24	0.08	0.09	0.76	0.04	0.52	0.25	0.53	0.77	0.72	0.64	0.64
Avail Cap(c_a), veh/h	237	781	756	494	913	814	237	2167	673	503	1716	939
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.3	31.9	31.9	31.2	25.6	27.8	35.0	15.5	17.9	31.7	13.2	13.2
Incr Delay (d2), s/veh	2.0	0.3	0.3	5.4	0.1	1.6	1.7	0.9	8.3	3.0	1.9	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.2	0.2	2.8	0.2	2.2	0.2	4.5	8.3	2.3	6.3	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.2	32.1	32.2	36.6	25.6	29.4	36.6	16.5	26.2	34.6	15.1	16.6
LnGrp LOS	D	C	C	D	C	C	D	B	C	C	B	B
Approach Vol, veh/h		35			455			1684			1962	
Approach Delay, s/veh		34.3			34.1			19.7			18.1	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.7	37.4	12.7	11.1	5.9	43.2	5.5	18.2
Change Period (Y+Rc), s	* 4.2	6.5	* 4.2	6.2	* 4.2	6.5	* 4.2	6.2
Max Green Setting (Gmax), s	* 7	30.9	* 10	32.0	* 5	36.5	* 5	37.4
Max Q Clear Time (g_c+I1), s	7.3	22.3	8.2	2.4	2.4	19.3	2.3	7.7
Green Ext Time (p_c), s	0.3	5.9	0.2	0.1	0.0	11.1	0.0	0.9

Intersection Summary	
HCM 6th Ctrl Delay	20.7
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	156	24	79	72	29	55	90	1474	56	87	1538	225
Future Volume (veh/h)	156	24	79	72	29	55	90	1474	56	87	1538	225
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	164	25	83	76	31	58	95	1552	59	92	1619	237
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	190	33	108	153	42	79	457	2976	113	115	1702	248
Arrive On Green	0.11	0.09	0.09	0.09	0.07	0.07	0.26	0.59	0.59	0.06	0.38	0.38
Sat Flow, veh/h	1781	380	1263	1781	583	1091	1781	5048	192	1781	4500	656
Grp Volume(v), veh/h	164	0	108	76	0	89	95	1047	564	92	1223	633
Grp Sat Flow(s),veh/h/ln	1781	0	1643	1781	0	1674	1781	1702	1836	1781	1702	1752
Q Serve(g_s), s	10.9	0.0	7.7	4.9	0.0	6.2	5.0	21.9	21.9	6.1	41.8	42.2
Cycle Q Clear(g_c), s	10.9	0.0	7.7	4.9	0.0	6.2	5.0	21.9	21.9	6.1	41.8	42.2
Prop In Lane	1.00		0.77	1.00		0.65	1.00		0.10	1.00		0.37
Lane Grp Cap(c), veh/h	190	0	141	153	0	121	457	2007	1082	115	1288	663
V/C Ratio(X)	0.86	0.00	0.77	0.50	0.00	0.73	0.21	0.52	0.52	0.80	0.95	0.95
Avail Cap(c_a), veh/h	190	0	496	157	0	474	457	2007	1082	140	1288	663
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.36	0.36	0.36	0.79	0.79	0.79
Uniform Delay (d), s/veh	52.7	0.0	53.7	52.4	0.0	54.5	35.0	14.6	14.6	55.4	36.2	36.3
Incr Delay (d2), s/veh	31.2	0.0	8.3	2.5	0.0	8.3	0.1	0.4	0.7	18.9	13.2	21.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	0.0	3.5	2.3	0.0	2.9	2.2	8.3	9.0	3.4	19.4	21.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	83.9	0.0	62.0	54.9	0.0	62.8	35.1	14.9	15.2	74.3	49.4	58.1
LnGrp LOS	F	A	E	D	A	E	D	B	B	E	D	E
Approach Vol, veh/h		272			165			1706			1948	
Approach Delay, s/veh		75.2			59.1			16.2			53.4	
Approach LOS		E			E			B			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	77.2	15.4	15.4	37.3	51.9	17.0	13.8
Change Period (Y+Rc), s	* 4.2	6.5	5.1	* 5.1	6.5	* 6.5	* 4.2	5.1
Max Green Setting (Gmax), s	* 9.4	43.8	10.6	* 36	7.8	* 45	* 13	34.0
Max Q Clear Time (g_c+I1), s	8.1	23.9	6.9	9.7	7.0	44.2	12.9	8.2
Green Ext Time (p_c), s	0.0	11.6	0.0	0.6	0.0	1.1	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	39.5
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	144	342	330	294	283	86	450	1448	536	191	1395	131
Future Volume (veh/h)	144	342	330	294	283	86	450	1448	536	191	1395	131
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	152	360	347	309	298	91	474	1524	0	201	1468	138
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	531	766	579	344	389	117	517	2123		235	1681	158
Arrive On Green	0.15	0.22	0.22	0.10	0.14	0.14	0.15	0.42	0.00	0.07	0.35	0.35
Sat Flow, veh/h	3456	3554	1585	3456	2694	808	3456	5274	0	3456	4748	446
Grp Volume(v), veh/h	152	360	347	309	195	194	474	1524	0	201	1052	554
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1725	1728	1702	0	1728	1702	1790
Q Serve(g_s), s	4.5	10.3	20.7	10.3	12.2	12.6	15.7	28.9	0.0	6.7	33.6	33.7
Cycle Q Clear(g_c), s	4.5	10.3	20.7	10.3	12.2	12.6	15.7	28.9	0.0	6.7	33.6	33.7
Prop In Lane	1.00		1.00	1.00		0.47	1.00		0.00	1.00		0.25
Lane Grp Cap(c), veh/h	531	766	579	344	257	249	517	2123		235	1205	634
V/C Ratio(X)	0.29	0.47	0.60	0.90	0.76	0.78	0.92	0.72		0.86	0.87	0.87
Avail Cap(c_a), veh/h	531	947	659	344	499	485	517	2123		235	1205	634
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.6	39.8	30.0	51.8	47.8	48.0	48.8	28.3	0.0	53.7	35.2	35.2
Incr Delay (d2), s/veh	0.3	0.4	1.2	24.9	4.6	5.3	21.4	2.1	0.0	25.5	8.9	15.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	4.5	8.0	5.6	5.7	5.8	8.3	12.0	0.0	3.7	15.2	17.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.9	40.3	31.2	76.7	52.4	53.3	70.2	30.4	0.0	79.2	44.1	50.6
LnGrp LOS	D	D	C	E	D	D	E	C		E	D	D
Approach Vol, veh/h		859			698			1998	A		1807	
Approach Delay, s/veh		37.3			63.4			39.9			50.0	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.4	54.9	15.8	31.3	21.6	47.7	24.1	23.0
Change Period (Y+Rc), s	6.5	* 6.5	* 4.2	6.2	* 4.2	6.5	6.2	* 6.2
Max Green Setting (Gmax), s	7.9	* 48	* 12	31.0	* 17	38.9	9.9	* 33
Max Q Clear Time (g_c+I1), s	8.7	30.9	12.3	22.7	17.7	35.7	6.5	14.6
Green Ext Time (p_c), s	0.0	10.4	0.0	2.4	0.0	2.6	0.1	2.2

Intersection Summary	
HCM 6th Ctrl Delay	45.9
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

APPENDIX B

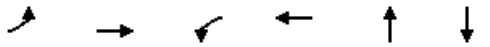
EXISTING INTERSECTION LEVEL OF SERVICE WORKSHEETS

Signal Queueing

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	6	475	177	261	615	47
v/c Ratio	0.05	0.61	0.71	0.19	0.90	0.07
Control Delay	41.0	24.3	52.3	19.7	35.3	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.0	24.3	52.3	19.7	35.3	8.2
Queue Length 50th (ft)	3	76	88	44	251	8
Queue Length 95th (ft)	16	140	#197	95	#471	24
Internal Link Dist (ft)		509		264	1550	354
Turn Bay Length (ft)	260		250			
Base Capacity (vph)	113	778	274	1349	871	834
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.61	0.65	0.19	0.71	0.06

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	357	532	15	780	167	506
v/c Ratio	0.92	0.35	0.21	0.97	0.70	0.97
Control Delay	82.2	27.3	71.9	69.9	71.7	78.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.2	27.3	71.9	69.9	71.7	78.8
Queue Length 50th (ft)	310	150	13	312	140	424
Queue Length 95th (ft)	#386	192	32	320	178	#504
Internal Link Dist (ft)		346		1948	136	1460
Turn Bay Length (ft)	130		125			
Base Capacity (vph)	387	1530	71	804	367	520
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.35	0.21	0.97	0.46	0.97

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	27	560	31	528	79	81
v/c Ratio	0.10	0.21	0.11	0.19	0.24	0.23
Control Delay	16.0	5.1	16.1	5.1	9.8	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.0	5.1	16.1	5.1	9.8	7.4
Queue Length 50th (ft)	3	0	3	0	3	1
Queue Length 95th (ft)	24	88	26	84	34	28
Internal Link Dist (ft)		1948		1135	222	1401
Turn Bay Length (ft)	130		200			
Base Capacity (vph)	270	2710	270	2718	1244	1220
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.21	0.11	0.19	0.06	0.07

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	440	201	18	7	151	1463	12	8	1573
v/c Ratio	0.87	0.34	0.18	0.07	0.74	0.76	0.01	0.11	0.77
Control Delay	59.3	6.8	59.1	45.6	74.1	26.2	0.0	60.6	34.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.3	6.8	59.1	45.6	74.1	26.2	0.0	60.6	34.1
Queue Length 50th (ft)	336	2	14	3	118	463	0	6	397
Queue Length 95th (ft)	#538	60	39	19	#229	#686	0	24	470
Internal Link Dist (ft)		870		249		1330			311
Turn Bay Length (ft)	270		100		250		185	260	
Base Capacity (vph)	508	597	508	503	204	1913	892	74	2031
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.34	0.04	0.01	0.74	0.76	0.01	0.11	0.77

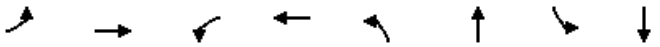
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	18	14	461	263	24	1396	469	157	1440
v/c Ratio	0.06	0.04	0.81	0.41	0.08	0.60	0.48	0.54	0.48
Control Delay	27.5	24.0	38.4	7.2	27.6	13.9	3.3	35.2	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.5	24.0	38.4	7.2	27.6	13.9	3.3	35.2	9.3
Queue Length 50th (ft)	3	2	78	3	4	116	0	26	73
Queue Length 95th (ft)	12	10	#187	33	15	225	52	#70	234
Internal Link Dist (ft)		1388		764		1747			298
Turn Bay Length (ft)	315		380		250		240	250	
Base Capacity (vph)	291	1862	571	1992	291	2339	981	291	2993
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.01	0.81	0.13	0.08	0.60	0.48	0.54	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	80	47	61	88	28	1735	53	1829
v/c Ratio	0.55	0.24	0.31	0.39	0.22	0.62	0.40	0.63
Control Delay	48.9	16.5	37.2	16.7	37.1	13.8	42.1	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.9	16.5	37.2	16.7	37.1	13.8	42.1	12.8
Queue Length 50th (ft)	35	4	27	6	12	206	23	155
Queue Length 95th (ft)	#98	33	#74	46	37	284	#59	306
Internal Link Dist (ft)		345		406		1002		1747
Turn Bay Length (ft)	60		80		190		240	
Base Capacity (vph)	146	825	194	832	126	2790	131	2908
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.06	0.31	0.11	0.22	0.62	0.40	0.63

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	187	176	295	699	413	144	1702	73	1753
v/c Ratio	0.55	0.51	0.64	0.83	0.48	0.70	0.78	0.46	0.86
Control Delay	53.5	52.1	25.1	49.6	34.1	69.3	30.0	61.2	35.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.5	52.1	25.1	49.6	34.1	69.3	30.0	61.2	35.2
Queue Length 50th (ft)	65	63	89	241	118	52	375	26	404
Queue Length 95th (ft)	104	98	184	#342	169	#101	460	52	493
Internal Link Dist (ft)		1135			601		320		1002
Turn Bay Length (ft)	150		130	200		260		310	
Base Capacity (vph)	391	1001	461	846	1437	207	2186	159	2043
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.18	0.64	0.83	0.29	0.70	0.78	0.46	0.86

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	48	437	73	380	147	141
v/c Ratio	0.23	0.24	0.31	0.20	0.55	0.45
Control Delay	28.3	9.7	28.5	8.7	26.3	18.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.3	9.7	28.5	8.7	26.3	18.9
Queue Length 50th (ft)	17	43	25	35	39	27
Queue Length 95th (ft)	47	88	63	74	91	74
Internal Link Dist (ft)		509		264	1550	354
Turn Bay Length (ft)	260		250			
Base Capacity (vph)	324	1795	414	1902	829	932
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.24	0.18	0.20	0.18	0.15

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	23	653	52	670	28	94
v/c Ratio	0.09	0.38	0.21	0.34	0.10	0.27
Control Delay	25.5	13.6	26.1	10.5	18.7	20.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.5	13.6	26.1	10.5	18.7	20.2
Queue Length 50th (ft)	6	63	13	36	4	19
Queue Length 95th (ft)	28	157	48	160	26	63
Internal Link Dist (ft)		346		1948	136	1460
Turn Bay Length (ft)	130		125			
Base Capacity (vph)	243	1748	248	1983	1129	1133
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.37	0.21	0.34	0.02	0.08

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	17	636	68	772	72	39
v/c Ratio	0.08	0.28	0.32	0.30	0.28	0.16
Control Delay	19.4	8.3	23.0	5.9	13.0	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.4	8.3	23.0	5.9	13.0	13.1
Queue Length 50th (ft)	4	57	16	40	7	4
Queue Length 95th (ft)	18	100	46	124	33	23
Internal Link Dist (ft)		1948		1135	222	1401
Turn Bay Length (ft)	130		200			
Base Capacity (vph)	208	2238	212	2533	954	925
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.28	0.32	0.30	0.08	0.04

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	246	197	12	31	208	1085	15	16	2193
v/c Ratio	0.73	0.43	0.11	0.25	0.95	0.51	0.02	0.19	0.94
Control Delay	53.7	8.5	52.9	33.0	98.8	16.1	0.0	58.4	36.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.7	8.5	52.9	33.0	98.8	16.1	0.0	58.4	36.5
Queue Length 50th (ft)	163	1	8	7	147	208	0	11	526
Queue Length 95th (ft)	255	61	29	40	#337	401	0	37	#783
Internal Link Dist (ft)		870		249		1330			311
Turn Bay Length (ft)	270		100		250		185	260	
Base Capacity (vph)	580	651	580	564	218	2133	985	85	2344
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.30	0.02	0.05	0.95	0.51	0.02	0.19	0.94

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	15	20	305	150	20	1146	518	256	1706
v/c Ratio	0.06	0.07	0.61	0.25	0.08	0.51	0.53	0.54	0.57
Control Delay	34.6	28.5	35.6	8.0	34.7	16.4	3.9	34.1	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.6	28.5	35.6	8.0	34.7	16.4	3.9	34.1	12.1
Queue Length 50th (ft)	3	3	60	2	4	111	0	49	98
Queue Length 95th (ft)	12	14	116	28	15	203	58	98	297
Internal Link Dist (ft)		1388		764		1747			298
Turn Bay Length (ft)	315		380		250		240	250	
Base Capacity (vph)	244	1553	508	1689	244	2235	986	517	3007
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.01	0.60	0.09	0.08	0.51	0.53	0.50	0.57

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	164	108	76	89	95	1611	92	1856
v/c Ratio	0.88	0.47	0.43	0.51	0.83	0.57	0.53	0.63
Control Delay	94.1	23.7	57.7	32.0	102.6	19.2	61.9	17.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.1	23.7	57.7	32.0	102.6	19.2	61.9	17.4
Queue Length 50th (ft)	127	19	56	23	74	277	69	313
Queue Length 95th (ft)	#252	74	105	73	#173	397	120	419
Internal Link Dist (ft)		345		406		1002		1747
Turn Bay Length (ft)	60		80		190		240	
Base Capacity (vph)	188	555	189	517	115	2822	179	2957
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.19	0.40	0.17	0.83	0.57	0.51	0.63

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	152	360	347	309	389	474	2088	201	1606
v/c Ratio	0.41	0.67	0.51	0.82	0.69	0.84	0.91	0.78	0.86
Control Delay	48.5	48.4	18.1	64.2	45.1	57.3	32.6	69.5	36.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.5	48.4	18.1	64.2	45.1	57.3	32.6	69.5	36.4
Queue Length 50th (ft)	50	121	108	106	120	160	444	69	356
Queue Length 95th (ft)	86	170	193	#187	170	#259	#618	#135	#459
Internal Link Dist (ft)		1135			601		320		1002
Turn Bay Length (ft)	150		130	200		260		310	
Base Capacity (vph)	367	1044	677	379	1086	568	2298	258	1871
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.34	0.51	0.82	0.36	0.83	0.91	0.78	0.86

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

APPENDIX B

EXISTING INTERSECTION LEVEL OF SERVICE WORKSHEETS

With Southbound Right-Turn at El Camino Real/Poinsettia Lane

Poinsettia Reach E (LSA Project No. HCR1803)
Existing
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #9 El Camino Real / Poinsettia Ln

Cycle (sec):	100	Critical Vol./Cap.(X):	0.524
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	25	Level Of Service:	A

Street Name:	El Camino Real						Poinsettia Ln					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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:	2 0	3 0	1	2 0	3 0	1	2 0	1 1	0	2 0	1 1	0
Volume Module:												
Base Vol:	23	1326	446	149	1354	14	17	10	3	438	16	234
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:	23	1326	446	149	1354	14	17	10	3	438	16	234
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	23	1326	446	149	1354	14	17	10	3	438	16	234
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:	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 Volume:	23	1326	446	149	1354	14	17	10	3	438	16	234
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	23	1326	446	149	1354	14	17	10	3	438	16	234
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:	23	1326	446	149	1354	14	17	10	3	438	16	234
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	3.00	1.00	2.00	3.00	1.00	2.00	1.54	0.46	2.00	1.00	1.00
Final Sat.:	3200	4800	1600	3200	4800	1600	3200	2462	738	3200	1600	1600
Capacity Analysis Module:												
Vol/Sat:	0.01	0.28	0.28	0.05	0.28	0.01	0.01	0.00	0.00	0.14	0.01	0.15
Crit Moves:	****			****			****					****

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Poinsettia Reach E (LSA Project No. HCR1803)
Existing
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #9 El Camino Real / Poinsettia Ln

Cycle (sec):	100	Critical Vol./Cap.(X):	0.530
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	25	Level Of Service:	A

Street Name:	El Camino Real						Poinsettia Ln					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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:	2 0	3 0	1	2 0	3 0	1	2 0	1 1	0	2 0	1 1	0
Volume Module:												
Base Vol:	19	1089	492	243	1606	14	14	14	5	290	12	130
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:	19	1089	492	243	1606	14	14	14	5	290	12	130
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	19	1089	492	243	1606	14	14	14	5	290	12	130
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:	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 Volume:	19	1089	492	243	1606	14	14	14	5	290	12	130
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	19	1089	492	243	1606	14	14	14	5	290	12	130
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:	19	1089	492	243	1606	14	14	14	5	290	12	130
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	3.00	1.00	2.00	3.00	1.00	2.00	1.47	0.53	2.00	1.00	1.00
Final Sat.:	3200	4800	1600	3200	4800	1600	3200	2358	842	3200	1600	1600
Capacity Analysis Module:												
Vol/Sat:	0.01	0.23	0.31	0.08	0.33	0.01	0.00	0.01	0.01	0.09	0.01	0.08
Crit Moves:			****	****				****		****		

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	10	3	438	16	234	23	1326	446	149	1354	14
Future Volume (veh/h)	17	10	3	438	16	234	23	1326	446	149	1354	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	18	11	3	461	17	246	24	1396	469	157	1425	15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	73	219	57	497	358	319	93	2032	631	241	2251	699
Arrive On Green	0.02	0.08	0.08	0.14	0.20	0.20	0.03	0.40	0.40	0.07	0.44	0.44
Sat Flow, veh/h	3456	2789	728	3456	1777	1585	3456	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	18	7	7	461	17	246	24	1396	469	157	1425	15
Grp Sat Flow(s),veh/h/ln	1728	1777	1739	1728	1777	1585	1728	1702	1585	1728	1702	1585
Q Serve(g_s), s	0.3	0.2	0.3	9.0	0.5	10.0	0.5	15.4	17.2	3.0	14.7	0.4
Cycle Q Clear(g_c), s	0.3	0.2	0.3	9.0	0.5	10.0	0.5	15.4	17.2	3.0	14.7	0.4
Prop In Lane	1.00		0.42	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	73	140	137	497	358	319	93	2032	631	241	2251	699
V/C Ratio(X)	0.25	0.05	0.05	0.93	0.05	0.77	0.26	0.69	0.74	0.65	0.63	0.02
Avail Cap(c_a), veh/h	254	835	817	497	960	856	254	2032	631	254	2251	699
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.8	29.0	29.0	28.8	21.9	25.7	32.5	17.0	17.5	30.9	14.8	10.7
Incr Delay (d2), s/veh	1.7	0.1	0.2	23.7	0.1	4.0	1.5	1.9	7.8	5.4	1.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.1	0.1	5.2	0.2	3.9	0.2	5.8	7.0	1.4	5.4	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.5	29.2	29.2	52.5	22.0	29.7	33.9	18.9	25.3	36.3	16.1	10.8
LnGrp LOS	C	C	C	D	C	C	C	B	C	D	B	B
Approach Vol, veh/h		32			724			1889			1597	
Approach Delay, s/veh		32.2			44.0			20.7			18.1	
Approach LOS		C			D			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	33.6	14.0	11.6	6.0	36.5	5.6	19.9
Change Period (Y+Rc), s	* 4.2	6.5	* 4.2	6.2	* 4.2	6.5	* 4.2	6.2
Max Green Setting (Gmax), s	* 5	27.1	* 9.8	32.0	* 5	27.1	* 5	36.8
Max Q Clear Time (g_c+I1), s	5.0	19.2	11.0	2.3	2.5	16.7	2.3	12.0
Green Ext Time (p_c), s	0.0	6.0	0.0	0.0	0.0	6.8	0.0	1.7

Intersection Summary	
HCM 6th Ctrl Delay	23.8
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	18	14	461	263	24	1396	469	157	1425	15
v/c Ratio	0.06	0.04	0.81	0.41	0.08	0.60	0.48	0.54	0.48	0.01
Control Delay	27.5	24.0	38.4	7.2	27.6	13.9	3.3	35.2	9.2	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.5	24.0	38.4	7.2	27.6	13.9	3.3	35.2	9.2	0.0
Queue Length 50th (ft)	3	2	78	3	4	116	0	26	72	0
Queue Length 95th (ft)	12	10	#187	33	15	225	52	#70	231	0
Internal Link Dist (ft)		1388		764		1747			298	
Turn Bay Length (ft)	315		380		250		240	250		
Base Capacity (vph)	291	1862	571	1992	291	2339	981	291	2997	1007
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.01	0.81	0.13	0.08	0.60	0.48	0.54	0.48	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	14	5	290	12	130	19	1089	492	243	1606	14
Future Volume (veh/h)	14	14	5	290	12	130	19	1089	492	243	1606	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	15	15	5	305	13	137	20	1146	518	256	1691	15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	62	178	56	401	294	262	79	2167	673	354	2574	799
Arrive On Green	0.02	0.07	0.07	0.12	0.17	0.17	0.02	0.42	0.42	0.10	0.50	0.50
Sat Flow, veh/h	3456	2656	840	3456	1777	1585	3456	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	15	10	10	305	13	137	20	1146	518	256	1691	15
Grp Sat Flow(s),veh/h/ln	1728	1777	1719	1728	1777	1585	1728	1702	1585	1728	1702	1585
Q Serve(g_s), s	0.3	0.4	0.4	6.2	0.4	5.7	0.4	12.1	20.3	5.2	17.9	0.3
Cycle Q Clear(g_c), s	0.3	0.4	0.4	6.2	0.4	5.7	0.4	12.1	20.3	5.2	17.9	0.3
Prop In Lane	1.00		0.49	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	62	119	115	401	294	262	79	2167	673	354	2574	799
V/C Ratio(X)	0.24	0.08	0.09	0.76	0.04	0.52	0.25	0.53	0.77	0.72	0.66	0.02
Avail Cap(c_a), veh/h	237	781	756	494	913	814	237	2167	673	503	2574	799
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.3	31.9	31.9	31.2	25.6	27.8	35.0	15.5	17.9	31.7	13.4	9.0
Incr Delay (d2), s/veh	2.0	0.3	0.3	5.4	0.1	1.6	1.7	0.9	8.3	3.0	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.2	0.2	2.8	0.2	2.2	0.2	4.5	8.3	2.3	6.3	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.2	32.1	32.2	36.6	25.6	29.4	36.6	16.5	26.2	34.6	14.7	9.1
LnGrp LOS	D	C	C	D	C	C	D	B	C	C	B	A
Approach Vol, veh/h		35			455			1684			1962	
Approach Delay, s/veh		34.3			34.1			19.7			17.3	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.7	37.4	12.7	11.1	5.9	43.2	5.5	18.2
Change Period (Y+Rc), s	* 4.2	6.5	* 4.2	6.2	* 4.2	6.5	* 4.2	6.2
Max Green Setting (Gmax), s	* 11	30.9	* 10	32.0	* 5	36.5	* 5	37.4
Max Q Clear Time (g_c+I1), s	7.2	22.3	8.2	2.4	2.4	19.9	2.3	7.7
Green Ext Time (p_c), s	0.3	5.9	0.2	0.1	0.0	11.2	0.0	0.9

Intersection Summary	
HCM 6th Ctrl Delay	20.3
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	15	20	305	150	20	1146	518	256	1691	15
v/c Ratio	0.06	0.07	0.61	0.25	0.08	0.51	0.53	0.54	0.56	0.01
Control Delay	34.6	28.5	35.6	8.0	34.7	16.4	3.9	34.1	12.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.6	28.5	35.6	8.0	34.7	16.4	3.9	34.1	12.0	0.0
Queue Length 50th (ft)	3	3	60	2	4	111	0	49	97	0
Queue Length 95th (ft)	12	14	116	28	15	203	58	98	293	0
Internal Link Dist (ft)		1388		764		1747			298	
Turn Bay Length (ft)	315		380		250		240	250		
Base Capacity (vph)	244	1553	508	1689	244	2235	986	517	3010	1004
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.01	0.60	0.09	0.08	0.51	0.53	0.50	0.56	0.01

Intersection Summary

APPENDIX C

MULTIMODAL LEVEL OF SERVICE WORKSHEETS

ROADWAY INFO

Roadway Name	Poinsettia Lane
From	Aviara Parkway
To	Ambrosia Lane
Street Typology from Mobility Element	Arterial Connector
Average Daily Traffic (ADT) volume (2-way total)	

PEDESTRIAN

EB SCORE | LOS	WB SCORE | LOS
100 | A	100 | A

	Roadway Direction	
	EB	WB
* Are crosswalks marked per CA MUTCD standards?	Yes	Yes
* Minimum Sidewalk Unobstructed Width in Feet (Minimum ADA unobstructed width requirement is 4'):	10	10
* Do sidewalks meet ADA requirements (e.g., cross-slope and trip hazards)?	Yes	Yes
* Do ramps and landings meet ADA requirements?	Yes	Yes
* Do the street light locations appear adequate?	Yes	Yes
Speed limit (miles per hour - mph):	higher than 35 mph	higher than 35 mph
Number of Through Lanes:	2	2
Are there 3 lanes or less to be crossed without pedestrian refuge? (Include turn lanes in count)	Yes	Yes
Width (ft.) of landscaped buffer between pedestrian facility and vehicle travel way:	0' to 2'	0' to 2'
Does on-street parking or a bike lane provide 6' or more buffer between pedestrians and vehicle travel way?	No	No
Any apparent sight distance issues at intersections and pedestrian crossings?	No	No
Are there any permanent speed control devices installed?	No	No
Are there traffic calming measures that reduce crossing width (e.g., bulbouts, chokers, right-turn median island)?	No	No
Are crosswalks high visibility?	Yes	Yes
Are there intersection enhancements provided for pedestrians (e.g., pedestrian signal phasing, countdown heads)?	Yes	Yes
Are there Rectangular Rapid Flashing Beacons (RRFBs) at street crossings?	No	No
Is there pedestrian scale lighting?	No	No
Are there active building frontages on 80% of street curb line?	No	No
Is the street furniture oriented towards businesses or attractions?	No	No
Do the street trees provide shade over more than 50% of the sidewalk length?	No	No

* *Indicates an item that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

ROADWAY INFO

Roadway Name	Poinsettia Lane
From	Aviara Parkway
To	Ambrosia Lane
Street Typology from Mobility Element	Arterial Connector
Average Daily Traffic (ADT) volume (2-way total)	

BICYCLE

	EB SCORE | LOS	WB SCORE | LOS
	80 | B	80 | B

	Roadway Direction	
	EB	**WB**
* Are the roadway pavement conditions good (e.g., no pot holes)?	Yes	Yes
* Is bike facility on roadway free of obstructions (e.g., drainage grates)?	Yes	Yes
* Does the bicycle facility meet MUTCD signing and striping design guidelines?	Yes	Yes
Is on-street parking provided?	No	No
Speed limit (miles per hour - mph):	higher than 35 mph	higher than 35 mph
Does the bikeway on the study segment and side streets meet and/or exceed the Bicycle Master Plan?	Both	Both
Is there enhanced bicycle detection or video detection provided at intersections?	Yes	Yes
Any bicycle racks are provided along segment?	No	No
Bicycle Facility Provided:	Bike Lane	Bike Lane
	Lane Width (ft): 5	Lane Width (ft): 5
	Bicycle Buffer Width (ft): 0	Bicycle Buffer Width (ft): 0
	Bike lanes are striped continuously through the study segment? Yes	Bike lanes are striped continuously through the study segment? Yes

* *Indicates an item that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

ROADWAY INFO

Roadway Name	Poinsettia Lane
From	Ambrosia Lane
To	Cassia Road
Street Typology from Mobility Element	Arterial Connector
Average Daily Traffic (ADT) volume (2-way total)	

PEDESTRIAN

EB SCORE | LOS	WB SCORE | LOS
100 | A	100 | A

	Roadway Direction	
	EB	WB
* Are crosswalks marked per CA MUTCD standards?	Yes	Yes
* Minimum Sidewalk Unobstructed Width in Feet (Minimum ADA unobstructed width requirement is 4'):	10	10
* Do sidewalks meet ADA requirements (e.g., cross-slope and trip hazards)?	Yes	Yes
* Do ramps and landings meet ADA requirements?	Yes	Yes
* Do the street light locations appear adequate?	Yes	Yes
Speed limit (miles per hour - mph):	25 mph or lower	25 mph or lower
Number of Through Lanes:	1	2
Are there 3 lanes or less to be crossed without pedestrian refuge? (Include turn lanes in count)	No	No
Width (ft.) of landscaped buffer between pedestrian facility and vehicle travel way:	0' to 2'	0' to 2'
Does on-street parking or a bike lane provide 6' or more buffer between pedestrians and vehicle travel way?	No	No
Any apparent sight distance issues at intersections and pedestrian crossings?	No	No
Are there any permanent speed control devices installed?	No	No
Are there traffic calming measures that reduce crossing width (e.g., bulbouts, chokers, right-turn median island)?	No	No
Are crosswalks high visibility?	Yes	Yes
Are there intersection enhancements provided for pedestrians (e.g., pedestrian signal phasing, countdown heads)?	Yes	Yes
Are there Rectangular Rapid Flashing Beacons (RRFBs) at street crossings?	No	No
Is there pedestrian scale lighting?	No	No
Are there active building frontages on 80% of street curb line?	No	No
Is the street furniture oriented towards businesses or attractions?	No	No
Do the street trees provide shade over more than 50% of the sidewalk length?	No	No

* *Indicates an item that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

ROADWAY INFO

Roadway Name	Poinsettia Lane
From	Aviara Parkway
To	Ambrosia Lane
Street Typology from Mobility Element	Arterial Connector
Average Daily Traffic (ADT) volume (2-way total)	

BICYCLE

	EB SCORE | LOS	WB SCORE | LOS
	100 | A	100 | A

	Roadway Direction	
	EB	**WB**
* Are the roadway pavement conditions good (e.g., no pot holes)?	Yes	Yes
* Is bike facility on roadway free of obstructions (e.g., drainage grates)?	Yes	Yes
* Does the bicycle facility meet MUTCD signing and striping design guidelines?	Yes	Yes
Is on-street parking provided?	No	No
Speed limit (miles per hour - mph):	25 mph or lower	25 mph or lower
Does the bikeway on the study segment and side streets meet and/or exceed the Bicycle Master Plan?	Both	Both
Is there enhanced bicycle detection or video detection provided at intersections?	Yes	Yes
Any bicycle racks are provided along segment?	No	No
Bicycle Facility Provided:	Bike Lane	Bike Lane
	Lane Width (ft): 5	Lane Width (ft): 5
	Bicycle Buffer Width (ft): 0	Bicycle Buffer Width (ft): 0
	Bike lanes are striped continuously through the study segment? Yes	Bike lanes are striped continuously through the study segment? Yes

* *Indicates an item that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

ROADWAY INFO

Roadway Name	Poinsettia Lane
From	Cassia Road
To	El Camino Real
Street Typology from Mobility Element	Arterial Connector
Average Daily Traffic (ADT) volume (2-way total)	

PEDESTRIAN

EB SCORE | LOS	WB SCORE | LOS
100 | A	100 | A

	Roadway Direction	
	EB	WB
* Are crosswalks marked per CA MUTCD standards?	Yes	Yes
* Minimum Sidewalk Unobstructed Width in Feet (Minimum ADA unobstructed width requirement is 4'):	10	10
* Do sidewalks meet ADA requirements (e.g., cross-slope and trip hazards)?	Yes	Yes
* Do ramps and landings meet ADA requirements?	Yes	Yes
* Do the street light locations appear adequate?	Yes	Yes
Speed limit (miles per hour - mph):	higher than 35 mph	higher than 35 mph
Number of Through Lanes:	2	2
Are there 3 lanes or less to be crossed without pedestrian refuge? (Include turn lanes in count)	No	No
Width (ft.) of landscaped buffer between pedestrian facility and vehicle travel way:	0' to 2'	0' to 2'
Does on-street parking or a bike lane provide 6' or more buffer between pedestrians and vehicle travel way?	No	No
Any apparent sight distance issues at intersections and pedestrian crossings?	No	No
Are there any permanent speed control devices installed?	No	No
Are there traffic calming measures that reduce crossing width (e.g., bulbouts, chokers, right-turn median island)?	Yes	No
Are crosswalks high visibility?	Yes	Yes
Are there intersection enhancements provided for pedestrians (e.g., pedestrian signal phasing, countdown heads)?	Yes	Yes
Are there Rectangular Rapid Flashing Beacons (RRFBs) at street crossings?	No	No
Is there pedestrian scale lighting?	No	No
Are there active building frontages on 80% of street curb line?	No	No
Is the street furniture oriented towards businesses or attractions?	No	No
Do the street trees provide shade over more than 50% of the sidewalk length?	No	No

* *Indicates an item that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

ROADWAY INFO

X

Roadway Name	Poinsettia Lane
From	Aviara Parkway
To	Ambrosia Lane
Street Typology from Mobility Element	Arterial Connector
Average Daily Traffic (ADT) volume (2-way total)	

BICYCLE

EB SCORE | LOS	WB SCORE | LOS
80 | B	80 | B

	Roadway Direction	
	EB	**WB**
* Are the roadway pavement conditions good (e.g., no pot holes)?	Yes	Yes
* Is bike facility on roadway free of obstructions (e.g., drainage grates)?	Yes	Yes
* Does the bicycle facility meet MUTCD signing and striping design guidelines?	Yes	Yes
Is on-street parking provided?	No	No
Speed limit (miles per hour - mph):	higher than 35 mph	higher than 35 mph
Does the bikeway on the study segment and side streets meet and/or exceed the Bicycle Master Plan?	Both	Both
Is there enhanced bicycle detection or video detection provided at intersections?	Yes	Yes
Any bicycle racks are provided along segment?	No	No
Bicycle Facility Provided:	Bike Lane	Bike Lane
	Lane Width (ft): 5	Lane Width (ft): 5
	Bicycle Buffer Width (ft): 0	Bicycle Buffer Width (ft): 0
	Bike lanes are striped continuously through the study segment? Yes	Bike lanes are striped continuously through the study segment? Yes

* *Indicates an item that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

ROADWAY INFO

X

Roadway Name	El Camino Real
From	Cassia Road
To	Poinsettia Lane
Street Typology from Mobility Element	Arterial
Average Daily Traffic (ADT) volume (2-way total)	

TRANSIT

NB SCORE | LOS	SB SCORE | LOS
72 | C	77 | C

	Roadway Direction	
	NB	**SB**
* **Transit amenities available:**	☑ Bench ☑ Trash Cans ☐ Covered Bus Stop ☐ Well-lit Stops ☐ Stop located within a	☑ Bench ☑ Trash Cans ☑ Covered Bus Stop ☐ Well-lit Stops ☐ Stop located within a
Are the sidewalks or path to the transit stop ADA compliant?	Yes	Yes
Do multiple transit routes stop on the study segment?	No	No
Do any of the routes provide a direct link to a COASTER station or mobility hub?	Yes	Yes
Do any of the routes provide a single transfer to reach a COASTER station or mobility hub?	No	No
Closest distance to existing transit stop:	<= 1/4 mile walk to bus only	<= 1/4 mile walk to bus only
What type of transit priority is present?	None present	None present
Headways between 6:30-8:30 am and 4-6 pm on weekdays:	30 minutes	30 minutes
Is there commute shuttle service provided during the morning and afternoon commute periods?	No	No
On weekends, are the headways no more than 1 hour headways between 9 am-5 pm?	Yes	Yes
Is there bike parking available at the bus stop?	No	No
Is the bus stop within 1/4 mile of a bike repair shop?	No	No
Will there be TDM measures that result in a trip reduction of at least 15%?	No	No

* *Indicates an item that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

ROADWAY INFO

X

Roadway Name	El Camino Real
From	Poinsettia Lane
To	Aviara Parkway
Street Typology from Mobility Element	Arterial
Average Daily Traffic (ADT) volume (2-way total)	

TRANSIT

NB SCORE | LOS	SB SCORE | LOS
77 | C	77 | C

	Roadway Direction	
	NB	**SB**
* **Transit amenities available:**	☑ Bench ☑ Trash Cans ☐ Covered Bus Stop ☐ Well-lit Stops ☑ Stop located within a	☑ Bench ☑ Trash Cans ☐ Covered Bus Stop ☐ Well-lit Stops ☑ Stop located within a
Are the sidewalks or path to the transit stop ADA compliant?	Yes	Yes
Do multiple transit routes stop on the study segment?	No	No
Do any of the routes provide a direct link to a COASTER station or mobility hub?	Yes	Yes
Do any of the routes provide a single transfer to reach a COASTER station or mobility hub?	No	No
Closest distance to existing transit stop:	<= 1/4 mile walk to bus only	<= 1/4 mile walk to bus only
What type of transit priority is present?	None present	None present
Headways between 6:30-8:30 am and 4-6 pm on weekdays:	30 minutes	30 minutes
Is there commute shuttle service provided during the morning and afternoon commute periods?	No	No
On weekends, are the headways no more than 1 hour headways between 9 am-5 pm?	Yes	Yes
Is there bike parking available at the bus stop?	No	No
Is the bus stop within 1/4 mile of a bike repair shop?	No	No
Will there be TDM measures that result in a trip reduction of at least 15%?	No	No

* *Indicates an item that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

ROADWAY INFO

Roadway Name	Cassia Road
From	Poinsettia Lane
To	El Camino Real
Street Typology from Mobility Element	Local/Neighborhood
Average Daily Traffic (ADT) volume (2-way total)	

PEDESTRIAN

EB SCORE | LOS	WB SCORE | LOS
100 | A	100 | A

	Roadway Direction	
	EB	WB
* Are crosswalks marked per CA MUTCD standards?	Yes	Yes
* Minimum Sidewalk Unobstructed Width in Feet (Minimum ADA unobstructed width requirement is 4'):	8	8
* Do sidewalks meet ADA requirements (e.g., cross-slope and trip hazards)?	Yes	Yes
* Do ramps and landings meet ADA requirements?	Yes	Yes
* Do the street light locations appear adequate?	Yes	Yes
Speed limit (miles per hour - mph):	35 mph	35 mph
Number of Through Lanes:	1	1
Are there 3 lanes or less to be crossed without pedestrian refuge? (Include turn lanes in count)	Yes	Yes
Width (ft.) of landscaped buffer between pedestrian facility and vehicle travel way:	0' to 2'	0' to 2'
Does on-street parking or a bike lane provide 6' or more buffer between pedestrians and vehicle travel way?	Yes	Yes
Any apparent sight distance issues at intersections and pedestrian crossings?	No	No
Are there any permanent speed control devices installed?	Yes	Yes
Are there traffic calming measures that reduce crossing width (e.g., bulbouts, chokers, right-turn median island)?	No	No
Are crosswalks high visibility?	Yes	Yes
Are there intersection enhancements provided for pedestrians (e.g., pedestrian signal phasing, countdown heads)?	Yes	Yes
Are there Rectangular Rapid Flashing Beacons (RRFBs) at street crossings?	No	No
Is there pedestrian scale lighting?	No	No
Are there active building frontages on 80% of street curb line?	No	No
Is the street furniture oriented towards businesses or attractions?	No	No
Do the street trees provide shade over more than 50% of the sidewalk length?	No	No

* *Indicates an item that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

ROADWAY INFO

Roadway Name	Cassia Road
From	Poinsettia Lane
To	El Camino Real
Street Typology from Mobility Element	Local/Neighborhood
Average Daily Traffic (ADT) volume (2-way total)	

BICYCLE

	EB SCORE | LOS	WB SCORE | LOS
	100 | A	100 | A

	Roadway Direction	
	EB	**WB**
* Are the roadway pavement conditions good (e.g., no pot holes)?	Yes	Yes
* Is bike facility on roadway free of obstructions (e.g., drainage grates)?	Yes	Yes
* Does the bicycle facility meet MUTCD signing and striping design guidelines?	Yes	Yes
Is on-street parking provided?	No	No
Speed limit (miles per hour - mph):	35 mph	35 mph
Does the bikeway on the study segment and side streets meet and/or exceed the Bicycle Master Plan?	Both	Both
Is there enhanced bicycle detection or video detection provided at intersections?	Yes	Yes
Any bicycle racks are provided along segment?	No	No
Bicycle Facility Provided:	Bike Lane	Bike Lane
	Lane Width (ft)	Lane Width (ft)
	6	6
	Bicycle Buffer Width (ft)	Bicycle Buffer Width (ft)
	0	0
	Bike lanes are striped continuously through the study segment?	Bike lanes are striped continuously through the study segment?
	Yes	Yes

* *Indicates an item that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

ROADWAY INFO

Roadway Name	Ambrosia Lane
From	Poinsettia Lane
To	Aviara Parkway
Street Typology from Mobility Element	Schools
Average Daily Traffic (ADT) volume (2-way total)	

PEDESTRIAN

NB SCORE | LOS	SB SCORE | LOS
100 | A	100 | A

	Roadway Direction	
	NB	**SB**
* Are crosswalks marked per CA MUTCD standards?	Yes	Yes
* Minimum Sidewalk Unobstructed Width in Feet (Minimum ADA unobstructed width requirement is 4'):	10	10
* Do sidewalks meet ADA requirements (e.g., cross-slope and trip hazards)?	Yes	Yes
* Do ramps and landings meet ADA requirements?	Yes	Yes
* Do the street light locations appear adequate?	Yes	Yes
Speed limit (miles per hour - mph):	35 mph	35 mph
Number of Through Lanes:	1	1
Are there 3 lanes or less to be crossed without pedestrian refuge? (Include turn lanes in count)	Yes	Yes
Width (ft.) of landscaped buffer between pedestrian facility and vehicle travel way:	0' to 2'	0' to 2'
Does on-street parking or a bike lane provide 6' or more buffer between pedestrians and vehicle travel way?	Yes	Yes
Any apparent sight distance issues at intersections and pedestrian crossings?	No	No
Are there any permanent speed control devices installed?	No	No
Are there traffic calming measures that reduce crossing width (e.g., bulbouts, chokers, right-turn median island)?	No	No
Are crosswalks high visibility?	Yes	Yes
Are there intersection enhancements provided for pedestrians (e.g., pedestrian signal phasing, countdown heads)?	Yes	Yes
Are there Rectangular Rapid Flashing Beacons (RRFBs) at street crossings?	No	No
Is there pedestrian scale lighting?	No	No
Are there active building frontages on 80% of street curb line?	No	No
Is the street furniture oriented towards businesses or attractions?	No	No
Do the street trees provide shade over more than 50% of the sidewalk length?	No	No

* *Indicates an item that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

ROADWAY INFO

Roadway Name	Ambrosia Lane
From	Poinsettia Lane
To	Aviara Parkway
Street Typology from Mobility Element	Schools
Average Daily Traffic (ADT) volume (2-way total)	

BICYCLE

NB SCORE | LOS	SB SCORE | LOS
70 | C	70 | C

	Roadway Direction	
	NB	SB
* Are the roadway pavement conditions good (e.g., no pot holes)?	Yes	Yes
* Is bike facility on roadway free of obstructions (e.g., drainage grates)?	Yes	Yes
* Does the bicycle facility meet MUTCD signing and striping design guidelines?	Yes	Yes
Is on-street parking provided?	Parallel parking	Parallel parking
Speed limit (miles per hour - mph):	35 mph	35 mph
Does the bikeway on the study segment and side streets meet and/or exceed the Bicycle Master Plan?	Both	Both
Is there enhanced bicycle detection or video detection provided at intersections?	Yes	Yes
Any bicycle racks are provided along segment?	No	No
Bicycle Facility Provided:		

* *Indicates an item that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

ROADWAY INFO

Roadway Name	Mimosa Drive
From	Oriole Court
To	Aviara Parkway
Street Typology from Mobility Element	Local/Neighborhood
Average Daily Traffic (ADT) volume (2-way total)	

PEDESTRIAN

NB SCORE | LOS	SB SCORE | LOS
100 | A	100 | A

	Roadway Direction	
	NB	**SB**
* Are crosswalks marked per CA MUTCD standards?	Yes	Yes
* Minimum Sidewalk Unobstructed Width in Feet (Minimum ADA unobstructed width requirement is 4'):	9	9
* Do sidewalks meet ADA requirements (e.g., cross-slope and trip hazards)?	Yes	Yes
* Do ramps and landings meet ADA requirements?	Yes	Yes
* Do the street light locations appear adequate?	Yes	Yes
Speed limit (miles per hour - mph):	25 mph or lower	25 mph or lower
Number of Through Lanes:	1	1
Are there 3 lanes or less to be crossed without pedestrian refuge? (Include turn lanes in count)	Yes	Yes
Width (ft.) of landscaped buffer between pedestrian facility and vehicle travel way:	0' to 2'	0' to 2'
Does on-street parking or a bike lane provide 6' or more buffer between pedestrians and vehicle travel way?	Yes	Yes
Any apparent sight distance issues at intersections and pedestrian crossings?	No	No
Are there any permanent speed control devices installed?	No	No
Are there traffic calming measures that reduce crossing width (e.g., bulbouts, chokers, right-turn median island)?	No	No
Are crosswalks high visibility?	Yes	Yes
Are there intersection enhancements provided for pedestrians (e.g., pedestrian signal phasing, countdown heads)?	Yes	Yes
Are there Rectangular Rapid Flashing Beacons (RRFBs) at street crossings?	No	No
Is there pedestrian scale lighting?	No	No
Are there active building frontages on 80% of street curb line?	No	No
Is the street furniture oriented towards businesses or attractions?	No	No
Do the street trees provide shade over more than 50% of the sidewalk length?	No	No

* *Indicates an item that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

ROADWAY INFO

Roadway Name	Mimosa Drive
From	Oriole Court
To	Aviara Parkway
Street Typology from Mobility Element	Local/Neighborhood
Average Daily Traffic (ADT) volume (2-way total)	

BICYCLE

NB SCORE | LOS	SB SCORE | LOS
100 | A	100 | A

	Roadway Direction	
	NB	SB
* Are the roadway pavement conditions good (e.g., no pot holes)?	Yes	Yes
* Is bike facility on roadway free of obstructions (e.g., drainage grates)?	Yes	Yes
* Does the bicycle facility meet MUTCD signing and striping design guidelines?	Yes	Yes
Is on-street parking provided?	Parallel parking	Parallel parking
Speed limit (miles per hour - mph):	25 mph or lower	25 mph or lower
Does the bikeway on the study segment and side streets meet and/or exceed the Bicycle Master Plan?	Both	Both
Is there enhanced bicycle detection or video detection provided at intersections?	Yes	Yes
Any bicycle racks are provided along segment?	No	No
Bicycle Facility Provided:		

* *Indicates an item that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

ROADWAY INFO

Roadway Name	Dove Lane
From	Moorhen Place
To	El Camino Real
Street Typology from Mobility Element	Local/Neighborhood
Average Daily Traffic (ADT) volume (2-way total)	

PEDESTRIAN

EB SCORE | LOS	WB SCORE | LOS
100 | A	100 | A

	Roadway Direction	
	EB	**WB**
* Are crosswalks marked per CA MUTCD standards?	Yes	Yes
* Minimum Sidewalk Unobstructed Width in Feet (Minimum ADA unobstructed width requirement is 4'):	10	10
* Do sidewalks meet ADA requirements (e.g., cross-slope and trip hazards)?	Yes	Yes
* Do ramps and landings meet ADA requirements?	Yes	Yes
* Do the street light locations appear adequate?	Yes	Yes
Speed limit (miles per hour - mph):	35 mph	35 mph
Number of Through Lanes:	1	1
Are there 3 lanes or less to be crossed without pedestrian refuge? (Include turn lanes in count)	Yes	Yes
Width (ft.) of landscaped buffer between pedestrian facility and vehicle travel way:	0' to 2'	0' to 2'
Does on-street parking or a bike lane provide 6' or more buffer between pedestrians and vehicle travel way?	Yes	Yes
Any apparent sight distance issues at intersections and pedestrian crossings?	No	No
Are there any permanent speed control devices installed?	No	No
Are there traffic calming measures that reduce crossing width (e.g., bulbouts, chokers, right-turn median island)?	No	No
Are crosswalks high visibility?	Yes	Yes
Are there intersection enhancements provided for pedestrians (e.g., pedestrian signal phasing, countdown heads)?	Yes	Yes
Are there Rectangular Rapid Flashing Beacons (RRFBs) at street crossings?	No	No
Is there pedestrian scale lighting?	No	No
Are there active building frontages on 80% of street curb line?	No	No
Is the street furniture oriented towards businesses or attractions?	No	No
Do the street trees provide shade over more than 50% of the sidewalk length?	No	No

* *Indicates an item that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

ROADWAY INFO

Roadway Name	Dove Lane
From	Moorhen Place
To	El Camino Real
Street Typology from Mobility Element	Local/Neighborhood
Average Daily Traffic (ADT) volume (2-way total)	

BICYCLE

EB SCORE | LOS	WB SCORE | LOS
100 | A	100 | A

	Roadway Direction	
	EB	**WB**
* Are the roadway pavement conditions good (e.g., no pot holes)?	Yes	Yes
* Is bike facility on roadway free of obstructions (e.g., drainage grates)?	Yes	Yes
* Does the bicycle facility meet MUTCD signing and striping design guidelines?	Yes	Yes
Is on-street parking provided?	Parallel parking	Parallel parking
Speed limit (miles per hour - mph):	35 mph	35 mph
Does the bikeway on the study segment and side streets meet and/or exceed the Bicycle Master Plan?	Both	Both
Is there enhanced bicycle detection or video detection provided at intersections?	Yes	Yes
Any bicycle racks are provided along segment?	No	No
Bicycle Facility Provided:	Bike Lane	Bike Lane
	Lane Width (ft)	Lane Width (ft)
	5	5
	Bicycle Buffer Width (ft)	Bicycle Buffer Width (ft)
	0	0
	Bike lanes are striped continuously through the study segment?	Bike lanes are striped continuously through the study segment?
	No	No

* *Indicates an item that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

APPENDIX D

2035 WITHOUT POINSETTIA LANE GAP CLOSURE LEVEL OF SERVICE WORKSHEETS

APPENDIX D

2035 WITHOUT POINSETTIA LANE GAP CLOSURE LEVEL OF SERVICE WORKSHEETS

ICU Worksheets

Poinsettia Reach E (LSA Project No. HCR1803)
Future
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #1 Ambrosia Ln / Poinsettia Ln

Cycle (sec):	100	Critical Vol./Cap.(X):	0.778
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	48	Level Of Service:	C

Street Name:	Ambrosia Ln						Poinsettia Ln					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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	1! 0	0	0	1! 0	1	0	1 1 0	1	0	1 1 0
Volume Module:												
Base Vol:	414	6	245	22	9	14	7	308	212	217	308	12
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:	414	6	245	22	9	14	7	308	212	217	308	12
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:	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 Volume:	414	6	245	22	9	14	7	308	212	217	308	12
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	414	6	245	22	9	14	7	308	212	217	308	12
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:	414	6	245	22	9	14	7	308	212	217	308	12
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.62	0.01	0.37	0.49	0.20	0.31	1.00	1.18	0.82	1.00	1.92	0.08
Final Sat.:	996	14	589	782	320	498	1600	1895	1305	1600	3080	120
Capacity Analysis Module:												
Vol/Sat:	0.26	0.42	0.42	0.01	0.03	0.03	0.00	0.16	0.16	0.14	0.10	0.10
Crit Moves:	****			****				****		****		

Poinsettia Reach E (LSA Project No. HCR1803)
Future
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #2 Ambrosia Ln / Aviara Pkwy

Cycle (sec):	100	Critical Vol./Cap.(X):	0.786
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	49	Level Of Service:	C

Street Name:	Ambrosia Ln						Aviara Pkwy					
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			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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	1! 0	0	0	1! 0	1	0	1 1 0	1	0	1 1 0
Volume Module:												
Base Vol:	8	104	13	239	12	179	300	414	32	12	363	282
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:	8	104	13	239	12	179	300	414	32	12	363	282
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:	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 Volume:	8	104	13	239	12	179	300	414	32	12	363	282
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	8	104	13	239	12	179	300	414	32	12	363	282
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:	8	104	13	239	12	179	300	414	32	12	363	282
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.06	0.84	0.10	0.55	0.03	0.42	1.00	1.86	0.14	1.00	1.13	0.87
Final Sat.:	102	1331	166	889	45	666	1600	2970	230	1600	1801	1399
Capacity Analysis Module:												
Vol/Sat:	0.08	0.08	0.08	0.27	0.27	0.27	0.19	0.14	0.14	0.01	0.20	0.20
Crit Moves:	****			****			****				****	

Poinsettia Reach E (LSA Project No. HCR1803)
Future
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #7 Mimosa Dr / Aviara Pkwy

Cycle (sec):	100	Critical Vol./Cap.(X):	0.332
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	18	Level Of Service:	A

Street Name:	Mimosa Dr						Aviara Pkwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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	1! 0	0	0	1! 0	1	0	1 1 0	1	0	1 1 0
Volume Module:												
Base Vol:	30	8	46	9	1	87	29	561	25	32	541	11
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:	30	8	46	9	1	87	29	561	25	32	541	11
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:	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 Volume:	30	8	46	9	1	87	29	561	25	32	541	11
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	30	8	46	9	1	87	29	561	25	32	541	11
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:	30	8	46	9	1	87	29	561	25	32	541	11
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.36	0.09	0.55	0.09	0.01	0.90	1.00	1.91	0.09	1.00	1.96	0.04
Final Sat.:	571	152	876	148	16	1435	1600	3063	137	1600	3136	64
Capacity Analysis Module:												
Vol/Sat:	0.02	0.05	0.05	0.01	0.06	0.06	0.02	0.18	0.18	0.02	0.17	0.17
Crit Moves:	****			****			****			****		

Poinsettia Reach E (LSA Project No. HCR1803)
Future
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #8 El Camino Real / Cassia Rd

Cycle (sec):	100	Critical Vol./Cap.(X):	0.836
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	61	Level Of Service:	D

Street Name:	El Camino Real						Cassia Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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	2 0	1	1 0	2 1	0	1 0	0 1	0	1 0	0 1	0
Volume Module:												
Base Vol:	158	1532	12	9	1437	209	475	5	212	17	4	3
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:	158	1532	12	9	1437	209	475	5	212	17	4	3
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:	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 Volume:	158	1532	12	9	1437	209	475	5	212	17	4	3
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	158	1532	12	9	1437	209	475	5	212	17	4	3
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:	158	1532	12	9	1437	209	475	5	212	17	4	3
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.62	0.38	1.00	0.02	0.98	1.00	0.57	0.43
Final Sat.:	1600	3200	1600	1600	4191	609	1600	37	1563	1600	914	686
Capacity Analysis Module:												
Vol/Sat:	0.10	0.48	0.01	0.01	0.34	0.34	0.30	0.14	0.14	0.01	0.00	0.00
Crit Moves:		****			****			****			****	

Poinsettia Reach E (LSA Project No. HCR1803)
Future
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #9 El Camino Real / Poinsettia Ln

Cycle (sec):	100	Critical Vol./Cap.(X):	0.614
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	30	Level Of Service:	B

Street Name:	El Camino Real						Poinsettia Ln					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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:	2 0	3 0	1	2 0	2 1	0	2 0	1 1	0	2 0	1 1	0
Volume Module:												
Base Vol:	27	1574	529	164	1492	15	21	12	4	535	20	286
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:	27	1574	529	164	1492	15	21	12	4	535	20	286
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:	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 Volume:	27	1574	529	164	1492	15	21	12	4	535	20	286
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	27	1574	529	164	1492	15	21	12	4	535	20	286
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:	27	1574	529	164	1492	15	21	12	4	535	20	286
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	3.00	1.00	2.00	2.97	0.03	2.00	1.50	0.50	2.00	1.00	1.00
Final Sat.:	3200	4800	1600	3200	4752	48	3200	2400	800	3200	1600	1600
Capacity Analysis Module:												
Vol/Sat:	0.01	0.33	0.33	0.05	0.31	0.31	0.01	0.01	0.01	0.17	0.01	0.18
Crit Moves:		****			****			****				****

Poinsettia Reach E (LSA Project No. HCR1803)
Future
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #10 El Camino Real / Dove Ln

Cycle (sec):	100	Critical Vol./Cap.(X):	0.574
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	54	Level Of Service:	A

Street Name:	El Camino Real						Dove Ln					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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	2	1 0	1 0	2	1 0	1 0	0	1 0	1 0	0	1 0
Volume Module:												
Base Vol:	32	1927	31	59	1928	135	116	14	55	58	14	69
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:	32	1927	31	59	1928	135	116	14	55	58	14	69
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:	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 Volume:	32	1927	31	59	1928	135	116	14	55	58	14	69
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	32	1927	31	59	1928	135	116	14	55	58	14	69
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:	32	1927	31	59	1928	135	116	14	55	58	14	69
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.95	0.05	1.00	2.80	0.20	1.00	0.20	0.80	1.00	0.17	0.83
Final Sat.:	1600	4724	76	1600	4486	314	1600	325	1275	1600	270	1330
Capacity Analysis Module:												
Vol/Sat:	0.02	0.41	0.41	0.04	0.43	0.43	0.07	0.04	0.04	0.04	0.05	0.05
Crit Moves:	****				****		****				****	

Poinsettia Reach E (LSA Project No. HCR1803)
Future
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #11 El Camino Real / Aviara Pkwy

Cycle (sec):	100	Critical Vol./Cap.(X):	0.884
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	78	Level Of Service:	D

Street Name:	El Camino Real						Aviara Pkwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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:	2 0	2	1 0	2 0	2	1 0	2 0	2	0 1	2 0	1	1 0
Volume Module:												
Base Vol:	163	1681	237	82	1856	121	196	184	309	732	320	114
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:	163	1681	237	82	1856	121	196	184	309	732	320	114
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:	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 Volume:	163	1681	237	82	1856	121	196	184	309	732	320	114
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	163	1681	237	82	1856	121	196	184	309	732	320	114
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:	163	1681	237	82	1856	121	196	184	309	732	320	114
OvlAdjVol:									228			
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	2.63	0.37	2.00	2.82	0.18	2.00	2.00	1.00	2.00	1.47	0.53
Final Sat.:	3200	4207	593	3200	4506	294	3200	3200	1600	3200	2359	841
Capacity Analysis Module:												
Vol/Sat:	0.05	0.40	0.40	0.03	0.41	0.41	0.06	0.06	0.19	0.23	0.14	0.14
OvlAdjV/S:									0.14			
Crit Moves:	****				****				****	****		

Poinsettia Reach E (LSA Project No. HCR1803)
Future
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #1 Ambrosia Ln / Poinsettia Ln

Cycle (sec):	100	Critical Vol./Cap.(X):	0.394
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	20	Level Of Service:	A

Street Name:	Ambrosia Ln						Poinsettia Ln					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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	1! 0	0	0	1! 0	1	0	1 1 0	1	0	1 1 0
Volume Module:												
Base Vol:	87	18	53	44	28	63	53	363	115	89	384	81
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:	87	18	53	44	28	63	53	363	115	89	384	81
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:	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 Volume:	87	18	53	44	28	63	53	363	115	89	384	81
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	87	18	53	44	28	63	53	363	115	89	384	81
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:	87	18	53	44	28	63	53	363	115	89	384	81
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.55	0.11	0.34	0.32	0.21	0.47	1.00	1.52	0.48	1.00	1.65	0.35
Final Sat.:	881	182	537	521	332	747	1600	2430	770	1600	2643	557
Capacity Analysis Module:												
Vol/Sat:	0.05	0.10	0.10	0.03	0.08	0.08	0.03	0.15	0.15	0.06	0.15	0.15
Crit Moves:	****			****			****			****		

Poinsettia Reach E (LSA Project No. HCR1803)
Future
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #2 Ambrosia Ln / Aviara Pkwy

Cycle (sec):	100	Critical Vol./Cap.(X):	0.380
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	19	Level Of Service:	A

Street Name:	Ambrosia Ln						Aviara Pkwy					
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			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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 1! 0		0	0 1! 0		1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	10	6	10	77	6	18	25	675	19	54	626	75
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:	10	6	10	77	6	18	25	675	19	54	626	75
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:	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 Volume:	10	6	10	77	6	18	25	675	19	54	626	75
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	10	6	10	77	6	18	25	675	19	54	626	75
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:	10	6	10	77	6	18	25	675	19	54	626	75
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.39	0.23	0.38	0.76	0.06	0.18	1.00	1.95	0.05	1.00	1.79	0.21
Final Sat.:	615	369	615	1220	95	285	1600	3112	88	1600	2858	342
Capacity Analysis Module:												
Vol/Sat:	0.02	0.02	0.02	0.06	0.06	0.06	0.02	0.22	0.22	0.03	0.22	0.22
Crit Moves:	****			****			****			****		

Poinsettia Reach E (LSA Project No. HCR1803)
Future
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #7 Mimosa Dr / Aviara Pkwy

Cycle (sec):	100	Critical Vol./Cap.(X):	0.374
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	19	Level Of Service:	A

Street Name:	Mimosa Dr						Aviara Pkwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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	1! 0	0	0	1! 0	1	0	1 1 0	1	0	1 1 0
Volume Module:												
Base Vol:	31	4	41	20	4	23	18	645	21	72	782	26
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:	31	4	41	20	4	23	18	645	21	72	782	26
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:	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 Volume:	31	4	41	20	4	23	18	645	21	72	782	26
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	31	4	41	20	4	23	18	645	21	72	782	26
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:	31	4	41	20	4	23	18	645	21	72	782	26
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.41	0.05	0.54	0.43	0.08	0.49	1.00	1.94	0.06	1.00	1.94	0.06
Final Sat.:	653	84	863	681	136	783	1600	3099	101	1600	3097	103
Capacity Analysis Module:												
Vol/Sat:	0.02	0.05	0.05	0.01	0.03	0.03	0.01	0.21	0.21	0.05	0.25	0.25
Crit Moves:	****			****			****				****	

Poinsettia Reach E (LSA Project No. HCR1803)
Future
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #8 El Camino Real / Cassia Rd

Cycle (sec):	100	Critical Vol./Cap.(X):	0.849
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	65	Level Of Service:	D

Street Name:	El Camino Real						Cassia Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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	2 0	1	1 0	2 1	0	1 0	0 1	0	1 0	0 1	0
Volume Module:												
Base Vol:	218	1136	15	17	1851	445	266	2	210	11	10	19
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:	218	1136	15	17	1851	445	266	2	210	11	10	19
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:	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 Volume:	218	1136	15	17	1851	445	266	2	210	11	10	19
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	218	1136	15	17	1851	445	266	2	210	11	10	19
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:	218	1136	15	17	1851	445	266	2	210	11	10	19
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.42	0.58	1.00	0.01	0.99	1.00	0.34	0.66
Final Sat.:	1600	3200	1600	1600	3870	930	1600	15	1585	1600	552	1048
Capacity Analysis Module:												
Vol/Sat:	0.14	0.36	0.01	0.01	0.48	0.48	0.17	0.13	0.13	0.01	0.02	0.02
Crit Moves:	****				****		****				****	

Poinsettia Reach E (LSA Project No. HCR1803)
Future
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #9 El Camino Real / Poinsettia Ln

Cycle (sec):	100	Critical Vol./Cap.(X):	0.617
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	30	Level Of Service:	B

Street Name:	El Camino Real						Poinsettia Ln					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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:	2 0	3 0	1	2 0	2 1	0	2 0	1 1	0	2 0	1 1	0
Volume Module:												
Base Vol:	23	1293	584	268	1770	15	17	17	6	354	15	159
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:	23	1293	584	268	1770	15	17	17	6	354	15	159
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:	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 Volume:	23	1293	584	268	1770	15	17	17	6	354	15	159
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	23	1293	584	268	1770	15	17	17	6	354	15	159
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:	23	1293	584	268	1770	15	17	17	6	354	15	159
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	3.00	1.00	2.00	2.97	0.03	2.00	1.48	0.52	2.00	1.00	1.00
Final Sat.:	3200	4800	1600	3200	4760	40	3200	2365	835	3200	1600	1600
Capacity Analysis Module:												
Vol/Sat:	0.01	0.27	0.37	0.08	0.37	0.37	0.01	0.01	0.01	0.11	0.01	0.10
Crit Moves:			****	****				****		****		

Poinsettia Reach E (LSA Project No. HCR1803)
Future
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #10 El Camino Real / Dove Ln

Cycle (sec):	100	Critical Vol./Cap.(X):	0.704
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	77	Level Of Service:	C

Street Name:	El Camino Real						Dove Ln					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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 2	1 0	1	0 2	1 0	1	0 0	1 0	1	0 0	1 0
Volume Module:												
Base Vol:	107	1750	66	103	1826	267	238	37	121	72	29	55
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:	107	1750	66	103	1826	267	238	37	121	72	29	55
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:	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 Volume:	107	1750	66	103	1826	267	238	37	121	72	29	55
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	107	1750	66	103	1826	267	238	37	121	72	29	55
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:	107	1750	66	103	1826	267	238	37	121	72	29	55
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.89	0.11	1.00	2.62	0.38	1.00	0.23	0.77	1.00	0.35	0.65
Final Sat.:	1600	4626	174	1600	4188	612	1600	375	1225	1600	552	1048
Capacity Analysis Module:												
Vol/Sat:	0.07	0.38	0.38	0.06	0.44	0.44	0.15	0.10	0.10	0.05	0.05	0.05
Crit Moves:	****				****		****				****	

Poinsettia Reach E (LSA Project No. HCR1803)
Future
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #11 El Camino Real / Aviara Pkwy

Cycle (sec):	100	Critical Vol./Cap.(X):	0.831
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	59	Level Of Service:	D

Street Name:	El Camino Real						Aviara Pkwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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:	2 0	2	1 0	2 0	2	1 0	2 0	2	0 1	2 0	1	1 0
Volume Module:												
Base Vol:	534	1719	636	227	1656	155	159	377	364	324	312	95
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:	534	1719	636	227	1656	155	159	377	364	324	312	95
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:	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 Volume:	534	1719	636	227	1656	155	159	377	364	324	312	95
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	534	1719	636	227	1656	155	159	377	364	324	312	95
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:	534	1719	636	227	1656	155	159	377	364	324	312	95
OvlAdjVol:									97			
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	2.19	0.81	2.00	2.74	0.26	2.00	2.00	1.00	2.00	1.53	0.47
Final Sat.:	3200	3504	1296	3200	4389	411	3200	3200	1600	3200	2453	747
Capacity Analysis Module:												
Vol/Sat:	0.17	0.49	0.49	0.07	0.38	0.38	0.05	0.12	0.23	0.10	0.13	0.13
OvlAdjV/S:									0.06			
Crit Moves:	****			****				****		****		

APPENDIX D

2035 WITHOUT POINSETTIA LANE GAP CLOSURE LEVEL OF SERVICE WORKSHEETS

HCM Worksheets

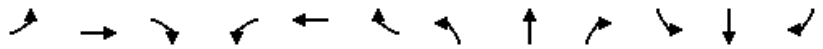
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	308	212	217	308	12	414	6	245	22	9	14
Future Volume (veh/h)	7	308	212	217	308	12	414	6	245	22	9	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	7	324	223	228	324	13	436	6	258	23	9	15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	16	356	240	264	1094	44	528	6	272	398	161	233
Arrive On Green	0.01	0.18	0.18	0.15	0.31	0.31	0.50	0.50	0.50	0.50	0.50	0.50
Sat Flow, veh/h	1781	2033	1368	1781	3483	139	914	13	541	667	319	462
Grp Volume(v), veh/h	7	282	265	228	165	172	700	0	0	47	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1624	1781	1777	1845	1467	0	0	1449	0	0
Q Serve(g_s), s	0.3	13.4	13.8	10.8	6.0	6.1	37.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.3	13.4	13.8	10.8	6.0	6.1	39.0	0.0	0.0	1.2	0.0	0.0
Prop In Lane	1.00		0.84	1.00		0.08	0.62		0.37	0.49		0.32
Lane Grp Cap(c), veh/h	16	311	285	264	558	580	807	0	0	792	0	0
V/C Ratio(X)	0.44	0.91	0.93	0.86	0.30	0.30	0.87	0.00	0.00	0.06	0.00	0.00
Avail Cap(c_a), veh/h	103	311	285	273	558	580	864	0	0	845	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	42.5	34.8	35.0	35.9	22.3	22.3	20.1	0.0	0.0	10.9	0.0	0.0
Incr Delay (d2), s/veh	17.8	31.9	38.1	23.4	1.3	1.3	8.9	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	8.4	8.3	6.3	2.7	2.8	14.0	0.0	0.0	0.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.3	66.8	73.1	59.3	23.7	23.7	29.1	0.0	0.0	10.9	0.0	0.0
LnGrp LOS	E	E	E	E	C	C	C	A	A	B	A	A
Approach Vol, veh/h		554			565			700			47	
Approach Delay, s/veh		69.7			38.0			29.1			10.9	
Approach LOS		E			D			C			B	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	47.9	17.0	21.3	47.9	5.0	33.3
Change Period (Y+Rc), s	4.5	* 4.2	6.2	4.5	* 4.2	* 6.2
Max Green Setting (Gmax), s	46.8	* 13	15.1	46.8	* 5	* 24
Max Q Clear Time (g_c+I1), s	41.0	12.8	15.8	3.2	2.3	8.1
Green Ext Time (p_c), s	2.5	0.0	0.0	0.3	0.0	1.7

Intersection Summary	
HCM 6th Ctrl Delay	43.4
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	300	414	32	12	363	282	8	104	13	239	12	179
Future Volume (veh/h)	300	414	32	12	363	282	8	104	13	239	12	179
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	400	552	43	16	484	376	11	139	17	319	16	239
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	376	1281	100	32	362	281	14	176	21	269	14	202
Arrive On Green	0.21	0.38	0.38	0.02	0.19	0.19	0.12	0.12	0.12	0.29	0.29	0.29
Sat Flow, veh/h	1781	3341	260	1781	1904	1477	121	1524	186	943	47	706
Grp Volume(v), veh/h	400	293	302	16	452	408	167	0	0	574	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1824	1781	1777	1605	1831	0	0	1696	0	0
Q Serve(g_s), s	21.0	12.1	12.2	0.9	18.9	18.9	8.8	0.0	0.0	28.4	0.0	0.0
Cycle Q Clear(g_c), s	21.0	12.1	12.2	0.9	18.9	18.9	8.8	0.0	0.0	28.4	0.0	0.0
Prop In Lane	1.00		0.14	1.00		0.92	0.07		0.10	0.56		0.42
Lane Grp Cap(c), veh/h	376	682	700	32	338	305	211	0	0	485	0	0
V/C Ratio(X)	1.06	0.43	0.43	0.50	1.34	1.34	0.79	0.00	0.00	1.18	0.00	0.00
Avail Cap(c_a), veh/h	376	682	700	90	338	305	499	0	0	485	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	39.2	22.6	22.6	48.3	40.2	40.2	42.8	0.0	0.0	35.5	0.0	0.0
Incr Delay (d2), s/veh	63.9	0.4	0.4	11.6	170.0	172.9	6.5	0.0	0.0	102.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.7	5.0	5.2	0.5	24.1	22.0	4.3	0.0	0.0	25.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	103.1	23.0	23.0	59.9	210.2	213.1	49.3	0.0	0.0	137.7	0.0	0.0
LnGrp LOS	F	C	C	E	F	F	D	A	A	F	A	A
Approach Vol, veh/h		995			876			167			574	
Approach Delay, s/veh		55.2			208.8			49.3			137.7	
Approach LOS		E			F			D			F	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	16.1	6.0	44.3	33.0	25.2	25.1
Change Period (Y+Rc), s	4.6	* 4.2	6.2	4.6	* 4.2	6.2
Max Green Setting (Gmax), s	27.1	* 5	34.9	28.4	* 21	18.9
Max Q Clear Time (g_c+I1), s	10.8	2.9	14.2	30.4	23.0	20.9
Green Ext Time (p_c), s	0.8	0.0	3.6	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	124.5
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	48	0	4	0	6	34	5	8	0
Future Volume (Veh/h)	0	0	0	48	0	4	0	6	34	5	8	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	0	51	0	4	0	6	36	5	8	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		1			1							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	4			0			106	106	0	141	102	0
vC1, stage 1 conf vol							0	0		102	102	
vC2, stage 2 conf vol							106	106		39	0	
vCu, unblocked vol	4			0			106	106	0	141	102	0
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			100	99	97	99	99	100
cM capacity (veh/h)	1618			1623			786	711	1085	757	712	1085

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	51	4	42	13
Volume Left	51	0	0	5
Volume Right	0	4	36	0
cSH	1623	1700	1009	729
Volume to Capacity	0.03	0.00	0.04	0.02
Queue Length 95th (ft)	2	0	3	1
Control Delay (s)	7.3	0.0	8.7	10.0
Lane LOS	A		A	B
Approach Delay (s)	6.8		8.7	10.0
Approach LOS			A	B

Intersection Summary				
Average Delay	7.9			
Intersection Capacity Utilization	14.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	2.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	13	5	29	11	14	49
Future Vol, veh/h	13	5	29	11	14	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	5	31	12	15	52

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	119	37	0	0	43	0
Stage 1	37	-	-	-	-	-
Stage 2	82	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	877	1035	-	-	1566	-
Stage 1	985	-	-	-	-	-
Stage 2	941	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	868	1035	-	-	1566	-
Mov Cap-2 Maneuver	868	-	-	-	-	-
Stage 1	975	-	-	-	-	-
Stage 2	941	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9	0	1.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	909	1566	-
HCM Lane V/C Ratio	-	-	0.021	0.009	-
HCM Control Delay (s)	-	-	9	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	5	20	8	8	9	1
Future Vol, veh/h	5	20	8	8	9	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	21	8	8	9	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	26	0	40	16
Stage 1	-	-	-	-	16	-
Stage 2	-	-	-	-	24	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1588	-	972	1063
Stage 1	-	-	-	-	1007	-
Stage 2	-	-	-	-	999	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1588	-	967	1063
Mov Cap-2 Maneuver	-	-	-	-	967	-
Stage 1	-	-	-	-	1002	-
Stage 2	-	-	-	-	999	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.6	8.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	976	-	-	1588	-
HCM Lane V/C Ratio	0.011	-	-	0.005	-
HCM Control Delay (s)	8.7	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

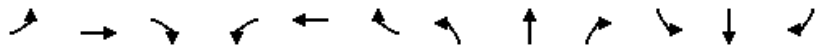
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	561	25	32	541	11	30	8	46	9	1	87
Future Volume (veh/h)	29	561	25	32	541	11	30	8	46	9	1	87
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	31	591	26	34	569	12	32	8	48	9	1	92
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	66	1500	66	71	1550	33	191	31	105	118	8	168
Arrive On Green	0.04	0.43	0.43	0.04	0.44	0.44	0.12	0.12	0.12	0.12	0.12	0.12
Sat Flow, veh/h	1781	3467	152	1781	3559	75	481	265	895	89	66	1434
Grp Volume(v), veh/h	31	303	314	34	284	297	88	0	0	102	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1843	1781	1777	1857	1641	0	0	1590	0	0
Q Serve(g_s), s	0.6	4.3	4.3	0.7	3.9	3.9	0.0	0.0	0.0	0.5	0.0	0.0
Cycle Q Clear(g_c), s	0.6	4.3	4.3	0.7	3.9	3.9	1.7	0.0	0.0	2.2	0.0	0.0
Prop In Lane	1.00		0.08	1.00		0.04	0.36		0.55	0.09		0.90
Lane Grp Cap(c), veh/h	66	768	797	71	774	809	326	0	0	293	0	0
V/C Ratio(X)	0.47	0.39	0.39	0.48	0.37	0.37	0.27	0.00	0.00	0.35	0.00	0.00
Avail Cap(c_a), veh/h	244	768	797	244	774	809	1342	0	0	1360	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	17.2	7.1	7.1	17.2	6.9	6.9	15.0	0.0	0.0	15.2	0.0	0.0
Incr Delay (d2), s/veh	5.2	1.5	1.5	4.9	1.3	1.3	0.4	0.0	0.0	0.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.4	1.4	0.3	1.3	1.3	0.6	0.0	0.0	0.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.4	8.6	8.6	22.1	8.3	8.2	15.4	0.0	0.0	15.9	0.0	0.0
LnGrp LOS	C	A	A	C	A	A	B	A	A	B	A	A
Approach Vol, veh/h		648			615			88			102	
Approach Delay, s/veh		9.2			9.0			15.4			15.9	
Approach LOS		A			A			B			B	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	8.9	5.7	22.0	8.9	5.5	22.1
Change Period (Y+Rc), s	4.6	* 4.2	6.2	4.6	* 4.2	6.2
Max Green Setting (Gmax), s	29.2	* 5	15.8	29.2	* 5	15.8
Max Q Clear Time (g_c+I1), s	3.7	2.7	6.3	4.2	2.6	5.9
Green Ext Time (p_c), s	0.4	0.0	2.6	0.5	0.0	2.5

Intersection Summary	
HCM 6th Ctrl Delay	10.0
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



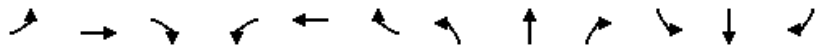
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	475	5	212	17	4	3	158	1532	12	9	1437	209
Future Volume (veh/h)	475	5	212	17	4	3	158	1532	12	9	1437	209
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	500	5	223	18	4	3	166	1613	13	9	1513	220
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	537	11	469	42	24	18	182	1732	773	19	1785	259
Arrive On Green	0.30	0.30	0.30	0.02	0.02	0.02	0.10	0.49	0.49	0.01	0.40	0.40
Sat Flow, veh/h	1781	35	1555	1781	992	744	1781	3554	1585	1781	4503	654
Grp Volume(v), veh/h	500	0	228	18	0	7	166	1613	13	9	1143	590
Grp Sat Flow(s),veh/h/ln	1781	0	1590	1781	0	1736	1781	1777	1585	1781	1702	1753
Q Serve(g_s), s	31.6	0.0	13.5	1.2	0.0	0.5	10.7	49.3	0.5	0.6	35.3	35.5
Cycle Q Clear(g_c), s	31.6	0.0	13.5	1.2	0.0	0.5	10.7	49.3	0.5	0.6	35.3	35.5
Prop In Lane	1.00		0.98	1.00		0.43	1.00		1.00	1.00		0.37
Lane Grp Cap(c), veh/h	537	0	480	42	0	41	182	1732	773	19	1349	695
V/C Ratio(X)	0.93	0.00	0.48	0.42	0.00	0.17	0.91	0.93	0.02	0.47	0.85	0.85
Avail Cap(c_a), veh/h	583	0	521	523	0	510	182	1732	773	77	1349	695
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.3	0.0	33.0	55.7	0.0	55.4	51.5	27.9	15.3	56.9	31.8	31.8
Incr Delay (d2), s/veh	20.9	0.0	0.7	6.6	0.0	1.9	43.2	10.5	0.0	16.4	6.7	12.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.7	0.0	5.3	0.6	0.0	0.2	6.9	22.6	0.2	0.3	15.5	17.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.1	0.0	33.7	62.3	0.0	57.3	94.7	38.4	15.4	73.3	38.5	44.1
LnGrp LOS	E	A	C	E	A	E	F	D	B	E	D	D
Approach Vol, veh/h		728			25			1792			1742	
Approach Delay, s/veh		51.8			60.9			43.4			40.6	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.5	62.9		40.0	16.0	52.4		7.4				
Change Period (Y+Rc), s	* 4.2	6.5		5.1	* 4.2	6.5		4.6				
Max Green Setting (Gmax), s	* 5	52.7		37.9	* 12	45.9		34.0				
Max Q Clear Time (g_c+I1), s	2.6	51.3		33.6	12.7	37.5		3.2				
Green Ext Time (p_c), s	0.0	1.2		1.4	0.0	6.5		0.1				

Intersection Summary	
HCM 6th Ctrl Delay	43.8
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	12	4	535	20	286	27	1574	529	164	1492	15
Future Volume (veh/h)	21	12	4	535	20	286	27	1574	529	164	1492	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	22	13	4	563	21	301	28	1657	557	173	1571	16
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	82	174	51	656	409	365	98	2188	679	246	2457	25
Arrive On Green	0.02	0.06	0.06	0.19	0.23	0.23	0.03	0.43	0.43	0.07	0.47	0.47
Sat Flow, veh/h	3456	2711	794	3456	1777	1585	3456	5106	1585	3456	5212	53
Grp Volume(v), veh/h	22	8	9	563	21	301	28	1657	557	173	1026	561
Grp Sat Flow(s),veh/h/ln	1728	1777	1727	1728	1777	1585	1728	1702	1585	1728	1702	1861
Q Serve(g_s), s	0.5	0.4	0.4	13.5	0.8	15.5	0.7	23.5	26.5	4.2	19.5	19.5
Cycle Q Clear(g_c), s	0.5	0.4	0.4	13.5	0.8	15.5	0.7	23.5	26.5	4.2	19.5	19.5
Prop In Lane	1.00		0.46	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	82	114	111	656	409	365	98	2188	679	246	1604	877
V/C Ratio(X)	0.27	0.07	0.08	0.86	0.05	0.83	0.29	0.76	0.82	0.70	0.64	0.64
Avail Cap(c_a), veh/h	202	664	645	759	950	848	202	2188	679	258	1604	877
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.1	37.7	37.7	33.6	25.7	31.3	40.8	20.7	21.6	38.9	17.1	17.1
Incr Delay (d2), s/veh	1.7	0.3	0.3	8.7	0.1	4.7	1.6	2.5	10.7	7.9	2.0	3.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.2	0.2	6.3	0.3	6.2	0.3	9.3	11.2	2.0	7.5	8.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.8	38.0	38.0	42.3	25.7	36.1	42.3	23.2	32.2	46.8	19.1	20.7
LnGrp LOS	D	D	D	D	C	D	D	C	C	D	B	C
Approach Vol, veh/h		39			885			2242			1760	
Approach Delay, s/veh		40.7			39.8			25.7			22.3	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	43.2	20.5	11.7	6.6	46.9	6.2	25.9
Change Period (Y+Rc), s	* 4.2	6.5	* 4.2	6.2	* 4.2	6.5	* 4.2	6.2
Max Green Setting (Gmax), s	* 6.4	36.7	* 19	32.0	* 5	38.1	* 5	45.8
Max Q Clear Time (g_c+I1), s	6.2	28.5	15.5	2.4	2.7	21.5	2.5	17.5
Green Ext Time (p_c), s	0.0	6.8	0.8	0.0	0.0	10.1	0.0	2.3

Intersection Summary	
HCM 6th Ctrl Delay	27.1
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

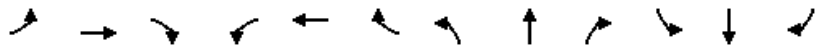
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	116	14	55	58	14	69	32	1927	31	59	1928	135
Future Volume (veh/h)	116	14	55	58	14	69	32	1927	31	59	1928	135
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	122	15	58	61	15	73	34	2028	33	62	2029	142
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	140	36	140	78	20	99	417	3297	54	80	2088	145
Arrive On Green	0.08	0.11	0.11	0.04	0.07	0.07	0.23	0.64	0.64	0.04	0.43	0.43
Sat Flow, veh/h	1781	336	1300	1781	277	1350	1781	5175	84	1781	4874	339
Grp Volume(v), veh/h	122	0	73	61	0	88	34	1333	728	62	1414	757
Grp Sat Flow(s),veh/h/ln	1781	0	1636	1781	0	1627	1781	1702	1855	1781	1702	1809
Q Serve(g_s), s	8.1	0.0	5.0	4.1	0.0	6.4	1.8	28.0	28.1	4.1	48.7	49.4
Cycle Q Clear(g_c), s	8.1	0.0	5.0	4.1	0.0	6.4	1.8	28.0	28.1	4.1	48.7	49.4
Prop In Lane	1.00		0.79	1.00		0.83	1.00		0.05	1.00		0.19
Lane Grp Cap(c), veh/h	140	0	176	78	0	119	417	2168	1182	80	1458	775
V/C Ratio(X)	0.87	0.00	0.41	0.78	0.00	0.74	0.08	0.61	0.62	0.78	0.97	0.98
Avail Cap(c_a), veh/h	140	0	496	104	0	461	417	2168	1182	83	1458	775
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.42	0.42	0.42	0.77	0.77	0.77
Uniform Delay (d), s/veh	54.7	0.0	50.0	56.8	0.0	54.5	35.9	13.0	13.0	56.7	33.5	33.7
Incr Delay (d2), s/veh	41.5	0.0	1.6	23.1	0.0	8.5	0.0	0.6	1.0	28.7	14.6	23.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	0.0	2.1	2.3	0.0	2.9	0.8	10.3	11.4	2.5	22.5	26.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	96.3	0.0	51.6	79.9	0.0	63.0	35.9	13.6	14.0	85.5	48.2	57.1
LnGrp LOS	F	A	D	E	A	E	D	B	B	F	D	E
Approach Vol, veh/h		195			149			2095			2233	
Approach Delay, s/veh		79.5			69.9			14.1			52.2	
Approach LOS		E			E			B			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.6	82.9	9.5	18.0	34.6	57.9	13.6	13.9
Change Period (Y+Rc), s	* 4.2	6.5	* 4.2	5.1	6.5	* 6.5	* 4.2	5.1
Max Green Setting (Gmax), s	* 5.6	51.0	* 7	36.4	5.2	* 51	* 9.4	34.0
Max Q Clear Time (g_c+I1), s	6.1	30.1	6.1	7.0	3.8	51.4	10.1	8.4
Green Ext Time (p_c), s	0.0	15.2	0.0	0.4	0.0	0.0	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	36.8
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	196	184	309	732	320	114	163	1681	237	82	1856	121
Future Volume (veh/h)	196	184	309	732	320	114	163	1681	237	82	1856	121
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	206	194	325	771	337	120	172	1769	0	86	1954	127
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	254	723	414	722	875	306	200	2042		118	1918	124
Arrive On Green	0.07	0.20	0.20	0.21	0.34	0.34	0.06	0.40	0.00	0.03	0.39	0.39
Sat Flow, veh/h	3456	3554	1585	3456	2581	904	3456	5274	0	3456	4900	317
Grp Volume(v), veh/h	206	194	325	771	230	227	172	1769	0	86	1355	726
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1708	1728	1702	0	1728	1702	1813
Q Serve(g_s), s	8.9	7.0	29.0	31.8	15.0	15.4	7.5	48.5	0.0	3.8	59.6	59.6
Cycle Q Clear(g_c), s	8.9	7.0	29.0	31.8	15.0	15.4	7.5	48.5	0.0	3.8	59.6	59.6
Prop In Lane	1.00		1.00	1.00		0.53	1.00		0.00	1.00		0.17
Lane Grp Cap(c), veh/h	254	723	414	722	602	579	200	2042		118	1332	710
V/C Ratio(X)	0.81	0.27	0.78	1.07	0.38	0.39	0.86	0.87		0.73	1.02	1.02
Avail Cap(c_a), veh/h	340	723	414	722	602	579	200	2042		118	1332	710
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	69.5	51.1	52.3	60.2	38.2	38.4	71.1	42.0	0.0	72.9	46.4	46.4
Incr Delay (d2), s/veh	10.4	0.2	9.5	53.3	0.4	0.4	29.7	5.3	0.0	20.2	29.1	39.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	3.2	12.7	19.3	6.7	6.6	4.2	21.3	0.0	2.0	30.4	34.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	79.9	51.3	61.8	113.6	38.6	38.8	100.9	47.2	0.0	93.1	75.4	86.1
LnGrp LOS	E	D	E	F	D	D	F	D		F	F	F
Approach Vol, veh/h		725			1228			1941	A		2167	
Approach Delay, s/veh		64.1			85.7			52.0			79.7	
Approach LOS		E			F			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.7	67.4	36.0	37.2	13.0	66.1	15.4	57.8
Change Period (Y+Rc), s	6.5	* 6.5	* 4.2	6.2	* 4.2	6.5	* 4.2	6.2
Max Green Setting (Gmax), s	5.2	* 61	* 32	31.0	* 8.8	57.3	* 15	47.8
Max Q Clear Time (g_c+I1), s	5.8	50.5	33.8	31.0	9.5	61.6	10.9	17.4
Green Ext Time (p_c), s	0.0	8.0	0.0	0.0	0.0	0.0	0.2	3.0

Intersection Summary	
HCM 6th Ctrl Delay	70.2
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

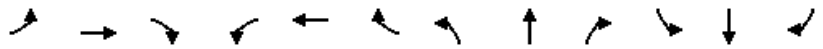
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	363	115	89	384	81	87	18	53	44	28	63
Future Volume (veh/h)	53	363	115	89	384	81	87	18	53	44	28	63
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	56	382	121	94	404	85	92	19	56	46	29	66
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	104	1020	319	145	1189	248	266	44	85	185	76	124
Arrive On Green	0.06	0.38	0.38	0.08	0.41	0.41	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1781	2664	833	1781	2927	610	790	279	539	408	486	786
Grp Volume(v), veh/h	56	253	250	94	244	245	167	0	0	141	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1720	1781	1777	1760	1608	0	0	1680	0	0
Q Serve(g_s), s	1.2	4.0	4.1	2.0	3.7	3.8	0.7	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.2	4.0	4.1	2.0	3.7	3.8	3.5	0.0	0.0	2.9	0.0	0.0
Prop In Lane	1.00		0.48	1.00		0.35	0.55		0.34	0.33		0.47
Lane Grp Cap(c), veh/h	104	680	659	145	722	715	395	0	0	385	0	0
V/C Ratio(X)	0.54	0.37	0.38	0.65	0.34	0.34	0.42	0.00	0.00	0.37	0.00	0.00
Avail Cap(c_a), veh/h	231	680	659	226	722	715	1084	0	0	1122	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	18.0	8.7	8.8	17.5	8.0	8.1	15.4	0.0	0.0	15.2	0.0	0.0
Incr Delay (d2), s/veh	4.3	1.6	1.7	4.8	1.3	1.3	0.7	0.0	0.0	0.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	1.4	1.4	0.9	1.3	1.3	1.2	0.0	0.0	1.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.4	10.3	10.4	22.3	9.3	9.4	16.1	0.0	0.0	15.8	0.0	0.0
LnGrp LOS	C	B	B	C	A	A	B	A	A	B	A	A
Approach Vol, veh/h		559			583			167			141	
Approach Delay, s/veh		11.6			11.4			16.1			15.8	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	10.7	7.4	21.3	10.7	6.5	22.2
Change Period (Y+Rc), s	4.5	* 4.2	6.2	4.5	* 4.2	* 6.2
Max Green Setting (Gmax), s	25.1	* 5	15.0	25.1	* 5.1	* 16
Max Q Clear Time (g_c+I1), s	5.5	4.0	6.1	4.9	3.2	5.8
Green Ext Time (p_c), s	0.9	0.0	2.0	0.7	0.0	2.1

Intersection Summary	
HCM 6th Ctrl Delay	12.5
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	675	19	54	626	75	10	6	10	77	6	18
Future Volume (veh/h)	25	675	19	54	626	75	10	6	10	77	6	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	26	711	20	57	659	79	11	6	11	81	6	19
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	56	1070	30	106	1058	127	23	12	23	118	9	28
Arrive On Green	0.03	0.30	0.30	0.06	0.33	0.33	0.03	0.03	0.03	0.09	0.09	0.09
Sat Flow, veh/h	1781	3530	99	1781	3196	383	674	368	674	1335	99	313
Grp Volume(v), veh/h	26	358	373	57	366	372	28	0	0	106	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1852	1781	1777	1801	1715	0	0	1747	0	0
Q Serve(g_s), s	0.5	6.7	6.7	1.2	6.6	6.6	0.6	0.0	0.0	2.2	0.0	0.0
Cycle Q Clear(g_c), s	0.5	6.7	6.7	1.2	6.6	6.6	0.6	0.0	0.0	2.2	0.0	0.0
Prop In Lane	1.00		0.05	1.00		0.21	0.39		0.39	0.76		0.18
Lane Grp Cap(c), veh/h	56	539	562	106	588	596	58	0	0	155	0	0
V/C Ratio(X)	0.46	0.66	0.66	0.54	0.62	0.62	0.48	0.00	0.00	0.69	0.00	0.00
Avail Cap(c_a), veh/h	234	785	818	234	785	795	1244	0	0	1194	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	18.1	11.6	11.6	17.4	10.7	10.7	18.1	0.0	0.0	16.8	0.0	0.0
Incr Delay (d2), s/veh	5.8	1.4	1.4	4.2	1.1	1.1	6.2	0.0	0.0	5.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.2	2.3	0.5	2.1	2.1	0.3	0.0	0.0	1.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.9	13.0	12.9	21.6	11.8	11.8	24.2	0.0	0.0	22.1	0.0	0.0
LnGrp LOS	C	B	B	C	B	B	C	A	A	C	A	A
Approach Vol, veh/h		757			795			28			106	
Approach Delay, s/veh		13.3			12.5			24.2			22.1	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	5.9	6.5	17.7	8.0	5.4	18.8
Change Period (Y+Rc), s	4.6	* 4.2	6.2	4.6	* 4.2	6.2
Max Green Setting (Gmax), s	27.6	* 5	16.8	26.0	* 5	16.8
Max Q Clear Time (g_c+I1), s	2.6	3.2	8.7	4.2	2.5	8.6
Green Ext Time (p_c), s	0.1	0.0	2.8	0.5	0.0	2.9

Intersection Summary	
HCM 6th Ctrl Delay	13.7
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	37	0	16	0	4	24	6	4	0
Future Volume (Veh/h)	0	0	0	37	0	16	0	4	24	6	4	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	0	39	0	17	0	4	25	6	4	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		1			1							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	17			0			80	95	0	105	78	0
vC1, stage 1 conf vol							0	0		78	78	
vC2, stage 2 conf vol							80	95		27	0	
vCu, unblocked vol	17			0			80	95	0	105	78	0
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			100	99	98	99	99	100
cM capacity (veh/h)	1600			1623			822	724	1085	799	736	1085

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	39	17	29	10
Volume Left	39	0	0	6
Volume Right	0	17	25	0
cSH	1623	1700	1015	773
Volume to Capacity	0.02	0.01	0.03	0.01
Queue Length 95th (ft)	2	0	2	1
Control Delay (s)	7.3	0.0	8.7	9.7
Lane LOS	A		A	A
Approach Delay (s)	5.1		8.7	9.7
Approach LOS			A	A

Intersection Summary				
Average Delay	6.6			
Intersection Capacity Utilization	15.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	2.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	6	25	10	6	19
Future Vol, veh/h	10	6	25	10	6	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	6	26	11	6	20

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	64	32	0	0	37	0
Stage 1	32	-	-	-	-	-
Stage 2	32	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	942	1042	-	-	1574	-
Stage 1	991	-	-	-	-	-
Stage 2	991	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	938	1042	-	-	1574	-
Mov Cap-2 Maneuver	938	-	-	-	-	-
Stage 1	987	-	-	-	-	-
Stage 2	991	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	1.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	974	1574	-
HCM Lane V/C Ratio	-	-	0.017	0.004	-
HCM Control Delay (s)	-	-	8.8	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	4.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	4	11	8	4	11	5
Future Vol, veh/h	4	11	8	4	11	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	12	8	4	12	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	16	0	30	10
Stage 1	-	-	-	-	10	-
Stage 2	-	-	-	-	20	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1602	-	984	1071
Stage 1	-	-	-	-	1013	-
Stage 2	-	-	-	-	1003	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1602	-	979	1071
Mov Cap-2 Maneuver	-	-	-	-	979	-
Stage 1	-	-	-	-	1008	-
Stage 2	-	-	-	-	1003	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.8	8.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1006	-	-	1602	-
HCM Lane V/C Ratio	0.017	-	-	0.005	-
HCM Control Delay (s)	8.6	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

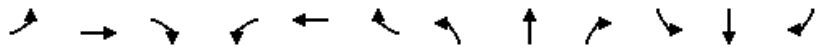
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	645	21	72	782	26	31	4	41	20	4	23
Future Volume (veh/h)	18	645	21	72	782	26	31	4	41	20	4	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	19	679	22	76	823	27	33	4	43	21	4	24
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	43	1536	50	129	1706	56	190	15	83	190	26	78
Arrive On Green	0.02	0.44	0.44	0.07	0.49	0.49	0.10	0.10	0.10	0.10	0.10	0.10
Sat Flow, veh/h	1781	3513	114	1781	3511	115	578	153	849	568	265	800
Grp Volume(v), veh/h	19	343	358	76	416	434	80	0	0	49	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1850	1781	1777	1850	1579	0	0	1633	0	0
Q Serve(g_s), s	0.4	5.1	5.2	1.6	6.0	6.0	0.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.4	5.1	5.2	1.6	6.0	6.0	1.7	0.0	0.0	1.0	0.0	0.0
Prop In Lane	1.00		0.06	1.00		0.06	0.41		0.54	0.43		0.49
Lane Grp Cap(c), veh/h	43	777	809	129	863	899	287	0	0	294	0	0
V/C Ratio(X)	0.45	0.44	0.44	0.59	0.48	0.48	0.28	0.00	0.00	0.17	0.00	0.00
Avail Cap(c_a), veh/h	233	777	809	238	863	899	1252	0	0	1253	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	18.4	7.5	7.5	17.2	6.6	6.6	16.3	0.0	0.0	16.0	0.0	0.0
Incr Delay (d2), s/veh	7.2	1.8	1.8	4.2	1.9	1.9	0.5	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.7	1.8	0.7	1.9	1.9	0.6	0.0	0.0	0.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.5	9.3	9.3	21.4	8.5	8.4	16.8	0.0	0.0	16.3	0.0	0.0
LnGrp LOS	C	A	A	C	A	A	B	A	A	B	A	A
Approach Vol, veh/h		720			926			80			49	
Approach Delay, s/veh		9.7			9.5			16.8			16.3	
Approach LOS		A			A			B			B	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	8.3	7.0	22.9	8.3	5.1	24.8
Change Period (Y+Rc), s	4.6	* 4.2	6.2	4.6	* 4.2	6.2
Max Green Setting (Gmax), s	28.2	* 5.1	16.7	28.2	* 5	16.8
Max Q Clear Time (g_c+I1), s	3.7	3.6	7.2	3.0	2.4	8.0
Green Ext Time (p_c), s	0.4	0.0	3.0	0.2	0.0	3.5

Intersection Summary	
HCM 6th Ctrl Delay	10.1
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



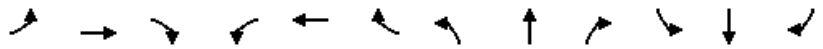
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	266	2	210	11	10	19	218	1136	15	17	1851	445
Future Volume (veh/h)	266	2	210	11	10	19	218	1136	15	17	1851	445
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	280	2	221	12	11	20	229	1196	16	18	1948	468
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	338	3	298	60	20	37	216	2004	894	35	1913	444
Arrive On Green	0.19	0.19	0.19	0.03	0.03	0.03	0.12	0.56	0.56	0.02	0.46	0.46
Sat Flow, veh/h	1781	14	1573	1781	595	1081	1781	3554	1585	1781	4139	962
Grp Volume(v), veh/h	280	0	223	12	0	31	229	1196	16	18	1590	826
Grp Sat Flow(s),veh/h/ln	1781	0	1587	1781	0	1676	1781	1777	1585	1781	1702	1697
Q Serve(g_s), s	16.0	0.0	14.0	0.7	0.0	1.9	12.8	23.4	0.5	1.1	48.8	48.8
Cycle Q Clear(g_c), s	16.0	0.0	14.0	0.7	0.0	1.9	12.8	23.4	0.5	1.1	48.8	48.8
Prop In Lane	1.00		0.99	1.00		0.65	1.00		1.00	1.00		0.57
Lane Grp Cap(c), veh/h	338	0	301	60	0	57	216	2004	894	35	1573	784
V/C Ratio(X)	0.83	0.00	0.74	0.20	0.00	0.55	1.06	0.60	0.02	0.52	1.01	1.05
Avail Cap(c_a), veh/h	573	0	511	573	0	539	216	2004	894	84	1573	784
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.1	0.0	40.3	49.6	0.0	50.2	46.4	15.1	10.2	51.3	28.4	28.4
Incr Delay (d2), s/veh	5.2	0.0	3.6	1.6	0.0	7.9	78.2	1.3	0.0	11.6	25.5	47.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.4	0.0	5.7	0.3	0.0	0.9	10.3	9.3	0.2	0.6	24.4	29.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.4	0.0	43.9	51.2	0.0	58.1	124.6	16.5	10.2	62.9	53.9	75.4
LnGrp LOS	D	A	D	D	A	E	F	B	B	E	F	F
Approach Vol, veh/h		503			43			1441			2434	
Approach Delay, s/veh		45.3			56.2			33.6			61.2	
Approach LOS		D			E			C			E	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.3	66.0		25.1	17.0	55.3		8.2
Change Period (Y+Rc), s	* 4.2	6.5		5.1	* 4.2	6.5		4.6
Max Green Setting (Gmax), s	* 5	56.6		34.0	* 13	48.8		34.0
Max Q Clear Time (g_c+I1), s	13.1	25.4		18.0	14.8	50.8		3.9
Green Ext Time (p_c), s	0.0	11.0		2.1	0.0	0.0		0.2

Intersection Summary	
HCM 6th Ctrl Delay	50.4
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	17	6	354	15	159	23	1293	584	268	1770	15
Future Volume (veh/h)	17	17	6	354	15	159	23	1293	584	268	1770	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	18	18	6	373	16	167	24	1361	615	282	1863	16
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	71	159	50	459	306	273	88	2279	707	371	2757	24
Arrive On Green	0.02	0.06	0.06	0.13	0.17	0.17	0.03	0.45	0.45	0.11	0.53	0.53
Sat Flow, veh/h	3456	2656	840	3456	1777	1585	3456	5106	1585	3456	5222	45
Grp Volume(v), veh/h	18	12	12	373	16	167	24	1361	615	282	1214	665
Grp Sat Flow(s),veh/h/ln	1728	1777	1719	1728	1777	1585	1728	1702	1585	1728	1702	1862
Q Serve(g_s), s	0.4	0.5	0.6	8.7	0.6	8.1	0.6	16.7	29.2	6.6	21.8	21.8
Cycle Q Clear(g_c), s	0.4	0.5	0.6	8.7	0.6	8.1	0.6	16.7	29.2	6.6	21.8	21.8
Prop In Lane	1.00		0.49	1.00		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	71	106	103	459	306	273	88	2279	707	371	1797	983
V/C Ratio(X)	0.25	0.11	0.12	0.81	0.05	0.61	0.27	0.60	0.87	0.76	0.68	0.68
Avail Cap(c_a), veh/h	208	684	662	540	855	762	208	2279	707	507	1797	983
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.1	37.0	37.0	35.0	28.7	31.8	39.8	17.4	20.8	36.1	14.4	14.4
Incr Delay (d2), s/veh	1.9	0.5	0.5	8.0	0.1	2.2	1.6	1.2	13.7	4.5	2.1	3.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.2	0.2	4.1	0.3	3.2	0.3	6.4	12.7	3.0	8.1	9.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.0	37.5	37.5	43.0	28.8	34.1	41.4	18.5	34.6	40.6	16.5	18.1
LnGrp LOS	D	D	D	D	C	C	D	B	C	D	B	B
Approach Vol, veh/h		42			556			2000			2161	
Approach Delay, s/veh		39.4			39.9			23.7			20.1	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.1	43.6	15.3	11.2	6.3	50.4	5.9	20.5
Change Period (Y+Rc), s	* 4.2	6.5	* 4.2	6.2	* 4.2	6.5	* 4.2	6.2
Max Green Setting (Gmax), s	* 8	36.7	* 13	32.0	* 5	43.9	* 5	40.0
Max Q Clear Time (g_c+I1), s	8.6	31.2	10.7	2.6	2.6	23.8	2.4	10.1
Green Ext Time (p_c), s	0.3	4.5	0.3	0.1	0.0	13.6	0.0	1.2

Intersection Summary	
HCM 6th Ctrl Delay	24.1
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

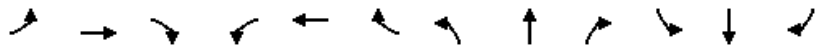
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	238	37	121	72	29	55	107	1750	66	103	1826	267
Future Volume (veh/h)	238	37	121	72	29	55	107	1750	66	103	1826	267
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	251	39	127	76	31	58	113	1842	69	108	1922	281
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	261	46	150	161	40	75	380	2930	110	127	1905	275
Arrive On Green	0.15	0.12	0.12	0.09	0.07	0.07	0.21	0.58	0.58	0.07	0.42	0.42
Sat Flow, veh/h	1781	386	1258	1781	583	1091	1781	5051	189	1781	4507	651
Grp Volume(v), veh/h	251	0	166	76	0	89	113	1241	670	108	1446	757
Grp Sat Flow(s),veh/h/ln	1781	0	1644	1781	0	1674	1781	1702	1836	1781	1702	1753
Q Serve(g_s), s	21.0	0.0	14.8	6.1	0.0	7.8	8.0	36.1	36.2	9.0	63.4	63.4
Cycle Q Clear(g_c), s	21.0	0.0	14.8	6.1	0.0	7.8	8.0	36.1	36.2	9.0	63.4	63.4
Prop In Lane	1.00		0.77	1.00		0.65	1.00		0.10	1.00		0.37
Lane Grp Cap(c), veh/h	261	0	196	161	0	115	380	1975	1065	127	1439	741
V/C Ratio(X)	0.96	0.00	0.85	0.47	0.00	0.78	0.30	0.63	0.63	0.85	1.00	1.02
Avail Cap(c_a), veh/h	261	0	472	161	0	379	380	1975	1065	127	1439	741
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.21	0.21	0.21	0.75	0.75	0.75
Uniform Delay (d), s/veh	63.6	0.0	64.8	64.8	0.0	68.7	49.5	20.8	20.8	68.9	43.3	43.3
Incr Delay (d2), s/veh	44.8	0.0	9.8	2.1	0.0	10.6	0.1	0.3	0.6	31.4	21.8	34.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.8	0.0	6.8	2.9	0.0	3.7	3.6	14.3	15.6	5.2	30.7	34.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	108.3	0.0	74.5	67.0	0.0	79.3	49.6	21.1	21.4	100.3	65.1	77.5
LnGrp LOS	F	A	E	E	A	E	D	C	C	F	F	F
Approach Vol, veh/h		417			165			2024			2311	
Approach Delay, s/veh		94.9			73.6			22.8			70.8	
Approach LOS		F			E			C			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.9	93.5	18.6	22.9	38.5	69.9	26.2	15.4
Change Period (Y+Rc), s	* 4.2	6.5	5.1	* 5.1	6.5	* 6.5	* 4.2	5.1
Max Green Setting (Gmax), s	* 11	63.3	12.9	* 43	10.6	* 63	* 22	34.0
Max Q Clear Time (g_c+I1), s	11.0	38.2	8.1	16.8	10.0	65.4	23.0	9.8
Green Ext Time (p_c), s	0.0	16.1	0.1	1.0	0.0	0.0	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	53.2
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	159	377	364	324	312	95	534	1719	636	227	1656	155
Future Volume (veh/h)	159	377	364	324	312	95	534	1719	636	227	1656	155
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	167	397	383	341	328	100	562	1809	0	239	1743	163
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	502	723	583	354	397	119	567	2384		254	1859	173
Arrive On Green	0.15	0.20	0.20	0.10	0.15	0.15	0.16	0.47	0.00	0.07	0.39	0.39
Sat Flow, veh/h	3456	3554	1585	3456	2694	808	3456	5274	0	3456	4752	443
Grp Volume(v), veh/h	167	397	383	341	215	213	562	1809	0	239	1247	659
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1725	1728	1702	0	1728	1702	1791
Q Serve(g_s), s	6.6	15.3	30.7	15.0	17.8	18.3	24.7	44.6	0.0	10.5	53.6	53.9
Cycle Q Clear(g_c), s	6.6	15.3	30.7	15.0	17.8	18.3	24.7	44.6	0.0	10.5	53.6	53.9
Prop In Lane	1.00		1.00	1.00		0.47	1.00		0.00	1.00		0.25
Lane Grp Cap(c), veh/h	502	723	583	354	262	254	567	2384		254	1332	701
V/C Ratio(X)	0.33	0.55	0.66	0.96	0.82	0.84	0.99	0.76		0.94	0.94	0.94
Avail Cap(c_a), veh/h	502	723	583	354	396	384	567	2384		254	1332	701
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.5	54.4	40.1	68.1	62.9	63.2	63.5	33.5	0.0	70.2	44.5	44.6
Incr Delay (d2), s/veh	0.4	0.9	2.7	38.1	8.0	9.8	35.3	2.3	0.0	40.4	13.5	22.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	7.0	12.5	8.5	8.7	8.8	13.7	18.9	0.0	6.1	25.0	28.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.8	55.3	42.8	106.1	70.9	73.0	98.8	35.8	0.0	110.6	58.0	66.8
LnGrp LOS	E	E	D	F	E	E	F	D		F	E	E
Approach Vol, veh/h		947			769			2371	A		2145	
Approach Delay, s/veh		50.9			87.1			50.8			66.6	
Approach LOS		D			F			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.7	77.6	19.8	37.2	29.2	66.1	28.3	28.7
Change Period (Y+Rc), s	6.5	* 6.5	* 4.2	6.2	* 4.2	6.5	6.2	* 6.2
Max Green Setting (Gmax), s	11.2	* 71	* 16	31.0	* 25	57.3	12.7	* 34
Max Q Clear Time (g_c+I1), s	12.5	46.6	17.0	32.7	26.7	55.9	8.6	20.3
Green Ext Time (p_c), s	0.0	15.6	0.0	0.0	0.0	1.2	0.2	2.1

Intersection Summary	
HCM 6th Ctrl Delay	60.7
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

APPENDIX D

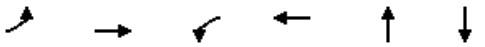
2035 WITHOUT POINSETTIA LANE GAP CLOSURE LEVEL OF SERVICE WORKSHEETS

Signal Queueing

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	7	547	228	337	700	47
v/c Ratio	0.07	0.77	0.87	0.27	0.96	0.07
Control Delay	42.0	32.9	70.2	21.6	45.7	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.0	32.9	70.2	21.6	45.7	8.4
Queue Length 50th (ft)	4	111	129	67	336	9
Queue Length 95th (ft)	18	#177	#260	118	#594	25
Internal Link Dist (ft)		509		264	1550	354
Turn Bay Length (ft)	260		250			
Base Capacity (vph)	101	709	266	1270	764	711
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.77	0.86	0.27	0.92	0.07

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	400	595	16	860	167	574
v/c Ratio	1.10	0.43	0.19	1.18	0.64	1.15
Control Delay	116.7	24.8	53.6	125.3	52.0	124.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	116.7	24.8	53.6	125.3	52.0	124.2
Queue Length 50th (ft)	~298	134	10	~312	101	~431
Queue Length 95th (ft)	#392	182	28	#337	137	#516
Internal Link Dist (ft)		346		1948	136	1460
Turn Bay Length (ft)	130		125			
Base Capacity (vph)	363	1393	86	731	489	497
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.10	0.43	0.19	1.18	0.34	1.15

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	31	617	34	581	88	102
v/c Ratio	0.12	0.27	0.14	0.25	0.27	0.28
Control Delay	16.7	6.5	16.8	6.5	10.2	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.7	6.5	16.8	6.5	10.2	7.1
Queue Length 50th (ft)	5	30	5	27	6	2
Queue Length 95th (ft)	26	98	27	92	36	30
Internal Link Dist (ft)		1948		1135	222	1401
Turn Bay Length (ft)	130		200			
Base Capacity (vph)	249	2321	249	2328	1262	1303
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.27	0.14	0.25	0.07	0.08

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	500	228	18	7	166	1613	13	9	1733
v/c Ratio	0.88	0.35	0.18	0.07	0.94	0.90	0.02	0.12	0.89
Control Delay	57.7	6.0	59.1	45.6	108.7	35.5	0.0	61.1	41.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.7	6.0	59.1	45.6	108.7	35.5	0.0	61.1	41.2
Queue Length 50th (ft)	381	3	14	3	133	594	0	7	472
Queue Length 95th (ft)	#600	62	39	19	#282	#900	0	26	#589
Internal Link Dist (ft)		870		249		1330			311
Turn Bay Length (ft)	270		100		250		185	260	
Base Capacity (vph)	566	660	508	503	176	1798	843	74	1945
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.35	0.04	0.01	0.94	0.90	0.02	0.12	0.89

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	22	17	563	322	28	1657	557	173	1587
v/c Ratio	0.10	0.07	0.67	0.42	0.13	0.71	0.57	0.63	0.57
Control Delay	38.5	32.1	32.8	14.7	38.7	20.0	6.3	48.0	14.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.5	32.1	32.8	14.7	38.7	20.0	6.3	48.0	14.4
Queue Length 50th (ft)	5	3	125	30	6	213	28	42	138
Queue Length 95th (ft)	18	14	#218	71	21	353	131	#95	323
Internal Link Dist (ft)		1388		764		1747			298
Turn Bay Length (ft)	315		380		250		240	250	
Base Capacity (vph)	215	1374	836	1825	215	2341	969	275	2792
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.01	0.67	0.18	0.13	0.71	0.57	0.63	0.57

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	122	73	61	88	34	2061	62	2171
v/c Ratio	0.88	0.33	0.61	0.51	0.45	0.65	0.41	0.63
Control Delay	105.8	21.9	80.4	27.1	74.5	16.6	59.7	12.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	105.8	21.9	80.4	27.1	74.5	16.6	59.7	12.7
Queue Length 50th (ft)	95	11	47	11	26	356	46	339
Queue Length 95th (ft)	#211	56	#107	62	#63	485	90	442
Internal Link Dist (ft)		345		406		1002		1747
Turn Bay Length (ft)	60		80		190		240	
Base Capacity (vph)	138	538	103	514	76	3175	150	3426
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.14	0.59	0.17	0.45	0.65	0.41	0.63

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	206	194	325	771	457	172	2018	86	2081
v/c Ratio	0.62	0.58	0.75	0.93	0.54	0.75	0.87	0.64	0.95
Control Delay	65.5	64.1	39.4	67.1	43.2	80.8	36.7	83.5	45.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.5	64.1	39.4	67.1	43.2	80.8	36.7	83.5	45.9
Queue Length 50th (ft)	88	84	157	333	167	75	550	38	612
Queue Length 95th (ft)	131	126	269	#470	227	#134	652	#77	#764
Internal Link Dist (ft)		1135			601		320		1002
Turn Bay Length (ft)	150		130	200		260		310	
Base Capacity (vph)	391	834	436	830	1258	229	2321	135	2201
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.23	0.75	0.93	0.36	0.75	0.87	0.64	0.95

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	56	503	94	489	167	141
v/c Ratio	0.27	0.31	0.46	0.25	0.48	0.38
Control Delay	22.6	10.4	28.6	8.2	16.0	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.6	10.4	28.6	8.2	16.0	12.1
Queue Length 50th (ft)	13	41	23	23	25	16
Queue Length 95th (ft)	42	84	#73	82	65	50
Internal Link Dist (ft)		509		264	1550	354
Turn Bay Length (ft)	260		250			
Base Capacity (vph)	210	1628	206	1986	872	909
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.31	0.46	0.25	0.19	0.16

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	26	731	57	738	28	106
v/c Ratio	0.11	0.41	0.24	0.36	0.10	0.29
Control Delay	23.4	12.9	24.6	10.0	17.1	18.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.4	12.9	24.6	10.0	17.1	18.7
Queue Length 50th (ft)	6	73	14	41	4	22
Queue Length 95th (ft)	29	182	51	182	25	68
Internal Link Dist (ft)		346		1948	136	1460
Turn Bay Length (ft)	130		125			
Base Capacity (vph)	235	1768	235	2033	1206	1170
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.41	0.24	0.36	0.02	0.09

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	19	701	76	850	80	49
v/c Ratio	0.09	0.32	0.35	0.34	0.30	0.19
Control Delay	19.1	8.7	22.9	6.3	12.7	12.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.1	8.7	22.9	6.3	12.7	12.7
Queue Length 50th (ft)	4	65	18	45	8	5
Queue Length 95th (ft)	19	113	49	142	35	26
Internal Link Dist (ft)		1948		1135	222	1401
Turn Bay Length (ft)	130		200			
Base Capacity (vph)	214	2206	218	2507	1009	992
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.32	0.35	0.34	0.08	0.05

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	280	223	12	31	229	1196	16	18	2416
v/c Ratio	0.75	0.44	0.11	0.25	1.08	0.57	0.02	0.22	1.06
Control Delay	53.6	7.8	54.8	34.1	130.5	18.7	0.0	61.3	65.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.6	7.8	54.8	34.1	130.5	18.7	0.0	61.3	65.4
Queue Length 50th (ft)	190	1	8	8	~191	263	0	13	~723
Queue Length 95th (ft)	290	62	30	41	#394	492	0	40	#967
Internal Link Dist (ft)		870		249		1330			311
Turn Bay Length (ft)	270		100		250		185	260	
Base Capacity (vph)	566	657	566	551	213	2082	963	83	2288
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.34	0.02	0.06	1.08	0.57	0.02	0.22	1.06

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	18	24	373	183	24	1361	615	282	1879
v/c Ratio	0.08	0.09	0.67	0.30	0.11	0.59	0.59	0.59	0.61
Control Delay	39.8	31.9	40.1	8.5	40.0	18.6	4.4	39.3	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.8	31.9	40.1	8.5	40.0	18.6	4.4	39.3	13.1
Queue Length 50th (ft)	4	4	86	3	5	159	3	64	134
Queue Length 95th (ft)	15	17	#164	32	19	272	71	119	362
Internal Link Dist (ft)		1388		764		1747			298
Turn Bay Length (ft)	315		380		250		240	250	
Base Capacity (vph)	213	1360	555	1605	213	2324	1049	521	3082
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.02	0.67	0.11	0.11	0.59	0.59	0.54	0.61

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	251	166	76	89	113	1911	108	2203
v/c Ratio	0.97	0.73	0.33	0.58	0.90	0.68	0.59	0.75
Control Delay	111.2	42.8	64.7	42.6	125.8	25.9	76.9	24.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	111.2	42.8	64.7	42.6	125.8	25.9	76.9	24.6
Queue Length 50th (ft)	248	54	69	30	112	469	102	545
Queue Length 95th (ft)	#428	130	125	88	#236	600	166	660
Internal Link Dist (ft)		345		406		1002		1747
Turn Bay Length (ft)	60		80		190		240	
Base Capacity (vph)	259	552	229	425	125	2823	183	2955
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.30	0.33	0.21	0.90	0.68	0.59	0.75

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	167	397	383	341	428	562	2478	239	1906
v/c Ratio	0.47	0.75	0.59	0.89	0.76	0.92	0.98	0.87	0.92
Control Delay	64.9	66.2	29.0	87.1	62.5	77.6	47.2	93.3	48.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.9	66.2	29.0	87.1	62.5	77.6	47.2	93.3	48.1
Queue Length 50th (ft)	74	184	204	160	188	261	772	112	594
Queue Length 95th (ft)	119	242	311	#265	247	#394	#993	#202	#760
Internal Link Dist (ft)		1135			601		320		1002
Turn Bay Length (ft)	150		130	200		260		310	
Base Capacity (vph)	355	783	654	382	845	612	2521	274	2061
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.51	0.59	0.89	0.51	0.92	0.98	0.87	0.92

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

APPENDIX E

2035 WITH POINSETTIA LANE GAP CLOSURE LEVEL OF SERVICE WORKSHEETS

APPENDIX E

2035 WITH POINSETTIA LANE GAP CLOSURE LEVEL OF SERVICE WORKSHEETS

ICU Worksheets

Poinsettia Reach E (LSA Project No. HCR1803)
Future Plus Extension
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #1 Ambrosia Ln / Poinsettia Ln

Cycle (sec):	100	Critical Vol./Cap.(X):	0.675
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	35	Level Of Service:	B

Street Name:	Ambrosia Ln						Poinsettia Ln					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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	1! 0	0	0	1! 0	1	0	1 1 0	1	0	1 1 0
Volume Module:												
Base Vol:	361	5	214	22	9	14	6	267	184	172	244	10
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:	361	5	214	22	9	14	6	267	184	172	244	10
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:	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 Volume:	361	5	214	22	9	14	6	267	184	172	244	10
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	361	5	214	22	9	14	6	267	184	172	244	10
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:	361	5	214	22	9	14	6	267	184	172	244	10
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.62	0.01	0.37	0.49	0.20	0.31	1.00	1.18	0.82	1.00	1.92	0.08
Final Sat.:	996	14	590	782	320	498	1600	1894	1306	1600	3074	126
Capacity Analysis Module:												
Vol/Sat:	0.23	0.36	0.36	0.01	0.03	0.03	0.00	0.14	0.14	0.11	0.08	0.08
Crit Moves:	****			****				****		****		

Poinsettia Reach E (LSA Project No. HCR1803)
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AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #2 Ambrosia Ln / Aviara Pkwy

Cycle (sec):	100	Critical Vol./Cap.(X):	0.700
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	37	Level Of Service:	C

Street Name:	Ambrosia Ln						Aviara Pkwy					
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			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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 1! 0		0	0 1! 0		1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	8	104	13	209	10	156	260	359	28	10	315	245
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:	8	104	13	209	10	156	260	359	28	10	315	245
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:	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 Volume:	8	104	13	209	10	156	260	359	28	10	315	245
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	8	104	13	209	10	156	260	359	28	10	315	245
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:	8	104	13	209	10	156	260	359	28	10	315	245
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.06	0.84	0.10	0.56	0.03	0.41	1.00	1.86	0.14	1.00	1.12	0.88
Final Sat.:	102	1331	166	892	43	666	1600	2968	232	1600	1800	1400
Capacity Analysis Module:												
Vol/Sat:	0.08	0.08	0.08	0.23	0.23	0.23	0.16	0.12	0.12	0.01	0.17	0.17
Crit Moves:	****			****			****				****	

Poinsettia Reach E (LSA Project No. HCR1803)
Future Plus Extension
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #3 Cassia Rd / Poinsettia Ln

Cycle (sec):	100	Critical Vol./Cap.(X):	0.442
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	21	Level Of Service:	A

Street Name:	Cassia Rd						Poinsettia Ln					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	1!	0	0	1	0	2	0	0	0	0	1	1	0
Volume Module:												
Base Vol:	0	0	0	20	0	222	193	416	0	0	376	10
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	20	0	222	193	416	0	0	376	10
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:	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 Volume:	0	0	0	20	0	222	193	416	0	0	376	10
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	20	0	222	193	416	0	0	376	10
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	20	0	222	193	416	0	0	376	10
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	0.08	0.00	0.92	1.00	2.00	0.00	0.00	1.95	0.05
Final Sat.:	0	0	0	132	0	1468	1600	3200	0	0	3117	83
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.01	0.00	0.15	0.12	0.13	0.00	0.00	0.12	0.12
Crit Moves:						****	****				****	

Poinsettia Reach E (LSA Project No. HCR1803)
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AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #4 Skimmer Ct-Oriole Ct / Poinsettia Ln

Cycle (sec):	100	Critical Vol./Cap.(X):	0.264
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	17	Level Of Service:	A

Street Name:	Skimmer Ct-Oriole Ct						Poinsettia Ln					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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	1! 0	0	0	1! 0	1	0	1 1 0	1	0	1 1 0
Volume Module:												
Base Vol:	34	6	41	5	2	6	2	414	20	39	346	2
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:	34	6	41	5	2	6	2	414	20	39	346	2
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:	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 Volume:	34	6	41	5	2	6	2	414	20	39	346	2
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	34	6	41	5	2	6	2	414	20	39	346	2
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:	34	6	41	5	2	6	2	414	20	39	346	2
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.42	0.07	0.51	0.38	0.15	0.47	1.00	1.91	0.09	1.00	1.99	0.01
Final Sat.:	672	119	810	615	246	738	1600	3053	147	1600	3182	18
Capacity Analysis Module:												
Vol/Sat:	0.02	0.05	0.05	0.00	0.01	0.01	0.00	0.14	0.14	0.02	0.11	0.11
Crit Moves:	****			****				****		****		

Poinsettia Reach E (LSA Project No. HCR1803)
Future Plus Extension
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #7 Mimosa Dr / Aviara Pkwy

Cycle (sec):	100	Critical Vol./Cap.(X):	0.282
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	17	Level Of Service:	A

Street Name:	Mimosa Dr						Aviara Pkwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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	1! 0	0	0	1! 0	1	0	1 1 0	1	0	1 1 0
Volume Module:												
Base Vol:	30	8	46	5	1	53	25	487	22	28	470	10
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:	30	8	46	5	1	53	25	487	22	28	470	10
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:	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 Volume:	30	8	46	5	1	53	25	487	22	28	470	10
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	30	8	46	5	1	53	25	487	22	28	470	10
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:	30	8	46	5	1	53	25	487	22	28	470	10
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.36	0.09	0.55	0.08	0.02	0.90	1.00	1.91	0.09	1.00	1.96	0.04
Final Sat.:	571	152	876	136	27	1437	1600	3062	138	1600	3133	67
Capacity Analysis Module:												
Vol/Sat:	0.02	0.05	0.05	0.00	0.04	0.04	0.02	0.16	0.16	0.02	0.15	0.15
Crit Moves:	****				****			****		****		

Poinsettia Reach E (LSA Project No. HCR1803)
Future Plus Extension
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #8 El Camino Real / Cassia Rd

Cycle (sec):	100	Critical Vol./Cap.(X):	0.598
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	29	Level Of Service:	A

Street Name:	El Camino Real						Cassia Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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	2 0	1	1 0	2 1	0	1 0	0 1	0	1 0	0 1	0
Volume Module:												
Base Vol:	30	1550	12	9	1613	53	85	4	38	17	4	3
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:	30	1550	12	9	1613	53	85	4	38	17	4	3
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:	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 Volume:	30	1550	12	9	1613	53	85	4	38	17	4	3
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	30	1550	12	9	1613	53	85	4	38	17	4	3
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:	30	1550	12	9	1613	53	85	4	38	17	4	3
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.90	0.10	1.00	0.10	0.90	1.00	0.57	0.43
Final Sat.:	1600	3200	1600	1600	4647	153	1600	152	1448	1600	914	686
Capacity Analysis Module:												
Vol/Sat:	0.02	0.48	0.01	0.01	0.35	0.35	0.05	0.03	0.03	0.01	0.00	0.00
Crit Moves:		****			****			****			****	

Poinsettia Reach E (LSA Project No. HCR1803)
Future Plus Extension
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #9 El Camino Real / Poinsettia Ln

Cycle (sec):	100	Critical Vol./Cap.(X):	0.717
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	39	Level Of Service:	C

Street Name:	El Camino Real						Poinsettia Ln					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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:	2 0	3 0	1	2 0	2 1	0	2 0	1 1	0	2 0	1 1	0
Volume Module:												
Base Vol:	176	1531	529	166	1510	185	255	41	114	519	36	286
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:	176	1531	529	166	1510	185	255	41	114	519	36	286
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:	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 Volume:	176	1531	529	166	1510	185	255	41	114	519	36	286
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	176	1531	529	166	1510	185	255	41	114	519	36	286
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:	176	1531	529	166	1510	185	255	41	114	519	36	286
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	3.00	1.00	2.00	2.67	0.33	2.00	1.00	1.00	2.00	1.00	1.00
Final Sat.:	3200	4800	1600	3200	4276	524	3200	1600	1600	3200	1600	1600
Capacity Analysis Module:												
Vol/Sat:	0.06	0.32	0.33	0.05	0.35	0.35	0.08	0.03	0.07	0.16	0.02	0.18
Crit Moves:	****				****		****					****

Poinsettia Reach E (LSA Project No. HCR1803)
Future Plus Extension
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #10 El Camino Real / Dove Ln

Cycle (sec):	100	Critical Vol./Cap.(X):	0.597
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	57	Level Of Service:	A

Street Name:	El Camino Real						Dove Ln					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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	2	1 0	1 0	2	1 0	1 0	0	1 0	1 0	0	1 0
Volume Module:												
Base Vol:	34	2021	33	62	2022	142	117	14	56	58	14	69
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:	34	2021	33	62	2022	142	117	14	56	58	14	69
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:	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 Volume:	34	2021	33	62	2022	142	117	14	56	58	14	69
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	34	2021	33	62	2022	142	117	14	56	58	14	69
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:	34	2021	33	62	2022	142	117	14	56	58	14	69
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.95	0.05	1.00	2.80	0.20	1.00	0.20	0.80	1.00	0.17	0.83
Final Sat.:	1600	4723	77	1600	4485	315	1600	320	1280	1600	270	1330
Capacity Analysis Module:												
Vol/Sat:	0.02	0.43	0.43	0.04	0.45	0.45	0.07	0.04	0.04	0.04	0.05	0.05
Crit Moves:	****				****		****				****	

Poinsettia Reach E (LSA Project No. HCR1803)
Future Plus Extension
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #11 El Camino Real / Aviara Pkwy

Cycle (sec):	100	Critical Vol./Cap.(X):	0.843
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	63	Level Of Service:	D

Street Name:	El Camino Real						Aviara Pkwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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:	2 0	2	1 0	2 0	2	1 0	2 0	2	0 1	2 0	1	1 0
Volume Module:												
Base Vol:	141	1763	249	86	1947	105	170	160	268	635	278	99
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:	141	1763	249	86	1947	105	170	160	268	635	278	99
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:	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 Volume:	141	1763	249	86	1947	105	170	160	268	635	278	99
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	141	1763	249	86	1947	105	170	160	268	635	278	99
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:	141	1763	249	86	1947	105	170	160	268	635	278	99
OvlAdjVol:									198			
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	2.63	0.37	2.00	2.85	0.15	2.00	2.00	1.00	2.00	1.47	0.53
Final Sat.:	3200	4206	594	3200	4554	246	3200	3200	1600	3200	2360	840
Capacity Analysis Module:												
Vol/Sat:	0.04	0.42	0.42	0.03	0.43	0.43	0.05	0.05	0.17	0.20	0.12	0.12
OvlAdjV/S:									0.12			
Crit Moves:	****			****					****	****		

Poinsettia Reach E (LSA Project No. HCR1803)
Future Plus Extension
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #1 Ambrosia Ln / Poinsettia Ln

Cycle (sec):	100	Critical Vol./Cap.(X):	0.356
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	19	Level Of Service:	A

Street Name:	Ambrosia Ln						Poinsettia Ln					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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	1! 0	0	0	1! 0	1	0	1 1 0	1	0	1 1 0
Volume Module:												
Base Vol:	76	16	46	44	28	63	46	315	100	71	305	64
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:	76	16	46	44	28	63	46	315	100	71	305	64
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:	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 Volume:	76	16	46	44	28	63	46	315	100	71	305	64
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	76	16	46	44	28	63	46	315	100	71	305	64
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:	76	16	46	44	28	63	46	315	100	71	305	64
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.55	0.12	0.33	0.32	0.21	0.47	1.00	1.52	0.48	1.00	1.65	0.35
Final Sat.:	881	186	533	521	332	747	1600	2429	771	1600	2645	555
Capacity Analysis Module:												
Vol/Sat:	0.05	0.09	0.09	0.03	0.08	0.08	0.03	0.13	0.13	0.04	0.12	0.12
Crit Moves:	****				****			****			****	

Poinsettia Reach E (LSA Project No. HCR1803)
Future Plus Extension
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #2 Ambrosia Ln / Aviara Pkwy

Cycle (sec):	100	Critical Vol./Cap.(X):	0.339
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	18	Level Of Service:	A

Street Name:	Ambrosia Ln						Aviara Pkwy					
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			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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 1! 0		0	0 1! 0		1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	10	6	10	67	5	16	22	586	16	47	543	65
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:	10	6	10	67	5	16	22	586	16	47	543	65
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:	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 Volume:	10	6	10	67	5	16	22	586	16	47	543	65
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	10	6	10	67	5	16	22	586	16	47	543	65
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:	10	6	10	67	5	16	22	586	16	47	543	65
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.39	0.23	0.38	0.76	0.06	0.18	1.00	1.95	0.05	1.00	1.79	0.21
Final Sat.:	615	369	615	1218	91	291	1600	3115	85	1600	2858	342
Capacity Analysis Module:												
Vol/Sat:	0.02	0.02	0.02	0.05	0.06	0.06	0.01	0.19	0.19	0.03	0.19	0.19
Crit Moves:	****			****			****			****		

Poinsettia Reach E (LSA Project No. HCR1803)
Future Plus Extension
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #3 Cassia Rd / Poinsettia Ln

Cycle (sec):	100	Critical Vol./Cap.(X):	0.402
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	20	Level Of Service:	A

Street Name:	Cassia Rd						Poinsettia Ln					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	1! 0	0	1	0	2	0	0	0	0	1	1	0
Volume Module:												
Base Vol:	0	0	0	10	0	68	197	308	0	0	562	15
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	10	0	68	197	308	0	0	562	15
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:	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 Volume:	0	0	0	10	0	68	197	308	0	0	562	15
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	10	0	68	197	308	0	0	562	15
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	10	0	68	197	308	0	0	562	15
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	0.13	0.00	0.87	1.00	2.00	0.00	0.00	1.95	0.05
Final Sat.:	0	0	0	205	0	1395	1600	3200	0	0	3117	83
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.01	0.00	0.05	0.12	0.10	0.00	0.00	0.18	0.18
Crit Moves:						****	****				****	

Poinsettia Reach E (LSA Project No. HCR1803)
Future Plus Extension
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #4 Skimmer Ct-Oriole Ct / Poinsettia Ln

Cycle (sec):	100	Critical Vol./Cap.(X):	0.268
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	17	Level Of Service:	A

Street Name:	Skimmer Ct-Oriole Ct						Poinsettia Ln					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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	1! 0	0	0	1! 0	1	0	1 1 0	1	0	1 1 0
Volume Module:												
Base Vol:	9	4	34	6	2	2	8	295	15	31	566	8
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:	9	4	34	6	2	2	8	295	15	31	566	8
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:	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 Volume:	9	4	34	6	2	2	8	295	15	31	566	8
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	9	4	34	6	2	2	8	295	15	31	566	8
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:	9	4	34	6	2	2	8	295	15	31	566	8
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.19	0.09	0.72	0.60	0.20	0.20	1.00	1.90	0.10	1.00	1.97	0.03
Final Sat.:	306	136	1157	960	320	320	1600	3045	155	1600	3155	45
Capacity Analysis Module:												
Vol/Sat:	0.01	0.03	0.03	0.00	0.01	0.01	0.01	0.10	0.10	0.02	0.18	0.18
Crit Moves:	****			****			****				****	

Poinsettia Reach E (LSA Project No. HCR1803)
Future Plus Extension
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #7 Mimosa Dr / Aviara Pkwy

Cycle (sec):	100	Critical Vol./Cap.(X):	0.334
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	18	Level Of Service:	A

Street Name:	Mimosa Dr						Aviara Pkwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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	1! 0	0	0	1! 0	1	0	1 1 0	1	0	1 1 0
Volume Module:												
Base Vol:	31	4	41	12	2	14	16	560	18	62	679	23
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:	31	4	41	12	2	14	16	560	18	62	679	23
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:	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 Volume:	31	4	41	12	2	14	16	560	18	62	679	23
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	31	4	41	12	2	14	16	560	18	62	679	23
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:	31	4	41	12	2	14	16	560	18	62	679	23
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.41	0.05	0.54	0.43	0.07	0.50	1.00	1.94	0.06	1.00	1.93	0.07
Final Sat.:	653	84	863	686	114	800	1600	3100	100	1600	3095	105
Capacity Analysis Module:												
Vol/Sat:	0.02	0.05	0.05	0.01	0.02	0.02	0.01	0.18	0.18	0.04	0.22	0.22
Crit Moves:	****			****			****				****	

Poinsettia Reach E (LSA Project No. HCR1803)
Future Plus Extension
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #8 El Camino Real / Cassia Rd

Cycle (sec):	100	Critical Vol./Cap.(X):	0.607
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	29	Level Of Service:	B

Street Name:	El Camino Real						Cassia Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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	2 0	1	1 0	2 1	0	1 0	0 1	0	1 0	0 1	0
Volume Module:												
Base Vol:	40	1150	15	17	2211	112	48	1	37	11	10	19
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:	40	1150	15	17	2211	112	48	1	37	11	10	19
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:	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 Volume:	40	1150	15	17	2211	112	48	1	37	11	10	19
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	40	1150	15	17	2211	112	48	1	37	11	10	19
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:	40	1150	15	17	2211	112	48	1	37	11	10	19
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.86	0.14	1.00	0.03	0.97	1.00	0.34	0.66
Final Sat.:	1600	3200	1600	1600	4569	231	1600	42	1558	1600	552	1048
Capacity Analysis Module:												
Vol/Sat:	0.03	0.36	0.01	0.01	0.48	0.48	0.03	0.02	0.02	0.01	0.02	0.02
Crit Moves:	****				****		****				****	

Poinsettia Reach E (LSA Project No. HCR1803)
Future Plus Extension
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #9 El Camino Real / Poinsettia Ln

Cycle (sec):	100	Critical Vol./Cap.(X):	0.743
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	42	Level Of Service:	C

Street Name:	El Camino Real						Poinsettia Ln					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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:	2 0	3 0	1	2 0	2 1	0	2 0	1 1	0	2 0	1 1	0
Volume Module:												
Base Vol:	221	1190	592	271	1791	364	142	42	113	334	35	159
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:	221	1190	592	271	1791	364	142	42	113	334	35	159
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:	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 Volume:	221	1190	592	271	1791	364	142	42	113	334	35	159
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	221	1190	592	271	1791	364	142	42	113	334	35	159
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:	221	1190	592	271	1791	364	142	42	113	334	35	159
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	3.00	1.00	2.00	2.49	0.51	2.00	1.00	1.00	2.00	1.00	1.00
Final Sat.:	3200	4800	1600	3200	3989	811	3200	1600	1600	3200	1600	1600
Capacity Analysis Module:												
Vol/Sat:	0.07	0.25	0.37	0.08	0.45	0.45	0.04	0.03	0.07	0.10	0.02	0.10
Crit Moves:	****				****				****	****		

Poinsettia Reach E (LSA Project No. HCR1803)
Future Plus Extension
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #10 El Camino Real / Dove Ln

Cycle (sec):	100	Critical Vol./Cap.(X):	0.730
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	85	Level Of Service:	C

Street Name:	El Camino Real						Dove Ln					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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	2	1 0	1 0	2	1 0	1 0	0	1 0	1 0	0	1 0
Volume Module:												
Base Vol:	112	1836	69	108	1915	280	241	37	122	72	29	55
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:	112	1836	69	108	1915	280	241	37	122	72	29	55
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:	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 Volume:	112	1836	69	108	1915	280	241	37	122	72	29	55
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	112	1836	69	108	1915	280	241	37	122	72	29	55
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:	112	1836	69	108	1915	280	241	37	122	72	29	55
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.89	0.11	1.00	2.62	0.38	1.00	0.23	0.77	1.00	0.35	0.65
Final Sat.:	1600	4626	174	1600	4188	612	1600	372	1228	1600	552	1048
Capacity Analysis Module:												
Vol/Sat:	0.07	0.40	0.40	0.07	0.46	0.46	0.15	0.10	0.10	0.05	0.05	0.05
Crit Moves:	****				****		****				****	

Poinsettia Reach E (LSA Project No. HCR1803)
Future Plus Extension
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #11 El Camino Real / Aviara Pkwy

Cycle (sec):	100	Critical Vol./Cap.(X):	0.829
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	59	Level Of Service:	D

Street Name:	El Camino Real						Aviara Pkwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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:	2 0	2	1 0	2 0	2	1 0	2 0	2	0 1	2 0	1	1 0
Volume Module:												
Base Vol:	464	1803	667	238	1737	135	138	327	316	281	271	82
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:	464	1803	667	238	1737	135	138	327	316	281	271	82
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:	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 Volume:	464	1803	667	238	1737	135	138	327	316	281	271	82
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	464	1803	667	238	1737	135	138	327	316	281	271	82
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:	464	1803	667	238	1737	135	138	327	316	281	271	82
OvlAdjVol:									84			
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	2.19	0.81	2.00	2.78	0.22	2.00	2.00	1.00	2.00	1.54	0.46
Final Sat.:	3200	3504	1296	3200	4454	346	3200	3200	1600	3200	2457	743
Capacity Analysis Module:												
Vol/Sat:	0.15	0.51	0.51	0.07	0.39	0.39	0.04	0.10	0.20	0.09	0.11	0.11
OvlAdjV/S:									0.05			
Crit Moves:	****			****				****		****		

APPENDIX E

2035 WITH POINSETTIA LANE GAP CLOSURE LEVEL OF SERVICE WORKSHEETS

HCM Worksheets

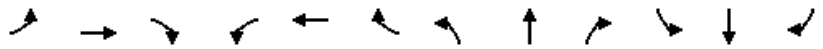
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	267	184	172	244	10	361	5	214	22	9	14
Future Volume (veh/h)	6	267	184	172	244	10	361	5	214	22	9	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	6	281	194	181	257	11	380	5	225	23	9	15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	14	431	289	223	1143	49	502	6	250	376	153	214
Arrive On Green	0.01	0.21	0.21	0.13	0.33	0.33	0.46	0.46	0.46	0.46	0.46	0.46
Sat Flow, veh/h	1781	2037	1364	1781	3472	148	915	12	542	657	331	463
Grp Volume(v), veh/h	6	244	231	181	131	137	610	0	0	47	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1625	1781	1777	1844	1469	0	0	1451	0	0
Q Serve(g_s), s	0.2	9.3	9.7	7.3	4.0	4.0	27.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.2	9.3	9.7	7.3	4.0	4.0	28.3	0.0	0.0	1.1	0.0	0.0
Prop In Lane	1.00		0.84	1.00		0.08	0.62		0.37	0.49		0.32
Lane Grp Cap(c), veh/h	14	376	344	223	585	607	758	0	0	743	0	0
V/C Ratio(X)	0.43	0.65	0.67	0.81	0.22	0.23	0.81	0.00	0.00	0.06	0.00	0.00
Avail Cap(c_a), veh/h	120	376	344	317	585	607	1004	0	0	975	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	36.6	26.7	26.9	31.6	18.0	18.0	18.2	0.0	0.0	11.0	0.0	0.0
Incr Delay (d2), s/veh	19.5	8.4	10.0	10.2	0.9	0.9	3.6	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	4.7	4.6	3.7	1.7	1.8	9.3	0.0	0.0	0.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.1	35.1	36.9	41.8	18.9	18.9	21.8	0.0	0.0	11.1	0.0	0.0
LnGrp LOS	E	D	D	D	B	B	C	A	A	B	A	A
Approach Vol, veh/h		481			449			610			47	
Approach Delay, s/veh		36.2			28.1			21.8			11.1	
Approach LOS		D			C			C			B	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	38.8	13.5	21.9	38.8	4.8	30.6
Change Period (Y+Rc), s	4.5	* 4.2	6.2	4.5	* 4.2	* 6.2
Max Green Setting (Gmax), s	46.8	* 13	15.1	46.8	* 5	* 24
Max Q Clear Time (g_c+I1), s	30.3	9.3	11.7	3.1	2.2	6.0
Green Ext Time (p_c), s	4.0	0.2	0.9	0.3	0.0	1.4

Intersection Summary	
HCM 6th Ctrl Delay	27.6
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	260	359	28	10	315	245	8	104	13	209	10	156
Future Volume (veh/h)	260	359	28	10	315	245	8	104	13	209	10	156
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	347	479	37	13	420	327	11	139	17	279	13	208
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	376	1291	99	27	363	281	14	176	22	271	13	202
Arrive On Green	0.21	0.39	0.39	0.02	0.19	0.19	0.12	0.12	0.12	0.29	0.29	0.29
Sat Flow, veh/h	1781	3343	258	1781	1907	1474	121	1524	186	946	44	706
Grp Volume(v), veh/h	347	254	262	13	391	356	167	0	0	500	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1824	1781	1777	1605	1831	0	0	1696	0	0
Q Serve(g_s), s	19.0	10.2	10.2	0.7	18.9	18.9	8.8	0.0	0.0	28.4	0.0	0.0
Cycle Q Clear(g_c), s	19.0	10.2	10.2	0.7	18.9	18.9	8.8	0.0	0.0	28.4	0.0	0.0
Prop In Lane	1.00		0.14	1.00		0.92	0.07		0.10	0.56		0.42
Lane Grp Cap(c), veh/h	376	686	704	27	338	305	211	0	0	485	0	0
V/C Ratio(X)	0.92	0.37	0.37	0.48	1.16	1.17	0.79	0.00	0.00	1.03	0.00	0.00
Avail Cap(c_a), veh/h	377	686	704	90	338	305	500	0	0	485	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	38.4	21.8	21.9	48.5	40.2	40.2	42.8	0.0	0.0	35.5	0.0	0.0
Incr Delay (d2), s/veh	27.9	0.3	0.3	12.7	98.6	104.1	6.5	0.0	0.0	49.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	4.2	4.4	0.4	17.4	16.2	4.3	0.0	0.0	18.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.3	22.2	22.2	61.2	138.8	144.3	49.3	0.0	0.0	84.5	0.0	0.0
LnGrp LOS	E	C	C	E	F	F	D	A	A	F	A	A
Approach Vol, veh/h		863			760			167			500	
Approach Delay, s/veh		39.9			140.1			49.3			84.5	
Approach LOS		D			F			D			F	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	16.1	5.7	44.6	33.0	25.2	25.1
Change Period (Y+Rc), s	4.6	* 4.2	6.2	4.6	* 4.2	6.2
Max Green Setting (Gmax), s	27.1	* 5	34.9	28.4	* 21	18.9
Max Q Clear Time (g_c+I1), s	10.8	2.7	12.2	30.4	21.0	20.9
Green Ext Time (p_c), s	0.8	0.0	3.1	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	83.6
HCM 6th LOS	F

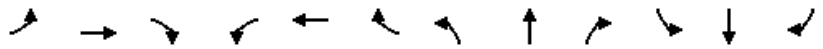
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	SBL	SBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Volume (vph)	20	222	193	416	376	10
Future Volume (vph)	20	222	193	416	376	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.88		1.00	1.00	1.00	
Flt Protected	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	1625		1770	3539	3525	
Flt Permitted	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	1625		1770	3539	3525	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	234	203	438	396	11
RTOR Reduction (vph)	190	0	0	0	2	0
Lane Group Flow (vph)	65	0	203	438	405	0
Turn Type	Prot		Prot	NA	NA	
Protected Phases	2		3	8	4	
Permitted Phases						
Actuated Green, G (s)	7.6		8.4	24.0	11.1	
Effective Green, g (s)	7.6		8.4	24.0	11.1	
Actuated g/C Ratio	0.19		0.21	0.59	0.27	
Clearance Time (s)	4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	304		366	2092	963	
v/s Ratio Prot	c0.04		c0.11	0.12	c0.11	
v/s Ratio Perm						
v/c Ratio	0.21		0.55	0.21	0.42	
Uniform Delay, d1	14.0		14.4	3.9	12.1	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.4		1.8	0.1	0.3	
Delay (s)	14.3		16.2	3.9	12.4	
Level of Service	B		B	A	B	
Approach Delay (s)	14.3			7.8	12.4	
Approach LOS	B			A	B	

Intersection Summary			
HCM 2000 Control Delay	10.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	40.6	Sum of lost time (s)	13.5
Intersection Capacity Utilization	47.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	414	20	39	346	2	34	6	41	5	2	6
Future Volume (veh/h)	2	414	20	39	346	2	34	6	41	5	2	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	2	436	21	41	364	2	36	6	43	5	2	6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	7	908	44	87	1121	6	276	59	148	245	102	139
Arrive On Green	0.00	0.26	0.26	0.05	0.31	0.31	0.19	0.19	0.19	0.19	0.19	0.19
Sat Flow, veh/h	1781	3451	166	1781	3624	20	460	319	797	322	547	745
Grp Volume(v), veh/h	2	224	233	41	178	188	85	0	0	13	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1841	1781	1777	1867	1576	0	0	1614	0	0
Q Serve(g_s), s	0.0	2.9	2.9	0.6	2.1	2.1	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	2.9	2.9	0.6	2.1	2.1	1.1	0.0	0.0	0.2	0.0	0.0
Prop In Lane	1.00		0.09	1.00		0.01	0.42		0.51	0.38		0.46
Lane Grp Cap(c), veh/h	7	467	484	87	550	577	484	0	0	485	0	0
V/C Ratio(X)	0.30	0.48	0.48	0.47	0.32	0.32	0.18	0.00	0.00	0.03	0.00	0.00
Avail Cap(c_a), veh/h	331	1189	1232	563	1421	1492	1331	0	0	1334	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	13.4	8.4	8.4	12.4	7.1	7.1	9.4	0.0	0.0	9.0	0.0	0.0
Incr Delay (d2), s/veh	23.6	0.8	0.7	3.9	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.8	0.8	0.3	0.5	0.5	0.3	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.0	9.1	9.1	16.3	7.5	7.5	9.5	0.0	0.0	9.0	0.0	0.0
LnGrp LOS	D	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		459			407			85			13	
Approach Delay, s/veh		9.2			8.4			9.5			9.0	
Approach LOS		A			A			A			A	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	9.5	5.8	11.6	9.5	4.6	12.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	20.0	8.5	18.0	20.0	5.0	21.5
Max Q Clear Time (g_c+I1), s	3.1	2.6	4.9	2.2	2.0	4.1
Green Ext Time (p_c), s	0.3	0.0	2.2	0.0	0.0	1.9

Intersection Summary	
HCM 6th Ctrl Delay	8.9
HCM 6th LOS	A

Intersection	
Int Delay, s/veh	1.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	3	70	7	20	30
Future Vol, veh/h	8	3	70	7	20	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	3	74	7	21	32

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	152	78	0	0	81	0
Stage 1	78	-	-	-	-	-
Stage 2	74	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	840	983	-	-	1517	-
Stage 1	945	-	-	-	-	-
Stage 2	949	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	828	983	-	-	1517	-
Mov Cap-2 Maneuver	828	-	-	-	-	-
Stage 1	932	-	-	-	-	-
Stage 2	949	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.2	0	3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	865	1517	-
HCM Lane V/C Ratio	-	-	0.013	0.014	-
HCM Control Delay (s)	-	-	9.2	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	5	22	9	9	10	1
Future Vol, veh/h	5	22	9	9	10	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	23	9	9	11	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	28	0	44	17
Stage 1	-	-	-	-	17	-
Stage 2	-	-	-	-	27	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1585	-	967	1062
Stage 1	-	-	-	-	1006	-
Stage 2	-	-	-	-	996	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1585	-	961	1062
Mov Cap-2 Maneuver	-	-	-	-	961	-
Stage 1	-	-	-	-	1000	-
Stage 2	-	-	-	-	996	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.6	8.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	969	-	-	1585	-
HCM Lane V/C Ratio	0.012	-	-	0.006	-
HCM Control Delay (s)	8.8	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	487	22	28	470	10	30	8	46	5	1	53
Future Volume (veh/h)	25	487	22	28	470	10	30	8	46	5	1	53
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	26	513	23	29	495	11	32	8	48	5	1	56
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	57	1523	68	62	1574	35	190	25	94	117	8	157
Arrive On Green	0.03	0.44	0.44	0.03	0.44	0.44	0.11	0.11	0.11	0.11	0.11	0.11
Sat Flow, veh/h	1781	3464	155	1781	3554	79	493	233	872	83	73	1452
Grp Volume(v), veh/h	26	263	273	29	247	259	88	0	0	62	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1842	1781	1777	1856	1598	0	0	1607	0	0
Q Serve(g_s), s	0.5	3.5	3.5	0.6	3.2	3.2	0.5	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.5	3.5	3.5	0.6	3.2	3.2	1.7	0.0	0.0	1.3	0.0	0.0
Prop In Lane	1.00		0.08	1.00		0.04	0.36		0.55	0.08		0.90
Lane Grp Cap(c), veh/h	57	781	810	62	787	822	309	0	0	282	0	0
V/C Ratio(X)	0.46	0.34	0.34	0.47	0.31	0.31	0.28	0.00	0.00	0.22	0.00	0.00
Avail Cap(c_a), veh/h	248	781	810	248	787	822	1372	0	0	1386	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	17.1	6.6	6.6	17.0	6.5	6.5	15.1	0.0	0.0	14.9	0.0	0.0
Incr Delay (d2), s/veh	5.7	1.2	1.1	5.3	1.0	1.0	0.5	0.0	0.0	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.1	1.1	0.3	1.0	1.0	0.6	0.0	0.0	0.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.8	7.8	7.8	22.3	7.5	7.5	15.6	0.0	0.0	15.3	0.0	0.0
LnGrp LOS	C	A	A	C	A	A	B	A	A	B	A	A
Approach Vol, veh/h		562			535			88			62	
Approach Delay, s/veh		8.5			8.3			15.6			15.3	
Approach LOS		A			A			B			B	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	8.5	5.5	22.0	8.5	5.3	22.1
Change Period (Y+Rc), s	4.6	* 4.2	6.2	4.6	* 4.2	6.2
Max Green Setting (Gmax), s	29.2	* 5	15.8	29.2	* 5	15.8
Max Q Clear Time (g_c+I1), s	3.7	2.6	5.5	3.3	2.5	5.2
Green Ext Time (p_c), s	0.4	0.0	2.3	0.3	0.0	2.2

Intersection Summary	
HCM 6th Ctrl Delay	9.2
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	4	38	17	4	3	30	1550	12	9	1613	53
Future Volume (veh/h)	85	4	38	17	4	3	30	1550	12	9	1613	53
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	89	4	40	18	4	3	32	1632	13	9	1698	56
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	134	11	110	47	26	20	56	2273	1014	20	3144	104
Arrive On Green	0.08	0.08	0.08	0.03	0.03	0.03	0.03	0.64	0.64	0.01	0.62	0.62
Sat Flow, veh/h	1781	146	1461	1781	992	744	1781	3554	1585	1781	5077	167
Grp Volume(v), veh/h	89	0	44	18	0	7	32	1632	13	9	1138	616
Grp Sat Flow(s),veh/h/ln	1781	0	1607	1781	0	1736	1781	1777	1585	1781	1702	1840
Q Serve(g_s), s	4.0	0.0	2.1	0.8	0.0	0.3	1.5	25.2	0.2	0.4	15.8	15.8
Cycle Q Clear(g_c), s	4.0	0.0	2.1	0.8	0.0	0.3	1.5	25.2	0.2	0.4	15.8	15.8
Prop In Lane	1.00		0.91	1.00		0.43	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	134	0	121	47	0	46	56	2273	1014	20	2108	1140
V/C Ratio(X)	0.67	0.00	0.36	0.38	0.00	0.15	0.57	0.72	0.01	0.45	0.54	0.54
Avail Cap(c_a), veh/h	819	0	739	735	0	716	255	2273	1014	108	2108	1140
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.1	0.0	36.2	39.4	0.0	39.2	39.4	9.9	5.4	40.5	9.0	9.0
Incr Delay (d2), s/veh	5.6	0.0	1.8	5.0	0.0	1.5	8.8	2.0	0.0	14.8	1.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	0.9	0.4	0.0	0.2	0.8	8.7	0.1	0.3	5.3	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.7	0.0	38.1	44.5	0.0	40.7	48.1	11.9	5.4	55.2	10.0	10.8
LnGrp LOS	D	A	D	D	A	D	D	B	A	E	A	B
Approach Vol, veh/h		133			25			1677			1763	
Approach Delay, s/veh		41.1			43.4			12.5			10.5	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.1	59.2		11.3	6.8	57.5		6.8
Change Period (Y+Rc), s	* 4.2	6.5		5.1	* 4.2	6.5		4.6
Max Green Setting (Gmax), s	* 5	52.7		37.9	* 12	45.9		34.0
Max Q Clear Time (g_c+I1), s	2.4	27.2		6.0	3.5	17.8		2.8
Green Ext Time (p_c), s	0.0	15.0		0.5	0.0	15.7		0.1

Intersection Summary	
HCM 6th Ctrl Delay	12.8
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	255	41	114	519	36	286	176	1531	529	166	1510	185
Future Volume (veh/h)	255	41	114	519	36	286	176	1531	529	166	1510	185
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	268	43	120	546	38	301	185	1612	557	175	1589	195
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	191	188	167	632	414	369	191	2077	645	245	1946	238
Arrive On Green	0.06	0.11	0.11	0.18	0.23	0.23	0.06	0.41	0.41	0.07	0.42	0.42
Sat Flow, veh/h	3456	1777	1585	3456	1777	1585	3456	5106	1585	3456	4608	564
Grp Volume(v), veh/h	268	43	120	546	38	301	185	1612	557	175	1173	611
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1702	1585	1728	1702	1769
Q Serve(g_s), s	5.0	2.0	6.6	13.8	1.5	16.2	4.8	24.7	29.0	4.5	27.4	27.5
Cycle Q Clear(g_c), s	5.0	2.0	6.6	13.8	1.5	16.2	4.8	24.7	29.0	4.5	27.4	27.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.32
Lane Grp Cap(c), veh/h	191	188	167	632	414	369	191	2077	645	245	1437	747
V/C Ratio(X)	1.40	0.23	0.72	0.86	0.09	0.81	0.97	0.78	0.86	0.71	0.82	0.82
Avail Cap(c_a), veh/h	191	630	562	720	902	805	191	2077	645	245	1437	747
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.6	37.0	39.1	35.8	27.1	32.8	42.5	23.2	24.5	41.0	23.0	23.0
Incr Delay (d2), s/veh	208.2	0.6	5.6	9.7	0.1	4.4	55.0	2.9	14.3	9.5	5.2	9.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.6	0.9	2.8	6.6	0.6	6.5	3.5	10.0	12.8	2.2	11.4	12.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	250.9	37.6	44.7	45.4	27.2	37.2	97.6	26.1	38.8	50.5	28.2	32.7
LnGrp LOS	F	D	D	D	C	D	F	C	D	D	C	C
Approach Vol, veh/h		431			885			2354			1959	
Approach Delay, s/veh		172.2			41.8			34.7			31.6	
Approach LOS		F			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.6	43.2	20.7	15.7	9.2	44.6	9.2	27.2
Change Period (Y+Rc), s	* 4.2	6.5	* 4.2	6.2	* 4.2	6.5	* 4.2	6.2
Max Green Setting (Gmax), s	6.4	36.7	* 19	32.0	* 5	38.1	* 5	45.8
Max Q Clear Time (g_c+I1), s	6.5	31.0	15.8	8.6	6.8	29.5	7.0	18.2
Green Ext Time (p_c), s	0.0	4.9	0.7	0.9	0.0	6.7	0.0	2.3

Intersection Summary	
HCM 6th Ctrl Delay	45.3
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

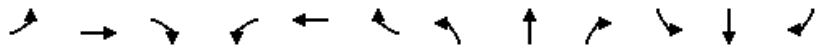
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	14	56	58	14	69	34	2021	33	62	2022	142
Future Volume (veh/h)	117	14	56	58	14	69	34	2021	33	62	2022	142
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	123	15	59	61	15	73	36	2127	35	65	2128	149
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	140	36	140	78	20	99	417	3285	54	83	2088	145
Arrive On Green	0.08	0.11	0.11	0.04	0.07	0.07	0.23	0.63	0.63	0.05	0.43	0.43
Sat Flow, veh/h	1781	332	1304	1781	277	1350	1781	5174	85	1781	4875	339
Grp Volume(v), veh/h	123	0	74	61	0	88	36	1398	764	65	1481	796
Grp Sat Flow(s),veh/h/ln	1781	0	1636	1781	0	1627	1781	1702	1855	1781	1702	1809
Q Serve(g_s), s	8.2	0.0	5.1	4.1	0.0	6.4	1.9	30.5	30.6	4.3	51.4	51.4
Cycle Q Clear(g_c), s	8.2	0.0	5.1	4.1	0.0	6.4	1.9	30.5	30.6	4.3	51.4	51.4
Prop In Lane	1.00		0.80	1.00		0.83	1.00		0.05	1.00		0.19
Lane Grp Cap(c), veh/h	140	0	176	78	0	119	417	2161	1178	83	1458	775
V/C Ratio(X)	0.88	0.00	0.42	0.78	0.00	0.74	0.09	0.65	0.65	0.78	1.02	1.03
Avail Cap(c_a), veh/h	140	0	496	104	0	461	417	2161	1178	83	1458	775
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.42	0.42	0.42	0.46	0.46	0.46
Uniform Delay (d), s/veh	54.7	0.0	50.0	56.8	0.0	54.5	35.9	13.6	13.6	56.6	34.3	34.3
Incr Delay (d2), s/veh	43.2	0.0	1.6	23.1	0.0	8.5	0.0	0.6	1.2	19.6	20.1	29.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	0.0	2.2	2.3	0.0	2.9	0.8	11.2	12.5	2.4	24.7	28.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	97.9	0.0	51.6	79.9	0.0	63.0	36.0	14.2	14.8	76.2	54.4	63.3
LnGrp LOS	F	A	D	E	A	E	D	B	B	E	F	F
Approach Vol, veh/h		197			149			2198			2342	
Approach Delay, s/veh		80.5			69.9			14.8			58.0	
Approach LOS		F			E			B			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.8	82.7	9.5	18.0	34.6	57.9	13.6	13.9
Change Period (Y+Rc), s	* 4.2	6.5	* 4.2	5.1	6.5	* 6.5	* 4.2	5.1
Max Green Setting (Gmax), s	* 5.6	51.0	* 7	36.4	5.2	* 51	* 9.4	34.0
Max Q Clear Time (g_c+I1), s	6.3	32.6	6.1	7.1	3.9	53.4	10.2	8.4
Green Ext Time (p_c), s	0.0	14.3	0.0	0.4	0.0	0.0	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	39.8
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	160	268	635	278	99	141	1763	249	86	1947	105
Future Volume (veh/h)	170	160	268	635	278	99	141	1763	249	86	1947	105
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	179	168	282	668	293	104	148	1856	0	91	2049	111
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	227	655	377	679	815	283	186	2181		121	2101	113
Arrive On Green	0.07	0.18	0.18	0.20	0.31	0.31	0.05	0.43	0.00	0.03	0.42	0.42
Sat Flow, veh/h	3456	3554	1585	3456	2586	899	3456	5274	0	3456	4959	268
Grp Volume(v), veh/h	179	168	282	668	199	198	148	1856	0	91	1404	756
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1709	1728	1702	0	1728	1702	1822
Q Serve(g_s), s	7.6	6.0	24.5	28.6	12.9	13.3	6.3	48.6	0.0	3.9	60.2	60.8
Cycle Q Clear(g_c), s	7.6	6.0	24.5	28.6	12.9	13.3	6.3	48.6	0.0	3.9	60.2	60.8
Prop In Lane	1.00		1.00	1.00		0.53	1.00		0.00	1.00		0.15
Lane Grp Cap(c), veh/h	227	655	377	679	560	538	186	2181		121	1442	772
V/C Ratio(X)	0.79	0.26	0.75	0.98	0.36	0.37	0.80	0.85		0.75	0.97	0.98
Avail Cap(c_a), veh/h	307	741	416	679	562	540	186	2181		121	1442	772
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	68.4	51.9	52.5	59.5	39.3	39.5	69.5	38.3	0.0	71.1	42.0	42.2
Incr Delay (d2), s/veh	9.4	0.2	6.6	30.5	0.4	0.4	20.9	4.4	0.0	23.0	18.2	27.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	2.7	10.5	15.4	5.8	5.7	3.3	21.1	0.0	2.1	28.6	33.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	77.8	52.1	59.1	90.0	39.7	39.9	90.5	42.8	0.0	94.2	60.2	69.9
LnGrp LOS	E	D	E	F	D	D	F	D		F	E	E
Approach Vol, veh/h		629			1065			2004	A		2251	
Approach Delay, s/veh		62.6			71.3			46.3			64.8	
Approach LOS		E			E			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.7	70.0	33.4	33.6	12.2	69.5	14.0	53.0
Change Period (Y+Rc), s	6.5	* 6.5	* 4.2	6.2	* 4.2	6.5	* 4.2	6.2
Max Green Setting (Gmax), s	5.2	* 64	* 29	31.0	* 8	60.7	* 13	47.0
Max Q Clear Time (g_c+I1), s	15.9	50.6	30.6	26.5	8.3	62.8	9.6	15.3
Green Ext Time (p_c), s	0.0	9.8	0.0	0.9	0.0	0.0	0.2	2.6

Intersection Summary	
HCM 6th Ctrl Delay	59.5
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

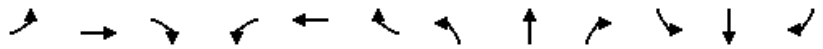
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	315	100	71	305	64	76	16	46	44	28	63
Future Volume (veh/h)	46	315	100	71	305	64	76	16	46	44	28	63
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	48	332	105	75	321	67	80	17	48	46	29	66
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	73	824	256	97	913	188	417	98	220	260	174	329
Arrive On Green	0.04	0.31	0.31	0.05	0.31	0.31	0.45	0.45	0.45	0.45	0.45	0.45
Sat Flow, veh/h	1781	2668	830	1781	2934	605	771	217	489	445	386	731
Grp Volume(v), veh/h	48	219	218	75	193	195	145	0	0	141	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1721	1781	1777	1762	1477	0	0	1561	0	0
Q Serve(g_s), s	2.1	7.8	8.0	3.3	6.7	6.9	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	2.1	7.8	8.0	3.3	6.7	6.9	3.9	0.0	0.0	3.9	0.0	0.0
Prop In Lane	1.00		0.48	1.00		0.34	0.55		0.33	0.33		0.47
Lane Grp Cap(c), veh/h	73	549	531	97	553	548	735	0	0	763	0	0
V/C Ratio(X)	0.66	0.40	0.41	0.77	0.35	0.36	0.20	0.00	0.00	0.18	0.00	0.00
Avail Cap(c_a), veh/h	196	549	531	263	553	548	735	0	0	763	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	37.8	21.8	21.9	37.3	21.3	21.3	13.2	0.0	0.0	13.2	0.0	0.0
Incr Delay (d2), s/veh	9.6	2.2	2.3	12.0	1.7	1.8	0.6	0.0	0.0	0.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	3.4	3.5	1.7	2.9	3.0	1.6	0.0	0.0	1.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.4	24.0	24.2	49.3	23.0	23.1	13.8	0.0	0.0	13.7	0.0	0.0
LnGrp LOS	D	C	C	D	C	C	B	A	A	B	A	A
Approach Vol, veh/h		485			463			145			141	
Approach Delay, s/veh		26.4			27.3			13.8			13.7	
Approach LOS		C			C			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		40.5	8.6	30.9		40.5	9.5	30.0				
Change Period (Y+Rc), s		4.5	* 4.2	6.2		4.5	6.2	* 5.1				
Max Green Setting (Gmax), s		32.5	* 12	20.8		32.5	8.8	* 25				
Max Q Clear Time (g_c+I1), s		5.9	5.3	10.0		5.9	4.1	8.9				
Green Ext Time (p_c), s		0.8	0.1	1.9		0.8	0.0	2.0				

Intersection Summary	
HCM 6th Ctrl Delay	23.8
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	586	16	47	543	65	10	6	10	67	5	16
Future Volume (veh/h)	22	586	16	47	543	65	10	6	10	67	5	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	29	781	21	63	724	87	13	8	13	89	7	21
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	60	1273	34	109	1237	149	25	16	25	125	10	30
Arrive On Green	0.03	0.36	0.36	0.06	0.39	0.39	0.04	0.04	0.04	0.09	0.09	0.09
Sat Flow, veh/h	1781	3535	95	1781	3194	384	657	405	657	1329	105	314
Grp Volume(v), veh/h	29	393	409	63	403	408	34	0	0	117	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1853	1781	1777	1801	1719	0	0	1747	0	0
Q Serve(g_s), s	0.7	8.0	8.0	1.5	7.9	7.9	0.9	0.0	0.0	2.9	0.0	0.0
Cycle Q Clear(g_c), s	0.7	8.0	8.0	1.5	7.9	7.9	0.9	0.0	0.0	2.9	0.0	0.0
Prop In Lane	1.00		0.05	1.00		0.21	0.38		0.38	0.76		0.18
Lane Grp Cap(c), veh/h	60	640	667	109	688	697	66	0	0	165	0	0
V/C Ratio(X)	0.48	0.61	0.61	0.58	0.59	0.59	0.51	0.00	0.00	0.71	0.00	0.00
Avail Cap(c_a), veh/h	316	1852	1931	478	2014	2041	1150	0	0	1129	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	20.8	11.6	11.6	20.1	10.7	10.7	20.7	0.0	0.0	19.3	0.0	0.0
Incr Delay (d2), s/veh	5.8	1.0	0.9	4.8	0.8	0.8	6.0	0.0	0.0	5.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	2.7	2.8	0.7	2.5	2.6	0.4	0.0	0.0	1.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.6	12.5	12.5	24.9	11.5	11.5	26.7	0.0	0.0	24.9	0.0	0.0
LnGrp LOS	C	B	B	C	B	B	C	A	A	C	A	A
Approach Vol, veh/h		831			874			34			117	
Approach Delay, s/veh		13.0			12.4			26.7			24.9	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	6.3	6.9	22.0	8.7	5.7	23.2
Change Period (Y+Rc), s	4.6	* 4.2	6.2	4.6	* 4.2	6.2
Max Green Setting (Gmax), s	29.4	* 12	45.8	28.4	* 7.8	49.8
Max Q Clear Time (g_c+I1), s	2.9	3.5	10.0	4.9	2.7	9.9
Green Ext Time (p_c), s	0.1	0.1	5.8	0.6	0.0	6.1

Intersection Summary	
HCM 6th Ctrl Delay	13.7
HCM 6th LOS	B

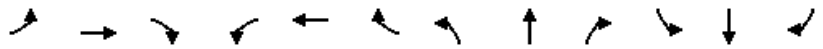
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	SBL	SBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Volume (vph)	10	68	562	15	197	308
Future Volume (vph)	10	68	562	15	197	308
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.88		1.00	1.00	0.91	
Flt Protected	0.99		0.95	1.00	1.00	
Satd. Flow (prot)	1634		1770	3539	3215	
Flt Permitted	0.99		0.95	1.00	1.00	
Satd. Flow (perm)	1634		1770	3539	3215	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	72	592	16	207	324
RTOR Reduction (vph)	51	0	0	0	277	0
Lane Group Flow (vph)	32	0	592	16	254	0
Turn Type	Prot		Prot	NA	NA	
Protected Phases	2		3	8	4	
Permitted Phases						
Actuated Green, G (s)	22.9		31.9	48.1	11.7	
Effective Green, g (s)	22.9		31.9	48.1	11.7	
Actuated g/C Ratio	0.29		0.40	0.60	0.15	
Clearance Time (s)	4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	467		705	2127	470	
v/s Ratio Prot	c0.02		c0.33	0.00	c0.08	
v/s Ratio Perm						
v/c Ratio	0.07		0.84	0.01	0.54	
Uniform Delay, d1	20.8		21.7	6.4	31.7	
Progression Factor	1.00		0.65	0.49	1.00	
Incremental Delay, d2	0.3		8.5	0.0	1.3	
Delay (s)	21.1		22.8	3.1	32.9	
Level of Service	C		C	A	C	
Approach Delay (s)	21.1			22.3	32.9	
Approach LOS	C			C	C	

Intersection Summary			
HCM 2000 Control Delay	26.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	295	15	31	566	8	9	4	34	6	2	2
Future Volume (veh/h)	8	295	15	31	566	8	9	4	34	6	2	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	8	311	16	33	596	8	9	4	36	6	2	2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	19	987	51	72	1137	15	184	49	215	333	104	57
Arrive On Green	0.01	0.29	0.29	0.04	0.32	0.32	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	1781	3439	176	1781	3590	48	158	268	1180	679	572	313
Grp Volume(v), veh/h	8	160	167	33	295	309	49	0	0	10	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1839	1781	1777	1862	1607	0	0	1564	0	0
Q Serve(g_s), s	0.1	1.9	2.0	0.5	3.7	3.7	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.1	1.9	2.0	0.5	3.7	3.7	0.7	0.0	0.0	0.1	0.0	0.0
Prop In Lane	1.00		0.10	1.00		0.03	0.18		0.73	0.60		0.20
Lane Grp Cap(c), veh/h	19	510	528	72	563	590	447	0	0	494	0	0
V/C Ratio(X)	0.42	0.31	0.32	0.46	0.52	0.52	0.11	0.00	0.00	0.02	0.00	0.00
Avail Cap(c_a), veh/h	324	1163	1203	343	1182	1238	1200	0	0	1208	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	13.5	7.7	7.7	12.9	7.7	7.7	9.5	0.0	0.0	9.3	0.0	0.0
Incr Delay (d2), s/veh	13.7	0.3	0.3	4.5	0.8	0.7	0.1	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.5	0.5	0.2	0.9	1.0	0.2	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.3	8.0	8.0	17.4	8.5	8.4	9.6	0.0	0.0	9.3	0.0	0.0
LnGrp LOS	C	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		335			637			49			10	
Approach Delay, s/veh		8.5			8.9			9.6			9.3	
Approach LOS		A			A			A			A	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	9.5	5.6	12.4	9.5	4.8	13.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.2	5.3	18.0	18.2	5.0	18.3
Max Q Clear Time (g_c+I1), s	2.7	2.5	4.0	2.1	2.1	5.7
Green Ext Time (p_c), s	0.1	0.0	1.5	0.0	0.0	3.0

Intersection Summary	
HCM 6th Ctrl Delay	8.8
HCM 6th LOS	A

Intersection	
Int Delay, s/veh	2.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	4	37	6	10	12
Future Vol, veh/h	6	4	37	6	10	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	4	39	6	11	13

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	77	42	0	0	45	0
Stage 1	42	-	-	-	-	-
Stage 2	35	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	926	1029	-	-	1563	-
Stage 1	980	-	-	-	-	-
Stage 2	987	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	920	1029	-	-	1563	-
Mov Cap-2 Maneuver	920	-	-	-	-	-
Stage 1	973	-	-	-	-	-
Stage 2	987	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	3.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	961	1563	-
HCM Lane V/C Ratio	-	-	0.011	0.007	-
HCM Control Delay (s)	-	-	8.8	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	4.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	4	12	9	4	12	5
Future Vol, veh/h	4	12	9	4	12	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	13	9	4	13	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	17	0	33	11
Stage 1	-	-	-	-	11	-
Stage 2	-	-	-	-	22	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1600	-	980	1070
Stage 1	-	-	-	-	1012	-
Stage 2	-	-	-	-	1001	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1600	-	974	1070
Mov Cap-2 Maneuver	-	-	-	-	974	-
Stage 1	-	-	-	-	1006	-
Stage 2	-	-	-	-	1001	-

Approach	EB	WB	NB
HCM Control Delay, s	0	5	8.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1000	-	-	1600	-
HCM Lane V/C Ratio	0.018	-	-	0.006	-
HCM Control Delay (s)	8.7	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	560	18	62	679	23	31	4	41	12	2	14
Future Volume (veh/h)	16	560	18	62	679	23	31	4	41	12	2	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	17	589	19	65	715	24	33	4	43	13	2	15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	39	1562	50	117	1713	57	190	11	76	189	23	75
Arrive On Green	0.02	0.44	0.44	0.07	0.49	0.49	0.09	0.09	0.09	0.09	0.09	0.09
Sat Flow, veh/h	1781	3514	113	1781	3508	118	603	119	839	567	256	824
Grp Volume(v), veh/h	17	298	310	65	362	377	80	0	0	30	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1850	1781	1777	1849	1562	0	0	1647	0	0
Q Serve(g_s), s	0.4	4.2	4.2	1.3	4.9	4.9	1.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.4	4.2	4.2	1.3	4.9	4.9	1.8	0.0	0.0	0.6	0.0	0.0
Prop In Lane	1.00		0.06	1.00		0.06	0.41		0.54	0.43		0.50
Lane Grp Cap(c), veh/h	39	790	822	117	868	903	277	0	0	287	0	0
V/C Ratio(X)	0.44	0.38	0.38	0.56	0.42	0.42	0.29	0.00	0.00	0.10	0.00	0.00
Avail Cap(c_a), veh/h	237	790	822	242	868	903	1275	0	0	1271	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	18.2	7.0	7.0	17.0	6.2	6.2	16.3	0.0	0.0	15.8	0.0	0.0
Incr Delay (d2), s/veh	7.7	1.4	1.3	4.1	1.5	1.4	0.6	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.3	1.4	0.6	1.5	1.5	0.6	0.0	0.0	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.9	8.3	8.3	21.1	7.7	7.6	16.9	0.0	0.0	16.0	0.0	0.0
LnGrp LOS	C	A	A	C	A	A	B	A	A	B	A	A
Approach Vol, veh/h		625			804			80			30	
Approach Delay, s/veh		8.8			8.7			16.9			16.0	
Approach LOS		A			A			B			B	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	8.0	6.7	22.9	8.0	5.0	24.6
Change Period (Y+Rc), s	4.6	* 4.2	6.2	4.6	* 4.2	6.2
Max Green Setting (Gmax), s	28.2	* 5.1	16.7	28.2	* 5	16.8
Max Q Clear Time (g_c+I1), s	3.8	3.3	6.2	2.6	2.4	6.9
Green Ext Time (p_c), s	0.4	0.0	2.7	0.1	0.0	3.3

Intersection Summary	
HCM 6th Ctrl Delay	9.3
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

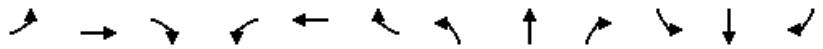
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	1	37	11	10	19	40	1150	15	17	2211	112
Future Volume (veh/h)	48	1	37	11	10	19	40	1150	15	17	2211	112
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	51	1	39	12	11	20	42	1211	16	18	2327	118
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	90	2	79	66	22	40	65	2346	1046	36	3205	161
Arrive On Green	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.66	0.66	0.02	0.64	0.64
Sat Flow, veh/h	1781	40	1551	1781	595	1081	1781	3554	1585	1781	4979	251
Grp Volume(v), veh/h	51	0	40	12	0	31	42	1211	16	18	1585	860
Grp Sat Flow(s),veh/h/ln	1781	0	1591	1781	0	1676	1781	1777	1585	1781	1702	1825
Q Serve(g_s), s	2.5	0.0	2.2	0.6	0.0	1.6	2.0	15.4	0.3	0.9	27.3	27.9
Cycle Q Clear(g_c), s	2.5	0.0	2.2	0.6	0.0	1.6	2.0	15.4	0.3	0.9	27.3	27.9
Prop In Lane	1.00		0.98	1.00		0.65	1.00		1.00	1.00		0.14
Lane Grp Cap(c), veh/h	90	0	81	66	0	62	65	2346	1046	36	2192	1175
V/C Ratio(X)	0.56	0.00	0.50	0.18	0.00	0.50	0.65	0.52	0.02	0.50	0.72	0.73
Avail Cap(c_a), veh/h	689	0	615	689	0	648	101	2346	1046	101	2192	1175
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.8	0.0	40.6	41.0	0.0	41.5	41.8	7.7	5.1	42.6	10.4	10.5
Incr Delay (d2), s/veh	5.4	0.0	4.6	1.3	0.0	6.1	10.3	0.8	0.0	10.3	2.1	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.9	0.3	0.0	0.8	1.1	5.2	0.1	0.5	9.3	10.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.2	0.0	45.3	42.4	0.0	47.7	52.1	8.5	5.2	52.9	12.6	14.6
LnGrp LOS	D	A	D	D	A	D	D	A	A	D	B	B
Approach Vol, veh/h		91			43			1269			2463	
Approach Delay, s/veh		45.8			46.2			9.9			13.6	
Approach LOS		D			D			A			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.0	64.5		9.6	7.4	63.1		7.9				
Change Period (Y+Rc), s	* 4.2	6.5		5.1	* 4.2	6.5		4.6				
Max Green Setting (Gmax), s	* 5	56.6		34.0	* 5	56.6		34.0				
Max Q Clear Time (g_c+I1), s	2.5	17.4		4.5	4.0	29.9		3.6				
Green Ext Time (p_c), s	0.0	12.1		0.3	0.0	21.5		0.2				

Intersection Summary	
HCM 6th Ctrl Delay	13.5
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



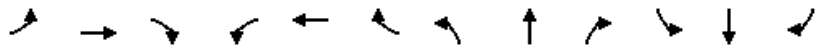
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	42	113	334	35	159	221	1190	592	271	1791	364
Future Volume (veh/h)	142	42	113	334	35	159	221	1190	592	271	1791	364
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	149	44	119	352	37	167	233	1253	623	285	1885	383
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	215	179	160	394	272	242	261	2440	758	356	2159	430
Arrive On Green	0.06	0.10	0.10	0.11	0.15	0.15	0.08	0.48	0.48	0.10	0.51	0.51
Sat Flow, veh/h	3456	1777	1585	3456	1777	1585	3456	5106	1585	3456	4271	850
Grp Volume(v), veh/h	149	44	119	352	37	167	233	1253	623	285	1495	773
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1702	1585	1728	1702	1717
Q Serve(g_s), s	4.4	2.4	7.5	10.4	1.9	10.3	6.9	17.6	35.0	8.3	40.0	41.9
Cycle Q Clear(g_c), s	4.4	2.4	7.5	10.4	1.9	10.3	6.9	17.6	35.0	8.3	40.0	41.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.50
Lane Grp Cap(c), veh/h	215	179	160	394	272	242	261	2440	758	356	1721	868
V/C Ratio(X)	0.69	0.25	0.74	0.89	0.14	0.69	0.89	0.51	0.82	0.80	0.87	0.89
Avail Cap(c_a), veh/h	337	550	490	394	579	516	261	2440	758	458	1721	868
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.6	42.9	45.2	45.2	37.9	41.5	47.4	18.7	23.2	45.4	22.5	23.0
Incr Delay (d2), s/veh	4.0	0.7	6.7	21.8	0.2	3.5	29.9	0.8	9.8	7.6	6.2	13.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	1.1	3.2	5.6	0.8	4.2	4.0	6.9	14.5	3.9	16.6	19.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.6	43.6	51.8	67.0	38.1	44.9	77.3	19.5	33.0	53.0	28.8	36.3
LnGrp LOS	D	D	D	E	D	D	E	B	C	D	C	D
Approach Vol, veh/h		312			556			2109			2553	
Approach Delay, s/veh		50.5			58.5			29.9			33.8	
Approach LOS		D			E			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.9	55.9	16.0	16.6	12.0	58.8	10.6	22.0
Change Period (Y+Rc), s	* 4.2	6.5	* 4.2	6.2	* 4.2	6.5	* 4.2	6.2
Max Green Setting (Gmax), s	* 14	46.4	* 12	32.0	* 7.8	52.3	* 10	33.7
Max Q Clear Time (g_c+I1), s	10.3	37.0	12.4	9.5	8.9	43.9	6.4	12.3
Green Ext Time (p_c), s	0.3	6.9	0.0	0.9	0.0	7.4	0.1	1.2

Intersection Summary	
HCM 6th Ctrl Delay	35.7
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



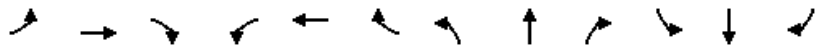
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	241	37	122	72	29	55	112	1836	69	108	1915	280
Future Volume (veh/h)	241	37	122	72	29	55	112	1836	69	108	1915	280
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	254	39	128	76	31	58	118	1933	73	114	2016	295
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	257	64	210	98	45	85	127	2517	95	127	2138	308
Arrive On Green	0.14	0.17	0.17	0.06	0.08	0.08	0.07	0.50	0.50	0.07	0.47	0.47
Sat Flow, veh/h	1781	384	1260	1781	583	1091	1781	5050	190	1781	4508	649
Grp Volume(v), veh/h	254	0	167	76	0	89	118	1302	704	114	1514	797
Grp Sat Flow(s),veh/h/ln	1781	0	1644	1781	0	1674	1781	1702	1836	1781	1702	1754
Q Serve(g_s), s	13.6	0.0	9.0	4.0	0.0	5.0	6.3	29.7	29.9	6.1	40.3	41.9
Cycle Q Clear(g_c), s	13.6	0.0	9.0	4.0	0.0	5.0	6.3	29.7	29.9	6.1	40.3	41.9
Prop In Lane	1.00		0.77	1.00		0.65	1.00		0.10	1.00		0.37
Lane Grp Cap(c), veh/h	257	0	274	98	0	130	127	1696	915	127	1615	832
V/C Ratio(X)	0.99	0.00	0.61	0.77	0.00	0.69	0.93	0.77	0.77	0.90	0.94	0.96
Avail Cap(c_a), veh/h	257	0	620	218	0	595	127	1696	915	127	1615	832
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.9	0.0	37.0	44.6	0.0	43.0	44.2	19.5	19.5	44.1	23.8	24.2
Incr Delay (d2), s/veh	53.0	0.0	2.2	12.0	0.0	6.3	59.4	3.4	6.2	50.9	11.8	22.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.7	0.0	3.7	2.1	0.0	2.3	4.8	11.8	13.5	4.4	17.8	21.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	93.8	0.0	39.2	56.7	0.0	49.3	103.6	22.9	25.7	95.1	35.6	46.8
LnGrp LOS	F	A	D	E	A	D	F	C	C	F	D	D
Approach Vol, veh/h		421			165			2124			2425	
Approach Delay, s/veh		72.2			52.7			28.3			42.1	
Approach LOS		E			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	54.2	9.5	21.0	13.3	51.9	18.0	12.5
Change Period (Y+Rc), s	* 4.2	6.5	* 4.2	5.1	6.5	* 6.5	* 4.2	5.1
Max Green Setting (Gmax), s	* 6.8	45.4	* 12	36.1	6.8	* 45	* 14	34.0
Max Q Clear Time (g_c+I1), s	8.1	31.9	6.0	11.0	8.3	43.9	15.6	7.0
Green Ext Time (p_c), s	0.0	10.6	0.1	1.0	0.0	1.4	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	39.2
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	138	327	316	281	271	82	464	1803	667	238	1737	135
Future Volume (veh/h)	138	327	316	281	271	82	464	1803	667	238	1737	135
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	145	344	333	296	285	86	488	1898	0	251	1828	142
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	191	690	548	303	613	181	524	2485		262	2060	159
Arrive On Green	0.06	0.19	0.19	0.09	0.23	0.23	0.15	0.49	0.00	0.08	0.43	0.43
Sat Flow, veh/h	3456	3554	1585	3456	2703	800	3456	5274	0	3456	4833	374
Grp Volume(v), veh/h	145	344	333	296	185	186	488	1898	0	251	1286	684
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1726	1728	1702	0	1728	1702	1803
Q Serve(g_s), s	6.2	13.0	26.2	12.9	13.6	14.0	21.0	45.7	0.0	10.9	52.4	52.8
Cycle Q Clear(g_c), s	6.2	13.0	26.2	12.9	13.6	14.0	21.0	45.7	0.0	10.9	52.4	52.8
Prop In Lane	1.00		1.00	1.00		0.46	1.00		0.00	1.00		0.21
Lane Grp Cap(c), veh/h	191	690	548	303	403	391	524	2485		262	1451	768
V/C Ratio(X)	0.76	0.50	0.61	0.98	0.46	0.47	0.93	0.76		0.96	0.89	0.89
Avail Cap(c_a), veh/h	262	735	568	303	403	391	524	2485		262	1451	768
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	70.1	54.1	40.7	68.4	50.2	50.4	63.0	31.5	0.0	69.3	39.8	39.9
Incr Delay (d2), s/veh	8.2	0.6	1.8	45.0	0.8	0.9	23.6	2.3	0.0	44.1	8.3	14.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	5.9	10.6	7.6	6.2	6.2	11.0	19.2	0.0	6.4	23.5	26.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	78.3	54.6	42.5	113.4	51.0	51.3	86.7	33.8	0.0	113.4	48.1	54.6
LnGrp LOS	E	D	D	F	D	D	F	C		F	D	D
Approach Vol, veh/h		822			667			2386	A		2221	
Approach Delay, s/veh		53.9			78.8			44.6			57.5	
Approach LOS		D			E			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.9	79.7	17.4	35.4	27.0	70.6	12.5	40.3
Change Period (Y+Rc), s	6.5	* 6.5	* 4.2	6.2	* 4.2	6.5	* 4.2	6.2
Max Green Setting (Gmax), s	11.4	* 73	* 13	31.1	* 23	61.8	* 11	32.9
Max Q Clear Time (g_c+I1), s	12.9	47.7	14.9	28.2	23.0	54.8	8.2	16.0
Green Ext Time (p_c), s	0.0	16.8	0.0	1.0	0.0	5.9	0.1	2.0

Intersection Summary	
HCM 6th Ctrl Delay	54.3
HCM 6th LOS	D

Notes

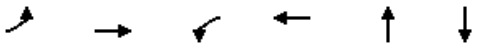
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

APPENDIX E

2035 WITH POINSETTIA LANE GAP CLOSURE LEVEL OF SERVICE WORKSHEETS

Signal Queueing



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	6	475	181	268	610	47
v/c Ratio	0.05	0.61	0.69	0.20	0.90	0.07
Control Delay	41.2	24.4	49.8	19.3	36.3	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.2	24.4	49.8	19.3	36.3	8.5
Queue Length 50th (ft)	3	78	92	46	255	9
Queue Length 95th (ft)	16	140	#190	95	#474	25
Internal Link Dist (ft)		509		264	1550	354
Turn Bay Length (ft)	260		250			
Base Capacity (vph)	113	776	298	1368	848	814
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.61	0.61	0.20	0.72	0.06

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	347	516	13	747	167	500
v/c Ratio	0.96	0.35	0.15	1.02	0.64	1.01
Control Delay	79.1	22.4	52.5	73.5	52.0	78.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.1	22.4	52.5	73.5	52.0	78.3
Queue Length 50th (ft)	226	113	8	~230	101	~314
Queue Length 95th (ft)	#319	157	24	#261	137	#416
Internal Link Dist (ft)		346		1948	136	1460
Turn Bay Length (ft)	130		125			
Base Capacity (vph)	363	1455	86	730	489	497
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.35	0.15	1.02	0.34	1.01

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	SBL	SEL	SET	NWT
Lane Group Flow (vph)	255	203	438	407
v/c Ratio	0.52	0.42	0.22	0.42
Control Delay	8.4	17.6	4.2	15.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	8.4	17.6	4.2	15.3
Queue Length 50th (ft)	4	37	16	39
Queue Length 95th (ft)	56	106	43	94
Internal Link Dist (ft)	774		217	2046
Turn Bay Length (ft)		150		
Base Capacity (vph)	920	1343	3486	1740
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.28	0.15	0.13	0.23

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	2	457	41	366	85	13
v/c Ratio	0.01	0.37	0.10	0.28	0.21	0.03
Control Delay	15.0	8.5	12.5	7.4	8.8	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.0	8.5	12.5	7.4	8.8	10.1
Queue Length 50th (ft)	0	17	3	13	3	1
Queue Length 95th (ft)	5	77	29	55	37	12
Internal Link Dist (ft)		2046		1388	167	162
Turn Bay Length (ft)	150		150			
Base Capacity (vph)	340	2435	578	2914	1157	1180
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.19	0.07	0.13	0.07	0.01

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	26	536	29	506	88	62
v/c Ratio	0.11	0.23	0.12	0.22	0.29	0.19
Control Delay	16.6	6.3	16.7	6.3	10.5	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.6	6.3	16.7	6.3	10.5	7.2
Queue Length 50th (ft)	4	25	4	23	6	1
Queue Length 95th (ft)	23	84	24	80	36	23
Internal Link Dist (ft)		1948		1135	222	1401
Turn Bay Length (ft)	130		200			
Base Capacity (vph)	241	2322	241	2328	1181	1259
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.23	0.12	0.22	0.07	0.05

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	89	44	18	7	32	1632	13	9	1754
v/c Ratio	0.45	0.20	0.14	0.05	0.22	0.67	0.01	0.09	0.56
Control Delay	44.3	16.2	42.6	34.3	43.2	12.6	0.0	44.6	13.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.3	16.2	42.6	34.3	43.2	12.6	0.0	44.6	13.2
Queue Length 50th (ft)	41	2	8	2	15	171	0	4	182
Queue Length 95th (ft)	101	34	33	16	49	567	0	22	364
Internal Link Dist (ft)		870		249		1330			311
Turn Bay Length (ft)	270		100		250		185	260	
Base Capacity (vph)	769	721	690	681	239	2423	1109	101	3145
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.06	0.03	0.01	0.13	0.67	0.01	0.09	0.56

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	268	163	546	339	185	1612	557	175	1784
v/c Ratio	1.41	0.47	0.77	0.42	0.97	0.78	0.61	0.72	0.84
Control Delay	248.5	21.2	42.4	20.5	104.7	26.8	7.3	59.4	28.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	248.5	21.2	42.4	20.5	104.7	26.8	7.3	59.4	28.0
Queue Length 50th (ft)	~106	17	152	55	55	285	34	51	321
Queue Length 95th (ft)	#191	48	#222	94	#127	363	131	#102	407
Internal Link Dist (ft)		1388		764		1747			298
Turn Bay Length (ft)	315		380		250		240	250	
Base Capacity (vph)	190	1181	714	1613	190	2066	916	243	2122
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.41	0.14	0.76	0.21	0.97	0.78	0.61	0.72	0.84

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	123	74	61	88	36	2162	65	2277
v/c Ratio	0.89	0.34	0.61	0.51	0.47	0.70	0.42	0.66
Control Delay	107.2	21.7	80.4	27.1	76.4	18.6	59.5	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	107.2	21.7	80.4	27.1	76.4	18.6	59.5	13.3
Queue Length 50th (ft)	96	11	47	11	28	391	48	370
Queue Length 95th (ft)	#212	57	#107	62	#69	528	93	480
Internal Link Dist (ft)		345		406		1002		1747
Turn Bay Length (ft)	60		80		190		240	
Base Capacity (vph)	138	538	103	514	76	3068	155	3426
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.14	0.59	0.17	0.47	0.70	0.42	0.66

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	179	168	282	668	397	148	2118	91	2160
v/c Ratio	0.59	0.54	0.67	0.87	0.51	0.70	0.87	0.67	0.92
Control Delay	65.5	63.5	33.5	62.2	43.1	78.7	34.6	85.3	40.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.5	63.5	33.5	62.2	43.1	78.7	34.6	85.3	40.2
Queue Length 50th (ft)	76	72	117	282	142	64	565	40	610
Queue Length 95th (ft)	117	111	218	#394	197	#115	667	#81	#721
Internal Link Dist (ft)		1135			601		320		1002
Turn Bay Length (ft)	150		130	200		260		310	
Base Capacity (vph)	347	840	419	768	1247	210	2438	136	2350
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.20	0.67	0.87	0.32	0.70	0.87	0.67	0.92

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	48	437	75	388	145	141
v/c Ratio	0.28	0.38	0.39	0.29	0.24	0.21
Control Delay	37.5	20.9	34.6	15.2	12.7	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.5	20.9	34.6	15.2	12.7	9.6
Queue Length 50th (ft)	22	79	36	76	33	23
Queue Length 95th (ft)	54	128	m53	73	72	58
Internal Link Dist (ft)		509		264	1550	354
Turn Bay Length (ft)	260		250			
Base Capacity (vph)	194	1137	261	1316	592	663
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.38	0.29	0.29	0.24	0.21

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

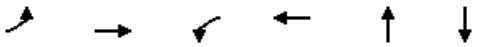
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	29	802	63	811	34	117
v/c Ratio	0.11	0.45	0.20	0.42	0.12	0.30
Control Delay	35.0	17.4	32.3	14.0	26.7	29.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.0	17.4	32.3	14.0	26.7	29.1
Queue Length 50th (ft)	11	146	25	100	8	42
Queue Length 95th (ft)	35	196	59	181	31	86
Internal Link Dist (ft)		346		1948	136	1460
Turn Bay Length (ft)	130		125			
Base Capacity (vph)	344	2665	521	2744	1031	1016
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.30	0.12	0.30	0.03	0.12

Intersection Summary

Lane Group	SBL	SEL	SET	NWT
Lane Group Flow (vph)	83	592	16	531
v/c Ratio	0.16	0.84	0.01	0.71
Control Delay	10.7	25.3	1.8	17.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.7	25.3	1.8	17.4
Queue Length 50th (ft)	4	124	1	50
Queue Length 95th (ft)	44	377	m1	91
Internal Link Dist (ft)	774		217	2046
Turn Bay Length (ft)		150		
Base Capacity (vph)	551	735	2416	974
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.15	0.81	0.01	0.55

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	8	327	33	604	49	10
v/c Ratio	0.02	0.24	0.09	0.43	0.13	0.03
Control Delay	14.0	6.6	13.8	7.8	7.8	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.0	6.6	13.8	7.8	7.8	11.5
Queue Length 50th (ft)	1	11	3	23	1	1
Queue Length 95th (ft)	11	46	26	85	23	11
Internal Link Dist (ft)		2046		1388	167	162
Turn Bay Length (ft)	150		150			
Base Capacity (vph)	333	2383	352	2433	1093	1021
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.14	0.09	0.25	0.04	0.01

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	17	608	65	739	80	30
v/c Ratio	0.08	0.28	0.30	0.29	0.30	0.12
Control Delay	18.9	8.4	22.0	6.0	12.7	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.9	8.4	22.0	6.0	12.7	12.6
Queue Length 50th (ft)	4	54	15	37	8	3
Queue Length 95th (ft)	17	96	44	120	35	19
Internal Link Dist (ft)		1948		1135	222	1401
Turn Bay Length (ft)	130		200			
Base Capacity (vph)	212	2206	217	2507	1011	980
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.28	0.30	0.29	0.08	0.03

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	51	40	12	31	42	1211	16	18	2445
v/c Ratio	0.33	0.23	0.10	0.23	0.44	0.47	0.01	0.19	0.71
Control Delay	47.5	17.2	44.8	28.6	59.9	9.8	0.0	49.7	14.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.5	17.2	44.8	28.6	59.9	9.8	0.0	49.7	14.9
Queue Length 50th (ft)	30	1	7	7	26	164	0	11	404
Queue Length 95th (ft)	68	32	25	36	#69	324	0	35	538
Internal Link Dist (ft)		870		249		1330			311
Turn Bay Length (ft)	270		100		250		185	260	
Base Capacity (vph)	657	615	657	637	96	2555	1164	96	3446
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.07	0.02	0.05	0.44	0.47	0.01	0.19	0.71

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	149	163	352	204	233	1253	623	285	2268
v/c Ratio	0.48	0.49	0.87	0.45	0.87	0.52	0.58	0.66	0.87
Control Delay	48.7	19.8	66.4	14.2	77.3	19.8	3.8	49.4	25.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.7	19.8	66.4	14.2	77.3	19.8	3.8	49.4	25.4
Queue Length 50th (ft)	46	14	115	11	77	201	0	89	432
Queue Length 95th (ft)	80	46	#201	46	#151	257	61	136	542
Internal Link Dist (ft)		1388		764		1747			298
Turn Bay Length (ft)	315		380		250		240	250	
Base Capacity (vph)	346	1087	404	1154	267	2406	1077	469	2609
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.15	0.87	0.18	0.87	0.52	0.58	0.61	0.87

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	254	167	76	89	118	2006	114	2311
v/c Ratio	0.95	0.50	0.43	0.46	0.89	0.80	0.86	0.93
Control Delay	85.5	17.6	47.8	26.1	100.7	22.9	94.8	30.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.5	17.6	47.8	26.1	100.7	22.9	94.8	30.1
Queue Length 50th (ft)	151	21	43	18	71	352	68	452
Queue Length 95th (ft)	#320	83	89	64	#185	457	#178	#636
Internal Link Dist (ft)		345		406		1002		1747
Turn Bay Length (ft)	60		80		190		240	
Base Capacity (vph)	267	729	226	662	132	2521	132	2496
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.23	0.34	0.13	0.89	0.80	0.86	0.93

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	145	344	333	296	371	488	2600	251	1970
v/c Ratio	0.56	0.72	0.55	0.90	0.67	0.87	0.99	0.88	0.86
Control Delay	70.6	66.0	28.0	91.1	57.7	73.8	45.3	92.8	39.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.6	66.0	28.0	91.1	57.7	73.8	45.3	92.8	39.0
Queue Length 50th (ft)	64	157	164	137	157	221	794	116	569
Queue Length 95th (ft)	105	211	262	#233	213	#327	#1007	#205	684
Internal Link Dist (ft)		1135			601		320		1002
Turn Bay Length (ft)	150		130	200		260		310	
Base Capacity (vph)	284	800	615	329	835	569	2637	284	2283
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.43	0.54	0.90	0.44	0.86	0.99	0.88	0.86

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

APPENDIX E

2035 WITH POINSETTIA LANE GAP CLOSURE LEVEL OF SERVICE WORKSHEETS

With Southbound Right-Turn at El Camino Real/Poinsettia Lane

Poinsettia Reach E (LSA Project No. HCR1803)
Future Plus Extension
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #9 El Camino Real / Poinsettia Ln

Cycle (sec):	100	Critical Vol./Cap.(X):	0.691
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	36	Level Of Service:	B

Street Name:	El Camino Real						Poinsettia Ln					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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:	2 0	3 0	1	2 0	3 0	1	2 0	1 1	0	2 0	1 1	0
Volume Module:												
Base Vol:	176	1531	529	166	1510	185	255	41	114	519	36	286
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:	176	1531	529	166	1510	185	255	41	114	519	36	286
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	176	1531	529	166	1510	185	255	41	114	519	36	286
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:	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 Volume:	176	1531	529	166	1510	185	255	41	114	519	36	286
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	176	1531	529	166	1510	185	255	41	114	519	36	286
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:	176	1531	529	166	1510	185	255	41	114	519	36	286
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	3.00	1.00	2.00	3.00	1.00	2.00	1.00	1.00	2.00	1.00	1.00
Final Sat.:	3200	4800	1600	3200	4800	1600	3200	1600	1600	3200	1600	1600
Capacity Analysis Module:												
Vol/Sat:	0.06	0.32	0.33	0.05	0.31	0.12	0.08	0.03	0.07	0.16	0.02	0.18
Crit Moves:		****	****				****					****

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Poinsettia Reach E (LSA Project No. HCR1803)
Future Plus Extension
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #9 El Camino Real / Poinsettia Ln

Cycle (sec):	100	Critical Vol./Cap.(X):	0.680
Loss Time (sec):	5	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	35	Level Of Service:	B

Street Name:	El Camino Real						Poinsettia Ln					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
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:	2 0	3 0	1	2 0	3 0	1	2 0	1 1	0	2 0	1 1	0
Volume Module:												
Base Vol:	221	1190	592	271	1791	364	142	42	113	334	35	159
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:	221	1190	592	271	1791	364	142	42	113	334	35	159
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	221	1190	592	271	1791	364	142	42	113	334	35	159
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:	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 Volume:	221	1190	592	271	1791	364	142	42	113	334	35	159
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	221	1190	592	271	1791	364	142	42	113	334	35	159
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:	221	1190	592	271	1791	364	142	42	113	334	35	159
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	3.00	1.00	2.00	3.00	1.00	2.00	1.00	1.00	2.00	1.00	1.00
Final Sat.:	3200	4800	1600	3200	4800	1600	3200	1600	1600	3200	1600	1600
Capacity Analysis Module:												
Vol/Sat:	0.07	0.25	0.37	0.08	0.37	0.23	0.04	0.03	0.07	0.10	0.02	0.10
Crit Moves:			****	****					****	****		

Traffix 8.0.0715 (c) 2008 Dowling Assoc. Licensed to LSA ASSOC. IRVINE, CA

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	255	41	114	519	36	286	176	1531	529	166	1510	185
Future Volume (veh/h)	255	41	114	519	36	286	176	1531	529	166	1510	185
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	268	43	120	546	38	301	185	1612	557	175	1589	195
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	191	188	167	632	414	369	191	2077	645	245	2156	669
Arrive On Green	0.06	0.11	0.11	0.18	0.23	0.23	0.06	0.41	0.41	0.07	0.42	0.42
Sat Flow, veh/h	3456	1777	1585	3456	1777	1585	3456	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	268	43	120	546	38	301	185	1612	557	175	1589	195
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1702	1585	1728	1702	1585
Q Serve(g_s), s	5.0	2.0	6.6	13.8	1.5	16.2	4.8	24.7	29.0	4.5	23.6	7.3
Cycle Q Clear(g_c), s	5.0	2.0	6.6	13.8	1.5	16.2	4.8	24.7	29.0	4.5	23.6	7.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	191	188	167	632	414	369	191	2077	645	245	2156	669
V/C Ratio(X)	1.40	0.23	0.72	0.86	0.09	0.81	0.97	0.78	0.86	0.71	0.74	0.29
Avail Cap(c_a), veh/h	191	630	562	720	902	805	191	2077	645	245	2156	669
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.6	37.0	39.1	35.8	27.1	32.8	42.5	23.2	24.5	41.0	21.9	17.2
Incr Delay (d2), s/veh	208.2	0.6	5.6	9.7	0.1	4.4	55.0	2.9	14.3	9.5	2.3	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.6	0.9	2.8	6.6	0.6	6.5	3.5	10.0	12.8	2.2	9.4	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	250.9	37.6	44.7	45.4	27.2	37.2	97.6	26.1	38.8	50.5	24.2	18.3
LnGrp LOS	F	D	D	D	C	D	F	C	D	D	C	B
Approach Vol, veh/h		431			885			2354			1959	
Approach Delay, s/veh		172.2			41.8			34.7			25.9	
Approach LOS		F			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.6	43.2	20.7	15.7	9.2	44.6	9.2	27.2
Change Period (Y+Rc), s	* 4.2	6.5	* 4.2	6.2	* 4.2	6.5	* 4.2	6.2
Max Green Setting (Gmax), s	* 6.4	36.7	* 19	32.0	* 5	38.1	* 5	45.8
Max Q Clear Time (g_c+I1), s	6.5	31.0	15.8	8.6	6.8	25.6	7.0	18.2
Green Ext Time (p_c), s	0.0	4.9	0.7	0.9	0.0	8.9	0.0	2.3

Intersection Summary	
HCM 6th Ctrl Delay	43.3
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	268	163	546	339	185	1612	557	175	1589	195
v/c Ratio	1.41	0.47	0.77	0.42	0.97	0.78	0.61	0.72	0.74	0.25
Control Delay	248.5	21.2	42.4	20.5	104.7	26.8	7.3	59.4	24.8	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	248.5	21.2	42.4	20.5	104.7	26.8	7.3	59.4	24.8	4.7
Queue Length 50th (ft)	~106	17	152	55	55	285	34	51	271	7
Queue Length 95th (ft)	#191	48	#222	94	#127	363	131	#102	345	49
Internal Link Dist (ft)		1388		764		1747			298	
Turn Bay Length (ft)	315		380		250		240	250		
Base Capacity (vph)	190	1181	714	1613	190	2066	916	243	2145	767
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.41	0.14	0.76	0.21	0.97	0.78	0.61	0.72	0.74	0.25

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	42	113	334	35	159	221	1190	592	271	1791	364
Future Volume (veh/h)	142	42	113	334	35	159	221	1190	592	271	1791	364
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	149	44	119	352	37	167	233	1253	623	285	1885	383
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	215	179	160	394	272	242	261	2440	758	356	2581	801
Arrive On Green	0.06	0.10	0.10	0.11	0.15	0.15	0.08	0.48	0.48	0.10	0.51	0.51
Sat Flow, veh/h	3456	1777	1585	3456	1777	1585	3456	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	149	44	119	352	37	167	233	1253	623	285	1885	383
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1702	1585	1728	1702	1585
Q Serve(g_s), s	4.4	2.4	7.5	10.4	1.9	10.3	6.9	17.6	35.0	8.3	29.9	16.3
Cycle Q Clear(g_c), s	4.4	2.4	7.5	10.4	1.9	10.3	6.9	17.6	35.0	8.3	29.9	16.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	215	179	160	394	272	242	261	2440	758	356	2581	801
V/C Ratio(X)	0.69	0.25	0.74	0.89	0.14	0.69	0.89	0.51	0.82	0.80	0.73	0.48
Avail Cap(c_a), veh/h	337	550	490	394	579	516	261	2440	758	458	2581	801
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.6	42.9	45.2	45.2	37.9	41.5	47.4	18.7	23.2	45.4	20.0	16.7
Incr Delay (d2), s/veh	4.0	0.7	6.7	21.8	0.2	3.5	29.9	0.8	9.8	7.6	1.9	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	1.1	3.2	5.6	0.8	4.2	4.0	6.9	14.5	3.9	11.7	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.6	43.6	51.8	67.0	38.1	44.9	77.3	19.5	33.0	53.0	21.9	18.7
LnGrp LOS	D	D	D	E	D	D	E	B	C	D	C	B
Approach Vol, veh/h		312			556			2109			2553	
Approach Delay, s/veh		50.5			58.5			29.9			24.9	
Approach LOS		D			E			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.9	55.9	16.0	16.6	12.0	58.8	10.6	22.0
Change Period (Y+Rc), s	* 4.2	6.5	* 4.2	6.2	* 4.2	6.5	* 4.2	6.2
Max Green Setting (Gmax), s	* 14	46.4	* 12	32.0	* 7.8	52.3	* 10	33.7
Max Q Clear Time (g_c+I1), s	10.3	37.0	12.4	9.5	8.9	31.9	6.4	12.3
Green Ext Time (p_c), s	0.3	6.9	0.0	0.9	0.0	15.4	0.1	1.2

Intersection Summary	
HCM 6th Ctrl Delay	31.6
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	149	163	352	204	233	1253	623	285	1885	383
v/c Ratio	0.48	0.49	0.87	0.45	0.87	0.52	0.58	0.66	0.71	0.39
Control Delay	48.7	19.8	66.4	14.2	77.3	19.8	3.8	49.4	20.2	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.7	19.8	66.4	14.2	77.3	19.8	3.8	49.4	20.2	4.6
Queue Length 50th (ft)	46	14	115	11	77	201	0	89	317	25
Queue Length 95th (ft)	80	46	#201	46	#151	257	61	136	397	80
Internal Link Dist (ft)		1388		764		1747			298	
Turn Bay Length (ft)	315		380		250		240	250		
Base Capacity (vph)	346	1087	404	1154	267	2406	1077	469	2655	970
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.15	0.87	0.18	0.87	0.52	0.58	0.61	0.71	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

APPENDIX F

TRAFFIC SIGNAL WARRANT WORKSHEETS

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 1 of 5)

COUNT DATE _____
CALC _____ DATE _____
CHK _____ DATE _____

DIST _____ CO _____ RTE _____ PM _____

Major St: Poinsettia Lane
Minor St: Cassia Road

Critical Approach Speed _____ mph
Critical Approach Speed _____ mph

Speed limit or critical speed on major street traffic > 40 mph ☑
or
In built up area of isolated community of < 10,000 population ☐
} RURAL (R)
☐ URBAN (U)

WARRANT 1 - Eight Hour Vehicular Volume SATISFIED YES ☑ NO ☐
(Condition A or Condition B or combination of A and B must be satisfied)

Condition A - Minimum Vehicle Volume
100% SATISFIED YES ☑ NO ☐
80% SATISFIED YES ☑ NO ☐

	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				11:00 am	12:00 pm	13:00	14:00	15:00	16:00	17:00	18:00	Hour
	U	R	U	R									
APPROACH LANES	1		2 or More										
Both Approaches Major Street	500 (400)	350 (280)	600 (480)	420 (336)	477	531	531	796	796	690	796	690	
Highest Approach Minor Street	150 (120)	105 (84)	200 (160)	140 (112)	327	364	400	546	473	509	546	473	

Condition B - Interruption of Continuous Traffic
100% SATISFIED YES ☐ NO ☐
80% SATISFIED YES ☐ NO ☐

	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)												
	U	R	U	R									
APPROACH LANES	1		2 or More										Hour
Both Approaches Major Street	750 (600)	525 (420)	900 (720)	630 (504)									
Highest Approach Minor Street	75 (60)	53 (42)	100 (80)	70 (56)									

Combination of Conditions A & B SATISFIED YES ☐ NO ☐

REQUIREMENT	CONDITION	✓	FULFILLED
TWO CONDITIONS SATISFIED 80%	A. MINIMUM VEHICULAR VOLUME		Yes ☐ No ☐
	AND, B. INTERRUPTION OF CONTINUOUS TRAFFIC		
AND, AN ADEQUATE TRIAL OF OTHER ALTERNATIVES THAT COULD CAUSE LESS DELAY AND INCONVENIENCE TO TRAFFIC HAS FAILED TO SOLVE THE TRAFFIC PROBLEMS			Yes ☐ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 5)

WARRANT 2 - Four Hour Vehicular Volume **SATISFIED* YES ☑ NO ☐**

Record hourly vehicular volumes for any four hours of an average day.

APPROACH LANES	One	2 or More	14:00	15:00	16:00	17:00 (Hour)
Both Approaches - Major Street		✓	804	804	680	804
Higher Approach - Minor Street	✓		555	473	493	535

*All plotted points fall above the applicable curve in Figure 4C-1. (URBAN AREAS)	Yes ☑ No ☐
OR, All plotted points fall above the applicable curve in Figure 4C-2. (RURAL AREAS)	Yes ☑ No ☐

WARRANT 3 - Peak Hour **SATISFIED YES ☑ NO ☐**
(Part A or Part B must be satisfied)

PART A **SATISFIED YES ☐ NO ☐**
(All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)

1. The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; AND	Yes ☐ No ☐
2. The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND	Yes ☐ No ☐
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches.	Yes ☐ No ☐

PART B **SATISFIED YES ☑ NO ☐**

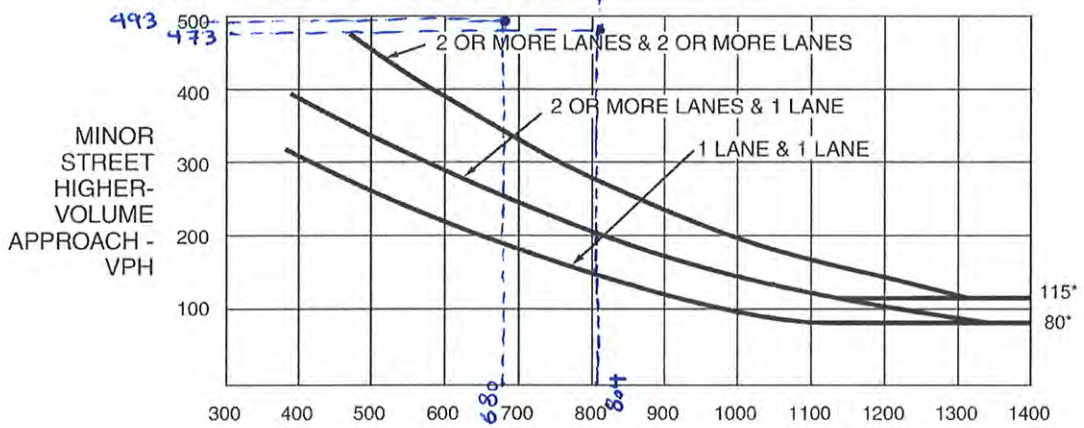
APPROACH LANES	One	2 or More	Major / Minor 7:15 / 7:30 (Hour)
Both Approaches - Major Street		✓	906
Higher Approach - Minor Street	✓		568

The plotted point falls above the applicable curve in Figure 4C-3. (URBAN AREAS)	Yes ☑ No ☐
OR, The plotted point falls above the applicable curve in Figure 4C-4. (RURAL AREAS)	Yes ☑ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

555
536
493
473

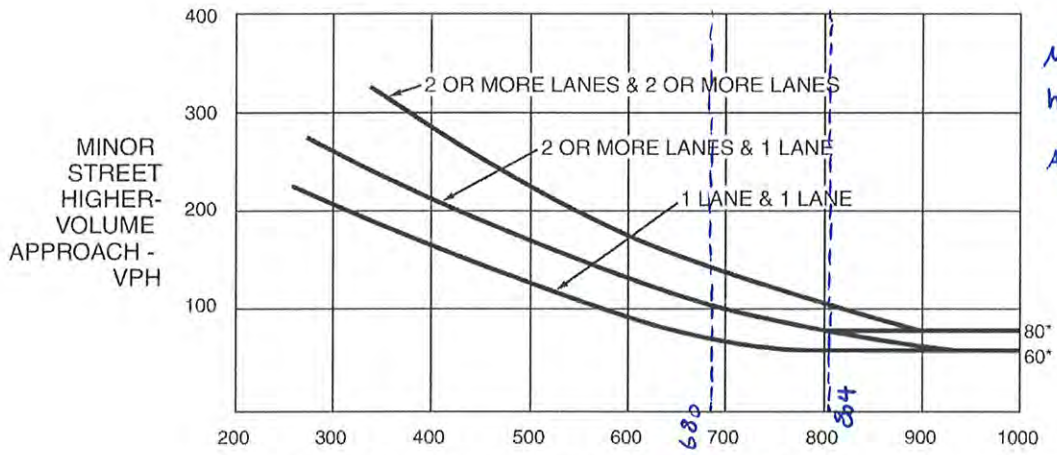
Figure 4C-T. Warrant 2, Four-Hour Vehicular Volume



*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)

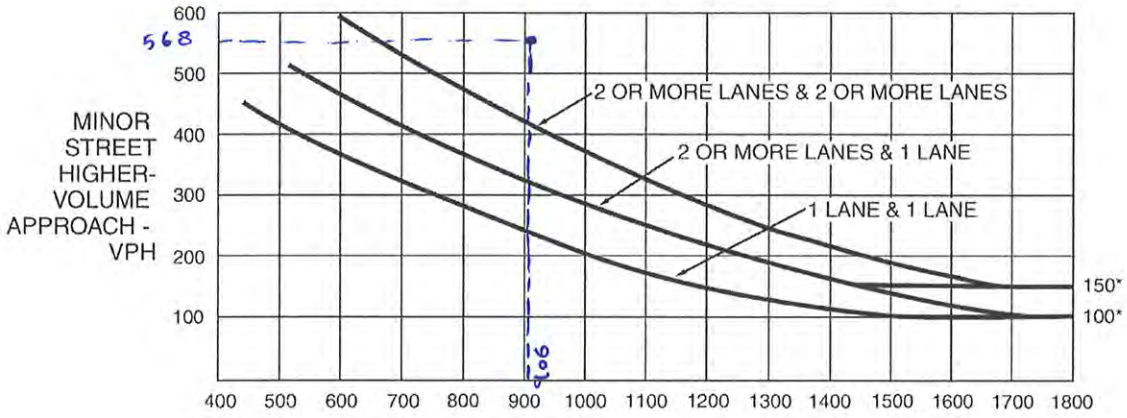


Minor Street Volumes higher than 400

All points above Curves

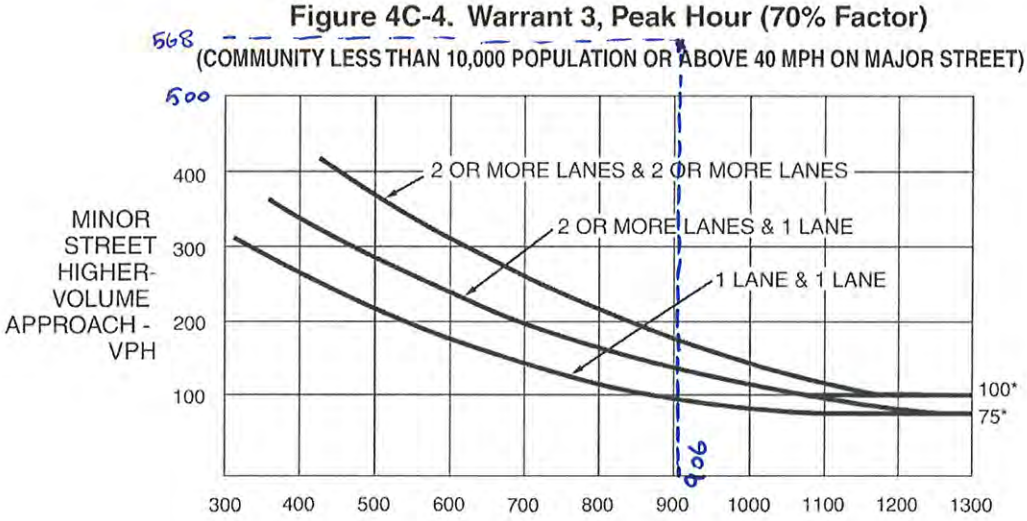
*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-3. Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 3 of 5)

WARRANT 4 - Pedestrian Volume
(Parts 1 and 2 Must Be Satisfied)

SATISFIED YES ☐ NO ☑

Part 1 (Parts A or B must be satisfied)

	Hours - - ->				
A.	Vehicles per hour for any 4 hours				
	Pedestrians per hour for any 4 hours				

Figure 4C-5 or Figure 4C-6
SATISFIED YES ☐ NO ☐

	Hours - - ->	7:15			
B.	Vehicles per hour for any 1 hour	1,474			
	Pedestrians per hour for any 1 hour	0			

Figure 4C-7 or Figure 4C-8
SATISFIED YES ☐ NO ☑

Part 2 SATISFIED YES ☐ NO ☐

AND, The distance to the nearest traffic signal along the major street is greater than 300 ft	Yes ☐ No ☐
OR, The proposed traffic signal will not restrict progressive traffic flow along the major street.	Yes ☐ No ☐

WARRANT 5 - School Crossing
(Parts A and B Must Be Satisfied)

SATISFIED YES ☐ NO ☑

Part A
Gap/Minutes and # of Children

SATISFIED YES ☐ NO ☐

		Hour
Gaps vs Minutes	Minutes Children Using Crossing	
	Number of Adequate Gaps	
School Age Pedestrians Crossing Street / hr		

Gaps < Minutes YES ☐ NO ☐
AND Children > 20/hr YES ☐ NO ☐

AND, Consideration has been given to less restrictive remedial measures.	Yes ☐ No ☐

Part B SATISFIED YES ☐ NO ☐

The distance to the nearest traffic signal along the major street is greater than 300 ft	Yes ☐ No ☐
OR, The proposed signal will not restrict the progressive movement of traffic.	Yes ☐ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-7. Warrant 4, Pedestrian Peak Hour

*Note: 133 pph applies as the lower threshold volume.

Figure 4C-8. Warrant 4, Pedestrian Peak Hour (70% Factor)

*Note: 93 pph applies as the lower threshold volume.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 4 of 5)

WARRANT 6 - Coordinated Signal System **SATISFIED YES ☐ NO ☐**
(All Parts Must Be Satisfied)

MINIMUM REQUIREMENTS	DISTANCE TO NEAREST SIGNAL	
≥ 1000 ft	N _____ ft, S _____ ft, E _____ ft, W _____ ft	Yes ☐ No ☐
On a one-way street or a street that has traffic predominantly in one direction, the adjacent traffic control signals are so far apart that they do not provide the necessary degree of vehicular platooning.		Yes ☐ No ☐
OR, On a two-way street, adjacent traffic control signals do not provide the necessary degree of platooning and the proposed and adjacent traffic control signals will collectively provide a progressive operation.		

WARRANT 7 - Crash Experience Warrant **SATISFIED YES ☐ NO ☐**
(All Parts Must Be Satisfied)

Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce the crash frequency.			Yes ☐ No ☐
REQUIREMENTS	Number of crashes reported within a 12 month period susceptible to correction by a traffic signal, and involving injury or damage exceeding the requirements for a reportable crash.		Yes ☐ No ☐
5 OR MORE			
REQUIREMENTS	CONDITIONS	✓	
ONE CONDITION SATISFIED 80%	Warrant 1, Condition A - Minimum Vehicular Volume		Yes ☐ No ☐
	OR, Warrant 1, Condition B - Interruption of Continuous Traffic		
	OR, Warrant 4, Pedestrian Volume Condition Ped Vol ≥ 80% of Figure 4C-5 through Figure 4C-8		

WARRANT 8 - Roadway Network **SATISFIED YES ☐ NO ☐**
(All Parts Must Be Satisfied)

MINIMUM VOLUME REQUIREMENTS	ENTERING VOLUMES - ALL APPROACHES	✓	FULFILLED
1000 Veh/Hr	During Typical Weekday Peak Hour _____ Veh/Hr and has 5-year projected traffic volumes that meet one or more of Warrants 1, 2, and 3 during an average weekday.		Yes ☐ No ☐
	OR During Each of Any 5 Hrs. of a Sat. or Sun _____ Veh/Hr		

CHARACTERISTICS OF MAJOR ROUTES	MAJOR ROUTE A	MAJOR ROUTE B	
Hwy. System Serving as Principal Network for Through Traffic			
Rural or Suburban Highway Outside Of, Entering, or Traversing a City			
Appears as Major Route on an Official Plan			
Any Major Route Characteristics Met, Both Streets			Yes ☐ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 5 of 5)

WARRANT 9 - Intersection Near a Grade Crossing **SATISFIED YES ☐ NO ☐**
(Both Parts A and B Must Be Satisfied)

PART A A grade crossing exists on an approach controlled by a STOP or YIELD sign and the center of the track nearest to the intersection is within 140 feet of the stop line or yield line on the approach. Track Center Line to Limit Line _____ ft	Yes ☐ No ☐
PART B **There is one minor street approach lane at the track crossing -** During the highest traffic volume hour during which rail traffic uses the crossing, the plotted point falls above the applicable curve in Figure 4C-9. Major Street - Total of both approaches: _____ VPH Minor Street - Crosses the track (one direction only, approaching the intersection): _____ VPH X AF (Use Tables 4C-2, 3, & 4 below to calculate AF) = _____ VPH	Yes ☐ No ☐
OR, There are two or more minor street approach lanes at the track crossing - During the highest traffic volume hour during which rail traffic uses the crossing, the plotted point falls above the applicable curve in Figure 4C-10. Major Street - Total of both approaches : _____ VPH Minor Street - Crosses the track (one direction only, approaching the intersection): _____ VPH X AF (Use Tables 4C-2, 3, & 4 below to calcualte AF) = _____ VPH	

The minor street approach volume may be multiplied by up to three following adjustment factors (AF) as described in Section 4C.10.

1- Number of Rail Traffic per Day_____ Adjustment factor from table 4C-2____

2- Percentage of High-Occupancy Buses on Minor Street Approach_____ Adjustment factor from table 4C-3____

3- Percentage of Tractor-Trailer Trucks on Minor Street Approach_____ Adjustment factor from table 4C-4____

NOTE: If no data is availale or known, then use AF = 1 (no adjustment)

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 1 of 5)

COUNT DATE _____
CALC _____ DATE _____
CHK _____ DATE _____

DIST ____ CO ____ RTE ____ PM ____

Major St: Poinsettia Lane
Minor St: Skimmer Ct – Oriole Ct

Critical Approach Speed _____ mph
Critical Approach Speed _____ mph

Speed limit or critical speed on major street traffic > 40 mph ☑
or
In built up area of isolated community of < 10,000 population ☐
} RURAL (R)
☐ URBAN (U)

WARRANT 1 - Eight Hour Vehicular Volume SATISFIED YES ☐ NO ☐
(Condition A or Condition B or combination of A and B must be satisfied)

Condition A - Minimum Vehicle Volume 100% SATISFIED YES ☐ NO ☑
80% SATISFIED YES ☐ NO ☑

	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				11:00 a.m.	12:00 p.m.	13:00	14:00	15:00	16:00	17:00	18:00	Hour
	U	R	U	R									
APPROACH LANES	1		2 or More										
Both Approaches Major Street	500 (400)	350 (280)	600 (480)	420 (336)	390	390	439	1,268	731	683	634	341	
Highest Approach Minor Street	150 (120)	105 (84)	200 (160)	140 (112)	25	38	38	60	38	38	47	32	

Condition B - Interruption of Continuous Traffic 100% SATISFIED YES ☐ NO ☑
80% SATISFIED YES ☐ NO ☑

	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				11:00 a.m	12:00 p.m	13:00	14:00	15:00	16:00	17:00	18:00	Hour
	U	R	U	R									
APPROACH LANES	1		2 or More										
Both Approaches Major Street	750 (600)	525 (420)	900 (720)	630 (504)	390	390	439	1,268	731	683	634	341	
Highest Approach Minor Street	75 (60)	53 (42)	100 (80)	70 (56)	25	38	38	60	38	38	47	32	

Combination of Conditions A & B SATISFIED YES ☐ NO ☐

REQUIREMENT	CONDITION	✓	FULFILLED
TWO CONDITIONS SATISFIED 80%	A. MINIMUM VEHICULAR VOLUME		Yes ☐ No ☐
	AND, B. INTERRUPTION OF CONTINUOUS TRAFFIC		
AND, AN ADEQUATE TRIAL OF OTHER ALTERNATIVES THAT COULD CAUSE LESS DELAY AND INCONVENIENCE TO TRAFFIC HAS FAILED TO SOLVE THE TRAFFIC PROBLEMS			Yes ☐ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 5)

WARRANT 2 - Four Hour Vehicular Volume SATISFIED* YES ☐ NO ☑

Record hourly vehicular volumes for any four hours of an average day.

APPROACH LANES	One	2 or More	14:00	15:00	16:00	17:00 Hour
Both Approaches - Major Street		✓	1,249	723	690	624
Higher Approach - Minor Street	✓		68	40	38	34

*All plotted points fall above the applicable curve in Figure 4C-1. (URBAN AREAS)	Yes ☐ No ☑
OR, All plotted points fall above the applicable curve in Figure 4C-2. (RURAL AREAS)	Yes ☐ No ☑

WARRANT 3 - Peak Hour SATISFIED YES ☐ NO ☐
(Part A or Part B must be satisfied)

PART A SATISFIED YES ☐ NO ☐

(All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)

1. The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; AND	Yes ☐ No ☐
2. The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND	Yes ☐ No ☐
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches.	Yes ☐ No ☐

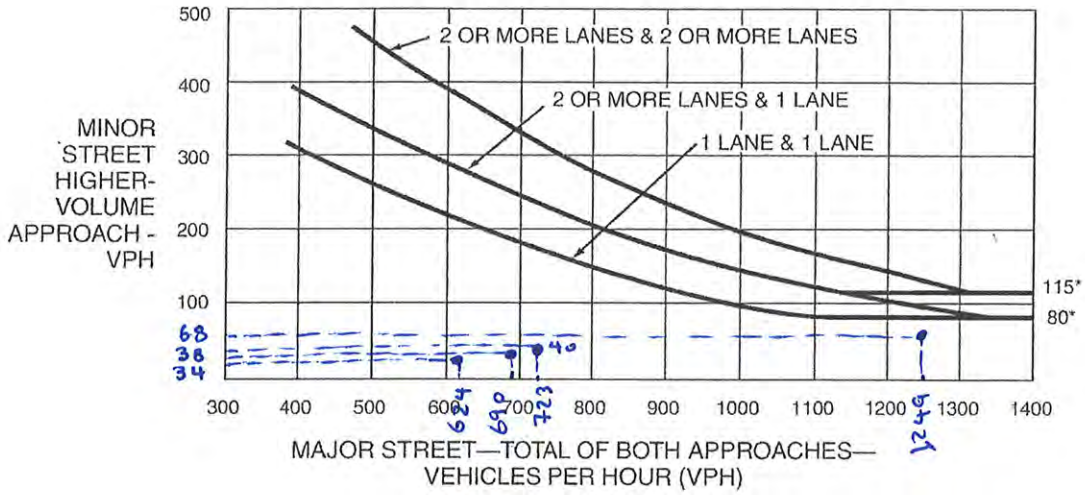
PART B SATISFIED YES ☐ NO ☐

APPROACH LANES	One	2 or More	Major Minor 2:15pm / 7:00 Hour
Both Approaches - Major Street		✓	1,268
Higher Approach - Minor Street	✓		63

The plotted point falls above the applicable curve in Figure 4C-3. (URBAN AREAS)	Yes ☐ No ☐
OR, The plotted point falls above the applicable curve in Figure 4C-4. (RURAL AREAS)	Yes ☐ No ☑

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

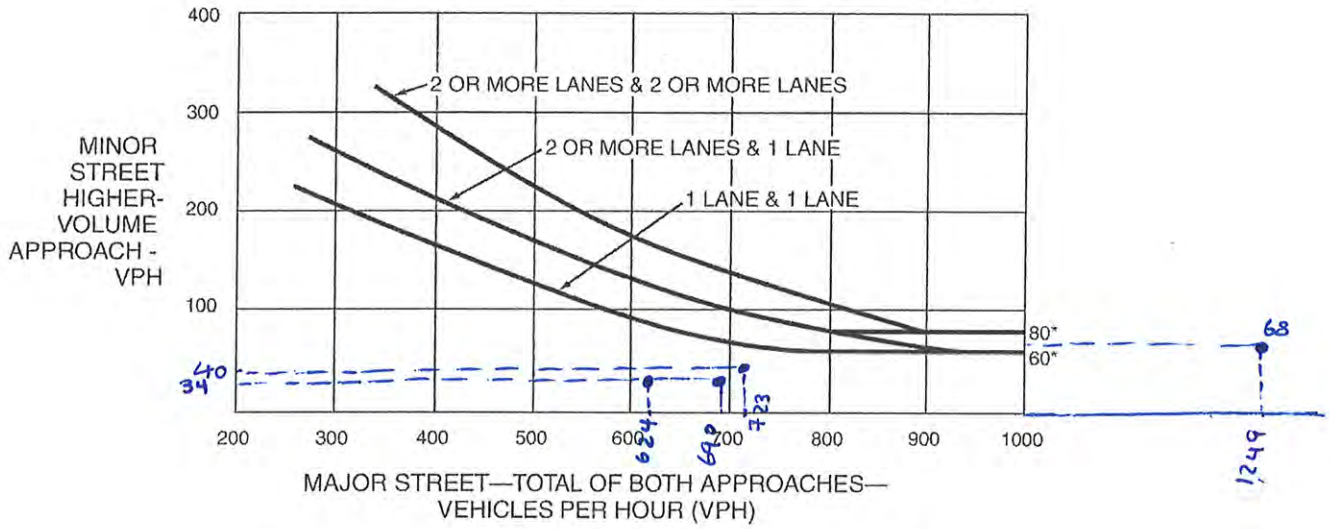
Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume



*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.

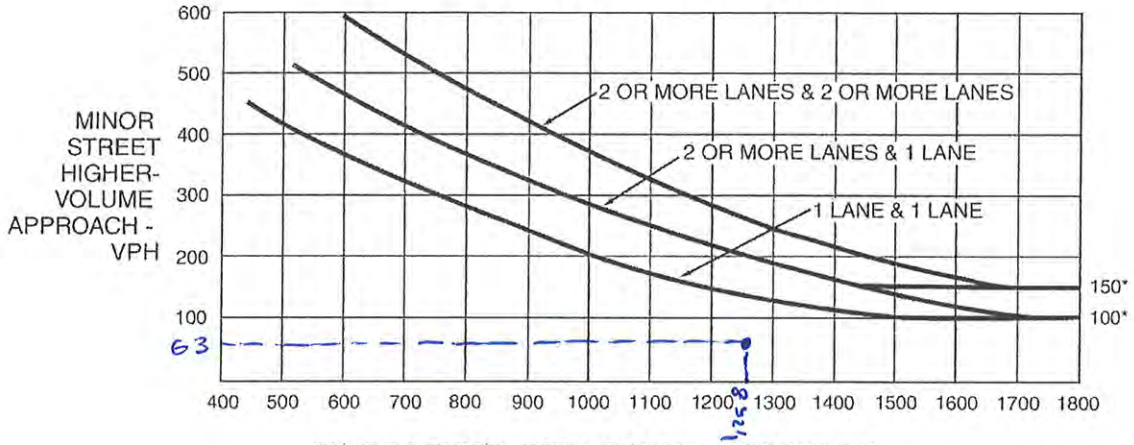
Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

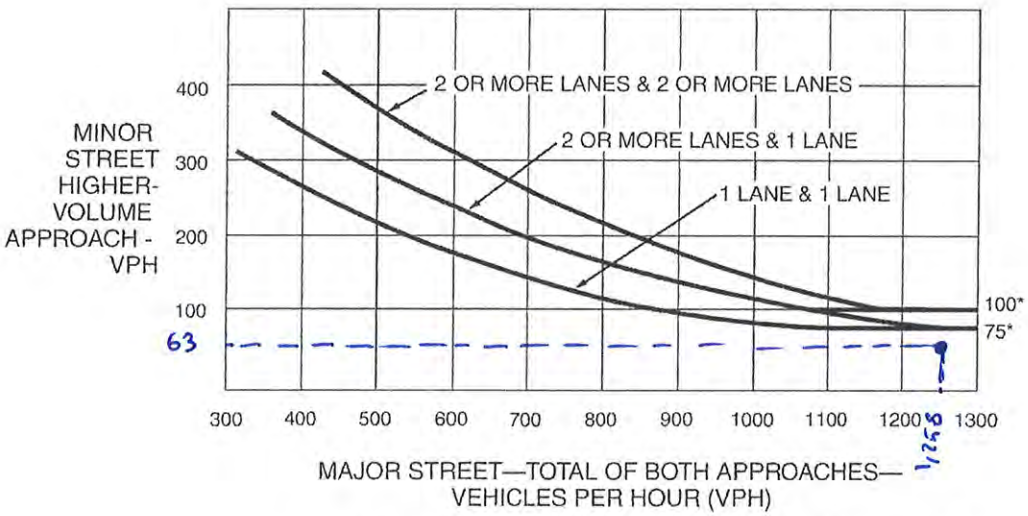
Figure 4C-3. Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 3 of 5)

WARRANT 4 - Pedestrian Volume
(Parts 1 and 2 Must Be Satisfied)

SATISFIED YES ☐ NO ☑

Part 1 (Parts A or B must be satisfied)

	Hours - - ->				
A.	Vehicles per hour for any 4 hours				
	Pedestrians per hour for any 4 hours				

Figure 4C-5 or Figure 4C-6
SATISFIED YES ☐ NO ☐

	Hours - - ->				
B.	Vehicles per hour for any 1 hour	1,321			
	Pedestrians per hour for any 1 hour	6			

Figure 4C-7 or Figure 4C-8
SATISFIED YES ☐ NO ☑

Part 2 SATISFIED YES ☐ NO ☐

AND, The distance to the nearest traffic signal along the major street is greater than 300 ft	Yes ☐	No ☐
OR, The proposed traffic signal will not restrict progressive traffic flow along the major street.	Yes ☐	No ☐

WARRANT 5 - School Crossing
(Parts A and B Must Be Satisfied)

SATISFIED YES ☐ NO ☑

Part A SATISFIED YES ☐ NO ☐
Gap/Minutes and # of Children

		Hour
Gaps vs Minutes	Minutes Children Using Crossing	
	Number of Adequate Gaps	
School Age Pedestrians Crossing Street / hr		

Gaps < Minutes YES ☐ NO ☐
AND Children > 20/hr YES ☐ NO ☐

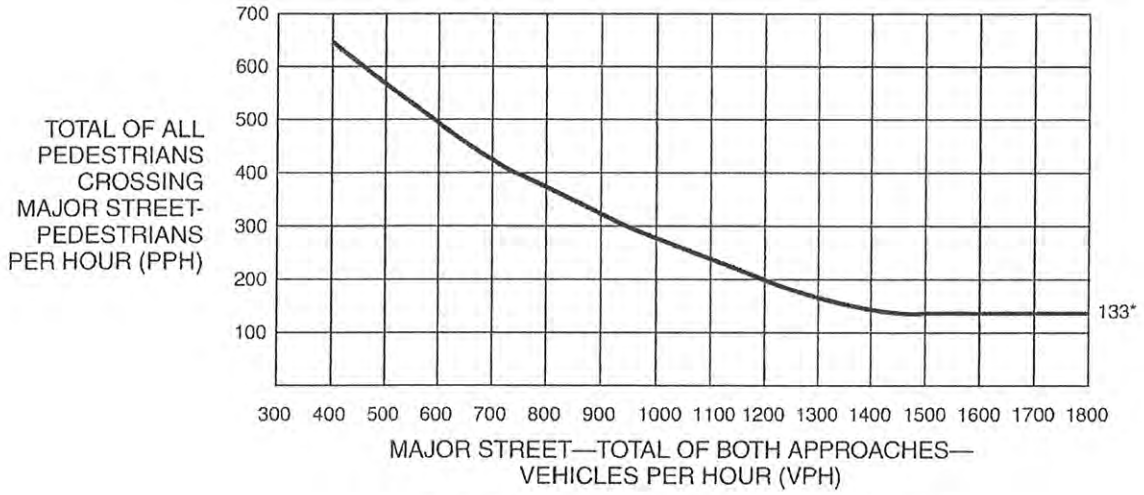
AND, Consideration has been given to less restrictive remedial measures.	Yes ☐	No ☐

Part B SATISFIED YES ☐ NO ☐

The distance to the nearest traffic signal along the major street is greater than 300 ft	Yes ☐	No ☐
OR, The proposed signal will not restrict the progressive movement of traffic.	Yes ☐	No ☐

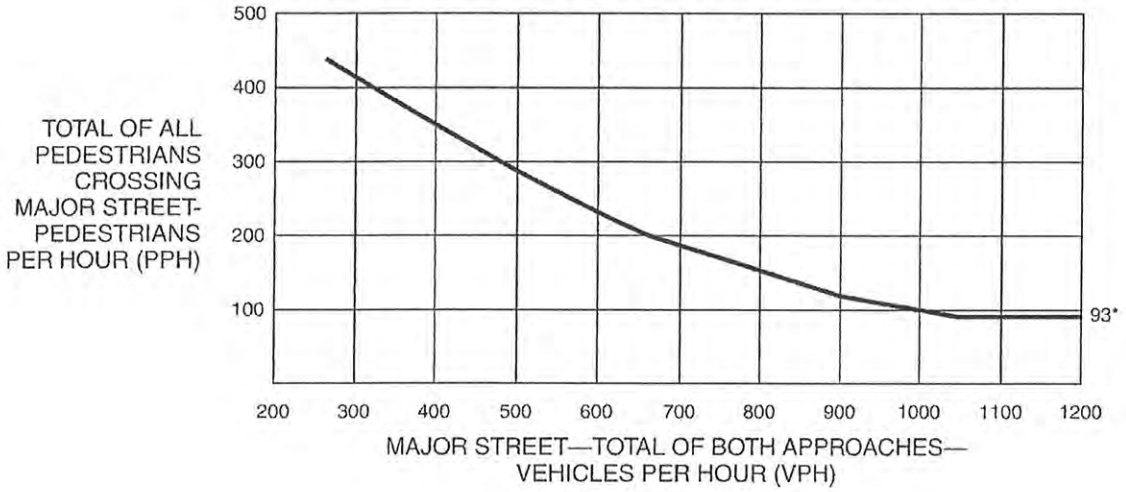
The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-7. Warrant 4, Pedestrian Peak Hour



*Note: 133 pph applies as the lower threshold volume.

Figure 4C-8. Warrant 4, Pedestrian Peak Hour (70% Factor)



*Note: 93 pph applies as the lower threshold volume.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 4 of 5)

WARRANT 6 - Coordinated Signal System **SATISFIED YES ☐ NO ☐**
(All Parts Must Be Satisfied)

MINIMUM REQUIREMENTS	DISTANCE TO NEAREST SIGNAL	
≥ 1000 ft	N _____ ft, S _____ ft, E _____ ft, W _____ ft	Yes ☐ No ☐
On a one-way street or a street that has traffic predominantly in one direction, the adjacent traffic control signals are so far apart that they do not provide the necessary degree of vehicular platooning.		Yes ☐ No ☐
OR, On a two-way street, adjacent traffic control signals do not provide the necessary degree of platooning and the proposed and adjacent traffic control signals will collectively provide a progressive operation.		

WARRANT 7 - Crash Experience Warrant **SATISFIED YES ☐ NO ☐**
(All Parts Must Be Satisfied)

Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce the crash frequency.			Yes ☐ No ☐
REQUIREMENTS	Number of crashes reported within a 12 month period susceptible to correction by a traffic signal, and involving injury or damage exceeding the requirements for a reportable crash.		Yes ☐ No ☐
5 OR MORE			
REQUIREMENTS	CONDITIONS	✓	
ONE CONDITION SATISFIED 80%	Warrant 1, Condition A - Minimum Vehicular Volume		Yes ☐ No ☐
	OR, Warrant 1, Condition B - Interruption of Continuous Traffic		
	OR, Warrant 4, Pedestrian Volume Condition Ped Vol ≥ 80% of Figure 4C-5 through Figure 4C-8		

WARRANT 8 - Roadway Network **SATISFIED YES ☐ NO ☐**
(All Parts Must Be Satisfied)

MINIMUM VOLUME REQUIREMENTS	ENTERING VOLUMES - ALL APPROACHES	✓	FULFILLED
1000 Veh/Hr	During Typical Weekday Peak Hour _____ Veh/Hr and has 5-year projected traffic volumes that meet one or more of Warrants 1, 2, and 3 during an average weekday.		Yes ☐ No ☐
	OR During Each of Any 5 Hrs. of a Sat. or Sun _____ Veh/Hr		

CHARACTERISTICS OF MAJOR ROUTES	MAJOR ROUTE A	MAJOR ROUTE B
Hwy. System Serving as Principal Network for Through Traffic		
Rural or Suburban Highway Outside Of, Entering, or Traversing a City		
Appears as Major Route on an Official Plan		
Any Major Route Characteristics Met, Both Streets		Yes ☐ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 5 of 5)

WARRANT 9 - Intersection Near a Grade Crossing **SATISFIED YES ☐ NO ☐**
(Both Parts A and B Must Be Satisfied)

PART A A grade crossing exists on an approach controlled by a STOP or YIELD sign and the center of the track nearest to the intersection is within 140 feet of the stop line or yield line on the approach. Track Center Line to Limit Line _____ ft	Yes ☐ No ☐
PART B **There is one minor street approach lane at the track crossing -** During the highest traffic volume hour during which rail traffic uses the crossing, the plotted point falls above the applicable curve in Figure 4C-9. Major Street - Total of both approaches: _____ VPH Minor Street - Crosses the track (one direction only, approaching the intersection): _____ VPH X AF (Use Tables 4C-2, 3, & 4 below to calculate AF) = _____ VPH	Yes ☐ No ☐
OR, There are two or more minor street approach lanes at the track crossing - During the highest traffic volume hour during which rail traffic uses the crossing, the plotted point falls above the applicable curve in Figure 4C-10. Major Street - Total of both approaches : _____ VPH Minor Street - Crosses the track (one direction only, approaching the intersection): _____ VPH X AF (Use Tables 4C-2, 3, & 4 below to calcualte AF) = _____ VPH	

The minor street approach volume may be multiplied by up to three following adjustment factors (AF) as described in Section 4C.10.

1- Number of Rail Traffic per Day_____ Adjustment factor from table 4C-2____

2- Percentage of High-Occupancy Buses on Minor Street Approach_____ Adjustment factor from table 4C-3____

3- Percentage of Tractor-Trailer Trucks on Minor Street Approach_____ Adjustment factor from table 4C-4____

NOTE: If no data is availale or known, then use AF = 1 (no adjustment)

APPENDIX G

POINSETTIA LANE BIOLOGICAL RESOURCES ASSESSMENT RESULTS

From: Patrick Somerville <psomerville@HNTB.com>
Sent: Thursday, March 14, 2019 9:42 PM
To: Arthur Black
Subject: RE: Carlsbad

Arthur,

I swung by on my way back up from SD. That vault is for SDG&E gas and it appears that it does not have a traffic rated lid on it. It also may not be able to be adjusted to the new street grade without rebuilding the vault in its entirety (or relocate elsewhere). One of two things will happen…1) they are in franchise and all costs are on SDG&E or 2) they have an easement or prior rights and the City will pick up the tab of the work. It's really difficult to understand what that cost might be…range might be $100k to $500k (or more for full relocation).

There is a 16" Kinder Morgan petroleum line in the street. There is a cathodic protection testing station in the curb return, this is a simple adjust to grade.

Traffic signal controller will be in the way and require relocation.

Retaining wall will reach 12' in height at the corner. This should be a typical/standard plan retaining wall. Assuming it'll go this route instead of slope to minimize impact to mitigation area.

I took some pics while I was out there, sent you a Dropbox link to them.

Length	Width-Depth	Total-Conversion	Unit Cost	Cost	Item
200	8	1600	$ 6.00	$ 9,600	SW
200			$ 30.00	$ 6,000	CG
2100	1	0.074	$ 150.00	$ 23,310	AC
2100	2	27	$ 75.00	$ 11,667	AB
3700	3	27	$ 50.00	$ 20,556	RX
200	8		$ 100.00	$ 160,000	Wall
				$ 100,000	TS Mod
				$ 2,500	S&S
		500	$ 10.00	$ 5,000	Planting & Irrigation
			20%	$ 66,226	Misc Items
				$ 404,859	Subtotal Construction
			30%	$ 121,458	Soft Costs
		2100	$ 50.00	$ 105,000	R/W
			30%	$ 189,395	Contingency
				$ 820,711	Total Estimate

Pat

This e-mail and any files transmitted with it are confidential and are intended solely for the use of the individual or entity to whom they are addressed. If you are NOT the intended recipient and receive this communication, please delete this message and any attachments. Thank you.

CARLSBAD
FRESNO
IRVINE
LOS ANGELES
PALM SPRINGS
POINT RICHMOND
RIVERSIDE
ROSEVILLE
SAN LUIS OBISPO

MEMORANDUM

DATE: October 2, 2018

TO: The City of Carlsbad

FROM: Jaime Morales, LSA Senior Biologist

SUBJECT: Poinsettia Lane Reach E Project – Biological Resources Assessment Results (LSA Project No. HCR1803)

This memorandum describes the results of a biological resources assessment performed at the project area at the northwestern corner of the intersection of Poinsettia Avenue and El Camino Real in the City of Carlsbad, California (see attached Figure 1 for project location; all figures attached).

METHODOLOGY

On September 18, 2018, LSA Senior Biologist Jaime Morales walked the entire study area (a larger area surrounding and including the impact footprint) and mapped vegetation communities according to the Habitat Management Plan for Natural Communities in the City of Carlsbad (HMP) vegetation classifications. Mr. Morales used a field map containing a recent aerial photograph to record vegetation communities on site. Mr. Morales documented all plant and wildlife species observed and/or detected during the assessment.

RESULTS

With respect to the HMP, the study area is within the Coastal Zone, within the eastern edge of the central section of Local Facilities Management Zone 21, and within an existing hardline preserve (Preserve Number P/A#705). A portion of the study area (southern end) is within a standards area that will be a future preserve. A very small portion (southeastern corner of the study area) closest to the intersection of El Camino Real and Poinsettia Lane is outside of existing hardline preserve and standards areas. Figure 2 displays the boundaries of the preserve and standards areas.

Soils within the study area are composed of Loamy alluvial land-Huerhuero complex, 9 to 50 percent slopes, severely eroded. This complex occurs on old coastal ridges. The landscape is one of strongly sloping to steep, severely eroded soils and alluvial fill along drainage ways. There are barren exposures of soft marine sediments, sandstone, and shale.

The vegetation within the study area was dominated by southern maritime chaparral that appeared to be recovering from a recent fire, as evidenced by the charred remains of several bushes. The southern maritime chaparral comprises the following species: Del Mar manzanita (*Arctostaphylos glandulosa* ssp. *crassifolia*; federally-listed as endangered, California Rare Plant Rank [CRPR] 1B.1, Narrow Endemic Species), summer holly (*Comarostaphylis diversifolia* ssp. *diversifolia*; CRPR 1B.2),

coastal goldenbush (*Isocoma menziesii*), common sun rose (*Helianthemum scoparium*), virgated wreath plant (*Stephanomeria virgata*), bushmallow (*Malacothamnus densiflorus*), laurel sumac (*Malosma laurina*), deerweed (*Acmispon glaber*), brittlebush (*Encelia farinosa*), California buckwheat (*Eriogonum fasciculatum*), black sage (*Salvia mellifera*), lemonadeberry (*Rhus integrifolia*), chamise (*Adenostoma fasciculata*), coyote brush (*Baccharis pilularis*), coastal prickly pear (*Opuntia littoralis*), and Mojave yucca (*Yucca schidigera*). A row of mostly mature coastal goldenbush and brittlebush shrubs occurs west of and adjacent to the sidewalk on the west side of El Camino Real (east of the eastern property fence). An area near the center of the study area lacks vegetation and was mapped as bare ground. Figure 2 displays the boundaries of vegetation communities within the study area.

The following wildlife species were observed during the biological resources assessment: western tiger swallowtail (*Papilio rutulus*), western fence lizard (*Sceloporus occidentali*), American crow (*Corvus brachyrhynchos*), black phoebe (*Sayornis nigricans*), house finch (*Haemorhous mexicanus*), and mourning dove (*Zenaida macroura*).

Del Mar manzanita and summer holly were the only special-status plant species observed during the biological resources assessment. No special-status wildlife species were observed or detected during the biological resources assessment. Based on a review of the California Department of Fish and Wildlife's California Natural Diversity Data Base (CNDDB) and the California Native Plant Society's Online Inventory of Rare and Endangered Plants of California, the following special-status plant and wildlife species have a potential to occur within the study area due to the presence of suitable habitat: Del Mar Mesa sand aster (*Corethrogyne filaginifolia* ssp. *linifolia*; CRPR 1B.1, Narrow Endemic Species), Orcutt's brodiaea (*Brodiaea orcuttii*; CRPR 1B.1, Narrow Endemic Species), Nuttall's scrub oak (*Quercus dumosa*; CRPR 1B.1), wart-stemmed ceanothus (*Ceanothus verrucosus*; CRPR 2B.2), coastal California gnatcatcher (*Polioptila californica californica*; federally-listed as threatened, CDFW Species of Special Concern), and northwestern San Diego pocket mouse (*Chaetodipus fallax* ssp. *fallax*; CDFW Species of Special Concern).

Nuttall's scrub oak and wart-stemmed ceanothus are conspicuous, perennial shrubs that would have been identified had they been on site. Orcutt's brodiaea and Del Mar Mesa sand aster are perennial herbs that would be difficult to identify when not flowering. Orcutt's brodiaea flowers between the months of May and July, while Del Mar Mesa sand aster flowers from March through September. Neither of these species was identified within the study area during the survey. A focused survey for Orcutt's brodiaea and Del Mar Mesa sand aster would need to be performed to determine conclusively that these species are absent from the study area.

Although coastal California gnatcatcher was not detected during the biological resources assessment, the southern maritime chaparral within the study area is suitable to support this species. A focused survey for coastal California gnatcatcher would need to be performed to determine conclusively that this species is absent from the study area.

Because burrows were generally absent from the study area and the most recent occurrence of northwestern San Diego pocket mouse in the vicinity of the study area (per the CNDDB) was in 1992, this species is not expected to be present within the study area.

No aquatic resources subject to City of Carlsbad or resource agency jurisdiction were identified within the study area during the biological resources assessment.

CONCLUSION

Portions of the study area are within existing hardline preserve and standards areas. Per the Guidelines for Biological Studies (Technology Associates 2008), impacts to biological resources are not allowed within hardline areas, unless (a) they are associated with a covered project, as defined by the HMP, (b) an equivalency finding results in a minor amendment and adjustment to the hardline boundaries, or (c) a major amendment to the HMP is approved.

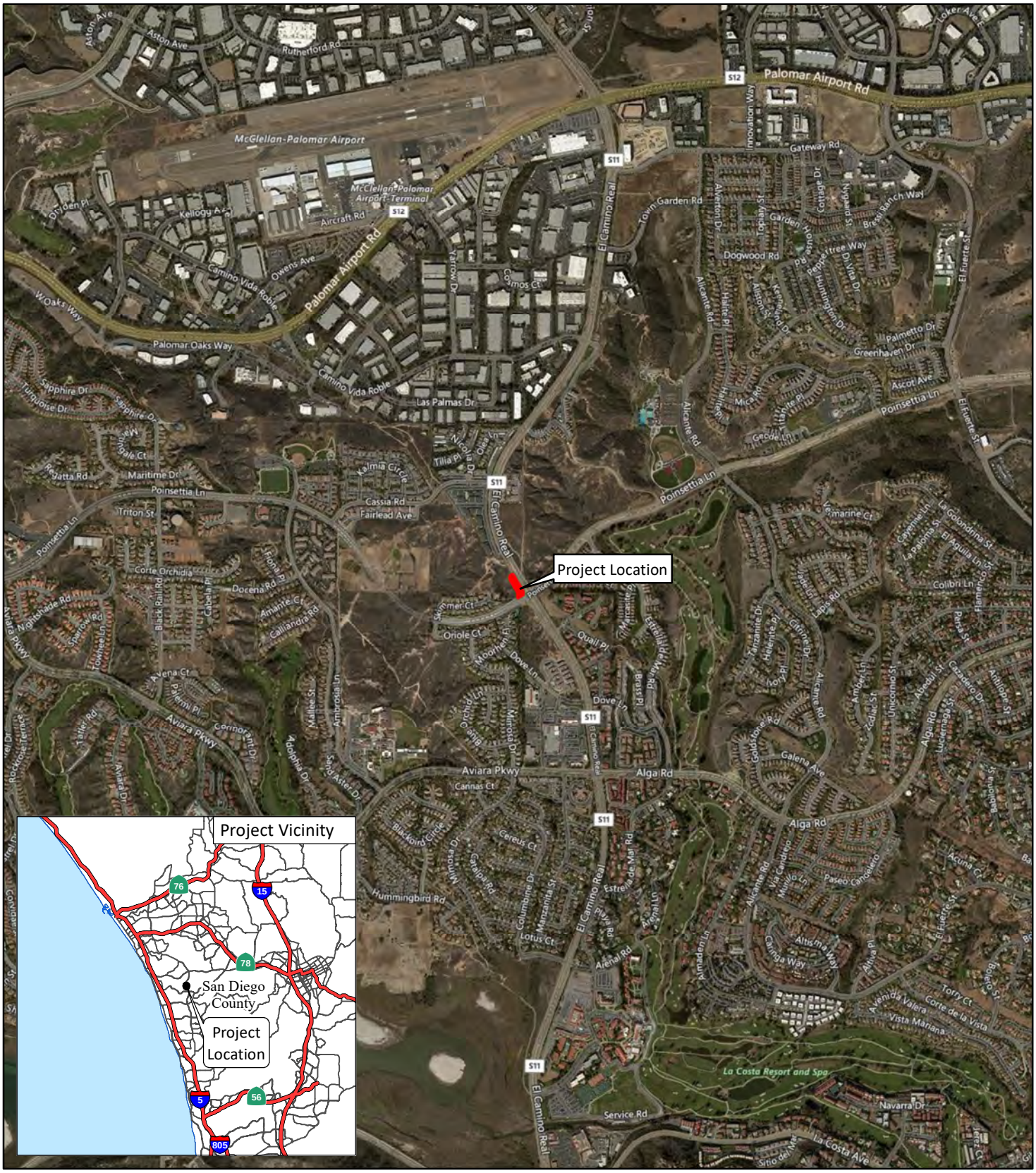
If impacts within hardline areas are approved, the HMP will require a 3:1 mitigation to impact ratio for impacts to southern maritime chaparral. An impact area that includes the workspace necessary to perform the proposed road improvement and all necessary access and staging areas will be required to quantify impacts to southern maritime chaparral and to determine the total mitigation requirement. Furthermore, because the project site is within the Coastal Zone, the project must comply with additional conservation standards in the HMP (Conservation Standards 7-1 to 7-14 on page D-114 of the HMP).

Focused surveys for Orcutt's brodiaea, Del Mar Mesa sand aster, and coastal California gnatcatcher should be performed to determine the presence/absence of these species.

Please contact me at (760) 934-5471 or at Jaime.Morales@LSA.net if you have any questions or comments.

ATTACHMENTS

- Figure 1: Project Location Map
- Figure 2: Vegetation Map



LSA

LEGEND

Project Location

FIGURE 1

N

0 1000 2000

FEET

SOURCE: Bing Maps (2015)

I:\HCR1803\GIS\ProjLoc.mxd (10/2/2018)

Poinsettia Lane Reach E Project

Project Location

LSA

LEGEND

Study Area

Vegetation

Bare Ground

Southern Maritime Chaparral

Carlsbad HMP

Existing Hardline Preserve

Standards Area

0 50 100

FEET

SOURCE: Bing Maps (2015)

I:\HCR1803\GIS\Veg.mxd (10/2/2018)

FIGURE 2

Poinsettia Lane Reach E Project

Vegetation Communities

All Receive - Agenda Item # 10
For the Information of the:
CITY COUNCIL
Date 11/19/19 CA X CC X
CM X COO X DCM (3) X

City of Carlsbad
Memo ID# 2019132

Council Memorandum

Nov. 19, 2019

To: Honorable Mayor Hall and Members of the City Council
From: Elaine Lukey, Chief Operations Officer
Re: **Responses to Questions from the Nov. 18, 2019, Council Briefings**

Agenda Item No. 10 – Advertise for Bids for Traffic Signal at Poinsettia Lane and Cassia Road, and Traffic Signal at Poinsettia Lane and Oriole Court/Skimmer Court, CIP Project Nos. 6329 and 6330 (Project)

Question 1: What were the results of the Poinsettia Lane Gap Closure Study (Study) performed by LSA?
Answer: The Study is included as Attachment A.

Question 2: When was this Study requested, and was it competitively bid on its own or procured through a Master Agreement?
Answer: Under a Master Agreement with LSA, dated Nov. 17, 2015, the city requested a scope for the Study and it was submitted by LSA on Jan. 5, 2018. The task order was executed on March 22, 2018, and is included as Attachment B.

Question 3: What was included in the scope of the Study?
Answer: The signed agreement, including the scope of work, is included as Attachment B.

Question 4: Do we have any results from the November 2018 community meeting with the HOAs in the nearby neighborhoods?
Answer: The public meeting for the Project was held on Nov. 7, 2018. All four affected HOAs and residents were invited to attend. The presentation for the public meeting is included as Attachment C. The public meeting notes are included as Attachment D.

The minutes from the Planning Commission meeting on Feb. 1, 2017, are included as Attachment E, and the minutes from the City Council meeting on March 14, 2017, are included as Attachment F.

Staff will be presenting the Study to the Traffic & Mobility Commission Dec. 2, 2019, and to City Council on Dec. 10, 2019.

Attachments:

A. Traffic Investigation Poinsettia Lane Closure Nov. 2019 (a PDF file is attached as an electronic version, and a hardcopy is available in the Office of the Executive Assistant to the City Council, as reference)
B. Project Task Description and Fee Allotment with LSA of March 22, 2018
C. Presentation – Neighborhood Traffic Workshop Poinsettia Lane Completion Traffic Study Nov. 7, 2018
D. Notes – Poinsettia Lane Completion Project Resident Feedback Nov. 7, 2018
E. Planning Commission Minutes Feb. 1, 2017 Meeting
F. City Council Minutes March 14, 2017 Meeting

cc: Scott Chadwick, City Manager
Celia Brewer, City Attorney
Babaq Taj, Interim Transportation Director
Amanda Guy, Deputy City Attorney
Hossein Ajideh, Engineering Manager
John Kim, City Traffic Engineer
Jonathan Schauble, Senior Engineer
Sheila Cobian, City Clerk Services Manager

CA1286

PROJECT TASK DESCRIPTION AND FEE ALLOTMENT NO. 3

This **third** Project Task Description and Fee Allotment, is entered into on March 22, 2018, pursuant to an Agreement between LSA ASSOCIATES, INC., a California corporation, ("Contractor") and the CITY OF CARLSBAD, ("City") dated November 17, 2015, (the "Agreement"), the terms of which are incorporated herein by this reference.

1. CONTRACTOR'S OBLIGATIONS

Contractor shall provide Traffic analysis in accordance with the "Project Engineer's Manual", 2001 edition, as published by the City's Engineering Department, City "Standards for Design & Construction of Public Works Improvements in the City of Carlsbad," and the proposal dated January 5, 2018, ("proposal"), attached as Appendix "A" for the **Poinsettia Traffic Study**, (the "Project"). The Project services shall include a traffic analysis, a cut-through traffic evaluation, an intersection geometric analysis, and traffic calming recommendations.

2. PROGRESS AND COMPLETION

Contractor's receipt of this Project Task Description and Fee Allotment, signed by the City Manager or Director and a Purchase Order from the City's Purchasing Department, constitutes notification to proceed to the Contractor. Contractor shall begin work within ten (10) working days after receiving this fully executed document and a City Purchase Order. Contractor shall complete the work within **sixty (60)** working days thereafter. Working days are defined in section 6-7.2 "Working Day" of the Standard Specifications for Public Works Construction (Green Book). Extensions of time for this Task Description may be granted if requested and agreed to in writing by the Director or City Manager. In no event shall Contractor work beyond the term or authorized compensation of the Master Agreement, as amended by this Project Task Description and Fee Allotment.

3. FEES TO BE PAID TO THE CONTRACTOR

Contractor's compensation for the Project is shown in Table 1, "Fee Allotment", herein. Fees shall be paid on the basis of time and materials for each task group shown in Table 1. Progress payments shall be based on work days. Appendix "A", attached, prepared by Contractor and reviewed by City, shows the parties' intent as to the elements, scope and extent of the task groups. Contractor acknowledges that performance of any and all tasks by the Contractor constitutes acknowledgment by Contractor that such tasks are those defined in Appendix "A".

Additional task groups, not shown in Table 1 or Appendix "A", will be performed by the Contractor only upon authorization of the City through the mechanism of a separate Project Task Description and Fee Allotment and Purchase Order. In the event that City directs Contractor to curtail or eliminate all, or portions of the task groups identified in Table 1 or Appendix A, then the Contractor shall only invoice the City for work actually performed. The maximum total cost of Contractor's services for this Project Task Description and Fee Allotment is **$27,000**.

TABLE 1 FEE ALLOTMENT
TRAFFIC STUDY OF THE AREA AFFECTED BY THE PROPOSED POINSETTIA 'REACH E' BRIDGE

TASK GROUP	TIME & MATERIALS
Traffic Study	$27,000
TOTAL (Not-to-Exceed)	**$27,000**

CONTRACTOR

LSA ASSOCIATES, INC.,
a California corporation
(name of Contractor)

By: _____
(sign here)

Mike Trotta, President
(print name/title)

LSA ASSOCIATES, INC.,
a California corporation
(name of Contractor)

By: _____
(sign here)

Rosalena Evans, CFO
(print name/title)

If Contractor is a corporation, this document must be signed by **one individual from each column:**

Column A
Chairman, President or Vice-President

Column B
Secretary, Assistant Secretary, CFO or Assistant Treasurer

Otherwise, the corporation must attach a resolution certified by the secretary or assistant secretary under corporate seal empowering the officer(s) signing to bind the corporation.

CITY OF CARLSBAD, a municipal corporation of the State of California

By: _____
Elaine Lukey / Public Works Director

Date: 3-22-18

APPROVED AS TO FORM:

CELIA A. BREWER, City Attorney

BY: _____
Deputy City Attorney

LSA

Appendix "A"

BERKELEY
CARLSBAD
FRESNO
IRVINE
LOS ANGELES
PALM SPRINGS
POINT RICHMOND
RIVERSIDE
ROSEVILLE
SAN LUIS OBISPO

January 5, 2018

Craig Williams
Transportation Planning and Mobility
City of Carlsbad
1635 Faraday Avenue
Carlsbad, CA 92008

Subject: Professional Services Proposal: Poinsettia Lane "Reach E" Circulation Services

Dear Mr. Williams:

LSA Associates, Inc., doing business as LSA, has prepared this professional services proposal to provide the City of Carlsbad (City) with circulation services regarding the extension of Poinsettia Lane ("Reach E"). This proposal includes four discrete tasks: a traffic analysis, a cut-through traffic evaluation, an intersection geometric analysis, and traffic calming recommendations. Each task is described below.

Traffic Analysis

The Traffic Impact Analysis (TIA) prepared for the Poinsettia 61 residential project by LSA includes traffic model data from the San Diego Association of Governments (SANDAG) for 2035 conditions with the Poinsettia Gap Closure. In January 2017, LSA prepared a separate analysis examining the existing plus project impacts in the Viadana and Pavoreal neighborhoods. This analysis did not include 2035 or 2040 traffic projections. LSA will request from the City any model data prepared for the 2015 General Plan update, such as base year model data or 2035 conditions without the Poinsettia Gap Closure that could assist in establishing growth rates. LSA will apply growth rates to forecast 2040 roadway volumes and will apply National Cooperative Highway Research Program (NCHRP) 225 methodology to forecast 2040 turn volumes.

The recommended study area would include the following roadway segments:

- Poinsettia Lane (Aviara Parkway to Ambrosia Lane)
- Poinsettia Lane (Ambrosia Lane to Cassia Road)
- Poinsettia Lane (Cassia Road to El Camino Real)
- El Camino Real (Cassia Road to Poinsettia Lane)
- El Camino Real (Poinsettia Lane to Aviara Parkway)
- Cassia Road (Poinsettia Lane to El Camino Real)
- Ambrosia Lane (Poinsettia Lane to Aviara Parkway)
- Mimosa Drive (Oriole Court to Aviara Parkway)
- Dove Lane (Moorhen Place to El Camino Real)

In addition, the study area would include the following intersections:

- Ambrosia Lane/Poinsettia Lane
- Poinsettia Lane/Cassia Road
- El Camino Real/Cassia Road
- El Camino Real/Poinsettia Lane
- El Camino Real/Dove Lane
- El Camino Real/Aviara Parkway
- Ambrosia Lane/Aviara Parkway

- Skimmer Court/Poinsettia Lane/Oriole Court
- Mimosa Drive/Moorhen Place
- Dove Lane/Moorhen Place
- Mimosa Drive/Aviara Parkway

LSA recommends collecting new 24-hour roadway volume data at all study roadway segments. LSA had previously collected traffic turn volume data at Ambrosia Lane/Poinsettia Lane, Poinsettia Lane/Cassia Road, El Camino Real/Cassia Road, and El Camino Real/Poinsettia Lane. However, new peak-hour turn volume data including bicycle and pedestrian data would be collected at all study intersections. Previously collected vehicle traffic volume data will be used to confirm the anticipated annual growth rate.

LSA will request City accident data for the roadways and intersections in the study area. LSA will also query Transportation Injury Mapping System (TIMS) and Statewide Integrated Traffic Records System (SWITRS) data. The existing setting will include a summary of accident data including location and cause.

As part of the existing setting, LSA will apply the City's multi-modal level of service (MMLOS) tool to score the roadways in the study area. It should be noted that the City's General Plan establishes different modal priorities for different classifications of roadways and LSA will account for these established priorities in the MMLOS analysis. LSA will comment on future multi-modal facility needs based on the existing MMLOS analysis and established modal priorities.

As mentioned previously, LSA will use the NCHRP 225 methodology to forecast future (2040) traffic volumes. LSA will analyze existing plus Poinsettia Gap Closure and 2040 with Poinsettia Gap Closure traffic volumes with existing lane configurations according to Highway Capacity Manual (HCM) methodology to calculate delay and level of service for the study intersections. At unsignalized locations, LSA will apply all-way stop control and traffic signal warrants and report on whether traffic volumes meet the warrants. LSA may also analyze roundabouts at certain locations such as Poinsettia Lane/Cassia Road and Skimmer Court/Poinsettia Lane/ Oriole Court if requested by the City.

Levels of service will be disclosed for roadways, intersections, and modal choices for the future conditions. Any improvements necessary to maintain satisfactory LOS will be identified. The comparisons for with and without "Reach E" will also be disclosed. LSA will review other Significance Thresholds and Neighborhood Traffic Context recommendations for acceptable increases in local and collector street traffic within neighborhoods from the Federal Highway Administration (FHWA), the National Association of City Transportation Officials (NACTO), the Institute of Transportation Engineers (ITE), the California Department of Transportation (Caltrans), Complete Communities, Circulate San Diego, and others. These will be suggested as criteria for the community to consider when evaluating the change in traffic associated with "Reach E".

Deliverable:

Traffic Analysis, illustrating existing setting, future no extension and future extension traffic volumes, and levels of service.

Cut-Through Traffic Evaluation

LSA's report will contain a thorough explanation of methodology and conclusions in a section evaluating the potential for cut-through traffic with the completion of Poinsettia Lane. LSA will examine the difference in traffic assignment between the traffic models with Poinsettia Lane and those without Poinsettia Lane. In addition, LSA will have speed surveys conducted at five (5) locations in the area over a 48-hour period under existing conditions. These surveys will be conducted at the same time as the traffic counts are taken and may be

collected by pneumatic tubes. These locations could be on Cassia Lane, Ambrosia Lane, Mimosa Drive, Poinsettia Lane east, or other sites at the direction of the City.

This examination will show which roadway volumes are anticipated to increase and which are anticipated to decrease as a result of the gap closure. Comparing the traffic volumes will show the relative magnitude of change. The existing speed profile will illustrate the average and prima facia speeds along the five selected routes. LSA will also prepare an analysis of travel time savings for various potential cut-through routes. Routes with potential travel time savings would be more likely to contribute to cut-through traffic than routes with no time savings. The time savings analysis will help identify the origins and destinations of the traffic volume changes identified by the traffic model. The combination of these two methods will allow LSA to estimate turn volumes of cut-through traffic. LSA's conclusions regarding cut-through traffic will be added to existing traffic volumes.

The intersection of El Camino Real/Poinsettia Lane was recently modified to convert the southbound right-turn lane to a third through lane. LSA will include a section in the report focusing on this intersection and movement. Restoring the southbound right-turn lane would remove a southbound through lane. Adding a southbound right-turn lane would require roadway widening. LSA will measure the width of the curb lane and observe its operation to help identify whether its existing configuration can operate as a de facto right-turn lane. LSA will identify whether the volume of southbound right-turning vehicles meet any established design guidelines for an exclusive right-turn lane. This section will present a comparison of intersection performance given three southbound configurations: one left, two through, and a through-right; one left, two through, and a right; and one left, three through, and a right. This section will summarize a technical memorandum to be prepared by LSA biology experts describing the habitat adjacent to El Camino Real and potential environmental impacts of the roadway widening. This section will also summarize a technical memorandum to be prepared by an engineering partner providing a high-level cost estimate of roadway widening.

Deliverable:

Technical Memorandum, with graphics, showing comparisons of intersection geometrics on levels of service and cost, and gross level potential natural resource impacts of alternative southbound lane complements.

Traffic Calming Recommendation

LSA will review the Carlsbad Residential Traffic Management Program to determine the toolbox of potential traffic calming solutions and thresholds for application as they would apply to neighborhoods accessed by Mimosa Drive. LSA will request from the City the design and construction costs associated with completed traffic calming projects within the City. If the report recommends implementation of any traffic calming elements, LSA will include a summary of potential traffic diversion (benefit) and design and construction costs. If requested by the City, LSA will attend one meeting with neighborhood homeowners to review the quantity of cut-through traffic anticipated as a result of Poinsettia Lane "Reach E" and the potential traffic calming solutions. Feedback from neighborhood homeowners regarding the potential traffic calming solutions will be included in the final report.

Deliverable:

One (1) Conceptual Drawing, of traffic calming recommendations for one roadway application (e.g., Mimosa Drive or Cassia Lane or Ambrosia Lane, etc.) overlaid on aerial photography for use by the City in meetings with homeowners.

~~Optional Task~~

~~It is conceivable that issues may arise as a result of the analysis, the presentation of the analysis or the dialogue in the public outreach. To this end, LSA proposes an optional task for unanticipated matters that may occur during the work effort. LSA will be available on a time and materials basis to address these matters with the City staff. LSA will only initiate work on this optional task after a discussion with City staff, and preparation and approval of a written LSA Additional Work Request by the City Project Manager.~~

~~LSA will prepare a draft technical letter (inclusive of the four task deliverables) within 8 weeks of receipt of the traffic volume/speed and traffic model data. The letter will include color graphics and all analysis worksheets as attachments. LSA will revise the draft technical letter based on one round of City review. LSA will also make one round of revisions after public review. LSA attendance at public hearings can be requested on a time-and-materials basis outside of this Scope of Work.~~

Based on this Scope of Work, a budget of $27,000 is required for preparation of the traffic study. This amount will be billed consistent with the attached terms and conditions. This amount will not be exceeded without prior authorization. ~~The Optional Task will be billed on a time and materials basis with a maximum of $3,000. This amount will only be utilized after LSA prepares a written Additional Work Request and that request is approved by the City Project Manager.~~ A draft traffic study will be submitted to the City for review within 8 weeks following receipt of data.

Thank you for the opportunity to submit this proposal. LSA looks forward to working with you on this project.

Sincerely,

LSA Associates, Inc.

Anthony L Petros

Anthony Petros
Principal

Attachment: Schedule of Standard Contract Provisions and Billing Rates

THE ABOVE STATED TERMS ARE HEREBY ACCEPTED AND AUTHORIZED.

CONSULTANT:	**CLIENT:**
LSA Associates, Inc.	
Company	Company
Anthony Petros	Authorized Signature
Principal	
Title	Title
Date	Date

Getting Started

- Purpose
- Planning process
- Input process
- Next steps

Neighborhood Traffic Workshop

Poinsettia Lane Completion Traffic Study
November 7, 2018

Conversation Guidelines

- Respect for all
- Balance what is important to you with curiosity for what is important to others
- Speak one at a time
- Speak for yourself with "I" statements
- Listen to understand

Welcome

- Craig Williams, Senior Engineer
  City of Carlsbad
- Kim Hysha, Principal
  Dialogue Partners

Attachment C

Project Overview

- History of project
  - Master plan
  - Completed by Lennar
  - Traffic study

Conversation Guidelines

- Participate in the dialogue
- Any sustainable solution considers the needs and interest of all of us
- Agree to disagree
- If an idea doesn't work for you, propose a solution that works for you and others

Safety and Sustainability

- Safe and efficient east-west travel
  - Designed for anticipated traffic volume
  - Connects Carlsbad Blvd/I-5 to El Camino Real
  - Multimodal transportation
- Environmentally beneficial

Hopes and Expectations

- Meet your neighbors
  - Name
  - Neighborhood and time in the area
  - Hopes and expectations for tonight

Your Traffic Experiences

- What have you seen?
- What traffic trends have you observed?
- What are drivers doing or not doing?
- What do you expect to happen when Poinsettia Lane is complete?

Planned Traffic Signals

- Entrance to Poinsettia 61 development
- Poinsettia / Cassia Rd.
- Poinsettia / Oriole Ct. and Skimmer Ct.

- Considered as part of traffic study

Priorities for the Future

- As a driver, what is most important?
- As a cyclist, what is most important?
- As a pedestrian, what is most important?
- What is most important for nearby schools?
- What is most important for residents?

Timeline and Introduction

- Summer 2018: road construction began
- Fall 2018: traffic study began
- Early 2019: traffic study complete
- End of 2020: roadway and bridge complete

Next Steps

- Feedback in traffic study
- Share with city council
- Email newsletter list for updates

City of Carlsbad

Poinsettia Lane Completion Project

Neighborhood Traffic Workshop
Wednesday, November 7, 2018

Resident Feedback

QUESTION: What brought you here?
Concerns:

- Current traffic
- Noise
- Noise from morning traffic on Cassia
- Aesthetics and noise of roadway completion – the way it is now is not a livable street
- Traffic speeds
- Safety
- Bridge sightline
- Need for traffic control
- Timeline for project
- Observation of accidents and near accidents
- Northbound El Camino Real (ECR)/Poinsettia Lane (Poinsettia) going from three lanes to two which slows down high speed traffic
- Danger of westbound Poinsettia traffic turning right at Black Rail Road (Black Rail)
- Poinsettia reducing from two lanes to one past Aviara Parkway
- Where Poinsettia goes from four lanes to two
- Traffic lights on Poinsettia not alleviating traffic issues on Cassia Road (Cassia)
- Lack of parking at Poinsettia 61
- Parking issue on Ambrosia Lane (Ambrosia) south of Poinsettia (where cars were abandoned during fire)
- Available fire exit
- Fire safety and emergency access
- Need for more ingress and egress
- Not safe for pedestrians (no sidewalk) west of Black Rail on Poinsettia
- More traffic to Melrose Drive (Melrose) using Poinsettia
- Dangerous curve on Skimmer and Oriole Courts at fast speed
- Low visibility where Dove Lane (Dove) meets Moorhen Place (Moorhen)
- Mitigate northbound traffic from cutting through residential neighborhoods
- Drivers not stopping on Cassia
- Lack of pedestrian crossing at Poinsettia/Cassia
- Drivers not stopping on Ambrosia
- Speeds and line of sight on Ambrosia
- Access to Ambrosia off Docena Road and Calliandra Road
- Would like to see speed limits of 35 mph or less
- Dangerous crossings to get to the park currently and would get worse with completion of Poinsettia
- Lack of bike lane
- Bike lane safety
- Traffic bottle neck at Poinsettia and Black Rail

- Unsafe traffic all times of day especially at rush hour
- Lack of police response to current traffic conditions
- Path of travel Cassia v. Poinsettia
- Poinsettia will turn into Palmar Airport Road (PAR)
- Concern regarding use by residents east of ECR adding to volume when they use Poinsettia to access 1-5, coast, etc.
- Lack of disclosure about road completion to new home buyers
- Increased wildlife (coyotes, snakes, etc.) in the area resulting from construction
- A need to study traffic east of ECR
- Input process if the bridge is already "done"

- Trucks
- Event traffic platoons

Hopes:

- Speed control, signals, 4-lane expansion
- Pedestrian access/crossing between Skimmer and Oriole Courts
- Dedicated right turn lane from ECR to Poinsettia
- Safe ingress and egress to/from neighborhoods
- Increase line of sight distance at Cassia turning onto ECR
- The city will listen to traffic experts and not solely rely on public input
- Avoid confusion like with the roundabouts on Cassia

Expectations and interest in learning about:

- Relief of traffic on Cassia
- Status of Cassia cut-through traffic
- Extent of project
- Completion date
- Planned traffic control
- Speed of traffic on ECR
- Speed limit on Poinsettia
- Traffic volume on Poinsettia
- Parking on Poinsettia
- Accessibility to schools and churches
- Practical solution for traffic concerns
- Sound walls
- Protection for vehicles entering residential area

Suggestions and comments:

- Close Oriole to prevent cut-through traffic to shopping center
- Flashing pedestrian crossings
- No current traffic/speeding concerns at Skimmer and Oriole

QUESTION: What have you observed?

- Need for stop sign at Mimosa and Moorhen
- Drivers using Moorhen as a cut through route to get to shopping center
- School traffic cutting through Pavoreal and Viadana to get to the shopping center
- Need for bumps or traffic calming at Mimosa/Oriole
- Drivers ignoring existing stop sign at Mimosa/Oriole
- More traffic at Skimmer and Oriole
- Cut through traffic
- Speeding and rude driving on ECR and Ambrosia
- Impatient drivers
- Parked cars on Ambrosia
- Vehicle parked on sidewalk
- Less traffic south, more traffic north
- Drivers using Poinsettia as a thoroughfare to Melrose
- Cut through traffic at Cassia and Oriole
- Lack of pedestrian safety at Poinsettia/Black Rail
- "Drag racing" on Poinsettia
- Sidewalk access incomplete or lacking
- Speeding down Mimosa and entire traffic study area
- Kids on bikes at Black Rail
- Cassia left turn lane to ECR (northbound) backs up
- Speeding, too much traffic volume on Cassia
- Speeding
- Downhill speeding
- Drivers not slowing to 35 mph at Black Rail
- Backed up traffic at Poinsettia/Aviara going straight, no one in the two lanes to turn right
- Unsafe crossings at Ambrosia from lack of sight line
- Need for countdown/crosswalk at Poinsettia by the park
- Need for speed bumps on Cassia
- Gaining speed from right hand turns at Black Rail to Poinsettia
- Commuter traffic
- Cassia backs up in the morning
- Speeds are too fast on Ambrosia and only one stop sign
- Increased traffic with ViaSat expansion
- Need for additional access to school off Ambrosia
- Speeding on Poinsettia
- Parking on Ambrosia
- Church activity
- School session
- Bridge impacts homeless
- Speed and line of sight
- Parking violations
- Need for regional buses more than once every hour
- Need to consider lane with new shopping center open
- Need to plan beyond 2018-19

- Hope that people continue using the roads they are used to and don't start taking side streets
- Would love to see pillow bumps on Cassia
- Dangerous speeds on Cassia/Ambrosia
- Noisy on Fairlead Ave
- Worried about crossings
- Worried about increased traffic with Viasat
- Need to plan for more people and traffic
- Westbound on Cassia to northbound ECR is a concern
- Access to Poinsettia at Skimmer could be difficult with speeds
- Cut through traffic to shopping center
- Southbound ECR traffic without righthand turn lane
- Quiet traffic on Skimmer/Oriole

- Truck/delivery

QUESTION: What should the city's priorities be or what should the city know thinking as a...

Driver

- Bottle neck on Poinsettia
- Less traffic signals
- Parked cars on Ambrosia
- Safety
- Ability to get to work
- Avoid ECR
- Need for "adaptive traffic signals" (e.g. Poinsettia at ECR)
- Help traffic at nearby streets
- There need to be reasonable speeds

Cyclist

- Unsafe
- Wide, dedicated bike lanes
- No sharrows
- Want bike trails to school and open spaces
- Turn trails into bike trails
- Clean lines of sight
- No parked cars
- Good buffer
- Speeds about the same as cars
- Safe bike trails
- Connections to schools and churches
- Want cyclists to not ride in a row (blocking the lane)

Pedestrian

- Bottleneck
- Sidewalks end and are limited
- Safe sidewalks
- Poinsettia should allow for multimodal use community road (not arterial)
- Sidewalk completion ECR/Poinsettia
- To be able to cross Poinsettia at Cassia
- Trail connection offset from road along both sides of Poinsettia

Resident

- Less traffic and convenience
- Road noise needs to be quieter
- Need for dedicated right turn lane on ECR (south) to Poinsettia (west)
- Less noise on Cassia so we can sleep with windows open
- Least amount of traffic through neighborhoods
- Sound barriers/landscaping for safety
- Maintaining the character of the neighborhood
- Listen to residents and check-in
- Enforcement on Cassia, increased patrols

- Recognize that there are residences on both sides
- Maintain character of roadway
- Concerns about cut through traffic heading south toward library

Schools

- Need direct paths to schools
- No sign on Ambrosia that says 25 mph when kids are present
- Emergency vehicles not able to get to school due to parked cars
- Increased safety for crossing
- Wider speed bumps on Ambrosia
- Kids being able to get to school along trail
- Need cross walks along Ambrosia
- Crossing guards
- New trail from development to school

Questions:

- Did area churches contribute to any road improvements?
- Will there be rubberized asphalt on the new section of Poinsettia?
- Can there be speed feedback devices on Poinsettia?
- Where is the park going to be?
- Will trails come off Poinsettia?
- Will there be parking along the road?
- Will there be a parking lot by trails?
- What is the roadway going to look like?
- Is it going to be two lanes the entire way?
- How many lanes will it be?
- Is it going to be a city or county road?
- Will condos be completed before the road?
- Will you put stop signs along Kalima Circle at Poinsettia Heights gate locations?
- What measures will you take immediately to calm traffic on Cassia?
- Bike lane needed on Cassia if Poinsettia is going to have bike lane?

Suggestions/Comments:

- Gate neighborhood but keep roads public
- Signal will make it feel more like drivers are supposed to turn
- Create something that appears like a neighborhood entry (median or guard shack)
- No go on speed bumps/humps, other treatments could be considered (expanding curbs, etc.)
- Don't want congestion
- No left turn onto Cassia from Poinsettia during specific hours
- More enforcement for speeding and trucks
- Left turn signal too short at ECR/Poinsettia
- Please consider increased police presence on Cassia to enforce speed limits
- Dedicate one of the two right-turn lanes at Poinsettia/Aviara for straight traffic
- Dedicate one lane to right-turn at Aviara/Ambrosia
- Decrease speed limit on Poinsettia (40-45 mph)
- Add yellow lane pocket to help traffic that backs up trying to turn right off Cassia to ECR
- Flashing stop signs at Cassia/Poinsettia
- New lights on Poinsettia = traffic stays on Cassia
- Dedicated right turn lane from ECR onto Poinsettia (west)
- Flashing crosswalk at Poinsettia/Fairlead Avenue
- Poinsettia traffic should be optimized during heavy traffic periods
- Consider flashing lights or other features to help access from intersections on Cassia

- Segment without Black Rail

Minutes of:	PLANNING COMMISSION
Time of Meeting:	6:00 p.m.
Date of Meeting:	February 1, 2017
Place of Meeting:	COUNCIL CHAMBER

CALL TO ORDER

Chairperson Segall called the meeting to order at 6:00 p.m.

PLEDGE OF ALLEGIANCE

Commissioner Goyarts led the Pledge of Allegiance.

ROLL CALL

Present: Chairperson Segall, Commissioners Anderson, Black, Goyarts, L'Heureux, Montgomery and Siekmann

Absent: None

STAFF PRESENT

Don Neu, City Planner
Ron Kemp, Assistant City Attorney
Teri Delcamp, Senior Planner
Paul Dan, Associate Planner
Jason Geldert, Engineering Manager
Craig Williams, Transportation Manager

PUBLIC COMMENTS ON ITEMS NOT LISTED ON THE AGENDA

Robert Wilkinson, Suite I, 2911 State Street, shared his concerns with projects that come before the Commission for consideration prior to the final Village Master Plan regarding outdated standards, character, development in the core village area and parking issues.

PLANNING COMMISSION PUBLIC HEARING

Chairperson Segall asked Mr. Neu to introduce the first item and opened the public hearing on Agenda Item 1.

1. **EIR 15-03/GPA 14-06/ZC 14-04/LCPA 14-06/CT 14-10/PUD 14-12/SDP 14-15/CDP 14-34/HDP 14-07/HMP 14-04 — POINSETTIA 61** — Request for the certification of an Environmental Impact Report, including the approval of Candidate Findings of Fact and a Mitigation Monitoring and Reporting Program, and a recommendation of approval of a General Plan Amendment from R-4 to R-8 (no change to project unit yield) and to adjust the boundaries of the open space and residential land use designations, a Zone Change from One family Residential (R-1) and Open Space to Residential Density-Multiple (RD-M) and Open Space (OS) and OS Land Use and zoning for an adjacent 10 acre site as mitigation land, a Local Coastal Program Amendment, Vesting Tentative Tract Map, Planned Development Permit, Site Development Plan (affordable housing component), Hillside Development Permit and a Habitat Management Plan permit for the development of a 50.8 acre site for a 123-unit single family detached condominium project and construction of the last remaining section of Poinsettia Lane ("Reach E"), all located south of Cassia Road, between the existing western and eastern segments of Poinsettia Lane, and east of Ambrosia Lane within the Mello II Segment of the Local Coastal Program and Local Facilities Management Zone 21. The project is not within the appealable area of the California Coastal Commission.

Mr. Neu introduced Agenda Item 1 and stated Senior Planner Teri Delcamp would make the staff presentation assisted by Engineering Manager Craig Williams and Tim Gnibus with HDR Engineering Inc.

Chairperson Segall asked if any of the Commissioners have ex parte communications to disclose for this item.

Commissioner Anderson disclosed that she attended the public meeting on the Community Benefit Agreement held at the Faraday Administration building and she drove by the property.

Commissioner Black disclosed that he viewed the site on Google Maps and drove by the property.

Commissioner Goyarts disclosed that he also viewed the site on Google Earth, read an article dated February 1st in the Weekly Pulse County referencing a San Diego Union Tribune article and read an article in the Coast News.

Commissioner L'Heureux disclosed that he viewed the site on Google Earth, walked around the premises and stated that he is a tenant with O'Day Consultants as they are the civil engineer on the project, although he has not discussed the project.

Commissioner Montgomery disclosed that the walked around the site.

Chairperson Segall disclosed that he walked and drove around the project, viewed the location on Google Earth and read media coverage.

Ms. Delcamp, Mr. Gnibus and Mr. Williams gave a presentation and stated they would be available to answer any questions.

Chairperson Segall asked if there were any questions of staff.

Commissioner Goyarts inquired about the number and type of electric charging stations available. Mr. Gnibus stated that there will be one charging station available for each home and also for general visitor parking. Commissioner Goyarts inquired about the plan and timing to pave the section of Poinsettia Lane that narrows down to one lane west of Black Rail Road so that, if approved, two lanes are available as the developer builds a bridge with traffic flowing down the artery west of the project. Mr. Williams stated that the city has a developer-build or widen roadways adjacent to planned development. He stated that the section of Poinsettia Lane has vacant parcels on both sides of the road. The developer of those vacant properties would be required to make those improvements as a condition of approval of their development. Mr. Williams concluded that the two lane section of the road currently has a fairly good distance between the two signals. The current capacity of the roadway is 8 thousand cars, however; the capacity of the roadway is close to 18 to 20 thousand cars. It is expected to see a rebalance of traffic when the roadway would open.

Commissioner Black asked how traffic management figures if the 4 traffic signals located on Cassia Lane and Poinsettia Lane, Ambrosia Lane, between streets A and B of the development and the existing signal on Oriole Court and Skimmer Court are not in tune with each other from a short driving distance. Mr. Williams replied stating that the signals will be carefully synchronized so that vehicles do not have to stop at each signal. He stated that it is important to have those signals to make sure pedestrians have a chance to cross the street in a safe manor.

Commissioner Anderson asked if the synchronized lights are only good for one direction as the other direction will likely stop more often. Mr. Williams stated that traffic lights are generally synchronized for the inbound trips in the a.m. and the outbound trips in the p.m. and that there will be a reasonable balance. Commissioner Anderson asked if the roundabout on Cassia Lane is permanent or temporary. Mr. Williams stated that the traffic circles were put in on a pilot basis to address significant speeding concerns from the residents. He stated that they are effective for reducing speeding, from and 12 miles per hour, since they have been added to the roads and whether they stay in the manor that they are in now or whether they are converted to a curb section is yet to be determined.

Commissioner Montgomery asked if the city would be able to react quickly to stop overload from bypass traffic between Oriole Court and Dove Lane to access the shopping center. Mr. Williams replied stating that the trip time of both routes will be analyzed to propose a less desirable route as a cut-through.

Commissioner Anderson asked if solar panels will be installed on the homes by the developer. Mr. Gnibus replied yes.

Commissioner Black asked about the nature of inclusionary housing. Ms. Delcamp stated that projects are required to provide 15% of the units as affordable housing. Some projects end up building the units onsite, others have the ability to pay a fee if it is less than a certain number of housing that is being built and others purchase credits that have been built by someone else above and beyond as they are available as mitigation. She stated that there are provisions in the code for alternatives to be proposed and discussed with the Housing Policy Committee. 17 additional units have been proposed in the southern portion of this project that went away and were proposed to help meet the inclusionary housing requirements. Ms. Delcamp stated that the constraints associated with the existing canyon, the riparian habitat that requires buffers as well as preservation and the desire and the need to preserve as much habitat as possible adversely impact the feasibility of constructing the inclusionary units on-site. She added that the applicant proposed to provide the maximum number of 15 accessory dwelling units under the code and concluded that the requirement is to provide 19 units in total, 15 accessory dwelling units and the purchase of 4 inclusionary housing credits.

Chairperson Segall asked if there were any further questions of staff. Seeing none, he asked if the applicant wished to make a presentation.

David Stern, Vice President of Acquisitions for Lennar Homes of California, John Baayoun and Andrew Han, Suite 300, 25 Enterprise, Aliso Viejo, Chris Texter, KTGY Architecture & Planning, Suite 200, 17911 Von Karman Avenue, Irvine, made the presentation and stated they would be available to answer any questions.

Commissioner Black asked if the arrangements between Lennar Homes of California, North County Advocates and some of the environmental organizations were made to produce the park and the restoration etc. Mr. Han stated yes, it is an agreement that is being contemplated between the city, the developer as well as community groups and environmental advocacy groups. Commissioner Black asked if the agreement has been formalized. Mr. Han stated no.

Commissioner Anderson inquired about the lifespan of solar panels. Mr. Baayoun stated that every home will be provided with a solar system through SunStreet Energy for 20 years at no cost to the home owner. He added that Sunstreet Energy will maintain all systems and the home owner will have a choice to either install an updated new system or to remove the system at the end of the 20 year cycle. Commissioner Anderson asked if Lennar pays for the removal if the homeowner chose to do so. Mr. Baayoun replied yes.

Chairperson Segall asked if there were any further questions for the applicant. Seeing none, he asked if any members of the audience wished to address Agenda Item 1. Chairperson Segall opened public testimony.

Josh Bourgeois, Golden State Environmental Justice Alliance, 2995 Gunsmoke Road, Corona, stated that the Environmental Impact Report (EIR) is flawed and should be redrafted and recirculated. He stated that the EIR does not present any analysis of impacts or potential mitigation measures from potential overlap of construction phases.

De'Ann Weimer, 6606 Fiona Place, representing Friends of Aviara and Aviara Premier Collection Homeowners Association, stated that she supports the project in terms of the addition and restoration of open space and what it means for the community for walkability.

Carl Krumrei, 6839 Moorhen Place, stated that he is disappointed in the timeliness, completeness and accuracy of the response given by the city to questions raised by residents impacted by the proposed road completion and stated his concerns with traffic.

Mark Tanner, 1777 Skimmer Court, stated his concerns with traffic and noise.

Mel Peterson, 6847 Moorhen Place, stated her concerns with traffic mitigation, speed and safety of the community.

Brett Porath, 6855 Moorhen Place, stated his concerns with traffic.

John Vance, 7905 Vista Canela, stated that he supports the project.
Paul Holdaway, 1760 Skimmer Court, stated that he is pleased to see signalized intersections for pedestrian crossing and shared concerns with noise and traffic.

Jeremy Peyton, 1730 Fairlead Avenue, stated his concerns with safety and traffic.

Theresa Perkins-Kirven, 6865 Mimosa Drive, stated her concerns with traffic and safety.

George Showah, 1711 Camassia Lane, stated that he supports the project and the signalized intersections.

Laure Brown, 1726 Oriole Court, shared her concerns with traffic, safety and noise.

Jay Brandenburg, 1770 Oriole Court, stated his concerns with traffic and speed.

Brian Connor, 4815 Windjammer Way, stated his concerns with traffic and commented that street parking for inclusionary housing has not been carefully evaluated.

Chairperson Segall asked if any member of the audience wished to address Agenda Item 1. Seeing none, he opened and closed public testimony.

RECESS

Chairperson Segall called for a 10-minute recess at 9:56 p.m.

MEETING CALLED TO ORDER

Chairperson Segall called the meeting to order at 10:06 p.m. with all Commissioners present.

Mr. Neu stated that staff is recommending that Agenda Item 2, be continued to a date certain of February 15, 2017.

2. **CT 14-11/PUD 16-02/CUP 14-10 – CARLSBAD BOAT CLUB & RESORT** – Request for a Tentative Tract Map, Nonresidential Planned Unit Development Permit and Conditional Use Permit for the demolition of a restaurant and single family residence and to allow the construction of a twenty (20) unit timeshare condominium project with underground parking on approximately one acre of land located at 4509 Adams Street, on the south side of Adams Street between Highland Drive and Park Drive, within the Agua Hedionda Segment of the Local Coastal Program (LCP) and in Local Facilities Management Zone 1. The City Planner has determined that the project belongs to a class of projects that the State Secretary for Resources has found do not have a significant impact on the environment, and it is therefore categorically exempt from the requirement for the preparation of environmental documents pursuant to state CEQA Guidelines Section 15332 - In-fill Development Projects. The Agua Hedionda LCP Segment is in an area of deferred certification where the City of Carlsbad does not have permit authority to issue Coastal Development permits and thus, the project will need to obtain a Coastal Development Permit issued by the California Coastal Commission.

MOTION

ACTION:	Motion by Commissioner Montgomery and duly seconded by Commissioner L'Heureux that the Planning Commission continue Agenda Item 2 to a date certain of February 15, 2017.
VOTE:	7-0
AYES:	Chairperson Segall, Commissioner Anderson, Commissioner Black, Commissioner Goyarts, Commissioner L'Heureux, Commissioner Montgomery and Commissioner Siekmann
NOES:	None
ABSENT:	None
ABSTAIN:	None

AGENDA ITEM 1 CONTINUED

Commissioner L'Heureux inquired about a time frame the city would have before the Via Donna neighborhood will start to experience actual impact. Ms. Delcamp stated that Lennar Homes of California envisions construction from 2018 to 2020.

Commissioner Anderson asked how many street parking spaces are counted. Ms. Delcamp stated that on street parking along the private streets and one side of the main drive aisle will be available. Commissioner Anderson inquired about the number of single story units. Mr. Han replied stating 21 homes.

Commissioner L'Heureux asked if the project will be phased. Mr. Baayoun stated yes, although the construction of the homes will be dependent on market conditions. Commissioner L'Heureux asked if the units will be allowed to be occupied before the bridge is completed and the timing of construction completion. Mr. Baayoun replied 36 months from approval of the subdivision agreement.

DISCUSSION

A motion was made by Commissioner Montgomery, which was seconded by Commissioner Goyarts, to recommend to the City Council consideration of a traffic signal at the intersection of Oriole Court/Skimmer Court and Poinsettia Lane that benefits primarily pedestrian crossing and a traffic signal at Cassia Road and Poinsettia Lane as part of the CIP; the traffic department take a proactive role identifying existing traffic counts and patterns through the Via Donna neighborhood; and that there is outreach to the Homeowner's Association for any possible traffic calming measures that they would agree upon jointly with the city. The Commission voted 7-0.

MOTION

A motion was made by Commissioner Siekmann, which was seconded by Commissioner Black, to extend the meeting until 10:15 p.m. The Commission voted 7-0 to extend the meeting.

MOTION

ACTION: Motion by Commissioner Montgomery and duly seconded by Commissioner Siekmann that the Planning Commission adopt Planning Commission Resolution No. 7224 recommending that the City Council certify the Environmental Impact Report EIR 15-03, including the approval of Candidate Findings of Fact and a Mitigation Monitoring and Reporting Program, adopt Planning Commission Resolution No. 7225 recommending approval of General Plan Amendment GPA 14-06, Zone Change ZC 14-04 and Local Coastal Program Amendment LCPA 14-06, and adopt Planning Commission Resolution Number 7226 recommending approval of Carlsbad Tract Map CT 14-10, Planned Development Permit PUD 14-12, Site Development Plan SDP 14-15, Coastal Development Permit CDP 1434, Hillside Development Permit HDP 14-07 and Habitat Management Plan Permit HMP 14-04 based on the findings and subject to the conditions contained therein including the errata sheet as amended.

VOTE: 7-0

AYES: Chairperson Segall, Commissioner Anderson, Commissioner Black, Commissioner Goyarts, Commissioner L'Heureux, Commissioner Montgomery and Commissioner Siekmann

NOES: None

ABSENT: None

ABSTAIN: None

Chairperson Segall closed the public hearing on Agenda Item 1.

COMMISSION COMMENTS

Chairperson Segall asked if there is a way to send public noticing to complete communities that will be impacted rather than the 600 foot radius. Mr. Neu stated that direction would be needed from the City Council as the state law requirement is only 300 foot radius from the subject property.

CITY PLANNER COMMENTS

Mr. Neu commented that the Commission should hold on to the Staff Report to the Carlsbad Boat Club and Resort as the item has been continued to February 15, 2017.

CITY ATTORNEY COMMENTS

None.

ADJOURNMENT

By proper motion, the Regular Meeting of the Planning Commission of January 18, 2017 was adjourned at 10:12 p.m.

Don Neu

DON NEU
City Planner

Farah Nisan
Minutes Clerk

CITY COUNCIL
Minutes

Council Chamber
1200 Carlsbad Village Drive
Carlsbad, CA 92008

March 14, 2017, 6 p.m.

CALL TO ORDER: 6:00 p.m.

ROLL CALL: M. Hall, K. Blackburn, M. Schumacher, C. Schumacher, M. Packard.

INVOCATION: None.

PLEDGE OF ALLEGIANCE: Mayor Pro Tem Blackburn led the Pledge of Allegiance.

APPROVAL OF MINUTES:
Minutes of the Regular Meeting held January 24, 2017.
Minutes of the Joint Special Meeting held January 24, 2017.
Minutes of the Special Meeting held February 14, 2017

Motion by Mayor Pro Tem K. Blackburn, seconded by Council Member M. Schumacher, to approve the minutes as presented. Motion carried, 5/0.

PUBLIC REPORT OF ACTION TAKEN IN CLOSED SESSION:

City Attorney Celia Brewer announced the City of Carlsbad and North County Advocates have reached a tentative resolution of the General Plan lawsuit. However that item is linked to and dependent upon the City Council's action on Item No. 5. The City Council has full authority to exercise its discretion on the item.

PRESENTATION: None.

CONSENT CALENDAR:

Item No. 4 was pulled for discussion by Council Member Cori Schumacher.

ACTION: Motion by Mayor Pro Tem K. Blackburn, seconded by Council Member M. Schumacher, to approve Consent Calendar Item Nos. 1 through 3. Motion carried unanimously, 5/0.

1. APPOINTMENT TO THE CARLSBAD GOLF LODGING BUSINESS IMPROVEMENT DISTRICT BOARD – Adoption of Resolution No. 2017-039 reappointing Ulrich Samietz to the Carlsbad Golf Lodging Business Improvement District Board. (Staff contact: Tammy McMinn, City Clerk Department)

2. CONTRACT WITH RAN ENTERPRISES, INC. FOR THE CITY HALL ROOF REPLACEMENT AND HVAC REFURBISHMENT, PROJECT NO. 4718 - Adoption of Resolution No. 2017-040 accepting bids and awarding a contract to RAN Enterprises, Inc., in the amount of $681,490 for the City Hall roof replacement and HVAC refurbishment. (Staff contact: Steven Stewart, Public Works)

3. TERMINATION OF CITY MANAGER'S DECLARATION OF A LOCAL EMERGENCY – Adoption of Resolution No. 2017-041 declaring that the Local Emergency on the west side of Batiquitos Drive, 0.25 miles south of Poinsettia Lane is terminated, pursuant to Carlsbad Municipal Code Section 3.28.120 and Public Contract Code 22050. (Staff contact: Elaine Lukey, Public Works)

CONSENT CALENDAR ITEM PULLED FOR DISCUSSION

4. AGREEMENT WITH SANDAG SERVICE BUREAU FOR EXPEDITED SERVICES WITH THE CALIFORNIA COASTAL COMMISSION - Adoption of Resolution No. 2017-042 reaffirming a commitment to the full term of an agreement with the SANDAG Service Bureau for expedited services with the California Coastal Commission. (Staff contact: Don Neu, Community & Economic Development)

   In response to Council Member Cori Schumacher, City Planner Don Neu presented the staff report and stated that the list of projects for next fiscal year had not yet been finalized.

   Council Member C. Schumacher made a motion to approve and discuss, seconded by M. Schumacher.

   In response to Council Member Cori Schumacher's inquiry about using this agreement to only fund projects that were City initiated and City led, Mayor Matt Hall stated that he believed that private projects often also give to the greater good of the community.

   In response to Council Member Cori Schumacher's inquiry about adding a stipulation to prioritize public projects and projects with critical infrastructure over private projects, City Planner Don Neu stated that they have handled it in that manner and that in coordination with the Coastal Commission, they prioritize projects on a monthly basis.

   ACTION: Motion by Council Member C. Schumacher, seconded by M. Schumacher to adopt Resolution No. 2017-042. Motion carried unanimously, 5/0.

ORDINANCES FOR INTRODUCTION: None.

ORDINANCES FOR ADOPTION: None.

PUBLIC COMMENT:

Josephina Di Salvo requested that the ACLU's Model 9 state and local law enforcement policies and rules to protect local immigrant and refugees be adopted by the City Council.

Laurie Boone spoke regarding the City Stuff program and the suggestion of the third grade participants that the City adopt an official city bird on the City's 60th anniversary.

Fred Sandquist expressed concerns relating to the issues regarding SANDAG'S Measure A.

Kim Trujillo spoke regarding concerns relating to vacation rentals and fairness.

Scott Engel spoke regarding decorum of the public and Council. He stated that he would like the common courtesy of feeling like his words were heard during the meeting.

PUBLIC HEARINGS:

Mayor Pro Tem Blackburn recused himself due to a potential conflict of interest and stepped down from the dais at 6:28 pm.

Mayor Hall and Council Members M. Schumacher, C. Schumacher and M. Packard disclosed that they had met with the project applicant.

This item was continued from the Regular Meeting of February 28, 2017.

5. POINSETTIA 61 (PROJECT NO. EIR 15-03/GPA 14-06/ZC 14-04/LCPA 14-06/CT 14-10/PUD 14-12/SDP 14-15/CDP 14-34/HDP 14-07/HMP 14-04) – Introduce Ordinance No. CS-316 approving Zone Change ZC 14-04; and, Adopt Resolution No. 2017-043 to certify the Environmental Impact Report EIR 15-03 and Errata, including the Candidate Findings of Fact and a Mitigation Monitoring and Reporting Program, approve General Plan Amendment 14-06, Local Coastal Program Amendment LCPA 14-06, Vesting Tentative Tract Map 14-10, Planned Development Permit 14-12, Site Development Plan 14-15, Coastal Development Permit 14-34, Hillside Development Permit 14-07 and Habitat Management Plan Permit 14-04 for the development of a 50.8 acre site for a 123-unit single family detached condominium project and construction of the last remaining section of Poinsettia Lane ("Reach E") located within the Mello II Segment of the Local Coastal Program and Local Facilities Management Zone 21; and, Adopt Resolution No. 2017-044 to approve a Settlement and Community Benefit Agreement. (Staff contact: Teri Delcamp, Community & Economic Development)

City Manager's Recommendation: Take public input, close the public hearing, introduce the ordinance and adopt the resolutions.

Principal Planner Teri Delcamp and Assistant City Manager Gary Barberio presented the staff report and reviewed a PowerPoint presentation (on file in the Office of the City Clerk).

The applicant's representative, David Sterne, reviewed a PowerPoint presentation (on file in the Office of the City Clerk) giving an overview of the project benefits.

Mayor Hall opened the duly noticed Public Hearing at 7:08 p.m.

Speakers in Support of staff's recommendation: Bronson Jacoway; John Beery; Stacie Greene; Ralph Williams; Marcela Escobar-Eck; Gayle Haye; Cheri Hoffman; Bob Gilbert; Jeremy Peyton; Fred Sandquist; Chancelor Shay; Howard Krauz; Robert Douglas Dentino; Lisa McAthen; De'Ann Weimer; Mary Anne Viney; Diane Ngaard; Everett Delano; Nicole.

Speakers Neutral of staff's recommendation: Brian Connor; Brett Porath.

Speakers in Opposition to staff's recommendation: Josh Bourgeois; Carl Krumrei; Theresa Perkins-Kirven.

Seeing no one else wishing to speak, Mayor Hall closed the Public Hearing at 8:04 p.m.

In response to Council Member C. Schumacher, the applicant stated that the rules are if a homeowner wishes to rent out a secondary unit it has to be a qualified renter approved through the City's Housing Authority.

In response to Council Member M. Schumacher, the applicant stated that there would be an endowment for the open space habitat area south of the project.

In response to an inquiry from Mayor Hall, Transportation Manager Craig Williams explained that currently he is not aware of a project in the CIP to improve the right turn lane.

In response to Mayor Hall, City Planner Neu explained that through annual reports, the road networks are evaluated to determine whether a roadway is meeting the City standards. Through this project, the developer will be conditioned to complete the segment of Poinsettia Lane.

Council Member Packard confirmed with staff that adequate parking would be provided for the homes constructed within the proposed project site.

In response to Council Member C. Schumacher, HDR Inc. EIR Consultant Tim Gnibus confirmed a hazardous materials study was prepared as part of the EIR and any materials such as tires and refrigerators would be removed from the project site.

In response to Council Member C. Schumacher, Manager Williams explained that the City has a residential traffic management program that they use. He stated that there is a traffic signal evaluation policy that was approved by Council that is used to look at signal light needs.

Council Member M. Schumacher asked the applicant how potential homeowners will be made aware of the impacts of the adjacent airport to the properties. In response, Mr. Stern explained the disclosures are provided with each home sale.

Motion by Council Member C. Schumacher, seconded by Council Member M. Schumacher to direct staff to utilize the Carlsbad Residential Traffic Management Program to develop traffic-calming solutions to discourage pass-through traffic in the Viadana and Pavoreal neighborhoods concurrent with the completion of Poinsettia Lane; and complete a comprehensive traffic analysis in neighborhoods encompassed by the Viadana HOA, Pavoreal HOA, Poinsettia Heights HOA and Voscana HOA located along Poinsettia Lane, including Mimosa Lane, Oriole Court, Skimmer Court, Cassia Lane, and the El Camino Real southbound turn onto Poinsettia Lane.

In response to an inquiry by Council Member M. Schumacher, Manager Williams stated that findings from staff's report will go through the Traffic Safety Commission and later be presented to Council.

Council discussion ensued regarding their support for the project.

City Attorney Celia Brewer titled the Ordinance.

ACTION: Motion by Council Member M. Schumacher, seconded by Council Member C. Schumacher, to introduce Ordinance No. CS-316 and adopt Resolution Nos. 2017-043 and 2017-044. Motion carried 4/0/1 (Mayor Pro Tem Blackburn – Absent).

ACTION: On a Minute Motion by Council Member C. Schumacher, seconded by Council Member M. Schumacher, Council directed staff to utilize the Carlsbad Residential Traffic Management Program to develop traffic-calming solutions to discourage pass-through traffic in the Viadana and Pavoreal neighborhoods concurrent with the completion of Poinsettia Lane; and complete a comprehensive traffic analysis in neighborhoods encompassed by the Viadana HOA, Pavoreal HOA, Poinsettia Heights HOA and Voscana HOA located along Poinsettia Lane, including Mimosa Lane, Oriole Court, Skimmer Court, Cassia Lane, and the El Camino Real southbound turn onto Poinsettia Lane. Motion carried 4/0/1 (Mayor Pro Tem Blackburn – Absent).

RECESS:
Mayor Hall declared a recess at 8:54 p.m. Mayor Hall reconvened the meeting at 9:00 p.m. with all Council Members present.

6. PROP D CANNON ROAD AGRICULTURAL/OPEN SPACE ZONE (PROJECT NO. ZCA 16-04/ZC 16-02/SP 207(L)/LCPA 16-03) – Adoption of Resolution No. 2017-045 approving an addendum to the Negative Declaration for Prop D Cannon Road Agricultural/Open Space Lands ZCA 09-02/ZC 09-06/SP 207(I)/SP 144(K)/LCPA 09-05 and an amendment to the Local Coastal Program; and, Introduce Ordinance No. CS-317 approving an amendment to the Carlsbad Municipal Code Title 21 (Zoning Ordinance) to add Chapter 21.209 – Cannon Road Agricultural/Open Space Zone (CR-A/OS) and recommending approval of other related amendments to the Zoning Ordinance, Zoning Map, Carlsbad Ranch Specific Plan, and the Local Coastal Program. (Staff contact: Carl Stiehl, Community & Economic Development)

Associate Planner Carl Stiehl and City Planner Don Neu presented the staff report and reviewed a PowerPoint presentation (on file in the Office of the City Clerk).

In response to Council Member Cori Schumacher's inquiry, Mr. Stiehl confirmed that Council would be able to revisit the south shore beach access during the next phase of the LCP apprehensive update.

Mayor Hall opened the duly noticed Public Hearing at 9:08 p.m.

Spoke in Support: Vicky Syage; Chris Calkins.

Seeing no one else wishing to speak, Mayor Hall closed the Public Hearing at 9:12 p.m.

In response to Mayor Hall, Mr. Neu confirmed that the materials relating to this item were available prior to the Planning Commission meeting.

Council Member C. Schumacher referenced pages 12 and 13 of the staff report and pointed out that the Coastal Commission made a change to the retail sales of goods and products related to a primary permitted open space use with a cumulative area of more than 500 square feet, changing it from the administrative hearing process to the Planning Commission process. She stated that she agreed with the change but also thought that there are two other areas where that same change should also be made. She stated she would like to see the secondary agricultural uses with retail sales of agricultural crops with a cumulative area of more than 1,000 square feet and food service including restaurants and cafes with a cumulative area of more than 500 square feet go to Planning Commission rather than an Administrative Hearing process.

Council Member M. Packard spoke in support of staff's recommendation as opposed to forcing further review process.

Council Member M. Schumacher and Mayor Pro Tem Blackburn concurred with Council Member Packard.

Council discussion ensued regarding support for the agenda item.

City Attorney Celia Brewer titled the Ordinance.

ACTION: Motion by Mayor Pro Tem K. Blackburn, seconded by Council Member M. Schumacher, to introduce Ordinance No. CS-317 and adopt Resolution No. 2017-045. Motion carried unanimously, 5/0.

DEPARTMENTAL AND CITY MANAGER REPORTS:

7. CONTRACT WITH MALLORY SAFETY & SUPPLY FOR A FIXED AND MOBILE LICENSE PLATE RECOGNITION SYSTEM – Adopt Resolution No. 2017-046 to enter into a contract with Mallory Safety & Supply for a fixed and mobile license plate recognition system in an amount not to exceed $807,025.20. (Staff contact: Cindy Anderson, Police Department)

   Captain Mickey Williams presented the report and reviewed a PowerPoint presentation (on file in the Office of the City Clerk).

   Council Member M. Packard encouraged staff to provide data relating to reduction in crime as a result of license plate recognition systems being used within a community.

   In response to Council Member C. Schumacher's inquiry regarding the width of the camera angle to capture the license plate, Captain Williams stated that the LPR's are designed to recognize and detect the license plate.

In response to an inquiry from Council Member M. Schumacher, Captain Williams explained that staff is recommending a one-year retention of the photographs. He further explained that other agencies within San Diego County also retain LPR images for one year.

In response to Council Member C. Schumacher, Captain Williams gave an overview of the crime statistics from 2015 and 2016.

Vicky Syage spoke in opposition to the proposed fixed 51 LPR's.

Pat Amador expressed concerns relating to the personal data that would be acquired through the use of the LPR's.

Noel Breen spoke in opposition to the proposed fixed 51 LPR's.

Bill Fowler spoke in opposition to the proposed contract.

Laura Drelleshak spoke in opposition to the proposed 51 fixed LPR's.

Kasey Cinciarelli spoke in support of the mobile LPR's; however, spoke in opposition of the proposed fixed LPR's.

In response to an inquiry from Council Member M. Schumacher, Captain Williams explained the source of funding for this request would be the City's Innovation Fund.

Council Member C. Schumacher confirmed that the camera also captures the area around the license plate and may capture photographs of people.

In response to Council Member C. Schumacher, Captain Williams explained that the Vigilant solution maintains a nationwide database. He further explained that the ARJIS system is a San Diego County System.

Mayor Pro Tem K. Blackburn spoke in support of the contract.

Council Member M. Schumacher spoke in favor of giving officers the tools they need.

Council Member M. Packard also spoke in support of the contract and the technology to protect Carlsbad residents.

Council Member C. Schumacher expressed concerns relating to the collection of personal information and the lack of a cost benefit analysis being prepared for the proposed contract; therefore, would not be voting in support of the agenda item.

Council Member M. Schumacher requested that the City Manager report back at a later date on the effectiveness of the cameras once the LPR's are implemented.

Mayor Hall spoke in support of the contract.

ACTION: Motion by Mayor Pro Tem K. Blackburn, seconded by Council Member M. Schumacher to adopt Resolution No. 2017-046. Motion carried 4/1 (C. Schumacher – No).

COUNCIL REPORTS AND COMMENTS:
Mayor Hall and Council Members reported on activities and meetings of some committees and sub-committees of which they are members.

CITY MANAGER COMMENTS: None.

CITY ATTORNEY COMMENTS: None.

ANNOUNCEMENTS:

Mayor Hall announced that Council Members may be participating in the upcoming events:

Saturday, March 18, 2017 – 1:00 p.m.
Council Goals Workshop – Public Comment
Faraday Center
1635 Faraday Avenue
Carlsbad, CA

ADJOURNMENT:
Meeting was adjourned at 11:00 p.m.

Sheila R. Cobian, CMC
City Clerk Services Manager