City of Kingsburg

1401 Draper Street, Kingsburg, CA 93631-1908
Phone (559)897-5821 Fax (559)897-5568

Mayor Michelle Roman
Mayor Pro Tem Laura North
Council Member Sherman Dix
Council Member Vince Palomar
Council Member Jewel Hurtado

City Manager Alexander J. Henderson

AGENDA

KINGSBURG CITY COUNCIL
REGULAR MEETING

Council Chamber, 1401 Draper Street, Kingsburg, CA 93631 (559) 897-5821
www.cityofkingsburg-ca.gov

Wednesday, March 4, 2020 at 6pm

6 P.M. REGULAR SESSION MEETING:

Invocation to be given by Pastor Tim Boynton, Covenant Church, followed by the Pledge of Allegiance led by Mayor Michelle Roman.

1. Call to Order and Roll Call

2. Public Comments: This is the time for any citizen to come forward and address the City Council on any issue within its jurisdiction that is not listed on the Agenda. A maximum of five (5) minutes is allowed for each speaker.

3. Approve Agenda: Action by the Council to approve the agenda or to make modifications. Items that can be added to the agenda is constrained by State law.

4. Consent Calendar: Items considered routine in nature are to be placed on the Consent Calendar. They will be considered as one item and voted upon in one vote unless individual consideration is requested. Each vote in favor of the Consent Calendar is considered and recorded as a separate affirmative vote in favor of each action listed. Approval of the Consent Calendar items include recitals reading ordinance(s) by titles(s) only and adoption of recommended action(s) contained in Staff Reports.

4.1 Approval of City Council Minutes: Approve the minutes from the February 13, 2020 Joint Workshop Meeting and the February 19, 2020 Regular City Council Meeting, as prepared by City Clerk Abigail Palsgaard.

4.2 Check Register: Ratify/approve payment of bills listed on the check register for the period February 13, 2020 through February 27, 2020 as prepared by Accounts Payable Clerk Grace Reyna.

4.3 Adopt the ADA Transition Plan for City Maintained Road System dated February 2020.

4.4 Waive the first reading and introduce Ordinance No. 2020-002, An Ordinance Of The City Of Kingsburg Amending Section 15.40.010 Of Chapter 15.40 Of Title 15 Of The Kingsburg Municipal Code and pass to a second reading on March 18, 2020 with the following recital constituting reading the title of the Ordinance:

"AN ORDINANCE OF THE CITY OF KINGSBURG AMENDING SECTION 15.40.010 OF CHAPTER 15.40 OF TITLE 15 OF THE KINGSBURG MUNICIPAL CODE"

4.5 Claim Rejection- Reject Serena Bordens' claim against the City filed on February 27. 2020- Staff Report prepared by City Clerk Abigail Palsgaard

5. Regular Calendar

5.1 Caltrans Mendocino/Mountain View Interchange Feasibility Study Presentation- Staff Report by City Engineer Dave Peters
Possible Action(s):
a. Presentation by Caltrans
b. Council Discussion
c. Action as Deemed Necessary

5.2 Extraterritorial water service connection to the Warlow Reststop on Highway 99 south of the Kings River- Staff Report by City Engineer Dave Peters
Possible Action(s):
a. Presentation by City Engineer Dave Peters
b. Council Discussion
c. Action as Deemed Necessary

5.3 Kingsburg Fire Department Annual Report- Report by Chief Daniel Perkins
Possible Action(s):
a. Presentation by Chief Daniel Perkins
b. Council Discussion
c. Informational- No Action Necessary

6. Council Reports and Staff Communications

6.1 Community Services Commission
6.2 Public Safety Committee
6.3 Chamber of Commerce
6.4 Economic Development
6.5 Finance Committee
6.6 Planning Commission
6.7 South Kings Groundwater Sustainability Agency Joint Powers Authority (SKGSA)
6.8 City Manager's Report

7. Other Business that may come properly before the City Council

8. Future Agenda Items

These items will be added to a future agenda with direction from Council.

9. Adjourn Regular Kingsburg City Council Meeting.

Any writings or documents provided to a majority of the City Council regarding any item on this agenda will be made available for public inspection at City Hall, in the City Clerk's office, during normal business hours. In addition, such writings and documents may be posted on the City's website at www.cityofkingsburg-ca.gov.

I hereby certify, under penalty of perjury under the laws of the State of California that the foregoing Agenda was posted at the front entrance of City Hall not less than 72 hours prior to the meeting. Dated this 28th day of February 2020.

_____

Abigail Palsgaard, City Clerk

KINGSBURG CITY COUNCIL AND THE PLANNING COMMISSION
JOINT WORKSHOP
February 13, 2020

6:30 P.M. KINGSBURG CITY COUNCIL AND PLANNING COMMISSION WORKSHOP:

Call to order and roll call: At 6:39pm Mayor Michelle Roman called the Joint Workshop to order.

Council Members present: Hurtado, Palomar, Dix, North and Mayor Roman.

Commissioners present: Carlson, Roundtree, Blayney and Chairman Kruper.

Commissioner absent: Brock.

City Staff present: City Manager Henderson, City Attorney Noland, City Planner Collins and City Clerk Abigail Palsgaard.

Tulare County Staff present: Aaron Bock, David Bryant and Susan Simon.

Public Comments: None.

Kingsburg Area Community Plan in Tulare County- Presentations by City and Tulare County staff.

City Manager Henderson stated that this is the first of several meeting on this topic. As a background, Kingsburg has a large portion of its sphere of influence in Tulare County, but will never be able to annex into the City Limits. With the experience of working with Tulare County with a housing project, staff thought forming a document with a plan of the future of our sphere of influence with Tulare County as the lead agency would be beneficial.

Aaron Bock, Tulare County, presented the County's zoning and the Urban Development Boundary that includes Kingsburg Sphere of Influence. The document will be called the Kingsburg Area Community Plan and the County does these often. Mr. Bock presented the timeline and went over the steps. This will guide all decision making for land use in the area.

The process of the drawing the Urban Development Boundary was discussed. It was drawn in the earlier 1970s to preserve agricultural land and to keep developments by existing cities in Tulare County. The Urban Development Boundary is a logical extension of growth by the City of Kingsburg and the Urban Development Boundary was established to regulate growth together. The County said the Urban Development Boundary can be extended.

A County resident asked how they are notified. They hadn't received anything in the mail. It was discussed how they notice. Council asked since the population is low in the area if they could ensure that all residents are contacted.

The workshop discussed the existing A1 Zone in the Urban Development Boundary that allows for residential next to commercial. Council stated that is why we want some say and input in what is going on with the process. That is why were are here tonight. To give input.

The public discussed having the boundaries shrink, not grow. The County wants it to expand and grow. It would be up to the City at the end to provide services.

Extra taxes in new developments (Community Facilities Districts) was discussed.

Council discussed affordable housing and declining enrollment in the school system.

The workshop discussed having growth while keeping Kingsburg a quality place to live.

Adjourn- Mayor Roman adjourned the Kingsburg City Council and the Planning Commission Workshop at 7:44pm.

Submitted by:

_____
Abigail Palsgaard, City Clerk

MINUTES
KINGSBURG CITY COUNCIL
REGULAR MEETING
FEBRUARY 19, 2020

6:00 P.M. REGULAR SESSION MEETING:

Invocation was given by Deacon Steve Wright, Holy Family Catholic Church, followed by the Pledge of Allegiance led by Mayor Michelle Roman.

Call to Order and Roll Call – At 6:00 P. M. Mayor Michelle Roman called the regular meeting of the Kingsburg City Council to order.

Council Members present: Jewel Hurtado, Vince Palomar, Laura North, Sherman Dix, and Mayor Michelle Roman.

Staff present: City Manager Alexander Henderson, City Attorney Michael Noland, City Clerk Abigail Palsgaard, Finance Director Alma Colado, Director of Administrative Services Christina Windover, and Police Records Supervisor Corina Padilla.

Public Comments: None

Approve Agenda: A motion was made by Council Member Hurtado, seconded by Council Member North, to approve the Agenda as published. The motion carried by unanimous voice vote.

Consent Calendar: Council Member Dix asked that Items No. 4.9 - 4.11 be pulled because he has a financial relationship with one of the applicants. A motion was made by Council Member North, seconded by Council Member Palomar, to approve the Consent Calendar Items except Items 4.9, 4.10, and 4.11. The motion carried by unanimous voice vote.

A motion was made by Council Member North, seconded by Council Member Hurtado, to approve Items 4.9, 4.10, and 4.11 of the Consent Calendar. The motion carried, four in favor, Council Member Dix recusing himself.

4.1 **Approval of City Council Minutes**: Approve the minutes from the February 5, 2020 Regular City Council Meeting, as prepared by City Clerk Abigail Palsgaard.

4.2 **Check Register:** Ratify/approve payment of bills listed on the check register for the period January 30, 2020 through February 12, 2020 as prepared by Accounts Payable Clerk Grace Reyna.

4.3 **Waive the second reading and adopt Ordinance No. 2020-001, An Ordinance Of The City Of Kingsburg Adding Chapter 16.42 To Title 16 Of The Kingsburg Municipal Code Pertaining To The Construction Of Model Homes And Production Homes with the following recital constituting reading the title of the Ordinance:**

"AN ORDINANCE OF THE CITY OF KINGSBURG ADDING CHAPTER 16.42 TO TITLE 16 OF THE KINGSBURG MUNICIPAL CODE PERTAINING TO THE CONSTRUCTION OF MODEL HOMES AND PRODUCTION HOMES"

4.4 **Council review and accept public comment regarding the FY2017/2018 and FY 2018/19 Development Impact Fee Annual Report and file the subject report with the Office of the City Clerk.-** Staff Report prepared by Finance Director Alma Colado.

4.5 **Adopt Resolutions 2020-011; 2020-012; 2020-013; 2020-014; 2020-015; 2020-016; 2020-017; 2020-018; 2020-019 Approving the Budget Amendments As Presented And Recommended By The Finance Committee-** Staff Report Prepared by Finance Director Alma Colado.

4.6 **Award a Contract to Willdan Financial Services for a Cost Allocation Plan Update -** Staff Report Prepared by Finance Director Alma Colado.

4.7 **Approve the Updated Public Works Director Job Description-** Staff Report prepared by Director of Administrative Services Christina Windover.

4.8 **Approve The City of Kingsburg participation in the Fresno County's Urban County Community Development Block Grant (CDBG) Program Years 2021-22, 2022-23 and 2023-24 and authorize the City Manager to sign the Joint Powers Agreement on the City's behalf.**

4.9 **Planning Commission Re-Appointment-** Affirm Mayor Roman's re-appointment of Paul Kruper to the Planning Commission to a term that is set to expire November 2023.

4.10 **Planning Commission Appointment-** Affirm Mayor Roman's appointment of Briana Valdez to the Planning Commission to a term that is set to expire November 2022.

4.11 **Planning Commission Appointment-** Affirm Mayor Roman's appointment of Robert Anthony Gonzales to the Planning Commission to a term that is set to expire November 2024.

4.12 **Public Safety Committee Appointment-** Affirm Mayor Roman's appointment of Vincent Lathom III to the Public Safety Committee to a term that is set to expire November 2023.

REGULAR CALENDAR

Kingsburg Fire Department Pinning Ceremony- Presentation by Chief Daniel Perkins

Chief Perkins asked that a moment of silence be observed for the two Porterville Firefighters that lost their lives in the Porterville Library fire.

Chief Perkins introduced new Kingsburg Fire Department personnel, Captain Jeremy Owens and Firefighter Dariuss Rodriguez, followed by the swearing in and pining ceremony.

Financial Statements for the Year Ended June 30, 2019 – Consider Statements as prepared by Price Paige & Company. Staff report prepared by Finance Director Alma Colado

Representatives from Price Page & Company presented the Financial Statements and explained the process. The City received an Unqualified Opinion (clean opinion) which is the best result. The results were and areas of improvement were reviewed. Council asked if the cash at the Building Department is necessary. Finance Director Alma Colado said that it is, for customer service.

A motion was made by Council Member North, seconded by Council Member Dix to Accept Financial Statements for Year Ended June 30, 2019. The motion carried by unanimous voice vote.

Crime Statistics Report for the Month of January 2020 and General Police Department Update- Crime Statistics Report prepared by Kingsburg Police Department Records Supervisor Corina Padilla.

Police Records Supervisor Corina Padilla reported that in 2019 the Records Department processed 1,658 reports that included reading every single report, verifying, stating, dissemination, and uploading to District Attorney's office for prosecution. The Police Department completed 140 public Livescans in 2019. In 2019 Police Services Technician Eva Zimmerman processed 418 articles of evidence including 16 weapons and released 22 articles. Evidence processing and storage is key to convictions. Records Supervisor Corina Padilla stated that they are converting storage to hold evidence. The January 2020 Crime Stats were reviewed. Council Member Dix asked about reviewing home surveillance video. Council thanked Records Supervisor Corina Padilla for all that she does.

Informational - No action necessary.

Council Reports and Staff Communications

Community Services Commission- Council Member North said they will meet next Wednesday.

Public Safety Committee- Council Member Palomar said they will meet next Tuesday.

Chamber of Commerce – Council Member Hurtado reported Chamber Vice President Jason Poyner resigned, they discussed car show, starting monthly mixer, annual chamber membership meeting, potential workshops to benefit businesses, and progress with the Downtown Business Improvement District. Mayor Roman mentioned the SKF Mixer in March.

Economic Development – Council Member Dix stated that they meet tomorrow morning to discuss agritourism. City Manager Henderson said the 5 Cities Fresno County Economic Development JPA are working on rebranding.

Finance Committee- Council Member Dix said they met a few weeks ago. City Manager Henderson said that a couple items on consent were recommendations from the meeting.

Planning Commission- Mayor Roman reported that they participated in a joint workshop regarding property zoning and use in Tulare County.

South Kings Groundwater Sustainability Agency Joint Powers Authority (SKGSA) Council Member Dix discussed ponding basin options to take the Consolidated Irrigation District water immediately. A couple of Kingsburg's will be able to take 300 to 400 of the 1000 acre feet. There will be a cost to convert them to Consolidated Irrigation District standards requiring the ability to measure the flow of water in to the basin.

City Manager's Report- City Manager Henderson gave an update regarding the T-Mobile merger, Public Works Director Darren Hayes upcoming retirement and applying for a California League for Cities award for the City's partnership with the Kingsburg Tri-County Health Care District.

Other Business that may come properly before the City Council
None.

Future Agenda Items
None.

Adjourn Kingsburg City Council Regular Meeting into Closed Session – Mayor Roman adjourned the meeting into closed session at 6:55pm to discuss the following item(s):

9.1 CONFERENCE WITH LEGAL COUNSEL—ANTICIPATED LITIGATION
Initiation of litigation pursuant to California Government Code Section 54956.9(c)
(One potential case)

Adjourn out of Closed Session into the Regular Kingsburg City Council Meeting and report out of Closed Session – Mayor Roman adjourned out of closed session into the regular meeting at 7:36pm.

Mayor Roman reported there was nothing to report.

Adjourn – Mayor Roman adjourned the Regular Kingsburg City Council Meeting at 7:36pm.

Submitted by:

_____
Abigail Palsgaard, City Clerk

Accounts Payable

Checks by Date - Summary by Check Date

User: gracer
Printed: 2/28/2020 2:16 PM

City of Kingsburg
1401 Draper Street
Kingsburg, CA 93631-1908
(559)897-5821

Check No	Vendor No	Vendor Name	Check Date	Check Amount
77362	4072	FAHRNEY FORD SALES	02/13/2020	38,820.20
			Total for 2/13/2020:	38,820.20
ACH	3231	ICMA RETIREMENT CORPORATION - V	02/14/2020	661.63
ACH	3470	Internal Revenue Service - ACH	02/14/2020	45,978.04
ACH	3471	Employment Development Department - A(	02/14/2020	7,504.59
ACH	3472	CalPERS - ACH	02/14/2020	33,059.29
ACH	3475	Empower	02/14/2020	2,915.00
ACH	3476	CHILD SUPPORT STATE DISBURSEME	02/14/2020	505.84
ACH	3526	Public Employees Retirement System 457 I	02/14/2020	20.00
ACH	3470	Internal Revenue Service - ACH	02/14/2020	2,731.10
ACH	3471	Employment Development Department - A(	02/14/2020	170.26
ACH	3472	CalPERS - ACH	02/14/2020	1,662.70
ACH	3470	Internal Revenue Service - ACH	02/14/2020	1,836.00
ACH	3471	Employment Development Department - A(	02/14/2020	116.31
ACH	3472	CalPERS - ACH	02/14/2020	769.68
ACH	3470	Internal Revenue Service - ACH	02/14/2020	2,299.91
ACH	3471	Employment Development Department - A(	02/14/2020	175.76
77363	4149	US DEPARTMENT OF EDUCATION AW	02/14/2020	313.03
			Total for 2/14/2020:	100,719.14
77364	4199	AAA BACKFLOW PREVENTION	02/21/2020	4.00
77365	4184	ADVANCED COMBAT EVOLUTIONS	02/21/2020	3,582.00
77366	3006	AIRGAS NCN	02/21/2020	750.67
77367	4173	AMI CONCEPTS	02/21/2020	2,000.00
77368	3020	ANGELICA TEXTILES SERVICES COR	02/21/2020	276.40
77369	3029	AT&T CALNET 3	02/21/2020	1,520.52
77370	3030	AT&T MOBILITY	02/21/2020	980.31
77371	3035	BAUER COMPRESSORS, INC.	02/21/2020	1,064.68
77372	3038	BENETRAC	02/21/2020	425.00
77373	3056	CAL STATE TERMITE AND PEST	02/21/2020	460.00
77374	3057	CALIFORNIA BUILDING STANDARDS	02/21/2020	752.40
77375	3704	CANON FINANCIAL-EQUIPMENT SAL	02/21/2020	1,079.34
77376	3068	BARBARA CARPENTER	02/21/2020	990.00
77377	4203	CEN-CAL AUTO & TRUCK PARTS/ NAI	02/21/2020	2,108.61
77378	3077	CENTRAL VALLEY OVERHEAD DOOR	02/21/2020	424.00
77379	3918	CINTAS	02/21/2020	1,106.56
77380	3111	COLLINS & SCHOETTLER	02/21/2020	3,712.50
77381	3115	COMCAST-PD	02/21/2020	161.20
77382	3120	COPWARE, INC.	02/21/2020	615.00
77383	3142	DELRAY TIRE & RETREADING	02/21/2020	2,437.55
77384	3152	E C N POLYGRAPH & INVEST	02/21/2020	200.00
77385	4197	ELLBERG WIGH PROPERTIES INC.	02/21/2020	58.00
77386	4011	ESCI EMERGENCY SERVICES CONSUI	02/21/2020	831.70
77387	3158	ENER POWER	02/21/2020	566.00

Check No	Vendor No	Vendor Name	Check Date	Check Amount
77388	4176	ENGINEERED FIRE SYSTEMS, INC	02/21/2020	700.00
77389	3162	ESO SOLUTIONS	02/21/2020	9,858.00
77390	3188	FRESNO COUNTY SHERIFF	02/21/2020	15,929.25
77391	3201	ALFREDO FUENTES	02/21/2020	64.00
77392	3219	HEALTHWISE SERVICES	02/21/2020	492.50
77393	3222	HENRY SCHEIN, INC.	02/21/2020	884.44
77394	4059	KRISTIN HERNANDEZ	02/21/2020	115.00
77395	3999	IRON MOUNTAIN	02/21/2020	35.00
77396	4190	J.P. COOKE COMPANY	02/21/2020	126.00
77397	3237	JC'S LAWN SERVICE	02/21/2020	5,000.00
77398	3248	KAHN, SOARES & CONWAY, LLP	02/21/2020	5,668.60
77399	3253	KINGSBURG CHAMBER OF COMMER(	02/21/2020	180.00
77400	3625	KINGSBURG MEDIA FOUNDATION	02/21/2020	3,064.56
77401	3518	METRO UNIFORM	02/21/2020	3,770.84
77402	4204	METROPOLITAN TRANSPORTATION C	02/21/2020	1,500.00
77403	3300	MuniServices/Avenu	02/21/2020	450.00
77404	3315	P G & E	02/21/2020	18,363.97
77405	4201	DANIEL PERKINS	02/21/2020	61.77
77406	3333	PRICE, PAIGE & COMPANY	02/21/2020	2,485.00
77407	4205	PRO CLEAN UP, INC	02/21/2020	8.70
77408	3334	PROFESSIONAL PRINT & MAIL, INC	02/21/2020	2,888.97
77409	3335	PROFORCE LAW ENFORCEMENT	02/21/2020	10,017.59
77410	4202	DIEGO RODRIGUEZ	02/21/2020	16.27
77411	3363	SAVE MART SUPERMARKETS	02/21/2020	34.96
77412	3369	SILVAS OIL COMPANY, INC.	02/21/2020	2,948.59
77413	3380	STATE OF CALIFORNIA-D O J	02/21/2020	367.00
77414	3397	THE GAS COMPANY	02/21/2020	1,974.43
77415	4016	ULINE Shipping Supplies Specialist	02/21/2020	446.58
77416	3413	UPS	02/21/2020	23.63
77417	4198	VAN BEURDEN INSURANCE	02/21/2020	300.00
77418	4102	VIVINT SOLAR DEV., LLC - ATT: AR D	02/21/2020	159.29
77419	4200	WIGH VAUGHAN PROPERTIES LLC	02/21/2020	13.00
			Total for 2/21/2020:	114,054.38
			Report Total (73 checks):	253,593.72

ADA TRANSITION PLAN FOR CITY MAINTAINED ROAD SYSTEM

City of Kingsburg
February 2020

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I. EXECUTIVE SUMMARY

This transition plan has been prepared in order to comply with The Americans with Disabilities Act (ADA) of 1990. The intention of the Plan is to define the policies for identifying and prioritizing deficiencies in pedestrian facilities within the City of Kingsburg's (City) public roadway rights-of-way. The Plan also sets forth strategies to address the identified deficiencies. The goal of these policies and practices is to ensure that pedestrian facilities evaluated in this plan are safe and accessible for all users.

The ADA Transition Plan (Plan) is required by the Department of Justice to address the following aspects of accessibility:

1. If a public entity has responsibility or authority over streets, roads or walkways, its ADA Transition Plan shall include a schedule for providing curb ramps or other sloped areas where pedestrians walk across curbs. In addition, priority will be given to walkways serving entities covered by the ADA, including State and local government offices and facilities, transportation, places of public accommodation, and employers, followed by walkways serving other areas;
2. The ADA Transition Plan shall identify physical obstacles in the public entity's right of way that limit the accessibility of its programs or activities to individuals with disabilities; this is achieved by providing a survey of the existing conditions of curb ramps and sidewalk locations and identifying if the locations are compliant or not;
3. The ADA Transition Plan shall describe the methods that will be used to make the facilities accessible, and;
4. The ADA Transition Plan shall specify the schedule for taking the steps necessary to achieve compliance with the ADA and, if the time period of the ADA Transition Plan is longer than one year, identify steps that will be taken during each year of the transition period.

The Plan focuses on all areas of pedestrian usage of City maintained roadway facilities. The areas were evaluated by performing a physical field review. Each ramp and sidewalk location was assigned a unique identifier and catalogued accordingly. Ramp locations were only identified where one of the following conditions existed: existing compliant ramp and existing non-compliant ramp, and no ramp. Sidewalk locations were only identified where a sidewalk currently exists. In some instances within the City, entire neighborhood areas lacked sidewalk or ramp improvements.

The Site Survey included an evaluation of both curb ramps and sidewalk locations along the study roadways. Six areas of compliance were evaluated for curb ramp/intersection areas, including whether each ramp has a lip and detectable warning system, both longitudinal and wing slopes, the width of each ramp, and the top of ramp landing slope.

In addition to the data collected for curb ramps, six pieces of data were collected for sidewalk locations, including sidewalk width, slopes for the west/south end, middle, and east/north end, sidewalk location uplift and the percentage of the sidewalk location uplift along the sidewalk location run.

Through this data collection, a database was built using a rating system for each ramp and sidewalk location. First the ramp or sidewalk location is identified as either compliant or non-compliant. For example, if one piece of collected information was found to be non-compliant, the sidewalk or curb ramp location was therefore categorized as non-compliant. Then the location is given a rating by ranking the physical proximity of the ramp or sidewalk to known frequented routes of persons with disabilities. Ramps or sidewalk locations near community facilities, such as government, post office, or libraries, or within two blocks of a combination of bus stops/schools, major streets, and commercial areas, were given a rating of "4" while ramps or sidewalk locations located in residential neighborhoods more than two blocks from major streets or other services were given a rating of "0".

The intention of the Plan is to allow City Staff to efficiently and effectively identify areas where improvements are needed and to make the necessary improvements to curb ramp and sidewalk locations.

If you have any questions regarding the City's plan or have concerns in regards to improvements in your neighborhood or around your business you can contact the Kingsburg Department of Public Works at (559) 897-5821 or reach the City Engineer by email at dpeters@peters-engineering.com

II. PROJECT BACKGROUND

Introduction

Goals and Objectives:

The Americans with Disabilities Act (ADA) of 1990, along with its implementing regulations, and the California Government Code Sections 4450 et seq. prescribe that facilities shall be made accessible to persons with disabilities. The Federal Highway Administration has reaffirmed that the Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG) shall apply to the design of Caltrans facilities under Title II of the ADA, which applies to the operations of State and local governments.

The goal of the Plan is to outline what has been accomplished to date, what is currently being done, and what the ongoing efforts will be to ensure that the City creates accessible paths of travel in the public right of way for people with disabilities.

To this end, the preparation of the Plan includes a site survey, which identified deficiencies and outlined needs. This survey- has been provided as a GIS layer for inclusion in the City's database. The priority designations will assist City staff in choosing projects and a schedule of implementation for approval by the Board of Supervisors. The City has recently updated the grievance/complaint form, which is required by law for handling complaints.

The City also provided opportunities for interested persons, including individuals with disabilities or organizations representing individuals with disabilities, to participate in the development of this Plan by participating in public meetings and having the opportunity to make comments or recommendations along the way.

City of Kingsburg Commitment:

The City has made a significant and long-term commitment to improving the accessibility of the public right of way. These improvements will be constructed using the current City of Kingsburg Standard Details for ramps and sidewalk locations.

Improvements in the public right of way can be characterized in the following ways:

1. Maintenance, Minor Upgrades, and Repair Projects and Programs
2. Capital Projects for Alterations
3. Capital Projects for New Construction
4. Improvements made during private land development improvement projects
5. Improvements made to existing roadway facilities previously constructed

Maintenance, Minor Upgrades, and Repair Projects and Programs:

Work that specifically addresses spot areas that are limited to normal maintenance, minor upgrades, and repairs in the public right-of-way will maintain accessibility of the public right- of-way.

Capital Projects for Alterations:

Work that, under the ADA, would be considered an alteration of existing public right-of-way will provide new accessible features and upgrade existing accessible features in the project area to meet current design standards.

Capital Projects for New Construction:

Work that involves creating new public right-of-way will provide accessible features in the project area that meets current design standards. All new projects include ADA approved access features such as ramps, pedestrian actuated signal buttons, detectable warning, etc.

Private Land Development Improvement Projects:

Since 1990, curb ramps have been required to be constructed to meet current ADA standards in all new land development projects of the City. Changes in standards since 1990 have resulted in the existence of many curb ramps which are out of compliance.

Previously Constructed Roadway Improvements:

Some City roadway improvements such as curb ramps exist that were constructed previously and do not meet current standards. These have been incorporated in this Transition Plan.

The City is thoroughly committed in making all sidewalk location and curb ramp areas accessible to all pedestrians including those with disabilities. It is the goal to work within budget and resource constraints while providing accessibility to all users.

This Transition Plan on City Maintained Roadways is intended not only to comply with the ADA requirements, but to also ensure that citizens can travel safely throughout the unincorporated City.

ADA Legislative Requirements/Background

The Americans with Disabilities Act (ADA), enacted on July 26, 1990, provides comprehensive civil rights protections to persons with disabilities in the areas of employment, state and local government services, transportation, telecommunications and access to public accommodations. The ADA is a companion civil rights legislation to the Civil Rights Act of 1964 and Section 504 of the Rehabilitation Act of 1973. This legislation mandates that qualified disabled individuals shall not be excluded from participation in, denied the benefit of, or be subjected to discrimination under any program or activity.

The legislative requirements of the ADA are divided into five parts, covering the following areas: Employment (Title I), Public Services (Title II), Public Accommodations (Title III), Telecommunications (Title IV), and Miscellaneous Provisions (Title V). Public Services (Title II) will be the focus of this Transition Plan, and is described as follows:

Title II: Public Services:

This Title prohibits state and local governments from discriminating against persons with disabilities or from excluding participation in or denying benefits of public programs, services, or activities to persons with disabilities. Curb ramps, sidewalk locations, and other roadway access issues are required as part of this title. A Transition Plan is intended to outline the methods by which physical or structural changes will be made to effect the non-discrimination policies described in Title II. It is under this Title that a Transition Plan is prepared.

Specifically, construction standards and requirements were implemented to insure that new development would be compliant. In addition, all new capital projects were designed to meet the latest accessibility requirements and standards.

Curb Ramps:

Curb ramps are used by all pedestrians, including those who are visually impaired, disabled, and hearing impaired to safely cross roads where controlled crossings are provided. Design and construction standards for curb ramps have evolved and changed over time as consensus has been forged by all users. This evolving nature of the standards has made it somewhat difficult to keep current of new needs, implement new standards, and to retrofit non-compliant facilities.

Sidewalk locations:

Sidewalk locations provide a safe, protected location for pedestrians to travel adjacent to vehicular traffic. While design standards have maintained a 2% maximum cross slope, construction of sidewalk locations has not always adhered strictly to the standard. Tree root uplift can also be a concern, especially for sidewalk locations in older neighborhoods with mature trees. With most of the retrofitting and reconstruction focused at ramp locations, sidewalk location issues may not be addressed as timely as desired.

City Responsibilities under the ADA

The City has various responsibilities under Title II of the ADA. Title II of the ADA is similar to Section 504 of the Rehabilitation Act of 1973, but differs in that Section 504 applies only to government agencies.

Title II of the ADA, mandates that a public agency such as the City operates each service, program or activity so that the service, program or activity when viewed in its entirety, is readily accessible to and usable by individuals with disabilities. However, as described in Title 28 of the Code of Federal Regulations, Section 35.150(a) (hereafter referred to as the ADA Rules), this does not necessarily require a public agency to make each of its existing facilities accessible to and usable by individuals with disabilities. Nor does it require a public agency to take any action that would threaten or destroy the historical significance of an historic property. If the public agency can demonstrate that a modification would fundamentally alter the nature of its service, program or activity, or cause undue financial and administrative burdens, it is not required to make that particular modification.

Title II dictates that a public agency must evaluate its facilities and public areas to determine whether or not they are in compliance with the nondiscrimination requirements of the ADA. The regulations detailing compliance requirements were issued in July 1991. The requirements include completing a self-evaluation and site survey first to identify any areas not within compliance of the ADA standards. Next, a Transition Plan is to be prepared describing any necessary structural or physical changes needed to make all required areas accessible and compliant with ADA. The City's plan as it relates to curb ramps and sidewalk location accessibility on City maintained roadways per Section 35.150(d)(2) of the ADA Rules accomplished the following:

1. Identifies inaccessible and non-compliant curb ramps and sidewalk locations located in the unincorporated urban portions of the City on City maintained roadways; and
2. Develops a planning schedule and budget for making corrections and repairs; and
3. Develops a repair/request procedure; and
4. Develops a grievance/complaint process; and
5. Implements a public involvement process; and
6. Provides a periodic review of standards and procedures

Site survey of curb ramps and sidewalk locations have been prepared as part of this study. The results are tabulated databases and are included in a Geographic Information System (GIS) file maintained by the City. All curb ramps and sidewalk locations in the urban portions of the City as indicated in the Appendix were evaluated. Six specific pieces of information were collected and catalogued for each curb ramp and sidewalk location. The City's GIS system was used to identify the existing locations of the curb ramps and sidewalk locations, with GIS nodes applied to their location. Each ramp and sidewalk location area was examined with levels and measuring tapes to determined exact slopes, widths, and other measurements. Each curb ramp and sidewalk location was deemed compliant or non-compliant. Each of these items has been thoroughly documented in Arc GIS database and is ready for use within the City's GIS system, as shown in Figure I below.

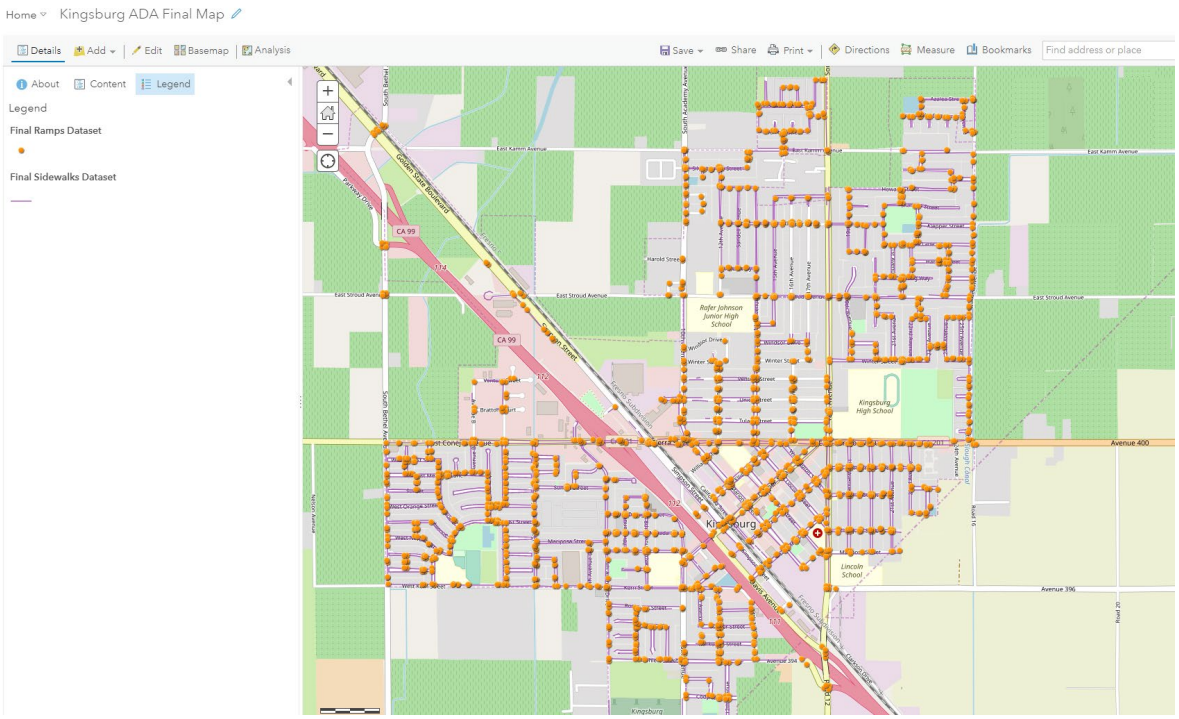

FIGURE I – GIS System

Transition Plan Content and Priorities

A Transition Plan identifies physical obstacles in the public agency's facilities that limit the accessibility of its programs or activities to individuals with disabilities; describes in detail the methods that will be used to make the facilities accessible; specifies the schedule for taking the steps necessary to achieve compliance in making the facilities accessible; and indicates the official responsible for implementation of the plan.

In addition to the requirements for City facilities, a public agency that has responsibility or authority over streets, roads or walkways, must also develop a transition plan to include a schedule for providing curb ramps or other sloped areas where pedestrian walks cross curbs, giving priority to walkways serving entities covered by the Act. The Department of Public Works and Planning possesses that responsibility for the City.

III. SELF EVALUATION

A self-evaluation form will be distributed to select staff within the Department of Public Works and Planning. The intent of the self-evaluation is to identify how well City Staff understands the procedure for identifying ADA issues and what person or persons are responsible for processing these issues. Their responses will be tabulated in a chart which will be included in the appendix.

Based on results of this survey, the City will provide additional training to their staff on the process and procedures for identifying ADA issues and acknowledge which person or persons are responsible for processing.

IV. SITE SURVEY

Objectives

The objectives of the site survey process involved surveying curb ramp and sidewalk locations throughout the City and prioritizing locations for any necessary corrective action. This was accomplished through exhaustive field data collection.

After all the field data was collected, each ramp and sidewalk location was evaluated, using both the existing condition of the curb ramp or sidewalk location and its physical proximity to frequented routes of persons with disabilities.

Existing Condition:

The existing condition factors upon which each ramp and sidewalk were rated are shown in Table II and III. The ramp and sidewalk locations were deemed compliant only if all measurements met the minimum standards.

The database is too large to feasibly be presented within this Transition Plan.

Physical Proximity Rating:

The factors upon which the physical proximity to frequented routes of persons with disabilities of the curb ramp or sidewalk location was rated are shown in Table I below.

TABLE I – CURB RAMPS & SIDEWALK – PHYSICAL PROXIMITY RATING

RATING	EVALUATION FACTORS	STANDARDS
4.	Known frequented routes of persons with disabilities	Located within two blocks of a government facility, post office, library, or a combination of the other evaluation factors. Highest rating.
3.	Transit Stop or School	Located within two blocks of a transit stop or school location.
2.	Commercial Business	Located within two blocks of retail/office/industrial businesses.
1.	Major Street access	Located within two blocks of an arterial or collector street.
0.	Residential Neighborhood / Rural Area	Located in a rural area or residential neighborhood without meeting any of the above criteria. Lowest rating.

GIS Mapping:

Using previously developed City GIS information an AutoCAD file was created and overlaid with aerial photos from Google Earth to assist with locating existing curb ramps and sidewalk locations for analysis. GIS nodes were created at each curb ramp location and the length of each sidewalk location run. Using these coordinates and aerials, it was possible to

identify the locations for review and link the database of the collected information to the AutoCAD file as GIS layers. The layers and databases developed for this plan will be incorporated into the City's GIS system. Figure II is an example.

FIGURE II – GIS Map view near SR 99 and SR 201

Methodology/Field Procedure

The site survey for curb ramps and sidewalk locations was completed in the spring of 2019. Data was collected within the city limits and on city maintained roadways. Using City GIS information, a smart-level, tape measure, and an iPad, information was gathered about each curb ramp and sidewalk location. Ramp locations were identified where one of the following conditions existed: existing compliant ramp, existing non-compliant ramp, or no existing ramp. Sidewalk locations were only identified where a sidewalk currently exists. In some instances within the City, entire community areas lacked sidewalk or ramp improvements. Evaluation factors for curb ramp locations consisted of checking ramp and sidewalk slopes and cross-slopes, ramp and sidewalk widths, presence of detectable warning systems (DWS) within the ramp area, and the existing type of curb and gutter. Evaluation factors for sidewalk locations consisted of checking cross slopes at three

locations along the sidewalk location run, verifying sidewalk location width, identifying uplifts, and estimating a percentage of uplifts within the sidewalk location run.

Survey Results

Results from the field survey and location rating information are compiled in Tables IV – V listed below. The data is broken down between ramp and sidewalk locations.

Curb Ramp Existing Condition Ratings:

Survey data was compared to the evaluation factors shown below in Table II to determine compliance.

TABLE II - CURB RAMPS – EXISTING CONDITION EVALUATION FACTORS

EVALUATION FACTORS	STANDARDS
Lip	Must be flush between gutter and ramp. If no lip, must not be greater than 5%
Slope	Longitudinal ramp slope must be 8.33% or less (1:12)
Width	Ramp width must be 4'0" or greater
Landing	Top of ramp landing must be 4' by 4' Square and must be less than 2%
Wings	Slopes on transitions adjacent to ramps must be 10% or less
Detectable Warning (DW)	Detectable Warning surface must be present – full ramp width and 36" in length

Sidewalk Existing Condition Ratings:

Based on the information gathered from the survey, a compliant or non-compliant rating was assigned to each sidewalk location based on the evaluation factors shown in Table III below.

TABLE III - SIDEWALK – EXISTING CONDITION EVALUATION FACTORS

EVALUATION FACTORS	STANDARDS
W/S Slope	West/South end of sidewalk location cross slope must be 2% or less
M Slope	Middle of sidewalk location cross slope must be 2% or less
E/N Slope	East/North end of sidewalk location cross slope must be 2% or less
Uplift	Are there any uplifts present in sidewalk location that are estimated to be over 3/8"
% Uplift	An estimate of the amount of sidewalk location in the run needing to be replaced due to uplift

Proximity Rating:

Physical proximity ratings were determined using the process of Table I. Ratings are displayed in Tables IV and V below.

TABLE IV– CURB RAMPS – PROXIMITY RATINGS

Ramp Proximity Rating	Quantity	Percent of Total
4 Points – Highest Priority	83	6.3%
3 Points	363	27.6%
2 Points	73	5.5%
1 Point	613	46.6%
0 Points – Lowest priority	184	14.0%
Total	**1,316**	**100%**

TABLE V– SIDEWALKS – PROXIMITY RATINGS

Sidewalk Proximity Rating	Quantity	Percent of Total
4 Points – Highest Priority	61	5.3%
3 Points	274	23.8%
2 Points	61	5.3%
1 Point	506	43.9%
0 Points – Lowest Priority	168	21.7%
Total	**1,151**	**100%**

V. FINAL TRANSITION PLAN

Evaluation of Ramps and Sidewalk Locations

This Transition Plan identifies a priority list by using the proximity ratings of non-compliant curb ramps and sidewalk locations. This priority list will assist in understanding which ramps or sidewalk locations are most in need of replacement, as shown in Tables VI and VII below.

TABLE VI – SUMMARY OF RATINGS AND POINTS

Ramp Status	Quantity	Percent of Total
Ramp Does Not Exist	251	19.1%
Compliant	48	3.7%
Non-Compliant	1,017	77.2%
Total	**1,316**	**100%**

TABLE VII – SUMMARY OF RATINGS AND POINTS

Sidewalk Status	Quantity	Percent of Total
Compliant	104	9.0%
Non-Compliant	1,047	91.0%
Total	**1,151**	**100%**

The above tables show that a significant number of ramps and sidewalk locations are in need of repair or installation. The City can access the actual ramp and sidewalk locations by searching the GIS database prepared as a part of this plan. This will better assist the City in reviewing the locations with the highest priority rating and initiating the construction process for upgrades.

VI. PUBLIC OUTREACH

The Americans with Disabilities Act of 1990 (ADA) stipulates involving the community, particularly those with disabilities, in the development and improvement of services. Participation by the disability community is essential for a key station plan. In highway planning, public involvement is important in the development of access at sidewalk locations, curb ramps and street crossings.

The City of Kingsburg held one public informational meeting on February 5, 2020 to introduce the ADA Transition Plan to the public and provided opportunities for feedback. The meeting was properly noticed on the City's website. A draft copy of the report was available for review and any comments from the public were answered.

The City will continue its efforts to provide services in the most integrated setting possible. The City's Transition Plan was designed to enhance the quality of life for anyone who may require special accommodations due to developmental, emotional, medical or physical considerations.

VII. CAPITAL IMPROVEMENT PROJECTS

Repair/Replacement - Schedule

The City of Kingsburg plans capital improvement programs approximately five years into the future.

The City will replace and/or repair existing curb ramps or install new ramps as part of the capital improvement program. A majority of these project sites are in areas where significant numbers of ramps that need upgrades are located.

As additional funds become available from other sources, the city will prioritize these funds for investment in ADA infrastructure as appropriate. In addition, new development will require ADA compliance for approval, to ensure accessibility in all newly constructed areas.

Ongoing and Near-Future Projects

- Mehlert Avenue Reconstruction
- 18th Avenue Sidewalks
- Sierra St & Bethel Ave Roundabout

Recently Completed Projects

- 18th Ave & Kern Street Lighted Crosswalk
- 21st Avenue Reconstruction
- 6th Avenue Drive / Sierra Street Reconstruction

VIII. DEVELOPMENT STANDARDS

Ramp Design Standards

Sheets ST-30 to ST-41 of the Kingsburg Standard Drawings reflect current ADA design requirements. Figure III below depicts the criteria measured for this project. Future improvement projects shall follow current city standards, available at (https://www.cityofkingsburg-ca.gov/159/Public-Works).

Periodic updates to the design standards will correlate with State and Federal requirements.

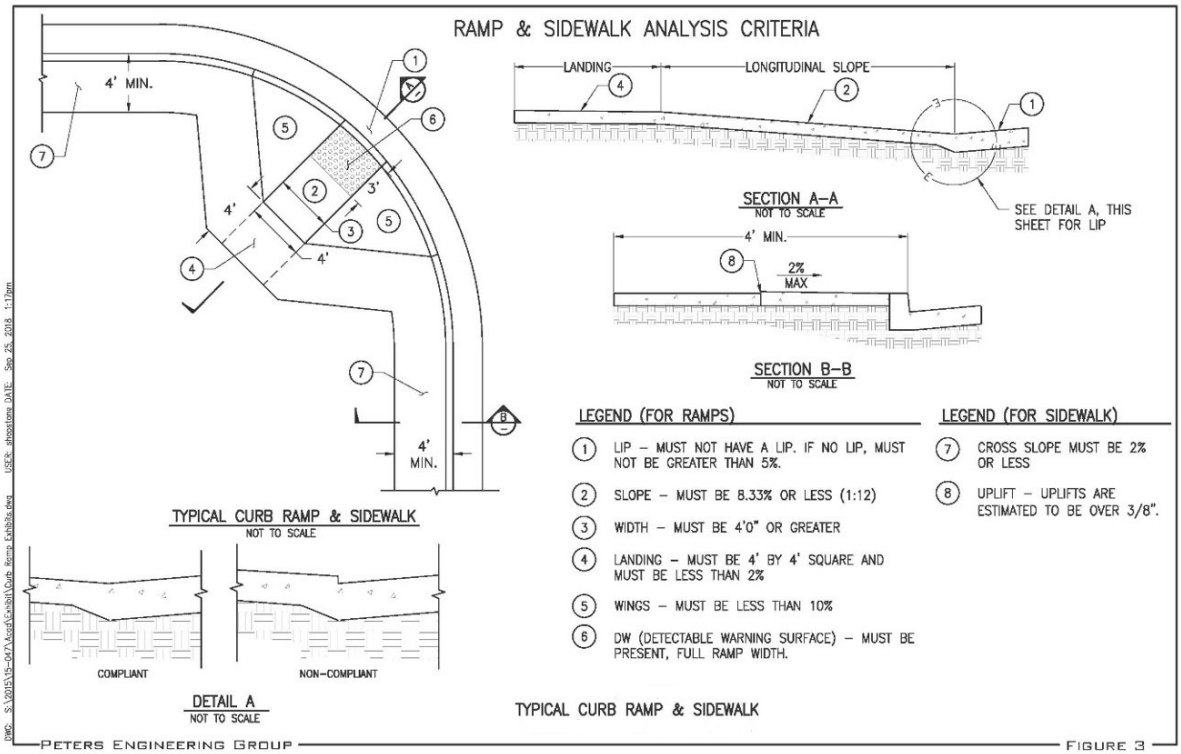

FIGURE III – ADA FIELD SURVEY GUIDE

Field Inspection Criteria During New Construction

For private projects needing an encroachment permit for work within City right of way, design and construction standards should conform to the current City of Kingsburg Standard Plans for ramp and sidewalk location construction. City Staff should only approve construction of facilities that conform to these standards.

Post Construction Survey Methodology

For all projects, including public works and privately funded work within the City right of way, City staff should use the following methodology for review and approval of ramp and sidewalk location construction:

- Review and approval of ramp and sidewalk location design in conformance with City of Kingsburg Standard Plans
- Prior to placement of concrete, check form boards for compliance with plans.
- After ramp construction, check the 6 criteria areas as identified in Figure II, including lip occurrence and slope, ramp slope, wing slope, ramp width, landing dimensions and slope, and placement of detectable warning.
- After sidewalk location construction, check that the cross slope is less than 1.5%, check that the longitudinal slope is less than 5%, and check that the sidewalk is at least 4' in width.
- A 2' Smart level or similar device should be used to check slope.
- An imperial tape measure should be used to measure dimensions.

If the constructed ramp fails to meet any of the requirements detailed in the City Standard Plans, then the ramp or sidewalk location must be removed and reconstructed until it meets the standard requirements.

IX. COMPLAINT AND GRIEVANCE PROCEDURE

To the maximum extent practicable, staff will endeavor to resolve complaints at the lowest level. Where phone calls, direct contact or web access complaints are brought forward, they will be dealt with quickly and fairly. In addition, staff will log the calls to keep an ongoing record of complaints that can be used in helping to set future projects and priorities.

Where staff is not able to resolve a complaint, a grievance procedure has been developed that provides for anyone with a disability to file a complaint or grievance. They can file the complaint if they believe they have been the subject of disability related discrimination on the basis of denial of access where sidewalk locations cross curbs.

Any person with a disability, who believes that they have been the subject of disability-related discrimination on the basis of denial of access where sidewalk locations cross curbs, would fill out the grievance form (Appendix C) with all the information requested. The grievance form would be filed with the Public Works ADA Coordinator within 60 working days of the alleged disability-related discrimination. A response would be returned to the complainant.

Should the complainant not be satisfied with the determination of the ADA coordinator, they could appeal to the City Public Works Director.

X. TRANSITION PLAN PROGRAM IMPLEMENTATION

The City is thoroughly committed in making all sidewalk location and curb ramp areas accessible to all pedestrians including those with disabilities. The City will work within existing budgets and resource constraints and to complete as much of the Plan as possible within limits.

During the implementation of the Plan the City will continue to make necessary repairs to curb ramps and sidewalk locations. This has been a standard practice of the Department of Public Works, and is generally done on a request/complaint basis. Generally, these requests come from citizens with disabilities who wish to get to shopping areas, medical facilities, bus stops, transportation, and other facilities or areas to accommodate their activities of daily living. The Plan will develop and implement a repair/complaint procedure that formalizes the current process. When requests come into the Department of Public Works ADA Coordinator, they will be logged into a Curb Ramp Request database and will be entered by date and time received. They will also develop and implement a similar formal grievance procedure.

Public Works will make available to applicants, participants, residents, and other interested parties, information contained in the Transition Plan. Public Works will also provide opportunities for interested persons, including individuals with disabilities or organizations representing individuals with disabilities, to participate in the development of the Transition Plan by submitting comments and making specific recommendations.

Responsible Individual

The Department of Public Works ADA Coordinator responsible for the development and implementation of the City's Transition Plan with respect to curb ramps and sidewalk locations can be reached via phone at (559) 897-5821.

XI. APPENDICES

Appendix A – Staff Survey
Appendix B – ADA Grievance / Complaint Intake Form
Appendix C – Grievance/Complaint Procedure

APPENDIX "A"

City of Kingsburg Staff Survey Form

Americans with Disabilities Act (ADA) Program

The City of Kingsburg is in the process of developing the City's ADA Self Evaluation and Transition Plan. The following is a program survey, which is requesting to be completed by Department of Public Works staff members.

Please take a moment to complete the Program Survey Form and return it to William Washburn by August 15, 2019. Thank you for assistance in completing this survey form.

Access Element	Don't Know	No or Disagree	No Opinion	Yes or Agree	Suggested Improvements/Comment
A. General Requirements					
1. Has the City designated an employee to coordinate efforts to comply with and carry out responsibilities under ADA?					
2. Do you know who the City's designated ADA Coordinator is? If yes, please provide name.					
3. Is the name and address of the ADA Coordinator posted and noticed in your work place?					
4. Do you know the City's complaint procedures and process for submitting an ADA Grievance?					
5. Has the City taken steps to ensure that all employees and consumers been instructed and notified regarding their rights under ADA?					
6. Has the City provided information to the public, in an accessible format, explaining its policy to provide accessible policies, programs, services or activities and practices?					

Access Element	Don't Know	No or Disagree	No Opinion	Yes or Agree	Suggested Improvements/Comment
B. Policy Requirements					
7. Do your department's policies ensure that persons with disabilities are provided access to programs, services and activities?					
8. Do your department's publications, service announcements and advertisements make known that they are available in alternative formats (e.g. large print, audio, Braille, captioned)?					
C. Communication Requirements					
9. Has your department reviewed its policies to ensure that it is accommodating persons with disabilities?					
10. Are facilities to accommodate persons with disabilities properly signed and noticed?					
E. Facility Checklist					
11. Are ADA facilities properly considered in the design or redesign of City facilities for which you have involvement?					
12. Are grievance procedures or complaint procedures noticed and posted at your site? If yes, where?					
13. Are individuals with disabilities included in or have an opportunity to participate in all programs, activities and services provided by your department?					
14. Are individuals with disabilities accommodated in your workplace?					

Access Element	Don't Know	No or Disagree	No Opinion	Yes or Agree	Suggested Improvements/Comment
15. Have you made accommodations for individuals with disabilities (employees, members of the public, etc)?					
16. Have you been provided training or information regarding the requirements of the Americans with Disabilities Act? If yes, describe:					
17. Would you like additional training regarding the Americans with Disabilities Act? If yes, describe:					
18. Have you received any awards or special recognitions regarding programs or services for individuals with disabilities? If yes, describe:					
19. Do you have access to current City policies, procedures, or practices?					
20. Are there any issues or information with regard to persons with disabilities or accessibility that require attention?					

OPTIONAL

Name, Title of Person Completing Survey:

_____

Phone Number:_____

E-mail:_____

APPENDIX "B"

Department of Public Works
1200 Kern Street
Kingsburg, CA 93631
(559) 897-5821

CITY OF KINGSBURG

Americans with Disabilities Act (ADA) and California Building Code Title 24 Grievance/Complaint Intake Form

(Please print or type information)

Complainant Name: _____ Email _____

Date: __/__/__ Address: _____

Telephone No.: Home (___)___-____ Work (___)___-____ Cell (___)___-____
Fax (___)___-____ TTY (___)___-____

Specific Location of Alleged Violation: _____

Complaint Description: _____

_____

_____

(For official use only)

Date/Time received: __/__/__ __:__ am/pm

Received by: _____ _____ _____
Name Department Phone #

Received via: [_] Mail [_] E-mail [_] Phone [_] Fax [_] In-person [_] Other

Complainant is County Employee: [_] Yes [_] No

Property Owner: _____ _____

Address: _____

Phone: Home (___)___-_____ Message/Other (___)___-_____

Date/Time inspected: __/__/__ __:__ am/pm Inspected by: _____

Notice Provided to Owner: [_] Yes [_] No Date: __/__/__

Intake/Referral (7 business days): Complainant Notification: __/__/__

Outside of Fresno County jurisdiction: [_] Yes [_] No

Referred to: _____ Date __/__/__

Comments: _____

Review Process (15 business days): [_] Yes [_] No Date: __/__/__

Department Contact: _____

Determination Response (30 business days): Date: __/__/__

Response made by: _____ ADACL Notified: __/__/__

Comments: _____

_____

ALL FORMS, CORRESPONDENCE AND DOCUMENTATION ARE TO BE RETAINED FOR 5 YEARS.

APPENDIX "C"

CITY OF KINGSBURG
AMERICANS WITH DISABILITIES
ACT and CALIFORNIA BUILDING
CODE TITLE 24
GRIEVANCE/COMPLAINT PROCEDURE

GRIEVANCE/COMPLAINT DEFINITION

This Grievance/Complaint Procedure was established to meet the requirements of the Americans with Disabilities Act. It may be used by anyone who wishes to file a complaint alleging discrimination on the basis of disability regarding access to City of Kingsburg facilities, services, programs, etc.

The City of Kingsburg Human Resources Department governs employment-related complaints of discrimination, including on the basis of disability. They can be reached at (559) 897-5821.

GRIEVANCE/COMPLAINT ("Complaint") PROCESS

Disability discrimination complaints may be submitted verbally or in writing. Complaints shall contain the complainant's name and contact information. Complaint should also contain the date, location, and description of the problem or violation.

The Complaint should be submitted by the Complainant or his/her designee(s) as soon as possible, but no later than 60 calendar days after the discovery of the alleged violation.

Submit Complaints to:

Mary Colby
1401 Draper Street
Kingsburg, CA 93631
Phone: (559) 897-6550
Email: mecolby@cityofkingsburg-ca.gov

INTAKE/REFERRAL PROCESS

Complaints will be taken on a City of Kingsburg Grievance/Complaint Intake Form. The complainant will be notified of receipt of the Complaint. In the event a Complaint is submitted verbally to a member of the Public Works Department, no additional notice of receipt will be required.

Within seven (7) business days of receipt of the Complaint, the ADACL will determine if the Complaint is within the City's jurisdiction and will notify the complainant of the following:

- Within the City's jurisdiction - the Complaint will be referred to the appropriate section or department.
- Outside the City's jurisdiction - the complaint will be advised that the matter is outside of the City's jurisdiction and the Complaint will be forwarded to the appropriate entity (e.g. City of Visalia, County of Kingsburg) or the complainant will be provided contact information for that entity.

REVIEW PROCESS

Within 15 business days of the referral, the complainant will be contacted by the department assigned the referral to discuss possible resolution and/or to request additional information if needed.

DETERMINATION

Within 30 business days following the Review, the assigned department representative will provide a response to the complainant. The response will serve to provide the complainant the determination made in regard to Complaint, including the anticipated timeline of expected resolution, if applicable.

Every reasonable attempt will be made by the City of Kingsburg to remedy the Complaint in a timely manner in accordance with all lawful codes, ordinances, regulations and City policies.

RETENTION OF DOCUMENTATION:

All forms, correspondence and documentation are to be retained for three (3) years.

ORDINANCE NO. 2020-002

AN ORDINANCE OF THE CITY OF KINGSBURG AMENDING SECTION 15.40.010 OF CHAPTER 15.40 OF TITLE 15 OF THE KINGSBURG MUNICIPAL CODE

The City Council of the City of Kingsburg does hereby ordain as follows:

Section 1. Section 15.40.010 of Chapter 15.04 of Title 15 of the Kingsburg Municipal Code is amended in its entirety as follows:

15.40.010 International Fire Code and California Fire Code adopted.

"The International Fire Code and Standards, 2018 Edition, and the California Fire Code with appendices, 2019 Edition, are hereby adopted by reference as if set forth in full in this Section 15.40.010. Copies of the International Fire Code, with Standards, 2018 Edition, and the California Fire Code with appendices, 2019 Edition are on file with the City."

Section 2. This ordinance shall take effect thirty (30) days after its passage and shall be published in the Kingsburg Recorder within fifteen (15) days after its passage.

PASSED AND ADOPTED at a regular meeting of the City Council of the City of Kingsburg duly called and held on the 18th day of March, 2020, by the following vote:

AYES:	Council Member	_____
		_____
		_____
		_____
		_____
NOES:	Council Member	_____
ABSTAIN:	Council Member	_____
ABSENT:	Council Member	_____

APPROVED _____
Mayor

ATTEST: _____
City Clerk

STATE OF CALIFORNIA)
COUNTY OF FRESNO)ss
CITY OF KINGSBURG)

I, **ABIGAIL PALSGAARD**, City Clerk of the City of Kingsburg, do hereby certify the foregoing ordinance was duly introduced at a regular meeting of the City Council of the City of Kingsburg on the 4th day of March, 2020, and it was duly passed and adopted at a regular meeting of said City Council of the City of Kingsburg on the 18th day of March, 2020.

Dated: March ___, 2020

_____
Abigail Palsgaard, City Clerk

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Meeting Date: 03/04/2020
Agenda Item: 4.5

CITY COUNCIL MEETING STAFF REPORT

REPORT TO: **Mayor Roman & City Council**

REPORT FROM: **Abigail Palsgaard, City Clerk** **REVIEWED BY: AH**

AGENDA ITEM: **Claim Rejection- Adria Santos on behalf of Serena Bordens**

ACTION REQUESTED: ___Ordinance ____Resolution __√_Motion _____Receive/File

EXECUTIVE SUMMARY

Adria Santos on behalf of Serena Bordens filed the attached claim was in the office of the City Clerk on February 27, 2020. The claim was referred to Acclamation Insurance Management Services (AIMS) for investigation. AIMS is the adjuster for Risk Management Authority (RMA) in liability issues. Suzanne E. Johnson, AIMS Claims Specialist, reviewed the claim and has recommended that the claim be taken to the City Council for rejection. After action by the City Council a notice will be sent to Serena Bordens informing her of the Council action.

RECOMMENDED ACTION BY CITY COUNCIL

1. Reject Claim filed by Adria Santos on behalf of Serena Bordens for her claim filed on February 27. 2020.

POLICY ALTERNATIVE(S)

1. None.

REASON FOR RECOMMENDATION/KEY METRIC

Ensure Financial Stability.

ATTACHED INFORMATION

1. Claim filed by Adria Santos on behalf of Serena Bordens

Completed forms are submitted to the clerk of the public entity, or its authorized designee. Government Code § 911.2, subd. (a).

CLAIM AGAINST LOCAL GOVERNMENT ENTITY
(Government Code Section 910.et seq.)

Public Entity Name and Address: City of Kingsburg, California , care of the City Clerk 1401 Draper Street, Kingsburg, CA 93631

Claimant Name: Adria Santos for her minor daughter Serena Bordens SSN# [redacted] (mom) Date of Birth [redacted] (Serena)

Address [redacted] Fowler, CA 93625

Phone Number (559) [redacted]

Name, address and phone number of person to receive notices concerning this claim. Kevin G. Little, LAW OFFICE OF KEVIN G. LITTLE, Post Office Box 8656, Fresno, CA 93747, (559) 342-5800

Date and time when damage or injury occurred. August 28, 2019, time unknown

Location of occurrence. Kingsburg HS, specific campus location unknown, and surrounding area of the City of Kingsburg

Circumstances of occurrence. Serena Bordens was subjected to a vicious beating by fellow students, due in significant part to the inadequate protective services provided at Kingsburg HS. Kingsburg HS staff also failed to timely notify the claimant's family, and that resulted in the delay in her receipt of necessary comfort and medical care.

Description of loss, damage or injury. Serena Bordens suffered significant physical injuries that required hospitalization and facial reconstruction, which kept her out of school for three months and which forced her to relocate and transfer to Fowler HS.

Name(s) of Public Employee(s) causing injury, damage or loss, if known. Don Shoemaker, Superintendent; Unknown Employees and agents of KJUHSD or KHS; Roger Carender, Head of Maintenance Facilities & Operations; Dr. Ryan Phelan Principal; Thom Sembritzki, Assistant Principal; Heather Wilson Assistant Principal; Unknown Agents of Employees of the City of Kingsburg

Amount* claimed at present including estimated amount of any prospective loss. This would be a superior court unlimited jurisdiction case, so no amount needs to be specified as per Gov't Code § 911(f).

Names and addresses of witnesses, doctors and/or hospitals. Adria Santos, Serena Bordens, Anthony Santos (grandfather), all can be contacted through the Law Office of Kevin G. Little; Community Regional Medical Center and providers at that facility

Claim must be signed and dated by claimant or person acting on claimant's behalf.

DATED: 2-27-20 SIGNED: [signature]

Claimant or Representative

~WARNING~

Section 72 of the Penal Code provides:

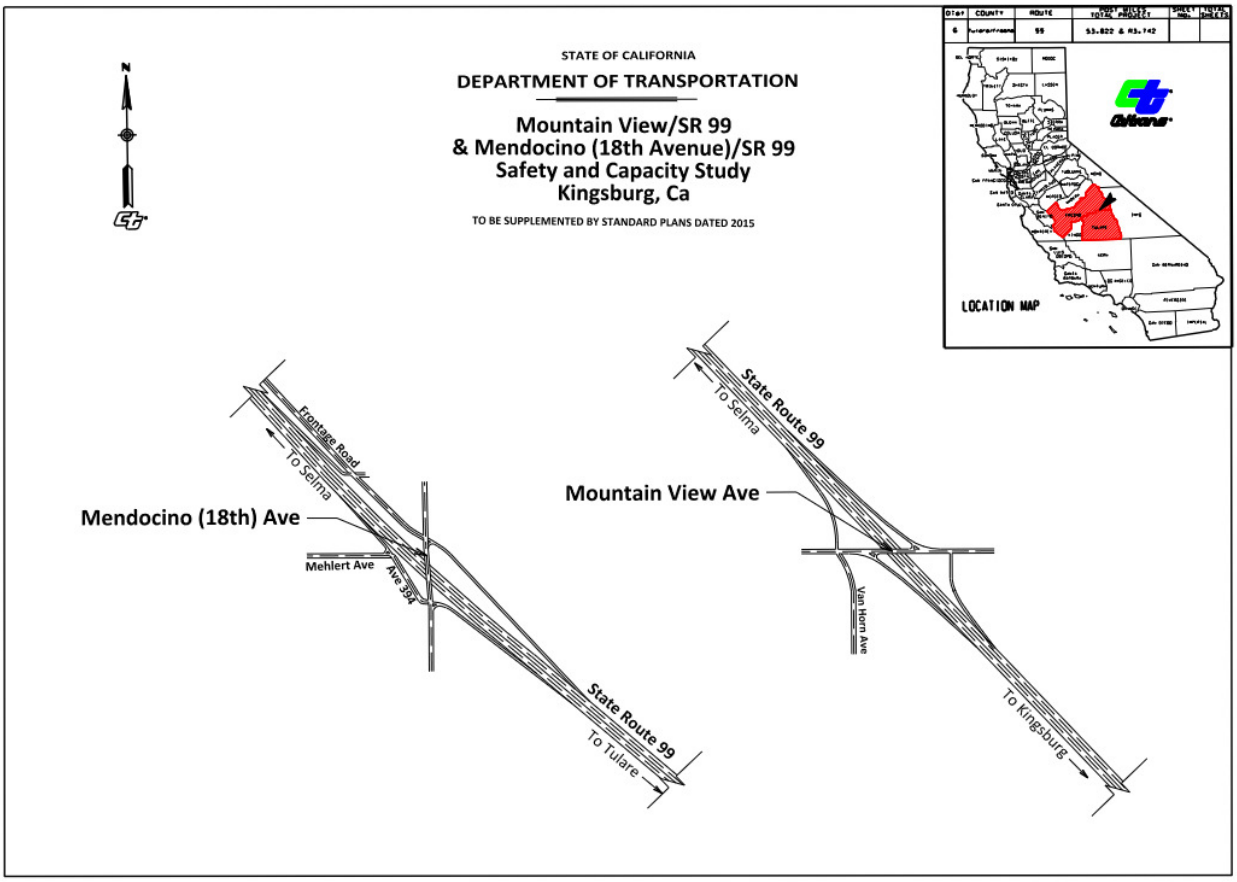
"Every person who, with intent to defraud, presents for allowance or for payment to any state board or officer, or to any county, town, city, district, ward or village board or officer, authorized to allow or pay the same if genuine, any false or fraudulent claim, bill, or account, voucher, or writing, is guilty of a felony"

This document is a public record and pursuant to the California Public Record Act must be made available for inspection and copying upon the request of any person, including, but not limited to a representative of the news media. (See Government Code §§ 6250 et seq.)

* The specific amount must be stated if the claim involves $10,000 or less. If the claim involves an amount exceeding $10,000, the Claimant must state whether the case would be a limited or unlimited civil case. (See Government Code § 911(f).)

CALIFORNIA DEPARTMENT OF TRANSPORTATION

Feasibility Study
Volume 1 of 2



IN FRESNO AND TULARE COUNTIES
WITHIN THE CITY OF KINGSBURG AND SELMA
State Route 99- Mendocino (18th) Ave (PM 53.822)
State Route 99-Mountain View Ave (PM R3.742)

May 2019

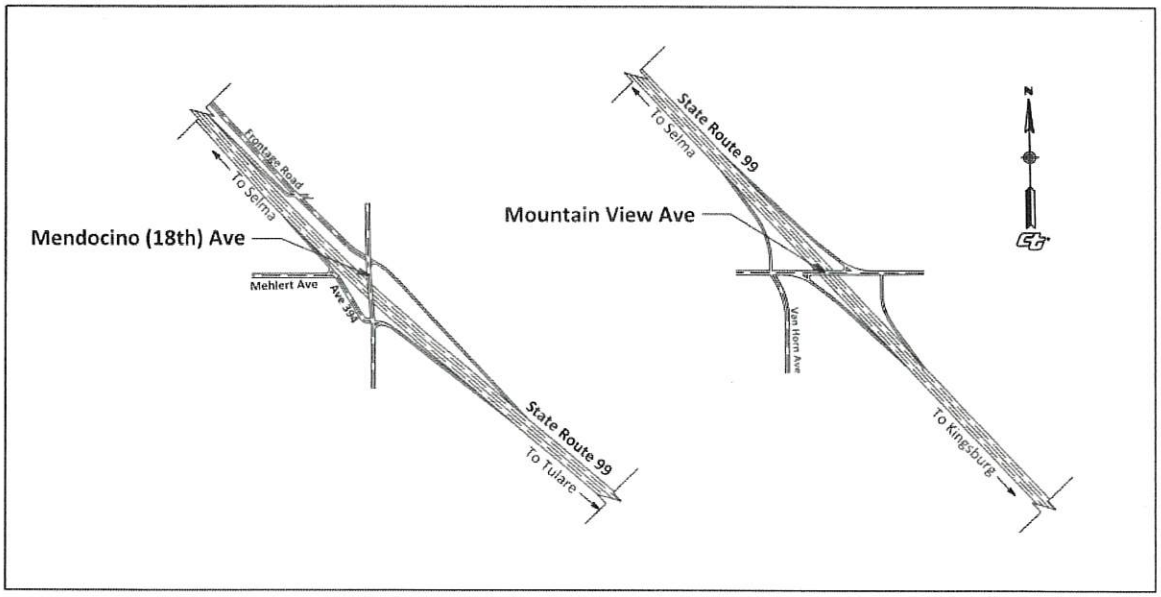
CALIFORNIA DEPARTMENT OF TRANSPORTATION

District 6

Feasibility Study

Mountain View/SR 99 & Mendocino (18th Avenue)/SR 99
Safety and Capacity Study
Kingsburg, Ca

May 2019



IN FRESNO/TULARE COUNTIES, WITHIN THE CITY OF KINGSBURG AND SELMA
Mountain View Ave (PM R3.742) and Mendocino Ave (PM R53.822)

APPROVAL RECOMMENDED:

5/6/19

CURT R. HATTON — **DATE**
Project Manager

APPROVED:

5/7/19

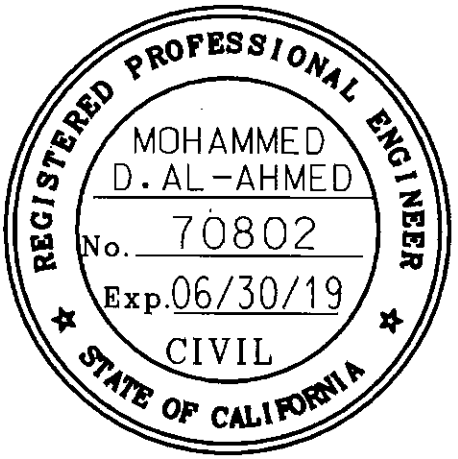
GAIL MILLER — **DATE**
Deputy District Director
Planning, Local Programs, and Environmental Analysis - District 6

This Corridor Study has been prepared under the direction of the following Registered Engineer. The Registered Civil Engineer attests to the technical information contained therein and has judged the qualifications of any technical specialists providing engineering data upon which recommendations for scoping of projects and long-term planning for the corridor are based.

5/7/19

MOHAMMED D. AL-AHMED
REGISTERED CIVIL ENGINEER

DATE



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Executive Summary

The purpose of the traffic safety/capacity study is to determine the future transportation needs on the State Route (SR) 99 / Mendocino (18th Avenue) Interchange and SR 99 / Mountain View Avenue Interchange within the areas of Kingsburg and Selma in Fresno County. The study identifies and recommends alternatives for future traffic demands and complements the Cities of Kingsburg and Selma General Plans. The study provides decision-makers with recommendations for design year 2045 and time frames when improvements are needed, as well as planning level cost estimates.

Acknowledging the role that Mountain View Avenue Interchange and Mendocino (18th Avenue) Interchange play in the transportation system in the area, the study developed a methodology to carry out an exhaustive examination of the current and future performance of both interchanges along SR 99. The methodology includes data collection to assess current operating conditions and a forecasting process to predict conditions for the year 2045. The Fresno County travel demand models were utilized as a reference to establish realistic forecasts of travel demand for the year 2045, and to ensure compatibility with relevant general plans and other transportation project appraisals.

The main metric used to assess the intersections conditions was level of service (LOS). A list of Level of Service for two-ways stop control and all-way stop control intersection are further detailed in the study.

The scope of the study includes analysis of all intersections located in the study area. Analysis of unsignalized intersection operations, particularly related to safety and access related issues, in addition to geometric deficiencies and level of service are discussed in the document. As part of the preliminary design of the proposed actions, further analysis, including updated turning movement counts and signal warrant analysis, was conducted to determine if additional traffic signals are necessary and warranted.

The study identifies existing geometric and safety deficiencies and provides a discussion of the potential operational improvements and safety benefits associated with each alternative. The study will determine a near-term, mid-term, and long-term improvements to meet transportation needs at the study locations. The study utilizes Fresno COG model, origin/destination map, and microsimulation tools to develop alternative traffic patterns.

The safety analysis conducted for the study was completed to the appropriate level of detail necessary to compare improvement alternatives. It identifies existing safety deficiencies and provided a discussion of the potential safety benefits associated with each alternative and the proposed action.

1. Introduction

1.1 Background

The Fresno Council of Governments (FCOG), the Tulare County Association of Governments (TCAG), the City of Kingsburg, and the City of Selma in cooperation with Caltrans have initiated this Feasibility Study. At a meeting in Kingsburg on February 22, 2018 all parties agreed that FCOG would serve as the lead agency representing the other local agencies in a Cooperative Agreement with Caltrans to perform traffic studies at the Mountain View Avenue and Mendocino (18th) Avenue interchanges. The purpose of the study was to identify current geometric deficiencies and to develop alternatives to improve safety and operations.

A Cooperative Agreement was approved with an effective date of May 29, 2018 and a meeting was held on July 10, 2018 to further discuss the scope of the study. The team agreed that the study should identify the current safety, geometric, and operational deficiencies and develop short term (less than 3 years), mid-term (3 – 15 years), and long term (20+ year) improvement alternatives. Alternatives at Mountain View should maintain access into the Flea Market. Additionally, planning level cost estimates will be developed for all proposed alternative improvements.

The team agreed that traffic counts should be gathered after school started in September and that traffic counts should also be taken on swap meet days to verify the peaks. The traffic counts should include truck % and forecasts at the Mountain View interchange should account for the Selma Crossings development. It was also discussed that the County has plans to widen Mountain View Avenue to four lanes.

Caltrans was also asked to look for measures that would help divert truck traffic away from 18th Avenue through Kingsburg. There is an elementary and High School that trucks pass when traveling 18th Avenue.

1.2 Study Objectives

1) Identify geometric deficiencies.
2) Perform a Safety Analysis.
3) Research ways to divert truck traffic along 18th Avenue in Kingsburg.
4) Develop short term improvements to improve safety.
5) Identify potential interim capacity improvements.
6) Analyze interim improvement alternatives.
7) Develop preliminary drawings and estimates for interim alternatives.
8) Determine failure year of interim alternatives.
9) Develop preliminary long term alternative drawings and estimates.
10) Draft report with conclusions.

2. Geometric Deficiencies

Inspection of as-built plans and reviews of available mapping has resulted in the following geometric feature deficiencies being identified.

2.1 Mountain View Avenue Interchange

Mountain View Avenue geometric deficiencies are presented in Table 2.1 (Exhibit 1).

Table 2.1 – Mountain View Avenue Interchange Geometric Deficiencies

Location	Deficiency
SR 99/Mountain View Avenue Interchange	Interchange Configuration Does Not Meet Currently Accepted Interchange Types
SR 99/Mountain View Avenue Interchange	Non-Continuous Sidewalks with Poor Pedestrian Access
Mountain View Avenue	Profile Has Non-Standard Sight Distance
Mountain View Avenue Overcrossing	Non-Standard Vertical Clearance Over State Route 99
Mountain View Avenue/SB Off-Ramp Intersection	Ramp Terminal Connects Where Grade Is Greater Than 4%
Mountain View Avenue/Van Horn Intersection	Non-Standard Intersection Skew Angle
Mountain View Avenue/Van Horn Intersection	Local Road Across from Ramp Terminal

2.2 Mendocino (18th) Avenue Interchange

Mendocino (18th) Avenue geometric deficiencies are presented in Table 2.2 (Exhibit 2).

Table 2.2 – Mendocino (18th) Avenue Interchange Geometric Deficiencies

Location	Deficiency
SR 99/Mendocino (18th) Avenue Interchange	Interchange Configuration Does Not Meet Currently Accepted Interchange Types
SR 99/Mendocino (18th) Avenue Interchange	Interchange Has Isolated Ramps
SR 99/Mendocino (18th) Avenue Interchange	Non-Continuous Sidewalks With Poor Pedestrian Access
Mendocino (18th) Avenue Overcrossing	Non-Standard Vertical Clearance Over State Route 99
Mendocino (18th) Avenue/NB Off-Ramp Intersection	Non-Standard Intersection Skew Angle
Mendocino (18th) Avenue/NB Off-Ramp Intersection	Sight Distance at Ramp Termini Not Met
Mendocino (18th) Avenue/NB Off-Ramp Intersection	Local Road Across from Ramp Terminal
Avenue 394/SB Off-Ramp Intersection	Non-Standard Intersection Skew Angle
Avenue 394/SB Off-Ramp Intersection	Uncontrolled Termini of Ramp at Intersection
SB Off-Ramp	Deceleration Distance Along Ramp Is Not Met

3. Safety Analysis

3.1 Safety Analysis Report

A Safety Analysis report dated September 17, 2018 (Attachment A) was prepared by the Caltrans District 6 Office of Traffic Operations. Accident tables for NB and SB SR 99 mainline and for the on and off ramps at each of the interchanges were created for the 3-year period from 01/01/2014 to 12/31/2016.

The accident tables indicated some Actual Accident rates on mainline were higher than the Statewide Average for similar types of facilities. However, after a review of the varied locations, factors, and types of collisions there doesn't appear to be any correctable accident causing situations on the mainline.

Accident tables for the Mountain View Avenue interchange ramps indicate that the Actual Fatal accident rates at all ramps is lower than the Statewide Averages for similar types of facilities. The Actual Fatal plus Injury and Total accident rates is lower than the Statewide Average for the NB off-ramp but higher than the Statewide Average for the NB on-ramp, SB off-ramp, and the SB on-ramp. Speeding is indicated as the most prominent Primary Collision Factor for all locations (Exhibit 3). The report recommended replacing one missing sign at the NB off-ramp exit gore and installing another sign at the intersection of the SB off-ramp facing Van Horn Avenue.

Accident tables for the Mendocino (18th) Avenue interchange ramps indicate the Actual Fatal, Fatal plus Injury, and Total accident rates at the SB on-ramp, and NB on-ramp are lower than the Statewide Averages for similar types of facilities. For the NB off-ramp the Actual Total accident rate is higher than the Statewide Average for similar types of facilities and for the SB off-ramp both the Actual Fatal plus Injury and Total accident rates are higher than the Statewide Average for similar types of facilities. Speeding is indicated as the most prominent Primary Collision Factor for the two off-ramp locations (Exhibit 4).

3.2 All Way Stop (AWS) Traffic Warrants

Due to Speeding being identified as the most prominent Primary Collision Factor at both interchanges District 6 Traffic Operations deployed hose counting stations in November 2018 to gather traffic volumes and determine whether ramp intersections met warrants for All Way Stop (AWSC) control (Attachment B). The ramp intersections with Mendocino Avenue met the traffic volume warrants for the Major and Minor street legs. At the Mountain View Avenue interchange the SB off-ramp intersection met the traffic volume warrants for the Major and Minor street legs however the NB off-ramp intersection met the warrant for Mountain View Avenue (Major Street) but did not meet the volume warrant for the NB off-ramp (Minor Street).

3.3 Divert Truck Traffic From 18th Avenue

A review of the California State Highways Truck Networks reveals that 18th Avenue through Kingsburg is not on the National Network (STAA) or the Terminal Access (STAA). Additionally, the SR 99 Mendocino (18th) Avenue interchange is not designated for access to Truck Services. Further review of the City of Kingsburg ordinances reveals that 18th Avenue is not a designated Truck Route by City Ordinance. Caltrans does not post signage precluding truck usage for facilities that are not designated as truck routes.

There are currently City signs on the NB off-ramp, Avenue 394, and 18th Avenue north of the Avenue 396 intersection indicating 18th Avenue is not a truck route. An application should be submitted for legal truck access to the industries on Clarkson Drive. Once an application is approved an End of Truck Route sign can be posted on 18th Avenue at the intersection of Kent Street. It is also recommended that enforcement be used to dissuade truck traffic from using 18th Avenue.

4. Alternatives

4.1 Mountain View Avenue

4.1.1 Near Term

Existing

This No-Build alternative would not alter the existing conditions and will not address safety issues.

Two Way Stop Control

This alternative proposes to add all way stop control at the SB off-ramp intersection and to re-delineate the slip on-ramp intersections to create perpendicular right turns. This alternative will slow traffic down on Mountain View Avenue but will negatively affect Levels of Service (LOS) (Exhibit 5).

4.1.2 Mid-Term

Mid-term alternatives for the Mountain View Avenue interchange propose to improve interchange operations and safety with minimal right-of-way (R/W) impacts and without impacting the Mountain View overcrossing structure. Three alternatives were developed as mid-term improvement options. All mid-term alternatives propose to realign the on-ramps to create single intersection points along Mountain View Avenue. The three alternatives will consider three types of intersection control; All Way Stop (AWS), signalized, and roundabout.

Access to the flea market on the east side of SR 99 will be maintained in both the EB and WB directions. A median island would be constructed with a left turn pocket for WB access. Access to the service station

on the southwest side of the interchange would be rerouted to a new intersection approximately 400 feet west of the existing SB off-ramp intersection. Connection of South Van Horn Avenue to Mountain View Avenue would be removed.

Pedestrian and bicycle access would be improved by the elimination of the high-speed slip ramps and reducing the widths of the ramp intersections. The sidewalk on the north side of Mountain View Avenue would be extended from the overcrossing to beyond the ramp intersections and crosswalks would be constructed.

Alternative 1 (Exhibit 6)

Realigned on-ramps with AWS intersection control.

Alternative 2 (Exhibit 7)

Realigned on-ramps with signalized intersection control. This alternative would widen Mountain View Avenue on each side of the overcrossing to provide left and right turn lanes to the on-ramps.

Alternative 3 (Exhibit 8)

Realigned on-ramps with roundabout intersection control.

An alternative was considered that would add hook on-ramps and eliminate the need for left turns from Mountain View Avenue to the existing on-ramps. Because of the narrow width between the bents adjacent to the SR 99 outside shoulders and the structure abutments hook ramps are not viable. Standard freeway entrance ramp geometry cannot be constructed with the available width.

4.1.3 Ultimate Long-Term Alternative

Alternative 4 (Exhibit 9)

An L-9 interchange configuration with signalized Intersections was developed as an ultimate alternative. This alternative would require reconstruction of the Mountain View Avenue overcrossing and adjusting the roadway profile. Additionally, construction of the successive on-ramps could create the need for construction of auxiliary lanes on SR 99. This alternative would also create R/W impacts to both service stations on the west side of the interchange and the Flea Market on the east side.

4.2 Mendocino (18th) Avenue Alternatives

4.2.1 Near Term Alternative

Two Way Stop Control

This No-Build alternative would not alter the existing conditions and will not address safety issues.

All Way Stop Control

This alternative proposes to add all way stop control at the two ramp intersections on Mendocino Avenue. This alternative will slow traffic down on Mendocino Avenue but will negatively affect Levels of Service (LOS).

4.2.2 Mid Term

Mid-term alternatives for Mendocino Avenue also propose to improve interchange operations and safety with minimal right-of-way (R/W) impacts and without impacting the Mendocino overcrossing structure. For Mendocino Avenue six alternatives were developed as mid-term improvement options. Mid-term alternatives for Mendocino Avenue are separated into two groups. Each group will consider three types of intersection control; All Way Stop (AWS), signalized, and roundabout.

The first group of alternatives, alternatives 1 – 3 propose to realign Avenue 394 and improve the Avenue 394/SB off-ramp intersection with stop control for the SB off-ramp. These alternatives will improve turn movements at the intersection with Mendocino Avenue. The first group also proposes to realign the NB off-ramp and Frontage Road to create a more perpendicular intersection with Mendocino Avenue. Realignment of the NB off-ramp and the Frontage Road would require construction of retaining walls due to the height of the intersection and the proximity between the railroad and State Route 99.

Pedestrian and bicycle access would be improved by reducing the widths of the ramp intersections. The sidewalk on the north side of Mendocino Avenue would be extended and made continuous from the railroad overhead east of the interchange to west of the Avenue 394/SB on-ramp intersection and crosswalks would be constructed.

Alternative 1 (Exhibit 10)

AWSC intersection control at Mendocino Avenue intersections and Two Way Stop (TWS) control at the Avenue 394/SB off-ramp intersection.

Alternative 2 (Exhibit 11)

Signalized intersection control at Mendocino Avenue intersections and Two Way Stop (TWSC) control at the Avenue 394/SB off-ramp intersection.

Alternative 3 (Exhibit 12)

Roundabout intersection control at Mendocino Avenue intersections and at the Avenue 394/SB off-ramp intersection.

The second group of alternatives, alternatives 4 – 6, propose to reconstruct the SB off-ramp and NB on-ramp to eliminate the isolated ramps. These alternatives propose to realign Avenue 394 to connect to Avenue 392 to the south and construct a cul-de-sac approximately 100 feet west of the current Avenue 394/SB off-ramp intersection. The Frontage Road access to Mendocino Avenue would be eliminated Band access to the businesses between the railroad and SR 99 would be shifted to the Sierra Street interchange.

These alternatives would require construction of retaining walls to realign the NB off-ramp and NB on-ramp.

In addition to the pedestrian and bicycle improvements provided by alternatives 1 – 3 these alternatives would further improve pedestrian safety at the intersection with the NB on-ramp. By reducing the roadway width with the removal of the SB movement from Frontage Road, the crosswalk would be significantly narrowed. A pedestrian access would be provided along the realigned SB off-ramp for access to the neighborhood along Avenue 394.

Alternative 4 (Exhibit 13)

AWS intersection control at Mendocino Avenue intersections.

Alternative 5 (Exhibit 14)

Signalized intersection control at Mendocino Avenue intersections.

Alternative 6 (Exhibit 15)

Roundabout intersection control at Mendocino Avenue intersections.

4.2.3 Ultimate Long-Term Alternative

Alternative 7 (Exhibit 16)

A combined L-1/L-2 interchange configuration with signalized Intersections was developed as an ultimate alternative for the Mendocino Avenue location because of the proximity to the railroad, see exhibit 16. This alternative would require reconstruction of the Mendocino Avenue overcrossing and the railroad overhead. The alternative would adjust the roadway profile to meet vertical clearance requirements over SR 99 and be realigned slightly north on the west side of SR 99 to improve the skew angle with the freeway. The realignment of Mendocino Avenue will improve ramp intersection angles. Because of the proximity to the railroad retaining walls would be needed for construction of the NB ramps. Additionally, Avenue 394 would need to be realigned for the ultimate interchange design.

5. Operational Analysis

5.1. Overview

This study followed certain procedures for all locations including collecting existing traffic data, describing lane configurations, evaluating deficiencies, and providing acceptable recommendations with realistic costs. The study methodology was developed to ensure an appropriate method was used for each location. A comprehensive evaluation of existing and future deficiencies on roadway networks, including interchanges and intersections was conducted. This study entails the development and evaluation of alternatives based on performance measures including conceptual designs.

5.2 Traffic Data Collection

The existing conditions analysis included researching and collecting the most current vehicle turns counts data, roadway geometry, such as number of lanes and storage lengths, pedestrian counts, vehicular queue length observations, large truck estimates, origin-destination analysis and general observations.

Traffic data was collected when schools were in session. An additional Sunday traffic count was conducted to collect Selma Flea Market traffic. Traffic data was collected on the following dates for the listed intersections:

Thursday, September 13, 2018, 6:00 - 9:00 AM, and 3:00 - 6:00 PM

- **SR 99 SB Off Ramp / Mountain View Avenue Intersection**
- **SR 99 SB On Ramp / Mountain View Avenue Intersection**
- **SR 99 NB On Ramp / Mountain View Avenue Intersection**
- **SR 99 NB Off Ramp / Mountain View Avenue Intersection**

Wednesday, September 26, 2018, 6:00-9:00 AM, and 3:00 – 6:00 PM

- **SR 99 NB Off Ramp / Mendocino (18th) Avenue Intersection**
- **SR 99 NB On Ramp / Frontage Road / Gilroy Street Intersection**
- **SR 99 SB Off Ramp / Ave 394 Intersection**
- **SR 99 SB Off Ramp / Ave 394 / 18th Avenue Intersection**

Sunday, October 28, 2018, 5:00-9:00 AM, and 2:00 – 6:00 PM

- **SR 99 SB Off Ramp / Mountain View Avenue Intersection**
- **SR 99 SB On Ramp / Mountain View Avenue Intersection**
- **SR 99 NB On Ramp / Mountain View Avenue Intersection**
- **SR 99 NB Off Ramp / Mountain View Avenue Intersection**

5.3 Analysis Years

This study used 2018 as the base year, 2025 as the construction year and 2035, 2045 as the 10 and 20-year design period. Estimated traffic volumes for the study also provides failure years and corresponding suggested project initiation years for locals to consider.

5.4 Forecasting

5.4.1 Overview

Transportation forecasting estimates the number of people or vehicles that will use a specific transportation facility in the future. Due to the lack of pedestrian and bicycle traffic observed in data collection forecasting for this study will be limited to the vehicle mode.

Traffic volumes forecasts are used as input in traffic operational analysis to identify future needs, evaluate performance measures, and serve as a basis of concept designs that will meet these needs.

5.4.2 Forecasting Tools

This study used several urban transportation planning procedures for forecasting:

- **Trip generation** uses standard trip generation rates based on land use studies. This study used the 10th edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual. Trip generation was used for locations where insufficient traffic volume counts were available.

- **Historical trends** were analyzed, and corresponding adjusted growth rates used for study locations.

- **Travel Demand Model.** Fresno County Council of Governments (Fresno COG) is the MPO in Fresno County. Fresno COG maintains and runs travel demand models for the Fresno County region. The models predict changes in travel patterns and are used to forecast the demand for future transportation infrastructure. The model transportation network is based on adopted local general plans and reflects existing and future freeways, expressways, arterials and collectors. Input variables include population, households, employment, school enrollment, income, traffic counts, speed, and existing or planned transportation networks.

  The current Fresno COG model was updated in 2013. The model was calibrated to 2008 population, employment and traffic count data and validated against socio-economic data. Fresno COG developed a new 2040 model as part of an eight county San Joaquin Valley (SJV) Model Improvement Program (MIP). This is to address SB 375, California's law requiring coordination of land use and transportation planning to support mandated greenhouse gas emission reductions.

5.4.3 2025, 2035 and 2045 Forecast Traffic Volumes

Travel demand models used to forecast future travel patterns. Socio-economic data, roadway networks, trip rates, and other factors are used by the model to calculate the current and future travel patterns. The resultant growth rate produced by the model was listed against growth rates computed by other methods such as from count trends, population growth, employment growth and trips generated from adjacent planned projects such as Selma-Crossing and Hash Project. Future land use was also used to generate the number of trips entering or exiting a site at a given time. Trip rates are functions of type of future land use, development, and square footage, number of dwelling units, or other standard measurable things, usually produced in General site plans. Origin-Destination map was produced by trip purpose, typically as a function of household demographics and land uses.

6. TRAFFIC STUDY METHODOLOGY

6.1 Operational Measures of Effectiveness (MOE)

Acceptable operations are defined, and operational needs are identified by measures of effectiveness for intersections. Intersections are evaluated using level of service (LOS) and Volume/Capacity (V/C) ratio. A detailed analysis by lane groups provides an effective way to identify operational needs and geometric design solutions to meet these needs. Improvements and the timing of improvements are proposed based on critical lane group MOEs including LOS, delay, 95% queue length, and V/C ratio.

6.2 Level of Service (LOS)

Level of Service is a qualitative measure used to gauge traffic operational performance by describing the driver's experience within a traffic stream in terms of speed and travel time, maneuverability in the traffic stream, interruptions and delay, and comfort and convenience. Six levels of service are defined by the HCM 6th edition. Letters designate each level, from LOS "A" indicating traffic flow with little to no delay to LOS "F" denoting over-saturated conditions where traffic flow exceeds capacity, resulting in excessive delays and long queues. Based on current and forecasted traffic volumes, the LOS for the various time frames was calculated using Highway Capacity Software (HCS) to analyze AWSC and TWSC intersections or the equivalent in Synchro 10 for signalized intersections and SYDRA 8 for roundabouts.

The HCM level of service criteria for signalized, un-signalized intersections and roundabouts are presented in Table 6.1.

Table 6.1 – Level of Service Definitions for Intersections

LOS	DESCRIPTION	CONTROL DELAY (Sec/Veh) WITH V/C ≤ 1		
		UNSIGNALIZED (AWSC, TWSC)	SIGNALIZED	ROUNDABOUT
A	Traffic flows with very little delay and optimal speeds. Most vehicles do not stop at all.	0-10	<10	0-10
B	Traffic flows with very little delay and speeds may be slightly reduced. Very infrequent and short waits at traffic signals. More vehicles stop at intersections than for LOS A.	>10-15	>10-20	>10-15
C	Traffic speeds continue to slow. Some vehicles may stop at this level, although many vehicles still pass through the intersection without stopping.	>15-25	>20-35	>15-25
D	Congestion becomes more noticeable. Many vehicles stop and the proportion of vehicles not stopping declines.	>25-35	>35-55	>25-35
E	Low speeds and traffic backups at intersections. Often considered to be the limit of acceptable delay.	>35-50	>55-80	>35-50
F	Very slow speeds and congestion. Long traffic backups. Very likely to wait for multiple greens to get through an intersection. This is unacceptable for most drivers.	>50	>80	>50

Source: Highway Capacity Manual 6th edition

For this study, it was decided to perform analysis using LOS D as the failure threshold and to plan the projects for 20-year horizon.

6.3 Volume/Capacity (V/C) Ratio

The V/C ratio estimates the ability of a roadway to accommodate traffic volume demand. It compares roadway demand (vehicle volumes) with roadway supply carrying capacity. Volume refers to the number of vehicles using a roadway at the peak commute times, while capacity is its ability to support that volume based on the geometric design and number of lanes. V/C ratio is a principal measure of effectiveness for critical lane groups or the intersection. Critical lane group is that portion of the roadway whose behavioral attributes (MOE) are distinctly different and operationally deficient in comparison to the intersection. The tables listed in the study will show intersection LOS, which do not necessarily indicate acceptable operational attributes on each approach. Critical lane groups could indicate excessive delay or queuing problems representing operational deficiencies. In general, a V/C ratio greater than 0.8 is near capacity and would require further analysis of other measures of effectiveness; V/C ratios greater than 0.9 is at capacity and above 1.0 is over capacity. This is true for the whole intersection or for critical lane groups.

6.4 95th Percentile Queue Length

Caltrans design criteria includes the 95th-percentile queue length when practicable. The 95th-percentile queue is defined to be the queue length (in vehicles) that has only a five percent probability of being exceeded during the analysis period. It is a useful parameter for determining the appropriate length of turn pockets. Proper queue length sizing is critical to prevent "queue blocking."

6.5 Delay

Delay is defined in the Highway Capacity Manual 2010 as "additional time experienced by a driver, passenger, bicyclist, or pedestrian beyond that required to travel at the desired speed." The delay encountered by a traveler at a signalized intersection constitutes the largest part of his or her travel time on non-freeway segments. Delay can be measured for lane groups or for the intersection. While the tables provide intersection delay, critical lane groups are evaluated by the engineer when considering the performance of an intersection. In general, delay has three main components: uniform stop delay, over-saturated delay and the stop delay caused by the initial queue from the previous cycles.

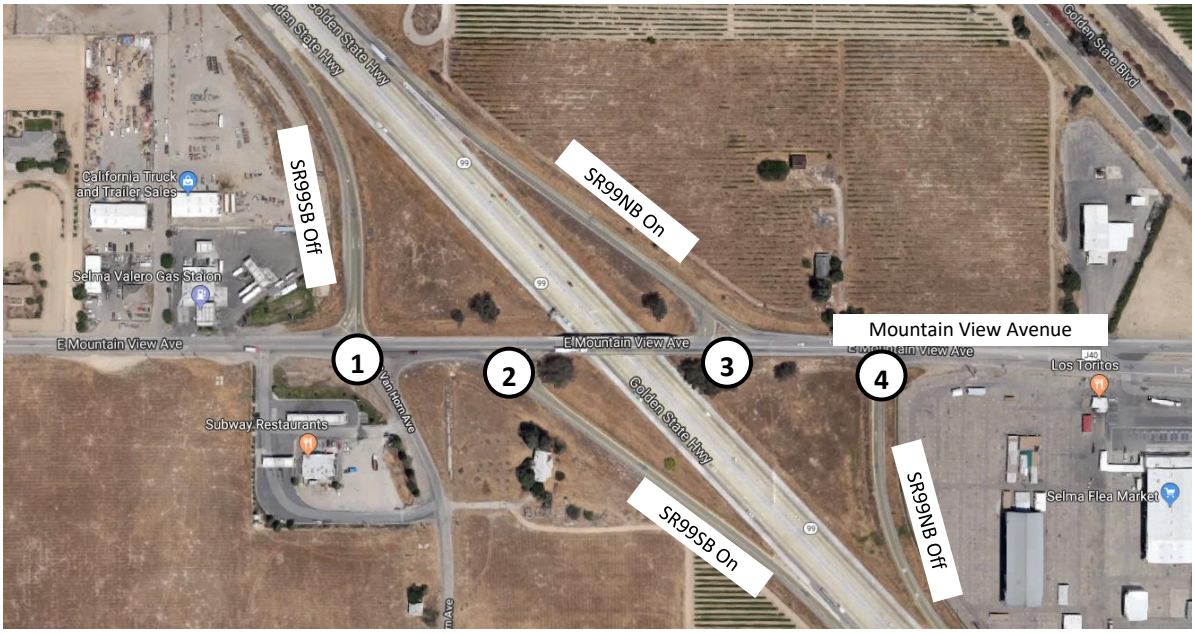
6.6 Average Delay

Average Delay for the intersection is calculated by taking a volume weighted average of all the delays.

7. Mountain View Avenue

Four intersections are located on Mountain View Avenue and SR 99 ramps.

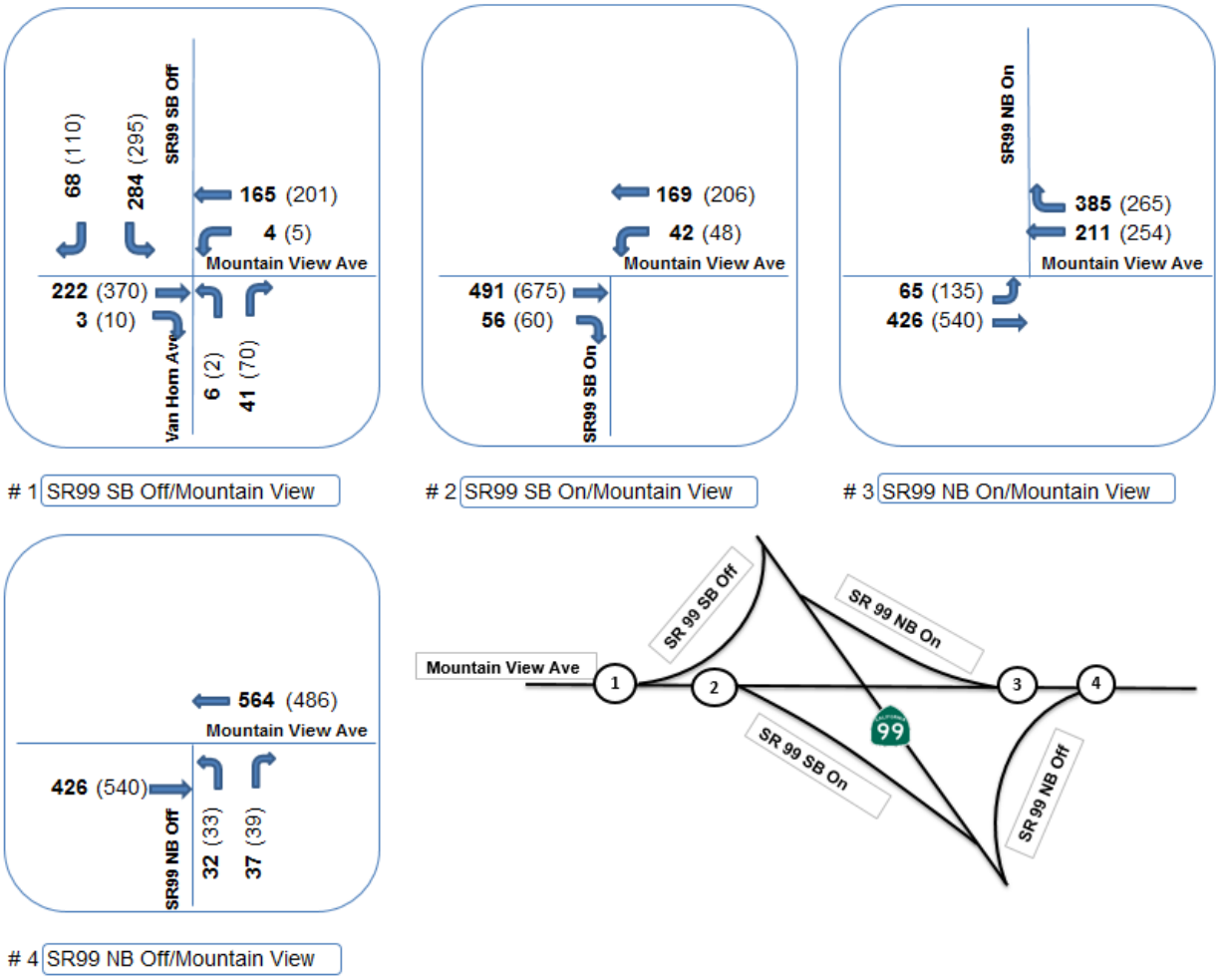
Figure 7.1 – Mountain View Avenue Existing Aerial Photo



7.2 2018 Existing Peak Hour Turning Movement Volumes

Figure 7.2 illustrates the Mountain View Avenue intersections 2018 existing AM (PM) peak hour turning movement volumes.

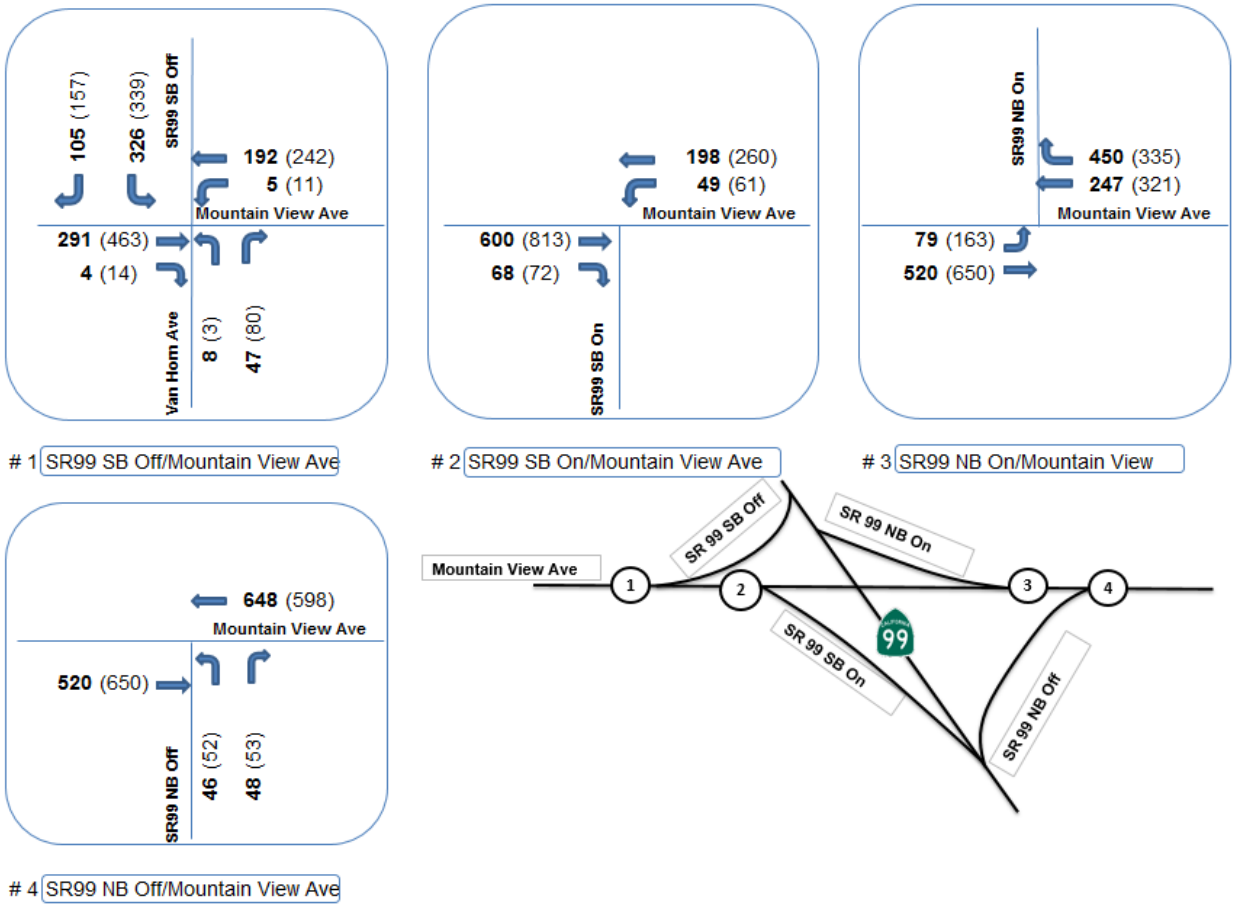
Figure 7.2 – SR-99/ Mountain View Avenue Intersections
2018 Existing AM (PM) Peak Hour Turning Movement Volumes



7.3 2025 Forecast Peak Hour Turning Movement Volumes

Figure 7.3 shows the SR99/Mountain View Avenue intersections 2025 forecast AM (PM) peak hour forecast turning movement volumes.

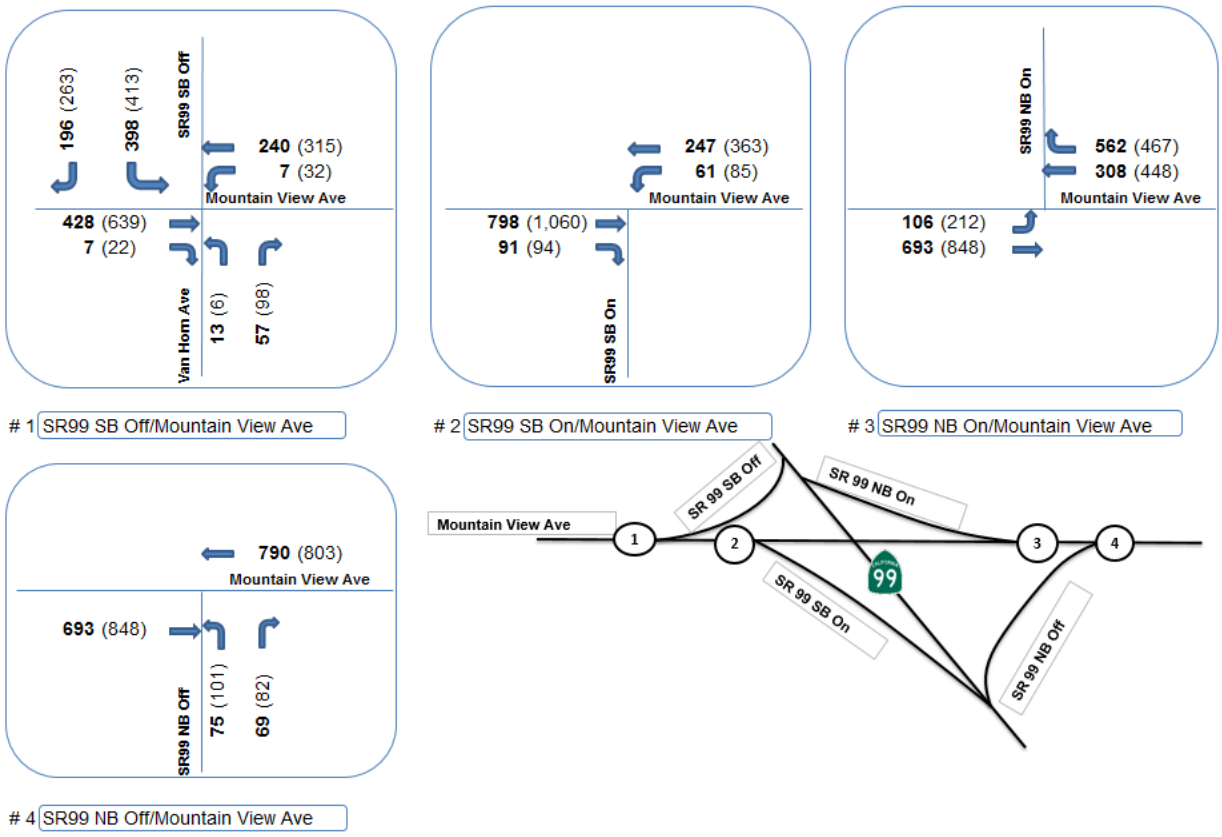
Figure 7.3 – SR-99/ Mountain View Avenue Intersections
2025 Forecast AM (PM) Peak Hour Turning Movement Volumes



7.4 2035 Forecast Peak Hour Turning Movement Volumes

Figure 7.4 shows the SR99/Mountain View Avenue intersections 2035 forecast AM (PM) peak hour forecast turning movement volumes.

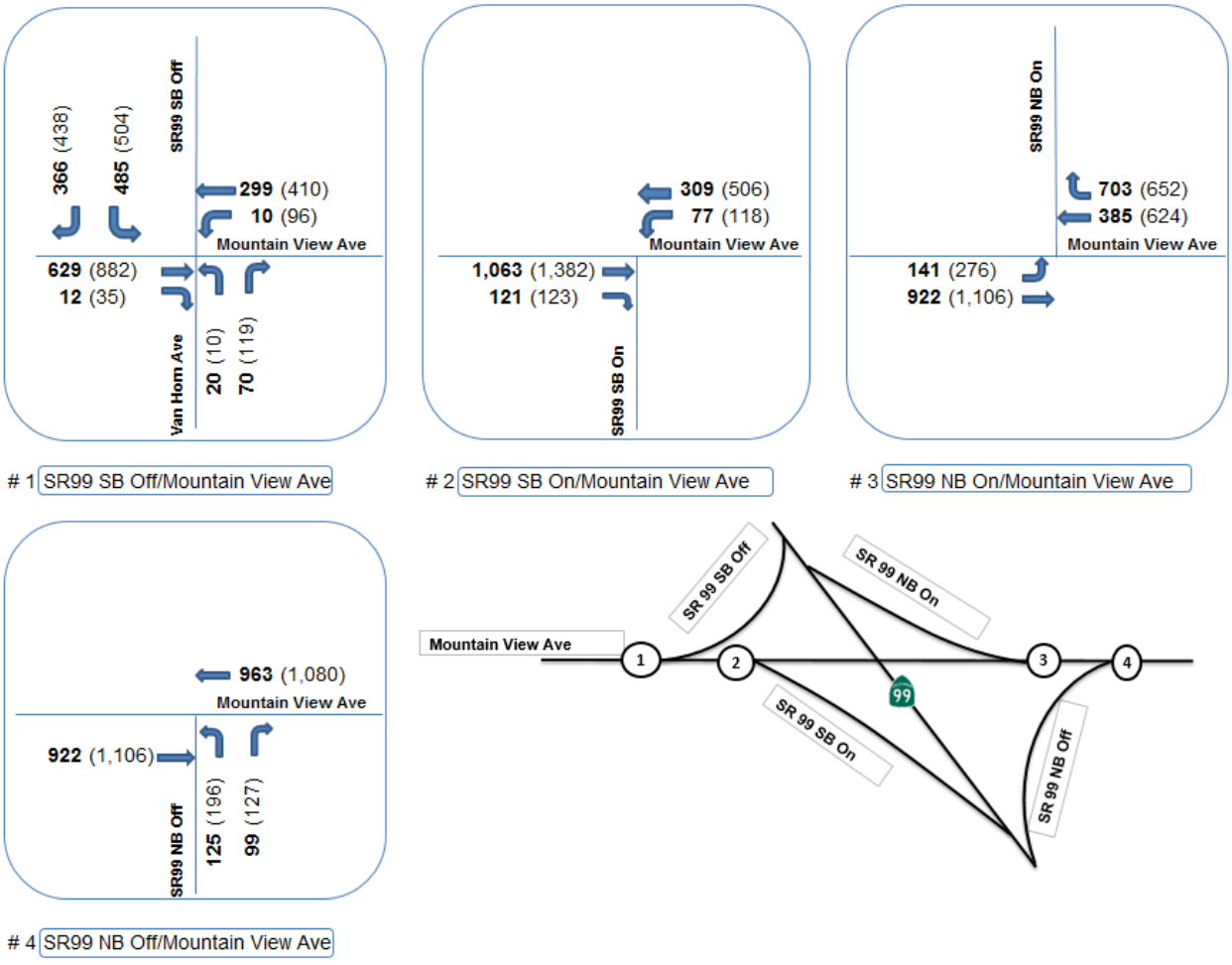
Figure 7.4 – SR-99/ Mountain View Avenue Intersections
2035 Forecast AM (PM) Peak Hour Turning Movement Volumes



7.5 2045 Forecast Peak Hour Turning Movement Volumes

Figure 7.5 shows the SR99/Mountain View Avenue intersections 2045 forecast AM (PM) peak hour forecast turning movement volumes.

Figure 7.5 – SR-99/ Mountain View Avenue Intersections
2045 Forecast AM (PM) Peak Hour Turning Movement Volumes



7.6 Existing Traffic Operational Conditions

The ramp intersections at the SR 99 and Mountain View Avenue interchange were analyzed for existing, 2035, and 2045 operating conditions (approach delay and LOS). Data for analysis was based on AM and PM peak hour turning movement counts.

Currently, the intersection at the SR 99 southbound off-ramp/Mountain View Avenue and northbound off-ramp/Mountain View Avenue interchanges are operating as TWSC, and the intersection at the SR 99 southbound on-ramp/Mountain View Avenue and northbound on-ramp/Mountain View Avenue interchanges are operating as unsignalized.

The acceptable level of service (LOS) for intersections is LOS D or better. Therefore, any intersections operating at a LOS E or F will be considered deficient. For existing traffic conditions, the SR 99 northbound ramps and Mountain View Avenue intersection is operating at LOS C, an acceptable level of service. However, the SR 99 southbound ramps and Mountain View Avenue intersection is operating at LOS E, See Table 7.1.

Queue and delay time on the southbound left turn traffic are the dominant problems. For the PM peak, the southbound left turn V/C ratio is 0.86 and delay time is 54.7 seconds with LOS F.

Table 7.1 – Mountain View Avenue Intersections, 2018 Existing Level of Service Summary .

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Off-Ramp	-	-	C (C)	-	-	-	24 (23)	-	C (C)	18 (18)
SR 99 SB Off-Ramp	-	A (A)	C (C)	D (F)	-	8 (9)	16 (16)	28 (55)	C (E)	25 (43)

7.7 Existing Deficiencies

7.7.1 SR 99 Southbound Off Ramp Intersection (Intersection 1)

The SR99 SB off ramp left-turn queue and the associated delay time are the dominant problems. For the PM peak, the southbound left turn delay time is 55 seconds with LOS F.

7.7.2 SR 99 Northbound Off Ramp Intersection (Intersection 4)

The analysis indicates that the intersection currently operates with satisfactory levels of service during both the morning and evening peak travel periods for the year 2018.

7.8 No-Build Traffic Operation Conditions

7.8.1 Year 2025 and 2035

Traffic operational analysis for the 2025 and 2035 no-build scenario indicates that the SR99/ Mountain View Avenue intersections would likely operate with unsatisfactory level of service F with long delay times, see Table 7.2 and 7.3, respectively.

Table 7.2 Mountain View Avenue Intersections, 2025 No-Build Level of Service Summary

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Off-Ramp	-	-	D (D)	-	-	-	34 (35)	-	C (C)	24 (25)
SR 99 SB Off-Ramp	-	A (A)	C (C)	F (F)	-	8 (9)	19 (20)	67 (202)	F (F)	54 (142)

Table 7.3 Mountain View Avenue Intersections, 2035 No-Build Level of Service Summary

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Off-Ramp	-	-	F (F)	-	-	-	105 (188)	-	F (F)	63 (113)
SR 99 SB Off-Ramp	-	A (A)	D (E)	F (F)	-	9 (10)	30 (37)	363 (935)	F (F)	247 (577)

The SR99 SB off ramp / Mountain View Avenue intersection is currently failing and SR99 NB off ramp / Mountain View Avenue intersection will fail in the year 2030 see Table 7.4.

Table 7.4 Mountain View Avenue Intersections Failing Year for No-Build

Location Project	Failing Year
SR 99 NB Off-Ramp/Mountain View Avenue	2030
SR 99 SB Off-Ramp/Mountain View Avenue	2018

7.9 Recommended Improvements to Address Deficiencies for Design Year 2045

The following are improvements recommended for the SR99 off ramps / Mountain View Avenue intersections to address deficiencies for Design Year 2045:

Realign on Ramps for all alternatives and install the following traffic control on ramp terminals:

- **Alternative 1 – All Way Stop Control (AWSC)**
- **Alternative 2 – Signalized**
- **Alternative 3 – Roundabout**

7.9.1 Alternative 1- Realign On-Ramps with All Way Stop Control (AWSC)

Table 7.5, 7.6 and 7.7 show that with the recommended improvements, the SR99 NB & SB ramps / Mountain View Avenue intersections would likely operate worse than the no-build scenario and with an unsatisfactory LOS F for both the morning and evening peak hours in the year 2045.

Table 7.5 Mountain View Avenue Intersections, Construction Year 2025 Level of Service Summary (AWSC)

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Off-Ramp	E (F)	C (B)	B (B)	-	36 (84)	16 (14)	11 (12)	-	C (F)	25 (52)
SR 99 SB Off-Ramp	C (F)	B (C)	-	C (D)	19 (104)	14 (19)	-	22 (29)	C (F)	19 (59)

Table 7.6 Mountain View Avenue Intersections, Year 2035 Level of Service Summary (AWSC)

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Off-Ramp	F (F)	D (D)	B (B)	-	153 (275)	33 (26)	12 (13)	-	F (F)	87 (154)
SR 99 SB Off-Ramp	F (F)	C (E)	-	E (F)	57 (270)	21 (39)	-	46 (55)	E (F)	44 (139)

Table 7.7 Mountain View Avenue Intersections, Year 2045 Level of Service Summary (AWSC)

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Off-Ramp	F (F)	F (F)	B (C)	-	366 (576)	112 (130)	14 (19)	-	F (F)	222 (338)
SR 99 SB Off-Ramp	F (F)	D (F)	-	F (F)	170 (493)	30 (130)	-	89 (117)	F (F)	106 (267)

7.9.2 Alternative 2- Realign On-Ramps with Signalized

Table 7.8, 7.9 and 7.10 shows the recommended signalized intersections improvements The SR99 NB ramps / Mountain View Avenue would likely operate with a satisfactory LOS C for the year 2045. The SR99 SB ramps / Mountain View Avenue would likely operate with unsatisfactory LOS F in the evening peak hour travel period with long delay times for the year 2045, see Table 7.9. The eastbound through, southbound left-turn have V/C ratios that are overcapacity with corresponding LOS F and long delay times. The SR99 SB ramps / Mountain View Avenue with the recommended signalized intersections improvements would fail in the year 2040.

Table 7.8 Mountain View Avenue Intersections, Construction Year 2025 Level of Service Summary (SIGNALIZED)

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Off-Ramp	B (B)	B (B)	A (A)	-	19 (19)	12 (15)	8 (9)	-	B (B)	15 (17)
SR 99 SB Off-Ramp	C (D)	A (A)	-	B (C)	32 (40)	8 (3)	-	17 (35)	C (C)	21 (30)

Table 7.9 Mountain View Avenue Intersections, Year 2035 Level of Service Summary (SIGNALIZED)

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Off-Ramp	B (B)	B (C)	A (C)	-	19 (11)	12 (25)	10 (28)	-	B (B)	15 (18)
SR 99 SB Off-Ramp	D (E)	A (A)	-	C (D)	39 (58)	5 (3)	-	22 (44)	C (D)	24 (40)

Table 7.10 Mountain View Avenue Intersections, Year 2045 Level of Service Summary (SIGNALIZED)

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Off-Ramp	A (B)	C (C)	C (D)	-	9 (16)	25 (26)	35 (50)	-	B (C)	18 (24)
SR 99 SB Off-Ramp	E (F)	A (B)	-	D (F)	61 (148)	6 (15)	-	38 (112)	D (F)	40 (103)

7.9.3 Alternative 3- Realign On-Ramps with Roundabout

Table 7.11, 7.12 and 7.13 shows the recommended roundabout intersections improvements. The SR99 NB & SB ramps / Mountain View Avenue intersections would likely operate with a LOS B and C for both the morning and evening peak hour consecutively in the year 2045.

Table 7.11 Mountain View Avenue Intersections, Construction Year 2025 Level of Service Summary (Roundabout)

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Off-Ramp	A (A)	A (A)	A (A)	-	7 (9)	4 (4)	8 (10)	-	A (A)	6 (7)
SR 99 SB Off-Ramp	A (A)	A (A)	-	A (A)	6 (7)	4 (4)	-	7 (8)	A (A)	6 (7)

Table 7.12 Mountain View Avenue Intersections, Year 2035 Level of Service Summary (Roundabout)

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Off-Ramp	A (B)	A (A)	A (B)	-	8 (11)	5 (5)	9 (14)	-	A (A)	7 (9)
SR 99 SB Off-Ramp	A (A)	A (A)	-	A (B)	7 (9)	4 (5)	-	9 (11)	A (A)	7 (9)

Table 7.13 Mountain View Avenue Intersections, Year 2045 Level of Service Summary (Roundabout)

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Off-Ramp	B (C)	A (A)	B (D)	-	12 (18)	6 (8)	13 (26)	-	A (B)	10 (15)
SR 99 SB Off-Ramp	A (C)	A (A)	-	B (D)	10 (19)	5 (5)	-	14 (28)	B (C)	11 (19)

7.10 Summary

Based on LOS for all the proposed improvements, Table 7.14 shows a LOS comparison of various time frames.

Table 7.14 – Mountain View Near-Term Alternatives
AM (PM) Peak Hour Level of Service Comparison Alternatives 1, 2, and 3

YEAR	LOCATION	Alternative 1* (AWSC)		Alternative 2* (SIGNALIZED)		Alternative 3* (ROUNDABOUT)	
		LOS	DELAY	LOS	DELAY	LOS	DELAY
2025	SR99 NB off Ramp / Mountain View	C (F)	25 (52)	B (B)	15 (17)	A (A)	6 (7)
	SR99 SB off Ramp / Mountain View	C (F)	19 (59)	C (C)	21 (30)	A (A)	6 (7)
2035	SR99 NB off Ramp / Mountain View	F (F)	87 (154)	B (B)	15 (18)	A (A)	7 (9)
	SR99 SB off Ramp / Mountain View	E (F)	44 (139)	C (D)	24 (40)	A (A)	7 (9)
2045	SR99 NB off Ramp / Mountain View	F (F)	222 (338)	B (C)	18 (24)	A (B)	10 (15)
	SR99 SB off Ramp / Mountain View	F (F)	106 (267)	D (F)	40 (103)	B (C)	11 (19)

*Realign on ramps on south and north bound

7.11 2045 Preliminary Cost Estimates

The preliminary cost estimates for the SR99 ramps / Mountain View Avenue intersections various alternatives are listed in Table 7.15.

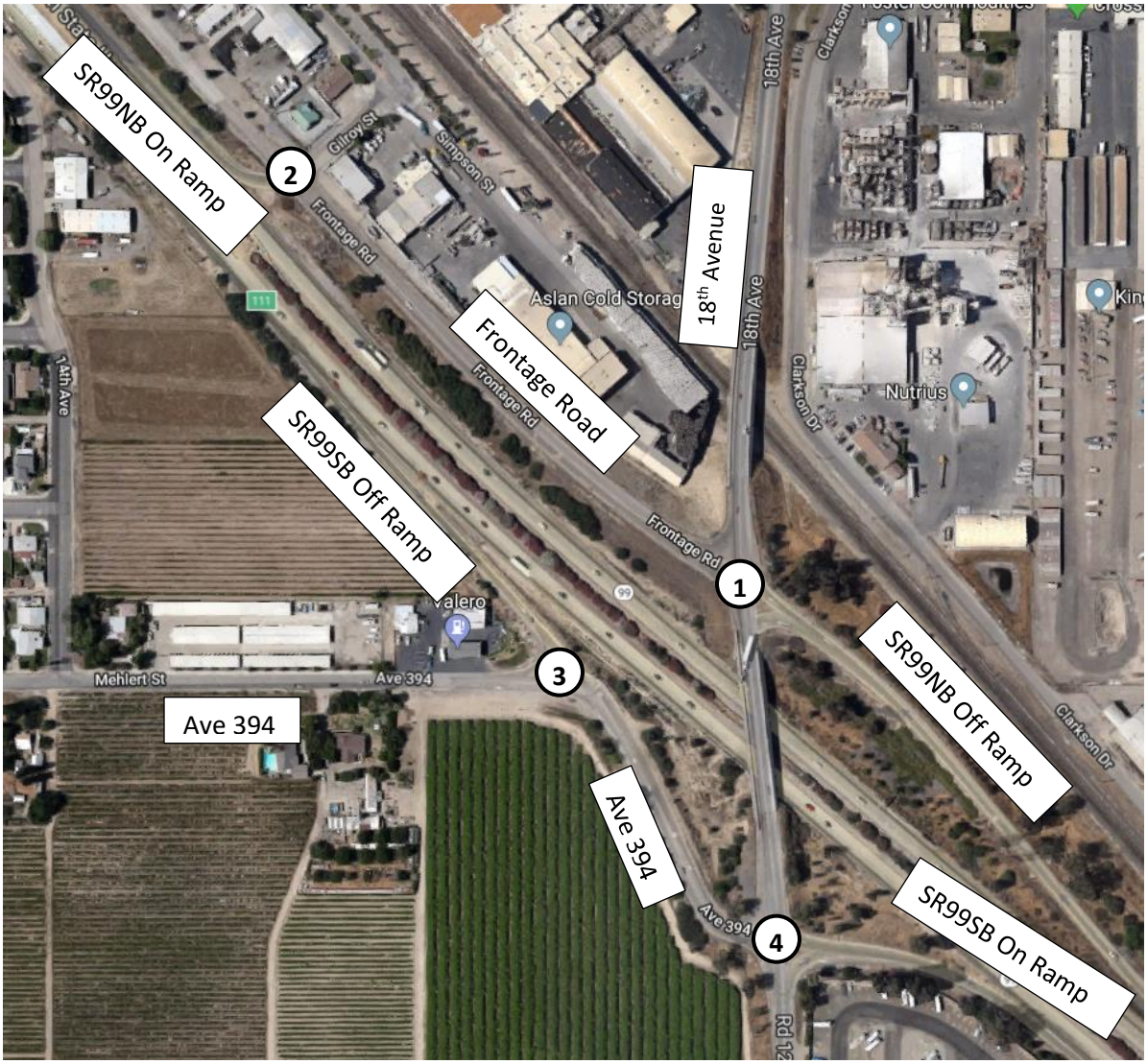
Table 7.15 – Mountain View Avenue Interchange Alternatives - Preliminary Cost Estimates

ELEMENT	Alternative 1 (AWSC)	Alternative 2 (Signalized)	Alternative 3 (Roundabout)	Long Term Alternative (L-9 Interchange)
Roadway	$3.6M-$4.5M	$5.4M-$6.8M	$5.2M-$6.5M	$11.3M-$14.2M
Structures	$0	$0	$0	$12.4M-$15.5M
Right of Way	$1.1M-$1.4M	$1.1M-$1.4M	$1.5M-$1.9M	$23.8M-$29.8M
Sub-Total	$4.7M-$5.9M	$6.5M-$8.2M	$6.7M-$8.4M	$47.5M-$59.5M
Support Cost	50%	50%	50%	30%
Total Project Capital Cost	**$7.1M-$8.9M**	**$9.8M-$12.3M**	**$10.1M-$12.6M**	**$61.8M- $77.4M**

8. Mendocino (18th) Avenue

Four intersections are located on Mendocino (18th) Avenue and SR 99 ramps.

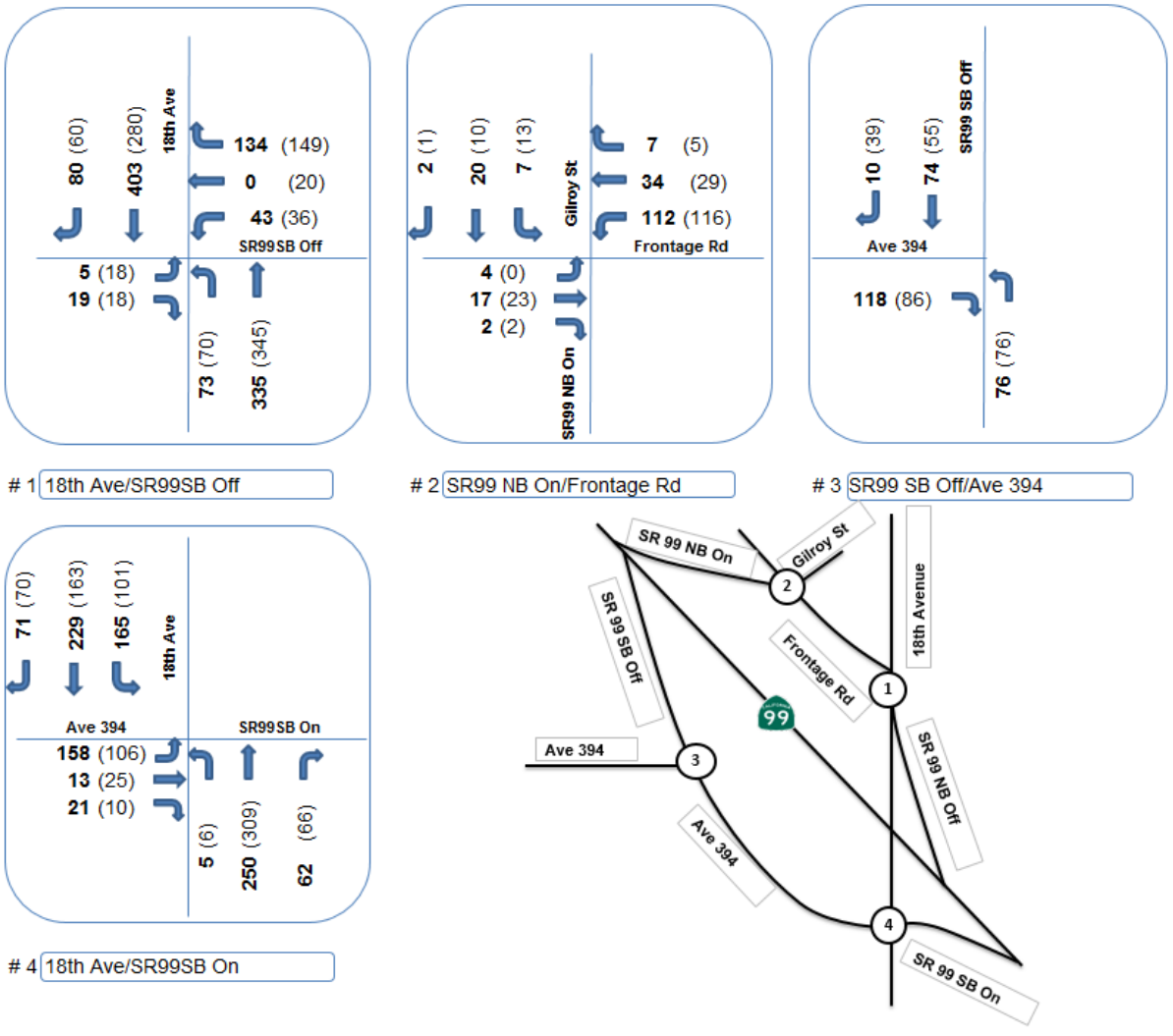
Figure 8.1 – Mountain View Avenue Existing Aerial Photo



8.2 2018 Existing Peak Hour Turning Movement Volumes

Figure 8.2 illustrates the Mendocino (18th) Avenue intersections 2018 existing AM (PM) peak hour turning movement volumes.

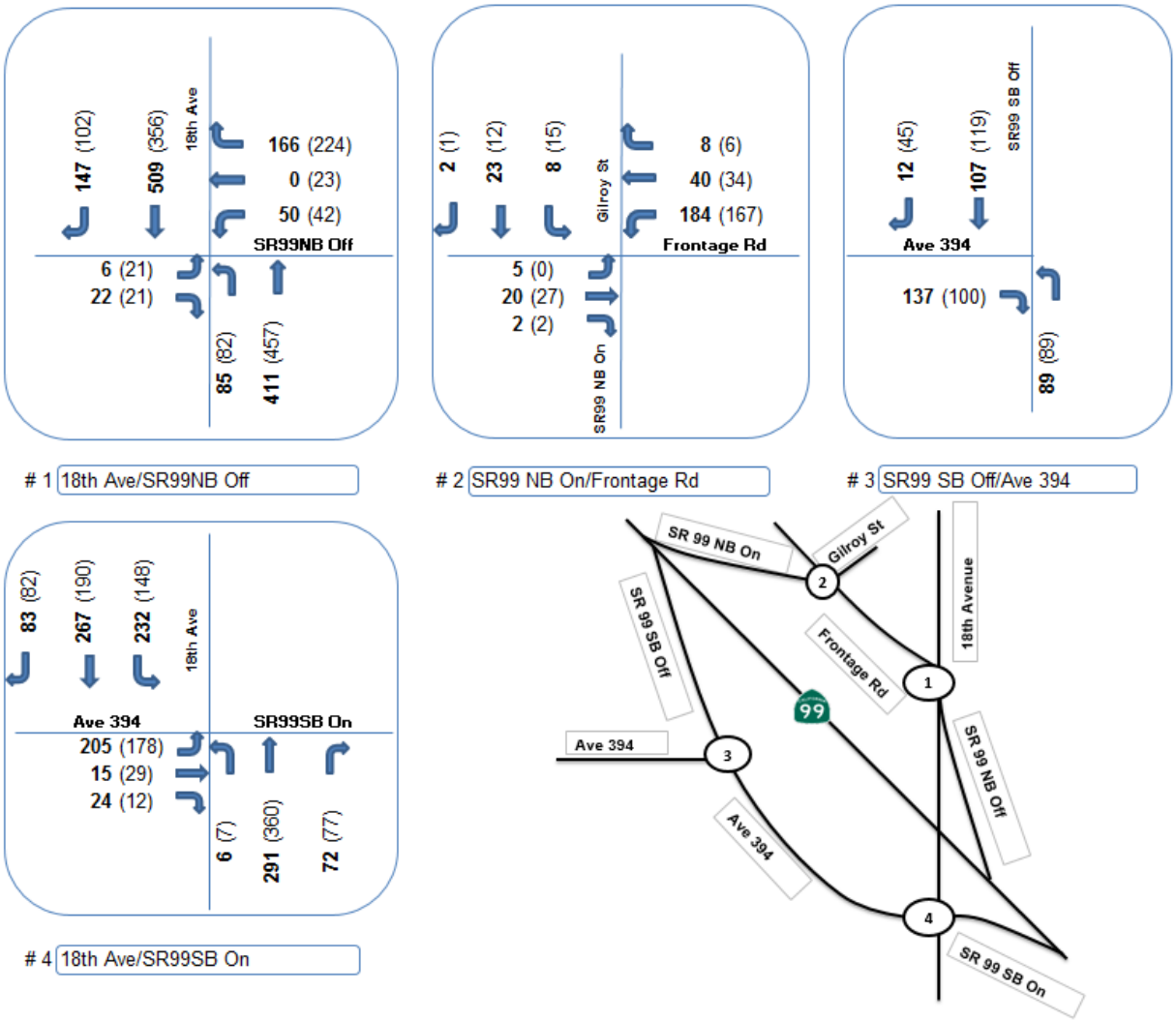
Figure 8.2 – SR-99/ Mendocino Avenue Intersections
2018 Existing AM (PM) Peak Hour Turning Movement Volumes



8.3 2025 Forecast Peak Hour Turning Movement Volumes

Figure 8.3 illustrates the Mendocino (18th) Avenue intersections 2025 forecast AM (PM) peak hour turning movement volumes.

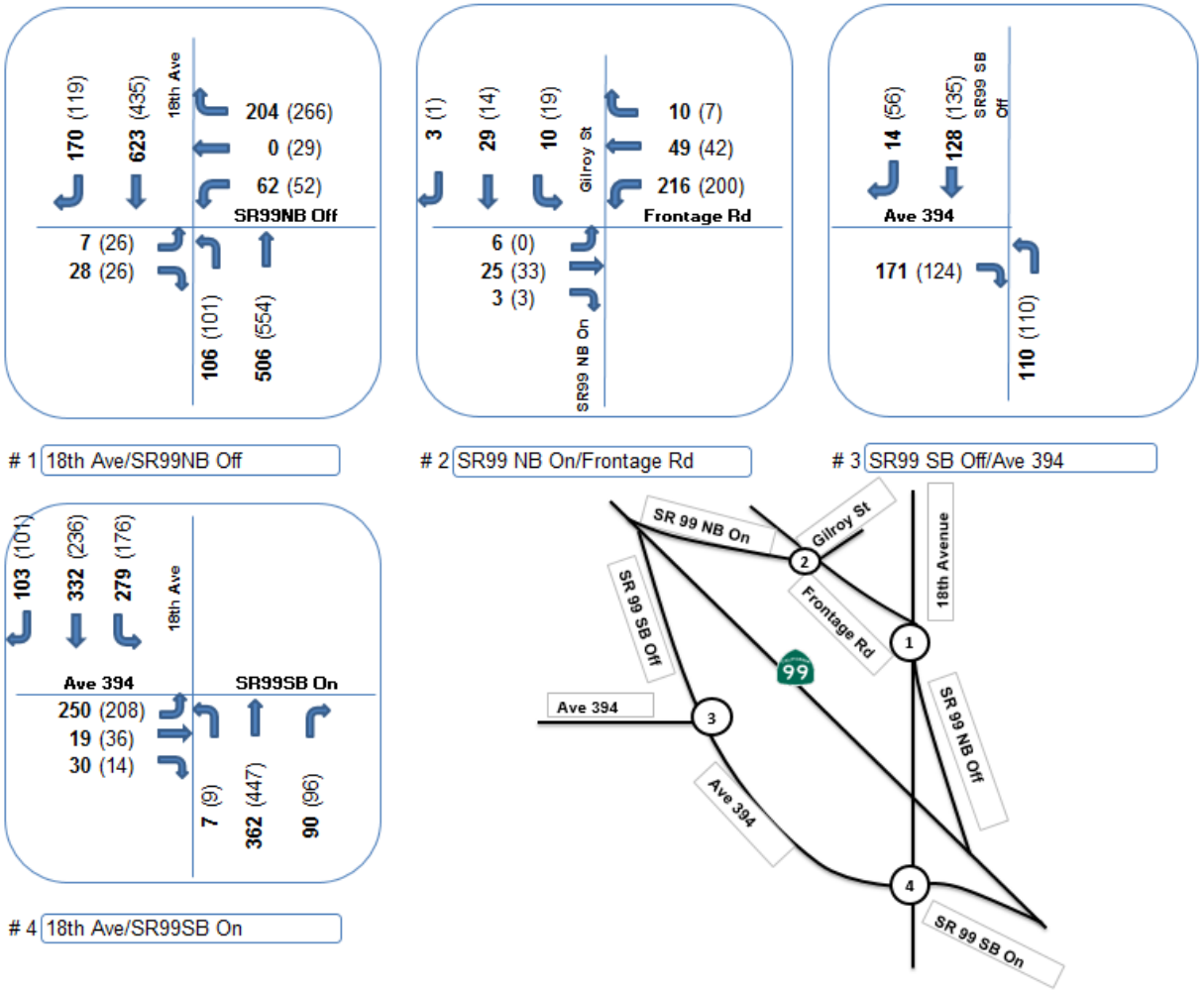
Figure 8.3 – SR-99/ Mendocino Avenue Intersections
2025 Forecast AM (PM) Peak Hour Turning Movement Volumes



8.4 2035 Forecast Peak Hour Turning Movement Volumes

Figure 8.4 shows the SR99/Mendocino (18th) Avenue intersections 2035 forecast AM (PM) peak hour forecast turning movement volumes.

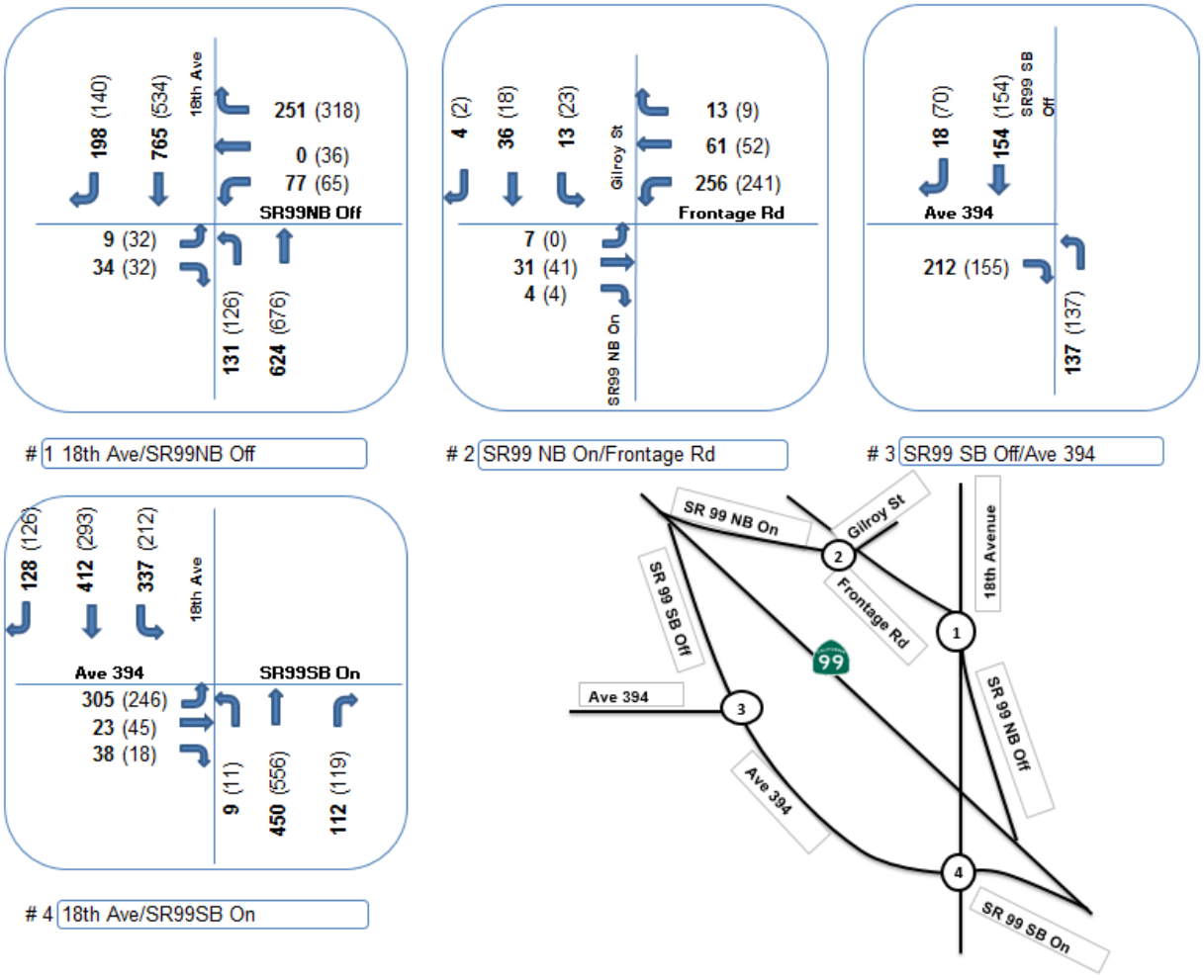
Figure 8.4 – SR-99/ Mendocino Avenue Intersections
2035 Forecast AM (PM) Peak Hour Turning Movement Volumes



8.5 2045 Forecast Peak Hour Turning Movement Volumes

Figure 8.5 shows the SR99/Mendocino (18th) Avenue intersections 2045 forecast AM (PM) peak hour forecast turning movement volumes.

Figure 8.5 – SR-99/ Mendocino Avenue Intersections
2045 Forecast AM (PM) Peak Hour Turning Movement Volumes



8.6 Existing Traffic Operational Conditions

The ramp intersections at the SR99/Mendocino (18th) Avenue interchange were analyzed for existing, 2035, and 2045 operating conditions (approach delay and LOS). Data for analysis was based on AM and PM peak hour turning movement counts.

Currently, the intersections at the Mountain View Avenue/SR 99 ramps are operating as TWSC, and the acceptable level of service (LOS) for intersections is LOS D or better. Therefore, any intersections operating at a LOS E or F will be considered deficient. For existing traffic conditions, the SR99 NB Off ramp and Mendocino (18th) Avenue intersection is operating at LOS C, an acceptable level of service. However, the SR 99 southbound ramps and Mendocino (18th) Avenue intersection is operating at LOS F, See Table 8.6.

Queue and delay time on the eastbound left turn traffic are the dominant problems. For the AM peak, the southbound left turn delay time is 144 seconds with LOS F.

Table 8.6 – Mendocino Avenue Intersections, 2018 Existing Level of Service Summary

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Off-Ramp	B (C)	E (D)	A (A)	-	14 (24)	46 (30)	10 (9)	-	C (C)	21 (24)
SR 99 SB On-Ramp	F (E)	-	A (A)	A (A)	161 (44)	-	8 (8)	9 (9)	F (E)	144 (42)

8.7 Existing Deficiencies

8.7.1 SR 99 Northbound Off Ramp Intersection (Intersection 1)

The SR99 NB off ramp left-turn queue and the associated delay time are the dominant problems. For the AM peak, the SR99 NB off ramp left-turn delay time is 46 seconds with LOS E.

8.7.2 Ave 394/ Mendocino Avenue Intersection (Intersection 4)

The analysis indicates that the intersection currently operates with unsatisfactory LOS during both the morning and evening peak travel periods for the year 2018. The SR99 SB off ramp left-turn queue and the associated delay time are the dominant problems. For the AM peak, Ave 394 left-turn delay time is 161 seconds with LOS F.

8.8 No-Build Traffic Operation Conditions

8.8.1 Year 2025 and 2035

Traffic operational analysis for the 2025 and 2035 no-build scenario indicates that the SR99/ Mendocino Avenue intersections would likely operate with unsatisfactory LOS F with long delay times, see Table 8.7 and Table 8.8, respectively.

Table 8.7 Mendocino Avenue Intersections, 2025 No-Build Level of Service Summary

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Off-Ramp	C (F)	F (F)	B (A)	-	23 (108)	133 (60)	11 (10)	-	E (F)	43 (108)
SR 99 SB On-Ramp	F (F)	-	A (A)	A (A)	450 (201)	-	9 (8)	9 (9)	F (F)	406 (191)

Table 8.8 Mendocino Avenue Intersections, 2035 No-Build Level of Service Summary

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Off-Ramp	F (F)	F (F)	B (A)	-	91 (1250)	627 (195)	12 (10)	-	F (F)	163 (1250)
SR 99 SB On-Ramp	F (F)	-	A (A)	A (A)	1236 (615)	-	9 (9)	10 (10)	F (F)	1113 (582)

The SR99 SB on ramp/Ave 394/Mendocino Avenue intersection is currently failing and SR99 NB off ramp/Frontage Road/Mendocino Avenue intersection will fail on the year 2025, see Table 8.9.

Table 8.9 Mountain View Avenue Intersections Failing Year for No-Build .

Location Project	Failing Year
SR 99 NB Off-Ramp/Frontage Road/Mendocino Avenue	2025
SR 99 SB On-Ramp/Ave 394/Mendocino Avenue	2018

8.9 Recommended Improvements to Address Deficiencies for Design Year 2045

The following are improvements recommended for the SR99 off ramps / Mendocino Avenue intersections to address deficiencies for Design Year 2045:

For alternative 1&2 Reconstruct a TWSC on Avenue 394/SR 99 SB Off Ramp Intersection, and roundabout for alternative 3 and install the following traffic control on SR99 SB on and SR99 NB off ramps terminals:

- **Alternative 1 – All Way Stop Control (AWSC)**
- **Alternative 2 – Signalized**
- **Alternative 3 – Roundabout**

Alternatives 4-6 propose to reconstruct the SB off-ramp and NB on-ramp to eliminate the isolated ramps. These alternatives propose to cul-de-sac Avenue 394 to eliminate access to SB off-ramp and cul-de-sac frontage Road to eliminate access to NB on-ramp. install the following traffic control on SR99 SB and SR99 NB ramps terminals:

- **Alternative 4 – All Way Stop Control (AWSC)**
- **Alternative 5 – Signalized**
- **Alternative 6 – Roundabout**

8.9.1 Alternative 1- Reconstruct the Ave 394/SB Off-Ramp intersection and install All Way Stop Control at the SB On-Ramp and NB Off-Ramps Terminals

Tables 8.10, 8.11 and 8.12 show the LOS summaries for 2025, 2035, and 2045 for AWSC. With these improvements, the SR99 NB Off-Ramp & SB On-Ramp intersections at Mendocino (18th) Avenue would continue to operate at unacceptable LOS. Both the NB Off-Ramp & SB On-Ramp intersections would operate at a LOS F in the AM peak hour in the year 2025 and will degrade to LOS F in both the AM and PM peak hours by 2035.

Table 8.10 Mendocino Avenue Intersections, Construction Year 2025 Level of Service Summary (AWSC)

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Off-Ramp	B (B)	B (C)	E (F)	F (D)	11 (12)	15 (18)	41 (57)	79 (27)	F (E)	54 (37)
SR 99 SB On-Ramp	C (C)	-	D (D)	D (C)	22 (18)	-	27 (35)	31 (20)	D (D)	28 (26)
SR 99 SB Off-Ramp & Ave 394 (TWSC)	A (A)	-	A (A)	-	10 (10)	-	8 (8)	-	A (A)	10 (10)

Table 8.11 Mendocino Avenue Intersections, Year 2035 Level of Service Summary (AWSC)

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Off-Ramp	B (B)	C (C)	F (F)	F (F)	12 (13)	17 (25)	108 (155)	187 (64)	F (F)	129 (91)
SR 99 SB On-Ramp	D (C)	-	F (F)	F (D)	34 (23)	-	62 (99)	83 (32)	F (F)	66 (58)
SR 99 SB Off-Ramp & Ave 394 (TWSC)	B (A)	-	A (A)	-	11 (10)	-	8 (8)	-	B (A)	11 (10)

Table 8.12 Mendocino Avenue Intersections, Year 2045 Level of Service Summary (AWSC)

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Off-Ramp	B (B)	C (E)	F (F)	F (F)	12 (13)	22 (38)	231 (294)	340 (156)	F (F)	244 (182)
SR 99 SB On-Ramp	F (D)	-	F (F)	F (F)	62 (32)	-	154 (223)	188 (74)	F (F)	152 (129)
SR 99 SB Off-Ramp & Ave 394 (TWSC)	B (A)	-	A (A)	-	12 (10)	-	8 (8)	-	B (A)	12 (10)

8.9.2 Alternative 2- Reconstruct Ave 394/SB Off Ramp and Signalized intersections at SB on and NB off Ramps Terminals

Table 8.13, 8.14 and 8.15 shows the recommended signalized intersections improvements. The SR99 NB and SB ramps / Mendocino Avenue would likely operate with a satisfactory LOS C for the year 2045, see Table 8.15.

Table 8.13 Mendocino Avenue Intersections, Construction Year 2025 Level of Service Summary (Signalized)

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Off-Ramp	A (B)	B (B)	A (A)	A (B)	7 (16)	11 (15)	9 (8)	9 (11)	A (B)	9 (11)
SR 99 SB On-Ramp	C (C)	-	B (B)	A (A)	31 (28)	-	19 (14)	9 (9)	B (B)	17 (15)
SR 99 SB Off-Ramp & Ave 394 (TWSC)	A (A)	-	A (A)	-	10 (10)	-	8 (8)	-	A (A)	10 (10)

Table 8.14 Mendocino Avenue Intersections, Year 2035 Level of Service Summary (Signalized)

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Off-Ramp	A (B)	B (B)	A (A)	B (B)	7 (18)	14 (17)	10 (10)	18 (13)	B (B)	14 (13)
SR 99 SB On-Ramp	C (C)	-	C (B)	B (A)	33 (32)	-	21 (18)	11 (9)	B (B)	19 (17)
SR 99 SB Off-Ramp & Ave 394 (TWSC)	B (A)	-	A (A)	-	11 (10)	-	8 (8)	-	B (A)	11 (10)

Table 8.15 Mendocino Avenue Intersections, Year 2045 Level of Service Summary (Signalized)

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Off-Ramp	B (C)	B (C)	A (B)	C (B)	11 (23)	17 (30)	5 (11)	21 (19)	B (B)	15 (18)
SR 99 SB On-Ramp	D (D)	-	C (C)	B (B)	48 (40)	-	28 (22)	13 (11)	C (C)	25 (21)
SR 99 SB Off-Ramp & Ave 394 (TWSC)	B (A)	-	A (A)	-	12 (10)	-	8 (8)	-	B (A)	12 (10)

8.9.3 Alternative 3- Reconstruct Ave 394/SB Off Ramp and construct Roundabouts at the intersections SB on and NB off Ramps Terminals

Table 8.16, 8.17 and 8.18 shows the recommended roundabout improvements. The SR99 ramps / Mendocino Avenue intersections would likely operate with a satisfactory LOS D and C for both the morning and evening peak hour consecutively in the year 2045.

Table 8.16 Mendocino Avenue Intersections, Construction Year 2025 Level of Service Summary (Roundabouts)

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Ramps	A (A)	A (A)	A (A)	A (A)	6 (5)	7 (8)	7 (8)	7 (5)	A (A)	7 (7)
SR 99 SB On-Ramp	A (A)	-	A (A)	A (A)	10 (7)	-	8 (8)	8 (6)	A (A)	8 (7)
SR 99 SB Off-Ramp & Ave 394	A (A)	-	A (A)	A (A)	5 (4)	-	4 (4)	4 (5)	A (A)	4 (4)

Table 8.17 Mendocino Avenue Intersections, Construction Year 2035 Level of Service Summary (Roundabouts)

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Off-Ramp	A (A)	A (B)	A (A)	A (A)	7 (6)	9 (11)	9 (10)	9 (7)	A (A)	9 (9)
SR 99 SB On-Ramp	B (A)	-	B (B)	A (A)	14 (9)	-	11 (11)	10 (7)	B (A)	11 (9)
SR 99 SB Off-Ramp & Ave 394	A (A)	-	A (A)	A (A)	5 (5)	-	4 (4)	5 (5)	A (A)	5 (5)

Table 8.18 Mendocino Avenue Intersections, Construction Year 2045 Level of Service Summary (Roundabouts)

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Off-Ramp	A (A)	B (C)	B (B)	B (A)	9 (7)	12 (17)	11 (13)	14 (9)	B (B)	13 (12)
SR 99 SB On-Ramp	D (B)	-	C (C)	B (A)	25 (12)	-	19 (19)	14 (9)	C (B)	18 (14)
SR 99 SB Off-Ramp & Ave 394	A (A)	-	A (A)	A (A)	6 (5)	-	4 (4)	5 (5)	A (A)	5 (5)

8.9.4 Alternative 4- Reconstruct the SB Off-Ramp and the NB On-Ramp. Cul-de-sac Avenue 394 to eliminate access to the SB Off-Ramp and cul-de-sac Frontage Road to eliminate access to the NB On-Ramp and install All Way Stop Control at the SB and NB Ramp Terminals.

Tables 8.19, 8.20 and 8.21 show the LOS summaries for 2025, 2035, and 2045 for AWSC. With these improvements, the SR99 NB Ramps & SB Ramps intersections at Mendocino (18th) Avenue would operate at unacceptable LOS by the year 2035. With these improvements the NB Ramps would operate at LOS F by 2025 and the SB Ramps intersections would operate at a LOS E in the year 2035. Both intersections would operate at LOS F in the AM and PM peak hours in the horizon year 2045.

Table 8.19 Mendocino Avenue Intersections, Construction Year 2025 Level of Service Summary (AWSC)

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Ramps	-	B (C)	E (E)	F (C)	-	15 (16)	39 (49)	77 (25)	F (D)	53 (33)
SR 99 SB Ramps	B (B)	-	C (C)	C (B)	13 (12)	-	22 (25)	17 (14)	C (C)	19 (20)

Table 8.20 Mendocino Avenue Intersections, Year 2035 Level of Service Summary (AWSC)

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Ramps	-	C (C)	F (F)	F (F)	-	17 (20)	106 (154)	184 (56)	F (F)	129 (90)
SR 99 SB Ramps	B (B)	-	F (F)	D (C)	14 (13)	-	59 (71)	28 (17)	E (E)	40 (45)

Table 8.21 Mendocino Avenue Intersections, Year 2045 Level of Service Summary (AWSC)

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Ramps	-	C (D)	F (F)	F (F)	-	21 (30)	237 (299)	340 (147)	F (F)	251 (186)
SR 99 SB Ramps	C (B)	-	F (F)	F (D)	16 (15)	-	159 (189	66 (27)	F (F)	100 (110)

8.9.5 Alternative 5- cul-de-sac Avenue 394/SB off-ramp and frontage Road/ NB on-ramp and Signalized intersections at SB on and NB off Ramps Terminals

Table 8.22, 8.23 and 8.24 shows that with the recommended signalized intersections improvements, the SR99 NB and SB ramps / Mendocino Avenue would likely operate with a satisfactory level of service C for the year 2045 (Table 8.24).

Table 8.22 Mendocino Avenue Intersections, Construction Year 2025 Level of Service Summary (Signalized)

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Ramps	-	B (B)	A (A)	A (A)	-	15 (13)	5 (4)	8 (8)	A (A)	8 (7)
SR 99 SB Ramps	C (C)	-	B (B)	B (B)	28 (26)	-	14 (11)	13 (14)	B (B)	15 (13)

Table 8.23 Mendocino Avenue Intersections, Year 2035 Level of Service Summary (Signalized)

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Ramps	-	B (B)	A (A)	B (A)	-	17 (15)	6 (4)	11 (10)	A (A)	10 (9)
SR 99 SB Ramps	C (C)	-	B (B)	B (B)	33 (31)	-	17 (13)	14 (16)	B (B)	17 (16)

Table 8.24 Mendocino Avenue Intersections, Year 2045 Level of Service Summary (Signalized)

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Ramps	-	B (C)	A (A)	B (B)	-	20 (28)	8 (6)	14 (14)	B (B)	13 (14)
SR 99 SB Ramps	D (D)	-	C (B)	B (B)	41 (37)	-	25 (20)	19 (18)	C (C)	24 (21)

8.9.6 Alternative 6- cul-de-sac Avenue 394 to eliminate access to SB off-ramp and cul-de-sac frontage Road to eliminate access to NB on-ramp and construct Roundabouts at the intersections SB on and NB off Ramps Terminals

Table 8.25, 8.26 and 8.27 show that with the recommended improvements, the SR99 ramps / Mendocino Avenue intersections would likely operate with a satisfactory level of service D and C for both the morning and evening peak hour consecutively in the year 2045.

Table 8.25 Mendocino Avenue Intersections, Construction Year 2025 Level of Service Summary (Roundabouts)

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Ramps	-	A (A)	A (A)	A (A)	-	7 (8)	7 (7)	7 (6)	A (A)	7 (7)
SR 99 SB On-Ramp	A (A)	-	A (A)	A (A)	7 (6)	-	7 (7)	8 (6)	A (A)	7 (7)

Table 8.26 Mendocino Avenue Intersections, Construction Year 2035 Level of Service Summary (Roundabouts)

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Off-Ramp	-	A (B)	A (A)	A (A)	-	8 (11)	8 (9)	9 (7)	A (A)	9 (8)
SR 99 SB On-Ramp	A (A)	-	A (A)	A (A)	10 (7)	-	10 (10)	9 (7)	A (A)	10 (8)

Table 8.27 Mendocino Avenue Intersections, Construction Year 2045 Level of Service Summary (Roundabouts)

Location	LOS by Leg				Delay (sec)				LOS	Delay
	EB	WB	NB	SB	EB	WB	NB	SB		
SR 99 NB Off-Ramp	-	B (C)	A (B)	B (A)	-	11 (17)	10 (11)	14 (8)	B (B)	12 (11)
SR 99 SB On-Ramp	B (A)	-	C (C)	B (A)	14 (9)	-	19 (17)	13 (8)	B (B)	15 (13)

8.10 Summary

Tables 8.28 and 8.29 shows LOS comparisons of the six alternatives for the construction year 2025 and forecast years 2035 and 2045.

Table 8.28 – Mendocino Avenue Near-Term Alternatives
AM (PM) Peak Hour Level of Service Comparison Alternatives 1, 2, and 3.

YEAR	LOCATION	Alternative 1* (AWSC)		Alternative 2* (SIGNALIZED)		Alternative 3* (ROUNDABOUT)	
		LOS	DELAY	LOS	DELAY	LOS	DELAY
2025	SR99 NB Off-Ramp / Mendocino Ave	F (E)	54 (37)	A (B)	9 (11)	A (A)	7 (7)
	SR99 SB On-Ramp / Mendocino Ave	D (D)	28 (26)	B (B)	17(15)	A (A)	8 (7)
	SR99 SB Off-Ramp / Ave 394					A (A)	4 (4)
2035	SR99 NB Off-Ramp / Mendocino Ave	F (F)	129 (91)	B (B)	14 (13)	A (A)	9 (9)
	SR99 SB On-Ramp / Mendocino Ave	F (F)	66 (58)	B (B)	19 (17)	B (A)	11 (9)
	SR99 SB Off-Ramp / Ave 394					A (A)	5 (5)
2045	SR99 NB Off-Ramp / Mendocino Ave	F (F)	244 (182)	B (B)	15 (18)	B (B)	13 (12)
	SR99 SB On-Ramp / Mendocino Ave	F (F)	152 (129)	C (C)	25 (21)	C (B)	18 (14)
	SR99 SB Off-Ramp / Ave 394					A (A)	5 (5)

*Realign on ramps on south and north bound

Table 8.29 – Mendocino Avenue Near-Term Alternatives
AM (PM) Peak Hour Level of Service Comparison Alternatives 4, 5, and 6 .

YEAR	LOCATION	Alternative 4* (AWSC)		Alternative 5* (SIGNALIZED)		Alternative 6* (ROUNDABOUT)	
		LOS	DELAY	LOS	DELAY	LOS	DELAY
2025	SR99 NB off Ramp / Mendocino Ave	F (D)	53 (33)	A (A)	8 (7)	A (A)	7 (7)
	SR99 SB off Ramp / Mendocino Ave	C (C)	19 (20)	B (B)	15 (13)	A (A)	7 (7)
2035	SR99 NB off Ramp / Mendocino Ave	F (F)	129 (90)	A (A)	10 (9)	A (A)	9 (8)
	SR99 SB off Ramp / Mendocino Ave	E (E)	40 (45)	B (B)	17 (16)	A (A)	10 (8)
2045	SR99 NB off Ramp / Mendocino Ave	F (F)	251 (186)	B (B)	13 (14)	B (B)	12 (11)
	SR99 SB off Ramp / Mendocino Ave	F (F)	100 (110)	C (C)	24 (21)	B (B)	15 (13)

*Eliminate access of Ave394 to SR99SB Off ramp and Frontage Road to SR99NB On ramp

8.11 2045 Preliminary Cost Estimates Comparison

The preliminary cost estimates for the SR99/ Mendocino (18th) Avenue interchange alternatives are listed in Table 8.30.

Table 8.30 – Mendocino Avenue Interchange Alternatives - Preliminary Cost Estimates

ELEMENT	Alternative 1 (AWSC)	Alternative 2 (Signalized)	Alternative 3 (Roundabout)	Long Term Alternative (L-9 Interchange)
Roadway	$3.2M-$4M	$4.0M-$5M	$3M-$3.8M	$10.2M-$12.8M
Structures	$2M-$2.5M	$2.1M-$2.7M	$3.1M-$3.9M	$15.6M-$19.5M
Right of Way	$0.5M-$0.7M	$0.5M-$.7M	$0.6M-$0.8M	$4M-$5M
Sub-Total	$5.7M-$7.2M	$6.6M-$8.4M	$6.7M-$8.5M	$29.6M-$37.3M
Support Cost	50%	50%	50%	30%
Total Project Capital Cost	**$8.6M-$10.8M**	**$9.9M-$10.5M**	**$10.1M-$12.8M**	**$38.5M-$48.5M**

Table 8.30 – Mendocino Avenue Interchange Alternatives - Preliminary Cost Estimates

ELEMENT	Alternative 4 (AWSC)	Alternative 5 (Signalized)	Alternative 6 (Roundabout)
Roadway	$4.1M-$5.2M	$4.8M-$6M	$3.4M-$4.3M
Structures	$2M-$2.5M	$2M-$2.5M	$3.1M-$3.9M
Right of Way	$0.7M-$0.9M	$0.7M-$0.9M	$0.8M-$1M
Sub-Total	$6.8M-$8.6M	$7.5M-$9.4M	$7.3M-$9.2M
Support Cost	50%	50%	50%
Total Project Capital Cost	**$10.2M-$12.9M**	**$11.3M-$14.1M**	**$11M-$13.8M**

9. PRELIMINARY COST ESTIMATES BACKGROUNDS

Preliminary cost estimates were developed for each location for near-term, interim and long-term improvements. The cost estimates use Caltrans most recent contract cost database for pricing. The right-of-way estimates were developed by consulting with Caltrans right-of-way department and determined by using costs for right-of-way from recent similar projects. All costs are in current dollars and are non-escalated values. No separate inflationary index for real estates is available or provided.

Changes in land use have a potentially greater effect on the project cost than the inflation index and as such right-of-way preservation and irrevocable offers of dedication should be used to minimize runaway pricing. Under the California Subdivision Map Act (Government Code 66410-66499.38), the land use approval agency can approve development on the condition that the developer dedicate land for the circulation element. State and local agencies should make every reasonable effort to plan in such a way to minimize purchasing private homes or businesses and develop adequate setbacks.

The cost estimates can be used to compare alternatives, to look for funding or as the basis of budgeting and to establish priorities.

10. CONCLUSION and RECOMMENDATIONS

Much of SR 99 in the study is urbanized as noted by the existing six-lane freeway and typically suburban land use characteristics. If land use changes, consistent with the General Plan, the forecast volumes along the corridor could easily be realized. The conceptual geometric designs developed and discussed in the study are based on the 2045 horizon year. If implementation of the improvements is delayed much beyond proposed years, the "design year" may move beyond 2045 and the forecast volumes would grow potentially affecting the scope and cost. As such, the near-term projects are more sensitive to changes in scope. In comparison, interim and ultimate projects will be reevaluated in the future and the concepts provided are more useful for planning rather than programming.

Listed in the comparison tables are the proposed improvements for each location and time frame based on the failure year.

This study is a roadmap for the local agencies (FCOG, TCAG, City of Kingsburg, and City of Selma) to prioritize the improvements based on funding availability. The study provides failure years, general time frames for improvements, alternatives with conceptual drawings and preliminary cost estimates. This information is sufficient for locals to plan the corridor and meet the transportation needs for the design year of 2045. The conceptual footprint of the improvements will also help the agencies preserve the right of way needed for future use, this will help avoid high cost for right of way in the future.

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Mohammed Al-Ahmed	Project Engineer	(559) 488-4175
Hien Ma	Transportation Engineer	(559) 445-5867

SR99 SB OFF RAMP

SR99 NB ON RAMP

Ramp Terminal Connects
Where Grade Is Greater Than 4%

Interchange Configuration Does Not Meet Currently
Accepted Interchange Types

Profile Has Non-Standard Sight Distance

MOUNTAIN VIEW AVE

Non-Standard Vertical Clearance
Over State Route 99

Non-Standard Intersection
Skew Angle

Local Road Across
From Ramp Terminal

Non Continuous Sidewalks With Poor Pedestrian Access

Ramp Terminal Connects
Where Grade Is Greater Than 4%

SR99 SB ON RAMP

STATE ROUTE 99

SR99 NB OFF RAMP

VAN HORN AVE

N

EXHIBIT 1

MOUNTAIN VIEW AVE
GEOMETRIC DEFICIENCES LOCATIONS AND TYPES

SR99 NB ON RAMP

SR99 SB OFF RAMP

Interchange Has Isolated Ramps

Deceleration Distance Along Ramp Is Not Met

Non-Standard Intersection Skew Angle

Uncontrolled Termini Of Ramp At Intersection

FRONTAGE ROAD

AVE 394

STATE ROUTE 99

Interchange Configuration Does Not Meet Currently Accepted Interchange Types

Non Continuous Sidewalks With Poor Pedestrian Access

Local Road Across From Ramp Terminal

MENDOCINO AVE

Non-Standard Vertical Clearance Over State Route 99

Non-Standard Intersection Skew Angle

Sight Distance At Ramp Termini Not Met

SR99 SB ON RAMP

SR99 NB OFF RAMP

EXHIBIT 2

MENDOCINO (18TH) AVE

GEOMETRIC DEFICIENCES LOCATIONS AND TYPES

State of California
DEPARTMENT OF TRANSPORTATION

California State Transportation Agency

Memorandum

To: ERIC OLSON, Senior Transportation Engineer
Technical Planning
District 6

Date: September 17, 2018

File: 06-Fre/Tul-99
PM VAR
EA 06-0X850
0618000157

From: ALBERT LEE, Chief
District 6 - Office of Traffic Operations

Subject: **SAFETY ANALYSIS**

This is in response to your request dated June 27, 2018 for a Safety Analysis for the above referenced project in Fresno and Tulare County. The project is to identify existing deficiencies and to develop interim improvements that improve safety and capacity at Mendocino Avenue Interchange and Mountain View Avenue Interchange on State Route (SR) 99 within the next ten years.

Field review was conducted on September 17, 2018.

Existing Conditions:

This segment of SR 99 is an urban 6-lane divided freeway in generally level terrain. The mainline roadway consists of 12-foot freeway lanes, 10-foot inside shoulders, and 10-foot outside shoulders. The paved median is approximately 22 feet wide and divided with concrete barrier. Rumble strips exist on both inside and outside shoulders in each direction. The posted speed limit is 70 MPH. The current (2016) ADT within the project limits is 63,000. The total percentage of heavy vehicles is approximately 23% (2016).

There are eight ramps within the project limits:

PM	Ramps	ADT (2016)
Tul R53.599	NB off to Mendocino Avenue	2400
Tul R53.684	SB on from Mendocino Avenue	2050
Tul R0.038	SB off to Mendocino Avenue	1100
Fre R0.190	NB on from Mendocino Avenue	1050
Fre R3.541	NB off to Mountain View Avenue	820
Fre R3.588	SB on from Mountain View Avenue	110
Fre R3.891	NB on from Mountain View Avenue	3850
Fre R3.947	SB off to Mountain View Avenue	4300

The following are the bridges within the project limits:

PM	Bridge	Bridge Number
Fre R0.038	Mendocino Avenue Overcrossing	46 0199
Fre R3.742	Mountain View Avenue Overcrossing	42 0219

Safety-Related Observations and Recommendations:

Accident History:

The accident history for the NB and SB mainline of SR 99, and the freeway ramps will be analyzed separately.

NB SR 99 mainline between Tul PM R53.499 and Fre PM R0.289 (Mendocino):

The accident rates for this NB segment of the freeway for the most recent 3-year study period (01/01/2014 to 12/31/2016) as shown on Table B, indicate that the *Actual Fatal* and the *Actual Fatal plus Injury* accident rates are **lower** than the *Statewide Average* accident rates with comparable traffic volumes. However, the *Actual Total* accident rate is **higher** than the *Statewide Average* accident rate. The accident rates in number of accidents per million-vehicle-miles are:

NB SR 99 Section	Actual (MVM)			Average (MVM)		
	Fatal	F+I	Total	Fatal	F+I	Total
Tul PM R53.499 to Fre PM R0.289	0.000	0.22	0.69	0.005	0.23	0.67

There were 16 accidents (0-Fatal, 5-Injury, 11-Property Damage Only (PDO)) at this mainline section of SR 99. The types of accidents and the primary collision factors are as follows:

Primary Collision Factor	Type of Accident						
	Sideswipe	Rear End	Broadside	Hit Object	Overturn	Other	Not Stated
Improper Turn	2	1		2	1		
Speeding		5					
Other Violations	1			1			
Other than driver				1		1	1
Total	3	6	0	4	1	1	1

The objects struck from the 4 Hit Object accidents are Guardrail and Cut Slope or Embankment.

Given the varied locations, factors, and types of the collisions along this northbound segment, there does not appear to be any accident concentrations that would indicate that there is a correctable accident causing situation.

SB SR 99 mainline between Tul PM R53.584 and Fre PM R0.137 (Mendocino):

The accident rates for this SB segment of the freeway for the same 3-year study period as shown on Table B, indicate that the *Actual* accident rates are **higher** than the *Statewide Average* accident rates. The accident rates in number of accidents per million-vehicle-miles are:

SB SR 99 Section	Actual (MVM)			Average (MVM)		
	Fatal	F+I	Total	Fatal	F+I	Total
Tul PM R53.584 to Fre PM R0.137	0.064	0.26	0.70	0.005	0.22	0.64

There were 11 accidents (1-Fatal, 3-Injury, 7-PDO) at this mainline section of SR 99. The types of accidents and the primary collision factors are as follows:

Primary Collision Factor	Type of Accident						
	Head-on	Sideswipe	Rear End	Broadside	Hit Object	Auto-Ped	Other
Influence of Alcohol			1				
Improper Turn		1			4		
Speeding			2				
Other Violations	1	1					
Other Than Driver							1
Total	1	2	3	0	4	0	1

The objects struck from the 4 Hit Object accidents are as follows:

Object Struck	No. of Occurrences
End of Guard Rail	1
Fence	1
Tree	1
Overturned	1
Total	4

The primary collision factor for the "Rear End" fatal accident at Tul PM R53.64 was Influence of Alcohol. The accident occurred when a vehicle traveling southbound SR 99, turned to the left, traveled into the median, collided into the back of a parked vehicle on median. It was reported that the driver of that vehicle was impaired by alcohol. The accident occurred in clear weather, dark with street light, and dry roadway conditions.

Given the varied locations, factors, and types of the collisions along this southbound segment, there does not appear to be any accident concentrations that would indicate that there is a correctable accident causing situation.

NB SR 99 mainline between Fre PM R3.441 and Fre PM R3.990 (Mountain View):

The accident rates for this NB segment of the freeway for the same 3-year study period as shown on Table B, indicate that the *Actual* accident rates are **lower** than the *Statewide Average* accident rates. The accident rates in number of accidents per million-vehicle-miles are:

NB SR 99 Section	Actual (MVM)			Average (MVM)		
	Fatal	F+I	Total	Fatal	F+I	Total
Fre PM R3.441 to Fre PM R3.990	0.000	0.00	0.44	0.004	0.15	0.45

There were 9 accidents (0-Fatal, 0-Injury, 9-PDO) at this mainline section of SR 99. The types of accidents and the primary collision factors are as follows:

Primary Collision Factor	Type of Accident						
	Head-on	Sideswipe	Rear End	Broadside	Hit Object	Overturn	Other
Improper Turn					1		
Speeding			2				
Other Violations		2					
Improper Driving		1					
Other Than Driver					1		1
Total	0	3	2	0	2	0	2

The objects struck from the 2 Hit Object accidents are Fence and Other Object on Road.

Given the varied locations, factors, and types of the collisions along this northbound segment, there does not appear to be any accident concentrations that would indicate that there is a correctable accident causing situation.

SB SR 99 mainline between Fre PM R3.488 and Fre PM R4.046 (Mountain View):

The accident rates for this SB segment of the freeway for the same 3-year study period as shown on Table B, indicate that the *Actual Fatal* accident rate is **lower** than the *Statewide Average Fatal* accident rate. However, the *Actual Fatal plus Injury* and *Actual Total* accident rates are **higher** than the *Statewide Average* accident rates. The accident rates in number of accidents per million-vehicle-miles are:

SR 99 Section	Actual (MVM)			Average (MVM)		
	Fatal	F+I	Total	Fatal	F+I	Total
Fre PM R3.488 to Fre PM R4.046	0.000	0.19	0.53	0.004	0.15	0.46

There were 11 accidents (0-Fatal, 4-Injury, 7-PDO) at this mainline section of SR 99. The types of accidents and the primary collision factors are as follows:

Primary Collision Factor	Type of Accident						
	Head-on	Sideswipe	Rear End	Broadside	Hit Object	Overturn	Other
Influence of Alcohol			1				
Improper Turn		1			2	1	
Speeding			3				
Other Violations		2					
Other Than Driver							1
Total	0	3	4	0	2	1	1

The objects struck from the 2 Hit Object accidents are Barrier.

Given the varied locations, factors, and types of the collisions along this southbound segment, there does not appear to be any accident concentrations that would indicate that there is a correctable accident causing situation.

SR 99 ramps:

The accident rates for the following SR 99 freeway ramps for the most recent 3-year study period (01/01/2014 to 12/31/2016) as shown on Table B, indicate that the *Actual* accident rates are **lower** than the *Statewide Average* accident rates for similar ramps with comparable traffic volumes. The accident rates in number of accidents per million-vehicle-miles are:

SR 99 Ramps	Actual (MVM)			Average (MVM)		
	Fatal	F+I	Total	Fatal	F+I	Total
SB on from Mendocino Avenue (PM R53.684)	0.000	0.00	0.39	0.002	0.21	0.60
NB on from Mendocino Avenue (PM R0.190)	0.000	0.00	0.00	0.001	0.14	0.48

SB On-ramp from Mendocino Avenue:

There was one accident (0-Fatal, 0-Injury, 1-PDO) recorded at this on-ramp. The type of accident was Sideswipe and it was caused by Other Violations.

NB On-ramp from Mendocino Avenue:

No accidents were recorded within the most recent 3-year study period.

The accident rates for the following SR 99 freeway ramps for the same 3-year study period as shown on Table B, indicate that the *Actual Fatal* and the *Actual Fatal plus Injury* accident rates are **lower** than the *Statewide Average* accident rates. However, the *Total* accident rates are **higher** than the *Statewide Average Total* accident rates. The accident rates in number of accidents per million-vehicle-miles are:

SR 99 Ramps	Actual (MVM)			Average (MVM)		
	Fatal	F+I	Total	Fatal	F+I	Total
NB off to Mendocino Avenue (PM R53.599)	0.000	0.00	1.96	0.004	0.32	0.92
NB off to Mountain View Avenue (PM R3.541)	0.000	0.00	3.30	0.004	0.32	0.92

NB Off-ramp to Mendocino Avenue:

There were five accidents (0-Fatal, 0-Injury, 5-PDO) recorded at this off-ramp. The types of accidents and the primary collision factors are as follows:

Primary Collision Factor	Type of Accident						
	Head-On	Sideswipe	Rear End	Broadside	Hit Object	Overturn	Other
Failure to yield				1			
Speeding			3				
Other Violations					1		
Total	0	0	3	1	1	0	0

The object struck from the one Hit Object accident was light or signal pole.

NB Off-ramp to Mountain View Avenue:

There were three accidents (0-Fatal, 0-Injury, 3-PDO) recorded at this off-ramp. The types of accidents and the primary collision factors are as follows:

Primary Collision Factor	Type of Accident						
	Head-On	Sideswipe	Rear End	Broadside	Hit Object	Overturn	Other
Failure to yield				1			
Speeding					2		
Total	0	0	0	1	2	0	0

The object struck from the Hit Object accidents were side of bridge railing and dike or curb.

The accident rates for the following SR 99 freeway ramps for the same 3-year study period as shown on Table B, indicate that the *Actual Fatal* accident rates are **lower** than the *Statewide Average Fatal* accident rates. However, the *Actual Fatal plus Injury* and *Actual Total* accident rates are **higher** than the *Statewide Average* accident rates. The accident rates in number of accidents per million-vehicle-miles are:

SR 99 Ramps	Actual (MVM)			Average (MVM)		
	Fatal	F+I	Total	Fatal	F+I	Total
SB off to Mendocino Avenue (PM R0.038)	0.000	1.52	1.52	0.003	0.18	0.50
SB on from Mountain View Avenue (PM R3.588)	0.000	1.68	2.53	0.002	0.21	0.60
NB on from Mountain View Avenue (PM R3.891)	0.000	1.16	4.41	0.002	0.21	0.60
SB off to Mountain View Avenue (PM R3.947)	0.000	0.62	1.24	0.004	0.32	0.92

SB Off-ramp to Mendocino Avenue:

There were two accidents (0-Fatal, 2-Injury, 0-PDO) recorded at this off-ramp. One is Rear End accident and caused by Speeding; another one is Broadside accident and caused by Failure to Yield.

SB On-ramp from Mountain View Avenue:

There were three accidents (0-Fatal, 2-Injury, 1-PDO) recorded at this on-ramp. Two of them are Hit Object accidents and both caused by Speeding; one of them is Broadside accident and caused by Failure to Yield.

NB On-ramp from Mountain View Avenue:

There were nineteen accidents (0-Fatal, 5-Injury, 14-PDO) recorded at this on-ramp. The types of accidents and the primary collision factors are as follows:

Primary Collision Factor	Type of Accident						
	Head-On	Sideswipe	Rear End	Broadside	Hit Object	Overturn	Other
Failure to yield		1		3			
Improper Turn					6		
Speeding			7		1	1	
Total	0	1	7	3	7	1	0

The objects struck from the 7 Hit Object accidents are as follows:

Object Struck	No. of Occurrences
Guardrail	6
Dike or curb	1
Total	7

SB Off-ramp to Mountain View Avenue:

There were six accidents (0-Fatal, 3-Injury, 3-PDO) recorded at this off-ramp. The types of accidents and the primary collision factors are as follows:

Primary Collision Factor	Type of Accident						
	Head-On	Sideswipe	Rear End	Broadside	Hit Object	Overturn	Other
Failure to yield	1			1			
Improper Turn				1			
Speeding			3				
Total	1	0	3	2	0	0	0

Recommendations:

Exit gore sign is missing at NB off-ramp to Mountain View Avenue. A two-post exit gore sign should be installed and placed near the back of the gore area.

Additional DO NOT ENTER (R5-1) sign and WRONG WAY (R5-1a) sign should be added facing Van Horn Avenue at SB Off-ramp termination at Mountain View Avenue to deter wrong-way entry.

If you have any questions, please call Caleb Wu at (559) 445-6982.

Attachments: Table B summary

SR99 SB OFF RAMP
SR99 NB ON RAMP
MOUNTAIN VIEW AVE
1
2
3
6
4
9
N
SR99 SB ON RAMP
STATE ROUTE 99
SR99 NB OFF RAMP
VAN HORN AVE
2
1
2
1
SPEEDING
IMPROPER TURN
YIELD
EXHIBIT 3
MOUNTAIN VIEW AVE
ACCIDENT TYPES, COUNTS, AND LOCATIONS
(JANUARY 2014 TO DECEMBER 2016)

SR99 NB ON RAMP

0

SR99 SB OFF RAMP

1
1

AVE 394

STATE ROUTE 99

FRONTAGE ROAD

MENDOCINO AVE

3
1
1

1

SR99 SB ON RAMP

SR99 NB OFF RAMP

OTHER VIOLATIONS
SPEEDING
IMPROPER TURN
YIELD

EXHIBIT 4

MENDOCINO (18TH) AVE
ACCIDENT TYPES, COUNTS, AND LOCATIONS
(JANUARY 2014 TO DECEMBER 2016)

Mountain View Ave

Near-Term Alternative

Alternative 1: Re-delineate NB & SB On Ramps---Exhibit 5

Mid-Term Alternatives

Alternative 1: All Way Stop Control (AWSC)-------Exhibit 6

Alternative 2: Signalized Intersection----------Exhibit 7

Alternative 3: Roundabout Intersection----------Exhibit 8

Long-Term Alternatives

Alternative 1: Partial Cloverleaf Interchange(L-9)--------Exhibit 9

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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N

SR99 SB OFF RAMP

SR99 NB ON RAMP

MOUNTAIN VIEW AVE

SR99 SB ON RAMP

STATE ROUTE 99

SR99 NB OFF RAMP

VAN HORN AVE

FOR PLANNING AND STUDY PURPOSE ONLY

EXHIBIT 5

STATE ROUTE 99-MOUNTAIN VIEW AVE
NEAR TERM ALTERNATIVE
REDELINEATE RIGHT TURN POCKET AT
NB AND SB ON RAMPS ADD ALL WAY STOP
CONTROL AT SB OFF RAMP INTERSECTION

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N

SR99 SB OFF RAMP

SR99 NB ON RAMP

MOUNTAIN VIEW AVE

SR99 SB ON RAMP

STATE ROUTE 99

SR99 NB OFF RAMP

VAN HORN AVE

FOR PLANNING AND STUDY PURPOSE ONLY

EXHIBIT 6

STATE ROUTE 99-MOUNTAIN VIEW AVE
ALTERNATIVE 1
CONSTRUCT ALL WAY STOP INTERSECTION CONTROL AT RAMP TERMINALS REALIGN NB AND SB ON RAMPS

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N

SR99 SB OFF RAMP

SR99 NB ON RAMP

MOUNTAIN VIEW AVE

SR99 SB ON RAMP

STATE ROUTE 99

SR99 NB OFF RAMP

VAN HORN AVE

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EXHIBIT 7

STATE ROUTE 99-MOUNTAIN VIEW AVE
ALTERNATIVE 2
CONSTRUCT SIGNALIZED INTERSECTION CONTROL
AT RAMP TERMINALS REALIGN NB AND SB ON RAMPS

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PROJECT NUMBER & PHASE 00000000001

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REGISTERED CIVIL ENGINEER DATE

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N

SR99 SB OFF RAMP

SR99 NB ON RAMP

MOUNTAIN VIEW AVE

Ø160

Ø160.00?

SR99 SB ON RAMP

STATE ROUTE 99

SR99 NB OFF RAMP

VAN HORN AVE

FOR PLANNING AND STUDY PURPOSE ONLY

EXHIBIT 8

STATE ROUTE 99-MOUNTAIN VIEW AVE
ALTERNATIVE 3
CONSTRUCT ROUNDABOUT INTERSECTION CONTROL AT RAMP TERMINALS REALIGN NB AND SB ON RAMPS

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UNIT 0000

PROJECT NUMBER & PHASE 00000000001

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N

SR99 SB OFF RAMP

SR99 SB ON LOOP RAMP

SR99 NB ON RAMP

MOUNTAIN VIEW AVE

SR99 SB ON RAMP

STATE ROUTE 99

SR99 NB ON LOOP RAMP

SR99 NB OFF RAMP

MOUNTAIN VIEW AVE

VAN HORN AVE

FOR PLANNING AND STUDY PURPOSE ONLY

EXHIBIT 9

STATE ROUTE 99-MOUNTAIN VIEW AVE
ALTERNATIVE 4-LONG TERM ALTERNATIVE
CONSTRUCT PARTIAL CLOVERLEAF INTERCHANGE (L-9)
WITH SIGNALIZED INTERSECTION CONTROL

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PROJECT NUMBER & PHASE 00000000001

Mendocino (18th) Ave

Mid-Term Alternatives

For Alt 1 & 2, reconstruct Two Way Stop Control (TWSC) on Ave 394 & SB Off Ramp. For Alt 3, construct Roundabout Intersection Control on Ave 394 & SB Off Ramp.

Alternative 1: All Way Stop Control (AWSC)------Exhibit 10

Alternative 2: Signalized Intersection----------Exhibit 11

Alternative 3: Roundabout Intersection----------Exhibit 12

For Alt 4, 5 & 6, realign NB On Ramp & SB Off Ramp to Mendocino Ave.

Alternative 4: All Way Stop Control (AWSC)-------Exhibit 13

Alternative 5: Signalized Intersection----------Exhibit 14

Alternative 6: Roundabout Intersection----------Exhibit 15

Long-Term Alternatives

Alternative 1: Compact Diamond Interchange (L-1)-----Exhibit 16

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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AVE 392

AVE 394

SR99 SB OFF RAMP

FRONTAGE ROAD

STATE ROUTE 99

MENDOCINO AVE

SR99 SB ON RAMP

SR99 NB OFF RAMP

FRESNO COUNTY

TULARE COUNTY

FOR PLANNING AND STUDY PURPOSE ONLY

EXHIBIT 10

STATE ROUTE 99-MENDOCINO AVE
ALTERNATIVE 1
CONSTRUCT ALL WAY STOP INTERSECTION CONTROL
AT RAMP TERMINALS AND REALIGN SB OFF RAMP AND AVE 394
WITH TWO WAY STOP INTERSECTION CONTROL
REALIGN NB OFF RAMP AND FRONTAGE ROAD
TO IMPROVE INTERSECTION SKEW ANGLE

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CIVIL
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AVE 392
AVE 394
SR99 SB OFF RAMP
FRONTAGE ROAD
STATE ROUTE 99
MENDOCINO AVE
SR99 SB ON RAMP
SR99 NB OFF RAMP
TULARE COUNTY
FRESNO COUNTY
N

FOR PLANNING AND STUDY PURPOSE ONLY

EXHIBIT 11

STATE ROUTE 99-MENDOCINO AVE
ALTERNATIVE 2
CONSTRUCT SIGNALIZED INTERSECTION CONTROL
AT RAMP TERMINALS REALIGN SB OFF RAMP AND AVE 394
WITH TWO WAY STOP INTERSECTION CONTROL
REALIGN NB OFF RAMP AND FRONTAGE ROAD
TO IMPROVE INTERSECTION SKEW ANGLE

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

FRESNO COUNTY
TULARE COUNTY

AVE 392

AVE 394

SR99 SB OFF RAMP

FRONTAGE ROAD

STATE ROUTE 99

MENDOCINO AVE

SR99 SB ON RAMP

SR99 NB OFF RAMP

Ø150.00'

Ø150.00'

Ø130.00'

N

FOR PLANNING AND STUDY PURPOSE ONLY

EXHIBIT 12

STATE ROUTE 99-MENDOCINO AVE
ALTERNATIVE 3
CONSTRUCT ROUNDABOUT INTERSECTION CONTROL
AT RAMP TERMINALS REALIGN SB OFF RAMP AND AVE 394
WITH ROUNDABOUT INTERSECTION CONTROL
REALIGN NB OFF RAMP AND FRONTAGE ROAD
TO IMPROVE INTERSECTION SKEW ANGLE

REVISED BY | DATE REVISED
CALCULATED-DESIGNED BY
CHECKED BY
FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

LAST REVISION DATE PLOTTED =$DATE
00-00-00 TIME PLOTTED =$TIME

BORDER LAST REVISED 7/2/2010 | USERNAME =$USER | DGN FILE =$REQUEST | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0000 | PROJECT NUMBER & PHASE 00000000001

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
No.
Exp.
CIVIL
STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

AVE 394

AVE 392

FRESNO COUNTY
TULARE COUNTY

FRONTAGE ROAD

STATE ROUTE 99

SR99 SB OFF RAMP

MENDOCINO AVE

SR99 SB ON RAMP

SR99 NB OFF RAMP

N

FOR PLANNING AND STUDY PURPOSE ONLY

EXHIBIT 13

STATE ROUTE 99-MENDOCINO AVE
ALTERNATIVE 4
CONSTRUCT ALL WAY STOP INTERSECTION CONTROL
AT RAMP TERMINALS REALIGN NB OFF RAMP AND FRONTAGE ROAD
TO IMPROVE INTERSECTION SKEW ANGLE
REALIGN SB OFF RAMP AND NB ON RAMP
TO REMOVE ISOLATED RAMPS

REVISED BY	DATE REVISED

CALCULATED-DESIGNED BY

CHECKED BY

FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

LAST REVISION 00-00-00 DATE PLOTTED =$DATE
TIME PLOTTED =$TIME

BORDER LAST REVISED 7/2/2010

USERNAME =$USER
DGN FILE =$REQUEST

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 00000000001

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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AVE 394

AVE 392

FRESNO COUNTY

TULARE COUNTY

FRONTAGE ROAD

STATE ROUTE 99

SR99 SB OFF RAMP

MENDOCINO AVE

SR99 SB ON RAMP

SR99 NB OFF RAMP

N

FOR PLANNING AND STUDY PURPOSE ONLY

EXHIBIT 14

STATE ROUTE 99-MENDOCINO AVE
ALTERNATIVE 5
CONSTRUCT SIGNALIZED INTERSECTION CONTROL
AT RAMP TERMINALS REALIGN NB OFF RAMP AND FRONTAGE ROAD
TO IMPROVE INTERSECTION SKEW ANGLE
REALIGN SB OFF RAMP AND NB ON RAMP
TO REMOVE ISOLATED RAMPS

REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY | FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

LAST REVISION $DATE $TIME

DATE PLOTTED $DATE

TIME PLOTTED $TIME

BORDER LAST REVISED 7/2/2010

USERNAME $USER

DGN FILE $REQUEST

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 00000000001

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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AVE 394

AVE 392

FRESNO COUNTY
TULARE COUNTY

SR99 SB OFF RAMP

STATE ROUTE 99

SR99 NB ON RAMP

MENDOCINO AVE

SR99 SB ON RAMP

SR99 NB OFF RAMP

Ø150.00'

Ø130.00'

SW

N

FOR PLANNING AND STUDY PURPOSE ONLY

EXHIBIT 15

STATE ROUTE 99-MENDOCINO AVE
ALTERNATIVE 6
CONSTRUCT ROUNDABOUT INTERSECTION CONTROL
AT RAMP TERMINALS REALIGN NB OFF RAMP AND FRONTAGE ROAD
TO IMPROVE INTERSECTION SKEW ANGLE
REALIGN SB OFF RAMP AND NB ON RAMP
TO REMOVE ISOLATED RAMPS

DATE REVISED	REVISED BY

CALCULATED-DESIGNED BY

CHECKED BY

FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

LAST REVISION DATE PLOTTED $DATE
00-00-00 TIME PLOTTED $TIME

BORDER LAST REVISED 7/2/2010

USERNAME $USER
DGN FILE $REQUEST

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 00000000001

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
No.
Exp.
CIVIL
STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

FRESNO COUNTY
TULARE COUNTY

AVE 394

AVE 392

N

SR99 SB OFF RAMP

STATE ROUTE 99

SR99 NB ON RAMP

MENDOCINO AVE

SR99 SB ON RAMP

SR99 NB OFF RAMP

SW

FOR PLANNING AND STUDY PURPOSE ONLY

EXHIBIT 16

STATE ROUTE 99-MENDOCINO AVE
ALTERNATIVE 4-LONG-TERM ALTERNATIVE
CONSTRUCT COMPACT DIAMOND INTERCHANGE (L-1)
WITH SIGNALIZED INTERSECTION CONTROL
REALIGN NB AND SB RAMPS

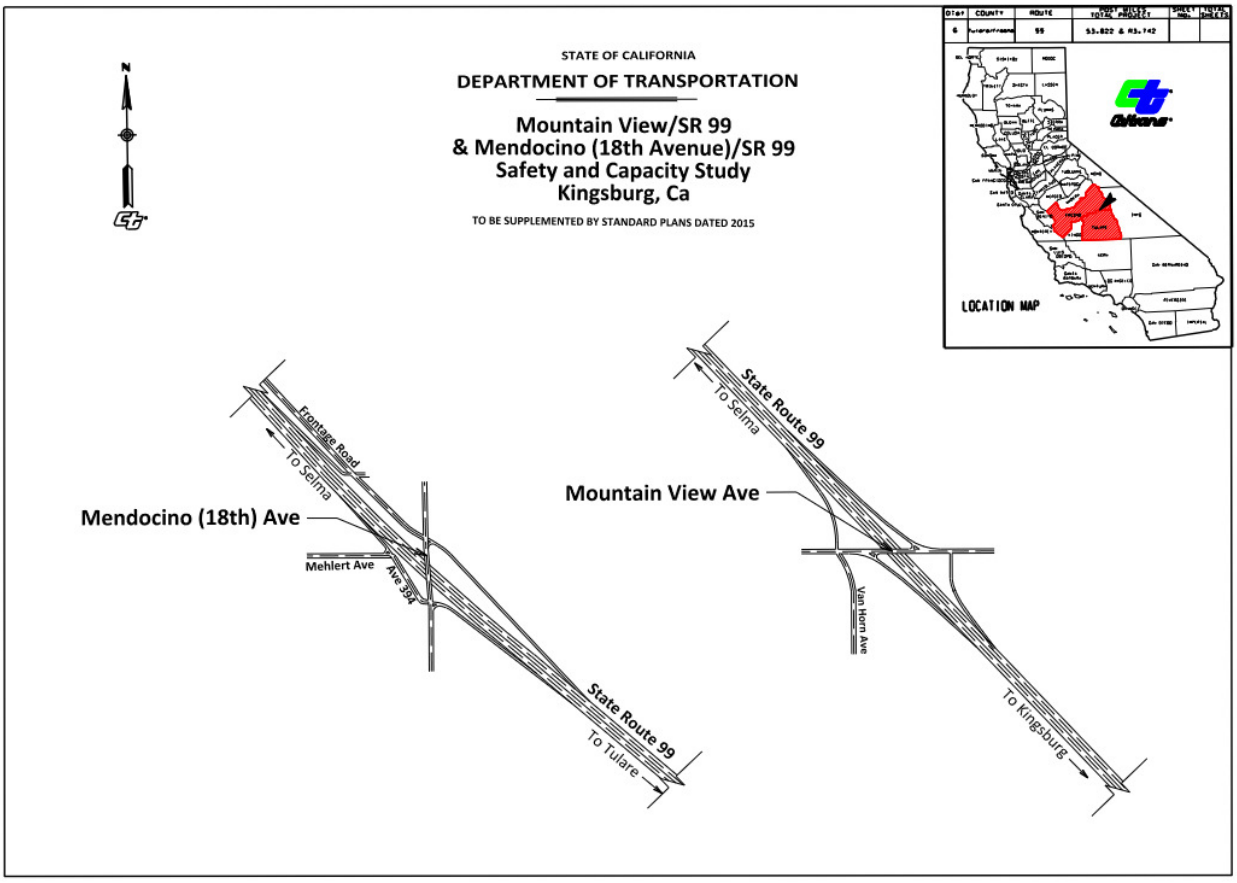
REVISED BY
DATE REVISED
CALCULATED-
DESIGNED BY
CHECKED BY
FUNCTIONAL SUPERVISOR
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

LAST REVISION DATE PLOTTED =$DATE
00-00-00 TIME PLOTTED =$TIME

BORDER LAST REVISED 7/2/2010
USERNAME =$USER
OGN FILE =$REQUEST
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
UNIT 0000
PROJECT NUMBER & PHASE 00000000001

CALIFORNIA DEPARTMENT OF TRANSPORTATION

Feasibility Study
Technical Appendices
Volume 2 of 2



IN FRESNO AND TULARE COUNTIES
WITHIN THE CITY OF KINGSBURG AND SELMA
State Route 99-Mountain View Ave (PM R3.742)
State Route 99- Mendocino (18th) Ave (PM 53.822)

May 2019

California DOT / Caltrans : Caltrans District 6 - Traffic Planning
Address

City, California, United States 12345
Phone eric.olson@dot.ca.gov

Count Name: 18th Ave_Frontage Rd_SR99NB Off Ramp
Site Code: unit # 6
Start Date: 09/26/2018

Turning Movement Peak Hour Data (7:15 AM)

Start Time	Westbound Approach Southbound					Northbound Approach Westbound					Eastbound Approach Northbound					Southbound Approach Eastbound					
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
7:15 AM	10	87	0	0	97	21	3	4	0	28	0	58	28	0	86	4	0	1	0	5	216
7:30 AM	20	111	0	0	131	36	4	21	0	61	0	93	19	0	112	7	0	1	0	8	312
7:45 AM	24	100	0	0	124	39	4	11	0	54	0	140	13	0	153	5	0	3	0	8	339
8:00 AM	26	105	0	0	131	26	1	7	0	34	0	58	13	0	71	4	0	0	0	4	240
Total	80	403	0	0	483	122	12	43	0	177	0	349	73	0	422	20	0	5	0	25	1107
Approach %	16.6	83.4	0.0	0.0	-	68.9	6.8	24.3	0.0	-	0.0	82.7	17.3	0.0	-	80.0	0.0	20.0	0.0	-	-
Total %	7.2	36.4	0.0	0.0	43.6	11.0	1.1	3.9	0.0	16.0	0.0	31.5	6.6	0.0	38.1	1.8	0.0	0.5	0.0	2.3	-
PHF	0.769	0.908	0.000	0.000	0.922	0.782	0.750	0.512	0.000	0.725	0.000	0.623	0.652	0.000	0.690	0.714	0.000	0.417	0.000	0.781	0.816
Lights	76	394	0	0	470	110	10	32	0	152	0	334	65	0	399	20	0	4	0	24	1045
% Lights	95.0	97.8	-	-	97.3	90.2	83.3	74.4	-	85.9	-	95.7	89.0	-	94.5	100.0	-	80.0	-	96.0	94.4
Other Vehicles	4	9	0	0	13	12	2	11	0	25	0	15	8	0	23	0	0	1	0	1	62
% Other Vehicles	5.0	2.2	-	-	2.7	9.8	16.7	25.6	-	14.1	-	4.3	11.0	-	5.5	0.0	-	20.0	-	4.0	5.6

California DOT / Caltrans : Caltrans District 6 - Traffic Planning
Address

City, California, United States 12345
Phone eric.olson@dot.ca.gov

Count Name: 18th Ave_Frontage Rd_SR99NB Off Ramp
Site Code: unit # 6
Start Date: 09/26/2018

Turning Movement Peak Hour Data (3:00 PM)

Start Time	Westbound Approach Southbound					Northbound Approach Westbound					Eastbound Approach Northbound					Southbound Approach Eastbound					
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
3:00 PM	16	89	0	0	105	38	5	11	0	54	0	95	24	0	119	3	0	2	0	5	283
3:15 PM	12	58	0	0	70	44	8	7	0	59	0	90	15	0	105	1	0	0	0	1	235
3:30 PM	25	69	0	0	94	34	4	9	0	47	0	73	15	0	88	0	0	0	0	0	229
3:45 PM	7	64	0	0	71	33	3	9	0	45	0	74	16	0	90	2	0	2	0	4	210
Total	60	280	0	0	340	149	20	36	0	205	0	332	70	0	402	6	0	4	0	10	957
Approach %	17.6	82.4	0.0	0.0	-	72.7	9.8	17.6	0.0	-	0.0	82.6	17.4	0.0	-	60.0	0.0	40.0	0.0	-	-
Total %	6.3	29.3	0.0	0.0	35.5	15.6	2.1	3.8	0.0	21.4	0.0	34.7	7.3	0.0	42.0	0.6	0.0	0.4	0.0	1.0	-
PHF	0.600	0.787	0.000	0.000	0.810	0.847	0.625	0.818	0.000	0.869	0.000	0.874	0.729	0.000	0.845	0.500	0.000	0.500	0.000	0.500	0.845
Lights	56	269	0	0	325	139	19	30	0	188	0	311	62	0	373	6	0	4	0	10	896
% Lights	93.3	96.1	-	-	95.6	93.3	95.0	83.3	-	91.7	-	93.7	88.6	-	92.8	100.0	-	100.0	-	100.0	93.6
Other Vehicles	4	11	0	0	15	10	1	6	0	17	0	21	8	0	29	0	0	0	0	0	61
% Other Vehicles	6.7	3.9	-	-	4.4	6.7	5.0	16.7	-	8.3	-	6.3	11.4	-	7.2	0.0	-	0.0	-	0.0	6.4

California DOT / Caltrans : Caltrans District 6 - Traffic Planning
Address

City, California, United States 12345
Phone eric.olson@dot.ca.gov

Count Name: Ave 394 and SR99SB Off Ramp
Site Code: unit # 8
Start Date: 09/26/2018

Turning Movement Peak Hour Data (7:15 AM)

Start Time	Southbound Approach				Westbound Approach				Eastbound Approach				
	Southbound				Westbound				Eastbound				
	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
7:15 AM	2	10	0	12	0	10	0	10	38	0	0	38	60
7:30 AM	4	15	0	19	0	13	0	13	27	0	0	27	59
7:45 AM	3	33	0	36	0	22	0	22	32	0	0	32	90
8:00 AM	1	16	0	17	0	31	0	31	21	0	0	21	69
Total	10	74	0	84	0	76	0	76	118	0	0	118	278
Approach %	11.9	88.1	0.0	-	0.0	100.0	0.0	-	100.0	0.0	0.0	-	-
Total %	3.6	26.6	0.0	30.2	0.0	27.3	0.0	27.3	42.4	0.0	0.0	42.4	-
PHF	0.625	0.561	0.000	0.583	0.000	0.613	0.000	0.613	0.776	0.000	0.000	0.776	0.772
Lights	9	69	0	78	0	74	0	74	114	0	0	114	266
% Lights	90.0	93.2	-	92.9	-	97.4	-	97.4	96.6	-	-	96.6	95.7
Other Vehicles	1	5	0	6	0	2	0	2	4	0	0	4	12
% Other Vehicles	10.0	6.8	-	7.1	-	2.6	-	2.6	3.4	-	-	3.4	4.3

California DOT / Caltrans : Caltrans District 6 - Traffic Planning
Address

City, California, United States 12345
Phone eric.olson@dot.ca.gov

Count Name: Ave394 and SR99SB OFF Ramp (PM)
Site Code: UNIT #8
Start Date: 09/26/2018

Turning Movement Peak Hour Data (3:30 PM)

Start Time	Southbound Approach Southbound				Northbound Approach Northbound				Eastbound Approach Eastbound				
	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
3:30 PM	6	16	0	22	0	23	0	23	18	0	0	18	63
3:45 PM	17	12	0	29	0	11	0	11	21	0	0	21	61
4:00 PM	10	14	0	24	0	15	0	15	22	0	0	22	61
4:15 PM	6	13	0	19	0	17	0	17	25	0	0	25	61
Total	39	55	0	94	0	66	0	66	86	0	0	86	246
Approach %	41.5	58.5	0.0	-	0.0	100.0	0.0	-	100.0	0.0	0.0	-	-
Total %	15.9	22.4	0.0	38.2	0.0	26.8	0.0	26.8	35.0	0.0	0.0	35.0	-
PHF	0.574	0.859	0.000	0.810	0.000	0.717	0.000	0.717	0.860	0.000	0.000	0.860	0.976
Lights	35	43	0	78	0	65	0	65	85	0	0	85	228
% Lights	89.7	78.2	-	83.0	-	98.5	-	98.5	98.8	-	-	98.8	92.7
Other Vehicles	4	12	0	16	0	1	0	1	1	0	0	1	18
% Other Vehicles	10.3	21.8	-	17.0	-	1.5	-	1.5	1.2	-	-	1.2	7.3

California DOT / Caltrans : Caltrans District 6 - Traffic Planning
Address

City, California, United States 12345
Phone eric.olson@dot.ca.gov

Count Name: Ave 394 and SR99SB ON Ramp (AM)
Site Code: UNIT # 5
Start Date: 09/26/2018

Turning Movement Peak Hour Data (7:15 AM)

Start Time	Westbound Approach Southbound					Northbound Approach Westbound					Eastbound Approach Northbound					Southbound Approach Eastbound					
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
7:15 AM	6	39	47	0	92	0	0	0	0	0	0	50	2	0	52	5	6	34	0	45	189
7:30 AM	12	60	59	0	131	1	0	0	0	1	0	75	1	0	76	4	2	38	0	44	252
7:45 AM	24	58	31	0	113	0	0	0	0	0	0	100	1	0	101	8	2	56	0	66	280
8:00 AM	29	69	25	0	123	0	0	0	0	0	0	45	1	0	46	4	3	30	0	37	206
Total	71	226	162	0	459	1	0	0	0	1	0	270	5	0	275	21	13	158	0	192	927
Approach %	15.5	49.2	35.3	0.0	-	100.0	0.0	0.0	0.0	-	0.0	98.2	1.8	0.0	-	10.9	6.8	82.3	0.0	-	-
Total %	7.7	24.4	17.5	0.0	49.5	0.1	0.0	0.0	0.0	0.1	0.0	29.1	0.5	0.0	29.7	2.3	1.4	17.0	0.0	20.7	-
PHF	0.612	0.819	0.686	0.000	0.876	0.250	0.000	0.000	0.000	0.250	0.000	0.675	0.625	0.000	0.681	0.656	0.542	0.705	0.000	0.727	0.828
Lights	70	213	157	0	440	1	0	0	0	1	0	250	5	0	255	20	12	151	0	183	879
% Lights	98.6	94.2	96.9	-	95.9	100.0	-	-	-	100.0	-	92.6	100.0	-	92.7	95.2	92.3	95.6	-	95.3	94.8
Other Vehicles	1	13	5	0	19	0	0	0	0	0	0	20	0	0	20	1	1	7	0	9	48
% Other Vehicles	1.4	5.8	3.1	-	4.1	0.0	-	-	-	0.0	-	7.4	0.0	-	7.3	4.8	7.7	4.4	-	4.7	5.2

California DOT / Caltrans : Caltrans District 6 - Traffic Planning
Address

City, California, United States 12345
Phone eric.olson@dot.ca.gov

Count Name: Ave 394 and SR99SB ON Ramp (PM)
Site Code: UNIT # 5
Start Date: 09/26/2018

Turning Movement Peak Hour Data (3:00 PM)

Start Time	Westbound Approach (Southbound)					Northbound Approach (Westbound)					Eastbound Approach (Northbound)					Southbound Approach (Eastbound)					
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
3:00 PM	30	48	24	1	103	0	0	0	0	0	0	100	2	0	102	2	5	16	0	23	228
3:15 PM	9	41	20	0	70	0	0	0	0	0	0	80	0	0	80	0	2	24	0	26	176
3:30 PM	20	39	27	0	86	0	0	0	0	0	0	63	4	0	67	0	4	26	0	30	183
3:45 PM	11	35	30	0	76	0	0	0	0	0	0	66	0	0	66	0	4	20	0	24	166
Total	70	163	101	1	335	0	0	0	0	0	0	309	6	0	315	2	15	86	0	103	753
Approach %	20.9	48.7	30.1	0.3	-	0.0	0.0	0.0	0.0	-	0.0	98.1	1.9	0.0	-	1.9	14.6	83.5	0.0	-	-
Total %	9.3	21.6	13.4	0.1	44.5	0.0	0.0	0.0	0.0	0.0	0.0	41.0	0.8	0.0	41.8	0.3	2.0	11.4	0.0	13.7	-
PHF	0.583	0.849	0.842	0.250	0.813	0.000	0.000	0.000	0.000	0.000	0.000	0.773	0.375	0.000	0.772	0.250	0.750	0.827	0.000	0.858	0.826
Lights	70	147	95	1	313	0	0	0	0	0	0	292	6	0	298	2	15	75	0	92	703
% Lights	100.0	90.2	94.1	100.0	93.4	-	-	-	-	-	-	94.5	100.0	-	94.6	100.0	100.0	87.2	-	89.3	93.4
Other Vehicles	0	16	6	0	22	0	0	0	0	0	0	17	0	0	17	0	0	11	0	11	50
% Other Vehicles	0.0	9.8	5.9	0.0	6.6	-	-	-	-	-	-	5.5	0.0	-	5.4	0.0	0.0	12.8	-	10.7	6.6

California DOT / Caltrans : Caltrans District 6 - Traffic Planning
Address

City, California, United States 12345
Phone eric.olson@dot.ca.gov

Count Name: Frontage Rd and SR99NB ON Ramp (AM)
Site Code: UNIT # 3
Start Date: 09/26/2018

Turning Movement Peak Hour Data (7:15 AM)

Start Time	Southbound Approach Southbound					Westbound Approach Westbound					Northbound Approach Northbound					Eastbound Approach Eastbound					
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
7:15 AM	0	3	1	0	4	0	1	1	0	2	2	6	30	0	38	0	0	0	0	0	44
7:30 AM	0	6	1	0	7	1	6	2	0	9	2	10	34	0	46	0	0	0	0	0	62
7:45 AM	1	6	2	0	9	0	6	2	0	8	2	13	27	0	42	0	0	0	0	0	59
8:00 AM	1	2	0	0	3	1	7	2	0	10	2	5	34	0	41	0	0	0	0	0	54
Total	2	17	4	0	23	2	20	7	0	29	8	34	125	0	167	0	0	0	0	0	219
Approach %	8.7	73.9	17.4	0.0	-	6.9	69.0	24.1	0.0	-	4.8	20.4	74.9	0.0	-	0.0	0.0	0.0	0.0	-	-
Total %	0.9	7.8	1.8	0.0	10.5	0.9	9.1	3.2	0.0	13.2	3.7	15.5	57.1	0.0	76.3	0.0	0.0	0.0	0.0	0.0	-
PHF	0.500	0.708	0.500	0.000	0.639	0.500	0.714	0.875	0.000	0.725	1.000	0.654	0.919	0.000	0.908	0.000	0.000	0.000	0.000	0.000	0.883
Lights	1	17	4	0	22	1	19	6	0	26	7	34	112	0	153	0	0	0	0	0	201
% Lights	50.0	100.0	100.0	-	95.7	50.0	95.0	85.7	-	89.7	87.5	100.0	89.6	-	91.6	-	-	-	-	-	91.8
Other Vehicles	1	0	0	0	1	1	1	1	0	3	1	0	13	0	14	0	0	0	0	0	18
% Other Vehicles	50.0	0.0	0.0	-	4.3	50.0	5.0	14.3	-	10.3	12.5	0.0	10.4	-	8.4	-	-	-	-	-	8.2

California DOT / Caltrans : Caltrans District 6 - Traffic Planning
Address

City, California, United States 12345
Phone eric.olson@dot.ca.gov

Count Name: Frontage Rd and SR99NB ON Ramp (PM)
Site Code: UNIT # 3
Start Date: 09/26/2018

Turning Movement Peak Hour Data (3:00 PM)

Start Time	Southbound Approach Southbound					Westbound Approach Westbound					Northbound Approach Northbound					Eastbound Approach Eastbound					
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
3:00 PM	1	6	0	0	7	0	3	1	0	4	0	8	36	0	44	0	0	0	0	0	55
3:15 PM	1	0	0	0	1	0	1	1	0	2	2	9	24	0	35	0	0	0	0	0	38
3:30 PM	0	6	0	0	6	1	2	4	0	7	2	5	38	0	45	0	0	0	0	0	58
3:45 PM	0	4	0	0	4	0	4	1	0	5	1	7	18	0	26	0	0	0	0	0	35
Total	2	16	0	0	18	1	10	7	0	18	5	29	116	0	150	0	0	0	0	0	186
Approach %	11.1	88.9	0.0	0.0	-	5.6	55.6	38.9	0.0	-	3.3	19.3	77.3	0.0	-	0.0	0.0	0.0	0.0	-	-
Total %	1.1	8.6	0.0	0.0	9.7	0.5	5.4	3.8	0.0	9.7	2.7	15.6	62.4	0.0	80.6	0.0	0.0	0.0	0.0	0.0	-
PHF	0.500	0.667	0.000	0.000	0.643	0.250	0.625	0.438	0.000	0.643	0.625	0.806	0.763	0.000	0.833	0.000	0.000	0.000	0.000	0.000	0.802
Lights	2	16	0	0	18	1	8	3	0	12	4	25	108	0	137	0	0	0	0	0	167
% Lights	100.0	100.0	-	-	100.0	100.0	80.0	42.9	-	66.7	80.0	86.2	93.1	-	91.3	-	-	-	-	-	89.8
Other Vehicles	0	0	0	0	0	0	2	4	0	6	1	4	8	0	13	0	0	0	0	0	19
% Other Vehicles	0.0	0.0	-	-	0.0	0.0	20.0	57.1	-	33.3	20.0	13.8	6.9	-	8.7	-	-	-	-	-	10.2

California DOT / Caltrans : Caltrans District 6 - Traffic Planning
Address

City, California, United States 12345
Phone eric.olson@dot.ca.gov

Count Name: mountain view avenue and sr99sb off ramp (AM)
Site Code: UNIT # 4
Start Date: 09/13/2018

Turning Movement Peak Hour Data (7:15 AM)

Start Time	Westbound Approach				Northbound Approach				Eastbound Approach				
	Westbound				Northbound				Eastbound				
	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
7:15 AM	161	0	0	161	7	6	0	13	0	113	0	113	287
7:30 AM	164	0	0	164	9	10	0	19	0	112	0	112	295
7:45 AM	117	0	0	117	8	9	0	17	0	107	0	107	241
8:00 AM	122	0	0	122	13	8	0	21	0	94	0	94	237
Total	564	0	0	564	37	33	0	70	0	426	0	426	1060
Approach %	100.0	0.0	0.0	-	52.9	47.1	0.0	-	0.0	100.0	0.0	-	-
Total %	53.2	0.0	0.0	53.2	3.5	3.1	0.0	6.6	0.0	40.2	0.0	40.2	-
PHF	0.860	0.000	0.000	0.860	0.712	0.825	0.000	0.833	0.000	0.942	0.000	0.942	0.898
Lights	514	0	0	514	25	32	0	57	0	372	0	372	943
% Lights	91.1	-	-	91.1	67.6	97.0	-	81.4	-	87.3	-	87.3	89.0
Other Vehicles	50	0	0	50	12	1	0	13	0	54	0	54	117
% Other Vehicles	8.9	-	-	8.9	32.4	3.0	-	18.6	-	12.7	-	12.7	11.0

California DOT / Caltrans : Caltrans District 6 - Traffic Planning
Address

City, California, United States 12345
Phone eric.olson@dot.ca.gov

Count Name: MOUNTAIN VIEW AVENUE AND SR99SB OFF RAMP
Site Code: UNIT # 4
Start Date: 09/13/2018

Turning Movement Peak Hour Data (4:45 PM)

Start Time	Westbound Approach Westbound				Northbound Approach Northbound				Eastbound Approach Eastbound				
	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
4:45 PM	113	0	0	113	12	7	0	19	0	134	0	134	266
5:00 PM	139	0	0	139	8	9	0	17	0	115	0	115	271
5:15 PM	130	0	0	130	7	8	0	15	0	130	0	130	275
5:30 PM	104	0	0	104	12	9	0	21	0	146	0	146	271
Total	486	0	0	486	39	33	0	72	0	525	0	525	1083
Approach %	100.0	0.0	0.0	-	54.2	45.8	0.0	-	0.0	100.0	0.0	-	-
Total %	44.9	0.0	0.0	44.9	3.6	3.0	0.0	6.6	0.0	48.5	0.0	48.5	-
PHF	0.874	0.000	0.000	0.874	0.813	0.917	0.000	0.857	0.000	0.899	0.000	0.899	0.985
Lights	433	0	0	433	29	27	0	56	0	492	0	492	981
% Lights	89.1	-	-	89.1	74.4	81.8	-	77.8	-	93.7	-	93.7	90.6
Other Vehicles	53	0	0	53	10	6	0	16	0	33	0	33	102
% Other Vehicles	10.9	-	-	10.9	25.6	18.2	-	22.2	-	6.3	-	6.3	9.4

California DOT / Caltrans : Caltrans District 6 - Traffic Planning
Address

City, California, United States 12345
Phone eric.olson@dot.ca.gov

Count Name: mountain view avenue and SR99NB Off Ramp
Site Code: unit 3
Start Date: 09/13/2018

Turning Movement Peak Hour Data (7:00 AM)

Start Time	Northbound St. Southbound					Eastbound St. Westbound					Southbound St. Northbound					Westbound St. Eastbound					
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
7:00 AM	18	3	54	0	75	0	27	2	0	29	9	1	5	0	15	0	48	0	0	48	167
7:15 AM	19	0	71	1	91	0	46	1	0	47	13	0	1	0	14	1	74	0	0	75	227
7:30 AM	12	0	87	0	99	0	39	0	0	39	6	0	0	0	6	1	42	0	0	43	187
7:45 AM	19	0	72	0	91	0	53	1	0	54	13	0	0	0	13	1	58	0	0	59	217
Total	68	3	284	1	356	0	165	4	0	169	41	1	6	0	48	3	222	0	0	225	798
Approach %	19.1	0.8	79.8	0.3	-	0.0	97.6	2.4	0.0	-	85.4	2.1	12.5	0.0	-	1.3	98.7	0.0	0.0	-	-
Total %	8.5	0.4	35.6	0.1	44.6	0.0	20.7	0.5	0.0	21.2	5.1	0.1	0.8	0.0	6.0	0.4	27.8	0.0	0.0	28.2	-
PHF	0.895	0.250	0.816	0.250	0.899	0.000	0.778	0.500	0.000	0.782	0.788	0.250	0.300	0.000	0.800	0.750	0.750	0.000	0.000	0.750	0.879
Lights	47	3	253	1	304	0	146	4	0	150	31	0	1	0	32	2	183	0	0	185	671
% Lights	69.1	100.0	89.1	100.0	85.4	-	88.5	100.0	-	88.8	75.6	0.0	16.7	-	66.7	66.7	82.4	-	-	82.2	84.1
Other Vehicles	21	0	31	0	52	0	19	0	0	19	10	1	5	0	16	1	39	0	0	40	127
% Other Vehicles	30.9	0.0	10.9	0.0	14.6	-	11.5	0.0	-	11.2	24.4	100.0	83.3	-	33.3	33.3	17.6	-	-	17.8	15.9

California DOT / Caltrans : Caltrans District 6 - Traffic Planning
Address

City, California, United States 12345
Phone eric.olson@dot.ca.gov

Count Name: mountain view avenue and sr99nb off ramp (PM)
Site Code: UNIT # 3
Start Date: 09/13/2018

Turning Movement Peak Hour Data (3:30 PM)

Start Time	Southbound Approach					Westbound Approach					Northbound Approach					Eastbound Approach					
	Southbound					Westbound					Northbound					Eastbound					
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
3:30 PM	30	0	63	0	93	0	40	3	0	43	11	0	0	0	11	2	115	0	0	117	264
3:45 PM	24	1	62	0	87	0	45	1	0	46	27	0	2	0	29	1	70	0	0	71	233
4:00 PM	23	1	74	0	98	0	37	1	0	38	17	0	0	0	17	1	109	0	0	110	263
4:15 PM	28	3	86	0	117	0	46	0	0	46	15	0	0	0	15	6	76	0	0	82	260
Total	105	5	285	0	395	0	168	5	0	173	70	0	2	0	72	10	370	0	0	380	1020
Approach %	26.6	1.3	72.2	0.0	-	0.0	97.1	2.9	0.0	-	97.2	0.0	2.8	0.0	-	2.6	97.4	0.0	0.0	-	-
Total %	10.3	0.5	27.9	0.0	38.7	0.0	16.5	0.5	0.0	17.0	6.9	0.0	0.2	0.0	7.1	1.0	36.3	0.0	0.0	37.3	-
PHF	0.875	0.417	0.828	0.000	0.844	0.000	0.913	0.417	0.000	0.940	0.648	0.000	0.250	0.000	0.621	0.417	0.804	0.000	0.000	0.812	0.966
Lights	88	5	251	0	344	0	153	5	0	158	51	0	2	0	53	9	346	0	0	355	910
% Lights	83.8	100.0	88.1	-	87.1	-	91.1	100.0	-	91.3	72.9	-	100.0	-	73.6	90.0	93.5	-	-	93.4	89.2
Other Vehicles	17	0	34	0	51	0	15	0	0	15	19	0	0	0	19	1	24	0	0	25	110
% Other Vehicles	16.2	0.0	11.9	-	12.9	-	8.9	0.0	-	8.7	27.1	-	0.0	-	26.4	10.0	6.5	-	-	6.6	10.8

California DOT / Caltrans : Caltrans District 6 - Traffic Planning
Address

City, California, United States 12345
Phone eric.olson@dot.ca.gov

Count Name: mountain view avenue and sr99nb on ramp (AM)
Site Code: UNIT # 1
Start Date: 09/13/2018

Turning Movement Peak Hour Data (7:00 AM)

Start Time	Eastbound Approach Westbound				Southbound Approach Northbound				Westbound Approach Eastbound				
	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
7:00 AM	89	11	0	100	0	0	0	0	98	36	0	134	234
7:15 AM	115	17	0	132	0	0	0	0	110	54	0	164	296
7:30 AM	111	12	0	123	0	0	0	0	111	59	0	170	293
7:45 AM	108	16	0	124	0	0	0	0	66	58	0	124	248
Total	423	56	0	479	0	0	0	0	385	207	0	592	1071
Approach %	88.3	11.7	0.0	-	0.0	0.0	0.0	-	65.0	35.0	0.0	-	-
Total %	39.5	5.2	0.0	44.7	0.0	0.0	0.0	0.0	35.9	19.3	0.0	55.3	-
PHF	0.920	0.824	0.000	0.907	0.000	0.000	0.000	0.000	0.867	0.877	0.000	0.871	0.905
Lights	369	38	0	407	0	0	0	0	359	178	0	537	944
% Lights	87.2	67.9	-	85.0	-	-	-	-	93.2	86.0	-	90.7	88.1
Other Vehicles	54	18	0	72	0	0	0	0	26	29	0	55	127
% Other Vehicles	12.8	32.1	-	15.0	-	-	-	-	6.8	14.0	-	9.3	11.9

California DOT / Caltrans : Caltrans District 6 - Traffic Planning
Address

City, California, United States 12345
Phone eric.olson@dot.ca.gov

Count Name: mountain view ave and sr99nb on ramp (PM)
Site Code: UNIT # 1
Start Date: 09/13/2018

Turning Movement Peak Hour Data (4:45 PM)

Start Time	Southbound Approach Southbound				Westbound Approach Westbound				Eastbound Approach Eastbound				
	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
4:45 PM	0	0	0	0	68	47	0	115	147	20	0	167	282
5:00 PM	0	0	0	0	71	78	0	149	115	27	0	142	291
5:15 PM	0	0	0	0	74	60	0	134	130	32	0	162	296
5:30 PM	0	0	0	0	52	60	0	112	148	11	0	159	271
Total	0	0	0	0	265	245	0	510	540	90	0	630	1140
Approach %	0.0	0.0	0.0	-	52.0	48.0	0.0	-	85.7	14.3	0.0	-	-
Total %	0.0	0.0	0.0	0.0	23.2	21.5	0.0	44.7	47.4	7.9	0.0	55.3	-
PHF	0.000	0.000	0.000	0.000	0.895	0.785	0.000	0.856	0.912	0.703	0.000	0.943	0.963
Lights	0	0	0	0	239	211	0	450	510	88	0	598	1048
% Lights	-	-	-	-	90.2	86.1	-	88.2	94.4	97.8	-	94.9	91.9
Other Vehicles	0	0	0	0	26	34	0	60	30	2	0	32	92
% Other Vehicles	-	-	-	-	9.8	13.9	-	11.8	5.6	2.2	-	5.1	8.1

Mountain View Avenue Intersections

2018 Existing TWSC Level of Service Reports

HCS 2010 Two-Way Stop-Control Report

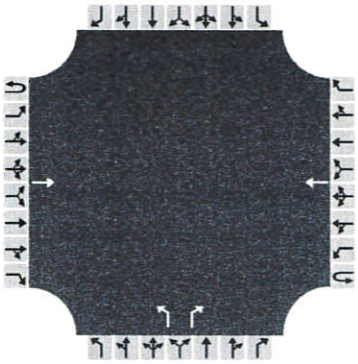
General Information

ıalyst	Hien
. ıgency/Co.	Caltrans
Date Performed	11/21/2018
Analysis Year	2018
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SR99 NB Off and Mountain View AM Peak

Site Information

Intersection	SR99 NB Off/Mountain View
Jurisdiction	
East/West Street	Mountain View
North/South Street	SR99 NB Off Ramp
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
ıority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		1	0	1		0	0	0
Configuration			T				T			L		R				
Volume, V (veh/h)			426				564			32		37				
Percent Heavy Vehicles (%)										3		32				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized		No				No				Yes				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)										7.1		6.2				
Critical Headway (sec)										6.43		6.52				
Base Follow-Up Headway (sec)										3.5		3.3				
Follow-Up Headway (sec)										3.53		3.59				

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)										36		41				
Capacity, c (veh/h)										234		534				
v/c Ratio										0.15		0.08				
95% Queue Length, Q_{95} (veh)										0.5		0.2				
Control Delay (s/veh)										23.2		12.3				
٧el of Service, LOS										C		B				
∧pproach Delay (s/veh)										17.4						
Approach LOS										C						

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HCS 2010 Two-Way Stop-Control Report

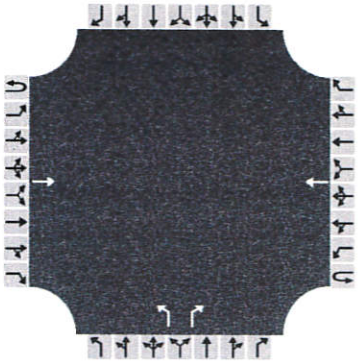
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	11/21/2018
Analysis Year	2018
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	SR99 NB Off and Mountain View PM Peak

Site Information

Intersection	SR99 NB OFF/Mountain View
Jurisdiction	
East/West Street	Mountain View
North/South Street	SR99 NB Off Ramp
Peak Hour Factor	0.99
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		1	0	1		0	0	0
Configuration			T				T			L		R				
Volume, V (veh/h)			540				486			33		39				
Percent Heavy Vehicles (%)										18		26				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized		No				No				Yes				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)										7.1		6.2				
Critical Headway (sec)										6.58		6.46				
Base Follow-Up Headway (sec)										3.5		3.3				
Follow-Up Headway (sec)										3.66		3.53				

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)										33		39				
Capacity, c (veh/h)										239		495				
v/c Ratio										0.14		0.08				
95% Queue Length, Q_{95} (veh)										0.5		0.3				
Control Delay (s/veh)										22.4		12.9				
Level of Service, LOS										C		B				
Approach Delay (s/veh)										17.3						
Approach LOS										C						

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HCS 2010 Two-Way Stop-Control Report

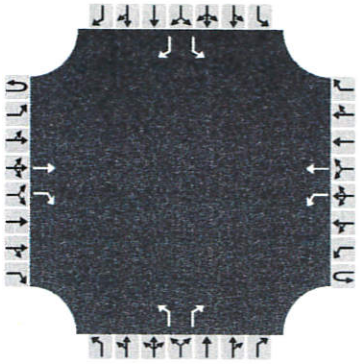
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	11/21/2018
Analysis Year	2018
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SR99 SB Off and Mountain View AM Peak

Site Information

Intersection	SR99 SB OFF/Mountain View
Jurisdiction	
East/West Street	Mountain View
North/South Street	SR99 SB Off Ramp
Peak Hour Factor	0.88
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	1	0	1	1	0		1	0	1		1	0	1
Configuration			T	R		L	T			L		R		L		R
Volume, V (veh/h)			222	3		4	165			6		41		284		68
Percent Heavy Vehicles (%)						0				83		24		11		31
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				No				Yes				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2		7.1		6.2
Critical Headway (sec)						4.10				7.93		6.44		7.21		6.51
Base Follow-Up Headway (sec)						2.2				3.5		3.3		3.5		3.3
Follow-Up Headway (sec)						2.20				4.25		3.52		3.60		3.58

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						5				7		47		323		77
Capacity, c (veh/h)						1322				365		736		471		785
v/c Ratio						0.00				0.02		0.06		0.69		0.10
95% Queue Length, Q_{95} (veh)						0.0				0.1		0.2		5.1		0.3
Control Delay (s/veh)						7.7				15.1		10.2		27.7		10.1
Level of Service, LOS						A				C		B		D		B
Approach Delay (s/veh)						0.2				10.9				24.3		
Approach LOS										B				C		

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HCS 2010 Two-Way Stop-Control Report

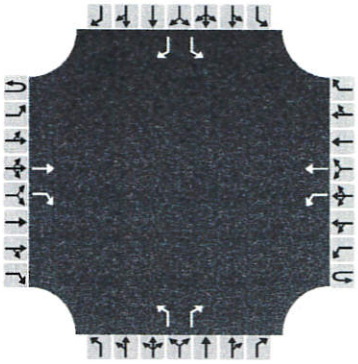
General Information

alyst	Hien
.gency/Co.	Caltrans
Date Performed	11/21/2018
Analysis Year	2018
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	SR99 SB Off and Mountain View PM Peak

Site Information

Intersection	SR99 SB OFF/Mountain View
Jurisdiction	
East/West Street	Mountain View
North/South Street	SR99 SB Off Ramp
Peak Hour Factor	0.97
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
ority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	1	0	1	1	0		1	0	1		1	0	1
Configuration			T	R		L	T			L		R		L		R
Volume, V (veh/h)			370	10		5	201			2		70		295		110
Percent Heavy Vehicles (%)						0				0		27		12		16
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				No				Yes				No		
Median Type/Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2		7.1		6.2
Critical Headway (sec)						4.10				7.10		6.47		7.22		6.36
Base Follow-Up Headway (sec)						2.2				3.5		3.3		3.5		3.3
Follow-Up Headway (sec)						2.20				3.50		3.54		3.61		3.44

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						5				2		72		304		113
Capacity, c (veh/h)						1179				357		614		352		799
v/c Ratio						0.00				0.01		0.12		0.86		0.14
95% Queue Length, Q_{95} (veh)						0.0				0.0		0.4		8.1		0.5
Control Delay (s/veh)						8.1				15.1		11.6		54.7		10.2
el of Service, LOS						A				C		B		F		B
Approach Delay (s/veh)						0.2				11.7				42.7		
Approach LOS										B				E		

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Mountain View Avenue Intersections

2025 No-Build TWSC Level of Service Reports

HCS 2010 Two-Way Stop-Control Report

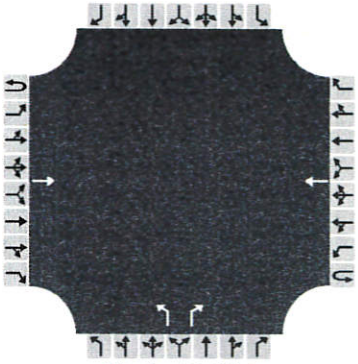
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	11/21/2018
Analysis Year	2025
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SR99 NB Off and Mountain View AM Peak

Site Information

Intersection	SR99 NB Off/Mountain View
Jurisdiction	
East/West Street	Mountain View
North/South Street	SR99 NB Off Ramp
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		1	0	1		0	0	0
Configuration			T				T			L		R				
Volume, V (veh/h)			520				648			46		48				
Percent Heavy Vehicles (%)										3		32				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized		No				No				Yes				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)										7.1		6.2				
Critical Headway (sec)										6.43		6.52				
Base Follow-Up Headway (sec)										3.5		3.3				
Follow-Up Headway (sec)										3.53		3.59				

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)										51		53				
Capacity, c (veh/h)										178		463				
v/c Ratio										0.29		0.11				
95% Queue Length, Q_{95} (veh)										1.1		0.4				
Control Delay (s/veh)										33.2		13.8				
Level of Service, LOS										D		B				
Approach Delay (s/veh)										23.3						
Approach LOS										C						

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HCS 2010 Two-Way Stop-Control Report

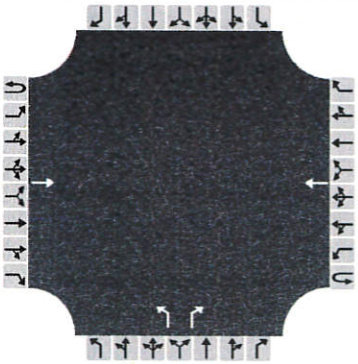
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	11/21/2018
Analysis Year	2025
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	SR99 NB Off and Mountain View PM Peak

Site Information

Intersection	SR99 NB OFF/Mountain View
Jurisdiction	
East/West Street	Mountain View
North/South Street	SR99 NB Off Ramp
Peak Hour Factor	0.99
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		1	0	1		0	0	0
Configuration			T				T			L		R				
Volume, V (veh/h)			650				598			52		53				
Percent Heavy Vehicles (%)										18		26				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized		No				No				Yes				No		
Median Type/Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)										7.1		6.2				
Critical Headway (sec)										6.58		6.46				
Base Follow-Up Headway (sec)										3.5		3.3				
Follow-Up Headway (sec)										3.66		3.53				

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)										53		54				
Capacity, c (veh/h)										174		425				
v/c Ratio										0.30		0.13				
95% Queue Length, Q_{95} (veh)										1.2		0.4				
Control Delay (s/veh)										34.5		14.7				
Level of Service, LOS										D		B				
Approach Delay (s/veh)										24.5						
Approach LOS										C						

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HCS 2010 Two-Way Stop-Control Report

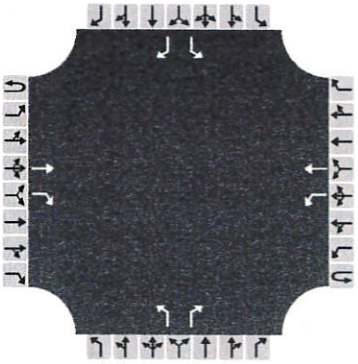
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	11/21/2018
Analysis Year	2025
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SR99 SB Off and Mountain View AM Peak

Site Information

Intersection	SR99 SB OFF/Mountain View
Jurisdiction	
East/West Street	Mountain View
North/South Street	SR99 SB Off Ramp
Peak Hour Factor	0.88
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	1	0	1	1	0		1	0	1		1	0	1
Configuration			T	R		L	T			L		R		L		R
Volume, V (veh/h)			291	4		5	192			8		47		326		105
Percent Heavy Vehicles (%)						0				83		24		11		31
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				No				Yes				No		
Median Type/Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2		7.1		6.2
Critical Headway (sec)						4.10				7.93		6.44		7.21		6.51
Base Follow-Up Headway (sec)						2.2				3.5		3.3		3.5		3.3
Follow-Up Headway (sec)						2.20				4.25		3.52		3.60		3.58

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						6				9		53		370		119
Capacity, c (veh/h)						1235				283		663		390		754
v/c Ratio						0.00				0.03		0.08		0.95		0.16
95% Queue Length, Q_{95} (veh)						0.0				0.1		0.3		10.6		0.6
Control Delay (s/veh)						7.9				18.2		10.9		66.8		10.7
Level of Service, LOS						A				C		B		F		B
Approach Delay (s/veh)						0.2				12.0				53.1		
Approach LOS										B				F		

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HCS 2010 Two-Way Stop-Control Report

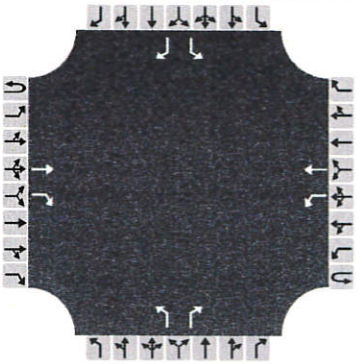
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	11/21/2018
Analysis Year	2025
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	SR99 SB Off and Mountain View PM Peak

Site Information

Intersection	SR99 SB OFF/Mountain View
Jurisdiction	
East/West Street	Mountain View
North/South Street	SR99 SB Off Ramp
Peak Hour Factor	0.97
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	1	0	1	1	0		1	0	1		1	0	1
Configuration			T	R		L	T			L		R		L		R
Volume, V (veh/h)			463	14		11	242			3		80		339		157
Percent Heavy Vehicles (%)						0				0		27		12		16
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				No				Yes				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2		7.1		6.2
Critical Headway (sec)						4.10				7.10		6.47		7.22		6.36
Base Follow-Up Headway (sec)						2.2				3.5		3.3		3.5		3.3
Follow-Up Headway (sec)						2.20				3.50		3.54		3.61		3.44

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						11				3		82		349		162
Capacity, c (veh/h)						1083				258		540		266		757
v/c Ratio						0.01				0.01		0.15		1.31		0.21
95% Queue Length, Q_{95} (veh)						0.0				0.0		0.5		17.7		0.8
Control Delay (s/veh)						8.4				19.1		12.9		201.7		11.0
Level of Service, LOS						A				C		B		F		B
Approach Delay (s/veh)						0.4				13.1				141.3		
Approach LOS										B				F		

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Mountain View Avenue Intersections

2035 No-Build TWSC Level of Service Reports

HCS 2010 Two-Way Stop-Control Report

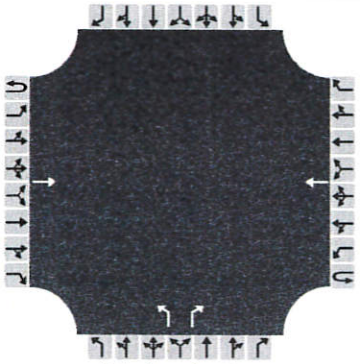
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	11/21/2018
Analysis Year	2035
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SR99 NB Off and Mountain View AM Peak

Site Information

Intersection	SR99 NB Off/Mountain View
Jurisdiction	
East/West Street	Mountain View
North/South Street	SR99 NB Off Ramp
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		1	0	1		0	0	0
Configuration			T				T			L		R				
Volume, V (veh/h)			693				790			75		69				
Percent Heavy Vehicles (%)										3		32				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized		No				No				Yes				No		
Median Type/Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)										83		77				
Capacity, c (veh/h)										108		356				
v/c Ratio										0.77		0.22				
95% Queue Length, Q_{95} (veh)										4.2		0.8				
Control Delay (s/veh)										104.7		17.9				
Level of Service, LOS										F		C				
Approach Delay (s/veh)										62.9						
Approach LOS										F						

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HCS 2010 Two-Way Stop-Control Report

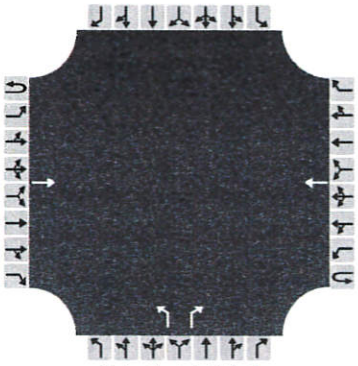
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	11/21/2018
Analysis Year	2035
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	SR99 NB Off and Mountain View PM Peak

Site Information

Intersection	SR99 NB OFF/Mountain View
Jurisdiction	
East/West Street	Mountain View
North/South Street	SR99 NB Off Ramp
Peak Hour Factor	0.99
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		1	0	1		0	0	0
Configuration			T				T			L		R				
Volume, V (veh/h)			848				803			101		82				
Percent Heavy Vehicles (%)										18		26				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized		No				No				Yes				No		
Median Type/Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)										102		83				
Capacity, c (veh/h)										97		324				
v/c Ratio										1.05		0.26				
95% Queue Length, Q_{95} (veh)										6.5		1.0				
Control Delay (s/veh)										187.3		19.9				
Level of Service, LOS										F		C				
Approach Delay (s/veh)										112.2						
Approach LOS										F						

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HCS 2010 Two-Way Stop-Control Report

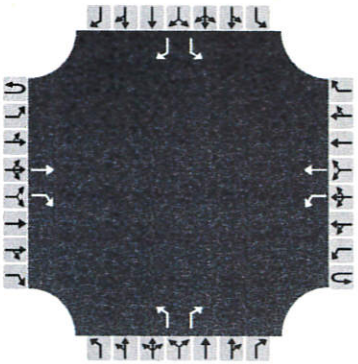
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	11/21/2018
Analysis Year	2035
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SR99 SB Off and Mountain View AM Peak

Site Information

Intersection	SR99 SB OFF/Mountain View
Jurisdiction	
East/West Street	Mountain View
North/South Street	SR99 SB Off Ramp
Peak Hour Factor	0.88
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	1	0	1	1	0		1	0	1		1	0	1
Configuration			T	R		L	T			L		R		L		R
Volume, V (veh/h)			428	7		7	240			13		57		398		196
Percent Heavy Vehicles (%)						0				83		24		11		31
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				No				Yes				No		
Median Type/Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						8				15		65		452		223
Capacity, c (veh/h)						1080				159		539		266		701
v/c Ratio						0.01				0.09		0.12		1.70		0.32
95% Queue Length, Q_{95} (veh)						0.0				0.3		0.4		29.1		1.4
Control Delay (s/veh)						8.4				30.0		12.6		362.4		12.5
Level of Service, LOS						A				D		B		F		B
Approach Delay (s/veh)						0.2				15.8				246.8		
Approach LOS										C				F		

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HCS 2010 Two-Way Stop-Control Report

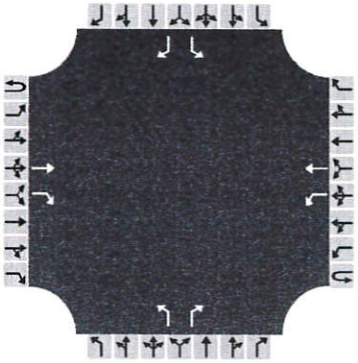
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	11/21/2018
Analysis Year	2035
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	SR99 SB Off and Mountain View PM Peak

Site Information

Intersection	SR99 SB OFF/Mountain View
Jurisdiction	
East/West Street	Mountain View
North/South Street	SR99 SB Off Ramp
Peak Hour Factor	0.97
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	1	0	1	1	0		1	0	1		1	0	1
Configuration			T	R		L	T			L		R		L		R
Volume, V (veh/h)			639	22		32	315			6		98		413		263
Percent Heavy Vehicles (%)						0				0		27		12		16
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				No				Yes				No		
Median Type/Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						33				6		101		426		271
Capacity, c (veh/h)						920				122		423		145		685
v/c Ratio						0.04				0.05		0.24		2.93		0.40
95% Queue Length, Q_{95} (veh)						0.1				0.2		0.9		39.2		1.9
Control Delay (s/veh)						9.1				36.1		16.2		934.2		13.7
Level of Service, LOS						A				E		C		F		B
Approach Delay (s/veh)						0.8				17.3				576.3		
Approach LOS										C				F		

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Mountain View Avenue Intersections

Alternative 1

Realign On-Ramps with All Way Stop Control

2025 Level of Service Reports

2035 Level of Service Reports

2045 Level of Service Reports

HCS 2010 All-Way Stop-Control Summary Report

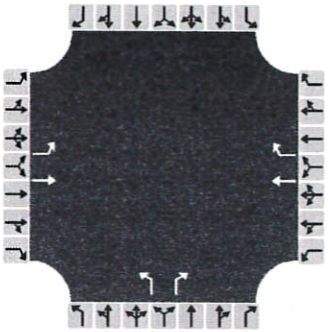
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	12/19/2018
Analysis Year	2025
Time Analyzed	0.25
Anaylysis Time Period (hrs)	AM Peak
Project Description	Alt 1 - SR99 NB Off & Mountain View AM Peak

Site Information

Intersection	SR99 NB Off/Mountain View
Jurisdiction	
East/West Street	Mountain View
North/South Street	SR99 NB Off Ramp
Peak Hour Factor	0.90

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	79	520			197	450	46		48			
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	L	T		T	R		L	R				
Flow Rate, v (veh/h)	88	578		219	500		51	53				
Percent Heavy Vehicles	2	0		0	2		3	0				

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20	3.20		3.20	3.20		3.20	3.20				
Initial Degree of Utilization, x	0.078	0.514		0.195	0.444		0.045	0.047				
Final Departure Headway, hd (s)	6.17	5.64		5.62	4.95		7.93	6.66				
Final Degree of Utilization, x	0.151	0.905		0.342	0.687		0.113	0.099				
Move-Up Time, m (s)	2.3	2.3		2.3	2.3		2.3	2.3				
Service Time, ts (s)	3.87	3.34		3.32	2.65		5.63	4.36				

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	88	578		219	500		51	53				
Capacity	583	639		641	728		454	540				
95% Queue Length, Q_{95} (veh)	0.5	11.4		1.5	5.5		0.4	0.3				
Control Delay (s/veh)	10.0	39.4		11.2	17.8		11.6	10.1				
Level of Service, LOS	A	E		B	C		B	B				
Approach Delay (s/veh)	35.5			15.8			10.8					
Approach LOS	E			C			B					
Intersection Delay, s/veh | LOS	24.3						C					

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HCS 2010 All-Way Stop-Control Summary Report

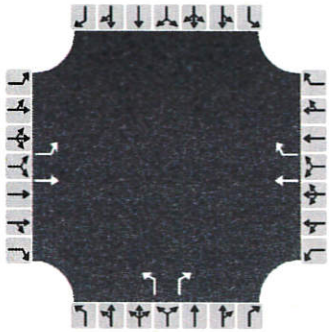
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	12/19/2018
Analysis Year	2025
Time Analyzed	0.25
Anaylysis Time Period (hrs)	PM Peak
Project Description	Alt 1 - SR99 NB Off & Mountain View PM Peak

Site Information

Intersection	SR99 NB Off/Mountain View
Jurisdiction	
East/West Street	Mountain View
North/South Street	SR99 NB Off Ramp
Peak Hour Factor	0.90

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	163	650			262	335	52		53			
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	L	T		T	R		L	R				
Flow Rate, v (veh/h)	181	722		291	372		58	59				
Percent Heavy Vehicles	2	0		0	2		3	0				

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20	3.20		3.20	3.20		3.20	3.20				
Initial Degree of Utilization, x	0.161	0.642		0.259	0.331		0.051	0.052				
Final Departure Headway, hd (s)	6.22	5.68		5.85	5.19		8.00	6.76				
Final Degree of Utilization, x	0.313	1.139		0.473	0.537		0.128	0.111				
Move-Up Time, m (s)	2.3	2.3		2.3	2.3		2.3	2.3				
Service Time, ts (s)	3.92	3.38		3.55	2.89		5.70	4.46				

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	181	722		291	372		58	59				
Capacity	579	634		615	693		450	532				
95% Queue Length, Q_{95} (veh)	1.3	22.9		2.5	3.2		0.4	0.4				
Control Delay (s/veh)	11.7	102.1		13.7	13.7		11.9	10.3				
Level of Service, LOS	B	F		B	B		B	B				
Approach Delay (s/veh)	84.0			13.7			11.1					
Approach LOS	F			B			B					
Intersection Delay, s/veh | LOS	51.2						F					

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HCS 2010 All-Way Stop-Control Summary Report

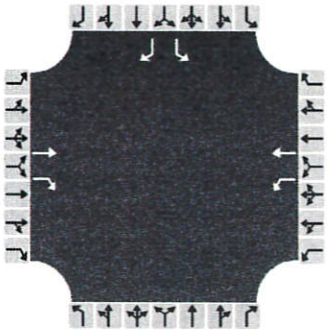
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	12/19/2018
Analysis Year	2025
Time Analyzed	0.25
Anaylysis Time Period (hrs)	AM Peak
Project Description	Alt 1 - SR99 SB Off & Mountain View AM Peak

Site Information

Intersection	SR99 SB Off/Mountain View
Jurisdiction	
East/West Street	Mountain View
North/South Street	SR99 SB Off Ramp
Peak Hour Factor	0.90

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume		323	68	49	199					326		105
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	T	R		L	T					L	R	
Flow Rate, v (veh/h)	359	76		54	221					362	117	
Percent Heavy Vehicles	0	2		2	0					2	2	

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20	3.20		3.20	3.20					3.20	3.20	
Initial Degree of Utilization, x	0.319	0.067		0.048	0.197					0.322	0.104	
Final Departure Headway, hd (s)	6.59	5.91		7.37	6.82					7.05	5.85	
Final Degree of Utilization, x	0.657	0.124		0.111	0.419					0.709	0.190	
Move-Up Time, m (s)	2.3	2.3		2.3	2.3					2.3	2.3	
Service Time, ts (s)	4.29	3.61		5.07	4.52					4.75	3.55	

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	359	76		54	221					362	117	
Capacity	546	609		488	528					511	616	
95% Queue Length, Q_{95} (veh)	4.8	0.4		0.4	2.1					5.6	0.7	
Control Delay (s/veh)	21.0	9.4		11.0	14.4					25.1	9.9	
Level of Service, LOS	C	A		B	B					D	A	
Approach Delay (s/veh)	19.0			13.7						21.4		
Approach LOS	C			B						C		
Intersection Delay, s/veh | LOS	18.7						C					

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HCS 2010 All-Way Stop-Control Summary Report

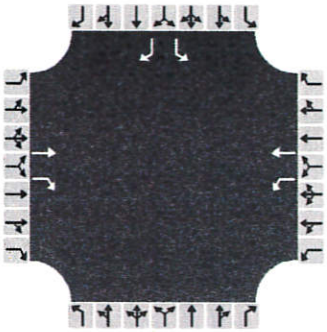
General Information

Analyst	Hien
,ency/Co.	Caltrans
Date Performed	12/19/2018
Analysis Year	2025
Time Analyzed	0.25
Anaylysis Time Period (hrs)	PM Peak
Project Description	Alt 1 - SR99 SB Off & Mountain View PM Peak

Site Information

Intersection	SR99 SB Off/Mountain View
Jurisdiction	
East/West Street	Mountain View
North/South Street	SR99 SB Off Ramp
Peak Hour Factor	0.90

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
'ume		530	72	57	260					339		157
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	T	R		L	T					L	R	
Flow Rate, v (veh/h)	589	80		63	289					377	174	
Percent Heavy Vehicles	0	2		2	0					2	2	

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20	3.20		3.20	3.20					3.20	3.20	
Initial Degree of Utilization, x	0.523	0.071		0.056	0.257					0.335	0.155	
Final Departure Headway, hd (s)	7.09	6.41		7.89	7.35					7.71	6.52	
Final Degree of Utilization, x	1.160	0.142		0.139	0.590					0.807	0.316	
Move-Up Time, m (s)	2.3	2.3		2.3	2.3					2.3	2.3	
Service Time, ts (s)	4.79	4.11		5.59	5.05					5.41	4.22	

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	589	80		63	289					377	174	
Capacity	508	562		456	490					467	552	
95% Queue Length, Q_{95} (veh)	20.8	0.5		0.5	3.8					7.5	1.3	
Control Delay (s/veh)	116.3	10.2		11.9	20.1					35.4	12.2	
Level of Service, LOS	F	B		B	C					E	B	
›roach Delay (s/veh)	103.6			18.6						28.1		
Approach LOS	F			C						D		
Intersection Delay, s/veh | LOS	58.1						F					

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HCS 2010 All-Way Stop-Control Summary Report

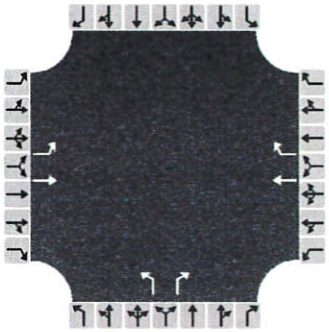
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	12/19/2018
Analysis Year	2035
Time Analyzed	0.25
Anaylysis Time Period (hrs)	AM Peak
Project Description	Alt 1 - SR99 NB Off & Mountain View AM Peak

Site Information

Intersection	SR99 NB Off/Mountain View
Jurisdiction	
East/West Street	Mountain View
North/South Street	SR99 NB Off Ramp
Peak Hour Factor	0.90

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	106	693			227	562	75		69			
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	L	T		T	R		L	R				
Flow Rate, v (veh/h)	118	770		252	624		83	77				
Percent Heavy Vehicles	2	0		0	2		3	0				

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20	3.20		3.20	3.20		3.20	3.20				
Initial Degree of Utilization, x	0.105	0.684		0.224	0.555		0.074	0.068				
Final Departure Headway, hd (s)	6.70	6.16		5.98	5.31		8.22	6.98				
Final Degree of Utilization, x	0.219	1.318		0.419	0.922		0.190	0.149				
Move-Up Time, m (s)	2.3	2.3		2.3	2.3		2.3	2.3				
Service Time, ts (s)	4.40	3.86		3.68	3.01		5.92	4.68				

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	118	770		252	624		83	77				
Capacity	537	584		602	678		438	516				
95% Queue Length, Q_{95} (veh)	0.8	32.2		2.1	12.3		0.7	0.5				
Control Delay (s/veh)	11.3	174.2		12.9	40.5		12.8	10.9				
Level of Service, LOS	B	F		B	E		B	B				
Approach Delay (s/veh)	152.6			32.6			11.9					
Approach LOS	F			D			B					
Intersection Delay, s/veh | LOS	86.2						F					

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HCS 2010 All-Way Stop-Control Summary Report

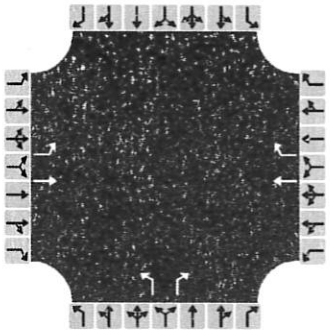
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	12/19/2018
Analysis Year	2035
Time Analyzed	0.25
Anaylysis Time Period (hrs)	PM Peak
Project Description	Alt 1 - SR99 NB Off & Mountain View PM Peak

Site Information

Intersection	SR99 NB Off/Mountain View
Jurisdiction	
East/West Street	Mountain View
North/South Street	SR99 NB Off Ramp
Peak Hour Factor	0.90

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	212	848			335	467	101		82			
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	L	T		T	R		L	R				
Flow Rate, v (veh/h)	236	942		372	519		112	91				
Percent Heavy Vehicles	2	0		0	2		3	0				

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20	3.20		3.20	3.20		3.20	3.20				
Initial Degree of Utilization, x	0.209	0.838		0.331	0.461		0.100	0.081				
Final Departure Headway, hd (s)	7.04	6.50		6.40	5.73		8.45	7.22				
Final Degree of Utilization, x	0.460	1.700		0.661	0.826		0.264	0.183				
Move-Up Time, m (s)	2.3	2.3		2.3	2.3		2.3	2.3				
Service Time, ts (s)	4.74	4.20		4.10	3.43		6.15	4.92				

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	236	942		372	519		112	91				
Capacity	512	554		563	628		426	499				
95% Queue Length, Q_{95} (veh)	2.4	54.9		4.9	8.7		1.0	0.7				
Control Delay (s/veh)	15.6	339.4		20.7	29.8		14.2	11.5				
Level of Service, LOS	C	F		C	D		B	B				
Approach Delay (s/veh)	274.6			26.0			13.0					
Approach LOS	F			D			B					
Intersection Delay, s/veh | LOS	153.7						F					

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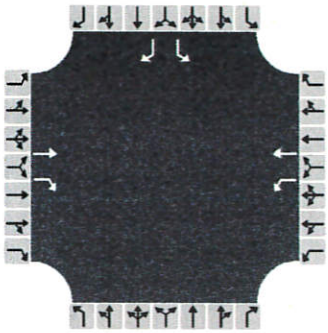
HCS 2010 All-Way Stop-Control Summary Report

General Information

Analyst	Hien	Intersection	SR99 SB Off/Mountain View
Agency/Co.	Caltrans	Jurisdiction	
Date Performed	12/19/2018	East/West Street	Mountain View
Analysis Year	2035	North/South Street	SR99 SB Off Ramp
Time Analyzed	0.25	Peak Hour Factor	0.90
Anaylysis Time Period (hrs)	AM Peak		
Project Description	Alt 1 - SR99 SB Off & Mountain View AM Peak		

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume		432	91	61	252					398		196
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	T	R		L	T					L	R	
Flow Rate, v (veh/h)	480	101		68	280					442	218	
Percent Heavy Vehicles	0	2		2	0					2	2	

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20	3.20		3.20	3.20					3.20	3.20	
Initial Degree of Utilization, x	0.427	0.090		0.060	0.249					0.393	0.194	
Final Departure Headway, hd (s)	7.44	6.76		8.38	7.83					7.83	6.62	
Final Degree of Utilization, x	0.992	0.190		0.158	0.609					0.962	0.400	
Move-Up Time, m (s)	2.3	2.3		2.3	2.3					2.3	2.3	
Service Time, ts (s)	5.14	4.46		6.08	5.53					5.53	4.32	

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	480	101		68	280					442	218	
Capacity	484	533		430	460					460	544	
95% Queue Length, Q_{95} (veh)	13.2	0.7		0.6	4.0					11.8	1.9	
Control Delay (s/veh)	66.1	11.0		12.6	22.0					60.8	13.7	
Level of Service, LOS	F	B		B	C					F	B	
Approach Delay (s/veh)	56.5			20.2						45.2		
Approach LOS	F			C						E		
Intersection Delay, s/veh | LOS	43.9						E					

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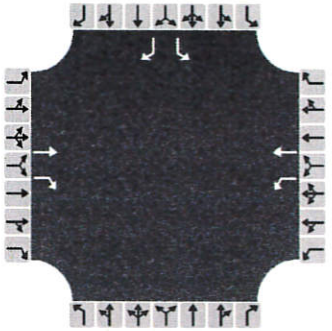
HCS 2010 All-Way Stop-Control Summary Report

General Information

Analyst	Moe	Intersection	SR99 SB Off/Mountain View
Agency/Co.	Caltrans	Jurisdiction	
Date Performed	12/19/2018	East/West Street	Mountain View
Analysis Year	2035	North/South Street	SR99 SB Off Ramp
Time Analyzed	0.25	Peak Hour Factor	0.90
Anaylysis Time Period (hrs)	PM Peak		
Project Description	Alt 1 - SR99 SB Off & Mountain View PM Peak		

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume		680	94	85	363					413		263
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	T	R		L	T					L	R	
Flow Rate, v (veh/h)	756	104		94	403					459	292	
Percent Heavy Vehicles	0	2		2	0					2	2	

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20	3.20		3.20	3.20					3.20	3.20	
Initial Degree of Utilization, x	0.672	0.093		0.084	0.359					0.408	0.260	
Final Departure Headway, hd (s)	7.69	7.03		8.32	7.79					8.06	6.87	
Final Degree of Utilization, x	1.613	0.204		0.218	0.873					1.027	0.558	
Move-Up Time, m (s)	2.3	2.3		2.3	2.3					2.3	2.3	
Service Time, ts (s)	5.39	4.73		6.02	5.49					5.76	4.57	

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	756	104		94	403					459	292	
Capacity	468	512		433	462					447	524	
95% Queue Length, Q_{95} (veh)	42.6	0.8		0.8	9.2					13.9	3.4	
Control Delay (s/veh)	305.3	11.5		13.3	44.2					78.1	17.9	
Level of Service, LOS	F	B		B	E					F	C	
Approach Delay (s/veh)	269.6			38.3						54.7		
Approach LOS	F			E						F		
Intersection Delay, s/veh | LOS	138.5						F					

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HCS 2010 All-Way Stop-Control Summary Report

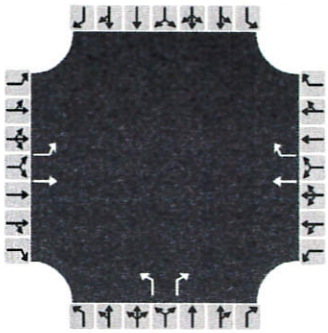
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	12/19/2018
Analysis Year	2045
Time Analyzed	0.25
Anaylysis Time Period (hrs)	AM Peak
Project Description	Alt 1 - SR99 NB Off & Mountain View AM Peak

Site Information

Intersection	SR99 NB Off/Mountain View
Jurisdiction	
East/West Street	Mountain View
North/South Street	SR99 NB Off Ramp
Peak Hour Factor	0.90

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	141	922			260	703	125		99			
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	L	T		T	R		L	R				
Flow Rate, v (veh/h)	157	1024		289	781		139	110				
Percent Heavy Vehicles	2	0		0	2		3	0				

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20	3.20		3.20	3.20		3.20	3.20				
Initial Degree of Utilization, x	0.139	0.911		0.257	0.694		0.123	0.098				
Final Departure Headway, hd (s)	7.14	6.61		6.45	5.78		8.40	7.16				
Final Degree of Utilization, x	0.311	1.880		0.517	1.255		0.324	0.219				
Move-Up Time, m (s)	2.3	2.3		2.3	2.3		2.3	2.3				
Service Time, ts (s)	4.84	4.31		4.15	3.48		6.10	4.86				

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	157	1024		289	781		139	110				
Capacity	504	545		558	622		429	503				
95% Queue Length, Q_{95} (veh)	1.3	65.8		3.0	29.7		1.4	0.8				
Control Delay (s/veh)	13.0	419.0		15.9	146.8		15.1	11.8				
Level of Service, LOS	B	F		C	F		C	B				
Approach Delay (s/veh)	365.2			111.5			13.6					
Approach LOS	F			F			B					
Intersection Delay, s/veh | LOS	221.6						F					

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HCS 2010 All-Way Stop-Control Summary Report

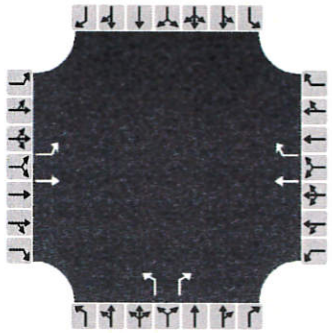
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	12/19/2018
Analysis Year	2045
Time Analyzed	0.25
Anaylysis Time Period (hrs)	PM Peak
Project Description	Alt 1 - SR99 NB Off & Mountain View PM Peak

Site Information

Intersection	SR99 NB Off/Mountain View
Jurisdiction	
East/West Street	Mountain View
North/South Street	SR99 NB Off Ramp
Peak Hour Factor	0.90

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	276	1106			428	652	196		127			
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	L	T		T	R		L	R				
Flow Rate, v (veh/h)	307	1229		476	724		218	141				
Percent Heavy Vehicles	2	0		0	2		3	0				

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20	3.20		3.20	3.20		3.20	3.20				
Initial Degree of Utilization, x	0.273	1.000		0.423	0.644		0.194	0.125				
Final Departure Headway, hd (s)	7.96	7.42		7.24	6.57		9.04	7.80				
Final Degree of Utilization, x	0.678	2.534		0.956	1.322		0.547	0.306				
Move-Up Time, m (s)	2.3	2.3		2.3	2.3		2.3	2.3				
Service Time, ts (s)	5.66	5.12		4.94	4.27		6.74	5.50				

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	307	1229		476	724		218	141				
Capacity	452	485		498	548		398	462				
95% Queue Length, Q_{95} (veh)	5.0	97.7		12.0	30.9		3.2	1.3				
Control Delay (s/veh)	25.8	712.6		56.6	177.5		22.1	13.9				
Level of Service, LOS	D	F		F	F		C	B				
Approach Delay (s/veh)	575.4			129.6			18.9					
Approach LOS	F			F			C					
Intersection Delay, s/veh | LOS	338.0						F					

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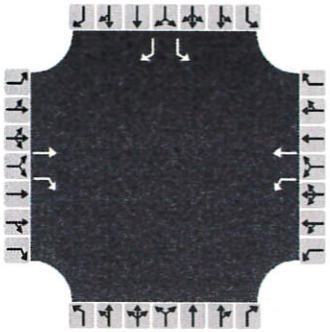
HCS 2010 All-Way Stop-Control Summary Report

General Information

Analyst	Hien	Intersection	SR99 SB Off/Mountain View
Agency/Co.	Caltrans	Jurisdiction	
Date Performed	12/19/2018	East/West Street	Mountain View
Analysis Year	2045	North/South Street	SR99 SB Off Ramp
Time Analyzed	0.25	Peak Hour Factor	0.90
Anaylysis Time Period (hrs)	AM Peak		
Project Description	Alt 1 - SR99 SB Off & Mountain View AM Peak		

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume		578	121	77	319					485		366
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	T	R		L	T					L	R	
Flow Rate, v (veh/h)	642	134		86	354					539	407	
Percent Heavy Vehicles	0	2		2	0					2	2	

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20	3.20		3.20	3.20					3.20	3.20	
Initial Degree of Utilization, x	0.571	0.120		0.076	0.315					0.479	0.361	
Final Departure Headway, hd (s)	7.70	7.04		8.46	7.94					7.99	6.80	
Final Degree of Utilization, x	1.373	0.263		0.201	0.781					1.196	0.768	
Move-Up Time, m (s)	2.3	2.3		2.3	2.3					2.3	2.3	
Service Time, ts (s)	5.40	4.74		6.16	5.64					5.69	4.50	

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	642	134		86	354					539	407	
Capacity	468	512		425	454					451	529	
95% Queue Length, Q_{95} (veh)	29.9	1.0		0.7	6.9					20.8	6.9	
Control Delay (s/veh)	202.9	12.2		13.3	33.6					133.9	28.6	
Level of Service, LOS	F	B		B	D					F	D	
Approach Delay (s/veh)	169.9			29.7						88.6		
Approach LOS	F			D						F		
Intersection Delay, s/veh | LOS	105.8						F					

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HCS 2010 All-Way Stop-Control Summary Report

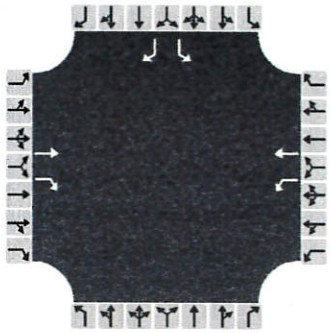
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	12/19/2018
Analysis Year	2045
Time Analyzed	0.25
Anaylysis Time Period (hrs)	PM Peak
Project Description	Alt 1 - SR99 SB Off & Mountain View PM Peak

Site Information

Intersection	SR99 SB Off/Mountain View
Jurisdiction	
East/West Street	Mountain View
North/South Street	SR99 SB Off Ramp
Peak Hour Factor	0.90

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume		878	123	118	506					504		438
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	T	R		L	T					L	R	
Flow Rate, v (veh/h)	976	137		131	562					560	487	
Percent Heavy Vehicles	0	2		2	0					2	2	

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20	3.20		3.20	3.20					3.20	3.20	
Initial Degree of Utilization, x	0.867	0.121		0.117	0.500					0.498	0.433	
Final Departure Headway, hd (s)	8.08	7.42		8.57	8.04					8.26	7.07	
Final Degree of Utilization, x	2.189	0.282		0.312	1.255					1.285	0.956	
Move-Up Time, m (s)	2.3	2.3		2.3	2.3					2.3	2.3	
Service Time, ts (s)	5.78	5.12		6.27	5.74					5.96	4.77	

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	976	137		131	562					560	487	
Capacity	446	485		420	448					436	509	
95% Queue Length, Q_{95} (veh)	71.4	1.1		1.3	23.3					24.2	12.2	
Control Delay (s/veh)	560.3	13.0		15.1	156.8					169.5	56.0	
Level of Service, LOS	F	B		C	F					F	F	
Approach Delay (s/veh)	493.0			130.0						116.7		
Approach LOS	F			F						F		
Intersection Delay, s/veh | LOS	266.7						F					

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Mountain View Avenue Intersections

Alternative 2

Realign On-Ramps with Signalized

2025 Level of Service Reports

2035 Level of Service Reports

2045 Level of Service Reports

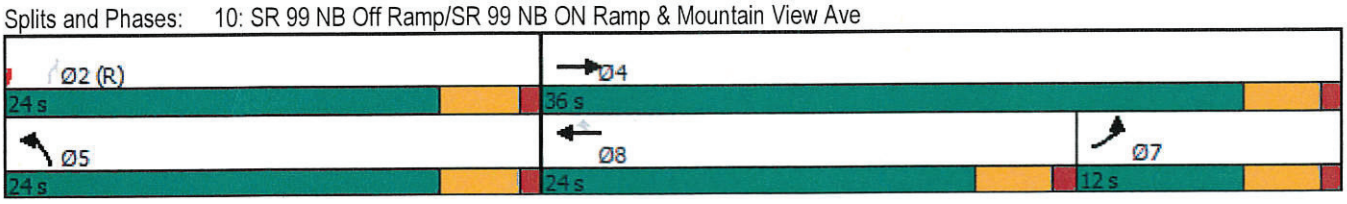
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	570	0	0	202	450	46	0	48	0	0	0
Future Volume (vph)	79	570	0	0	202	450	46	0	48	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		0	0		350	0		250	0		0
Storage Lanes	1		0	0		1	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1367	1681	0	0	1667	1509	1626	0	1233	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	1367	1681	0	0	1667	1509	1626	0	1233	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						489			109			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1148			1005			1107			1543	
Travel Time (s)		26.1			22.8			25.2			35.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	32%	13%	0%	0%	14%	7%	11%	0%	31%	0%	0%	0%
Adj. Flow (vph)	86	620	0	0	220	489	50	0	52	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	86	620	0	0	220	489	50	0	52	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2	1	1		1			
Detector Template	Left	Thru			Thru	Right	Left		Right			
Leading Detector (ft)	20	100			100	20	20		20			
Trailing Detector (ft)	0	0			0	0	0		0			
Detector 1 Position(ft)	0	0			0	0	0		0			
Detector 1 Size(ft)	20	6			6	20	20		20			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 2 Position(ft)		94			94							
Detector 2 Size(ft)		6			6							
Detector 2 Type		Cl+Ex			Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0							
Turn Type	Prot	NA			NA	Perm	Prot		Perm			
Protected Phases	7	4			8		5					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases						8			2			
Detector Phase	7	4			8	8	5		2			
Switch Phase												
Minimum Initial (s)	5.0	5.0			5.0	5.0	5.0		5.0			
Minimum Split (s)	9.5	22.5			22.5	22.5	9.5		22.5			
Total Split (s)	12.0	36.0			24.0	24.0	24.0		24.0			
Total Split (%)	20.0%	60.0%			40.0%	40.0%	40.0%		40.0%			
Maximum Green (s)	7.5	31.5			19.5	19.5	19.5		19.5			
Yellow Time (s)	3.5	3.5			3.5	3.5	3.5		3.5			
All-Red Time (s)	1.0	1.0			1.0	1.0	1.0		1.0			
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Total Lost Time (s)	4.5	4.5			4.5	4.5	4.5		4.5			
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0			
Recall Mode	None	None			None	None	None		C-Max			
Walk Time (s)		7.0			7.0	7.0			7.0			
Flash Dont Walk (s)		11.0			11.0	11.0			11.0			
Pedestrian Calls (#/hr)		0			0	0			0			
Act Effct Green (s)	7.8	26.9			16.6	16.6	24.1		24.1			
Actuated g/C Ratio	0.13	0.45			0.28	0.28	0.40		0.40			
v/c Ratio	0.48	0.82			0.48	0.63	0.08		0.09			
Control Delay	26.5	17.5			17.0	8.6	13.9		1.1			
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0			
Total Delay	26.5	17.5			17.0	8.6	13.9		1.1			
LOS	C	B			B	A	B		A			
Approach Delay		18.6			11.2			7.4				
Approach LOS		B			B			A				

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 32 (53%), Referenced to phase 2:NBR and 6:, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 14.4 Intersection LOS: B
Intersection Capacity Utilization 50.5% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 10: SR 99 NB Off Ramp/SR 99 NB ON Ramp & Mountain View Ave



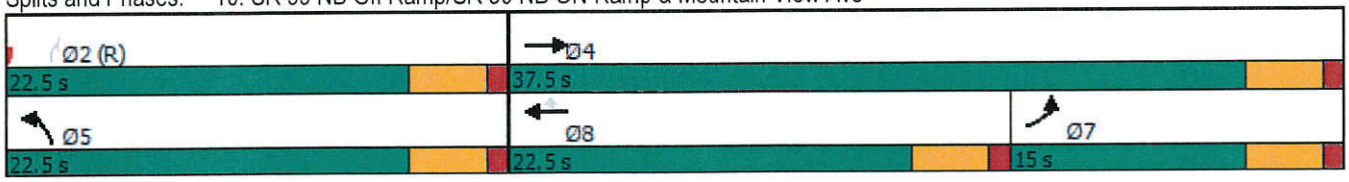
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	706	0	0	265	335	52	0	53	0	0	0
Future Volume (vph)	163	706	0	0	265	335	52	0	53	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		0	0		350	0		250	0		0
Storage Lanes	1		0	0		1	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1367	1681	0	0	1667	1509	1626	0	1233	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	1367	1681	0	0	1667	1509	1626	0	1233	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						364			109			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1148			1005			1107			1543	
Travel Time (s)		26.1			22.8			25.2			35.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	32%	13%	0%	0%	14%	7%	11%	0%	31%	0%	0%	0%
Adj. Flow (vph)	177	767	0	0	288	364	57	0	58	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	177	767	0	0	288	364	57	0	58	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2	1	1		1			
Detector Template	Left	Thru			Thru	Right	Left		Right			
Leading Detector (ft)	20	100			100	20	20		20			
Trailing Detector (ft)	0	0			0	0	0		0			
Detector 1 Position(ft)	0	0			0	0	0		0			
Detector 1 Size(ft)	20	6			6	20	20		20			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 2 Position(ft)		94			94							
Detector 2 Size(ft)		6			6							
Detector 2 Type		Cl+Ex			Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0							
Turn Type	Prot	NA			NA	Perm	Prot		Perm			
Protected Phases	7	4			8		5					

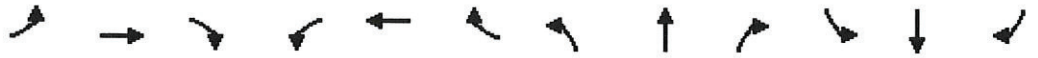
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases						8			2			
Detector Phase	7	4			8	8	5		2			
Switch Phase												
Minimum Initial (s)	5.0	5.0			5.0	5.0	5.0		5.0			
Minimum Split (s)	9.5	22.5			22.5	22.5	9.5		22.5			
Total Split (s)	15.0	37.5			22.5	22.5	22.5		22.5			
Total Split (%)	25.0%	62.5%			37.5%	37.5%	37.5%		37.5%			
Maximum Green (s)	10.5	33.0			18.0	18.0	18.0		18.0			
Yellow Time (s)	3.5	3.5			3.5	3.5	3.5		3.5			
All-Red Time (s)	1.0	1.0			1.0	1.0	1.0		1.0			
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Total Lost Time (s)	4.5	4.5			4.5	4.5	4.5		4.5			
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0			
Recall Mode	None	None			None	None	None		C-Max			
Walk Time (s)		7.0			7.0	7.0			7.0			
Flash Dont Walk (s)		11.0			11.0	11.0			11.0			
Pedestrian Calls (#/hr)		0			0	0			0			
Act Effct Green (s)	11.0	30.8			15.3	15.3	20.2		20.2			
Actuated g/C Ratio	0.18	0.51			0.26	0.26	0.34		0.34			
v/c Ratio	0.71	0.89			0.68	0.55	0.10		0.12			
Control Delay	28.4	15.9			23.3	7.6	15.8		1.7			
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0			
Total Delay	28.4	15.9			23.3	7.6	15.8		1.7			
LOS	C	B			C	A	B		A			
Approach Delay		18.2			14.5			8.7				
Approach LOS		B			B			A				

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 53 (88%), Referenced to phase 2:NBR and 6:, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 16.2 Intersection LOS: B
Intersection Capacity Utilization 62.1% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 10: SR 99 NB Off Ramp/SR 99 NB ON Ramp & Mountain View Ave





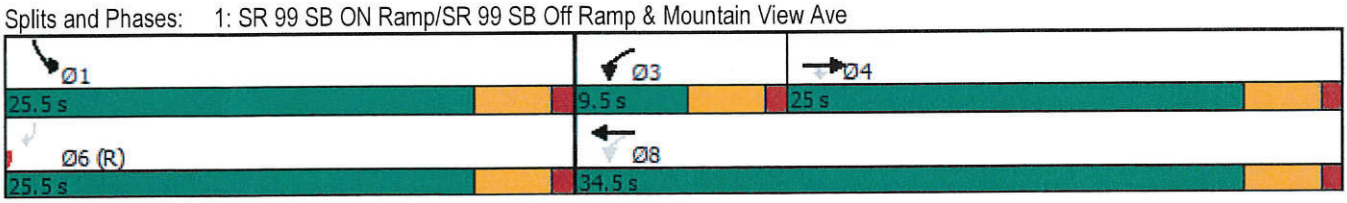
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	323	68	49	199	0	0	0	0	326	0	105
Future Volume (vph)	0	323	68	49	199	0	0	0	0	326	0	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		400	300		0	0		0	0		500
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	1367	1599	1805	1597	0	0	0	0	1378	0	1335
Flt Permitted				0.310						0.950		
Satd. Flow (perm)	0	1367	1599	589	1597	0	0	0	0	1378	0	1335
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109									114
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1057			1148			2070			1130	
Travel Time (s)		24.0			26.1			47.0			25.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	39%	1%	0%	19%	0%	0%	0%	0%	31%	0%	21%
Adj. Flow (vph)	0	351	74	53	216	0	0	0	0	354	0	114
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	351	74	53	216	0	0	0	0	354	0	114
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1	1	2					1		1
Detector Template		Thru	Right	Left	Thru					Left		Right
Leading Detector (ft)		100	20	20	100					20		20
Trailing Detector (ft)		0	0	0	0					0		0
Detector 1 Position(ft)		0	0	0	0					0		0
Detector 1 Size(ft)		6	20	20	6					20		20
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 2 Position(ft)		94			94							
Detector 2 Size(ft)		6			6							
Detector 2 Type		Cl+Ex			Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0							
Turn Type		NA	Perm	pm+pt	NA					Prot		Perm
Protected Phases		4		3	8					1		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			4	8						1		6
Detector Phase		4	4	3	8					1		6
Switch Phase												
Minimum Initial (s)		5.0	5.0	5.0	5.0					5.0		5.0
Minimum Split (s)		22.5	22.5	9.5	22.5					9.5		22.5
Total Split (s)		25.0	25.0	9.5	34.5					25.5		25.5
Total Split (%)		41.7%	41.7%	15.8%	57.5%					42.5%		42.5%
Maximum Green (s)		20.5	20.5	5.0	30.0					21.0		21.0
Yellow Time (s)		3.5	3.5	3.5	3.5					3.5		3.5
All-Red Time (s)		1.0	1.0	1.0	1.0					1.0		1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0					0.0		0.0
Total Lost Time (s)		4.5	4.5	4.5	4.5					4.5		4.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		3.0
Recall Mode		None	None	None	None					None		C-Max
Walk Time (s)		7.0	7.0		7.0							7.0
Flash Dont Walk (s)		11.0	11.0		11.0							11.0
Pedestrian Calls (#/hr)		0	0		0							0
Act Effct Green (s)		18.5	18.5	24.2	24.2					26.8		26.8
Actuated g/C Ratio		0.31	0.31	0.40	0.40					0.45		0.45
v/c Ratio		0.83	0.13	0.16	0.34					0.58		0.17
Control Delay		37.8	2.2	4.6	8.8					20.7		4.1
Queue Delay		0.0	0.0	0.0	0.0					0.0		0.0
Total Delay		37.8	2.2	4.6	8.8					20.7		4.1
LOS		D	A	A	A					C		A
Approach Delay		31.6			8.0						16.7	
Approach LOS		C			A						B	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 41 (68%), Referenced to phase 2: and 6:SBR, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 20.1 Intersection LOS: C
Intersection Capacity Utilization 50.5% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 1: SR 99 SB ON Ramp/SR 99 SB Off Ramp & Mountain View Ave



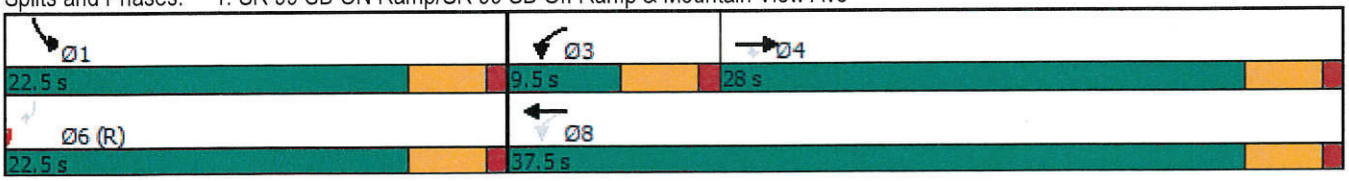
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↱	↰	↑					↰		↱
Traffic Volume (vph)	0	530	72	57	260	0	0	0	0	339	0	157
Future Volume (vph)	0	530	72	57	260	0	0	0	0	339	0	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		400	300		0	0		0	0		500
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	1367	1599	1805	1597	0	0	0	0	1378	0	1335
Flt Permitted				0.231						0.950		
Satd. Flow (perm)	0	1367	1599	439	1597	0	0	0	0	1378	0	1335
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109									171
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1057			1148			2070			1130	
Travel Time (s)		24.0			26.1			47.0			25.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	39%	1%	0%	19%	0%	0%	0%	0%	31%	0%	21%
Adj. Flow (vph)	0	576	78	62	283	0	0	0	0	368	0	171
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	576	78	62	283	0	0	0	0	368	0	171
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1	1	2					1		1
Detector Template		Thru	Right	Left	Thru					Left		Right
Leading Detector (ft)		100	20	20	100					20		20
Trailing Detector (ft)		0	0	0	0					0		0
Detector 1 Position(ft)		0	0	0	0					0		0
Detector 1 Size(ft)		6	20	20	6					20		20
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 2 Position(ft)		94			94							
Detector 2 Size(ft)		6			6							
Detector 2 Type		Cl+Ex			Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0							
Turn Type		NA	Perm	pm+pt	NA					Prot		Perm
Protected Phases		4		3	8					1		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			4	8						1		6
Detector Phase		4	4	3	8					1		6
Switch Phase												
Minimum Initial (s)		5.0	5.0	5.0	5.0					5.0		5.0
Minimum Split (s)		22.5	22.5	9.5	22.5					9.5		22.5
Total Split (s)		28.0	28.0	9.5	37.5					22.5		22.5
Total Split (%)		46.7%	46.7%	15.8%	62.5%					37.5%		37.5%
Maximum Green (s)		23.5	23.5	5.0	33.0					18.0		18.0
Yellow Time (s)		3.5	3.5	3.5	3.5					3.5		3.5
All-Red Time (s)		1.0	1.0	1.0	1.0					1.0		1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0					0.0		0.0
Total Lost Time (s)		4.5	4.5	4.5	4.5					4.5		4.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		3.0
Recall Mode		None	None	None	None					None		C-Max
Walk Time (s)		7.0	7.0		7.0							7.0
Flash Dont Walk (s)		11.0	11.0		11.0							11.0
Pedestrian Calls (#/hr)		0	0		0							0
Act Effct Green (s)		27.3	27.3	33.0	33.0					18.0		18.0
Actuated g/C Ratio		0.46	0.46	0.55	0.55					0.30		0.30
v/c Ratio		0.93	0.10	0.17	0.32					0.89		0.33
Control Delay		44.2	2.0	2.1	2.1					47.7		5.2
Queue Delay		0.0	0.0	0.0	0.0					0.0		0.0
Total Delay		44.2	2.0	2.1	2.1					47.7		5.2
LOS		D	A	A	A					D		A
Approach Delay		39.2			2.1						34.2	
Approach LOS		D			A						C	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 6 (10%), Referenced to phase 2: and 6:SBR, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 29.1 Intersection LOS: C
Intersection Capacity Utilization 62.1% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1: SR 99 SB ON Ramp/SR 99 SB Off Ramp & Mountain View Ave



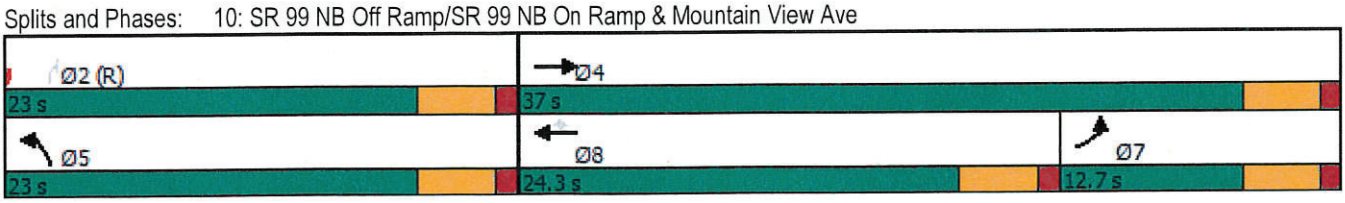
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	693	0	0	238	562	75	0	69	0	0	0
Future Volume (vph)	106	693	0	0	238	562	75	0	69	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		0	0		350	0		250	0		0
Storage Lanes	1		0	0		1	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1367	1681	0	0	1667	1509	1626	0	1233	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	1367	1681	0	0	1667	1509	1626	0	1233	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						611			109			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1148			1005			1107			1543	
Travel Time (s)		26.1			22.8			25.2			35.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	32%	13%	0%	0%	14%	7%	11%	0%	31%	0%	0%	0%
Adj. Flow (vph)	115	753	0	0	259	611	82	0	75	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	115	753	0	0	259	611	82	0	75	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2	1	1		1			
Detector Template	Left	Thru			Thru	Right	Left		Right			
Leading Detector (ft)	20	100			100	20	20		20			
Trailing Detector (ft)	0	0			0	0	0		0			
Detector 1 Position(ft)	0	0			0	0	0		0			
Detector 1 Size(ft)	20	6			6	20	20		20			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 2 Position(ft)		94			94							
Detector 2 Size(ft)		6			6							
Detector 2 Type		Cl+Ex			Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0							
Turn Type	Prot	NA			NA	Perm	Prot		Perm			
Protected Phases	7	4			8		5					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases						8			2			
Detector Phase	7	4			8	8	5		2			
Switch Phase												
Minimum Initial (s)	5.0	5.0			5.0	5.0	5.0		5.0			
Minimum Split (s)	9.5	22.5			22.5	22.5	9.5		22.5			
Total Split (s)	12.7	37.0			24.3	24.3	23.0		23.0			
Total Split (%)	21.2%	61.7%			40.5%	40.5%	38.3%		38.3%			
Maximum Green (s)	8.2	32.5			19.8	19.8	18.5		18.5			
Yellow Time (s)	3.5	3.5			3.5	3.5	3.5		3.5			
All-Red Time (s)	1.0	1.0			1.0	1.0	1.0		1.0			
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Total Lost Time (s)	4.5	4.5			4.5	4.5	4.5		4.5			
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0			
Recall Mode	None	None			None	None	None		C-Max			
Walk Time (s)		7.0			7.0	7.0			7.0			
Flash Dont Walk (s)		11.0			11.0	11.0			11.0			
Pedestrian Calls (#/hr)		0			0	0			0			
Act Effct Green (s)	9.2	30.6			19.1	19.1	20.4		20.4			
Actuated g/C Ratio	0.15	0.51			0.32	0.32	0.34		0.34			
v/c Ratio	0.55	0.88			0.49	0.68	0.15		0.15			
Control Delay	26.6	17.2			17.1	9.1	16.0		2.7			
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0			
Total Delay	26.6	17.2			17.1	9.1	16.0		2.7			
LOS	C	B			B	A	B		A			
Approach Delay		18.4			11.5			9.7				
Approach LOS		B			B			A				

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 32 (53%), Referenced to phase 2:NBR and 6:, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 14.5 Intersection LOS: B
Intersection Capacity Utilization 58.6% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 10: SR 99 NB Off Ramp/SR 99 NB On Ramp & Mountain View Ave



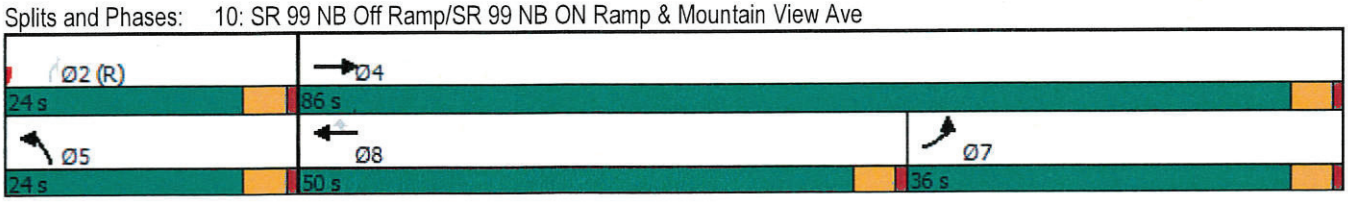
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	212	848	0	0	347	467	101	0	82	0	0	0
Future Volume (vph)	212	848	0	0	347	467	101	0	82	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		0	0		350	0		250	0		0
Storage Lanes	1		0	0		1	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1367	1681	0	0	1667	1509	1626	0	1233	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	1367	1681	0	0	1667	1509	1626	0	1233	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						508			89			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1148			1005			1107			1543	
Travel Time (s)		26.1			22.8			25.2			35.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	32%	13%	0%	0%	14%	7%	11%	0%	31%	0%	0%	0%
Adj. Flow (vph)	230	922	0	0	377	508	110	0	89	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	230	922	0	0	377	508	110	0	89	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2	1	1		1			
Detector Template	Left	Thru			Thru	Right	Left		Right			
Leading Detector (ft)	20	100			100	20	20		20			
Trailing Detector (ft)	0	0			0	0	0		0			
Detector 1 Position(ft)	0	0			0	0	0		0			
Detector 1 Size(ft)	20	6			6	20	20		20			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 2 Position(ft)		94			94							
Detector 2 Size(ft)		6			6							
Detector 2 Type		Cl+Ex			Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0							
Turn Type	Prot	NA			NA	Perm	Prot		Perm			
Protected Phases	7	4			8		5					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases						8			2			
Detector Phase	7	4			8	8	5		2			
Switch Phase												
Minimum Initial (s)	5.0	5.0			5.0	5.0	5.0		5.0			
Minimum Split (s)	9.5	22.5			22.5	22.5	9.5		22.5			
Total Split (s)	36.0	86.0			50.0	50.0	24.0		24.0			
Total Split (%)	32.7%	78.2%			45.5%	45.5%	21.8%		21.8%			
Maximum Green (s)	31.5	81.5			45.5	45.5	19.5		19.5			
Yellow Time (s)	3.5	3.5			3.5	3.5	3.5		3.5			
All-Red Time (s)	1.0	1.0			1.0	1.0	1.0		1.0			
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Total Lost Time (s)	4.5	4.5			4.5	4.5	4.5		4.5			
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0			
Recall Mode	None	None			None	None	None		C-Max			
Walk Time (s)		7.0			7.0	7.0			7.0			
Flash Dont Walk (s)		11.0			11.0	11.0			11.0			
Pedestrian Calls (#/hr)		0			0	0			0			
Act Effct Green (s)	38.2	75.9			33.2	33.2	25.1		25.1			
Actuated g/C Ratio	0.35	0.69			0.30	0.30	0.23		0.23			
v/c Ratio	0.49	0.80			0.75	0.63	0.30		0.25			
Control Delay	23.3	7.3			42.9	11.1	40.6		10.3			
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0			
Total Delay	23.3	7.3			42.9	11.1	40.6		10.3			
LOS	C	A			D	B	D		B			
Approach Delay		10.5			24.6			27.1				
Approach LOS		B			C			C				

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NBR and 6:, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 17.6 Intersection LOS: B
Intersection Capacity Utilization 72.8% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 10: SR 99 NB Off Ramp/SR 99 NB ON Ramp & Mountain View Ave



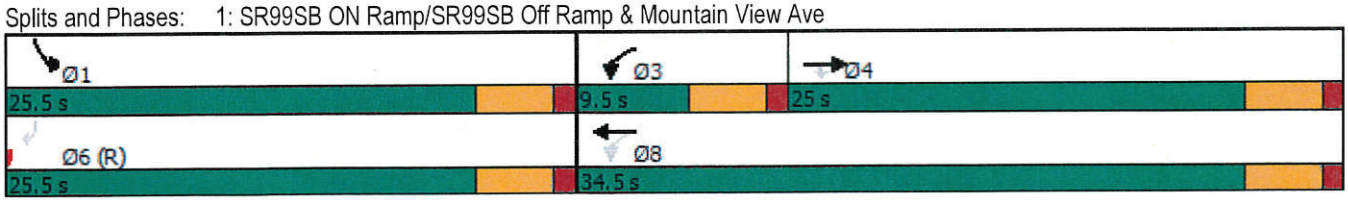
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↱	↰	↑					↰		↱
Traffic Volume (vph)	0	401	91	61	252	0	0	0	0	398	0	196
Future Volume (vph)	0	401	91	61	252	0	0	0	0	398	0	196
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		400	300		0	0		0	0		500
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	1367	1599	1805	1597	0	0	0	0	1378	0	1335
Flt Permitted				0.260						0.950		
Satd. Flow (perm)	0	1367	1599	494	1597	0	0	0	0	1378	0	1335
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109									213
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1057			1148			2070			1130	
Travel Time (s)		24.0			26.1			47.0			25.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	39%	1%	0%	19%	0%	0%	0%	0%	31%	0%	21%
Adj. Flow (vph)	0	436	99	66	274	0	0	0	0	433	0	213
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	436	99	66	274	0	0	0	0	433	0	213
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1	1	2					1		1
Detector Template		Thru	Right	Left	Thru					Left		Right
Leading Detector (ft)		100	20	20	100					20		20
Trailing Detector (ft)		0	0	0	0					0		0
Detector 1 Position(ft)		0	0	0	0					0		0
Detector 1 Size(ft)		6	20	20	6					20		20
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 2 Position(ft)		94			94							
Detector 2 Size(ft)		6			6							
Detector 2 Type		Cl+Ex			Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0							
Turn Type		NA	Perm	pm+pt	NA					Prot		Perm
Protected Phases		4		3	8					1		

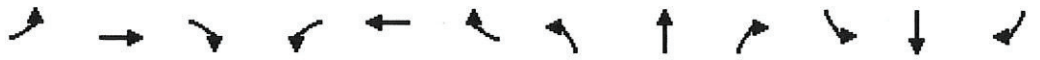
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			4	8						1		6
Detector Phase		4	4	3	8					1		6
Switch Phase												
Minimum Initial (s)		5.0	5.0	5.0	5.0					5.0		5.0
Minimum Split (s)		22.5	22.5	9.5	22.5					9.5		22.5
Total Split (s)		25.0	25.0	9.5	34.5					25.5		25.5
Total Split (%)		41.7%	41.7%	15.8%	57.5%					42.5%		42.5%
Maximum Green (s)		20.5	20.5	5.0	30.0					21.0		21.0
Yellow Time (s)		3.5	3.5	3.5	3.5					3.5		3.5
All-Red Time (s)		1.0	1.0	1.0	1.0					1.0		1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0					0.0		0.0
Total Lost Time (s)		4.5	4.5	4.5	4.5					4.5		4.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		3.0
Recall Mode		None	None	None	None					None		C-Max
Walk Time (s)		7.0	7.0		7.0							7.0
Flash Dont Walk (s)		11.0	11.0		11.0							11.0
Pedestrian Calls (#/hr)		0	0		0							0
Act Effct Green (s)		21.0	21.0	26.7	26.7					24.3		24.3
Actuated g/C Ratio		0.35	0.35	0.44	0.44					0.40		0.40
v/c Ratio		0.91	0.16	0.20	0.39					0.78		0.32
Control Delay		47.0	3.8	3.4	4.6					30.7		4.0
Queue Delay		0.0	0.0	0.0	0.0					0.0		0.0
Total Delay		47.0	3.8	3.4	4.6					30.7		4.0
LOS		D	A	A	A					C		A
Approach Delay		39.0			4.4						21.9	
Approach LOS		D			A						C	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 42 (70%), Referenced to phase 2: and 6:SBR, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 24.0 Intersection LOS: C
Intersection Capacity Utilization 58.6% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1: SR99SB ON Ramp/SR99SB Off Ramp & Mountain View Ave



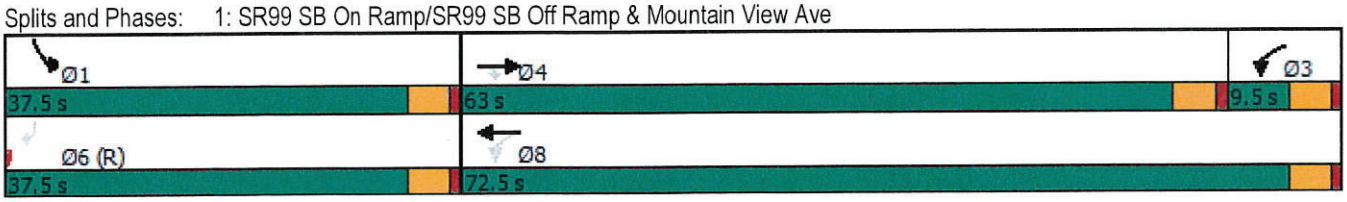


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	680	94	85	363	0	0	0	0	380	0	263
Future Volume (vph)	0	680	94	85	363	0	0	0	0	380	0	263
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		400	300		0	0		0	0		500
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	1367	1599	1805	1597	0	0	0	0	1378	0	1335
Flt Permitted				0.193						0.950		
Satd. Flow (perm)	0	1367	1599	367	1597	0	0	0	0	1378	0	1335
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			102									286
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1057			1148			2070			1130	
Travel Time (s)		24.0			26.1			47.0			25.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	39%	1%	0%	19%	0%	0%	0%	0%	31%	0%	21%
Adj. Flow (vph)	0	739	102	92	395	0	0	0	0	413	0	286
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	739	102	92	395	0	0	0	0	413	0	286
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1	1	2					1		1
Detector Template		Thru	Right	Left	Thru					Left		Right
Leading Detector (ft)		100	20	20	100					20		20
Trailing Detector (ft)		0	0	0	0					0		0
Detector 1 Position(ft)		0	0	0	0					0		0
Detector 1 Size(ft)		6	20	20	6					20		20
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 2 Position(ft)		94			94							
Detector 2 Size(ft)		6			6							
Detector 2 Type		Cl+Ex			Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0							
Turn Type		NA	Perm	pm+pt	NA					Prot		Perm
Protected Phases		4		3	8					1		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			4	8						1		6
Detector Phase		4	4	3	8					1		6
Switch Phase												
Minimum Initial (s)		5.0	5.0	5.0	5.0					5.0		5.0
Minimum Split (s)		22.5	22.5	9.5	22.5					9.5		22.5
Total Split (s)		63.0	63.0	9.5	72.5					37.5		37.5
Total Split (%)		57.3%	57.3%	8.6%	65.9%					34.1%		34.1%
Maximum Green (s)		58.5	58.5	5.0	68.0					33.0		33.0
Yellow Time (s)		3.5	3.5	3.5	3.5					3.5		3.5
All-Red Time (s)		1.0	1.0	1.0	1.0					1.0		1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0					0.0		0.0
Total Lost Time (s)		4.5	4.5	4.5	4.5					4.5		4.5
Lead/Lag		Lead	Lead	Lag								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		3.0
Recall Mode		None	None	None	None					None		C-Max
Walk Time (s)		7.0	7.0		7.0							7.0
Flash Dont Walk (s)		11.0	11.0		11.0							11.0
Pedestrian Calls (#/hr)		0	0		0							0
Act Effct Green (s)		58.5	58.5	67.1	66.1					34.9		34.9
Actuated g/C Ratio		0.53	0.53	0.61	0.60					0.32		0.32
v/c Ratio		1.02	0.11	0.32	0.41					0.95		0.46
Control Delay		64.9	2.8	3.4	1.8					70.0		6.1
Queue Delay		0.0	0.0	0.0	0.0					0.0		0.0
Total Delay		64.9	2.8	3.4	1.8					70.0		6.1
LOS		E	A	A	A					E		A
Approach Delay		57.3			2.1						43.9	
Approach LOS		E			A						D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 94 (85%), Referenced to phase 2: and 6:SBR, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.02			
Intersection Signal Delay: 39.4		Intersection LOS: D	
Intersection Capacity Utilization 72.8%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: SR99 SB On Ramp/SR99 SB Off Ramp & Mountain View Ave

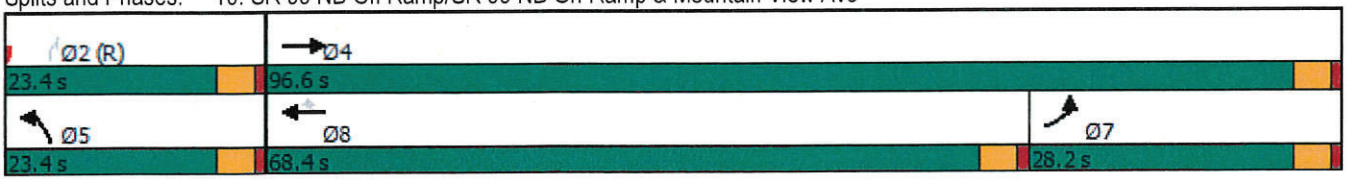


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	141	922	0	0	271	703	125	0	99	0	0	0
Future Volume (vph)	141	922	0	0	271	703	125	0	99	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		0	0		350	0		250	0		0
Storage Lanes	1		0	0		1	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1367	1681	0	0	1667	1509	1626	0	1233	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	1367	1681	0	0	1667	1509	1626	0	1233	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						706			108			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1148			1005			1107			1543	
Travel Time (s)		26.1			22.8			25.2			35.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	32%	13%	0%	0%	14%	7%	11%	0%	31%	0%	0%	0%
Adj. Flow (vph)	153	1002	0	0	295	764	136	0	108	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	153	1002	0	0	295	764	136	0	108	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2	1	1		1			
Detector Template	Left	Thru			Thru	Right	Left		Right			
Leading Detector (ft)	20	100			100	20	20		20			
Trailing Detector (ft)	0	0			0	0	0		0			
Detector 1 Position(ft)	0	0			0	0	0		0			
Detector 1 Size(ft)	20	6			6	20	20		20			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 2 Position(ft)		94			94							
Detector 2 Size(ft)		6			6							
Detector 2 Type		Cl+Ex			Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0							
Turn Type	Prot	NA			NA	Perm	Prot		Perm			
Protected Phases	7	4			8		5					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases						8			2			
Detector Phase	7	4			8	8	5		2			
Switch Phase												
Minimum Initial (s)	5.0	5.0			5.0	5.0	5.0		5.0			
Minimum Split (s)	9.5	22.5			22.5	22.5	9.5		22.5			
Total Split (s)	28.2	96.6			68.4	68.4	23.4		23.4			
Total Split (%)	23.5%	80.5%			57.0%	57.0%	19.5%		19.5%			
Maximum Green (s)	23.7	92.1			63.9	63.9	18.9		18.9			
Yellow Time (s)	3.5	3.5			3.5	3.5	3.5		3.5			
All-Red Time (s)	1.0	1.0			1.0	1.0	1.0		1.0			
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Total Lost Time (s)	4.5	4.5			4.5	4.5	4.5		4.5			
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0			
Recall Mode	None	None			None	None	None		C-Max			
Walk Time (s)		7.0			7.0	7.0			7.0			
Flash Dont Walk (s)		11.0			11.0	11.0			11.0			
Pedestrian Calls (#/hr)		0			0	0			0			
Act Effct Green (s)	52.4	90.6			33.7	33.7	20.4		20.4			
Actuated g/C Ratio	0.44	0.76			0.28	0.28	0.17		0.17			
v/c Ratio	0.26	0.79			0.63	0.82	0.49		0.36			
Control Delay	19.7	6.4			43.1	17.9	52.9		11.9			
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0			
Total Delay	19.7	6.4			43.1	17.9	52.9		11.9			
LOS	B	A			D	B	D		B			
Approach Delay		8.1			25.0			34.7				
Approach LOS		A			C			C				

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBR and 6:, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 18.0		Intersection LOS: B	
Intersection Capacity Utilization 72.8%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 10: SR 99 NB Off Ramp/SR 99 NB On Ramp & Mountain View Ave

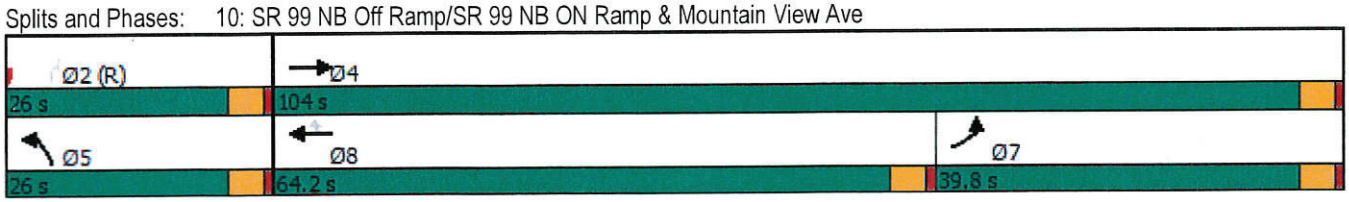


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	276	1106	0	0	428	652	196	0	127	0	0	0
Future Volume (vph)	276	1106	0	0	428	652	196	0	127	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		0	0		350	0		250	0		0
Storage Lanes	1		0	0		1	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1367	1681	0	0	1667	1509	1626	0	1233	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	1367	1681	0	0	1667	1509	1626	0	1233	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						574			138			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1148			1005			1107			1543	
Travel Time (s)		26.1			22.8			25.2			35.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	32%	13%	0%	0%	14%	7%	11%	0%	31%	0%	0%	0%
Adj. Flow (vph)	300	1202	0	0	465	709	213	0	138	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	300	1202	0	0	465	709	213	0	138	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2	1	1		1			
Detector Template	Left	Thru			Thru	Right	Left		Right			
Leading Detector (ft)	20	100			100	20	20		20			
Trailing Detector (ft)	0	0			0	0	0		0			
Detector 1 Position(ft)	0	0			0	0	0		0			
Detector 1 Size(ft)	20	6			6	20	20		20			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 2 Position(ft)		94			94							
Detector 2 Size(ft)		6			6							
Detector 2 Type		Cl+Ex			Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0							
Turn Type	Prot	NA			NA	Perm	Prot		Perm			
Protected Phases	7	4			8		5					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases						8			2			
Detector Phase	7	4			8	8	5		2			
Switch Phase												
Minimum Initial (s)	5.0	5.0			5.0	5.0	5.0		5.0			
Minimum Split (s)	9.5	22.5			22.5	22.5	9.5		22.5			
Total Split (s)	39.8	104.0			64.2	64.2	26.0		26.0			
Total Split (%)	30.6%	80.0%			49.4%	49.4%	20.0%		20.0%			
Maximum Green (s)	35.3	99.5			59.7	59.7	21.5		21.5			
Yellow Time (s)	3.5	3.5			3.5	3.5	3.5		3.5			
All-Red Time (s)	1.0	1.0			1.0	1.0	1.0		1.0			
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Total Lost Time (s)	4.5	4.5			4.5	4.5	4.5		4.5			
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0			
Recall Mode	None	None			None	None	None		C-Max			
Walk Time (s)		7.0			7.0	7.0			7.0			
Flash Dont Walk (s)		11.0			11.0	11.0			11.0			
Pedestrian Calls (#/hr)		0			0	0			0			
Act Effct Green (s)	47.7	99.5			47.3	47.3	21.5		21.5			
Actuated g/C Ratio	0.37	0.77			0.36	0.36	0.17		0.17			
v/c Ratio	0.60	0.93			0.77	0.78	0.79		0.43			
Control Delay	30.0	8.8			42.1	14.2	73.9		12.0			
Queue Delay	0.0	3.2			0.0	0.0	0.0		0.0			
Total Delay	30.0	12.0			42.1	14.2	73.9		12.0			
LOS	C	B			D	B	E		B			
Approach Delay		15.6			25.3			49.5				
Approach LOS		B			C			D				

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 0 (0%), Referenced to phase 2:NBR and 6:, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.93			
Intersection Signal Delay: 23.3		Intersection LOS: C	
Intersection Capacity Utilization 91.9%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 10: SR 99 NB Off Ramp/SR 99 NB ON Ramp & Mountain View Ave



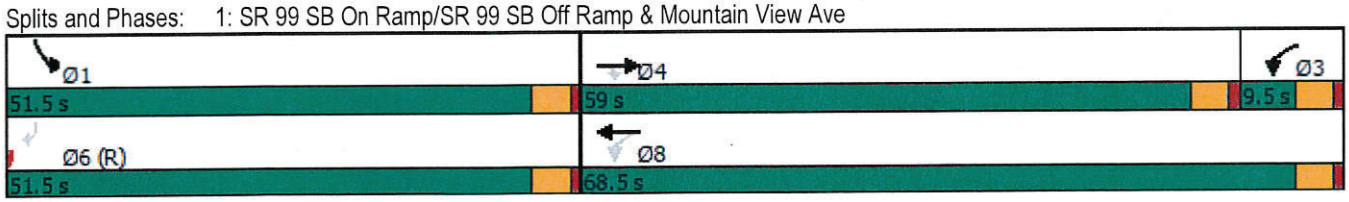
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↱	↰	↑					↰		↱
Traffic Volume (vph)	0	578	121	77	319	0	0	0	0	485	0	366
Future Volume (vph)	0	578	121	77	319	0	0	0	0	485	0	366
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		400	300		0	0		0	0		500
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	1367	1599	1805	1597	0	0	0	0	1378	0	1335
Flt Permitted				0.205						0.950		
Satd. Flow (perm)	0	1367	1599	390	1597	0	0	0	0	1378	0	1335
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			132									398
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1057			1148			2070			1130	
Travel Time (s)		24.0			26.1			47.0			25.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	39%	1%	0%	19%	0%	0%	0%	0%	31%	0%	21%
Adj. Flow (vph)	0	628	132	84	347	0	0	0	0	527	0	398
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	628	132	84	347	0	0	0	0	527	0	398
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1	1	2					1		1
Detector Template		Thru	Right	Left	Thru					Left		Right
Leading Detector (ft)		100	20	20	100					20		20
Trailing Detector (ft)		0	0	0	0					0		0
Detector 1 Position(ft)		0	0	0	0					0		0
Detector 1 Size(ft)		6	20	20	6					20		20
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 2 Position(ft)		94			94							
Detector 2 Size(ft)		6			6							
Detector 2 Type		Cl+Ex			Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0							
Turn Type		NA	Perm	pm+pt	NA					Prot		Perm
Protected Phases		4		3	8					1		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			4	8						1		6
Detector Phase		4	4	3	8					1		6
Switch Phase												
Minimum Initial (s)		5.0	5.0	5.0	5.0					5.0		5.0
Minimum Split (s)		22.5	22.5	9.5	22.5					9.5		22.5
Total Split (s)		59.0	59.0	9.5	68.5					51.5		51.5
Total Split (%)		49.2%	49.2%	7.9%	57.1%					42.9%		42.9%
Maximum Green (s)		54.5	54.5	5.0	64.0					47.0		47.0
Yellow Time (s)		3.5	3.5	3.5	3.5					3.5		3.5
All-Red Time (s)		1.0	1.0	1.0	1.0					1.0		1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0					0.0		0.0
Total Lost Time (s)		4.5	4.5	4.5	4.5					4.5		4.5
Lead/Lag		Lead	Lead	Lag								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		3.0
Recall Mode		None	None	None	None					None		C-Max
Walk Time (s)		7.0	7.0		7.0							7.0
Flash Dont Walk (s)		11.0	11.0		11.0							11.0
Pedestrian Calls (#/hr)		0	0		0							0
Act Effct Green (s)		54.5	54.5	63.1	62.1					48.9		48.9
Actuated g/C Ratio		0.45	0.45	0.53	0.52					0.41		0.41
v/c Ratio		1.01	0.17	0.32	0.42					0.94		0.51
Control Delay		72.7	3.7	6.9	4.8					61.4		4.9
Queue Delay		0.0	0.0	0.0	0.0					0.0		0.0
Total Delay		72.7	3.7	6.9	4.8					61.4		4.9
LOS		E	A	A	A					E		A
Approach Delay		60.7			5.2						37.1	
Approach LOS		E			A						D	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 104 (87%), Referenced to phase 2: and 6:SBR, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.01
Intersection Signal Delay: 39.1 Intersection LOS: D
Intersection Capacity Utilization 72.8% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: SR 99 SB On Ramp/SR 99 SB Off Ramp & Mountain View Ave



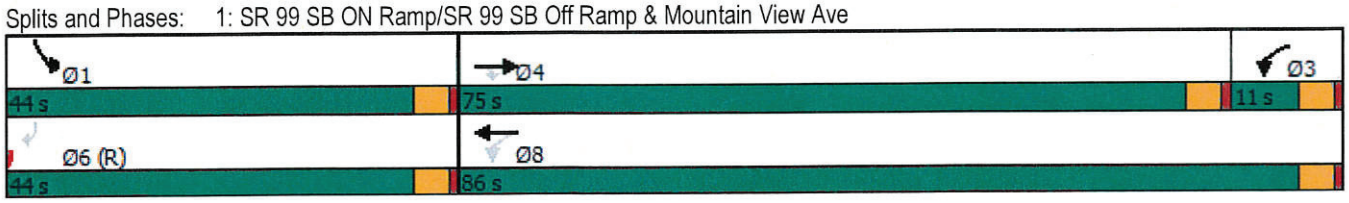
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	878	123	118	506	0	0	0	0	504	0	438
Future Volume (vph)	0	878	123	118	506	0	0	0	0	504	0	438
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		400	300		0	0		0	0		500
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	1367	1599	1805	1597	0	0	0	0	1378	0	1335
Flt Permitted				0.053						0.950		
Satd. Flow (perm)	0	1367	1599	101	1597	0	0	0	0	1378	0	1335
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			134									351
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1123			1148			2070			1130	
Travel Time (s)		25.5			26.1			47.0			25.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	39%	1%	0%	19%	0%	0%	0%	0%	31%	0%	21%
Adj. Flow (vph)	0	954	134	128	550	0	0	0	0	548	0	476
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	954	134	128	550	0	0	0	0	548	0	476
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1	1	2					1		1
Detector Template		Thru	Right	Left	Thru					Left		Right
Leading Detector (ft)		100	20	20	100					20		20
Trailing Detector (ft)		0	0	0	0					0		0
Detector 1 Position(ft)		0	0	0	0					0		0
Detector 1 Size(ft)		6	20	20	6					20		20
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 2 Position(ft)		94			94							
Detector 2 Size(ft)		6			6							
Detector 2 Type		Cl+Ex			Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0							
Turn Type		NA	Perm	pm+pt	NA					Prot		Perm
Protected Phases		4		3	8					1		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			4	8						1		6
Detector Phase		4	4	3	8					1		6
Switch Phase												
Minimum Initial (s)		5.0	5.0	5.0	5.0					5.0		5.0
Minimum Split (s)		22.5	22.5	9.5	22.5					9.5		22.5
Total Split (s)		75.0	75.0	11.0	86.0					44.0		44.0
Total Split (%)		57.7%	57.7%	8.5%	66.2%					33.8%		33.8%
Maximum Green (s)		70.5	70.5	6.5	81.5					39.5		39.5
Yellow Time (s)		3.5	3.5	3.5	3.5					3.5		3.5
All-Red Time (s)		1.0	1.0	1.0	1.0					1.0		1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0					0.0		0.0
Total Lost Time (s)		4.5	4.5	4.5	4.5					4.5		4.5
Lead/Lag		Lead	Lead	Lag								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		3.0
Recall Mode		None	None	None	None					None		C-Max
Walk Time (s)		7.0	7.0		7.0							7.0
Flash Dont Walk (s)		11.0	11.0		11.0							11.0
Pedestrian Calls (#/hr)		0	0		0							0
Act Effct Green (s)		70.5	70.5	81.5	81.5					39.5		39.5
Actuated g/C Ratio		0.54	0.54	0.63	0.63					0.30		0.30
v/c Ratio		1.29	0.14	0.86	0.55					1.31		0.73
Control Delay		167.8	2.7	65.3	2.2					193.4		18.0
Queue Delay		0.3	0.0	0.0	0.0					0.0		0.0
Total Delay		168.1	2.7	65.3	2.2					193.4		18.0
LOS		F	A	E	A					F		B
Approach Delay		147.8			14.1						111.8	
Approach LOS		F			B						F	

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 115 (88%), Referenced to phase 2: and 6:SBR, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.31
Intersection Signal Delay: 102.1 Intersection LOS: F
Intersection Capacity Utilization 91.9% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 1: SR 99 SB ON Ramp/SR 99 SB Off Ramp & Mountain View Ave



Mountain View Avenue Intersections

Alternative 3

Realign On-Ramps with Roundabout

2025 Level of Service Reports

2035 Level of Service Reports

2045 Level of Service Reports

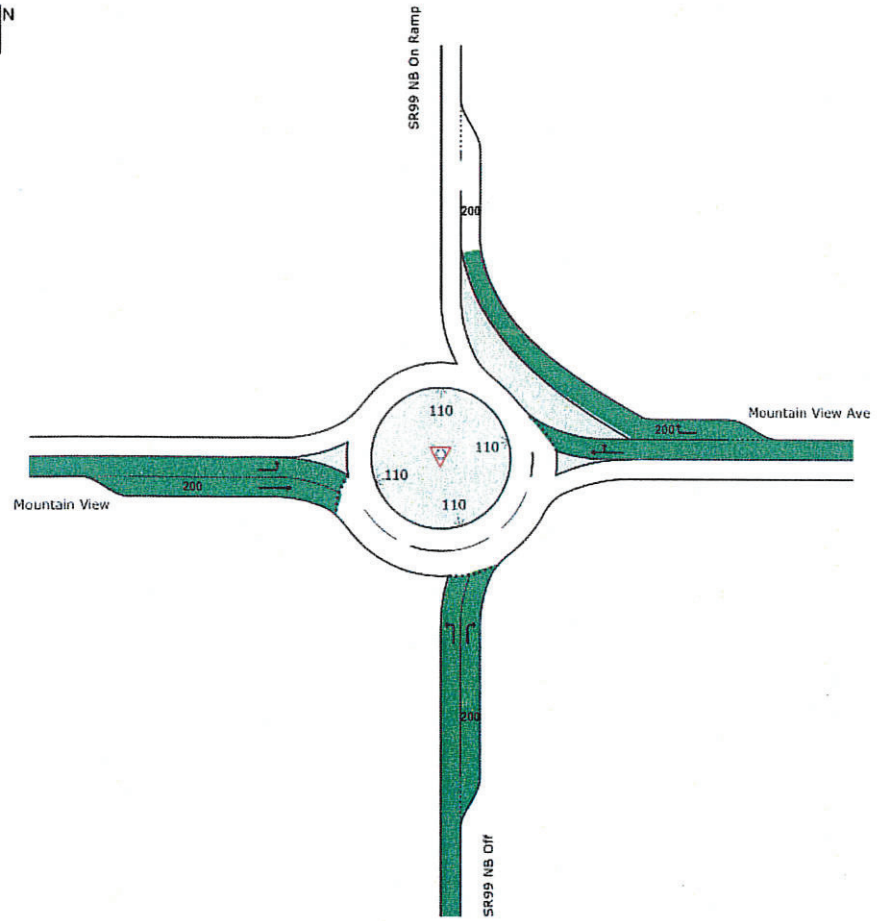
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [SR99 NB - AM - Construction Year]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	South	East	West	
LOS	A	A	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [SR99 NB - AM - Construction Year]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: SR99 NB Off													
Lane 1	50	18.0	573	0.087	100	7.3	LOS A	0.3	7.5	Full	1600	0.0	0.0
Lane 2[d]	52	25.0	600	0.087	100	7.0	LOS A	0.2	7.3	Short	200	0.0	NA
Approach	102	21.6		0.087		7.2	LOS A	0.3	7.5				
East: Mountain View Ave													
Lane 1[d]	405	6.0	1176	0.344	100	6.4	LOS A	1.6	42.3	Full	1100	0.0	0.0
Lane 2	304	6.0	1580	0.192	56[6]	0.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	709	6.0		0.344		3.7	LOS A	1.6	42.3				
West: Mountain View													
Lane 1	86	10.0	1291	0.067	100	3.3	LOS A	0.0	0.0	Full	1100	0.0	0.0
Lane 2[d]	620	6.0	1340	0.462	100	7.3	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	705	6.5		0.462		6.8	LOS A	0.0	0.0				
Intersection	1516	7.3		0.462		5.4	LOS A	1.6	42.3				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach

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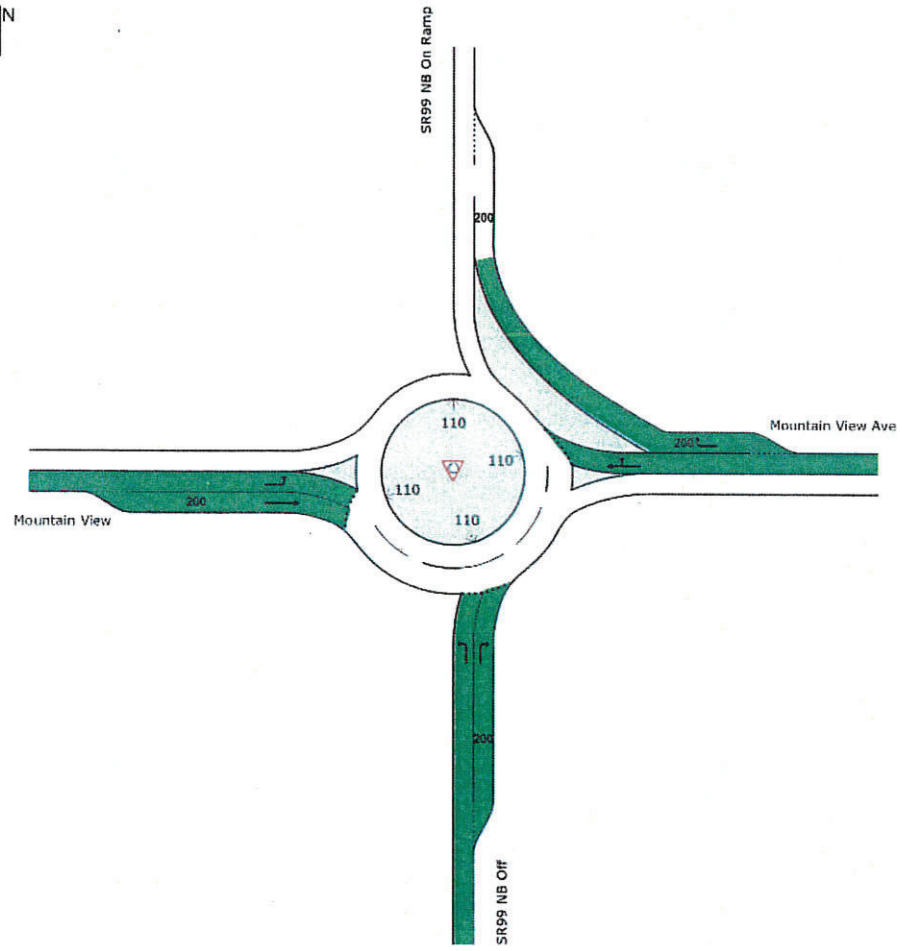
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [SR99 NB - PM - Construction Year]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	South	East	West	
LOS	A	A	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [SR99 NB - PM - Construction Year]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: SR99 NB Off													
Lane 1	57	18.0	452	0.125	100	9.7	LOS A	0.4	10.5	Full	1600	0.0	0.0
Lane 2[d]	58	25.0	482	0.119	100	9.1	LOS A	0.3	9.8	Short	200	0.0	NA
Approach	114	21.5		0.125		9.4	LOS A	0.4	10.5				
East: Mountain View Ave													
Lane 1[d]	358	6.0	1073	0.333	100	6.7	LOS A	1.5	38.8	Full	1100	0.0	0.0
Lane 2	295	6.0	1580	0.186	56[6]	0.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	652	6.0		0.333		3.7	LOS A	1.5	38.8				
West: Mountain View													
Lane 1	177	10.0	1291	0.137	100	3.9	LOS A	0.0	0.0	Full	1100	0.0	0.0
Lane 2[d]	767	6.0	1340	0.573	100	9.1	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	945	6.8		0.573		8.1	LOS A	0.0	0.0				
Intersection	1711	7.5		0.573		6.5	LOS A	1.5	38.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach

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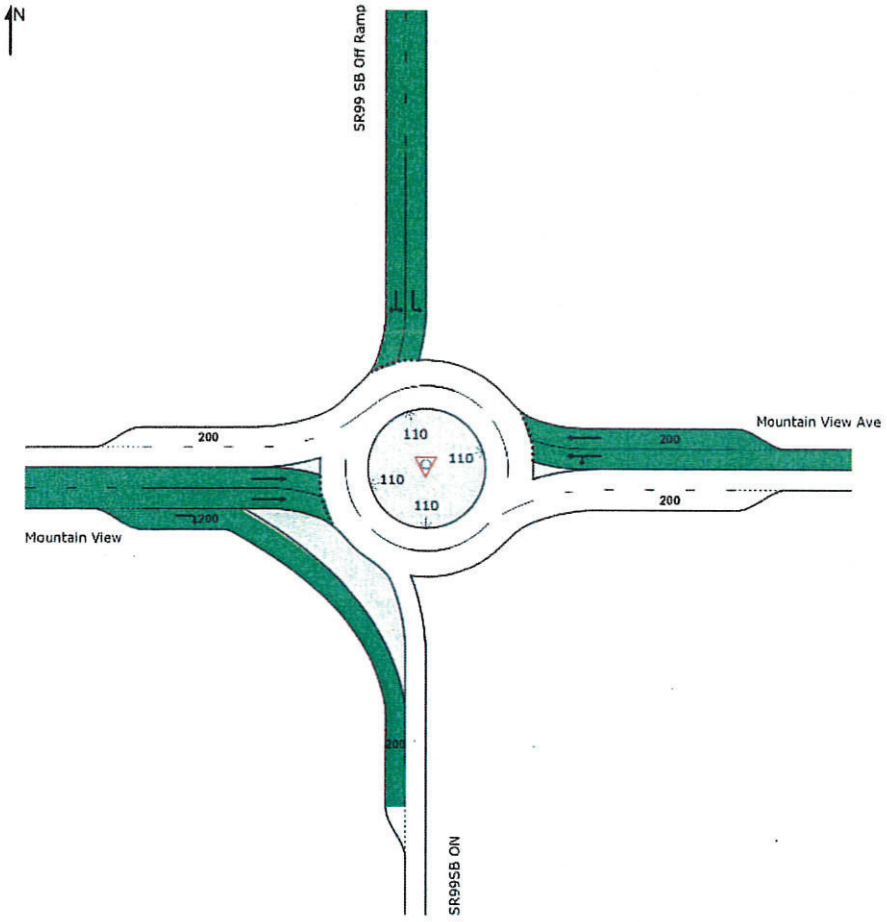
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [SR99 SB - AM - Construction Year]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	East	North	West	
LOS	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [SR99 SB - AM - Construction Year]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
East: Mountain View Ave													
Lane 1[d]	149	5.1	1351	0.110	100	3.5	LOS A	0.0	0.0	Full	1100	0.0	0.0
Lane 2	121	8.0	1250	0.097	88[6]	3.7	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	270	6.4		0.110		3.6	LOS A	0.0	0.0				
North: SR99 SB Off Ramp													
Lane 1	228	11.0	934	0.245	100	6.3	LOS A	1.0	26.0	Full	1600	0.0	0.0
Lane 2[d]	240	13.4	981	0.245	100	6.1	LOS A	0.9	25.3	Full	1600	0.0	0.0
Approach	468	12.2		0.245		6.2	LOS A	1.0	26.0				
West: Mountain View													
Lane 1[d]	194	6.5	912	0.213	100	6.1	LOS A	0.8	21.1	Full	1100	0.0	0.0
Lane 2	157	6.5	841	0.187	88[6]	6.2	LOS A	0.7	18.5	Full	1100	0.0	0.0
Lane 3	74	9.0	1536	0.048	100	0.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	425	6.9		0.213		5.1	LOS A	0.8	21.1				
Intersection	1163	8.9		0.245		5.2	LOS A	1.0	26.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach

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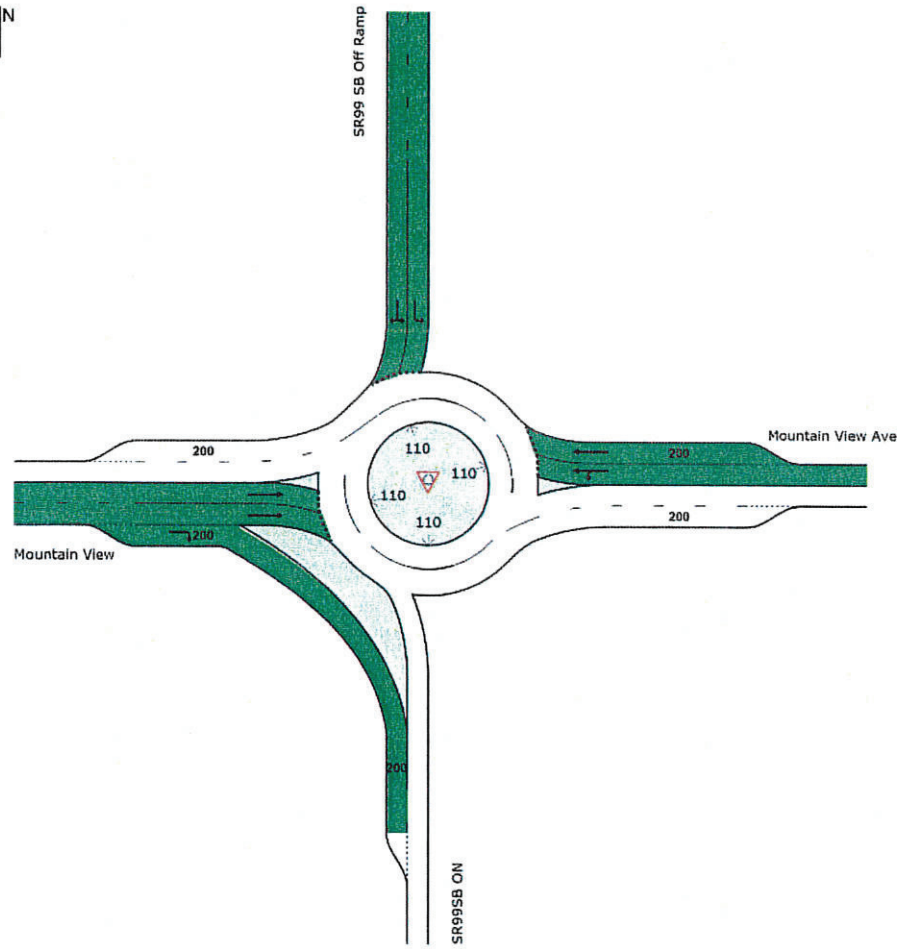
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [SR99 SB - PM - Construction Year]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	East	North	West	
LOS	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [SR99 SB - PM - Construction Year]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
East: Mountain View Ave													
Lane 1[d]	190	5.4	1348	0.141	100	3.8	LOS A	0.0	0.0	Full	1100	0.0	0.0
Lane 2	155	8.0	1250	0.124	88[6]	3.9	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	345	6.6		0.141		3.9	LOS A	0.0	0.0				
North: SR99 SB Off Ramp													
Lane 1	263	11.0	868	0.303	100	7.5	LOS A	1.2	32.9	Full	1600	0.0	0.0
Lane 2[d]	276	14.1	911	0.303	100	7.2	LOS A	1.2	32.0	Full	1600	0.0	0.0
Approach	539	12.6		0.303		7.3	LOS A	1.2	32.9				
West: Mountain View													
Lane 1[d]	319	6.5	893	0.357	100	8.0	LOS A	1.5	39.3	Full	1100	0.0	0.0
Lane 2	257	6.5	822	0.313	88[6]	7.9	LOS A	1.3	33.7	Full	1100	0.0	0.0
Lane 3	78	9.0	1536	0.051	100	0.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	654	6.8		0.357		7.0	LOS A	1.5	39.3				
Intersection	1538	8.8		0.357		6.4	LOS A	1.5	39.3				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach

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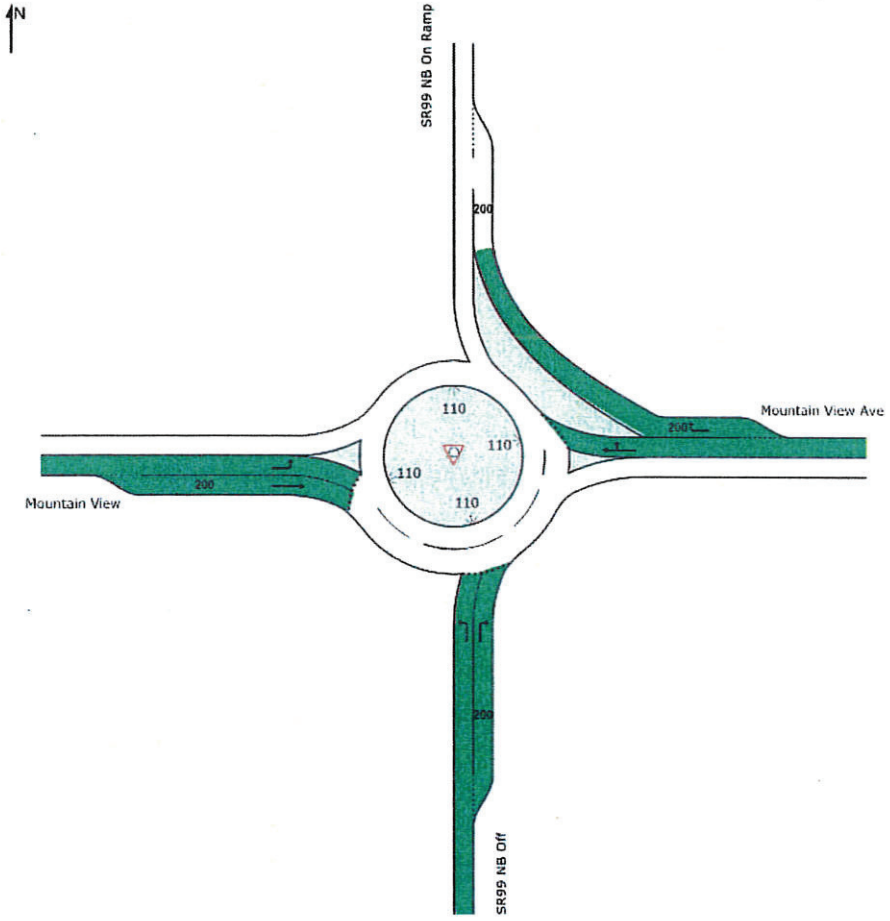
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [SR99 NB - 2035 AM]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	South	East	West	
LOS	A	A	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [SR99 NB - 2035 AM]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: SR99 NB Off													
Lane 1[d]	82	11.0	588	0.139	100	7.8	LOS A	0.4	11.9	Full	1600	0.0	0.0
Lane 2	75	17.4	496	0.151	100	9.3	LOS A	0.5	13.0	Short	200	0.0	NA
Approach	157	14.1		0.151		8.5	LOS A	0.5	13.0				
East: Mountain View Ave													
Lane 1[d]	485	5.0	1128	0.430	100	7.7	LOS A	2.2	57.3	Full	1100	0.0	0.0
Lane 2	384	4.8	1598	0.241	56[6]	0.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	870	4.9		0.430		4.3	LOS A	2.2	57.3				
West: Mountain View													
Lane 1	115	7.5	1322	0.087	100	3.4	LOS A	0.0	0.0	Full	1100	0.0	0.0
Lane 2[d]	753	4.9	1353	0.557	100	8.7	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	868	5.3		0.557		8.0	LOS A	0.0	0.0				
Intersection	1895	5.8		0.557		6.4	LOS A	2.2	57.3				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach

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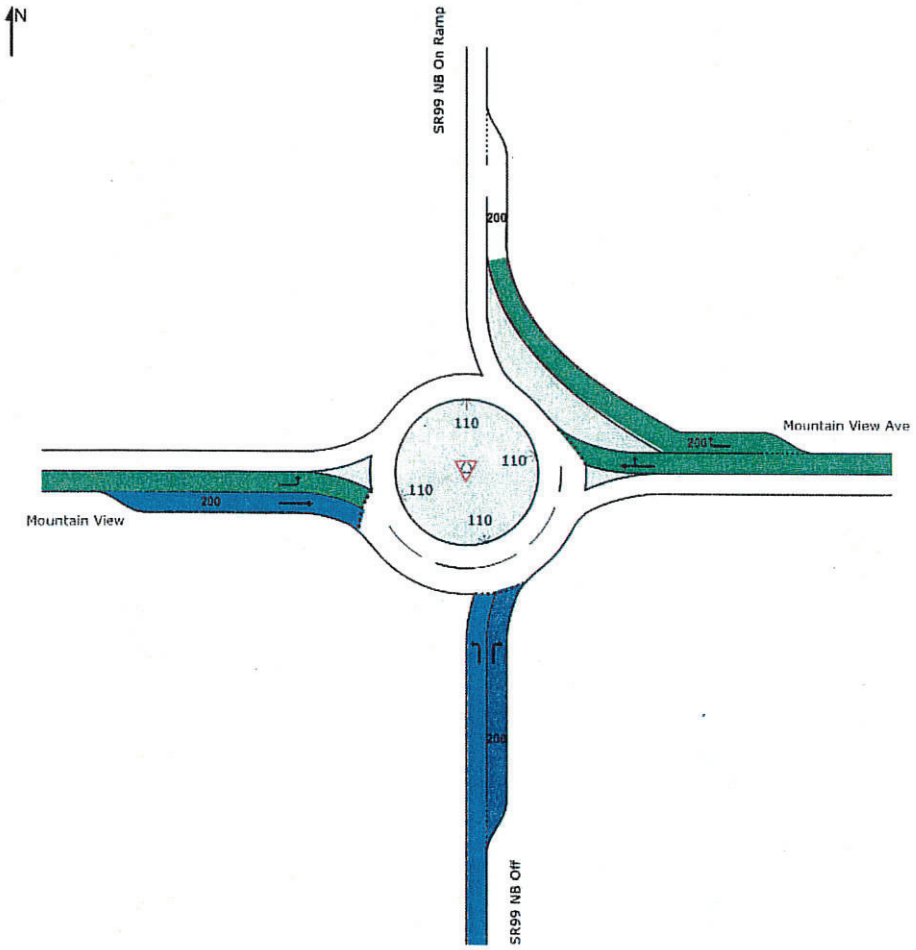
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [SR99 NB - 2035 PM]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	South	East	West	
LOS	B	A	B	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [SR99 NB - 2035 PM]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: SR99 NB Off													
Lane 1[d]	110	18.0	423	0.260	100	12.8	LOS B	0.8	22.3	Full	1600	0.0	0.0
Lane 2	89	25.0	348	0.256	100	15.1	LOS C	0.7	21.7	Short	200	0.0	NA
Approach	199	21.1		0.260		13.8	LOS B	0.8	22.3				
East: Mountain View Ave													
Lane 1[d]	463	6.0	967	0.478	100	9.5	LOS A	2.8	73.4	Full	1100	0.0	0.0
Lane 2	422	6.0	1580	0.267	56[6]	0.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	885	6.0		0.478		5.0	LOS A	2.8	73.4				
West: Mountain View													
Lane 1	230	10.0	1291	0.179	100	4.3	LOS A	0.0	0.0	Full	1100	0.0	0.0
Lane 2[d]	922	6.0	1340	0.688	100	11.8	LOS B	0.0	0.0	Short	200	0.0	NA
Approach	1152	6.8		0.688		10.3	LOS B	0.0	0.0				
Intersection	2236	7.8		0.688		8.5	LOS A	2.8	73.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach

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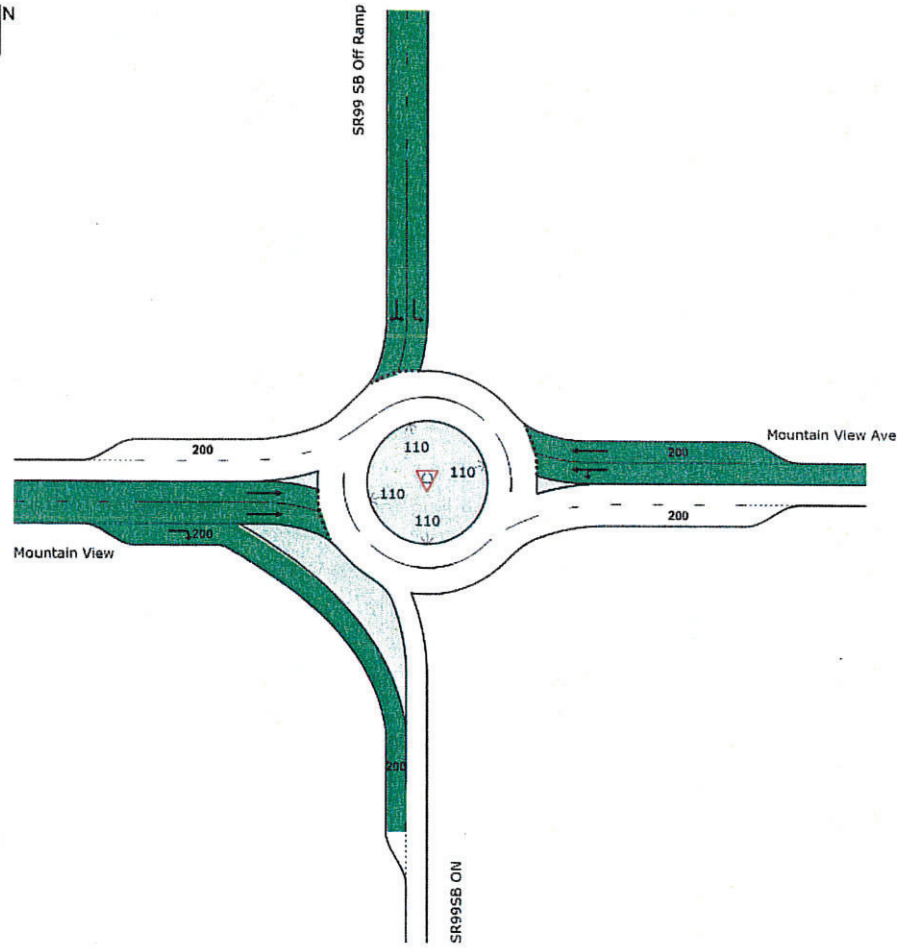
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [SR99 SB - 2035 AM]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	East	North	West	
LOS	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [SR99 SB - 2035 AM]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
East: Mountain View Ave													
Lane 1[d]	188	5.2	1351	0.139	100	3.8	LOS A	0.0	0.0	Full	1100	0.0	0.0
Lane 2	153	8.0	1250	0.122	88[6]	3.9	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	340	6.4		0.139		3.8	LOS A	0.0	0.0				
North: SR99 SB Off Ramp													
Lane 1	315	11.0	872	0.362	100	8.3	LOS A	1.5	41.3	Full	1600	0.0	0.0
Lane 2[d]	330	14.2	913	0.362	100	8.0	LOS A	1.4	40.1	Full	1600	0.0	0.0
Approach	646	12.6		0.362		8.1	LOS A	1.5	41.3				
West: Mountain View													
Lane 1[d]	242	6.5	838	0.288	100	7.5	LOS A	1.1	29.5	Full	1100	0.0	0.0
Lane 2	194	6.5	767	0.253	88[6]	7.5	LOS A	1.0	25.6	Full	1100	0.0	0.0
Lane 3	99	9.0	1536	0.064	100	0.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	535	7.0		0.288		6.1	LOS A	1.1	29.5				
Intersection	1521	9.3		0.362		6.5	LOS A	1.5	41.3				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach

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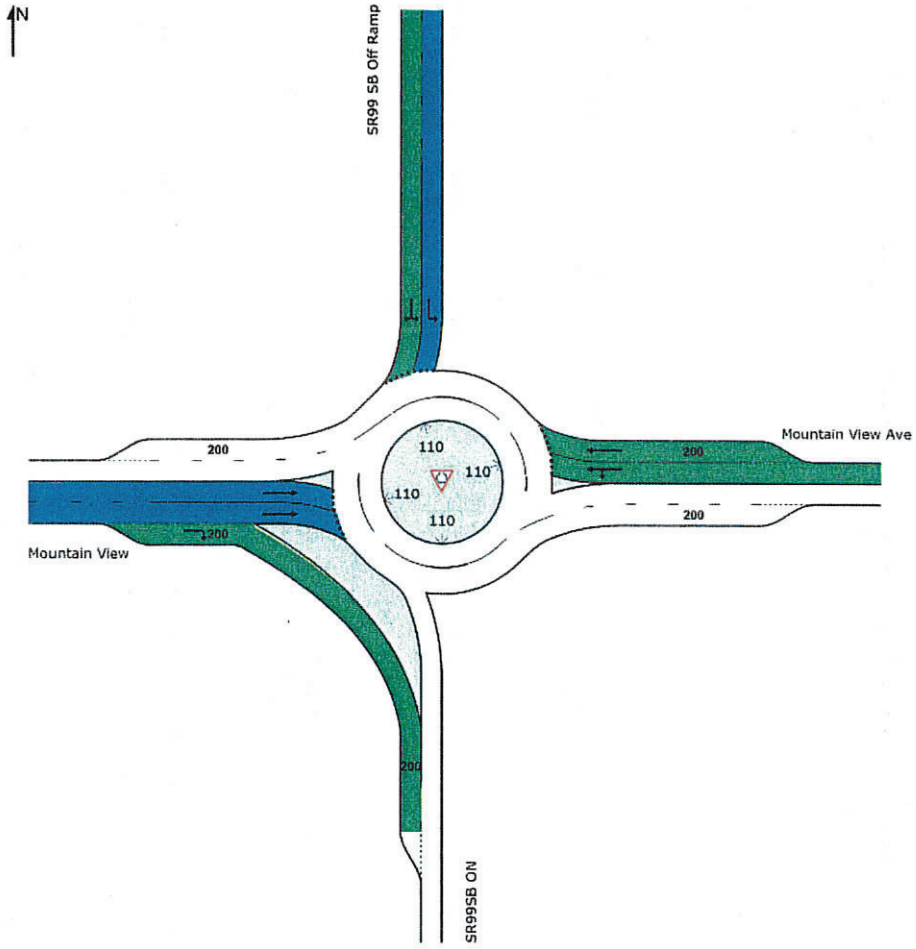
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [SR99 SB - 2035 PM]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	East	North	West	
LOS	A	B	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [SR99 SB - 2035 PM]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
East: Mountain View Ave													
Lane 1[d]	268	3.6	1371	0.195	100	4.2	LOS A	0.0	0.0	Full	1100	0.0	0.0
Lane 2	219	5.6	1279	0.172	88[6]	4.3	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	487	4.5		0.195		4.2	LOS A	0.0	0.0				
North: SR99 SB Off Ramp													
Lane 1	335	11.5	758	0.442	100	10.7	LOS B	2.3	62.1	Full	1600	0.0	0.0
Lane 2[d]	364	11.8	824	0.442	100	10.0	LOS A	2.2	61.2	Full	1600	0.0	0.0
Approach	699	11.7		0.442		10.3	LOS B	2.3	62.1				
West: Mountain View													
Lane 1[d]	410	3.8	855	0.480	100	10.4	LOS B	2.9	75.5	Full	1100	0.0	0.0
Lane 2	329	3.8	782	0.421	88[6]	10.0	LOS B	2.2	57.2	Full	1100	0.0	0.0
Lane 3	102	8.7	1540	0.066	100	0.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	841	4.4		0.480		9.0	LOS A	2.9	75.5				
Intersection	2027	6.9		0.480		8.3	LOS A	2.9	75.5				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach

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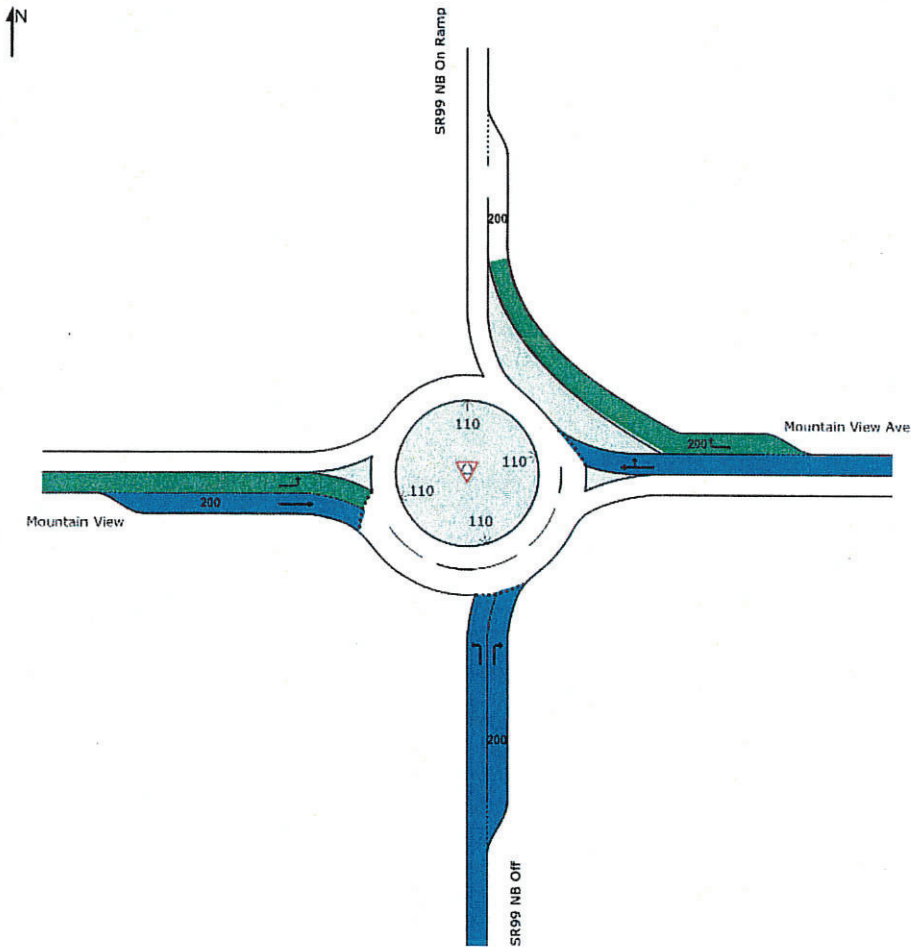
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [SR99 NB - 2045 AM]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	South	East	West	
LOS	B	A	B	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [SR99 NB - 2045 AM]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: SR99 NB Off													
Lane 1[d]	136	6.6	480	0.283	100	11.9	LOS B	1.0	25.9	Full	1600	0.0	0.0
Lane 2	108	12.1	399	0.270	100	13.7	LOS B	0.9	24.0	Short	200	0.0	NA
Approach	243	9.1		0.283		12.7	LOS B	1.0	25.9				
East: Mountain View Ave													
Lane 1[d]	570	4.2	1051	0.542	100	10.1	LOS B	4.0	102.7	Full	1100	0.0	0.0
Lane 2	489	3.8	1613	0.303	56[6]	0.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	1059	4.0		0.542		5.5	LOS A	4.0	102.7				
West: Mountain View													
Lane 1	153	5.6	1345	0.114	100	3.6	LOS A	0.0	0.0	Full	1100	0.0	0.0
Lane 2[d]	1002	3.7	1369	0.732	100	13.1	LOS B	0.0	0.0	Short	200	0.0	NA
Approach	1155	4.0		0.732		11.8	LOS B	0.0	0.0				
Intersection	2458	4.5		0.732		9.2	LOS A	4.0	102.7				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach

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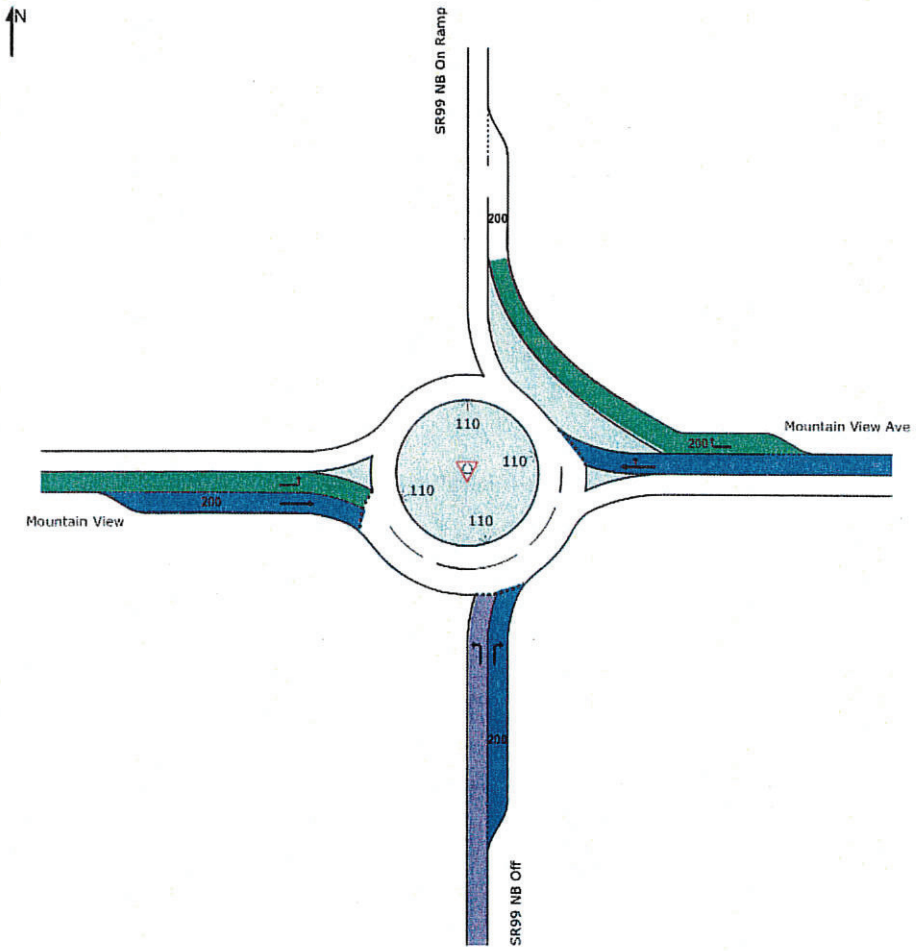
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [SR99 NB - 2045 PM]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	South	East	West	
LOS	D	A	C	B



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [SR99 NB - 2045 PM]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: SR99 NB Off													
Lane 1[d]	213	4.2	366	0.583	100	25.6	LOS D	2.7	69.3	Full	1600	0.0	0.0
Lane 2	138	9.4	297	0.465	100	24.6	LOS C	1.8	47.2	Short	200	0.0	NA
Approach	351	6.3		0.583		25.2	LOS D	2.7	69.3				
East: Mountain View Ave													
Lane 1[d]	580	3.1	876	0.661	100	15.0	LOS C	6.7	172.5	Full	1100	0.0	0.0
Lane 2	594	4.1	1608	0.370	56[6]	0.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	1174	3.6		0.661		7.4	LOS A	6.7	172.5				
West: Mountain View													
Lane 1	300	2.9	1380	0.217	100	4.4	LOS A	0.0	0.0	Full	1100	0.0	0.0
Lane 2[d]	1202	3.1	1377	0.873	100	21.3	LOS C	0.0	0.0	Short	200	0.0	NA
Approach	1502	3.0		0.873		17.9	LOS C	0.0	0.0				
Intersection	3027	3.6		0.873		14.7	LOS B	6.7	172.5				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach

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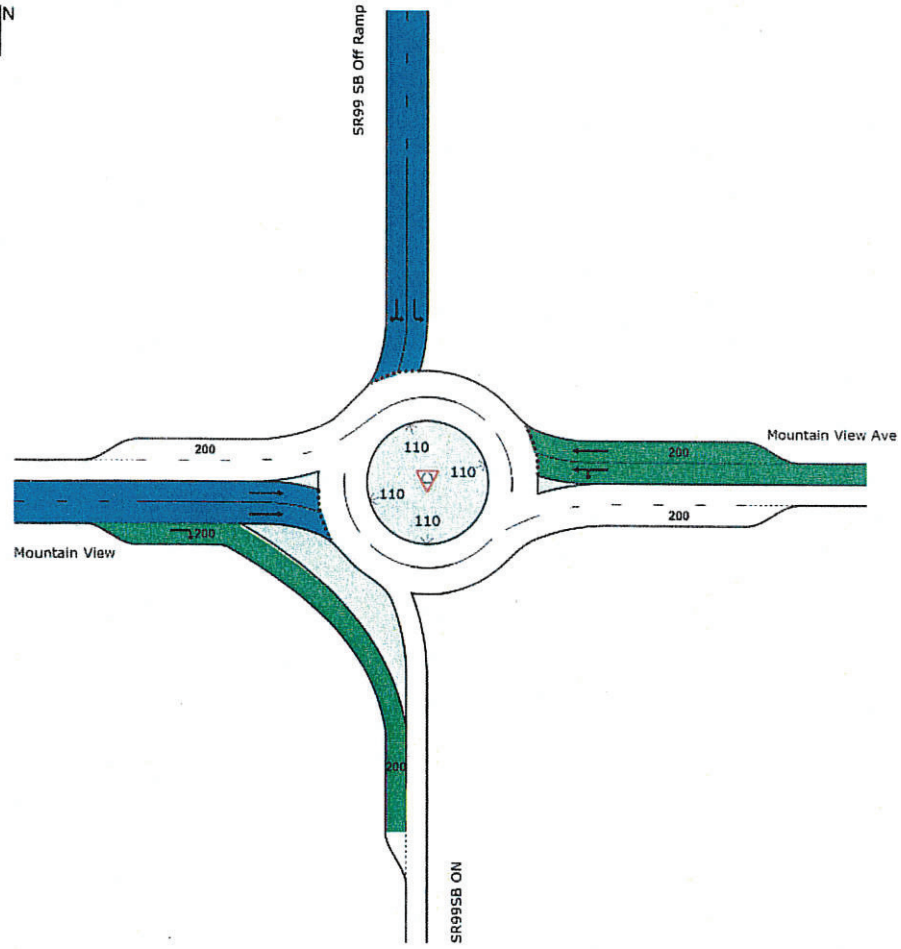
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [SR99 SB - 2045 AM]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	East	North	West	
LOS	A	B	A	B



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [SR99 SB - 2045 AM]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
East: Mountain View Ave													
Lane 1[d]	239	8.2	1313	0.182	100	4.3	LOS A	0.0	0.0	Full	1100	0.0	0.0
Lane 2	192	12.7	1198	0.160	88[6]	4.4	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	430	10.2		0.182		4.3	LOS A	0.0	0.0				
North: SR99 SB Off Ramp													
Lane 1	456	11.4	783	0.583	100	13.7	LOS B	4.5	123.6	Full	1600	0.0	0.0
Lane 2[d]	469	18.0	804	0.583	100	13.5	LOS B	4.3	122.8	Full	1600	0.0	0.0
Approach	925	14.7		0.583		13.6	LOS B	4.5	123.6				
West: Mountain View													
Lane 1[d]	350	9.9	731	0.479	100	11.8	LOS B	2.6	70.6	Full	1100	0.0	0.0
Lane 2	279	9.9	663	0.420	88[6]	11.4	LOS B	2.0	54.5	Full	1100	0.0	0.0
Lane 3	132	9.1	1534	0.086	100	0.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	760	9.7		0.479		9.6	LOS A	2.6	70.6				
Intersection	2115	12.0		0.583		10.3	LOS B	4.5	123.6				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach

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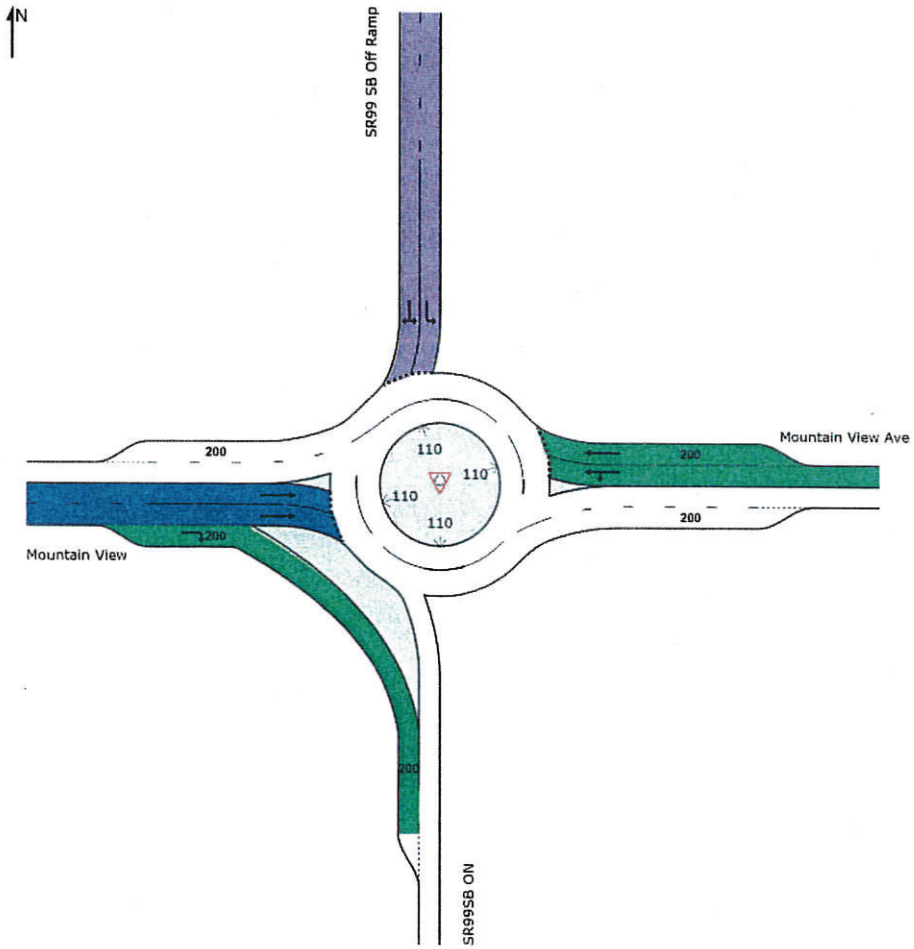
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [SR99 SB - 2045 PM]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	East	North	West	
LOS	A	D	C	C



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [SR99 SB - 2045 PM]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
East: Mountain View Ave													
Lane 1[d]	374	5.3	1350	0.277	100	5.1	LOS A	0.0	0.0	Full	1100	0.0	0.0
Lane 2	304	8.0	1250	0.243	88[6]	5.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	678	6.5		0.277		5.0	LOS A	0.0	0.0				
North: SR99 SB Off Ramp													
Lane 1	496	11.0	626	0.793	100	28.1	LOS D	8.6	234.3	Full	1600	0.0	0.0
Lane 2[d]	527	15.5	665	0.793	100	26.9	LOS D	8.6	243.0	Full	1600	0.0	0.0
Approach	1024	13.3		0.793		27.5	LOS D	8.6	243.0				
West: Mountain View													
Lane 1[d]	532	6.5	713	0.746	100	22.1	LOS C	7.6	198.7	Full	1100	0.0	0.0
Lane 2	422	6.5	644	0.656	88[6]	18.9	LOS C	5.1	134.7	Full	1100	0.0	0.0
Lane 3	134	9.0	1536	0.087	100	0.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	1088	6.8		0.746		18.1	LOS C	7.6	198.7				
Intersection	2790	9.1		0.793		18.4	LOS C	8.6	243.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach

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Mendocino Avenue Intersections

2018 Existing TWSC Level of Service Reports

HCS7 Two-Way Stop-Control Report

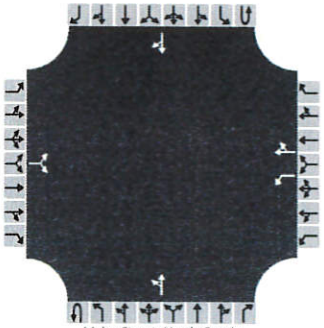
General Information

Analyst	Hien
gency/Co.	Caltrans
Date Performed	1/3/2019
Analysis Year	2018
Time Analyzed	AM Peak
ntersection Orientation	North-South
Project Description	SR 99 NB Off-Ramp

Site Information

Intersection	SR99 NB Off/Frontage Road
Jurisdiction	
East/West Street	Frontage Road
North/South Street	SR 99 NB Off-Ramp
Peak Hour Factor	0.82
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		1	1	0	0	0	1	0	0	0	1	0
Configuration			LR			L		TR		LT						TR
Volume (veh/h)		5		19		43	0	134		73	335				403	80
Percent Heavy Vehicles (%)		20		0		26	17	10		11						
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2		7.1	6.5	6.2		4.1						
Critical Headway (sec)		7.30		6.20		7.36	6.67	6.30		4.21						
Base Follow-Up Headway (sec)		3.5		3.3		3.5	4.0	3.3		2.2						
Follow-Up Headway (sec)		3.68		3.30		3.73	4.15	3.39		2.30						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			29			52		163		89						
Capacity, c (veh/h)			472			139		626		943						
v/c Ratio			0.06			0.38		0.26		0.09						
95% Queue Length, Q_{95} (veh)			0.2			1.6		1.0		0.3						
Control Delay (s/veh)			13.1			45.8		12.8		9.2						
Level of Service (LOS)			B			E		B		A						
Approach Delay (s/veh)		13.1				20.8				2.6						
pproach LOS		B				C										

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HCS 2010 Two-Way Stop-Control Report

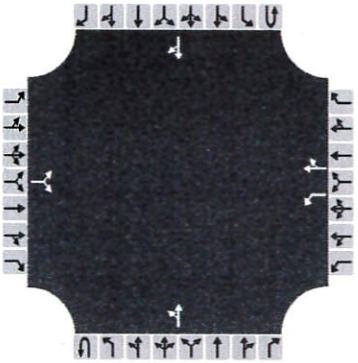
General Information

Analyst	Hien
gency/Co.	Caltrans
Date Performed	1/3/2019
Analysis Year	2018
Time Analyzed	PM Peak
Intersection Orientation	North-South
Project Description	SR 99 NB Off-Ramp

Site Information

Intersection	SR99 NB Off/Frontage Road
Jurisdiction	
East/West Street	Frontage Road
North/South Street	SR 99 NB Off-Ramp
Peak Hour Factor	0.82
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	1	0	0	0	1	0	0	0	1	0
Configuration			LR			L		TR		LT						TR
Volume, V (veh/h)		18		18		36	20	149		70	345				280	60
Percent Heavy Vehicles (%)		0		0		17	5	7		11						
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2		7.1	6.5	6.2		4.1						
Critical Headway (sec)		7.10		6.20		7.27	6.55	6.27		4.21						
Base Follow-Up Headway (sec)		3.5		3.3		3.5	4.0	3.3		2.2						
Follow-Up Headway (sec)		3.50		3.30		3.65	4.04	3.36		2.30						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			44			44		206		85						
Capacity, c (veh/h)			239			192		510		1098						
v/c Ratio			0.18			0.23		0.40		0.08						
95% Queue Length, Q_{95} (veh)			0.7			0.9		1.9		0.3						
Control Delay (s/veh)			23.4			29.2		16.8		8.6						
Level of Service, LOS			C			D		C		A						
Approach Delay (s/veh)		23.4				19.0				2.2						
Approach LOS		C				C										

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HCS7 Two-Way Stop-Control Report

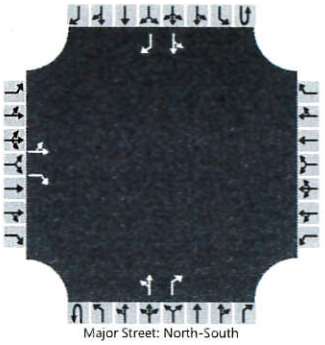
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	1/3/2019
Analysis Year	2018
Time Analyzed	AM Peak
Intersection Orientation	North-South
Project Description	SR 99 SB On-Ramp

Site Information

Intersection	SR 99 SB On-Ramp/18th Ave
Jurisdiction	
East/West Street	Ave 394
North/South Street	18th Ave
Peak Hour Factor	0.83
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	1		0	0	0	0	0	1	1	0	0	1	1
Configuration		LT		R						LT		R		LT		R
Volume (veh/h)		158	13	21						5	250	62		165	229	71
Percent Heavy Vehicles (%)		4	8	5						0				3		
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized		Yes								Yes				No		
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2						4.1				4.1		
Critical Headway (sec)		7.14	6.58	6.25						4.10				4.13		
Base Follow-Up Headway (sec)		3.5	4.0	3.3						2.2				2.2		
Follow-Up Headway (sec)		3.54	4.07	3.35						2.20				2.23		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		206		25						6				199		
Capacity, c (veh/h)		182		756						1208				1254		
v/c Ratio		1.13		0.03						0.00				0.16		
95% Queue Length, Q_{95} (veh)		10.5		0.1						0.0				0.6		
Control Delay (s/veh)		160.2		9.9						8.0				8.4		
Level of Service (LOS)		F		A						A				A		
Approach Delay (s/veh)		143.8								0.2				3.8		
Approach LOS		F														

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HCS7 Two-Way Stop-Control Report

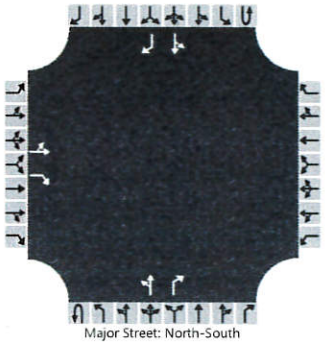
General Information

Analyst	Hien
ıency/Co.	Caltrans
Date Performed	1/3/2019
Analysis Year	2018
Time Analyzed	PM Peak
Intersection Orientation	North-South
Project Description	SR 99 SB On-Ramp

Site Information

Intersection	SR 99 SB On-Ramp/18th Ave
Jurisdiction	
East/West Street	Ave 394
North/South Street	18th Ave
Peak Hour Factor	0.83
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
·umber of Lanes		0	1	1		0	0	0	0	0	1	1	0	0	1	1
ɔnfiguration		LT		R						LT		R		LT		R
Volume (veh/h)		106	25	10						6	309	66		101	163	70
Percent Heavy Vehicles (%)		13	0	0						0				6		
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized		Yes								Yes				No		
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2						4.1				4.1		
Critical Headway (sec)		7.23	6.50	6.20						4.10				4.16		
Base Follow-Up Headway (sec)		3.5	4.0	3.3						2.2				2.2		
Follow-Up Headway (sec)		3.62	4.00	3.30						2.20				2.25		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		158		12						7				122		
Capacity, c (veh/h)		243		850						1293				1165		
v/c Ratio		0.65		0.01						0.01				0.10		
95% Queue Length, Q_{95} (veh)		4.0		0.0						0.0				0.3		
Control Delay (s/veh)		43.8		9.3						7.8				8.5		
Level of Service (LOS)		E		A						A				A		
Approach Delay (s/veh)		41.3								0.2				3.0		
proach LOS		E														

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Mendocino Avenue Intersections

2025 No-Build TWSC Level of Service Reports

HCS 2010 Two-Way Stop-Control Report

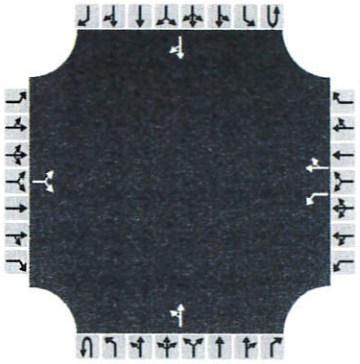
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	1/3/2019
Analysis Year	2025
Time Analyzed	AM Peak
Intersection Orientation	North-South
Project Description	SR 99 NB Off-Ramp

Site Information

Intersection	SR99 NB Off/Frontage Road
Jurisdiction	
East/West Street	Frontage Road
North/South Street	SR 99 NB Off-Ramp
Peak Hour Factor	0.82
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	1	0	0	0	1	0	0	0	1	0
Configuration			LR			L		TR		LT						TR
Volume, V (veh/h)		6		22		50	0	166		85	411				509	147
Percent Heavy Vehicles (%)		20		0		26	17	10		11						
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2		7.1	6.5	6.2		4.1						
Critical Headway (sec)		7.30		6.20		7.36	6.67	6.30		4.21						
Base Follow-Up Headway (sec)		3.5		3.3		3.5	4.0	3.3		2.2						
Follow-Up Headway (sec)		3.68		3.30		3.73	4.15	3.39		2.30						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			34			61		202		104						
Capacity, c (veh/h)			234			80		554		785						
v/c Ratio			0.15			0.77		0.36		0.13						
95% Queue Length, Q_{95} (veh)			0.5			3.8		1.7		0.5						
Control Delay (s/veh)			22.9			132.7		15.2		10.3						
Level of Service, LOS			C			F		C		B						
Approach Delay (s/veh)		22.9				42.4				3.3						
Approach LOS		C				E										

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HCS 2010 Two-Way Stop-Control Report

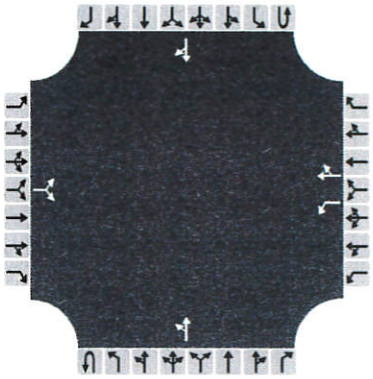
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	1/3/2019
Analysis Year	2025
Time Analyzed	PM Peak
Intersection Orientation	North-South
Project Description	SR 99 NB Off-Ramp

Site Information

Intersection	SR99 NB Off/Frontage Road
Jurisdiction	
East/West Street	Frontage Road
North/South Street	SR 99 NB Off-Ramp
Peak Hour Factor	0.82
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	1	0	0	0	1	0	0	0	1	0
Configuration			LR			L		TR		LT						TR
Volume, V (veh/h)		21		21		42	23	224		82	457				356	102
Percent Heavy Vehicles (%)		0		0		17	5	7		11						
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2		7.1	6.5	6.2		4.1						
Critical Headway (sec)		7.10		6.20		7.27	6.55	6.27		4.21						
Base Follow-Up Headway (sec)		3.5		3.3		3.5	4.0	3.3		2.2						
Follow-Up Headway (sec)		3.50		3.30		3.65	4.04	3.36		2.30						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			52			51		301		100						
Capacity, c (veh/h)			81			115		409		969						
v/c Ratio			0.64			0.44		0.74		0.10						
95% Queue Length, Q_{95} (veh)			3.0			1.9		5.8		0.3						
Control Delay (s/veh)			107.8			59.3		34.6		9.1						
Level of Service, LOS			F			F		D		A						
Approach Delay (s/veh)		107.8				38.2				2.5						
Approach LOS		F				E										

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HCS 2010 Two-Way Stop-Control Report

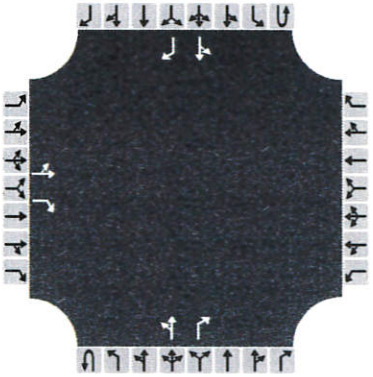
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	1/3/2019
Analysis Year	2025
Time Analyzed	AM Peak
Intersection Orientation	North-South
Project Description	SR 99 SB On-Ramp

Site Information

Intersection	SR 99 SB On-Ramp/18th Ave
Jurisdiction	
East/West Street	Ave 394
North/South Street	18th Ave
Peak Hour Factor	0.83
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	1		0	0	0	0	0	1	1	0	0	1	1
Configuration		LT		R						LT		R		LT		R
Volume, V (veh/h)		205	15	24						6	291	72		232	267	83
Percent Heavy Vehicles (%)		4	8	5						0				3		
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized		Yes				No				Yes				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2						4.1				4.1		
Critical Headway (sec)		7.14	6.58	6.25						4.10				4.13		
Base Follow-Up Headway (sec)		3.5	4.0	3.3						2.2				2.2		
Follow-Up Headway (sec)		3.54	4.07	3.35						2.20				2.23		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		265		29						7				280		
Capacity, c (veh/h)		145		712						1148				1202		
v/c Ratio		1.82		0.04						0.01				0.23		
95% Queue Length, Q_{95} (veh)		19.9		0.1						0.0				0.9		
Control Delay (s/veh)		449.1		10.3						8.2				8.9		
Level of Service, LOS		F		B						A				A		
Approach Delay (s/veh)		405.9								0.2				4.8		
Approach LOS		F														

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HCS 2010 Two-Way Stop-Control Report

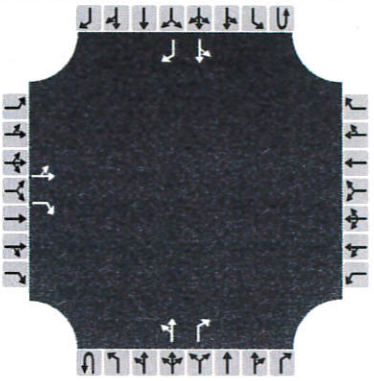
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	1/3/2019
Analysis Year	2025
Time Analyzed	PM Peak
Intersection Orientation	North-South
Project Description	SR 99 SB On-Ramp

Site Information

Intersection	SR 99 SB On-Ramp/18th Ave
Jurisdiction	
East/West Street	Ave 394
North/South Street	18th Ave
Peak Hour Factor	0.83
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	1		0	0	0	0	0	1	1	0	0	1	1
Configuration		LT		R						LT		R		LT		R
Volume, V (veh/h)		178	29	12						7	360	77		148	190	82
Percent Heavy Vehicles (%)		13	0	0						0				6		
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized		Yes				No				Yes				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2						4.1				4.1		
Critical Headway (sec)		7.23	6.50	6.20						4.10				4.16		
Base Follow-Up Headway (sec)		3.5	4.0	3.3						2.2				2.2		
Follow-Up Headway (sec)		3.62	4.00	3.30						2.20				2.25		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		249		14						8				178		
Capacity, c (veh/h)		197		815						1243				1105		
v/c Ratio		1.26		0.02						0.01				0.16		
95% Queue Length, Q_{95} (veh)		13.4		0.1						0.0				0.6		
Control Delay (s/veh)		200.7		9.5						7.9				8.9		
Level of Service, LOS		F		A						A				A		
Approach Delay (s/veh)		190.5								0.2				3.9		
Approach LOS		F														

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Mendocino Avenue Intersections

2035 No-Build TWSC Level of Service Reports

HCS 2010 Two-Way Stop-Control Report

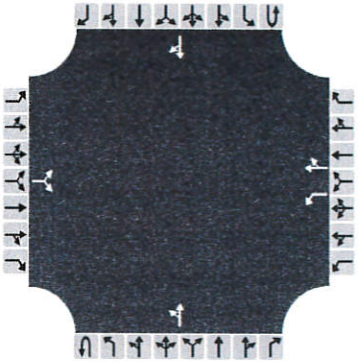
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	1/3/2019
Analysis Year	2035
Time Analyzed	AM Peak
Intersection Orientation	North-South
Project Description	SR 99 NB Off-Ramp

Site Information

Intersection	SR99 NB Off/Frontage Road
Jurisdiction	
East/West Street	Frontage Road
North/South Street	SR 99 NB Off-Ramp
Peak Hour Factor	0.82
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	1	0	0	0	1	0	0	0	1	0
Configuration			LR			L		TR		LT						TR
Volume, V (veh/h)		7		28		62	0	204		106	506				623	170
Percent Heavy Vehicles (%)		20		0		26	17	10		11						
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2		7.1	6.5	6.2		4.1						
Critical Headway (sec)		7.30		6.20		7.36	6.67	6.30		4.21						
Base Follow-Up Headway (sec)		3.5		3.3		3.5	4.0	3.3		2.2						
Follow-Up Headway (sec)		3.68		3.30		3.73	4.15	3.39		2.30						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			43			76		249		129						
Capacity, c (veh/h)			81			41		476		678						
v/c Ratio			0.53			1.87		0.52		0.19						
95% Queue Length, Q_{95} (veh)			2.3			8.0		3.0		0.7						
Control Delay (s/veh)			91.0			626.2		20.6		11.6						
Level of Service, LOS			F			F		C		B						
Approach Delay (s/veh)		91.0				162.2				4.8						
Approach LOS		F				F										

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HCS 2010 Two-Way Stop-Control Report

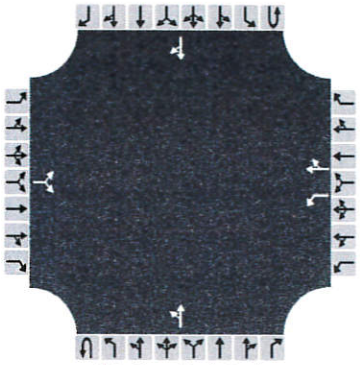
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	1/3/2019
Analysis Year	2035
Time Analyzed	PM Peak
Intersection Orientation	North-South
Project Description	SR 99 NB Off-Ramp

Site Information

Intersection	SR99 NB Off/Frontage Road
Jurisdiction	
East/West Street	Frontage Road
North/South Street	SR 99 NB Off-Ramp
Peak Hour Factor	0.82
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	1	0	0	0	1	0	0	0	1	0
Configuration			LR			L		TR		LT						TR
Volume, V (veh/h)		26		26		52	29	266		101	554				435	119
Percent Heavy Vehicles (%)		0		0		17	5	7		11						
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2		7.1	6.5	6.2		4.1						
Critical Headway (sec)		7.10		6.20		7.27	6.55	6.27		4.21						
Base Follow-Up Headway (sec)		3.5		3.3		3.5	4.0	3.3		2.2						
Follow-Up Headway (sec)		3.50		3.30		3.65	4.04	3.36		2.30						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			64			63		359		123						
Capacity, c (veh/h)			22			67		310		876						
v/c Ratio			2.94			0.94		1.16		0.14						
95% Queue Length, Q_{95} (veh)			8.2			4.6		15.1		0.5						
Control Delay (s/veh)			1249.1			194.8		137.8		9.8						
Level of Service, LOS			F			F		F		A						
Approach Delay (s/veh)		1249.1				146.3				3.4						
Approach LOS		F				F										

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HCS 2010 Two-Way Stop-Control Report

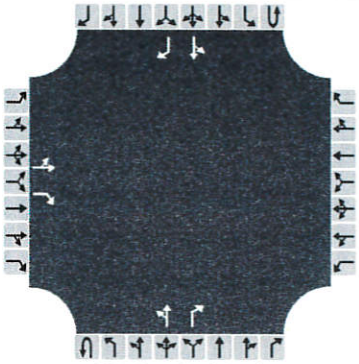
General Information

·alyst	Hien
·gency/Co.	Caltrans
Date Performed	1/3/2019
Analysis Year	2035
Time Analyzed	AM Peak
Intersection Orientation	North-South
Project Description	SR 99 SB On-Ramp

Site Information

Intersection	SR 99 SB On-Ramp/18th Ave
Jurisdiction	
East/West Street	Ave 394
North/South Street	18th Ave
Peak Hour Factor	0.83
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
·ority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	1		0	0	0	0	0	1	1	0	0	1	1
Configuration		LT		R						LT		R		LT		R
Volume, V (veh/h)		250	19	30						7	362	90		279	332	103
Percent Heavy Vehicles (%)		4	8	5						0				3		
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized		Yes				No				Yes				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2						4.1				4.1		
Critical Headway (sec)		7.14	6.58	6.25						4.10				4.13		
Base Follow-Up Headway (sec)		3.5	4.0	3.3						2.2				2.2		
Follow-Up Headway (sec)		3.54	4.07	3.35						2.20				2.23		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		324		36						8				336		
Capacity, c (veh/h)		92		644						1053				1119		
v/c Ratio		3.53		0.06						0.01				0.30		
95% Queue Length, Q_{95} (veh)		32.7		0.2						0.0				1.3		
Control Delay (s/veh)		1235.2		10.9						8.4				9.6		
·el of Service, LOS		F		B						A				A		
·pproach Delay (s/veh)		1112.7								0.2				5.7		
Approach LOS		F														

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HCS 2010 Two-Way Stop-Control Report

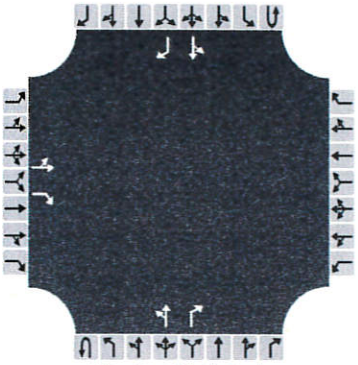
General Information

·alyst	Hien
.gency/Co.	Caltrans
Date Performed	1/3/2019
Analysis Year	2035
Time Analyzed	PM Peak
Intersection Orientation	North-South
Project Description	SR 99 SB On-Ramp

Site Information

Intersection	SR 99 SB On-Ramp/18th Ave
Jurisdiction	
East/West Street	Ave 394
North/South Street	18th Ave
Peak Hour Factor	0.83
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
·ority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	1		0	0	0	0	0	1	1	0	0	1	1
Configuration		LT		R						LT		R		LT		R
Volume, V (veh/h)		208	36	14						9	447	96		176	236	101
Percent Heavy Vehicles (%)		13	0	0						0				6		
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized		Yes				No				Yes				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2						4.1				4.1		
Critical Headway (sec)		7.23	6.50	6.20						4.10				4.16		
Base Follow-Up Headway (sec)		3.5	4.0	3.3						2.2				2.2		
Follow-Up Headway (sec)		3.62	4.00	3.30						2.20				2.25		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		294		17						11				212		
Capacity, c (veh/h)		134		760						1164				1010		
v/c Ratio		2.19		0.02						0.01				0.21		
95% Queue Length, Q_{95} (veh)		24.5		0.1						0.0				0.8		
Control Delay (s/veh)		614.9		9.8						8.1				9.5		
·el of Service, LOS		F		A						A				A		
·pproach Delay (s/veh)		581.9								0.2				4.5		
Approach LOS		F														

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Mendocino Avenue Intersections

Alternative 1

Reconstruct Ave 394/SB Off Ramp and install All Way Stop Control at SB on and NB Off Ramps Terminals

2025 Level of Service Reports

2035 Level of Service Reports

2045 Level of Service Reports

HCS 2010 All-Way Stop-Control Summary Report

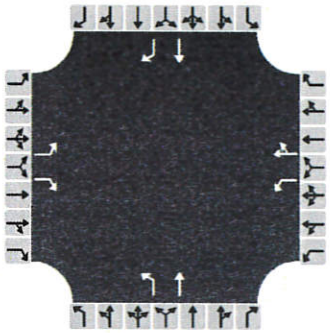
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	1/3/2019
Analysis Year	2025
Time Analyzed	0.25
Anaylysis Time Period (hrs)	AM Peak
Project Description	Alt 1-Reconstruct Ave 394/SB Off-Ramp Intersection

Site Information

Intersection	SR99 NB Off/Frontage Road
Jurisdiction	
East/West Street	Frontage Road
North/South Street	SR 99 NB Off-Ramp
Peak Hour Factor	0.82

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	6		22	50	0	166	85	411			509	147
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	L	R		L	TR		L	T		T	R	
Flow Rate, v (veh/h)	7	27		61	202		104	501		621	179	
Percent Heavy Vehicles	2	2		26	17		2	2		2	2	

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20	3.20		3.20	3.20		3.20	3.20		3.20	3.20	
Initial Degree of Utilization, x	0.007	0.024		0.054	0.180		0.092	0.446		0.552	0.159	
Final Departure Headway, hd (s)	8.77	7.61		8.52	7.20		7.08	6.59		6.47	5.77	
Final Degree of Utilization, x	0.018	0.057		0.144	0.405		0.204	0.917		1.115	0.287	
Move-Up Time, m (s)	2.3	2.3		2.3	2.3		2.3	2.3		2.3	2.3	
Service Time, ts (s)	6.47	5.31		6.22	4.90		4.78	4.29		4.17	3.47	

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	7	27		61	202		104	501		621	179	
Capacity	411	473		422	500		508	546		557	624	
95% Queue Length, Q_{95} (veh)	0.1	0.2		0.5	1.9		0.8	11.2		19.8	1.2	
Control Delay (s/veh)	11.6	10.8		12.7	14.7		11.6	46.1		97.6	10.8	
Level of Service, LOS	B	B		B	B		B	E		F	B	
Approach Delay (s/veh)	11.0			14.2			40.2			78.1		
Approach LOS	B			B			E			F		
Intersection Delay, s/veh | LOS	53.4						F					

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HCS 2010 All-Way Stop-Control Summary Report

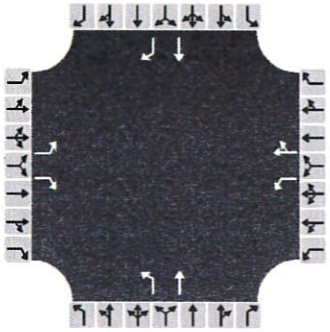
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	1/3/2019
Analysis Year	2025
Time Analyzed	0.25
Anaylysis Time Period (hrs)	PM Peak
Project Description	Alt 1-Reconstruct Ave 394/SB Off-Ramp Intersection

Site Information

Intersection	SR99 NB Off/Frontage Road
Jurisdiction	
East/West Street	Frontage Road
North/South Street	SR 99 NB Off-Ramp
Peak Hour Factor	0.85

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	21		21	42	23	224	82	457			356	102
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	L	R		L	TR		L	T		T	R	
Flow Rate, v (veh/h)	25	25		49	291		96	538		419	120	
Percent Heavy Vehicles	2	2		17	5		2	2		2	2	

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20	3.20		3.20	3.20		3.20	3.20		3.20	3.20	
Initial Degree of Utilization, x	0.022	0.022		0.044	0.258		0.086	0.478		0.372	0.107	
Final Departure Headway, hd (s)	8.80	7.65		8.29	6.99		7.22	6.72		6.88	6.19	
Final Degree of Utilization, x	0.060	0.053		0.114	0.564		0.193	1.003		0.800	0.206	
Move-Up Time, m (s)	2.3	2.3		2.3	2.3		2.3	2.3		2.3	2.3	
Service Time, ts (s)	6.50	5.35		5.99	4.69		4.92	4.42		4.58	3.89	

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	25	25		49	291		96	538		419	120	
Capacity	409	471		434	515		499	536		523	582	
95% Queue Length, Q_{95} (veh)	0.2	0.2		0.4	3.5		0.7	14.3		7.6	0.8	
Control Delay (s/veh)	12.1	10.8		12.1	18.3		11.6	65.1		31.7	10.5	
Level of Service, LOS	B	B		B	C		B	F		D	B	
Approach Delay (s/veh)	11.4			17.4			57.0			27.0		
Approach LOS	B			C			F			D		
Intersection Delay, s/veh | LOS	36.6						E					

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HCS 2010 All-Way Stop-Control Summary Report

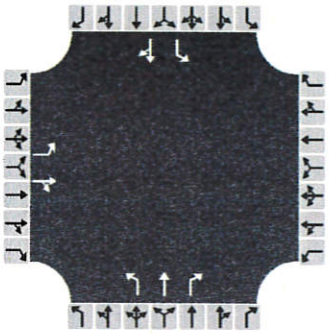
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	1/3/2019
Analysis Year	2025
Time Analyzed	0.25
Anaylysis Time Period (hrs)	AM Peak
Project Description	Alt 1-Reconstruct Ave 394/SB Off-Ramp Intersection

Site Information

Intersection	SR 99 SB On-Ramp/18th Ave
Jurisdiction	
East/West Street	Ave 394
North/South Street	18th Ave
Peak Hour Factor	0.83

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	205	15	24				6	291	72	232	267	83
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	L	TR					L	T	R	L	TR	
Flow Rate, v (veh/h)	247	47					7	351	87	280	422	
Percent Heavy Vehicles	2	2					2	2	7	2	2	

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20	3.20					3.20	3.20	3.20	3.20	3.20	
Initial Degree of Utilization, x	0.220	0.042					0.006	0.312	0.077	0.248	0.375	
Final Departure Headway, hd (s)	8.72	7.77					8.28	7.76	7.13	7.82	7.14	
Final Degree of Utilization, x	0.598	0.101					0.017	0.756	0.172	0.608	0.837	
Move-Up Time, m (s)	2.3	2.3					2.3	2.3	2.3	2.3	2.3	
Service Time, ts (s)	6.42	5.47					5.98	5.46	4.83	5.52	4.84	

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	247	47					7	351	87	280	422	
Capacity	413	463					435	464	505	460	504	
95% Queue Length, Q_{95} (veh)	3.8	0.3					0.1	6.4	0.6	4.0	8.4	
Control Delay (s/veh)	23.6	11.3					11.1	30.8	11.3	21.9	36.6	
Level of Service, LOS	C	B					B	D	B	C	E	
Approach Delay (s/veh)	21.6						26.7			30.8		
Approach LOS	C						D			D		
Intersection Delay, s/veh | LOS	27.6						D					

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HCS 2010 All-Way Stop-Control Summary Report

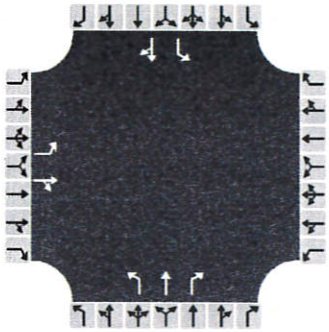
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	1/3/2019
Analysis Year	2025
Time Analyzed	0.25
Anaylysis Time Period (hrs)	PM Peak
Project Description	Alt 1-Reconstruct Ave 394/SB Off-Ramp Intersection

Site Information

Intersection	SR 99 SB On-Ramp/18th Ave
Jurisdiction	
East/West Street	Ave 394
North/South Street	18th Ave
Peak Hour Factor	0.83

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	178	29	12				7	360	77	148	190	82
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	L	TR					L	T	R	L	TR	
Flow Rate, v (veh/h)	214	49					8	434	93	178	328	
Percent Heavy Vehicles	2	2					2	2	6	2	2	

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20	3.20					3.20	3.20	3.20	3.20	3.20	
Initial Degree of Utilization, x	0.191	0.044					0.007	0.386	0.082	0.159	0.291	
Final Departure Headway, hd (s)	8.44	7.72					7.66	7.15	6.51	7.77	7.05	
Final Degree of Utilization, x	0.503	0.106					0.018	0.862	0.168	0.385	0.642	
Move-Up Time, m (s)	2.3	2.3					2.3	2.3	2.3	2.3	2.3	
Service Time, ts (s)	6.14	5.42					5.36	4.85	4.21	5.47	4.75	

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	214	49					8	434	93	178	328	
Capacity	427	466					470	503	553	463	511	
95% Queue Length, Q_{95} (veh)	2.7	0.4					0.1	9.1	0.6	1.8	4.5	
Control Delay (s/veh)	19.4	11.3					10.5	39.9	10.5	15.3	21.5	
Level of Service, LOS	C	B					B	E	B	C	C	
Approach Delay (s/veh)	17.9						34.4			19.3		
Approach LOS	C						D			C		
Intersection Delay, s/veh | LOS	25.2						D					

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HCS7 Two-Way Stop-Control Report

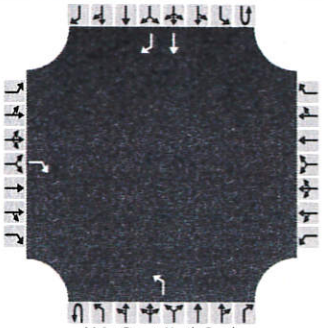
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	2/22/2019
Analysis Year	2025
Time Analyzed	AM Peak
Intersection Orientation	North-South
Project Description	Alt 1 & 2 - SR 99 SB Off-Ramp & Ave 394

Site Information

Intersection	SB Off-Ramp & Ave 394
Jurisdiction	
East/West Street	Ave 394
North/South Street	SB Off-Ramp
Peak Hour Factor	0.77
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	1		0	0	0	0	1	0	0	0	0	1	1
Configuration				R						L					T	R
Volume (veh/h)				137						89					107	12
Percent Heavy Vehicles (%)				3						3						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized		No												Yes		
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)				6.2						4.1						
Critical Headway (sec)				6.23						4.13						
Base Follow-Up Headway (sec)				3.3						2.2						
Follow-Up Headway (sec)				3.33						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)				178						116						
Capacity, c (veh/h)				906						1441						
v/c Ratio				0.20						0.08						
95% Queue Length, Q_{95} (veh)				0.7						0.3						
Control Delay (s/veh)				9.9						7.7						
Level of Service (LOS)				A						A						
Approach Delay (s/veh)		9.9								7.7						
Approach LOS		A														

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HCS7 Two-Way Stop-Control Report

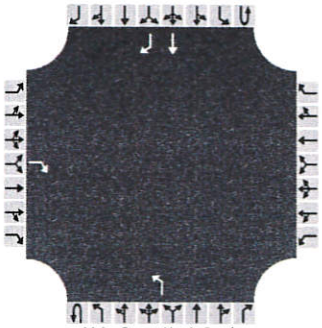
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	2/22/2019
Analysis Year	2025
Time Analyzed	PM Peak
Intersection Orientation	North-South
Project Description	Alt 1 & 2 - SR 99 SB Off-Ramp & Ave 394

Site Information

Intersection	SB Off-Ramp & Ave 394
Jurisdiction	
East/West Street	Ave 394
North/South Street	SB Off-Ramp
Peak Hour Factor	0.98
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	1		0	0	0	0	1	0	0	0	0	1	1
Configuration				R						L					T	R
Volume (veh/h)				100						89					119	45
Percent Heavy Vehicles (%)				1						2						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized		No												Yes		
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)				6.2						4.1						
Critical Headway (sec)				6.21						4.12						
Base Follow-Up Headway (sec)				3.3						2.2						
Follow-Up Headway (sec)				3.31						2.21						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)				102						91						
Capacity, c (veh/h)				932						1469						
v/c Ratio				0.11						0.06						
95% Queue Length, Q_{95} (veh)				0.4						0.2						
Control Delay (s/veh)				9.3						7.6						
Level of Service (LOS)				A						A						
Approach Delay (s/veh)		9.3								7.6						
Approach LOS		A														

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HCS 2010 All-Way Stop-Control Summary Report

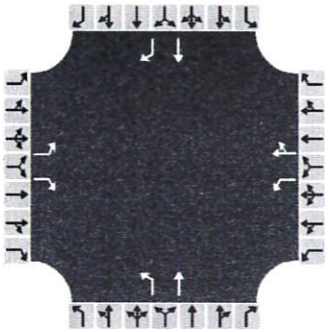
General Information

Analyst	Hien
ɣency/Co.	Caltrans
Date Performed	1/3/2019
Analysis Year	2035
Time Analyzed	0.25
Anaylysis Time Period (hrs)	AM Peak
Project Description	Alt 1-Reconstruct Ave 394/SB Off-Ramp Intersection

Site Information

Intersection	SR99 NB Off/Frontage Road
Jurisdiction	
East/West Street	Frontage Road
North/South Street	SR 99 NB Off-Ramp
Peak Hour Factor	0.82

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
ˈɔlume	7		28	62	0	204	106	506			623	170
₀ Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	L	R		L	TR		L	T		T	R	
Flow Rate, v (veh/h)	9	34		76	249		129	617		760	207	
Percent Heavy Vehicles	2	2		26	17		2	2		2	2	

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20	3.20		3.20	3.20		3.20	3.20		3.20	3.20	
Initial Degree of Utilization, x	0.008	0.030		0.067	0.221		0.115	0.549		0.675	0.184	
Final Departure Headway, hd (s)	9.23	8.07		8.83	7.49		7.44	6.95		6.89	6.20	
Final Degree of Utilization, x	0.022	0.077		0.185	0.518		0.267	1.191		1.455	0.357	
Move-Up Time, m (s)	2.3	2.3		2.3	2.3		2.3	2.3		2.3	2.3	
Service Time, ts (s)	6.93	5.77		6.53	5.19		5.14	4.65		4.59	3.90	

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	9	34		76	249		129	617		760	207	
Capacity	390	446		408	481		484	518		522	580	
95% Queue Length, Q_{95} (veh)	0.1	0.2		0.7	2.9		1.1	22.6		37.3	1.6	
Control Delay (s/veh)	12.1	11.4		13.5	18.0		12.8	127.4		234.4	12.3	
Level of Service, LOS	B	B		B	C		B	F		F	B	
ɔproach Delay (s/veh)	11.6			16.9			107.5			186.8		
Approach LOS	B			C			F			F		
Intersection Delay, s/veh | LOS	128.3						F					

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HCS 2010 All-Way Stop-Control Summary Report

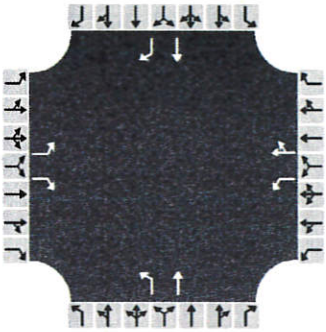
General Information

Analyst	Hien
ɟency/Co.	Caltrans
Date Performed	1/3/2019
Analysis Year	2035
Time Analyzed	0.25
Anaylysis Time Period (hrs)	PM Peak
Project Description	Alt 1-Reconstruct Ave 394/SB Off-Ramp Intersection

Site Information

Intersection	SR99 NB Off/Frontage Road
Jurisdiction	
East/West Street	Frontage Road
North/South Street	SR 99 NB Off-Ramp
Peak Hour Factor	0.85

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
ˈlume	26		26	52	29	266	101	554			435	119
⁄o Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	L	R		L	TR		L	T		T	R	
Flow Rate, v (veh/h)	31	31		61	347		119	652		512	140	
Percent Heavy Vehicles	2	2		17	5		2	2		2	2	

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20	3.20		3.20	3.20		3.20	3.20		3.20	3.20	
Initial Degree of Utilization, x	0.027	0.027		0.054	0.308		0.106	0.579		0.455	0.124	
Final Departure Headway, hd (s)	9.44	8.28		8.71	7.39		7.79	7.30		7.30	6.61	
Final Degree of Utilization, x	0.080	0.070		0.148	0.712		0.257	1.322		1.038	0.257	
Move-Up Time, m (s)	2.3	2.3		2.3	2.3		2.3	2.3		2.3	2.3	
Service Time, ts (s)	7.14	5.98		6.41	5.09		5.49	5.00		5.00	4.31	

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	31	31		61	347		119	652		512	140	
Capacity	382	435		414	487		462	493		493	544	
95% Queue Length, Q_{95} (veh)	0.3	0.2		0.5	5.6		1.0	28.4		15.1	1.0	
Control Delay (s/veh)	13.0	11.6		12.9	26.3		13.2	180.3		77.6	11.6	
Level of Service, LOS	B	B		B	D		B	F		F	B	
ˈproach Delay (s/veh)	12.3			24.3			154.5			63.4		
Approach LOS	B			C			F			F		
Intersection Delay, s/veh | LOS	90.4						F					

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HCS 2010 All-Way Stop-Control Summary Report

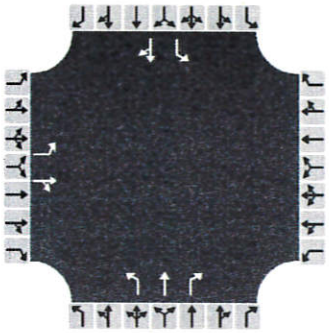
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	1/3/2019
Analysis Year	2035
Time Analyzed	0.25
Anaylysis Time Period (hrs)	AM Peak
Project Description	Alt 1-Reconstruct Ave 394/SB Off-Ramp Intersection

Site Information

Intersection	SR 99 SB On-Ramp/18th Ave
Jurisdiction	
East/West Street	Ave 394
North/South Street	18th Ave
Peak Hour Factor	0.83

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	250	19	30				7	362	90	279	332	103
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	L	TR					L	T	R	L	TR	
Flow Rate, v (veh/h)	301	59					8	436	108	336	524	
Percent Heavy Vehicles	2	2					2	2	7	2	2	

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20	3.20					3.20	3.20	3.20	3.20	3.20	
Initial Degree of Utilization, x	0.268	0.052					0.007	0.388	0.096	0.299	0.466	
Final Departure Headway, hd (s)	9.30	8.37					8.83	8.33	7.71	8.48	7.81	
Final Degree of Utilization, x	0.778	0.137					0.021	1.009	0.232	0.792	1.138	
Move-Up Time, m (s)	2.3	2.3					2.3	2.3	2.3	2.3	2.3	
Service Time, ts (s)	7.00	6.07					6.53	6.03	5.41	6.18	5.51	

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	301	59					8	436	108	336	524	
Capacity	387	430					408	432	467	424	461	
95% Queue Length, Q_{95} (veh)	6.5	0.5					0.1	13.0	0.9	7.0	18.5	
Control Delay (s/veh)	37.8	12.4					11.7	74.7	12.7	36.6	111.9	
Level of Service, LOS	E	B					B	F	B	E	F	
Approach Delay (s/veh)	33.7						61.6			82.5		
Approach LOS	D						F			F		
Intersection Delay, s/veh | LOS	66.0						F					

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HCS 2010 All-Way Stop-Control Summary Report

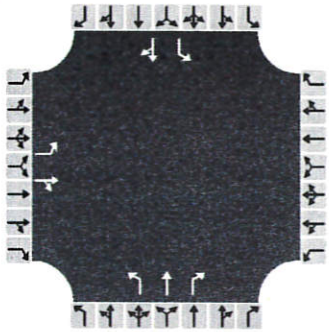
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	1/3/2019
Analysis Year	2035
Time Analyzed	0.25
Anaylysis Time Period (hrs)	PM Peak
Project Description	Alt 1-Reconstruct Ave 394/SB Off-Ramp Intersection

Site Information

Intersection	SR 99 SB On-Ramp/18th Ave
Jurisdiction	
East/West Street	Ave 394
North/South Street	18th Ave
Peak Hour Factor	0.83

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	208	36	14				9	447	96	176	236	101
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	L	TR					L	T	R	L	TR	
Flow Rate, v (veh/h)	251	60					11	539	116	212	406	
Percent Heavy Vehicles	2	2					2	2	6	2	2	

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20	3.20					3.20	3.20	3.20	3.20	3.20	
Initial Degree of Utilization, x	0.223	0.054					0.010	0.479	0.103	0.188	0.361	
Final Departure Headway, hd (s)	8.90	8.21					8.26	7.75	7.10	8.17	7.46	
Final Degree of Utilization, x	0.620	0.137					0.025	1.159	0.228	0.481	0.841	
Move-Up Time, m (s)	2.3	2.3					2.3	2.3	2.3	2.3	2.3	
Service Time, ts (s)	6.60	5.91					5.96	5.45	4.80	5.87	5.16	

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	251	60					11	539	116	212	406	
Capacity	404	439					436	465	507	441	483	
95% Queue Length, Q_{95} (veh)	4.0	0.5					0.1	19.6	0.9	2.6	8.5	
Control Delay (s/veh)	25.1	12.2					11.2	119.1	11.9	18.2	38.5	
Level of Service, LOS	D	B					B	F	B	C	E	
Approach Delay (s/veh)	22.6						98.7			31.5		
Approach LOS	C						F			D		
Intersection Delay, s/veh | LOS	57.8						F					

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HCS7 Two-Way Stop-Control Report

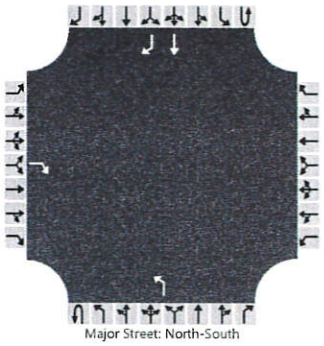
General Information

Analyst	Hien
,ency/Co.	Caltrans
Date Performed	2/22/2019
Analysis Year	2035
Time Analyzed	AM Peak
Intersection Orientation	North-South
Project Description	Alt 1 & 2 - SR 99 SB Off-Ramp & Ave 394

Site Information

Intersection	SB Off-Ramp & Ave 394
Jurisdiction	
East/West Street	Ave 394
North/South Street	SB Off-Ramp
Peak Hour Factor	0.77
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
mber of Lanes		0	0	1		0	0	0	0	1	0	0	0	0	1	1
Configuration				R						L					T	R
Volume (veh/h)				171						110					128	14
Percent Heavy Vehicles (%)				3						3						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized		No												Yes		
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)				6.2						4.1						
Critical Headway (sec)				6.23						4.13						
Base Follow-Up Headway (sec)				3.3						2.2						
Follow-Up Headway (sec)				3.33						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)				222						143						
Capacity, c (veh/h)				874						1408						
v/c Ratio				0.25						0.10						
95% Queue Length, Q_{95} (veh)				1.0						0.3						
Control Delay (s/veh)				10.5						7.8						
Level of Service (LOS)				B						A						
Approach Delay (s/veh)		10.5								7.8						
proach LOS		B														

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HCS7 Two-Way Stop-Control Report

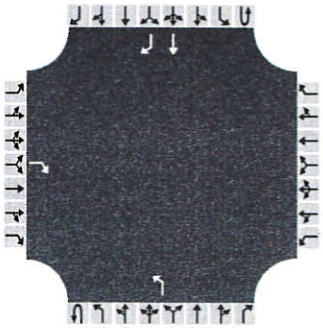
General Information

Analyst	Hien
gency/Co.	Caltrans
Date Performed	2/22/2019
Analysis Year	2035
Time Analyzed	PM Peak
Intersection Orientation	North-South
Project Description	Alt 1 & 2 - SR 99 SB Off-Ramp & Ave 394

Site Information

Intersection	SB Off-Ramp & Ave 394
Jurisdiction	
East/West Street	Ave 394
North/South Street	SB Off-Ramp
Peak Hour Factor	0.98
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
umber of Lanes		0	0	1		0	0	0	0	1	0	0	0	0	1	1
Configuration				R						L					T	R
Volume (veh/h)				124						110					135	56
Percent Heavy Vehicles (%)				1						2						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized		No												Yes		
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)				6.2						4.1						
Critical Headway (sec)				6.21						4.12						
Base Follow-Up Headway (sec)				3.3						2.2						
Follow-Up Headway (sec)				3.31						2.21						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)				127						112						
Capacity, c (veh/h)				913						1449						
v/c Ratio				0.14						0.08						
95% Queue Length, Q_{95} (veh)				0.5						0.3						
Control Delay (s/veh)				9.6						7.7						
Level of Service (LOS)				A						A						
Approach Delay (s/veh)		9.6								7.7						
pproach LOS		A														

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HCS 2010 All-Way Stop-Control Summary Report

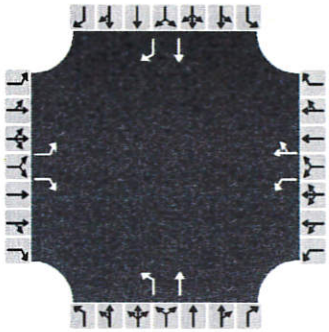
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	1/3/2019
Analysis Year	2045
Time Analyzed	0.25
Anaylysis Time Period (hrs)	AM Peak
Project Description	Alt 1-Reconstruct Ave 394/SB Off-Ramp Intersection

Site Information

Intersection	SR99 NB Off/Frontage Road
Jurisdiction	
East/West Street	Frontage Road
North/South Street	SR 99 NB Off-Ramp
Peak Hour Factor	0.82

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	9		34	77	0	251	131	624			765	198
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	L	R		L	TR		L	T		T	R	
Flow Rate, v (veh/h)	11	41		94	306		160	761		933	241	
Percent Heavy Vehicles	2	2		26	17		2	2		2	2	

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20	3.20		3.20	3.20		3.20	3.20		3.20	3.20	
Initial Degree of Utilization, x	0.010	0.037		0.083	0.272		0.142	0.676		0.829	0.215	
Final Departure Headway, hd (s)	9.49	8.33		8.95	7.61		7.82	7.33		7.28	6.59	
Final Degree of Utilization, x	0.029	0.096		0.233	0.647		0.347	1.549		1.886	0.442	
Move-Up Time, m (s)	2.3	2.3		2.3	2.3		2.3	2.3		2.3	2.3	
Service Time, ts (s)	7.19	6.03		6.65	5.31		5.52	5.03		4.98	4.29	

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	11	41		94	306		160	761		933	241	
Capacity	379	432		402	473		460	491		495	547	
95% Queue Length, Q_{95} (veh)	0.1	0.3		0.9	4.5		1.5	40.7		60.6	2.2	
Control Delay (s/veh)	12.5	11.9		14.4	23.2		14.6	276.4		423.5	14.4	
Level of Service, LOS	B	B		B	C		B	F		F	B	
Approach Delay (s/veh)	12.0			21.1			231.0			339.4		
Approach LOS	B			C			F			F		
Intersection Delay, s/veh | LOS	243.5						F					

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HCS 2010 All-Way Stop-Control Summary Report

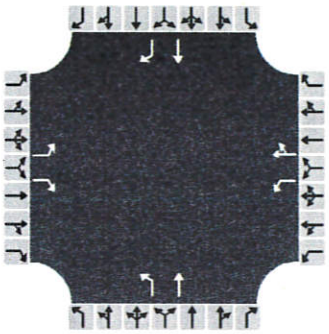
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	1/3/2019
Analysis Year	2045
Time Analyzed	0.25
Anaylysis Time Period (hrs)	PM Peak
Project Description	Alt 1-Reconstruct Ave 394/SB Off-Ramp Intersection

Site Information

Intersection	SR99 NB Off/Frontage Road
Jurisdiction	
East/West Street	Frontage Road
North/South Street	SR 99 NB Off-Ramp
Peak Hour Factor	0.85

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	32		32	65	36	318	126	676			534	140
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	L	R		L	TR		L	T		T	R	
Flow Rate, v (veh/h)	38	38		76	416		148	795		628	165	
Percent Heavy Vehicles	2	2		17	5		2	2		2	2	

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20	3.20		3.20	3.20		3.20	3.20		3.20	3.20	
Initial Degree of Utilization, x	0.033	0.033		0.068	0.370		0.132	0.707		0.558	0.146	
Final Departure Headway, hd (s)	9.70	8.55		8.83	7.51		8.21	7.71		7.72	7.03	
Final Degree of Utilization, x	0.101	0.089		0.187	0.869		0.338	1.704		1.347	0.322	
Move-Up Time, m (s)	2.3	2.3		2.3	2.3		2.3	2.3		2.3	2.3	
Service Time, ts (s)	7.40	6.25		6.53	5.21		5.91	5.41		5.42	4.73	

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	38	38		76	416		148	795		628	165	
Capacity	371	421		408	479		439	467		466	512	
95% Queue Length, Q_{95} (veh)	0.3	0.3		0.7	9.2		1.5	47.4		28.5	1.4	
Control Delay (s/veh)	13.5	12.1		13.6	42.4		15.0	345.0		192.4	13.0	
Level of Service, LOS	B	B		B	E		C	F		F	B	
Approach Delay (s/veh)	12.8			38.0			293.1			155.2		
Approach LOS	B			E			F			F		
Intersection Delay, s/veh | LOS	181.9						F					

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HCS 2010 All-Way Stop-Control Summary Report

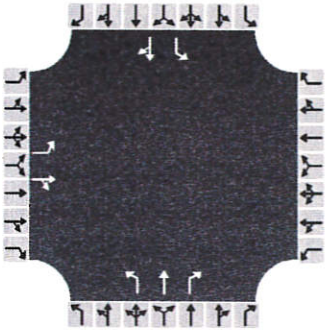
General Information

Analyst	Hien
gency/Co.	Caltrans
Date Performed	1/3/2019
Analysis Year	2045
Time Analyzed	0.25
Anaylysis Time Period (hrs)	AM Peak
Project Description	Alt 1-Reconstruct Ave 394/SB Off-Ramp Intersection

Site Information

Intersection	SR 99 SB On-Ramp/18th Ave
Jurisdiction	
East/West Street	Ave 394
North/South Street	18th Ave
Peak Hour Factor	0.83

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
'olume	305	23	38				9	450	112	337	412	128
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	L	TR					L	T	R	L	TR	
Flow Rate, v (veh/h)	367	73					11	542	135	406	651	
Percent Heavy Vehicles	2	2					2	2	7	2	2	

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20	3.20					3.20	3.20	3.20	3.20	3.20	
Initial Degree of Utilization, x	0.327	0.065					0.010	0.482	0.120	0.361	0.578	
Final Departure Headway, hd (s)	9.54	8.60					9.35	8.85	8.24	8.95	8.28	
Final Degree of Utilization, x	0.973	0.176					0.028	1.333	0.309	1.009	1.496	
Move-Up Time, m (s)	2.3	2.3					2.3	2.3	2.3	2.3	2.3	
Service Time, ts (s)	7.24	6.30					7.05	6.55	5.94	6.65	5.98	

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	367	73					11	542	135	406	651	
Capacity	378	419					385	407	437	402	435	
95% Queue Length, Q_{95} (veh)	11.1	0.6					0.1	25.1	1.3	12.6	34.1	
Control Delay (s/veh)	71.1	13.1					12.3	191.1	14.6	77.5	256.9	
Level of Service, LOS	F	B					B	F	B	F	F	
oproach Delay (s/veh)	61.5						153.7			188.0		
Approach LOS	F						F			F		
Intersection Delay, s/veh | LOS	151.7						F					

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HCS 2010 All-Way Stop-Control Summary Report

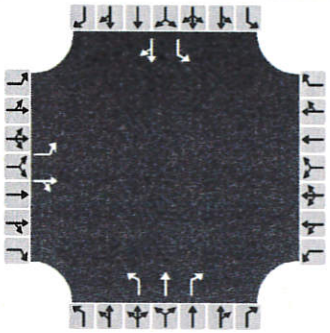
General Information

Analyst	Hien
,ency/Co.	Caltrans
Date Performed	1/3/2019
Analysis Year	2045
Time Analyzed	0.25
Anaylysis Time Period (hrs)	PM Peak
Project Description	Alt 1-Reconstruct Ave 394/SB Off-Ramp Intersection

Site Information

Intersection	SR 99 SB On-Ramp/18th Ave
Jurisdiction	
East/West Street	Ave 394
North/South Street	18th Ave
Peak Hour Factor	0.83

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
`lume	246	45	18				11	556	119	212	293	126
⁄o Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	L	TR					L	T	R	L	TR	
Flow Rate, v (veh/h)	296	76					13	670	143	255	505	
Percent Heavy Vehicles	2	2					2	2	6	2	2	

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20	3.20					3.20	3.20	3.20	3.20	3.20	
Initial Degree of Utilization, x	0.263	0.067					0.012	0.595	0.127	0.227	0.449	
Final Departure Headway, hd (s)	9.24	8.54					8.72	8.22	7.59	8.55	7.84	
Final Degree of Utilization, x	0.760	0.180					0.032	1.530	0.302	0.607	1.099	
Move-Up Time, m (s)	2.3	2.3					2.3	2.3	2.3	2.3	2.3	
Service Time, ts (s)	6.94	6.24					6.42	5.92	5.29	6.25	5.54	

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	296	76					13	670	143	255	505	
Capacity	390	422					413	438	474	421	459	
95% Queue Length, Q_{95} (veh)	6.2	0.6					0.1	36.0	1.3	3.9	16.9	
Control Delay (s/veh)	35.9	13.1					11.7	271.1	13.5	23.6	99.0	
Level of Service, LOS	E	B					B	F	B	C	F	
`pproach Delay (s/veh)	31.3						222.3			73.6		
Approach LOS	D						F			F		
Intersection Delay, s/veh | LOS	128.3						F					

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HCS7 Two-Way Stop-Control Report

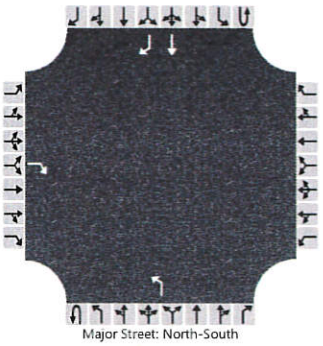
General Information

Analyst	Hien
ɟency/Co.	Caltrans
Date Performed	2/22/2019
Analysis Year	2045
Time Analyzed	AM Peak
Intersection Orientation	North-South
Project Description	Alt 1 & 2 - SR 99 SB Off-Ramp & Ave 394

Site Information

Intersection	SB Off-Ramp & Ave 394
Jurisdiction	
East/West Street	Ave 394
North/South Street	SB Off-Ramp
Peak Hour Factor	0.77
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
ımber of Lanes		0	0	1		0	0	0	0	1	0	0	0	0	1	1
Configuration				R						L					T	R
Volume (veh/h)				212						137					154	18
Percent Heavy Vehicles (%)				3						3						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized		No												Yes		
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)				6.2						4.1						
Critical Headway (sec)				6.23						4.13						
Base Follow-Up Headway (sec)				3.3						2.2						
Follow-Up Headway (sec)				3.33						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)				275						178						
Capacity, c (veh/h)				837						1369						
v/c Ratio				0.33						0.13						
95% Queue Length, Q_{95} (veh)				1.4						0.4						
Control Delay (s/veh)				11.4						8.0						
Level of Service (LOS)				B						A						
^ɒproach Delay (s/veh)		11.4								8.0						
,ɒroach LOS		B														

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HCS7 Two-Way Stop-Control Report

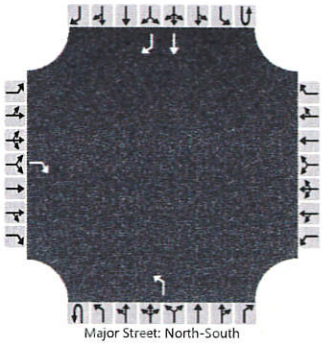
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	2/22/2019
Analysis Year	2045
Time Analyzed	PM Peak
Intersection Orientation	North-South
Project Description	Alt 1 & 2 - SR 99 SB Off-Ramp & Ave 394

Site Information

Intersection	SB Off-Ramp & Ave 394
Jurisdiction	
East/West Street	Ave 394
North/South Street	SB Off-Ramp
Peak Hour Factor	0.98
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	1		0	0	0	0	1	0	0	0	0	1	1
Configuration				R						L					T	R
Volume (veh/h)				155						137					154	70
Percent Heavy Vehicles (%)				1						2						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized		No												Yes		
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)				6.2						4.1						
Critical Headway (sec)				6.21						4.12						
Base Follow-Up Headway (sec)				3.3						2.2						
Follow-Up Headway (sec)				3.31						2.21						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)				158						140						
Capacity, c (veh/h)				890						1426						
v/c Ratio				0.18						0.10						
95% Queue Length, Q_{95} (veh)				0.6						0.3						
Control Delay (s/veh)				9.9						7.8						
Level of Service (LOS)				A						A						
Approach Delay (s/veh)		9.9								7.8						
Approach LOS		A														

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Mendocino Avenue Intersections

Alternative 2

Reconstruct Ave 394/SB Off Ramp and Signalized intersections at SB on and NB off Ramps Terminals

2025 Level of Service Reports

2035 Level of Service Reports

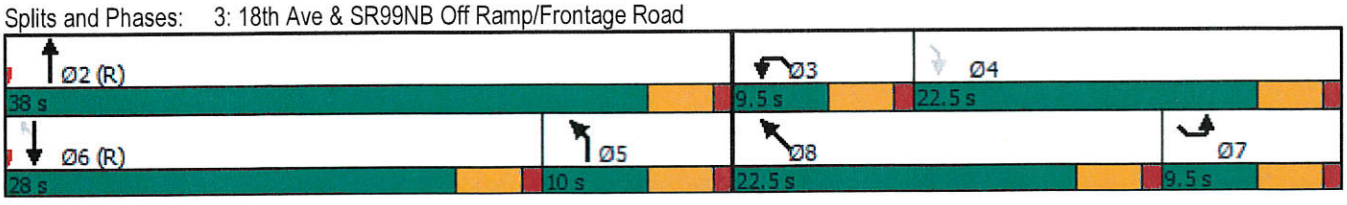
2045 Level of Service Reports

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	85	411	0	0	509	147	6	0	23	50	0	166
Future Volume (vph)	85	411	0	0	509	147	6	0	23	50	0	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	0		100	0		100	100		0
Storage Lanes	1		0	0		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850		0.850	
Flt Protected	0.950						0.950			0.950		
Satd. Flow (prot)	1770	1863	0	0	1863	1583	1770	0	1583	1770	1583	0
Flt Permitted	0.950						0.950			0.950		
Satd. Flow (perm)	1770	1863	0	0	1863	1583	1770	0	1583	1770	1583	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						234			164		419	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		668			641			822			1644	
Travel Time (s)		15.2			14.6			18.7			37.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	447	0	0	553	160	7	0	25	54	0	180
Shared Lane Traffic (%)												
Lane Group Flow (vph)	92	447	0	0	553	160	7	0	25	54	180	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2	1	1		1	1	2	
Detector Template	Left	Thru			Thru	Right	Left		Right	Left	Thru	
Leading Detector (ft)	20	100			100	20	20		20	20	100	
Trailing Detector (ft)	0	0			0	0	0		0	0	0	
Detector 1 Position(ft)	0	0			0	0	0		0	0	0	
Detector 1 Size(ft)	20	6			6	20	20		20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0	0.0	
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type	Prot	NA			NA	Perm	Prot		Perm	Prot	NA	
Protected Phases	5	2			6		7			3	8	
Permitted Phases						6			4			

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Detector Phase	5	2			6	6	7		4	3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0			5.0	5.0	5.0		5.0	5.0	5.0	
Minimum Split (s)	9.5	22.5			22.5	22.5	9.5		22.5	9.5	22.5	
Total Split (s)	10.0	38.0			28.0	28.0	9.5		22.5	9.5	22.5	
Total Split (%)	14.3%	54.3%			40.0%	40.0%	13.6%		32.1%	13.6%	32.1%	
Maximum Green (s)	5.5	33.5			23.5	23.5	5.0		18.0	5.0	18.0	
Yellow Time (s)	3.5	3.5			3.5	3.5	3.5		3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0			1.0	1.0	1.0		1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5			4.5	4.5	4.5		4.5	4.5	4.5	
Lead/Lag	Lag				Lead	Lead	Lag		Lag	Lead	Lead	
Lead-Lag Optimize?	Yes				Yes	Yes	Yes		Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0	3.0	3.0	
Recall Mode	None	C-Max			C-Max	C-Max	None		None	None	None	
Walk Time (s)		7.0			7.0	7.0			7.0		7.0	
Flash Dont Walk (s)		11.0			11.0	11.0			11.0		11.0	
Pedestrian Calls (#/hr)		0			0	0			0		0	
Act Effct Green (s)	5.5	51.4			43.4	43.4	5.9		5.8	5.1	7.4	
Actuated g/C Ratio	0.08	0.73			0.62	0.62	0.08		0.08	0.07	0.11	
v/c Ratio	0.66	0.33			0.48	0.15	0.05		0.09	0.42	0.33	
Control Delay	46.6	0.6			11.0	0.8	29.8		0.6	41.4	1.6	
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0	0.0	0.0	
Total Delay	46.6	0.6			11.0	0.8	29.8		0.6	41.4	1.6	
LOS	D	A			B	A	C		A	D	A	
Approach Delay		8.4			8.7			7.0			10.8	
Approach LOS		A			A			A			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 3 (4%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 8.9		Intersection LOS: A	
Intersection Capacity Utilization 53.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: 18th Ave & SR99NB Off Ramp/Frontage Road



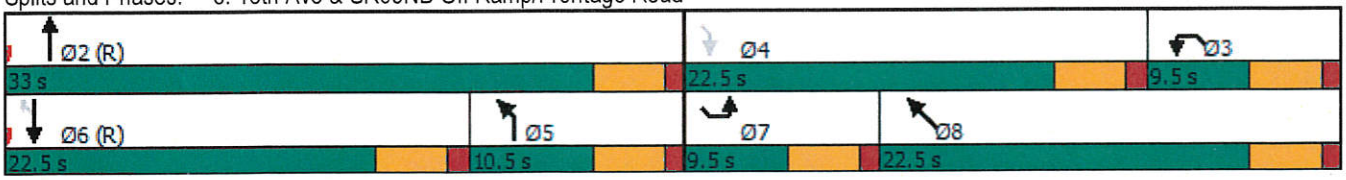
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	82	457	0	0	356	102	21	0	22	42	23	224
Future Volume (vph)	82	457	0	0	356	102	21	0	22	42	23	224
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	0		100	0		100	100		0
Storage Lanes	1		0	0		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850		0.864	
Flt Protected	0.950						0.950			0.950		
Satd. Flow (prot)	1770	1863	0	0	1863	1583	1770	0	1583	1770	1609	0
Flt Permitted	0.950						0.950			0.950		
Satd. Flow (perm)	1770	1863	0	0	1863	1583	1770	0	1583	1770	1609	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						252			176		243	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		668			641			822			1644	
Travel Time (s)		15.2			14.6			18.7			37.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	89	497	0	0	387	111	23	0	24	46	25	243
Shared Lane Traffic (%)												
Lane Group Flow (vph)	89	497	0	0	387	111	23	0	24	46	268	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2	1	1		1	1	2	
Detector Template	Left	Thru			Thru	Right	Left		Right	Left	Thru	
Leading Detector (ft)	20	100			100	20	20		20	20	100	
Trailing Detector (ft)	0	0			0	0	0		0	0	0	
Detector 1 Position(ft)	0	0			0	0	0		0	0	0	
Detector 1 Size(ft)	20	6			6	20	20		20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0	0.0	
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type	Prot	NA			NA	Perm	Prot		Perm	Prot	NA	
Protected Phases	5	2			6		7			3	8	
Permitted Phases						6			4			

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Detector Phase	5	2			6	6	7		4	3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0			5.0	5.0	5.0		5.0	5.0	5.0	
Minimum Split (s)	9.5	22.5			22.5	22.5	9.5		22.5	9.5	22.5	
Total Split (s)	10.5	33.0			22.5	22.5	9.5		22.5	9.5	22.5	
Total Split (%)	16.2%	50.8%			34.6%	34.6%	14.6%		34.6%	14.6%	34.6%	
Maximum Green (s)	6.0	28.5			18.0	18.0	5.0		18.0	5.0	18.0	
Yellow Time (s)	3.5	3.5			3.5	3.5	3.5		3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0			1.0	1.0	1.0		1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5			4.5	4.5	4.5		4.5	4.5	4.5	
Lead/Lag	Lag				Lead	Lead	Lead		Lead	Lag	Lag	
Lead-Lag Optimize?	Yes				Yes	Yes	Yes		Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0	3.0	3.0	
Recall Mode	None	C-Max			C-Max	C-Max	None		None	None	None	
Walk Time (s)		7.0			7.0	7.0			7.0		7.0	
Flash Dont Walk (s)		11.0			11.0	11.0			11.0		11.0	
Pedestrian Calls (#/hr)		0			0	0			0		0	
Act Effct Green (s)	5.9	43.9			35.5	35.5	5.0		5.5	8.2	8.3	
Actuated g/C Ratio	0.09	0.68			0.55	0.55	0.08		0.08	0.13	0.13	
v/c Ratio	0.55	0.40			0.38	0.11	0.17		0.08	0.21	0.64	
Control Delay	32.7	2.7			13.2	0.2	31.2		0.5	26.1	12.8	
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0	0.0	0.0	
Total Delay	32.7	2.7			13.2	0.2	31.2		0.5	26.1	12.8	
LOS	C	A			B	A	C		A	C	B	
Approach Delay		7.2			10.3			15.5			14.7	
Approach LOS		A			B			B			B	

Intersection Summary

Area Type: Other
Cycle Length: 65
Actuated Cycle Length: 65
Offset: 60 (92%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay: 10.2 Intersection LOS: B
Intersection Capacity Utilization 51.6% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3: 18th Ave & SR99NB Off Ramp/Frontage Road

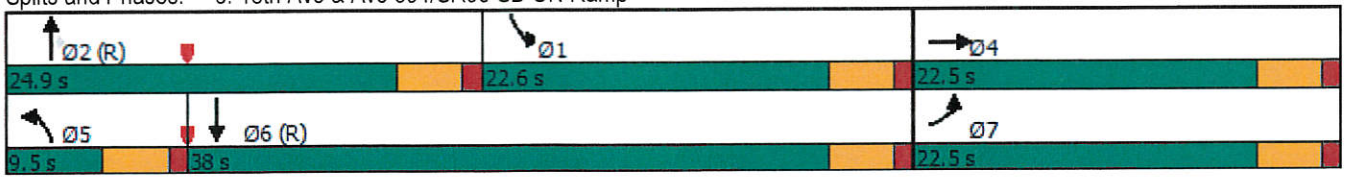


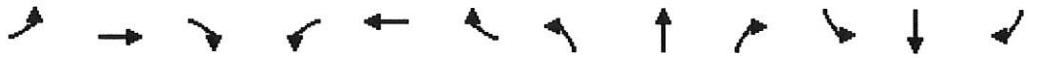
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	205	15	24	0	0	0	6	291	72	232	267	83
Future Volume (vph)	205	15	24	0	0	0	6	291	72	232	267	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	100		150	100		0
Storage Lanes	1		1	0		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.907							0.850		0.964	
Flt Protected	0.950						0.950			0.950		
Satd. Flow (prot)	1770	1690	0	0	0	0	1770	1863	1583	1770	1796	0
Flt Permitted	0.950						0.950			0.950		
Satd. Flow (perm)	1770	1690	0	0	0	0	1770	1863	1583	1770	1796	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26							94		31	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		670			1706			1221			668	
Travel Time (s)		15.2			38.8			27.8			15.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	223	16	26	0	0	0	7	316	78	252	290	90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	223	42	0	0	0	0	7	316	78	252	380	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2					1	2	1	1	2	
Detector Template	Left	Thru					Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100					20	100	20	20	100	
Trailing Detector (ft)	0	0					0	0	0	0	0	
Detector 1 Position(ft)	0	0					0	0	0	0	0	
Detector 1 Size(ft)	20	6					20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0					0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0					0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0					0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94						94			94	
Detector 2 Size(ft)		6						6			6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Prot	NA					Prot	NA	Perm	Prot	NA	
Protected Phases	7	4					5	2		1	6	
Permitted Phases									2			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4					5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0					5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5	22.5					9.5	22.5	22.5	9.5	22.5	
Total Split (s)	22.5	22.5					9.5	24.9	24.9	22.6	38.0	
Total Split (%)	32.1%	32.1%					13.6%	35.6%	35.6%	32.3%	54.3%	
Maximum Green (s)	18.0	18.0					5.0	20.4	20.4	18.1	33.5	
Yellow Time (s)	3.5	3.5					3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0					1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0					0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5					4.5	4.5	4.5	4.5	4.5	
Lead/Lag							Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0					3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None					None	C-Max	C-Max	None	C-Max	
Walk Time (s)		7.0						7.0	7.0		7.0	
Flash Dont Walk (s)		11.0						11.0	11.0		11.0	
Pedestrian Calls (#/hr)		0						0	0		0	
Act Effct Green (s)	13.7	13.7					5.6	24.7	24.7	18.1	45.4	
Actuated g/C Ratio	0.20	0.20					0.08	0.35	0.35	0.26	0.65	
v/c Ratio	0.64	0.12					0.05	0.48	0.13	0.55	0.32	
Control Delay	34.1	12.7					30.8	21.9	4.2	19.9	1.8	
Queue Delay	0.0	0.0					0.0	0.0	0.0	0.0	0.0	
Total Delay	34.1	12.7					30.8	21.9	4.2	19.9	1.8	
LOS	C	B					C	C	A	B	A	
Approach Delay		30.8						18.6			9.0	
Approach LOS		C						B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 8 (11%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 16.4		Intersection LOS: B	
Intersection Capacity Utilization 50.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 6: 18th Ave & Ave 394/SR99 SB ON Ramp



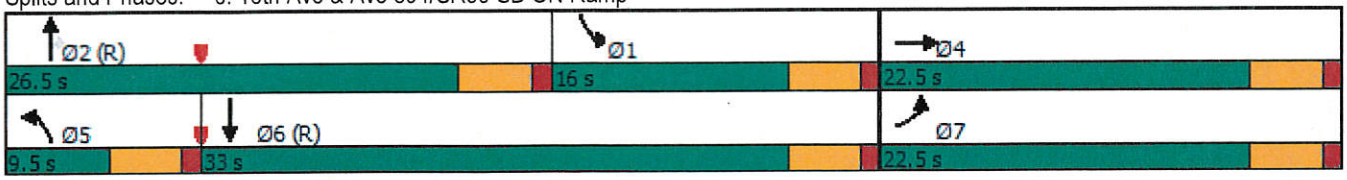


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	178	29	12	0	0	0	7	361	77	148	190	82
Future Volume (vph)	178	29	12	0	0	0	7	361	77	148	190	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	100		150	100		0
Storage Lanes	1		1	0		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.957							0.850		0.955	
Flt Protected	0.950						0.950			0.950		
Satd. Flow (prot)	1770	1783	0	0	0	0	1770	1863	1583	1770	1779	0
Flt Permitted	0.950						0.950			0.950		
Satd. Flow (perm)	1770	1783	0	0	0	0	1770	1863	1583	1770	1779	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13							101		42	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		670			1706			1221			668	
Travel Time (s)		15.2			38.8			27.8			15.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	193	32	13	0	0	0	8	392	84	161	207	89
Shared Lane Traffic (%)												
Lane Group Flow (vph)	193	45	0	0	0	0	8	392	84	161	296	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2					1	2	1	1	2	
Detector Template	Left	Thru					Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100					20	100	20	20	100	
Trailing Detector (ft)	0	0					0	0	0	0	0	
Detector 1 Position(ft)	0	0					0	0	0	0	0	
Detector 1 Size(ft)	20	6					20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0					0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0					0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0					0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94						94			94	
Detector 2 Size(ft)		6						6			6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Prot	NA					Prot	NA	Perm	Prot	NA	
Protected Phases	7	4					5	2		1	6	
Permitted Phases									2			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4					5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0					5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5	22.5					9.5	22.5	22.5	9.5	22.5	
Total Split (s)	22.5	22.5					9.5	26.5	26.5	16.0	33.0	
Total Split (%)	34.6%	34.6%					14.6%	40.8%	40.8%	24.6%	50.8%	
Maximum Green (s)	18.0	18.0					5.0	22.0	22.0	11.5	28.5	
Yellow Time (s)	3.5	3.5					3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0					1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0					0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5					4.5	4.5	4.5	4.5	4.5	
Lead/Lag							Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0					3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None					None	C-Max	C-Max	None	C-Max	
Walk Time (s)		7.0						7.0	7.0		7.0	
Flash Dont Walk (s)		11.0						11.0	11.0		11.0	
Pedestrian Calls (#/hr)		0						0	0		0	
Act Effct Green (s)	12.3	12.3					5.8	30.9	30.9	10.6	41.6	
Actuated g/C Ratio	0.19	0.19					0.09	0.48	0.48	0.16	0.64	
v/c Ratio	0.58	0.13					0.05	0.44	0.10	0.56	0.26	
Control Delay	30.4	16.5					27.7	16.0	3.1	22.0	1.1	
Queue Delay	0.0	0.0					0.0	0.0	0.0	0.0	0.0	
Total Delay	30.4	16.5					27.7	16.0	3.1	22.0	1.1	
LOS	C	B					C	B	A	C	A	
Approach Delay		27.8						14.0			8.4	
Approach LOS		C						B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 65			
Actuated Cycle Length: 65			
Offset: 64 (98%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay: 14.6		Intersection LOS: B	
Intersection Capacity Utilization 48.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 6: 18th Ave & Ave 394/SR99 SB ON Ramp



HCS7 Two-Way Stop-Control Report

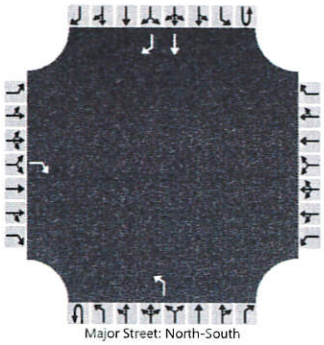
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	2/22/2019
Analysis Year	2025
Time Analyzed	AM Peak
Intersection Orientation	North-South
Project Description	Alt 1 & 2 - SR 99 SB Off-Ramp & Ave 394

Site Information

Intersection	SB Off-Ramp & Ave 394
Jurisdiction	
East/West Street	Ave 394
North/South Street	SB Off-Ramp
Peak Hour Factor	0.77
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	1		0	0	0	0	1	0	0	0	0	1	1
Configuration				R						L					T	R
Volume (veh/h)				137						89					107	12
Percent Heavy Vehicles (%)				3						3						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized		No												Yes		
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)				6.2						4.1						
Critical Headway (sec)				6.23						4.13						
Base Follow-Up Headway (sec)				3.3						2.2						
Follow-Up Headway (sec)				3.33						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)				178						116						
Capacity, c (veh/h)				906						1441						
v/c Ratio				0.20						0.08						
95% Queue Length, Q_{95} (veh)				0.7						0.3						
Control Delay (s/veh)				9.9						7.7						
Level of Service (LOS)				A						A						
Approach Delay (s/veh)		9.9								7.7						
Approach LOS		A														

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HCS7 Two-Way Stop-Control Report

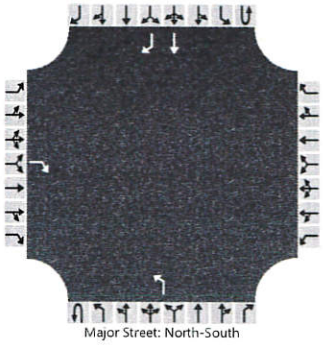
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	2/22/2019
Analysis Year	2025
Time Analyzed	PM Peak
Intersection Orientation	North-South
Project Description	Alt 1 & 2 - SR 99 SB Off-Ramp & Ave 394

Site Information

Intersection	SB Off-Ramp & Ave 394
Jurisdiction	
East/West Street	Ave 394
North/South Street	SB Off-Ramp
Peak Hour Factor	0.98
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	1		0	0	0	0	1	0	0	0	0	1	1
Configuration				R						L					T	R
Volume (veh/h)				100						89					119	45
Percent Heavy Vehicles (%)				1						2						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized		No												Yes		
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)				6.2						4.1						
Critical Headway (sec)				6.21						4.12						
Base Follow-Up Headway (sec)				3.3						2.2						
Follow-Up Headway (sec)				3.31						2.21						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)				102						91						
Capacity, c (veh/h)				932						1469						
v/c Ratio				0.11						0.06						
95% Queue Length, Q_{95} (veh)				0.4						0.2						
Control Delay (s/veh)				9.3						7.6						
Level of Service (LOS)				A						A						
Approach Delay (s/veh)		9.3								7.6						
Approach LOS		A														

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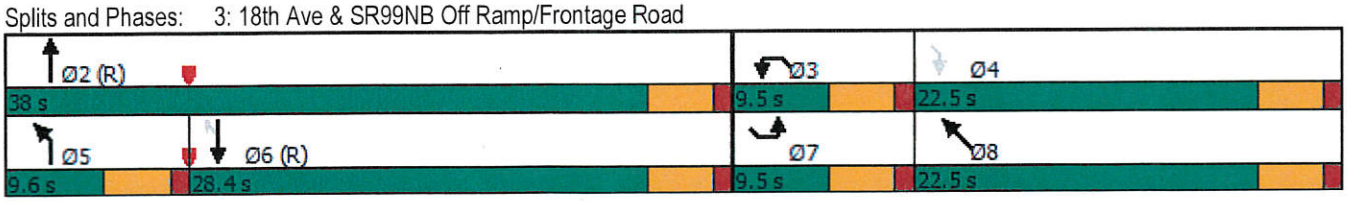
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	106	506	0	0	623	170	7	0	29	62	0	204
Future Volume (vph)	106	506	0	0	623	170	7	0	29	62	0	204
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	0		100	0		100	100		0
Storage Lanes	1		0	0		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850		0.850	
Flt Protected	0.950						0.950			0.950		
Satd. Flow (prot)	1770	1863	0	0	1863	1583	1770	0	1583	1770	1583	0
Flt Permitted	0.950						0.950			0.950		
Satd. Flow (perm)	1770	1863	0	0	1863	1583	1770	0	1583	1770	1583	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						164			164		347	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		668			641			828			1644	
Travel Time (s)		15.2			14.6			18.8			37.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	115	550	0	0	677	185	8	0	32	67	0	222
Shared Lane Traffic (%)												
Lane Group Flow (vph)	115	550	0	0	677	185	8	0	32	67	222	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2	1	1		1	1	2	
Detector Template	Left	Thru			Thru	Right	Left		Right	Left	Thru	
Leading Detector (ft)	20	100			100	20	20		20	20	100	
Trailing Detector (ft)	0	0			0	0	0		0	0	0	
Detector 1 Position(ft)	0	0			0	0	0		0	0	0	
Detector 1 Size(ft)	20	6			6	20	20		20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0	0.0	
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type	Prot	NA			NA	Perm	Prot		Perm	Prot	NA	
Protected Phases	5	2			6		7			3	8	
Permitted Phases						6			4			

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Detector Phase	5	2			6	6	7		4	3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0			5.0	5.0	5.0		5.0	5.0	5.0	
Minimum Split (s)	9.5	22.5			22.5	22.5	9.5		22.5	9.5	22.5	
Total Split (s)	9.6	38.0			28.4	28.4	9.5		22.5	9.5	22.5	
Total Split (%)	13.7%	54.3%			40.6%	40.6%	13.6%		32.1%	13.6%	32.1%	
Maximum Green (s)	5.1	33.5			23.9	23.9	5.0		18.0	5.0	18.0	
Yellow Time (s)	3.5	3.5			3.5	3.5	3.5		3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0			1.0	1.0	1.0		1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5			4.5	4.5	4.5		4.5	4.5	4.5	
Lead/Lag	Lead				Lag	Lag	Lead		Lag	Lead	Lag	
Lead-Lag Optimize?	Yes				Yes	Yes	Yes		Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0	3.0	3.0	
Recall Mode	None	C-Max			C-Max	C-Max	None		None	None	None	
Walk Time (s)		7.0			7.0	7.0			7.0		7.0	
Flash Dont Walk (s)		11.0			11.0	11.0			11.0		11.0	
Pedestrian Calls (#/hr)		0			0	0			0		0	
Act Effct Green (s)	11.0	51.6			36.1	36.1	5.0		5.6	5.2	7.5	
Actuated g/C Ratio	0.16	0.74			0.52	0.52	0.07		0.08	0.07	0.11	
v/c Ratio	0.41	0.40			0.71	0.21	0.06		0.12	0.51	0.46	
Control Delay	39.3	3.4			21.3	3.9	31.6		0.8	46.5	3.5	
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0	0.0	0.0	
Total Delay	39.3	3.4			21.3	3.9	31.6		0.8	46.5	3.5	
LOS	D	A			C	A	C		A	D	A	
Approach Delay		9.6			17.6			7.0			13.5	
Approach LOS		A			B			A			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 11 (16%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 13.8		Intersection LOS: B	
Intersection Capacity Utilization 62.5%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 3: 18th Ave & SR99NB Off Ramp/Frontage Road

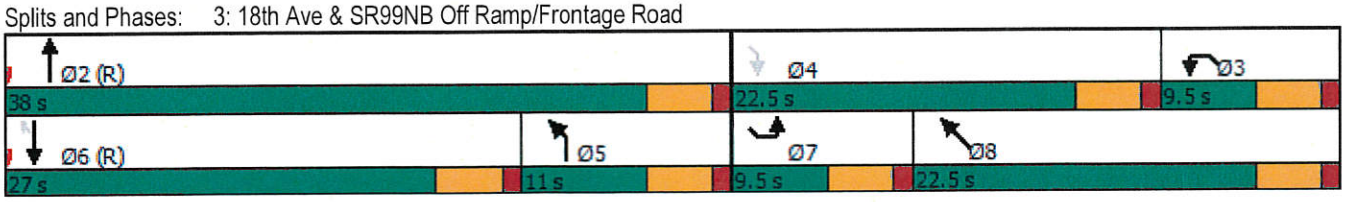


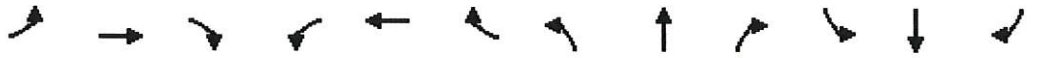
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	101	554	0	0	435	119	26	0	26	52	29	266
Future Volume (vph)	101	554	0	0	435	119	26	0	26	52	29	266
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	0		100	0		100	100		0
Storage Lanes	1		0	0		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850		0.865	
Flt Protected	0.950						0.950			0.950		
Satd. Flow (prot)	1770	1863	0	0	1863	1583	1770	0	1583	1770	1611	0
Flt Permitted	0.950						0.950			0.950		
Satd. Flow (perm)	1770	1863	0	0	1863	1583	1770	0	1583	1770	1611	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						234			164		276	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		668			641			828			1644	
Travel Time (s)		15.2			14.6			18.8			37.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	110	602	0	0	473	129	28	0	28	57	32	289
Shared Lane Traffic (%)												
Lane Group Flow (vph)	110	602	0	0	473	129	28	0	28	57	321	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2	1	1		1	1	2	
Detector Template	Left	Thru			Thru	Right	Left		Right	Left	Thru	
Leading Detector (ft)	20	100			100	20	20		20	20	100	
Trailing Detector (ft)	0	0			0	0	0		0	0	0	
Detector 1 Position(ft)	0	0			0	0	0		0	0	0	
Detector 1 Size(ft)	20	6			6	20	20		20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0	0.0	
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type	Prot	NA			NA	Perm	Prot		Perm	Prot	NA	
Protected Phases	5	2			6		7			3	8	
Permitted Phases						6			4			

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Detector Phase	5	2			6	6	7		4	3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0			5.0	5.0	5.0		5.0	5.0	5.0	
Minimum Split (s)	9.5	22.5			22.5	22.5	9.5		22.5	9.5	22.5	
Total Split (s)	11.0	38.0			27.0	27.0	9.5		22.5	9.5	22.5	
Total Split (%)	15.7%	54.3%			38.6%	38.6%	13.6%		32.1%	13.6%	32.1%	
Maximum Green (s)	6.5	33.5			22.5	22.5	5.0		18.0	5.0	18.0	
Yellow Time (s)	3.5	3.5			3.5	3.5	3.5		3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0			1.0	1.0	1.0		1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5			4.5	4.5	4.5		4.5	4.5	4.5	
Lead/Lag	Lag				Lead	Lead	Lead		Lead	Lag	Lag	
Lead-Lag Optimize?	Yes				Yes	Yes	Yes		Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0	3.0	3.0	
Recall Mode	None	C-Max			C-Max	C-Max	None		None	None	None	
Walk Time (s)		7.0			7.0	7.0			7.0		7.0	
Flash Dont Walk (s)		11.0			11.0	11.0			11.0		11.0	
Pedestrian Calls (#/hr)		0			0	0			0		0	
Act Effct Green (s)	6.5	47.9			39.1	39.1	5.0		5.5	9.3	9.3	
Actuated g/C Ratio	0.09	0.68			0.56	0.56	0.07		0.08	0.13	0.13	
v/c Ratio	0.67	0.47			0.46	0.13	0.22		0.10	0.24	0.71	
Control Delay	41.2	3.2			15.3	0.3	35.2		0.7	27.7	14.8	
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0	0.0	0.0	
Total Delay	41.2	3.2			15.3	0.3	35.2		0.7	27.7	14.8	
LOS	D	A			B	A	D		A	C	B	
Approach Delay		9.1			12.1			18.0			16.8	
Approach LOS		A			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 4 (6%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 12.1		Intersection LOS: B	
Intersection Capacity Utilization 60.9%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 3: 18th Ave & SR99NB Off Ramp/Frontage Road



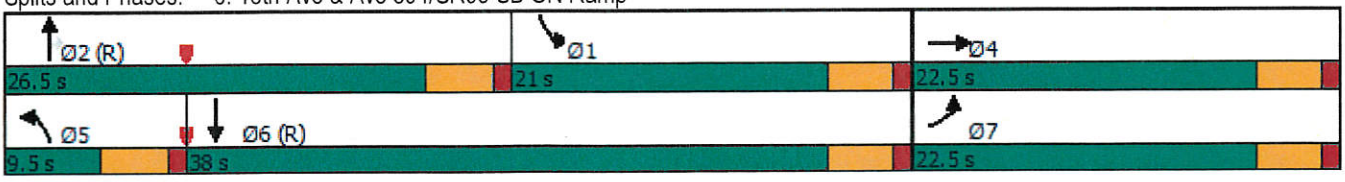


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	250	19	30	0	0	0	7	362	90	279	332	103
Future Volume (vph)	250	19	30	0	0	0	7	362	90	279	332	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	100		150	100		0
Storage Lanes	1		0	0		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.908							0.850		0.964	
Flt Protected	0.950						0.950			0.950		
Satd. Flow (prot)	1770	1691	0	0	0	0	1770	1863	1583	1770	1796	0
Flt Permitted	0.950						0.950			0.950		
Satd. Flow (perm)	1770	1691	0	0	0	0	1770	1863	1583	1770	1796	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		33							98		31	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		774			1706			1221			668	
Travel Time (s)		17.6			38.8			27.8			15.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	272	21	33	0	0	0	8	393	98	303	361	112
Shared Lane Traffic (%)												
Lane Group Flow (vph)	272	54	0	0	0	0	8	393	98	303	473	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2					1	2	1	1	2	
Detector Template	Left	Thru					Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100					20	100	20	20	100	
Trailing Detector (ft)	0	0					0	0	0	0	0	
Detector 1 Position(ft)	0	0					0	0	0	0	0	
Detector 1 Size(ft)	20	6					20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0					0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0					0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0					0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94						94			94	
Detector 2 Size(ft)		6						6			6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Prot	NA					Prot	NA	Perm	Prot	NA	
Protected Phases	7	4					5	2		1	6	
Permitted Phases									2			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4					5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0					5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5	22.5					9.5	22.5	22.5	9.5	22.5	
Total Split (s)	22.5	22.5					9.5	26.5	26.5	21.0	38.0	
Total Split (%)	32.1%	32.1%					13.6%	37.9%	37.9%	30.0%	54.3%	
Maximum Green (s)	18.0	18.0					5.0	22.0	22.0	16.5	33.5	
Yellow Time (s)	3.5	3.5					3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0					1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0					0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5					4.5	4.5	4.5	4.5	4.5	
Lead/Lag							Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0					3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None					None	C-Max	C-Max	None	C-Max	
Walk Time (s)		7.0						7.0	7.0		7.0	
Flash Dont Walk (s)		11.0						11.0	11.0		11.0	
Pedestrian Calls (#/hr)		0						0	0		0	
Act Effct Green (s)	15.1	15.1					5.4	24.9	24.9	16.5	44.0	
Actuated g/C Ratio	0.22	0.22					0.08	0.36	0.36	0.24	0.63	
v/c Ratio	0.72	0.14					0.06	0.59	0.16	0.73	0.41	
Control Delay	36.1	12.1					31.3	23.9	5.1	23.6	2.8	
Queue Delay	0.0	0.0					0.0	0.0	0.0	0.0	0.0	
Total Delay	36.1	12.1					31.3	23.9	5.1	23.6	2.8	
LOS	D	B					C	C	A	C	A	
Approach Delay		32.1						20.3			11.0	
Approach LOS		C						C			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 16 (23%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 18.2		Intersection LOS: B	
Intersection Capacity Utilization 59.6%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 6: 18th Ave & Ave 394/SR99 SB ON Ramp

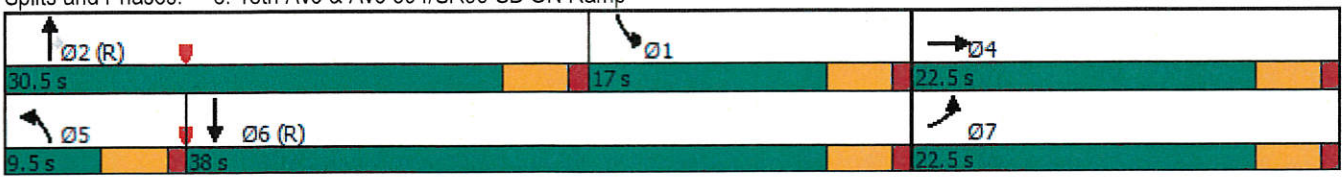


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	208	36	14	0	0	0	9	447	96	176	236	101
Future Volume (vph)	208	36	14	0	0	0	9	447	96	176	236	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	100		150	100		0
Storage Lanes	1		0	0		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.958							0.850		0.955	
Flt Protected	0.950						0.950			0.950		
Satd. Flow (prot)	1770	1785	0	0	0	0	1770	1863	1583	1770	1779	0
Flt Permitted	0.950						0.950			0.950		
Satd. Flow (perm)	1770	1785	0	0	0	0	1770	1863	1583	1770	1779	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15							104		42	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		774			1706			1221			668	
Travel Time (s)		17.6			38.8			27.8			15.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	226	39	15	0	0	0	10	486	104	191	257	110
Shared Lane Traffic (%)												
Lane Group Flow (vph)	226	54	0	0	0	0	10	486	104	191	367	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2					1	2	1	1	2	
Detector Template	Left	Thru					Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100					20	100	20	20	100	
Trailing Detector (ft)	0	0					0	0	0	0	0	
Detector 1 Position(ft)	0	0					0	0	0	0	0	
Detector 1 Size(ft)	20	6					20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0					0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0					0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0					0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94						94			94	
Detector 2 Size(ft)		6						6			6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Prot	NA					Prot	NA	Perm	Prot	NA	
Protected Phases	7	4					5	2		1	6	
Permitted Phases									2			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4					5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0					5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5	22.5					9.5	22.5	22.5	9.5	22.5	
Total Split (s)	22.5	22.5					9.5	30.5	30.5	17.0	38.0	
Total Split (%)	32.1%	32.1%					13.6%	43.6%	43.6%	24.3%	54.3%	
Maximum Green (s)	18.0	18.0					5.0	26.0	26.0	12.5	33.5	
Yellow Time (s)	3.5	3.5					3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0					1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0					0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5					4.5	4.5	4.5	4.5	4.5	
Lead/Lag							Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0					3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None					None	C-Max	C-Max	None	C-Max	
Walk Time (s)		7.0						7.0	7.0		7.0	
Flash Dont Walk (s)		11.0						11.0	11.0		11.0	
Pedestrian Calls (#/hr)		0						0	0		0	
Act Effct Green (s)	13.8	13.8					5.6	30.2	30.2	12.5	45.3	
Actuated g/C Ratio	0.20	0.20					0.08	0.43	0.43	0.18	0.65	
v/c Ratio	0.65	0.15					0.07	0.61	0.14	0.60	0.31	
Control Delay	34.3	17.7					31.1	20.3	4.0	23.9	1.3	
Queue Delay	0.0	0.0					0.0	0.0	0.0	0.0	0.0	
Total Delay	34.3	17.7					31.1	20.3	4.0	23.9	1.3	
LOS	C	B					C	C	A	C	A	
Approach Delay		31.1						17.7			9.0	
Approach LOS		C						B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 8 (11%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 16.9		Intersection LOS: B	
Intersection Capacity Utilization 56.1%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 6: 18th Ave & Ave 394/SR99 SB ON Ramp



HCS7 Two-Way Stop-Control Report

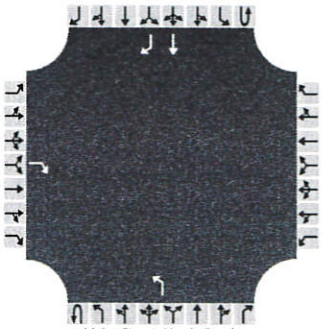
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	2/22/2019
Analysis Year	2035
Time Analyzed	AM Peak
Intersection Orientation	North-South
Project Description	Alt 1 & 2 - SR 99 SB Off-Ramp & Ave 394

Site Information

Intersection	SB Off-Ramp & Ave 394
Jurisdiction	
East/West Street	Ave 394
North/South Street	SB Off-Ramp
Peak Hour Factor	0.77
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	1		0	0	0	0	1	0	0	0	0	1	1
Configuration				R						L					T	R
Volume (veh/h)				171						110					128	14
Percent Heavy Vehicles (%)				3						3						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized		No												Yes		
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)				6.2						4.1						
Critical Headway (sec)				6.23						4.13						
Base Follow-Up Headway (sec)				3.3						2.2						
Follow-Up Headway (sec)				3.33						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)				222						143						
Capacity, c (veh/h)				874						1408						
v/c Ratio				0.25						0.10						
95% Queue Length, Q_{95} (veh)				1.0						0.3						
Control Delay (s/veh)				10.5						7.8						
Level of Service (LOS)				B						A						
Approach Delay (s/veh)		10.5								7.8						
Approach LOS		B														

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HCS7 Two-Way Stop-Control Report

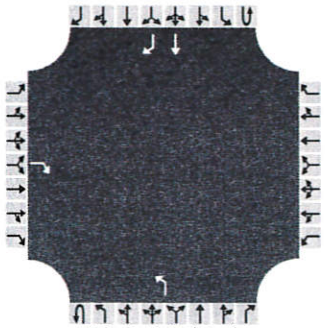
General Information

Analyst	Hien
,ency/Co.	Caltrans
Date Performed	2/22/2019
Analysis Year	2035
Time Analyzed	PM Peak
Intersection Orientation	North-South
Project Description	Alt 1 & 2 - SR 99 SB Off-Ramp & Ave 394

Site Information

Intersection	SB Off-Ramp & Ave 394
Jurisdiction	
East/West Street	Ave 394
North/South Street	SB Off-Ramp
Peak Hour Factor	0.98
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
ıber of Lanes		0	0	1		0	0	0	0	1	0	0	0	0	1	1
Configuration				R						L					T	R
Volume (veh/h)				124						110					135	56
Percent Heavy Vehicles (%)				1						2						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized		No												Yes		
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)				6.2						4.1						
Critical Headway (sec)				6.21						4.12						
Base Follow-Up Headway (sec)				3.3						2.2						
Follow-Up Headway (sec)				3.31						2.21						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)				127						112						
Capacity, c (veh/h)				913						1449						
v/c Ratio				0.14						0.08						
95% Queue Length, Q_{95} (veh)				0.5						0.3						
Control Delay (s/veh)				9.6						7.7						
Level of Service (LOS)				A						A						
^pproach Delay (s/veh)		9.6								7.7						
proach LOS		A														

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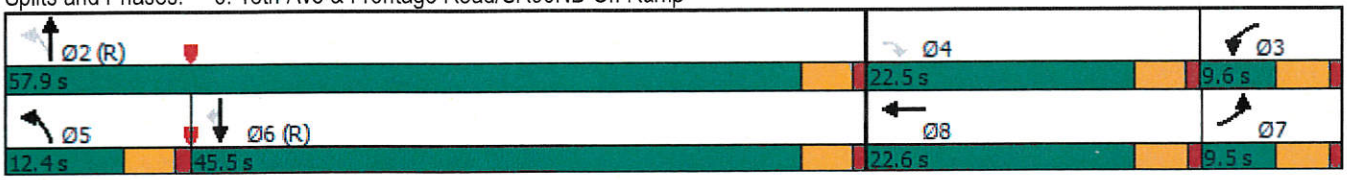
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	0	34	77	1	251	131	624	0	0	765	198
Future Volume (vph)	10	0	34	77	1	251	131	624	0	0	765	198
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	100		0	100		0	0		100
Storage Lanes	1		1	1		0	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.851							0.850
Flt Protected	0.950			0.950			0.950					
Satd. Flow (prot)	1770	0	1583	1770	1585	0	1770	1863	0	0	1863	1583
Flt Permitted	0.950			0.950			0.108					
Satd. Flow (perm)	1770	0	1583	1770	1585	0	201	1863	0	0	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127		273							127
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1111			1631			671			641	
Travel Time (s)		25.3			37.1			15.3			14.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	0	37	84	1	273	142	678	0	0	832	215
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	0	37	84	274	0	142	678	0	0	832	215
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1		1	1	2		1	2			2	1
Detector Template	Left		Right	Left	Thru		Left	Thru			Thru	Right
Leading Detector (ft)	20		20	20	100		20	100			100	20
Trailing Detector (ft)	0		0	0	0		0	0			0	0
Detector 1 Position(ft)	0		0	0	0		0	0			0	0
Detector 1 Size(ft)	20		20	20	6		20	6			6	20
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0	0.0	0.0		0.0	0.0			0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0		0.0	0.0			0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0		0.0	0.0			0.0	0.0
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type	Prot		Perm	Prot	NA		pm+pt	NA			NA	Perm
Protected Phases	7			3	8		5	2			6	
Permitted Phases			4				2					6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7		4	3	8		5	2			6	6
Switch Phase												
Minimum Initial (s)	5.0		5.0	5.0	5.0		5.0	5.0			5.0	5.0
Minimum Split (s)	9.5		22.5	9.5	22.5		9.5	22.5			22.5	22.5
Total Split (s)	9.5		22.5	9.6	22.6		12.4	57.9			45.5	45.5
Total Split (%)	10.6%		25.0%	10.7%	25.1%		13.8%	64.3%			50.6%	50.6%
Maximum Green (s)	5.0		18.0	5.1	18.1		7.9	53.4			41.0	41.0
Yellow Time (s)	3.5		3.5	3.5	3.5		3.5	3.5			3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0		1.0	1.0			1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0		0.0	0.0			0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5		4.5	4.5			4.5	4.5
Lead/Lag	Lag		Lead	Lag	Lead		Lead				Lag	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes							
Vehicle Extension (s)	3.0		3.0	3.0	3.0		3.0	3.0			3.0	3.0
Recall Mode	None		None	None	None		None	C-Max			C-Max	C-Max
Walk Time (s)			7.0		7.0			7.0			7.0	7.0
Flash Dont Walk (s)			11.0		11.0			11.0			11.0	11.0
Pedestrian Calls (#/hr)			0		0			0			0	0
Act Effct Green (s)	6.2		5.5	11.2	14.8		63.8	63.8			51.5	51.5
Actuated g/C Ratio	0.07		0.06	0.12	0.16		0.71	0.71			0.57	0.57
v/c Ratio	0.09		0.17	0.38	0.56		0.51	0.51			0.78	0.22
Control Delay	40.5		1.7	40.3	9.2		17.9	1.7			24.7	6.2
Queue Delay	0.0		0.0	0.0	0.0		0.0	0.1			0.0	0.0
Total Delay	40.5		1.7	40.3	9.2		17.9	1.7			24.7	6.2
LOS	D		A	D	A		B	A			C	A
Approach Delay		10.6			16.5			4.5			20.9	
Approach LOS		B			B			A			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 42 (47%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 14.1		Intersection LOS: B	
Intersection Capacity Utilization 74.4%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: 18th Ave & Frontage Road/SR99NB Off Ramp



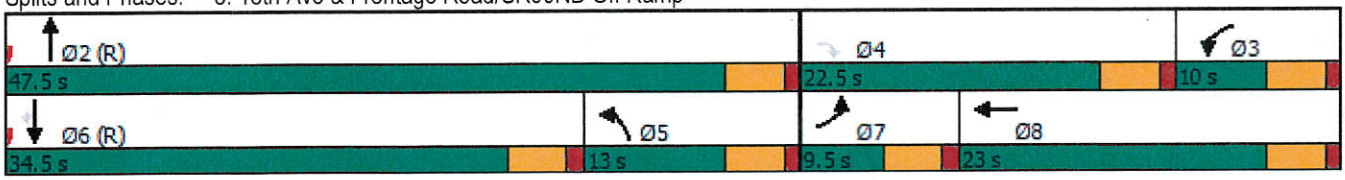
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	0	32	65	36	318	126	676	0	0	534	140
Future Volume (vph)	32	0	32	65	36	318	126	676	0	0	534	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	100		0	100		0	0		100
Storage Lanes	1		1	1		0	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.865							0.850
Flt Protected	0.950			0.950			0.950					
Satd. Flow (prot)	1770	0	1583	1770	1611	0	1770	1863	0	0	1863	1583
Flt Permitted	0.950			0.950			0.950					
Satd. Flow (perm)	1770	0	1583	1770	1611	0	1770	1863	0	0	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			143		221							205
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1111			1630			671			963	
Travel Time (s)		25.3			37.0			15.3			21.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	0	35	71	39	346	137	735	0	0	580	152
Shared Lane Traffic (%)												
Lane Group Flow (vph)	35	0	35	71	385	0	137	735	0	0	580	152
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1		1	1	2		1	2			2	1
Detector Template	Left		Right	Left	Thru		Left	Thru			Thru	Right
Leading Detector (ft)	20		20	20	100		20	100			100	20
Trailing Detector (ft)	0		0	0	0		0	0			0	0
Detector 1 Position(ft)	0		0	0	0		0	0			0	0
Detector 1 Size(ft)	20		20	20	6		20	6			6	20
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0	0.0	0.0		0.0	0.0			0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0		0.0	0.0			0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0		0.0	0.0			0.0	0.0
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type	Prot		Perm	Prot	NA		Prot	NA			NA	Perm
Protected Phases	7			3	8		5	2			6	
Permitted Phases			4									6

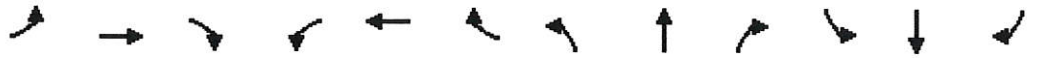
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7		4	3	8		5	2			6	6
Switch Phase												
Minimum Initial (s)	5.0		5.0	5.0	5.0		5.0	5.0			5.0	5.0
Minimum Split (s)	9.5		22.5	9.5	22.5		9.5	22.5			22.5	22.5
Total Split (s)	9.5		22.5	10.0	23.0		13.0	47.5			34.5	34.5
Total Split (%)	11.9%		28.1%	12.5%	28.8%		16.3%	59.4%			43.1%	43.1%
Maximum Green (s)	5.0		18.0	5.5	18.5		8.5	43.0			30.0	30.0
Yellow Time (s)	3.5		3.5	3.5	3.5		3.5	3.5			3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0		1.0	1.0			1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0		0.0	0.0			0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5		4.5	4.5			4.5	4.5
Lead/Lag	Lead		Lead	Lag	Lag		Lag				Lead	Lead
Lead-Lag Optimize?	Yes		Yes	Yes	Yes							
Vehicle Extension (s)	3.0		3.0	3.0	3.0		3.0	3.0			3.0	3.0
Recall Mode	None		None	None	None		None	C-Max			C-Max	C-Max
Walk Time (s)			7.0		7.0			7.0			7.0	7.0
Flash Dont Walk (s)			11.0		11.0			11.0			11.0	11.0
Pedestrian Calls (#/hr)			0		0			0			0	0
Act Effct Green (s)	5.0		5.5	13.4	13.7		8.5	51.6			38.6	38.6
Actuated g/C Ratio	0.06		0.07	0.17	0.17		0.11	0.64			0.48	0.48
v/c Ratio	0.32		0.14	0.24	0.84		0.73	0.61			0.65	0.17
Control Delay	43.9		1.2	28.7	29.9		42.6	4.1			23.2	1.6
Queue Delay	0.0		0.0	0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	43.9		1.2	28.7	29.9		42.6	4.1			23.2	1.6
LOS	D		A	C	C		D	A			C	A
Approach Delay		22.6			29.7			10.2			18.7	
Approach LOS		C			C			B			B	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 12 (15%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 17.7 Intersection LOS: B
Intersection Capacity Utilization 72.5% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 3: 18th Ave & Frontage Road/SR99NB Off Ramp



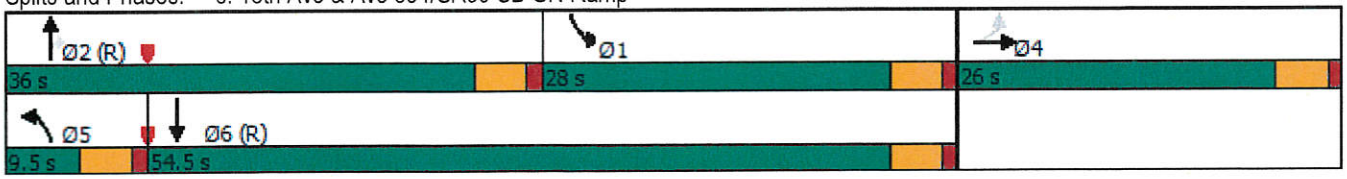


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	305	23	38	0	0	0	9	450	112	337	412	128
Future Volume (vph)	305	23	38	0	0	0	9	450	112	337	412	128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	100		150	100		0
Storage Lanes	1		1	0		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.907							0.850		0.964	
Flt Protected	0.950						0.950			0.950		
Satd. Flow (prot)	1770	1690	0	0	0	0	1770	1863	1583	1770	1796	0
Flt Permitted	0.950						0.950			0.950		
Satd. Flow (perm)	1770	1690	0	0	0	0	1770	1863	1583	1770	1796	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		41							107		28	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		704			1706			1221			671	
Travel Time (s)		16.0			38.8			27.8			15.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	332	25	41	0	0	0	10	489	122	366	448	139
Shared Lane Traffic (%)												
Lane Group Flow (vph)	332	66	0	0	0	0	10	489	122	366	587	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2					1	2	1	1	2	
Detector Template	Left	Thru					Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100					20	100	20	20	100	
Trailing Detector (ft)	0	0					0	0	0	0	0	
Detector 1 Position(ft)	0	0					0	0	0	0	0	
Detector 1 Size(ft)	20	6					20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0					0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0					0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0					0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94						94			94	
Detector 2 Size(ft)		6						6			6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA					Prot	NA	Perm	Prot	NA	
Protected Phases		4					5	2		1	6	
Permitted Phases	4								2			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4					5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0					5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5					9.5	22.5	22.5	9.5	22.5	
Total Split (s)	26.0	26.0					9.5	36.0	36.0	28.0	54.5	
Total Split (%)	28.9%	28.9%					10.6%	40.0%	40.0%	31.1%	60.6%	
Maximum Green (s)	21.5	21.5					5.0	31.5	31.5	23.5	50.0	
Yellow Time (s)	3.5	3.5					3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0					1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0					0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5					4.5	4.5	4.5	4.5	4.5	
Lead/Lag							Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0					3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None					None	C-Max	C-Max	None	C-Max	
Walk Time (s)	7.0	7.0						7.0	7.0		7.0	
Flash Dont Walk (s)	11.0	11.0						11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0	0						0	0		0	
Act Effct Green (s)	19.9	19.9					5.2	33.1	33.1	23.5	59.2	
Actuated g/C Ratio	0.22	0.22					0.06	0.37	0.37	0.26	0.66	
v/c Ratio	0.85	0.16					0.10	0.71	0.19	0.79	0.49	
Control Delay	54.5	14.7					42.7	32.0	6.3	29.3	2.8	
Queue Delay	0.0	0.0					0.0	0.0	0.0	0.0	0.0	
Total Delay	54.5	14.7					42.7	32.0	6.3	29.3	2.8	
LOS	D	B					D	C	A	C	A	
Approach Delay		47.9						27.2			13.0	
Approach LOS		D						C			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 48 (53%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 24.5		Intersection LOS: C	
Intersection Capacity Utilization 70.5%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 6: 18th Ave & Ave 394/SR99 SB ON Ramp



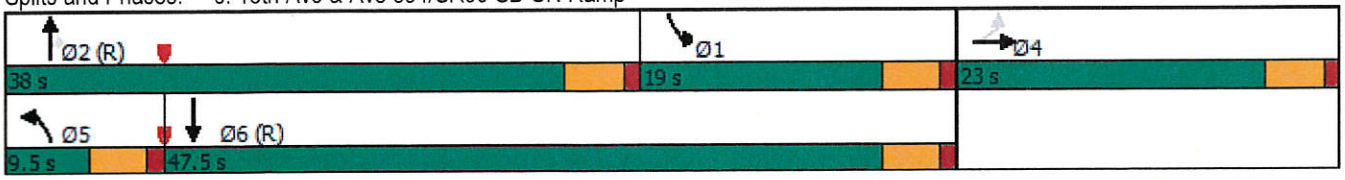
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	246	45	18	0	0	0	11	556	119	212	293	126
Future Volume (vph)	246	45	18	0	0	0	11	556	119	212	293	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	100		150	100		0
Storage Lanes	1		1	0		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.957							0.850		0.955	
Flt Protected	0.950						0.950			0.950		
Satd. Flow (prot)	1770	1783	0	0	0	0	1770	1863	1583	1770	1779	0
Flt Permitted	0.950						0.950			0.950		
Satd. Flow (perm)	1770	1783	0	0	0	0	1770	1863	1583	1770	1779	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20							116		42	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		704			1706			1221			671	
Travel Time (s)		16.0			38.8			27.8			15.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	267	49	20	0	0	0	12	604	129	230	318	137
Shared Lane Traffic (%)												
Lane Group Flow (vph)	267	69	0	0	0	0	12	604	129	230	455	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2					1	2	1	1	2	
Detector Template	Left	Thru					Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100					20	100	20	20	100	
Trailing Detector (ft)	0	0					0	0	0	0	0	
Detector 1 Position(ft)	0	0					0	0	0	0	0	
Detector 1 Size(ft)	20	6					20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0					0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0					0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0					0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94						94			94	
Detector 2 Size(ft)		6						6			6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA					Prot	NA	Perm	Prot	NA	
Protected Phases		4					5	2		1	6	
Permitted Phases	4								2			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4					5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0					5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5					9.5	22.5	22.5	9.5	22.5	
Total Split (s)	23.0	23.0					9.5	38.0	38.0	19.0	47.5	
Total Split (%)	28.8%	28.8%					11.9%	47.5%	47.5%	23.8%	59.4%	
Maximum Green (s)	18.5	18.5					5.0	33.5	33.5	14.5	43.0	
Yellow Time (s)	3.5	3.5					3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0					1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0					0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5					4.5	4.5	4.5	4.5	4.5	
Lead/Lag							Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0					3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None					None	C-Max	C-Max	None	C-Max	
Walk Time (s)	7.0	7.0						7.0	7.0		7.0	
Flash Dont Walk (s)	11.0	11.0						11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0	0						0	0		0	
Act Effct Green (s)	15.9	15.9					5.4	36.1	36.1	14.5	53.2	
Actuated g/C Ratio	0.20	0.20					0.07	0.45	0.45	0.18	0.66	
v/c Ratio	0.76	0.19					0.10	0.72	0.17	0.72	0.38	
Control Delay	44.2	20.6					37.4	24.9	4.4	29.9	1.1	
Queue Delay	0.0	0.0					0.0	0.0	0.0	0.0	0.0	
Total Delay	44.2	20.6					37.4	24.9	4.4	29.9	1.1	
LOS	D	C					D	C	A	C	A	
Approach Delay		39.3						21.6			10.8	
Approach LOS		D						C			B	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 16 (20%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 20.8 Intersection LOS: C
Intersection Capacity Utilization 65.9% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 6: 18th Ave & Ave 394/SR99 SB ON Ramp



HCS7 Two-Way Stop-Control Report

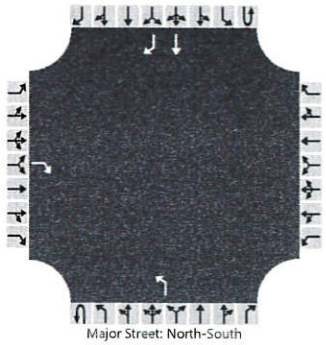
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	2/22/2019
Analysis Year	2045
Time Analyzed	AM Peak
Intersection Orientation	North-South
Project Description	Alt 1 & 2 - SR 99 SB Off-Ramp & Ave 394

Site Information

Intersection	SB Off-Ramp & Ave 394
Jurisdiction	
East/West Street	Ave 394
North/South Street	SB Off-Ramp
Peak Hour Factor	0.77
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	1		0	0	0	0	1	0	0	0	0	1	1
Configuration				R						L					T	R
Volume (veh/h)				212						137					154	18
Percent Heavy Vehicles (%)				3						3						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized		No												Yes		
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)				6.2						4.1						
Critical Headway (sec)				6.23						4.13						
Base Follow-Up Headway (sec)				3.3						2.2						
Follow-Up Headway (sec)				3.33						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)				275						178						
Capacity, c (veh/h)				837						1369						
v/c Ratio				0.33						0.13						
95% Queue Length, Q_{95} (veh)				1.4						0.4						
Control Delay (s/veh)				11.4						8.0						
Level of Service (LOS)				B						A						
Approach Delay (s/veh)		11.4								8.0						
Approach LOS		B														

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HCS7 Two-Way Stop-Control Report

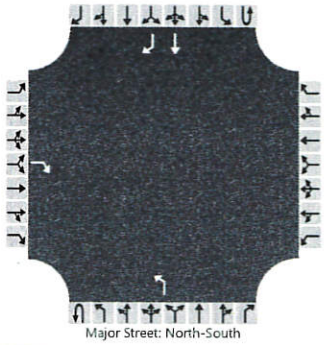
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	2/22/2019
Analysis Year	2045
Time Analyzed	PM Peak
Intersection Orientation	North-South
Project Description	Alt 1 & 2 - SR 99 SB Off-Ramp & Ave 394

Site Information

Intersection	SB Off-Ramp & Ave 394
Jurisdiction	
East/West Street	Ave 394
North/South Street	SB Off-Ramp
Peak Hour Factor	0.98
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	1		0	0	0	0	1	0	0	0	0	1	1
Configuration				R						L					T	R
Volume (veh/h)				155						137					154	70
Percent Heavy Vehicles (%)				1						2						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized		No												Yes		
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)				6.2						4.1						
Critical Headway (sec)				6.21						4.12						
Base Follow-Up Headway (sec)				3.3						2.2						
Follow-Up Headway (sec)				3.31						2.21						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)				158						140						
Capacity, c (veh/h)				890						1426						
v/c Ratio				0.18						0.10						
95% Queue Length, Q_{95} (veh)				0.6						0.3						
Control Delay (s/veh)				9.9						7.8						
Level of Service (LOS)				A						A						
Approach Delay (s/veh)		9.9								7.8						
Approach LOS		A														

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Mendocino Avenue Intersections

Alternative 3

Reconstruct Ave 394/SB Off Ramp and construct Roundabouts at the intersections SB on and NB off Ramps Terminals

2025 Level of Service Reports

2035 Level of Service Reports

2045 Level of Service Reports

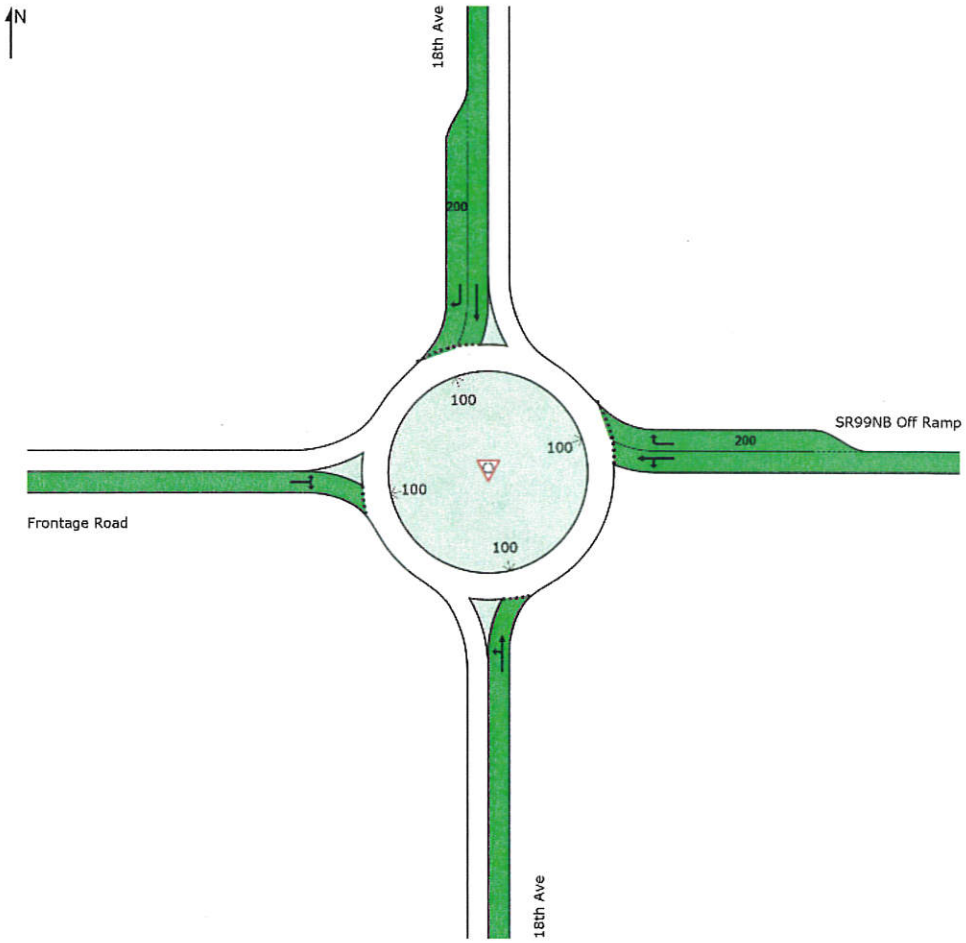
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [SR99 NB Ramps - 2025 AM - No Change Frontage Road]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [SR99 NB Ramps - 2025 AM - No Change Frontage Road]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: 18th Ave													
Lane 1[d]	516	9.8	1247	0.414	100	7.0	LOS A	2.5	68.1	Full	650	0.0	0.0
Approach	516	9.8		0.414		7.0	LOS A	2.5	68.1				
East: SR99NB Off Ramp													
Lane 1	55	24.5	676	0.082	100	6.2	LOS A	0.2	7.4	Full	1600	0.0	0.0
Lane 2[d]	170	9.0	772	0.220	100	7.1	LOS A	0.8	22.1	Short	200	0.0	NA
Approach	225	12.8		0.220		6.9	LOS A	0.8	22.1				
North: 18th Ave													
Lane 1[d]	510	2.0	1198	0.426	100	7.3	LOS A	2.5	62.6	Full	1100	0.0	0.0
Lane 2	101	5.0	1163	0.087	100	3.8	LOS A	0.3	8.8	Short	200	0.0	NA
Approach	611	2.5		0.426		6.8	LOS A	2.5	62.6				
West: Frontage Road													
Lane 1[d]	30	6.6	710	0.043	100	5.5	LOS A	0.2	4.1	Full	1100	0.0	0.0
Approach	30	6.6		0.043		5.5	LOS A	0.2	4.1				
Intersection	1383	7.0		0.426		6.8	LOS A	2.5	68.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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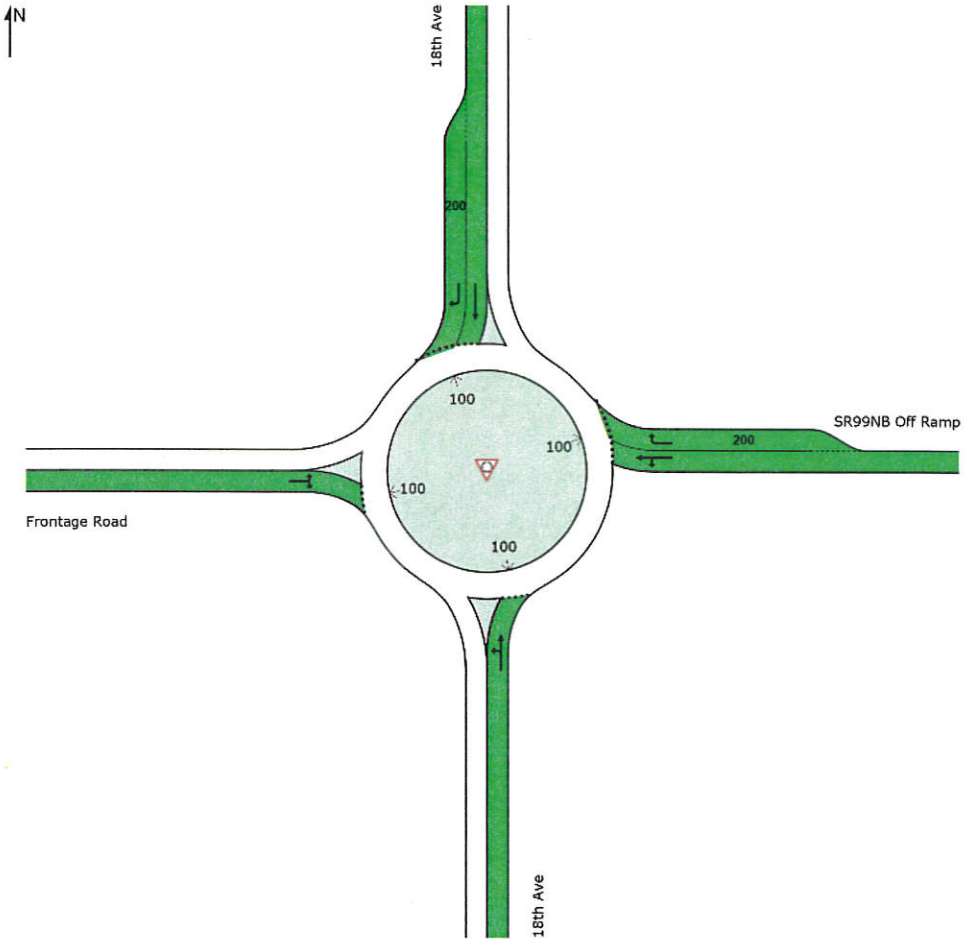
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [SR99 NB Ramps - 2025 PM - No Change Frontage Road]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [SR99 NB Ramps - 2025 PM - No Change Frontage Road]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: 18th Ave													
Lane 1[d]	526	9.6	1228	0.428	100	7.2	LOS A	2.6	71.1	Full	650	0.0	0.0
Approach	526	9.6		0.428		7.2	LOS A	2.6	71.1				
East: SR99NB Off Ramp													
Lane 1	71	19.2	689	0.102	100	6.3	LOS A	0.3	9.4	Full	1600	0.0	0.0
Lane 2[d]	189	8.1	761	0.249	100	7.5	LOS A	1.0	25.4	Short	200	0.0	NA
Approach	260	11.1		0.249		7.2	LOS A	1.0	25.4				
North: 18th Ave													
Lane 1[d]	354	2.9	1175	0.302	100	5.9	LOS A	1.5	37.8	Full	1100	0.0	0.0
Lane 2	76	6.6	1133	0.067	100	3.7	LOS A	0.3	6.6	Short	200	0.0	NA
Approach	430	3.5		0.302		5.5	LOS A	1.5	37.8				
West: Frontage Road													
Lane 1[d]	46	4.4	858	0.053	100	4.7	LOS A	0.2	5.4	Full	1100	0.0	0.0
Approach	46	4.4		0.053		4.7	LOS A	0.2	5.4				
Intersection	1262	7.7		0.428		6.6	LOS A	2.6	71.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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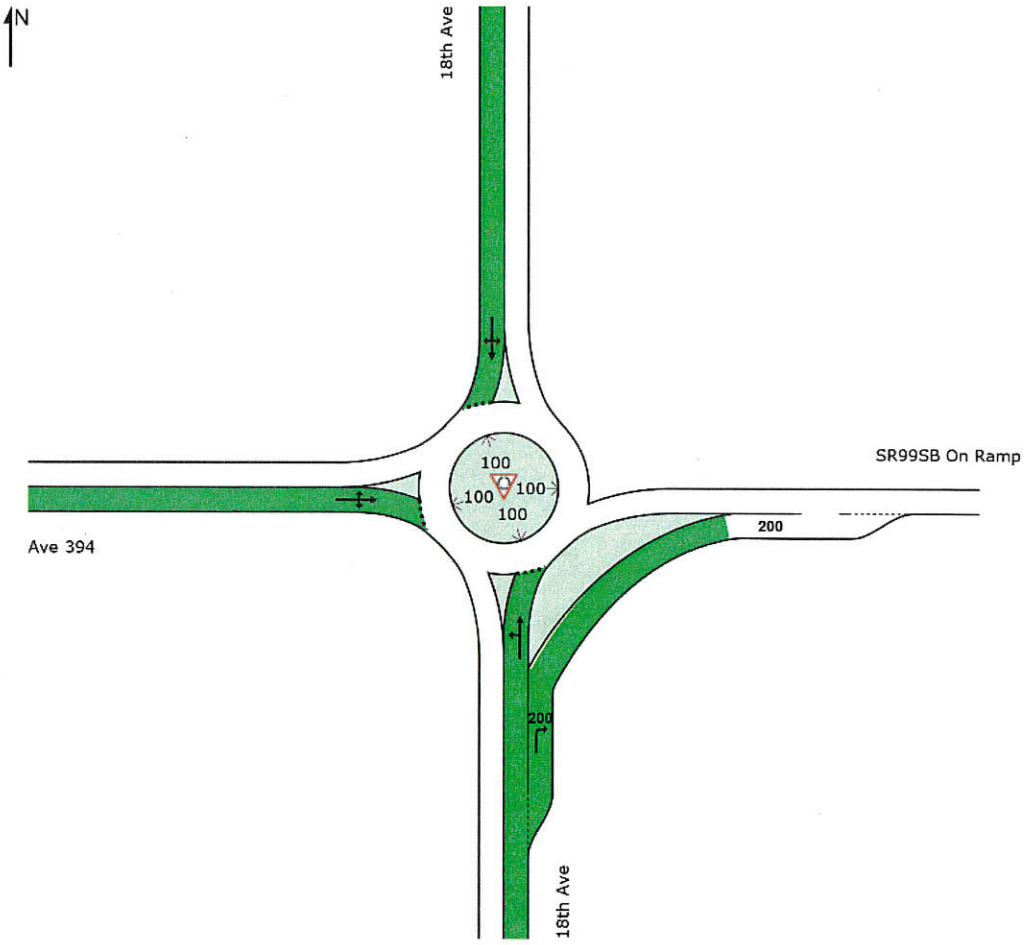
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [SR99 SB Ramps - 2025 AM - Reconstruct Ave 394 @ SR99SB Off Ramp]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	South	North	West	
LOS	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [SR99 SB Ramps - 2025 AM - Reconstruct Ave 394 @ SR99SB Off Ramp]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: 18th Ave													
Lane 1[d]	323	6.9	834	0.387	100	8.9	LOS A	1.8	47.4	Full	650	0.0	0.0
Lane 2	78	0.0	1675	0.047	100	0.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	401	5.5		0.387		7.2	LOS A	1.8	47.4				
North: 18th Ave													
Lane 1[d]	633	3.6	1323	0.478	100	7.6	LOS A	3.6	91.9	Full	650	0.0	0.0
Approach	633	3.6		0.478		7.6	LOS A	3.6	91.9				
West: Ave 394													
Lane 1[d]	265	5.1	738	0.359	100	9.4	LOS A	1.7	43.7	Full	1100	0.0	0.0
Approach	265	5.1		0.359		9.4	LOS A	1.7	43.7				
Intersection	1299	4.5		0.478		7.8	LOS A	3.6	91.9				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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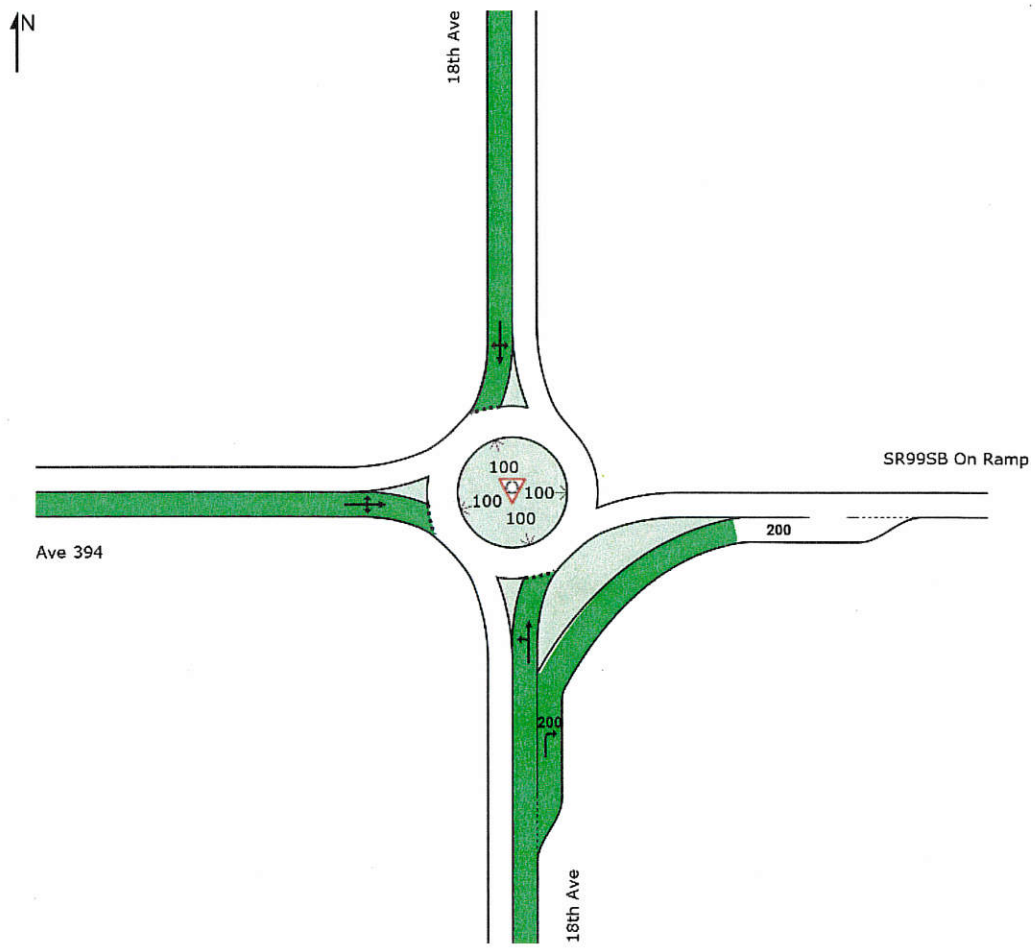
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [SR99 SB Ramps - 2025 PM - Reconstruct Ave 394 @ SR99SB Off Ramp]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	South	North	West	
LOS	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [SR99 SB Ramps - 2025 PM - Reconstruct Ave 394 @ SR99SB Off Ramp]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: 18th Ave													
Lane 1[d]	399	6.9	921	0.433	100	9.0	LOS A	2.2	58.3	Full	650	0.0	0.0
Lane 2	84	0.0	1675	0.050	100	0.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	483	5.7		0.433		7.5	LOS A	2.2	58.3				
North: 18th Ave													
Lane 1[d]	457	3.5	1323	0.345	100	5.9	LOS A	2.1	53.7	Full	650	0.0	0.0
Approach	457	3.5		0.345		5.9	LOS A	2.1	53.7				
West: Ave 394													
Lane 1[d]	238	5.3	887	0.268	100	6.9	LOS A	1.2	31.8	Full	1100	0.0	0.0
Approach	238	5.3		0.268		6.9	LOS A	1.2	31.8				
Intersection	1177	4.8		0.433		6.7	LOS A	2.2	58.3				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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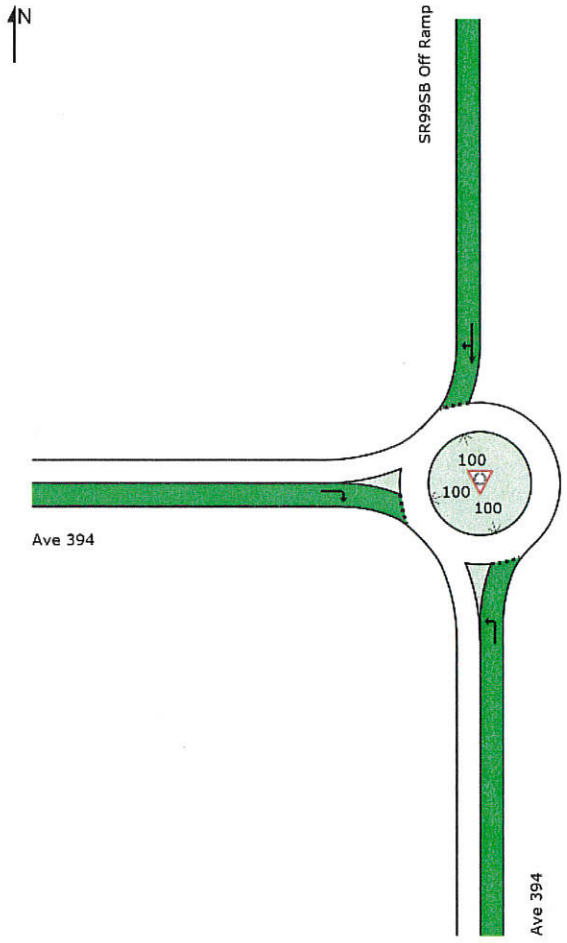
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [SR99 SB Off & Ave 394 - 2025 AM]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	South	North	West	
LOS	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [SR99 SB Off & Ave 394 - 2025 AM]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Ave 394													
Lane 1[d]	97	0.0	1380	0.070	100	3.2	LOS A	0.0	0.0	Full	1100	0.0	0.0
Approach	97	0.0		0.070		3.2	LOS A	0.0	0.0				
North: SR99SB Off Ramp													
Lane 1[d]	129	2.8	1216	0.106	100	3.8	LOS A	0.5	12.1	Full	1100	0.0	0.0
Approach	129	2.8		0.106		3.8	LOS A	0.5	12.1				
West: Ave 394													
Lane 1[d]	149	3.0	1186	0.126	100	4.1	LOS A	0.6	14.4	Full	1100	0.0	0.0
Approach	149	3.0		0.126		4.1	LOS A	0.6	14.4				
Intersection	375	2.2		0.126		3.8	LOS A	0.6	14.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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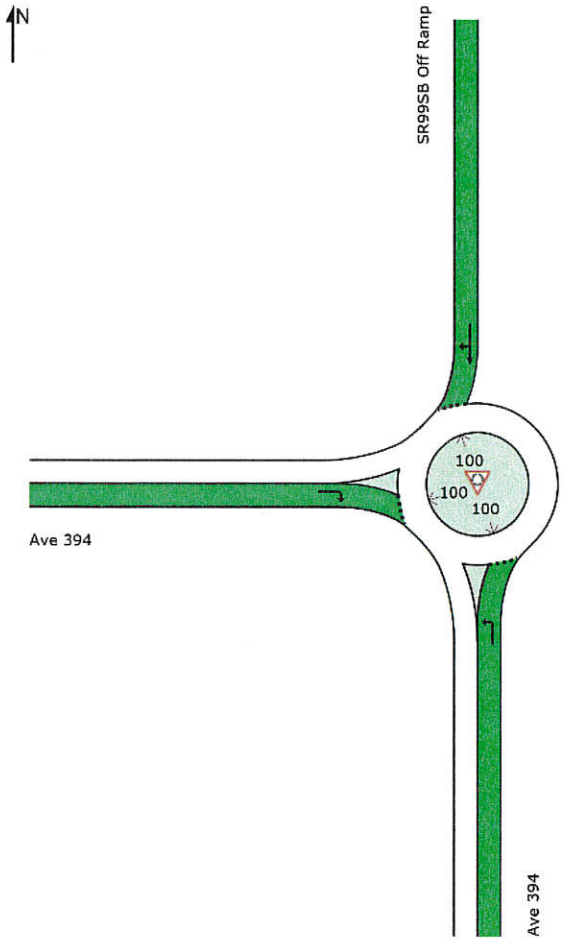
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [SR99 SB Off & Ave 394 - 2025 PM]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	South	North	West	
LOS	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [SR99 SB Off & Ave 394 - 2025 PM]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Ave 394													
Lane 1[d]	97	0.0	1380	0.070	100	3.2	LOS A	0.0	0.0	Full	1100	0.0	0.0
Approach	97	0.0		0.070		3.2	LOS A	0.0	0.0				
North: SR99SB Off Ramp													
Lane 1[d]	178	2.5	1220	0.146	100	4.2	LOS A	0.7	17.3	Full	1100	0.0	0.0
Approach	178	2.5		0.146		4.2	LOS A	0.7	17.3				
West: Ave 394													
Lane 1[d]	109	3.0	1170	0.093	100	3.9	LOS A	0.4	10.3	Full	1100	0.0	0.0
Approach	109	3.0		0.093		3.9	LOS A	0.4	10.3				
Intersection	384	2.0		0.146		3.8	LOS A	0.7	17.3				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

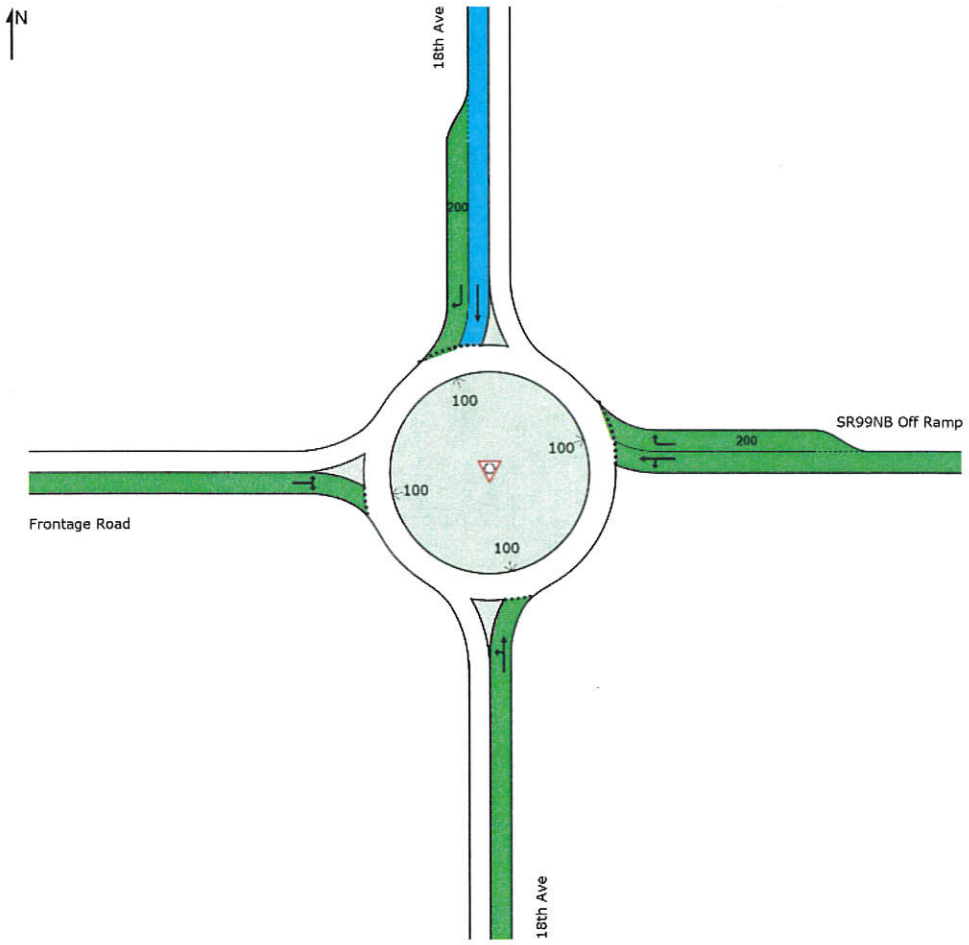
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [SR99 NB Ramps - 2035 AM - No Change Frontage Road - Copy]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [SR99 NB Ramps - 2035 AM - No Change Frontage Road - Copy]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: 18th Ave													
Lane 1[d]	665	7.6	1271	0.523	100	8.5	LOS A	3.9	104.4	Full	650	0.0	0.0
Approach	665	7.6		0.523		8.5	LOS A	3.9	104.4				
East: SR99NB Off Ramp													
Lane 1	68	19.8	613	0.112	100	7.2	LOS A	0.3	10.1	Full	1600	0.0	0.0
Lane 2[d]	222	6.9	687	0.323	100	9.3	LOS A	1.3	34.3	Short	200	0.0	NA
Approach	290	9.9		0.323		8.8	LOS A	1.3	34.3				
North: 18th Ave													
Lane 1[d]	677	1.5	1165	0.581	100	10.2	LOS B	4.1	104.5	Full	1100	0.0	0.0
Lane 2	185	2.7	1151	0.161	100	4.5	LOS A	0.7	17.3	Short	200	0.0	NA
Approach	862	1.8		0.581		9.0	LOS A	4.1	104.5				
West: Frontage Road													
Lane 1[d]	38	5.3	598	0.064	100	6.7	LOS A	0.2	6.0	Full	1100	0.0	0.0
Approach	38	5.3		0.064		6.7	LOS A	0.2	6.0				
Intersection	1855	5.2		0.581		8.7	LOS A	4.1	104.5				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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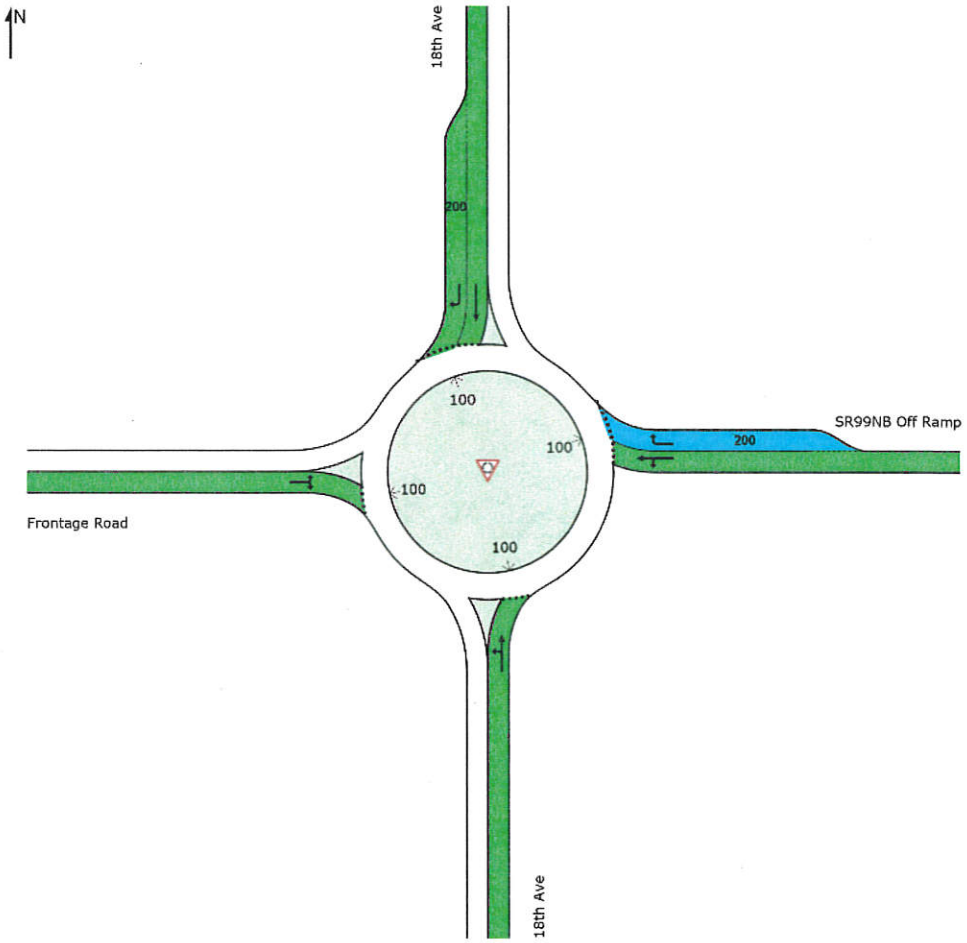
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [SR99 NB Ramps - 2035 PM - No Change Frontage Road]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	B	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [SR99 NB Ramps - 2035 PM - No Change Frontage Road]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: 18th Ave													
Lane 1[d]	712	7.1	1250	0.569	100	9.5	LOS A	4.6	121.3	Full	650	0.0	0.0
Approach	712	7.1		0.569		9.5	LOS A	4.6	121.3				
East: SR99NB Off Ramp													
Lane 1	88	15.4	598	0.147	100	7.8	LOS A	0.5	13.4	Full	1600	0.0	0.0
Lane 2[d]	289	5.3	656	0.441	100	11.9	LOS B	2.3	59.4	Short	200	0.0	NA
Approach	377	7.6		0.441		11.0	LOS B	2.3	59.4				
North: 18th Ave													
Lane 1[d]	473	2.2	1143	0.414	100	7.4	LOS A	2.3	58.1	Full	1100	0.0	0.0
Lane 2	129	3.9	1123	0.115	100	4.2	LOS A	0.5	11.8	Short	200	0.0	NA
Approach	602	2.5		0.414		6.7	LOS A	2.3	58.1				
West: Frontage Road													
Lane 1[d]	57	3.6	758	0.075	100	5.5	LOS A	0.3	7.4	Full	1100	0.0	0.0
Approach	57	3.6		0.075		5.5	LOS A	0.3	7.4				
Intersection	1748	5.5		0.569		8.7	LOS A	4.6	121.3				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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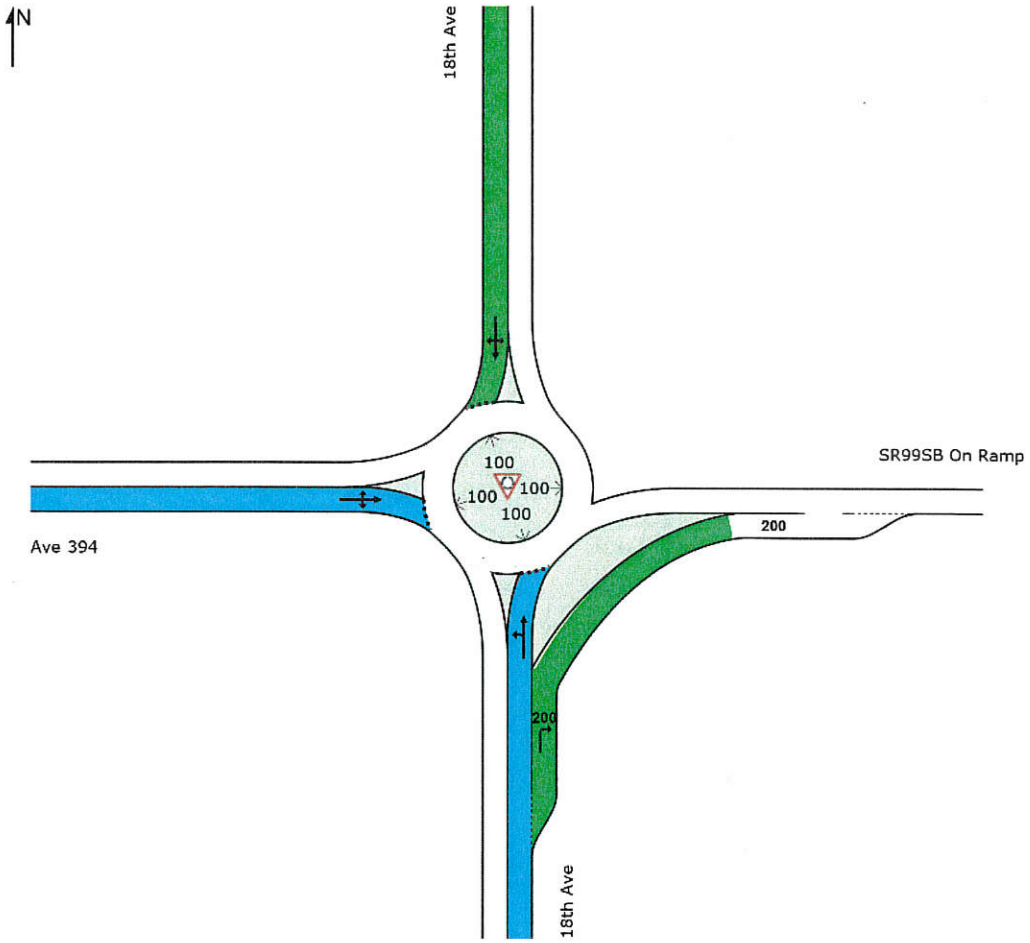
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [SR99 SB Ramps - 2035 AM - Reconstruct Ave 394 @ SR99SB Off Ramp]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	South	North	West	
LOS	B	A	B	B



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [SR99 SB Ramps - 2035 AM - Reconstruct Ave 394 @ SR99SB Off Ramp]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: 18th Ave													
Lane 1[d]	401	6.9	756	0.531	100	12.7	LOS B	3.5	93.2	Full	650	0.0	0.0
Lane 2	98	0.0	1675	0.058	100	0.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	499	5.5		0.531		10.2	LOS B	3.5	93.2				
North: 18th Ave													
Lane 1[d]	776	3.6	1321	0.587	100	9.5	LOS A	5.4	139.7	Full	650	0.0	0.0
Approach	776	3.6		0.587		9.5	LOS A	5.4	139.7				
West: Ave 394													
Lane 1[d]	325	5.1	649	0.501	100	13.5	LOS B	3.1	80.8	Full	1100	0.0	0.0
Approach	325	5.1		0.501		13.5	LOS B	3.1	80.8				
Intersection	1600	4.5		0.587		10.5	LOS B	5.4	139.7				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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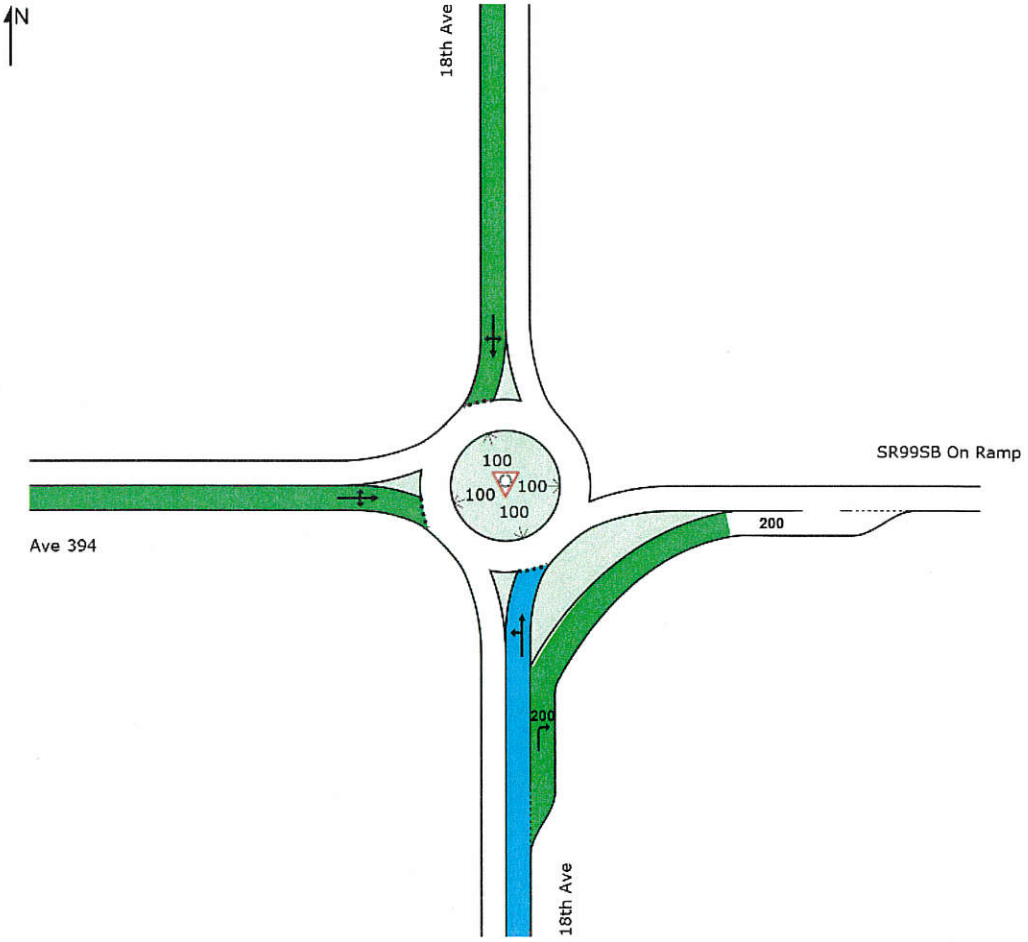
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [SR99 SB Ramps - 2035 PM - Reconstruct Ave 394 @ SR99SB Off Ramp]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	South	North	West	
LOS	B	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [SR99 SB Ramps - 2035 PM - Reconstruct Ave 394 @ SR99SB Off Ramp]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: 18th Ave													
Lane 1[d]	496	6.9	861	0.576	100	12.6	LOS B	4.7	124.4	Full	650	0.0	0.0
Lane 2	104	0.0	1675	0.062	100	0.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	600	5.7		0.576		10.4	LOS B	4.7	124.4				
North: 18th Ave													
Lane 1[d]	558	3.5	1320	0.423	100	6.8	LOS A	2.9	73.8	Full	650	0.0	0.0
Approach	558	3.5		0.423		6.8	LOS A	2.9	73.8				
West: Ave 394													
Lane 1[d]	280	5.4	814	0.345	100	8.5	LOS A	1.6	41.8	Full	1100	0.0	0.0
Approach	280	5.4		0.345		8.5	LOS A	1.6	41.8				
Intersection	1438	4.8		0.576		8.6	LOS A	4.7	124.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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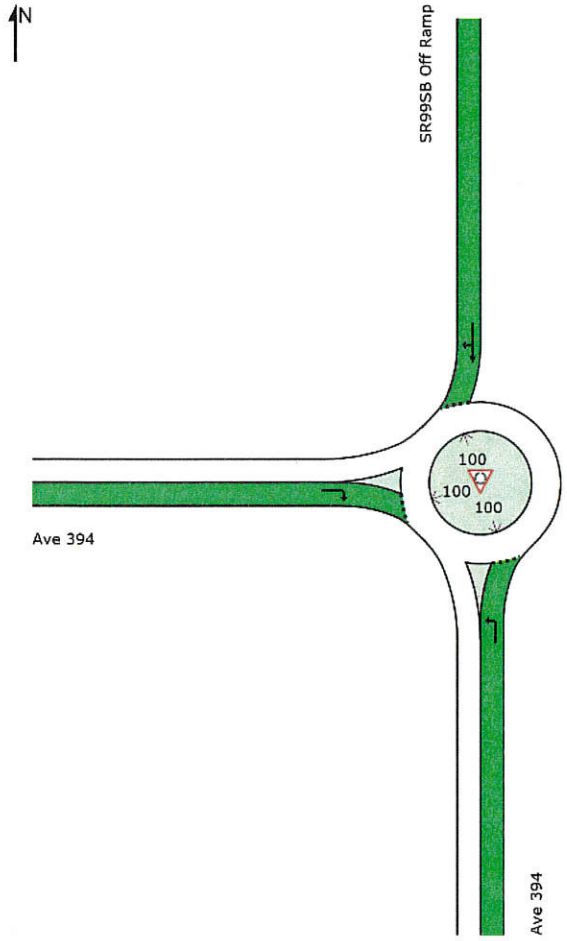
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [SR99 SB Off & Ave 394 - 2035 AM]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	South	North	West	
LOS	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [SR99 SB Off & Ave 394 - 2035 AM]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Ave 394													
Lane 1[d]	120	0.0	1380	0.087	100	3.3	LOS A	0.0	0.0	Full	1100	0.0	0.0
Approach	120	0.0		0.087		3.3	LOS A	0.0	0.0				
North: SR99SB Off Ramp													
Lane 1[d]	154	2.8	1188	0.130	100	4.1	LOS A	0.6	15.0	Full	1100	0.0	0.0
Approach	154	2.8		0.130		4.1	LOS A	0.6	15.0				
West: Ave 394													
Lane 1[d]	186	3.0	1158	0.161	100	4.5	LOS A	0.7	18.9	Full	1100	0.0	0.0
Approach	186	3.0		0.161		4.5	LOS A	0.7	18.9				
Intersection	460	2.2		0.161		4.1	LOS A	0.7	18.9				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

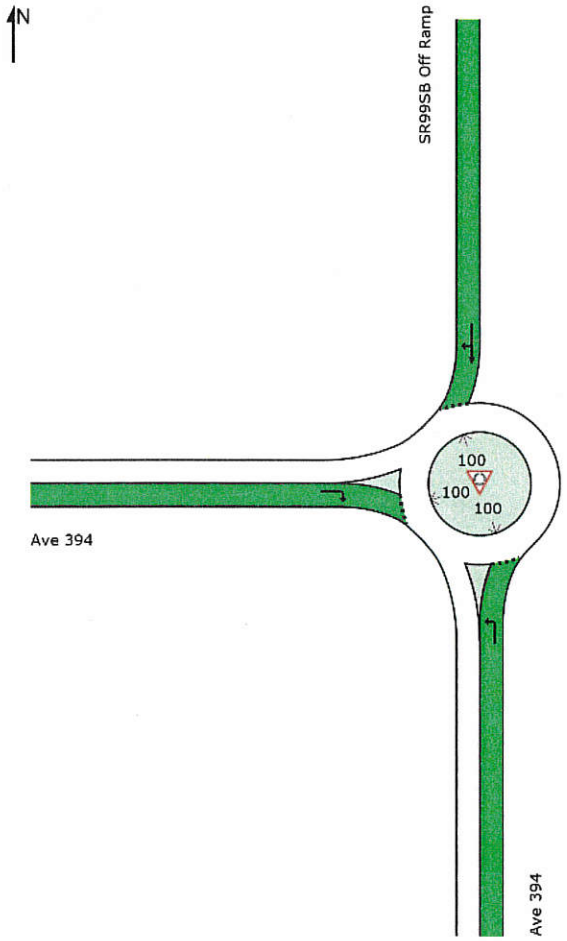
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [SR99 SB Off & Ave 394 - 2035 PM]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	South	North	West	
LOS	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [SR99 SB Off & Ave 394 - 2035 PM]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Ave 394													
Lane 1[d]	120	0.0	1380	0.087	100	3.3	LOS A	0.0	0.0	Full	1100	0.0	0.0
Approach	120	0.0		0.087		3.3	LOS A	0.0	0.0				
North: SR99SB Off Ramp													
Lane 1[d]	208	2.4	1193	0.174	100	4.5	LOS A	0.8	21.0	Full	1100	0.0	0.0
Approach	208	2.4		0.174		4.5	LOS A	0.8	21.0				
West: Ave 394													
Lane 1[d]	135	3.0	1148	0.117	100	4.1	LOS A	0.5	13.3	Full	1100	0.0	0.0
Approach	135	3.0		0.117		4.1	LOS A	0.5	13.3				
Intersection	462	2.0		0.174		4.1	LOS A	0.8	21.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

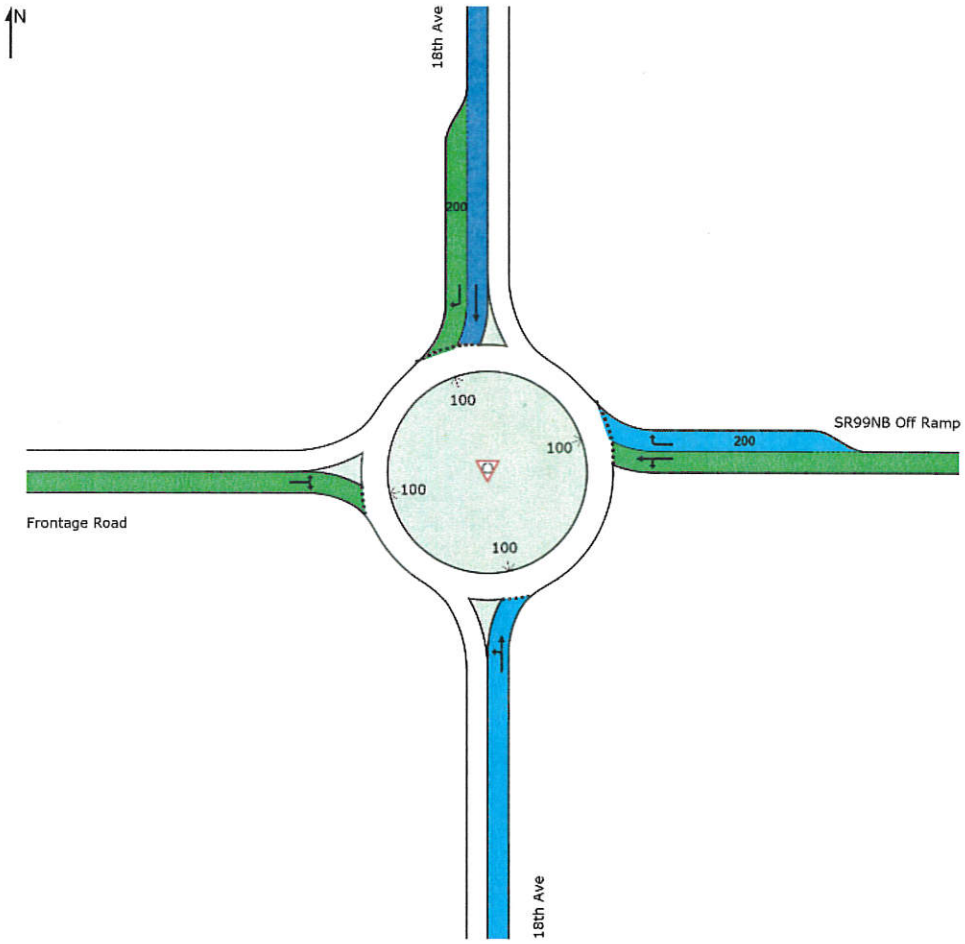
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [SR99 NB Ramps - 2045 AM - No Change Frontage Road]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	B	B	B	A	B



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [SR99 NB Ramps - 2045 AM - No Change Frontage Road]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: 18th Ave													
Lane 1[d]	821	6.2	1285	0.639	100	10.8	LOS B	6.2	163.1	Full	650	0.0	0.0
Approach	821	6.2		0.639		10.8	LOS B	6.2	163.1				
East: SR99NB Off Ramp													
Lane 1	85	16.0	548	0.155	100	8.5	LOS A	0.5	13.9	Full	1600	0.0	0.0
Lane 2[d]	273	5.6	602	0.453	100	13.1	LOS B	2.3	60.0	Short	200	0.0	NA
Approach	358	8.1		0.453		12.0	LOS B	2.3	60.0				
North: 18th Ave													
Lane 1[d]	832	1.2	1123	0.741	100	15.4	LOS C	14.1	354.8	Full	1100	0.0	0.0
Lane 2	215	2.3	1110	0.194	100	5.0	LOS A	0.8	21.3	Short	200	0.0	NA
Approach	1047	1.5		0.741		13.3	LOS B	14.1	354.8				
West: Frontage Road													
Lane 1[d]	47	4.3	508	0.092	100	8.3	LOS A	0.3	8.6	Full	1100	0.0	0.0
Approach	47	4.3		0.092		8.3	LOS A	0.3	8.6				
Intersection	2272	4.3		0.741		12.1	LOS B	14.1	354.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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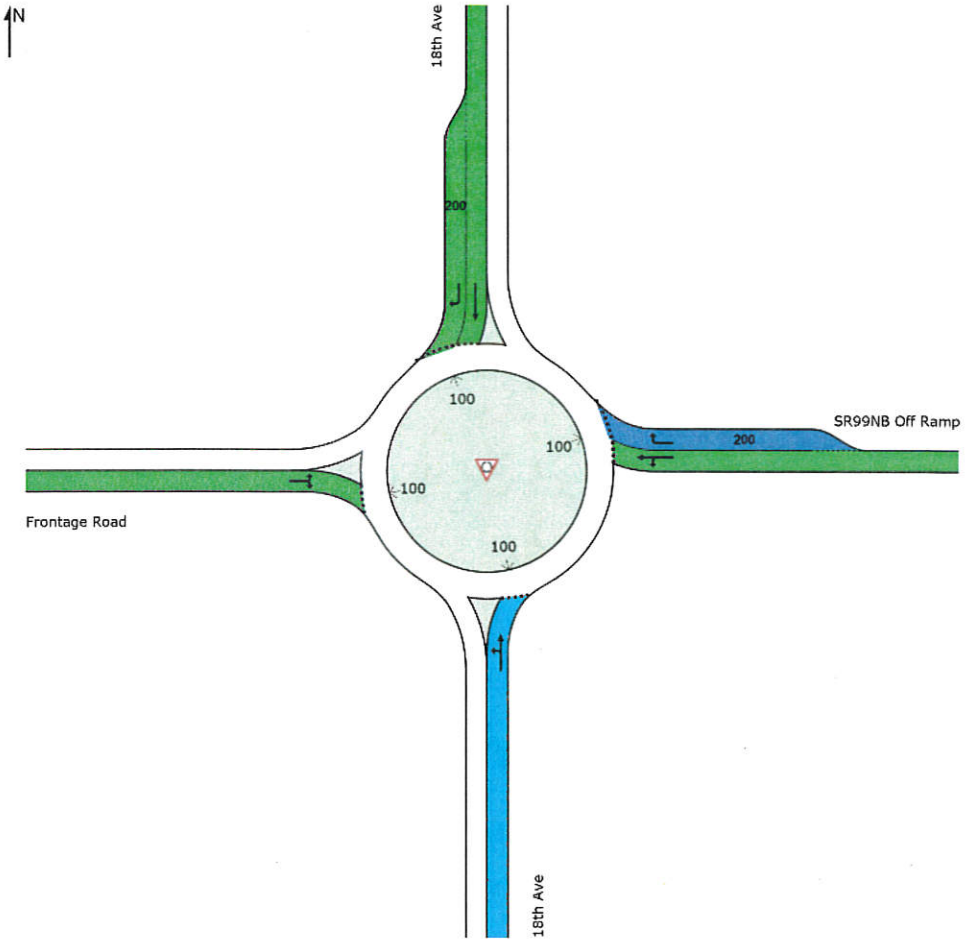
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [SR99 NB Ramps - 2045 PM - No Change Frontage Road]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	B	C	A	A	B



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [SR99 NB Ramps - 2045 PM - No Change Frontage Road]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: 18th Ave													
Lane 1[d]	872	5.8	1257	0.693	100	12.5	LOS B	7.4	194.4	Full	650	0.0	0.0
Approach	872	5.8		0.693		12.5	LOS B	7.4	194.4				
East: SR99NB Off Ramp													
Lane 1	110	12.4	528	0.208	100	9.6	LOS A	0.7	18.9	Full	1600	0.0	0.0
Lane 2[d]	346	4.4	569	0.608	100	18.7	LOS C	3.9	100.6	Short	200	0.0	NA
Approach	455	6.3		0.608		16.5	LOS C	3.9	100.6				
North: 18th Ave													
Lane 1[d]	580	1.8	1097	0.529	100	9.6	LOS A	3.4	87.2	Full	1100	0.0	0.0
Lane 2	152	3.3	1081	0.141	100	4.6	LOS A	0.6	14.7	Short	200	0.0	NA
Approach	733	2.1		0.529		8.5	LOS A	3.4	87.2				
West: Frontage Road													
Lane 1[d]	70	2.9	674	0.103	100	6.5	LOS A	0.4	10.2	Full	1100	0.0	0.0
Approach	70	2.9		0.103		6.5	LOS A	0.4	10.2				
Intersection	2129	4.5		0.693		11.8	LOS B	7.4	194.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

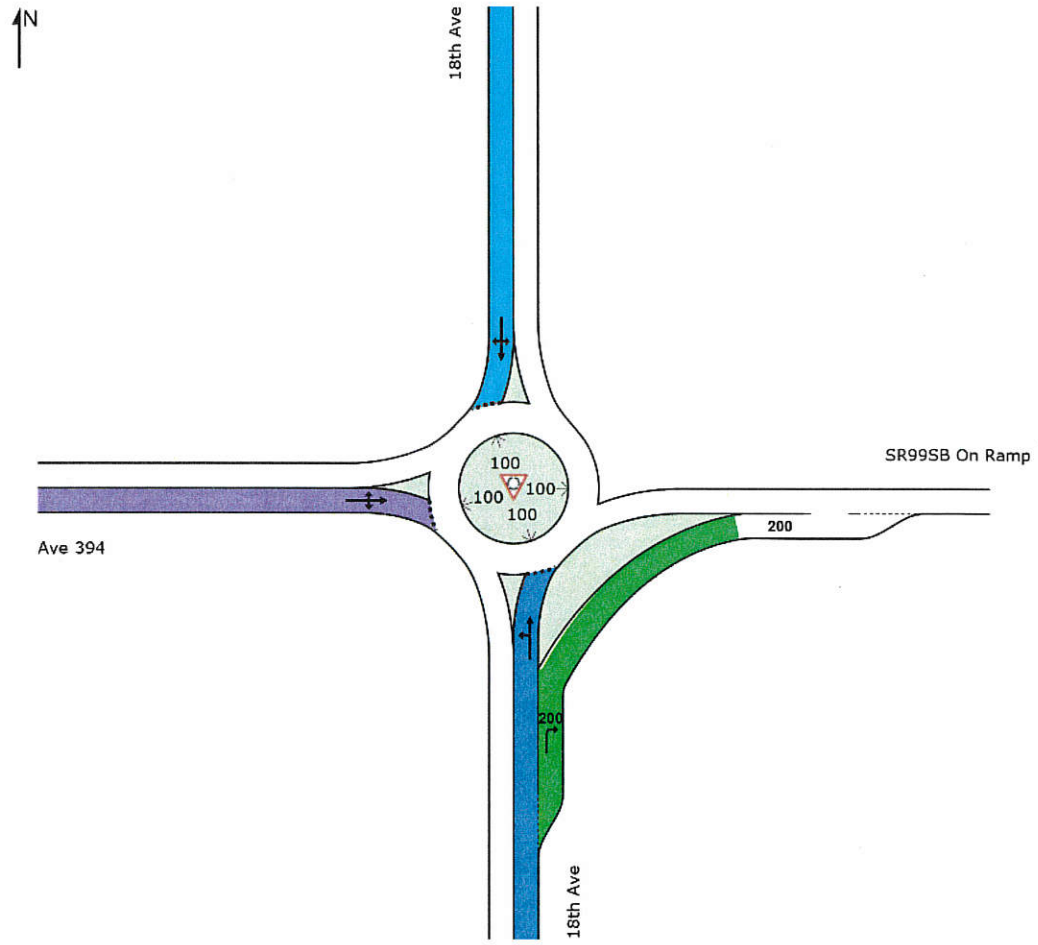
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [SR99 SB Ramps - 2045 AM - Reconstruct Ave 394 @ SR99SB Off Ramp]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	South	North	West	
LOS	C	B	D	C



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [SR99 SB Ramps - 2045 AM - Reconstruct Ave 394 @ SR99SB Off Ramp]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: 18th Ave													
Lane 1[d]	499	6.9	670	0.745	100	23.1	LOS C	7.4	194.4	Full	650	0.0	0.0
Lane 2	122	0.0	1675	0.073	100	0.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	621	5.5		0.745		18.5	LOS C	7.4	194.4				
North: 18th Ave													
Lane 1[d]	953	3.6	1318	0.723	100	13.1	LOS B	9.5	243.4	Full	650	0.0	0.0
Approach	953	3.6		0.723		13.1	LOS B	9.5	243.4				
West: Ave 394													
Lane 1[d]	398	5.1	553	0.719	100	25.0	LOS D	6.1	158.6	Full	1100	0.0	0.0
Approach	398	5.1		0.719		25.0	LOS D	6.1	158.6				
Intersection	1972	4.5		0.745		17.2	LOS C	9.5	243.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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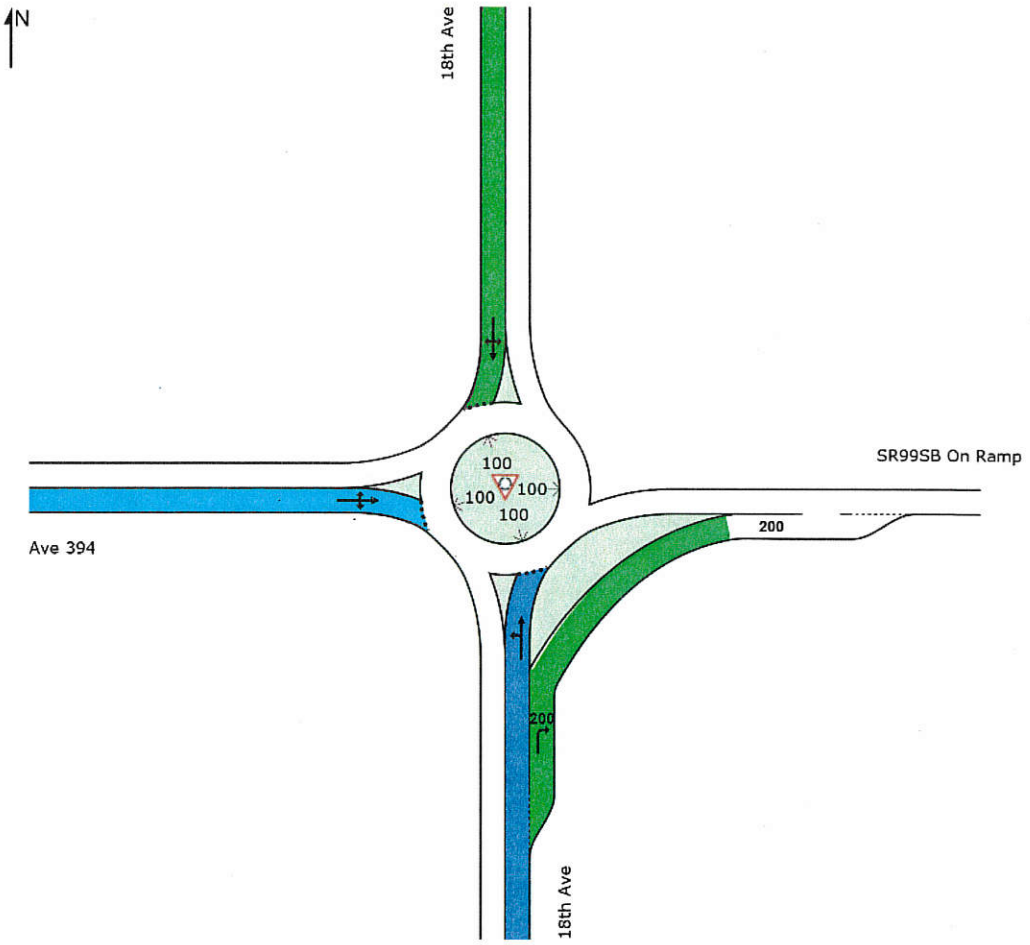
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [SR99 SB Ramps - 2045 PM - Reconstruct Ave 394 @ SR99SB Off Ramp]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	South	North	West	
LOS	C	A	B	B



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [SR99 SB Ramps - 2045 PM - Reconstruct Ave 394 @ SR99SB Off Ramp]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: 18th Ave													
Lane 1[d]	620	6.9	790	0.784	100	22.9	LOS C	10.7	282.1	Full	650	0.0	0.0
Lane 2	129	0.0	1675	0.077	100	0.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	749	5.7		0.784		18.9	LOS C	10.7	282.1				
North: 18th Ave													
Lane 1[d]	686	3.5	1317	0.521	100	8.3	LOS A	4.2	107.7	Full	650	0.0	0.0
Approach	686	3.5		0.521		8.3	LOS A	4.2	107.7				
West: Ave 394													
Lane 1[d]	336	5.4	731	0.460	100	11.3	LOS B	2.8	72.0	Full	1100	0.0	0.0
Approach	336	5.4		0.460		11.3	LOS B	2.8	72.0				
Intersection	1771	4.8		0.784		13.4	LOS B	10.7	282.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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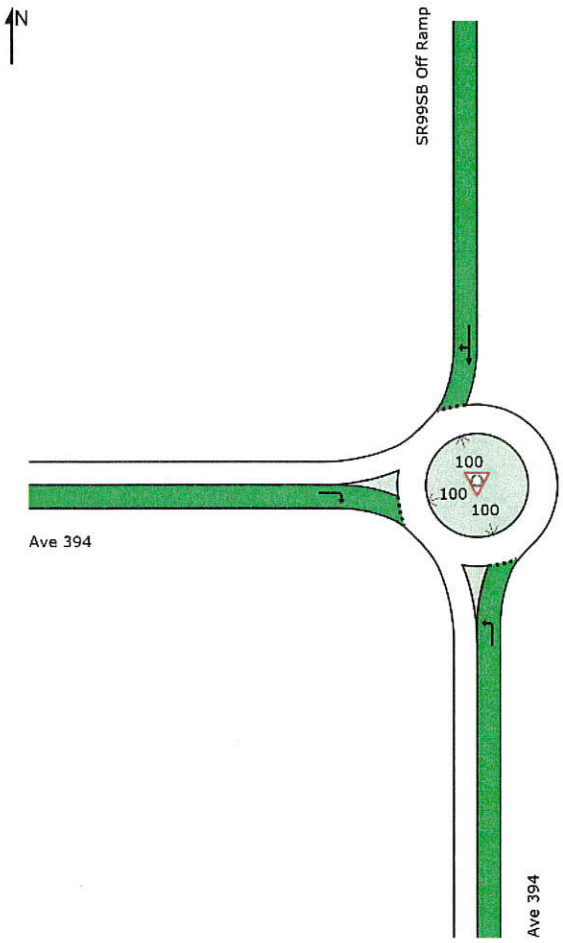
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [SR99 SB Off & Ave 394 - 2045 AM]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	South	North	West	
LOS	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [SR99 SB Off & Ave 394 - 2045 AM]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Ave 394													
Lane 1[d]	149	0.0	1380	0.108	100	3.5	LOS A	0.0	0.0	Full	1100	0.0	0.0
Approach	149	0.0		0.108		3.5	LOS A	0.0	0.0				
North: SR99SB Off Ramp													
Lane 1[d]	187	2.8	1153	0.162	100	4.5	LOS A	0.7	19.1	Full	1100	0.0	0.0
Approach	187	2.8		0.162		4.5	LOS A	0.7	19.1				
West: Ave 394													
Lane 1[d]	230	3.0	1124	0.205	100	5.1	LOS A	1.0	25.0	Full	1100	0.0	0.0
Approach	230	3.0		0.205		5.1	LOS A	1.0	25.0				
Intersection	566	2.1		0.205		4.5	LOS A	1.0	25.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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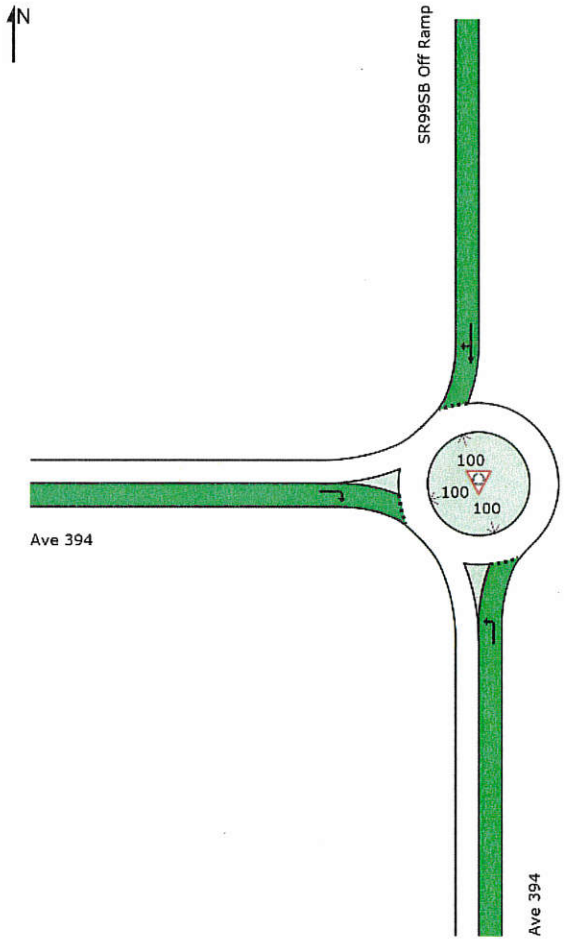
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [SR99 SB Off & Ave 394 - 2045 PM]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	South	North	West	
LOS	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [SR99 SB Off & Ave 394 - 2045 PM]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Ave 394													
Lane 1[d]	149	0.0	1380	0.108	100	3.5	LOS A	0.0	0.0	Full	1100	0.0	0.0
Approach	149	0.0		0.108		3.5	LOS A	0.0	0.0				
North: SR99SB Off Ramp													
Lane 1[d]	243	2.4	1158	0.210	100	5.0	LOS A	1.0	26.1	Full	1100	0.0	0.0
Approach	243	2.4		0.210		5.0	LOS A	1.0	26.1				
West: Ave 394													
Lane 1[d]	168	3.0	1124	0.150	100	4.5	LOS A	0.7	17.4	Full	1100	0.0	0.0
Approach	168	3.0		0.150		4.5	LOS A	0.7	17.4				
Intersection	561	1.9		0.210		4.4	LOS A	1.0	26.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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Mendocino Avenue Intersections

Alternative 4

Cul-de-sac Avenue 394 to eliminate access to SB off-ramp and cul-de-sac frontage Road to eliminate access to NB on-ramp and install All Way Stop Control at SB on and NB Off Ramps Terminals

2025 Level of Service Reports

2035 Level of Service Reports

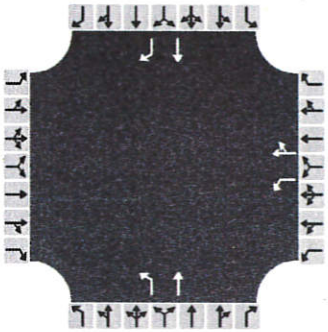
2045 Level of Service Reports

HCS 2010 All-Way Stop-Control Summary Report

General Information

Analyst	Hien	Intersection	SR99 NB Off/Frontage Road
Agency/Co.	Caltrans	Jurisdiction	
Date Performed	1/3/2019	East/West Street	Frontage Road
Analysis Year	2025	North/South Street	SR 99 NB Ramps
Time Analyzed	0.25	Peak Hour Factor	0.82
Anaylysis Time Period (hrs)	AM Peak		
Project Description	Alt 4-Realign Ave 394, SB Off-Ramp, & NB On-Ramp		

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume				50	0	166	65	411			509	127
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration				L	TR		L	T		T	R	
Flow Rate, v (veh/h)				61	202		79	501		621	155	
Percent Heavy Vehicles				26	17		2	2		2	2	

Departure Headway and Service Time

Initial Departure Headway, hd (s)				3.20	3.20		3.20	3.20		3.20	3.20	
Initial Degree of Utilization, x				0.054	0.180		0.070	0.446		0.552	0.138	
Final Departure Headway, hd (s)				8.47	7.13		6.96	6.46		6.39	5.68	
Final Degree of Utilization, x				0.143	0.401		0.153	0.899		1.102	0.244	
Move-Up Time, m (s)				2.3	2.3		2.3	2.3		2.3	2.3	
Service Time, ts (s)				6.17	4.83		4.66	4.16		4.09	3.38	

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)				61	202		79	501		621	155	
Capacity				425	505		517	557		563	634	
95% Queue Length, Q_{95} (veh)				0.5	1.9		0.5	10.6		19.3	1.0	
Control Delay (s/veh)				12.6	14.5		10.9	42.4		92.9	10.2	
Level of Service, LOS				B	B		B	E		F	B	
Approach Delay (s/veh)				14.1			38.1			76.4		
Approach LOS				B			E			F		
Intersection Delay, s/veh | LOS	52.5						F					

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HCS 2010 All-Way Stop-Control Summary Report

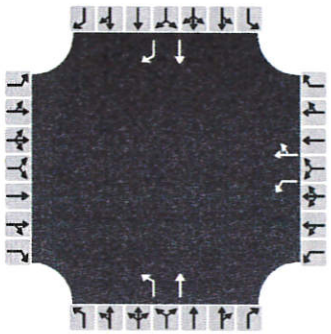
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	1/3/2019
Analysis Year	2025
Time Analyzed	0.25
Anaylysis Time Period (hrs)	PM Peak
Project Description	Alt 4-Realign Ave 394, SB Off-Ramp, & NB On-Ramp

Site Information

Intersection	SR99 NB Off/Frontage Road
Jurisdiction	
East/West Street	Frontage Road
North/South Street	SR 99 NB Ramps
Peak Hour Factor	0.85

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume				42	0	224	65	457			356	85
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration				L	TR		L	T		T	R	
Flow Rate, v (veh/h)				49	264		76	538		419	100	
Percent Heavy Vehicles				17	5		2	2		2	2	

Departure Headway and Service Time

Initial Departure Headway, hd (s)				3.20	3.20		3.20	3.20		3.20	3.20	
Initial Degree of Utilization, x				0.044	0.234		0.068	0.478		0.372	0.089	
Final Departure Headway, hd (s)				8.19	6.77		6.94	6.43		6.58	5.87	
Final Degree of Utilization, x				0.112	0.496		0.147	0.960		0.766	0.163	
Move-Up Time, m (s)				2.3	2.3		2.3	2.3		2.3	2.3	
Service Time, ts (s)				5.89	4.47		4.64	4.13		4.28	3.57	

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)				49	264		76	538		419	100	
Capacity				439	532		519	560		547	613	
95% Queue Length, Q_{95} (veh)				0.4	2.7		0.5	12.9		6.9	0.6	
Control Delay (s/veh)				11.9	15.9		10.8	53.6		27.6	9.7	
Level of Service, LOS				B	C		B	F		D	A	
Approach Delay (s/veh)				15.3			48.3			24.2		
Approach LOS				C			E			C		
Intersection Delay, s/veh | LOS	32.5						D					

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HCS 2010 All-Way Stop-Control Summary Report

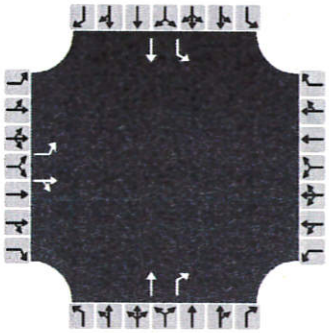
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	1/3/2019
Analysis Year	2025
Time Analyzed	0.25
Anaylysis Time Period (hrs)	AM Peak
Project Description	Alt 4-Realign Ave 394, SB Off-Ramp, & NB On-Ramp

Site Information

Intersection	SR99 SB On/18th Ave
Jurisdiction	
East/West Street	Ave 394
North/South Street	18th Ave
Peak Hour Factor	0.83

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	89	7	13					387	87	232	327	
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	L	TR					T	R		L	T	
Flow Rate, v (veh/h)	107	24					466	105		280	394	
Percent Heavy Vehicles	2	2					0	7		3	6	

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20	3.20					3.20	3.20		3.20	3.20	
Initial Degree of Utilization, x	0.095	0.021					0.414	0.093		0.248	0.350	
Final Departure Headway, hd (s)	7.80	6.83					5.87	5.29		6.24	5.79	
Final Degree of Utilization, x	0.232	0.046					0.761	0.154		0.484	0.633	
Move-Up Time, m (s)	2.3	2.3					2.3	2.3		2.3	2.3	
Service Time, ts (s)	5.50	4.53					3.57	2.99		3.94	3.49	

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	107	24					466	105		280	394	
Capacity	462	527					613	681		577	622	
95% Queue Length, Q_{95} (veh)	0.9	0.1					6.9	0.5		2.6	4.5	
Control Delay (s/veh)	12.8	9.9					24.8	8.9		14.7	17.9	
Level of Service, LOS	B	A					C	A		B	C	
Approach Delay (s/veh)	12.3						21.9			16.6		
Approach LOS	B						C			C		
Intersection Delay, s/veh | LOS	18.4						C					

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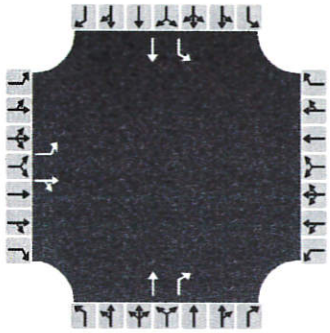
HCS 2010 All-Way Stop-Control Summary Report

General Information

Analyst	Hien	Intersection	SR99 SB On/18th Ave
,ency/Co.	Caltrans	Jurisdiction	
Date Performed	1/3/2019	East/West Street	Ave 394
Analysis Year	2025	North/South Street	18th Ave
Time Analyzed	0.25	Peak Hour Factor	0.83
Anaylysis Time Period (hrs)	PM Peak		
Project Description	Alt 4-Realign Ave 394, SB Off-Ramp, & NB On-Ramp		

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
lume	81	13	5					441	100	148	250	
.o Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	L	TR					T	R		L	T	
Flow Rate, v (veh/h)	98	22					531	120		178	301	
Percent Heavy Vehicles	2	2					0	6		6	10	

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20	3.20					3.20	3.20		3.20	3.20	
Initial Degree of Utilization, x	0.087	0.019					0.472	0.107		0.159	0.268	
Final Departure Headway, hd (s)	7.59	6.89					5.55	4.95		6.27	5.84	
Final Degree of Utilization, x	0.206	0.042					0.819	0.166		0.311	0.489	
Move-Up Time, m (s)	2.3	2.3					2.3	2.3		2.3	2.3	
Service Time, ts (s)	5.29	4.59					3.25	2.65		3.97	3.54	

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	98	22					531	120		178	301	
Capacity	474	523					649	728		574	617	
95% Queue Length, Q_{95} (veh)	0.8	0.1					8.6	0.6		1.3	2.7	
Control Delay (s/veh)	12.2	9.9					28.4	8.6		11.8	14.0	
Level of Service, LOS	B	A					D	A		B	B	
ɔroach Delay (s/veh)	11.8						24.7			13.2		
⌐pproach LOS	B						C			B		
Intersection Delay, s/veh | LOS	19.1						C					

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HCS 2010 All-Way Stop-Control Summary Report

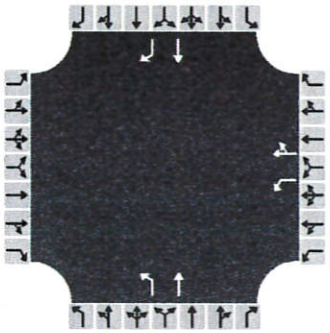
General Information

Analyst	Hien
ɟency/Co.	Caltrans
Date Performed	1/3/2019
Analysis Year	2035
Time Analyzed	0.25
Anaylysis Time Period (hrs)	AM Peak
Project Description	Alt 4-Realign Ave 394, SB Off-Ramp, & NB On-Ramp

Site Information

Intersection	SR99 NB Off/Frontage Road
Jurisdiction	
East/West Street	Frontage Road
North/South Street	SR 99 NB Ramps
Peak Hour Factor	0.82

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
ʾɔlume				62	0	206	81	511			633	158
,o Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration				L	TR		L	T		T	R	
Flow Rate, v (veh/h)				76	251		99	623		772	193	
Percent Heavy Vehicles				26	17		2	2		2	2	

Departure Headway and Service Time

Initial Departure Headway, hd (s)				3.20	3.20		3.20	3.20		3.20	3.20	
Initial Degree of Utilization, x				0.067	0.223		0.088	0.554		0.686	0.171	
Final Departure Headway, hd (s)				8.63	7.29		7.28	6.79		6.70	6.00	
Final Degree of Utilization, x				0.181	0.509		0.200	1.175		1.437	0.321	
Move-Up Time, m (s)				2.3	2.3		2.3	2.3		2.3	2.3	
Service Time, ts (s)				6.33	4.99		4.98	4.49		4.40	3.70	

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)				76	251		99	623		772	193	
Capacity				417	494		494	531		537	600	
95% Queue Length, Q_{95} (veh)				0.7	2.8		0.7	22.1		37.1	1.4	
Control Delay (s/veh)				13.2	17.3		11.8	120.4		226.0	11.5	
Level of Service, LOS				B	C		B	F		F	B	
ɔproach Delay (s/veh)				16.4			105.5			183.2		
ʌpproach LOS				C			F			F		
Intersection Delay, s/veh | LOS	128.3						F					

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HCS 2010 All-Way Stop-Control Summary Report

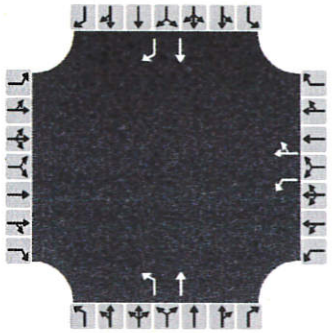
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	1/3/2019
Analysis Year	2035
Time Analyzed	0.25
Anaylysis Time Period (hrs)	PM Peak
Project Description	Alt 4-Realign Ave 394, SB Off-Ramp, & NB On-Ramp

Site Information

Intersection	SR99 NB Off/Frontage Road
Jurisdiction	
East/West Street	Frontage Road
North/South Street	SR 99 NB Ramps
Peak Hour Factor	0.85

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume				52	0	278	81	568			443	106
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration				L	TR		L	T		T	R	
Flow Rate, v (veh/h)				61	327		95	668		521	125	
Percent Heavy Vehicles				17	5		2	2		2	2	

Departure Headway and Service Time

Initial Departure Headway, hd (s)				3.20	3.20		3.20	3.20		3.20	3.20	
Initial Degree of Utilization, x				0.054	0.291		0.085	0.594		0.463	0.111	
Final Departure Headway, hd (s)				8.42	7.03		7.56	7.05		6.93	6.23	
Final Degree of Utilization, x				0.143	0.639		0.200	1.308		1.003	0.216	
Move-Up Time, m (s)				2.3	2.3		2.3	2.3		2.3	2.3	
Service Time, ts (s)				6.12	4.73		5.26	4.75		4.63	3.93	

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)				61	327		95	668		521	125	
Capacity				428	512		476	511		520	578	
95% Queue Length, Q_{95} (veh)				0.5	4.4		0.7	28.5		14.1	0.8	
Control Delay (s/veh)				12.5	21.3		12.1	173.5		66.1	10.6	
Level of Service, LOS				B	C		B	F		F	B	
Approach Delay (s/veh)				19.9			153.4			55.4		
Approach LOS				C			F			F		
Intersection Delay, s/veh | LOS	89.4						F					

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HCS 2010 All-Way Stop-Control Summary Report

General Information

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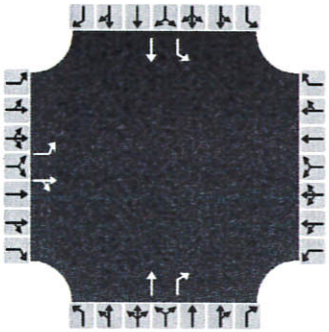
Agency/Co.	Caltrans
Date Performed	1/3/2019
Analysis Year	2035
Time Analyzed	0.25
Anaylysis Time Period (hrs)	AM Peak
Project Description	Alt 4-Realign Ave 394, SB Off-Ramp, & NB On-Ramp

Site Information

Intersection	SR99 SB On/18th Ave
Jurisdiction	
East/West Street	Ave 394
North/South Street	18th Ave
Peak Hour Factor	0.83

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	111	9	16					481	108	288	406	
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	L	TR					T	R		L	T	
Flow Rate, v (veh/h)	134	30					580	130		347	489	
Percent Heavy Vehicles	2	2					0	7		3	6	

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20	3.20					3.20	3.20		3.20	3.20	
Initial Degree of Utilization, x	0.119	0.027					0.515	0.116		0.308	0.435	
Final Departure Headway, hd (s)	8.24	7.31					6.38	5.79		6.61	6.16	
Final Degree of Utilization, x	0.306	0.061					1.027	0.209		0.637	0.837	
Move-Up Time, m (s)	2.3	2.3					2.3	2.3		2.3	2.3	
Service Time, ts (s)	5.94	5.01					4.08	3.49		4.31	3.86	

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	134	30					580	130		347	489	
Capacity	437	493					565	622		545	584	
95% Queue Length, Q_{95} (veh)	1.3	0.2					15.7	0.8		4.5	8.9	
Control Delay (s/veh)	14.5	10.5					69.7	10.0		20.2	32.8	
Level of Service, LOS	B	B					F	B		C	D	
Approach Delay (s/veh)	13.8						58.7			27.6		
Approach LOS	B						F			D		
Intersection Delay, s/veh | LOS	39.2						E					

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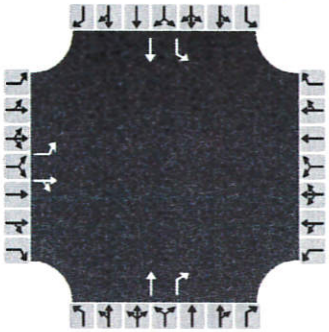
HCS 2010 All-Way Stop-Control Summary Report

General Information

Analyst	Hien	Intersection	SR99 SB On/18th Ave
Agency/Co.	Caltrans	Jurisdiction	
Date Performed	1/3/2019	East/West Street	Ave 394
Analysis Year	2035	North/South Street	18th Ave
Time Analyzed	0.25	Peak Hour Factor	0.83
Anaylysis Time Period (hrs)	PM Peak		
Project Description	Alt 4-Realign Ave 394, SB Off-Ramp, & NB On-Ramp		

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	101	16	6					548	124	184	311	
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	L	TR					T	R		L	T	
Flow Rate, v (veh/h)	122	27					660	149		222	375	
Percent Heavy Vehicles	2	2					0	6		6	10	

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20	3.20					3.20	3.20		3.20	3.20	
Initial Degree of Utilization, x	0.108	0.024					0.587	0.133		0.197	0.333	
Final Departure Headway, hd (s)	7.97	7.29					5.91	5.31		6.57	6.14	
Final Degree of Utilization, x	0.269	0.054					1.085	0.220		0.404	0.639	
Move-Up Time, m (s)	2.3	2.3					2.3	2.3		2.3	2.3	
Service Time, ts (s)	5.67	4.99					3.61	3.01		4.27	3.84	

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	122	27					660	149		222	375	
Capacity	452	494					609	678		548	587	
95% Queue Length, Q_{95} (veh)	1.1	0.2					19.3	0.8		1.9	4.5	
Control Delay (s/veh)	13.6	10.4					84.7	9.5		13.7	19.1	
Level of Service, LOS	B	B					F	A		B	C	
Approach Delay (s/veh)	13.0						70.8			17.0		
Approach LOS	B						F			C		
Intersection Delay, s/veh | LOS	44.7						E					

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HCS 2010 All-Way Stop-Control Summary Report

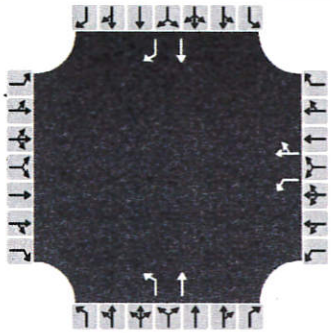
General Information

Analyst	Hien
Agency/Co.	Caltrans
Date Performed	1/3/2019
Analysis Year	2045
Time Analyzed	0.25
Anaylysis Time Period (hrs)	AM Peak
Project Description	Alt 4-Realign Ave 394, SB Off-Ramp, & NB On-Ramp

Site Information

Intersection	SR99 NB Off/Frontage Road
Jurisdiction	
East/West Street	Frontage Road
North/South Street	SR 99 NB Ramps
Peak Hour Factor	0.82

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume				77	0	257	100	635			787	196
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration				L	TR		L	T		T	R	
Flow Rate, v (veh/h)				94	313		122	774		960	239	
Percent Heavy Vehicles				26	17		2	2		2	2	

Departure Headway and Service Time

Initial Departure Headway, hd (s)				3.20	3.20		3.20	3.20		3.20	3.20	
Initial Degree of Utilization, x				0.083	0.279		0.108	0.688		0.853	0.212	
Final Departure Headway, hd (s)				8.71	7.37		7.66	7.16		7.06	6.36	
Final Degree of Utilization, x				0.227	0.641		0.259	1.540		1.882	0.422	
Move-Up Time, m (s)				2.3	2.3		2.3	2.3		2.3	2.3	
Service Time, ts (s)				6.41	5.07		5.36	4.86		4.76	4.06	

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)				94	313		122	774		960	239	
Capacity				413	489		470	503		510	566	
95% Queue Length, Q_{95} (veh)				0.9	4.5		1.0	41.0		62.0	2.1	
Control Delay (s/veh)				13.9	22.3		13.0	272.0		421.2	13.6	
Level of Service, LOS				B	C		B	F		F	B	
Approach Delay (s/veh)				20.4			236.8			340.0		
Approach LOS				C			F			F		
Intersection Delay, s/veh | LOS	251.0						F					

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HCS 2010 All-Way Stop-Control Summary Report

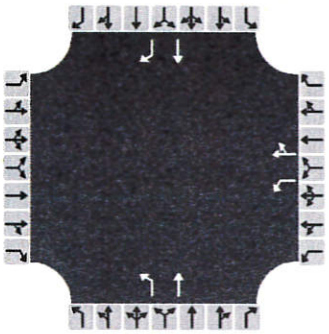
General Information

Analyst	Hien
gency/Co.	Caltrans
Date Performed	1/3/2019
Analysis Year	2045
Time Analyzed	0.25
Anaylysis Time Period (hrs)	PM Peak
Project Description	Alt 4-Realign Ave 394, SB Off-Ramp, & NB On-Ramp

Site Information

Intersection	SR99 NB Off/Frontage Road
Jurisdiction	
East/West Street	Frontage Road
North/South Street	SR 99 NB Ramps
Peak Hour Factor	0.85

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
olume				65	0	346	100	706			550	131
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration				L	TR		L	T		T	R	
Flow Rate, v (veh/h)				76	407		118	831		647	154	
Percent Heavy Vehicles				17	5		2	2		2	2	

Departure Headway and Service Time

Initial Departure Headway, hd (s)				3.20	3.20		3.20	3.20		3.20	3.20	
Initial Degree of Utilization, x				0.068	0.362		0.105	0.738		0.575	0.137	
Final Departure Headway, hd (s)				8.49	7.10		7.84	7.34		7.33	6.63	
Final Degree of Utilization, x				0.180	0.803		0.256	1.694		1.317	0.284	
Move-Up Time, m (s)				2.3	2.3		2.3	2.3		2.3	2.3	
Service Time, ts (s)				6.19	4.80		5.54	5.04		5.03	4.33	

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)				76	407		118	831		647	154	
Capacity				424	507		459	490		491	543	
95% Queue Length, Q_{95} (veh)				0.7	7.6		1.0	48.9		28.1	1.2	
Control Delay (s/veh)				13.1	32.8		13.2	339.4		178.6	11.9	
Level of Service, LOS				B	D		B	F		F	B	
pproach Delay (s/veh)				29.6			298.9			146.5		
Approach LOS				D			F			F		
Intersection Delay, s/veh | LOS	185.9						F					

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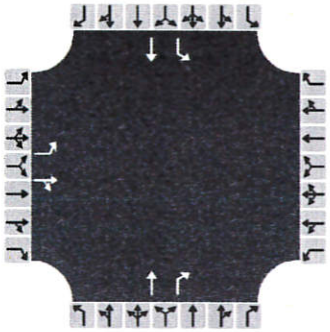
HCS 2010 All-Way Stop-Control Summary Report

General Information

Analyst	Hien	Intersection	SR99 SB On/18th Ave
Agency/Co.	Caltrans	Jurisdiction	
Date Performed	1/3/2019	East/West Street	Ave 394
Analysis Year	2045	North/South Street	18th Ave
Time Analyzed	0.25	Peak Hour Factor	0.83
Anaylysis Time Period (hrs)	AM Peak		
Project Description	Alt 4-Realign Ave 394, SB Off-Ramp, & NB On-Ramp		

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	138	11	20					598	134	359	505	
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	L	TR					T	R		L	T	
Flow Rate, v (veh/h)	166	37					720	161		433	608	
Percent Heavy Vehicles	2	2					0	7		3	6	

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20	3.20					3.20	3.20		3.20	3.20	
Initial Degree of Utilization, x	0.148	0.033					0.640	0.144		0.384	0.541	
Final Departure Headway, hd (s)	8.51	7.56					6.77	6.19		6.88	6.43	
Final Degree of Utilization, x	0.393	0.078					1.354	0.278		0.827	1.088	
Move-Up Time, m (s)	2.3	2.3					2.3	2.3		2.3	2.3	
Service Time, ts (s)	6.21	5.26					4.47	3.89		4.58	4.13	

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	166	37					720	161		433	608	
Capacity	423	476					532	582		523	559	
95% Queue Length, Q_{95} (veh)	1.8	0.3					32.0	1.1		8.3	18.5	
Control Delay (s/veh)	16.6	10.9					191.5	11.2		34.5	88.3	
Level of Service, LOS	C	B					F	B		D	F	
Approach Delay (s/veh)	15.6						158.5			65.9		
Approach LOS	C						F			F		
Intersection Delay, s/veh | LOS	99.5						F					

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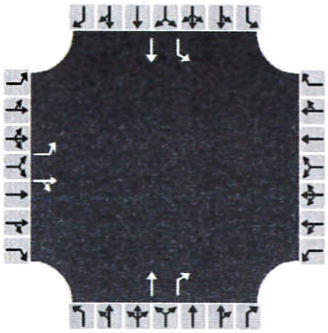
Analyst	Hien	Intersection	SR99 SB On/18th Ave
Agency/Co.	Caltrans	Jurisdiction	
Date Performed	1/3/2019	East/West Street	Ave 394
Analysis Year	2045	North/South Street	18th Ave
Time Analyzed	0.25	Peak Hour Factor	0.83
Anaylysis Time Period (hrs)	PM Peak		
Project Description	Alt 4-Realign Ave 394, SB Off-Ramp, & NB On-Ramp		

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	125	20	8					681	155	229	386	
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	L	TR					T	R		L	T	
Flow Rate, v (veh/h)	151	34					820	187		276	465	
Percent Heavy Vehicles	2	2					0	6		6	10	

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20	3.20					3.20	3.20		3.20	3.20	
Initial Degree of Utilization, x	0.134	0.030					0.729	0.166		0.245	0.413	
Final Departure Headway, hd (s)	8.23	7.54					6.35	5.75		6.83	6.40	
Final Degree of Utilization, x	0.344	0.071					1.448	0.298		0.523	0.827	
Move-Up Time, m (s)	2.3	2.3					2.3	2.3		2.3	2.3	
Service Time, ts (s)	5.93	5.24					4.05	3.45		4.53	4.10	

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	151	34					820	187		276	465	
Capacity	437	477					567	626		527	563	
95% Queue Length, Q_{95} (veh)	1.5	0.2					39.5	1.2		3.0	8.5	
Control Delay (s/veh)	15.2	10.8					229.3	10.9		16.8	32.6	
Level of Service, LOS	C	B					F	B		C	D	
Approach Delay (s/veh)	14.4						188.8			26.7		
Approach LOS	B						F			D		
Intersection Delay, s/veh | LOS	110.0						F					

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Mendocino Avenue Intersections

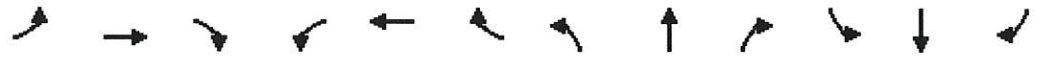
Alternative 5

Cul-de-sac Avenue 394/SB off-ramp and frontage Road/ NB on-ramp and Signalized intersections at SB on and NB off Ramps Terminals

2025 Level of Service Reports

2035 Level of Service Reports

2045 Level of Service Reports

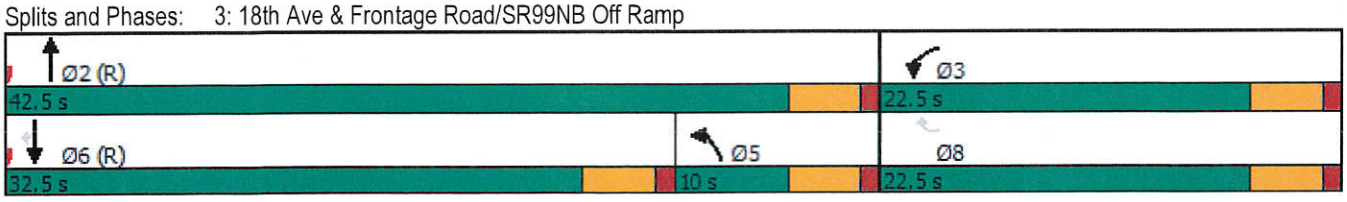


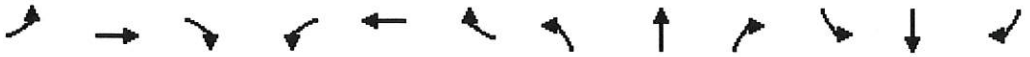
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	50	0	166	65	411	0	0	509	127
Future Volume (vph)	0	0	0	50	0	166	65	411	0	0	509	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	100		0	100		0	0		100
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	0	1583	1770	1863	0	0	1863	1583
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	1770	0	1583	1770	1863	0	0	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						180						121
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		700			1631			671			641	
Travel Time (s)		15.9			37.1			15.3			14.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	54	0	180	71	447	0	0	553	138
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	54	0	180	71	447	0	0	553	138
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	1
Detector Template				Left		Right	Left	Thru			Thru	Right
Leading Detector (ft)				20		20	20	100			100	20
Trailing Detector (ft)				0		0	0	0			0	0
Detector 1 Position(ft)				0		0	0	0			0	0
Detector 1 Size(ft)				20		20	20	6			6	20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Prot		Perm	Prot	NA			NA	Perm
Protected Phases				3			5	2			6	
Permitted Phases						8						6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				3		8	5	2			6	6
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	5.0
Minimum Split (s)				9.5		22.5	9.5	22.5			22.5	22.5
Total Split (s)				22.5		22.5	10.0	42.5			32.5	32.5
Total Split (%)				34.6%		34.6%	15.4%	65.4%			50.0%	50.0%
Maximum Green (s)				18.0		18.0	5.5	38.0			28.0	28.0
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	3.5
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	1.0
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	4.5
Lead/Lag							Lag				Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	3.0
Recall Mode				None		None	None	C-Max			C-Max	C-Max
Walk Time (s)						7.0		7.0			7.0	7.0
Flash Dont Walk (s)						11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)						0		0			0	0
Act Effct Green (s)				7.8		7.6	5.5	48.4			42.4	42.4
Actuated g/C Ratio				0.12		0.12	0.08	0.74			0.65	0.65
v/c Ratio				0.26		0.52	0.48	0.32			0.46	0.13
Control Delay				28.1		10.6	28.0	0.7			8.8	2.4
Queue Delay				0.0		0.0	0.0	0.0			0.0	0.0
Total Delay				28.1		10.6	28.0	0.7			8.8	2.4
LOS				C		B	C	A			A	A
Approach Delay					14.6			4.5			7.5	
Approach LOS					B			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 65			
Actuated Cycle Length: 65			
Offset: 61 (94%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.52			
Intersection Signal Delay: 7.6		Intersection LOS: A	
Intersection Capacity Utilization 49.4%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: 18th Ave & Frontage Road/SR99NB Off Ramp





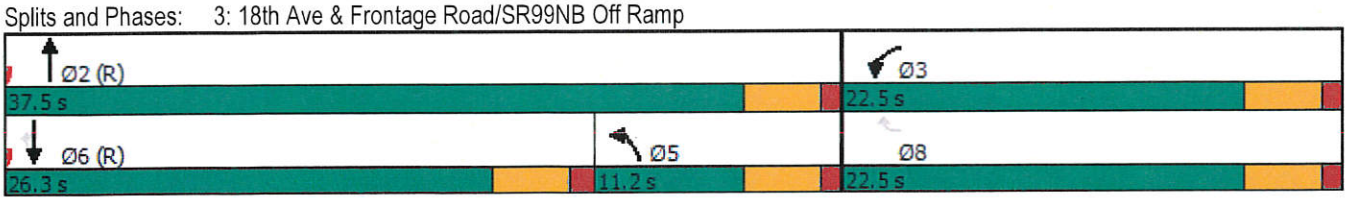
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	42	0	224	65	457	0	0	356	85
Future Volume (vph)	0	0	0	42	0	224	65	457	0	0	356	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	100		0	100		0	0		100
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	0	1583	1770	1863	0	0	1863	1583
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	1770	0	1583	1770	1863	0	0	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						243						109
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		700			1631			671			641	
Travel Time (s)		15.9			37.1			15.3			14.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	46	0	243	71	497	0	0	387	92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	46	0	243	71	497	0	0	387	92
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	1
Detector Template				Left		Right	Left	Thru			Thru	Right
Leading Detector (ft)				20		20	20	100			100	20
Trailing Detector (ft)				0		0	0	0			0	0
Detector 1 Position(ft)				0		0	0	0			0	0
Detector 1 Size(ft)				20		20	20	6			6	20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Prot		Perm	Prot	NA			NA	Perm
Protected Phases				3			5	2			6	
Permitted Phases						8						6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				3		8	5	2			6	6
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	5.0
Minimum Split (s)				9.5		22.5	9.5	22.5			22.5	22.5
Total Split (s)				22.5		22.5	11.2	37.5			26.3	26.3
Total Split (%)				37.5%		37.5%	18.7%	62.5%			43.8%	43.8%
Maximum Green (s)				18.0		18.0	6.7	33.0			21.8	21.8
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	3.5
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	1.0
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	4.5
Lead/Lag							Lag				Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	3.0
Recall Mode				None		None	None	C-Max			C-Max	C-Max
Walk Time (s)						7.0		7.0			7.0	7.0
Flash Dont Walk (s)						11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)						0		0			0	0
Act Effct Green (s)				7.7		7.4	6.4	43.6			36.9	36.9
Actuated g/C Ratio				0.13		0.12	0.11	0.73			0.62	0.62
v/c Ratio				0.20		0.60	0.38	0.37			0.34	0.09
Control Delay				24.2		10.3	21.6	1.1			8.7	2.0
Queue Delay				0.0		0.0	0.0	0.0			0.0	0.0
Total Delay				24.2		10.3	21.6	1.1			8.7	2.0
LOS				C		B	C	A			A	A
Approach Delay					12.5			3.7			7.4	
Approach LOS					B			A			A	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 18 (30%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.60
Intersection Signal Delay: 6.9 Intersection LOS: A
Intersection Capacity Utilization 47.1% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3: 18th Ave & Frontage Road/SR99NB Off Ramp

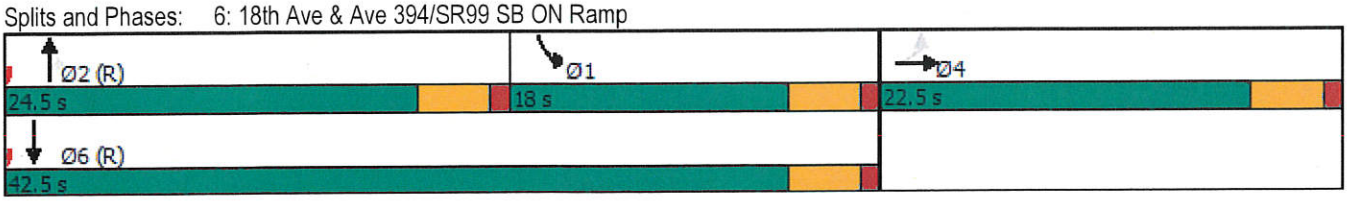


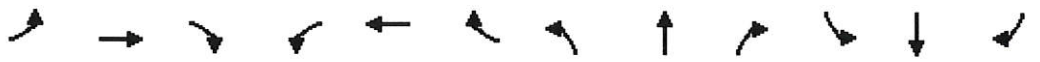
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	7	13	0	0	0	0	387	87	232	327	0
Future Volume (vph)	89	7	13	0	0	0	0	387	87	232	327	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	100		150	100		0
Storage Lanes	1		1	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.905							0.850			
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1770	1686	0	0	0	0	0	1863	1583	1770	1863	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1770	1686	0	0	0	0	0	1863	1583	1770	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14							101			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1553			1706			1221			671	
Travel Time (s)		35.3			38.8			27.8			15.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	97	8	14	0	0	0	0	421	95	252	355	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	97	22	0	0	0	0	0	421	95	252	355	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2						2	1	1	2	
Detector Template	Left	Thru						Thru	Right	Left	Thru	
Leading Detector (ft)	20	100						100	20	20	100	
Trailing Detector (ft)	0	0						0	0	0	0	
Detector 1 Position(ft)	0	0						0	0	0	0	
Detector 1 Size(ft)	20	6						6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex						Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94						94			94	
Detector 2 Size(ft)		6						6			6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA						NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4								2			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4						2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0						5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5						22.5	22.5	9.5	22.5	
Total Split (s)	22.5	22.5						24.5	24.5	18.0	42.5	
Total Split (%)	34.6%	34.6%						37.7%	37.7%	27.7%	65.4%	
Maximum Green (s)	18.0	18.0						20.0	20.0	13.5	38.0	
Yellow Time (s)	3.5	3.5						3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0						1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5						4.5	4.5	4.5	4.5	
Lead/Lag								Lead	Lead	Lag		
Lead-Lag Optimize?								Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0						3.0	3.0	3.0	3.0	
Recall Mode	None	None						C-Max	C-Max	None	C-Max	
Walk Time (s)	7.0	7.0						7.0	7.0		7.0	
Flash Dont Walk (s)	11.0	11.0						11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0	0						0	0		0	
Act Effct Green (s)	8.9	8.9						31.1	31.1	13.5	50.0	
Actuated g/C Ratio	0.14	0.14						0.48	0.48	0.21	0.77	
v/c Ratio	0.40	0.09						0.47	0.12	0.69	0.25	
Control Delay	29.8	15.6						15.3	3.3	28.7	1.3	
Queue Delay	0.0	0.0						0.0	0.0	0.0	0.0	
Total Delay	29.8	15.6						15.3	3.3	28.7	1.3	
LOS	C	B						B	A	C	A	
Approach Delay		27.2						13.1			12.7	
Approach LOS		C						B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 65			
Actuated Cycle Length: 65			
Offset: 64 (98%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 14.2		Intersection LOS: B	
Intersection Capacity Utilization 49.4%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 6: 18th Ave & Ave 394/SR99 SB ON Ramp





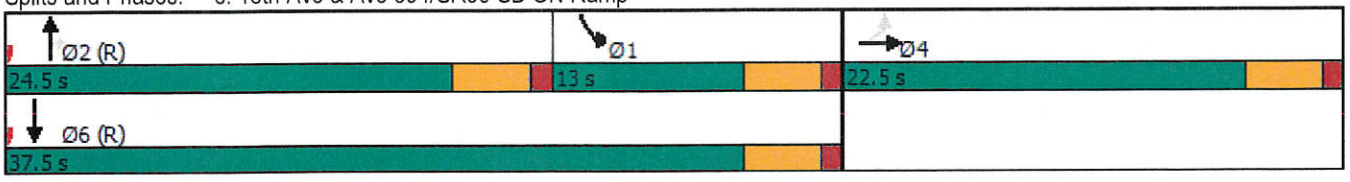
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	13	5	0	0	0	0	441	100	148	250	0
Future Volume (vph)	81	13	5	0	0	0	0	441	100	148	250	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	100		150	100		0
Storage Lanes	1		1	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.961							0.850			
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1770	1790	0	0	0	0	0	1863	1583	1770	1863	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1770	1790	0	0	0	0	0	1863	1583	1770	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5							109			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1553			1706			1221			671	
Travel Time (s)		35.3			38.8			27.8			15.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	88	14	5	0	0	0	0	479	109	161	272	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	88	19	0	0	0	0	0	479	109	161	272	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2						2	1	1	2	
Detector Template	Left	Thru						Thru	Right	Left	Thru	
Leading Detector (ft)	20	100						100	20	20	100	
Trailing Detector (ft)	0	0						0	0	0	0	
Detector 1 Position(ft)	0	0						0	0	0	0	
Detector 1 Size(ft)	20	6						6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex						Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94						94			94	
Detector 2 Size(ft)		6						6			6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA						NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4								2			

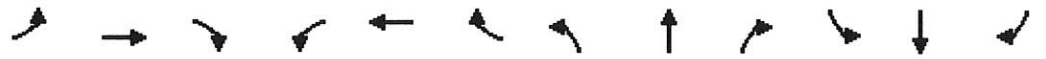
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4						2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0						5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5						22.5	22.5	9.5	22.5	
Total Split (s)	22.5	22.5						24.5	24.5	13.0	37.5	
Total Split (%)	37.5%	37.5%						40.8%	40.8%	21.7%	62.5%	
Maximum Green (s)	18.0	18.0						20.0	20.0	8.5	33.0	
Yellow Time (s)	3.5	3.5						3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0						1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5						4.5	4.5	4.5	4.5	
Lead/Lag								Lead	Lead	Lag		
Lead-Lag Optimize?								Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0						3.0	3.0	3.0	3.0	
Recall Mode	None	None						C-Max	C-Max	None	C-Max	
Walk Time (s)	7.0	7.0						7.0	7.0		7.0	
Flash Dont Walk (s)	11.0	11.0						11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0	0						0	0		0	
Act Effct Green (s)	8.4	8.4						35.1	35.1	8.2	45.5	
Actuated g/C Ratio	0.14	0.14						0.58	0.58	0.14	0.76	
v/c Ratio	0.36	0.07						0.44	0.11	0.67	0.19	
Control Delay	26.7	18.8						11.9	2.8	33.4	1.8	
Queue Delay	0.0	0.0						0.0	0.0	0.0	0.0	
Total Delay	26.7	18.8						11.9	2.8	33.4	1.8	
LOS	C	B						B	A	C	A	
Approach Delay		25.3						10.2			13.5	
Approach LOS		C						B			B	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 16 (27%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.67
Intersection Signal Delay: 12.9 Intersection LOS: B
Intersection Capacity Utilization 47.1% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 6: 18th Ave & Ave 394/SR99 SB ON Ramp



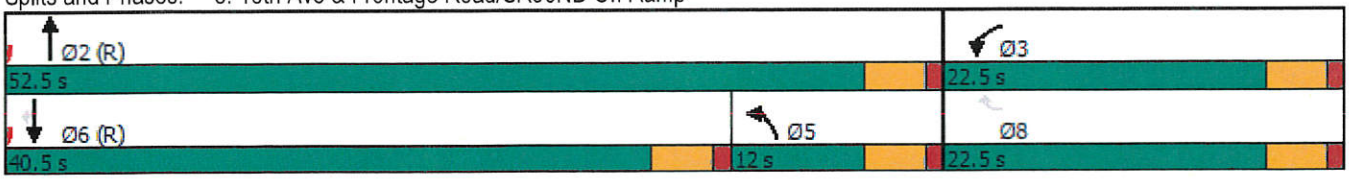


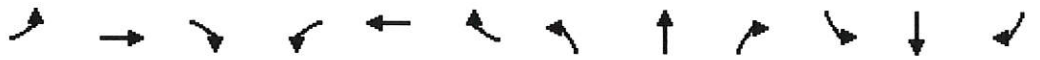
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	62	0	206	81	511	0	0	633	158
Future Volume (vph)	0	0	0	62	0	206	81	511	0	0	633	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	100		0	100		0	0		100
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	0	1583	1770	1863	0	0	1863	1583
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	1770	0	1583	1770	1863	0	0	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						224						115
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		700			1631			671			641	
Travel Time (s)		15.9			37.1			15.3			14.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	67	0	224	88	555	0	0	688	172
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	67	0	224	88	555	0	0	688	172
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	1
Detector Template				Left		Right	Left	Thru			Thru	Right
Leading Detector (ft)				20		20	20	100			100	20
Trailing Detector (ft)				0		0	0	0			0	0
Detector 1 Position(ft)				0		0	0	0			0	0
Detector 1 Size(ft)				20		20	20	6			6	20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Prot		Perm	Prot	NA			NA	Perm
Protected Phases				3			5	2			6	
Permitted Phases						8						6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				3		8	5	2			6	6
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	5.0
Minimum Split (s)				9.5		22.5	9.5	22.5			22.5	22.5
Total Split (s)				22.5		22.5	12.0	52.5			40.5	40.5
Total Split (%)				30.0%		30.0%	16.0%	70.0%			54.0%	54.0%
Maximum Green (s)				18.0		18.0	7.5	48.0			36.0	36.0
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	3.5
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	1.0
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	4.5
Lead/Lag							Lag				Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	3.0
Recall Mode				None		None	None	C-Max			C-Max	C-Max
Walk Time (s)						7.0		7.0			7.0	7.0
Flash Dont Walk (s)						11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)						0		0			0	0
Act Effct Green (s)				8.5		8.5	7.1	57.5			47.9	47.9
Actuated g/C Ratio				0.11		0.11	0.09	0.77			0.64	0.64
v/c Ratio				0.33		0.59	0.52	0.39			0.58	0.16
Control Delay				34.1		11.5	32.1	0.8			11.8	3.3
Queue Delay				0.0		0.0	0.0	0.0			0.0	0.0
Total Delay				34.1		11.5	32.1	0.8			11.8	3.3
LOS				C		B	C	A			B	A
Approach Delay					16.7			5.1			10.1	
Approach LOS					B			A			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 75			
Actuated Cycle Length: 75			
Offset: 72 (96%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.59			
Intersection Signal Delay: 9.4		Intersection LOS: A	
Intersection Capacity Utilization 58.7%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 3: 18th Ave & Frontage Road/SR99NB Off Ramp



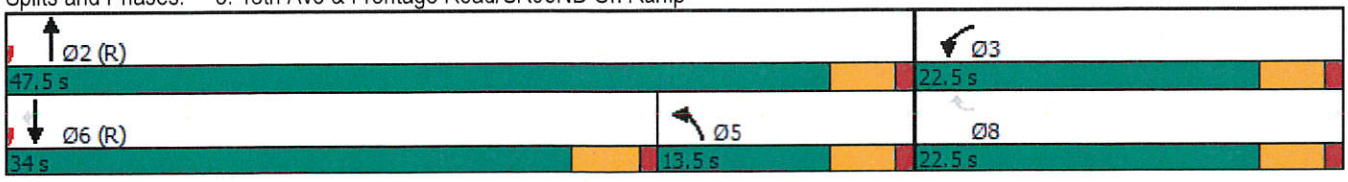


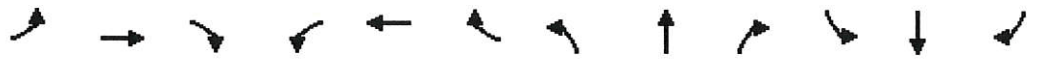
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	52	0	278	81	568	0	0	443	106
Future Volume (vph)	0	0	0	52	0	278	81	568	0	0	443	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	100		0	100		0	0		100
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	0	1583	1770	1863	0	0	1863	1583
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	1770	0	1583	1770	1863	0	0	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						296						106
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		700			1631			671			641	
Travel Time (s)		15.9			37.1			15.3			14.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	57	0	302	88	617	0	0	482	115
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	57	0	302	88	617	0	0	482	115
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	1
Detector Template				Left		Right	Left	Thru			Thru	Right
Leading Detector (ft)				20		20	20	100			100	20
Trailing Detector (ft)				0		0	0	0			0	0
Detector 1 Position(ft)				0		0	0	0			0	0
Detector 1 Size(ft)				20		20	20	6			6	20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Prot		Perm	Prot	NA			NA	Perm
Protected Phases				3			5	2			6	
Permitted Phases						8						6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				3		8	5	2			6	6
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	5.0
Minimum Split (s)				9.5		22.5	9.5	22.5			22.5	22.5
Total Split (s)				22.5		22.5	13.5	47.5			34.0	34.0
Total Split (%)				32.1%		32.1%	19.3%	67.9%			48.6%	48.6%
Maximum Green (s)				18.0		18.0	9.0	43.0			29.5	29.5
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	3.5
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	1.0
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	4.5
Lead/Lag							Lag				Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	3.0
Recall Mode				None		None	None	C-Max			C-Max	C-Max
Walk Time (s)						7.0		7.0			7.0	7.0
Flash Dont Walk (s)						11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)						0		0			0	0
Act Effct Green (s)				8.6		8.4	8.3	52.6			41.8	41.8
Actuated g/C Ratio				0.12		0.12	0.12	0.75			0.60	0.60
v/c Ratio				0.26		0.67	0.42	0.44			0.43	0.12
Control Delay				29.3		12.0	23.5	1.1			11.1	2.9
Queue Delay				0.0		0.0	0.0	0.0			0.0	0.0
Total Delay				29.3		12.0	23.5	1.1			11.1	2.9
LOS				C		B	C	A			B	A
Approach Delay					14.7			3.9			9.5	
Approach LOS					B			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 16 (23%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 8.3		Intersection LOS: A	
Intersection Capacity Utilization 55.9%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 3: 18th Ave & Frontage Road/SR99NB Off Ramp



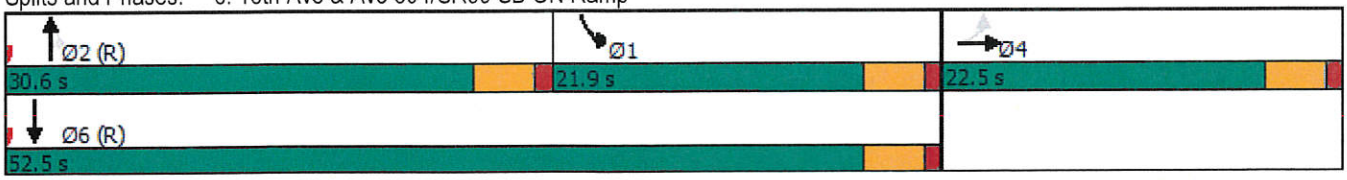


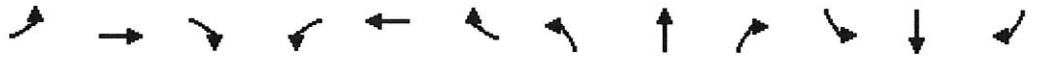
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	111	9	16	0	0	0	0	481	108	288	407	0
Future Volume (vph)	111	9	16	0	0	0	0	481	108	288	407	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	100		150	100		0
Storage Lanes	1		1	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.906							0.850			
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1770	1688	0	0	0	0	0	1863	1583	1770	1863	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1770	1688	0	0	0	0	0	1863	1583	1770	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17							115			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1553			1706			1221			671	
Travel Time (s)		35.3			38.8			27.8			15.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	121	10	17	0	0	0	0	523	117	313	442	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	121	27	0	0	0	0	0	523	117	313	442	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2						2	1	1	2	
Detector Template	Left	Thru						Thru	Right	Left	Thru	
Leading Detector (ft)	20	100						100	20	20	100	
Trailing Detector (ft)	0	0						0	0	0	0	
Detector 1 Position(ft)	0	0						0	0	0	0	
Detector 1 Size(ft)	20	6						6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex						Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94						94			94	
Detector 2 Size(ft)		6						6			6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA						NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4								2			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4						2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0						5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5						22.5	22.5	9.5	22.5	
Total Split (s)	22.5	22.5						30.6	30.6	21.9	52.5	
Total Split (%)	30.0%	30.0%						40.8%	40.8%	29.2%	70.0%	
Maximum Green (s)	18.0	18.0						26.1	26.1	17.4	48.0	
Yellow Time (s)	3.5	3.5						3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0						1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5						4.5	4.5	4.5	4.5	
Lead/Lag								Lead	Lead	Lag		
Lead-Lag Optimize?								Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0						3.0	3.0	3.0	3.0	
Recall Mode	None	None						C-Max	C-Max	None	C-Max	
Walk Time (s)	7.0	7.0						7.0	7.0		7.0	
Flash Dont Walk (s)	11.0	11.0						11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0	0						0	0		0	
Act Effct Green (s)	10.4	10.4						35.9	35.9	17.4	58.7	
Actuated g/C Ratio	0.14	0.14						0.48	0.48	0.23	0.78	
v/c Ratio	0.49	0.11						0.59	0.14	0.76	0.30	
Control Delay	36.0	17.0						19.4	3.8	32.0	0.8	
Queue Delay	0.0	0.0						0.0	0.0	0.0	0.0	
Total Delay	36.0	17.0						19.4	3.8	32.0	0.8	
LOS	D	B						B	A	C	A	
Approach Delay		32.5						16.6			13.7	
Approach LOS		C						B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 75			
Actuated Cycle Length: 75			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 16.7		Intersection LOS: B	
Intersection Capacity Utilization 58.7%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 6: 18th Ave & Ave 394/SR99 SB ON Ramp





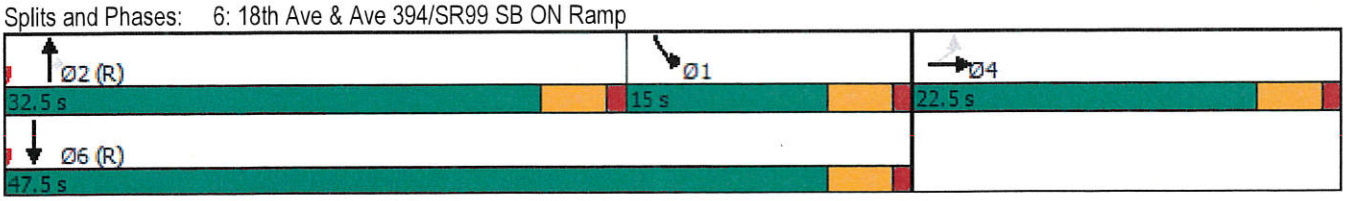
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	101	16	6	0	0	0	0	548	124	184	311	0
Future Volume (vph)	101	16	6	0	0	0	0	548	124	184	311	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	100		150	100		0
Storage Lanes	1		1	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.956							0.850			
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1770	1781	0	0	0	0	0	1863	1583	1770	1863	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1770	1781	0	0	0	0	0	1863	1583	1770	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7							135			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1553			1706			1221			671	
Travel Time (s)		35.3			38.8			27.8			15.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	110	17	7	0	0	0	0	596	135	200	338	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	110	24	0	0	0	0	0	596	135	200	338	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2						2	1	1	2	
Detector Template	Left	Thru						Thru	Right	Left	Thru	
Leading Detector (ft)	20	100						100	20	20	100	
Trailing Detector (ft)	0	0						0	0	0	0	
Detector 1 Position(ft)	0	0						0	0	0	0	
Detector 1 Size(ft)	20	6						6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex						Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94						94			94	
Detector 2 Size(ft)		6						6			6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA						NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4								2			

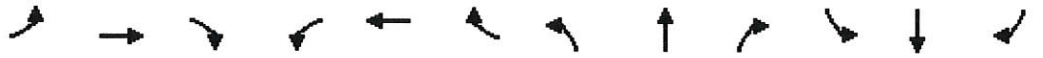
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4						2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0						5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5						22.5	22.5	9.5	22.5	
Total Split (s)	22.5	22.5						32.5	32.5	15.0	47.5	
Total Split (%)	32.1%	32.1%						46.4%	46.4%	21.4%	67.9%	
Maximum Green (s)	18.0	18.0						28.0	28.0	10.5	43.0	
Yellow Time (s)	3.5	3.5						3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0						1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5						4.5	4.5	4.5	4.5	
Lead/Lag								Lead	Lead	Lag		
Lead-Lag Optimize?								Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0						3.0	3.0	3.0	3.0	
Recall Mode	None	None						C-Max	C-Max	None	C-Max	
Walk Time (s)	7.0	7.0						7.0	7.0		7.0	
Flash Dont Walk (s)	11.0	11.0						11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0	0						0	0		0	
Act Effct Green (s)	9.7	9.7						38.4	38.4	10.5	54.3	
Actuated g/C Ratio	0.14	0.14						0.55	0.55	0.15	0.78	
v/c Ratio	0.45	0.10						0.58	0.15	0.75	0.23	
Control Delay	32.9	20.6						15.0	2.6	40.5	0.8	
Queue Delay	0.0	0.0						0.0	0.0	0.0	0.0	
Total Delay	32.9	20.6						15.0	2.6	40.5	0.8	
LOS	C	C						B	A	D	A	
Approach Delay		30.7						12.8			15.5	
Approach LOS		C						B			B	

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 16 (23%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 15.5 Intersection LOS: B
Intersection Capacity Utilization 55.9% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 6: 18th Ave & Ave 394/SR99 SB ON Ramp



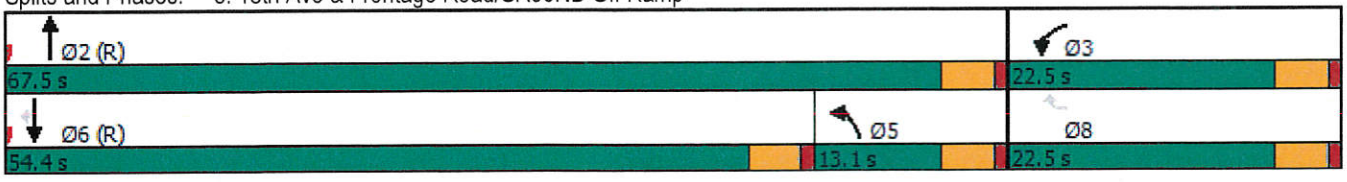


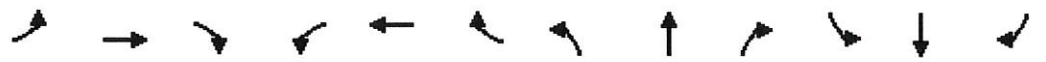
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	77	0	257	100	635	0	0	787	186
Future Volume (vph)	0	0	0	77	0	257	100	635	0	0	787	186
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	100		0	100		0	0		100
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	0	1583	1770	1863	0	0	1863	1583
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	1770	0	1583	1770	1863	0	0	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						279						106
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		700			1631			671			641	
Travel Time (s)		15.9			37.1			15.3			14.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	84	0	279	109	690	0	0	855	202
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	84	0	279	109	690	0	0	855	202
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	1
Detector Template				Left		Right	Left	Thru			Thru	Right
Leading Detector (ft)				20		20	20	100			100	20
Trailing Detector (ft)				0		0	0	0			0	0
Detector 1 Position(ft)				0		0	0	0			0	0
Detector 1 Size(ft)				20		20	20	6			6	20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Prot		Perm	Prot	NA			NA	Perm
Protected Phases				3			5	2			6	
Permitted Phases						8						6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				3		8	5	2			6	6
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	5.0
Minimum Split (s)				9.5		22.5	9.5	22.5			22.5	22.5
Total Split (s)				22.5		22.5	13.1	67.5			54.4	54.4
Total Split (%)				25.0%		25.0%	14.6%	75.0%			60.4%	60.4%
Maximum Green (s)				18.0		18.0	8.6	63.0			49.9	49.9
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	3.5
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	1.0
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	4.5
Lead/Lag							Lag				Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	3.0
Recall Mode				None		None	None	C-Max			C-Max	C-Max
Walk Time (s)						7.0		7.0			7.0	7.0
Flash Dont Walk (s)						11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)						0		0			0	0
Act Effct Green (s)				9.8		9.8	8.6	71.2			58.1	58.1
Actuated g/C Ratio				0.11		0.11	0.10	0.79			0.65	0.65
v/c Ratio				0.44		0.66	0.64	0.47			0.71	0.19
Control Delay				43.5		12.9	46.5	0.8			15.4	4.0
Queue Delay				0.0		0.0	0.0	0.2			0.0	0.0
Total Delay				43.5		12.9	46.5	1.0			15.4	4.0
LOS				D		B	D	A			B	A
Approach Delay					20.0			7.2			13.3	
Approach LOS					B			A			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 88 (98%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 12.2		Intersection LOS: B	
Intersection Capacity Utilization 70.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 3: 18th Ave & Frontage Road/SR99NB Off Ramp





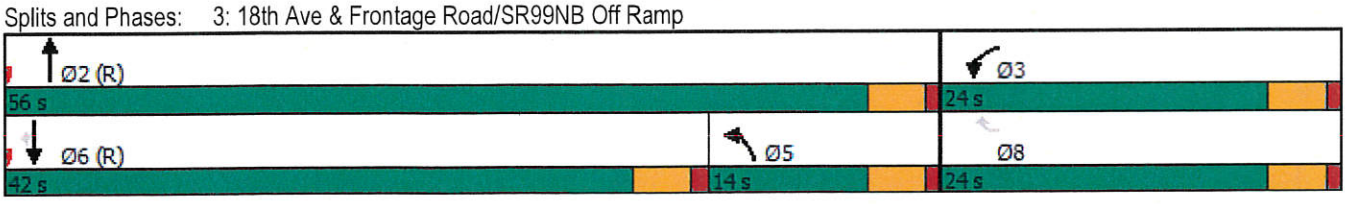
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	65	0	346	100	706	0	0	550	131
Future Volume (vph)	0	0	0	65	0	346	100	706	0	0	550	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	100		0	100		0	0		100
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	0	1583	1770	1863	0	0	1863	1583
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	1770	0	1583	1770	1863	0	0	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						230						101
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		700			1631			671			641	
Travel Time (s)		15.9			37.1			15.3			14.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	71	0	376	109	767	0	0	598	142
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	71	0	376	109	767	0	0	598	142
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	1
Detector Template				Left		Right	Left	Thru			Thru	Right
Leading Detector (ft)				20		20	20	100			100	20
Trailing Detector (ft)				0		0	0	0			0	0
Detector 1 Position(ft)				0		0	0	0			0	0
Detector 1 Size(ft)				20		20	20	6			6	20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Prot		Perm	Prot	NA			NA	Perm
Protected Phases				3			5	2			6	
Permitted Phases						8						6

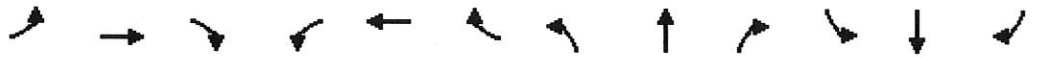
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				3		8	5	2			6	6
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	5.0
Minimum Split (s)				9.5		22.5	9.5	22.5			22.5	22.5
Total Split (s)				24.0		24.0	14.0	56.0			42.0	42.0
Total Split (%)				30.0%		30.0%	17.5%	70.0%			52.5%	52.5%
Maximum Green (s)				19.5		19.5	9.5	51.5			37.5	37.5
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	3.5
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	1.0
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	4.5
Lead/Lag							Lag				Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	3.0
Recall Mode				None		None	None	C-Max			C-Max	C-Max
Walk Time (s)						7.0		7.0			7.0	7.0
Flash Dont Walk (s)						11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)						0		0			0	0
Act Effct Green (s)				13.3		13.3	8.9	57.7			46.5	46.5
Actuated g/C Ratio				0.17		0.17	0.11	0.72			0.58	0.58
v/c Ratio				0.24		0.83	0.56	0.57			0.55	0.15
Control Delay				28.5		27.8	29.9	1.6			15.5	4.6
Queue Delay				0.0		0.0	0.0	0.1			0.0	0.0
Total Delay				28.5		27.8	29.9	1.7			15.5	4.6
LOS				C		C	C	A			B	A
Approach Delay					27.9			5.2			13.4	
Approach LOS					C			A			B	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 16 (20%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 13.1 Intersection LOS: B
Intersection Capacity Utilization 66.7% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 3: 18th Ave & Frontage Road/SR99NB Off Ramp





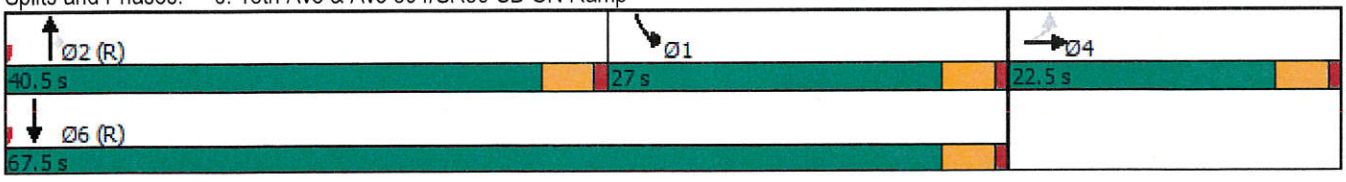
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	138	11	20	0	0	0	0	597	134	359	505	0
Future Volume (vph)	138	11	20	0	0	0	0	597	134	359	505	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	100		150	100		0
Storage Lanes	1		1	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.903							0.850			
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1770	1682	0	0	0	0	0	1863	1583	1770	1863	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1770	1682	0	0	0	0	0	1863	1583	1770	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22							105			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1553			1706			1221			671	
Travel Time (s)		35.3			38.8			27.8			15.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	150	12	22	0	0	0	0	649	146	390	549	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	150	34	0	0	0	0	0	649	146	390	549	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2						2	1	1	2	
Detector Template	Left	Thru						Thru	Right	Left	Thru	
Leading Detector (ft)	20	100						100	20	20	100	
Trailing Detector (ft)	0	0						0	0	0	0	
Detector 1 Position(ft)	0	0						0	0	0	0	
Detector 1 Size(ft)	20	6						6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex						Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94						94			94	
Detector 2 Size(ft)		6						6			6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA						NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4								2			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4						2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0						5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5						22.5	22.5	9.5	22.5	
Total Split (s)	22.5	22.5						40.5	40.5	27.0	67.5	
Total Split (%)	25.0%	25.0%						45.0%	45.0%	30.0%	75.0%	
Maximum Green (s)	18.0	18.0						36.0	36.0	22.5	63.0	
Yellow Time (s)	3.5	3.5						3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0						1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5						4.5	4.5	4.5	4.5	
Lead/Lag								Lead	Lead	Lag		
Lead-Lag Optimize?								Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0						3.0	3.0	3.0	3.0	
Recall Mode	None	None						C-Max	C-Max	None	C-Max	
Walk Time (s)	7.0	7.0						7.0	7.0		7.0	
Flash Dont Walk (s)	11.0	11.0						11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0	0						0	0		0	
Act Effct Green (s)	12.9	12.9						41.1	41.1	22.5	68.1	
Actuated g/C Ratio	0.14	0.14						0.46	0.46	0.25	0.76	
v/c Ratio	0.59	0.13						0.76	0.19	0.88	0.39	
Control Delay	45.3	18.3						28.9	6.4	43.1	1.0	
Queue Delay	0.0	0.0						0.0	0.0	0.0	0.0	
Total Delay	45.3	18.3						28.9	6.4	43.1	1.0	
LOS	D	B						C	A	D	A	
Approach Delay		40.3						24.8			18.5	
Approach LOS		D						C			B	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 23.2 Intersection LOS: C
Intersection Capacity Utilization 70.2% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 6: 18th Ave & Ave 394/SR99 SB ON Ramp



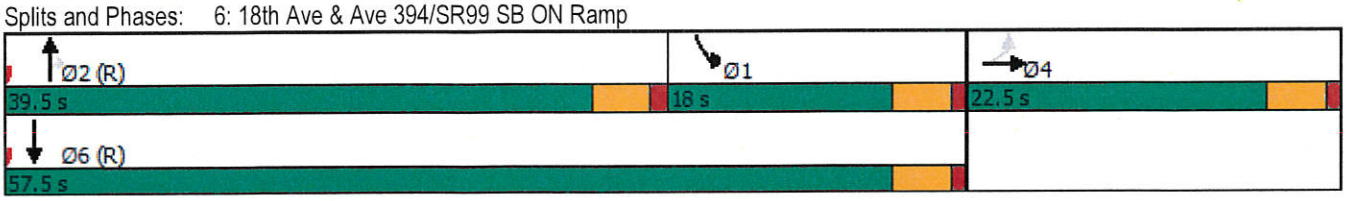
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	20	8	0	0	0	0	681	155	229	386	0
Future Volume (vph)	125	20	8	0	0	0	0	681	155	229	386	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	100		150	100		0
Storage Lanes	1		1	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.956							0.850			
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1770	1781	0	0	0	0	0	1863	1583	1770	1863	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1770	1781	0	0	0	0	0	1863	1583	1770	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9							127			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1553			1706			1221			671	
Travel Time (s)		35.3			38.8			27.8			15.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	136	22	9	0	0	0	0	740	168	249	420	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	136	31	0	0	0	0	0	740	168	249	420	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2						2	1	1	2	
Detector Template	Left	Thru						Thru	Right	Left	Thru	
Leading Detector (ft)	20	100						100	20	20	100	
Trailing Detector (ft)	0	0						0	0	0	0	
Detector 1 Position(ft)	0	0						0	0	0	0	
Detector 1 Size(ft)	20	6						6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex						Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94						94			94	
Detector 2 Size(ft)		6						6			6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA						NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4								2			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4						2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0						5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5						22.5	22.5	9.5	22.5	
Total Split (s)	22.5	22.5						39.5	39.5	18.0	57.5	
Total Split (%)	28.1%	28.1%						49.4%	49.4%	22.5%	71.9%	
Maximum Green (s)	18.0	18.0						35.0	35.0	13.5	53.0	
Yellow Time (s)	3.5	3.5						3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0						1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5						4.5	4.5	4.5	4.5	
Lead/Lag								Lead	Lead	Lag		
Lead-Lag Optimize?								Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0						3.0	3.0	3.0	3.0	
Recall Mode	None	None						C-Max	C-Max	None	C-Max	
Walk Time (s)	7.0	7.0						7.0	7.0		7.0	
Flash Dont Walk (s)	11.0	11.0						11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0	0						0	0		0	
Act Effct Green (s)	11.4	11.4						41.6	41.6	13.5	59.6	
Actuated g/C Ratio	0.14	0.14						0.52	0.52	0.17	0.74	
v/c Ratio	0.54	0.12						0.76	0.19	0.84	0.30	
Control Delay	39.2	23.0						23.2	4.4	45.7	0.9	
Queue Delay	0.0	0.0						0.0	0.0	0.0	0.0	
Total Delay	39.2	23.0						23.2	4.4	45.7	0.9	
LOS	D	C						C	A	D	A	
Approach Delay		36.2						19.8			17.6	
Approach LOS		D						B			B	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 16 (20%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 20.5 Intersection LOS: C
Intersection Capacity Utilization 66.7% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 6: 18th Ave & Ave 394/SR99 SB ON Ramp



Mendocino Avenue Intersections

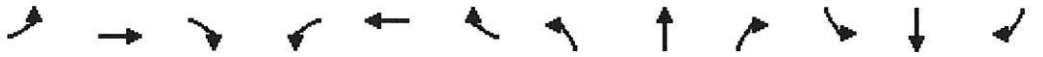
Alternative 5

Cul-de-sac Avenue 394/SB off-ramp and frontage Road/ NB on-ramp and Signalized intersections at SB on and NB off Ramps Terminals

2025 Level of Service Reports

2035 Level of Service Reports

2045 Level of Service Reports

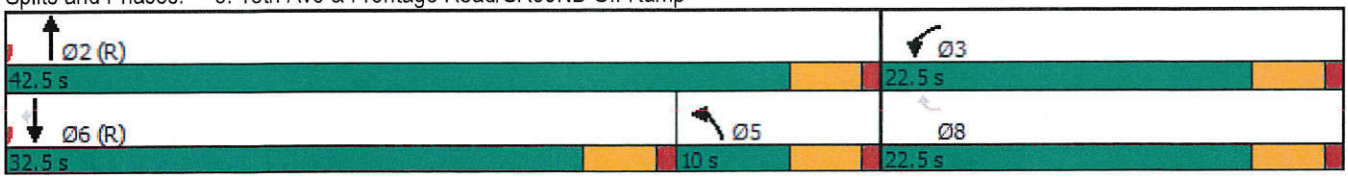


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	50	0	166	65	411	0	0	509	127
Future Volume (vph)	0	0	0	50	0	166	65	411	0	0	509	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	100		0	100		0	0		100
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	0	1583	1770	1863	0	0	1863	1583
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	1770	0	1583	1770	1863	0	0	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						180						121
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		700			1631			671			641	
Travel Time (s)		15.9			37.1			15.3			14.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	54	0	180	71	447	0	0	553	138
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	54	0	180	71	447	0	0	553	138
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	1
Detector Template				Left		Right	Left	Thru			Thru	Right
Leading Detector (ft)				20		20	20	100			100	20
Trailing Detector (ft)				0		0	0	0			0	0
Detector 1 Position(ft)				0		0	0	0			0	0
Detector 1 Size(ft)				20		20	20	6			6	20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Prot		Perm	Prot	NA			NA	Perm
Protected Phases				3			5	2			6	
Permitted Phases						8						6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				3		8	5	2			6	6
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	5.0
Minimum Split (s)				9.5		22.5	9.5	22.5			22.5	22.5
Total Split (s)				22.5		22.5	10.0	42.5			32.5	32.5
Total Split (%)				34.6%		34.6%	15.4%	65.4%			50.0%	50.0%
Maximum Green (s)				18.0		18.0	5.5	38.0			28.0	28.0
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	3.5
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	1.0
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	4.5
Lead/Lag							Lag				Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	3.0
Recall Mode				None		None	None	C-Max			C-Max	C-Max
Walk Time (s)						7.0		7.0			7.0	7.0
Flash Dont Walk (s)						11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)						0		0			0	0
Act Effct Green (s)				7.8		7.6	5.5	48.4			42.4	42.4
Actuated g/C Ratio				0.12		0.12	0.08	0.74			0.65	0.65
v/c Ratio				0.26		0.52	0.48	0.32			0.46	0.13
Control Delay				28.1		10.6	28.0	0.7			8.8	2.4
Queue Delay				0.0		0.0	0.0	0.0			0.0	0.0
Total Delay				28.1		10.6	28.0	0.7			8.8	2.4
LOS				C		B	C	A			A	A
Approach Delay					14.6			4.5			7.5	
Approach LOS					B			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 65			
Actuated Cycle Length: 65			
Offset: 61 (94%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.52			
Intersection Signal Delay: 7.6		Intersection LOS: A	
Intersection Capacity Utilization 49.4%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: 18th Ave & Frontage Road/SR99NB Off Ramp



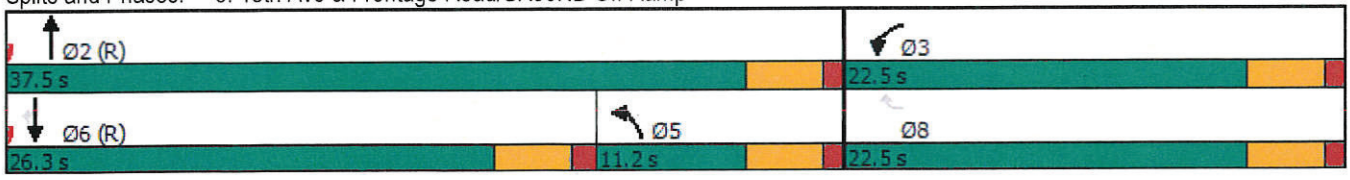
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	42	0	224	65	457	0	0	356	85
Future Volume (vph)	0	0	0	42	0	224	65	457	0	0	356	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	100		0	100		0	0		100
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	0	1583	1770	1863	0	0	1863	1583
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	1770	0	1583	1770	1863	0	0	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						243						109
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		700			1631			671			641	
Travel Time (s)		15.9			37.1			15.3			14.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	46	0	243	71	497	0	0	387	92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	46	0	243	71	497	0	0	387	92
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	1
Detector Template				Left		Right	Left	Thru			Thru	Right
Leading Detector (ft)				20		20	20	100			100	20
Trailing Detector (ft)				0		0	0	0			0	0
Detector 1 Position(ft)				0		0	0	0			0	0
Detector 1 Size(ft)				20		20	20	6			6	20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Prot		Perm	Prot	NA			NA	Perm
Protected Phases				3			5	2			6	
Permitted Phases						8						6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				3		8	5	2			6	6
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	5.0
Minimum Split (s)				9.5		22.5	9.5	22.5			22.5	22.5
Total Split (s)				22.5		22.5	11.2	37.5			26.3	26.3
Total Split (%)				37.5%		37.5%	18.7%	62.5%			43.8%	43.8%
Maximum Green (s)				18.0		18.0	6.7	33.0			21.8	21.8
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	3.5
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	1.0
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	4.5
Lead/Lag							Lag				Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	3.0
Recall Mode				None		None	None	C-Max			C-Max	C-Max
Walk Time (s)						7.0		7.0			7.0	7.0
Flash Dont Walk (s)						11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)						0		0			0	0
Act Effct Green (s)				7.7		7.4	6.4	43.6			36.9	36.9
Actuated g/C Ratio				0.13		0.12	0.11	0.73			0.62	0.62
v/c Ratio				0.20		0.60	0.38	0.37			0.34	0.09
Control Delay				24.2		10.3	21.6	1.1			8.7	2.0
Queue Delay				0.0		0.0	0.0	0.0			0.0	0.0
Total Delay				24.2		10.3	21.6	1.1			8.7	2.0
LOS				C		B	C	A			A	A
Approach Delay					12.5			3.7			7.4	
Approach LOS					B			A			A	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 18 (30%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.60
Intersection Signal Delay: 6.9 Intersection LOS: A
Intersection Capacity Utilization 47.1% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3: 18th Ave & Frontage Road/SR99NB Off Ramp



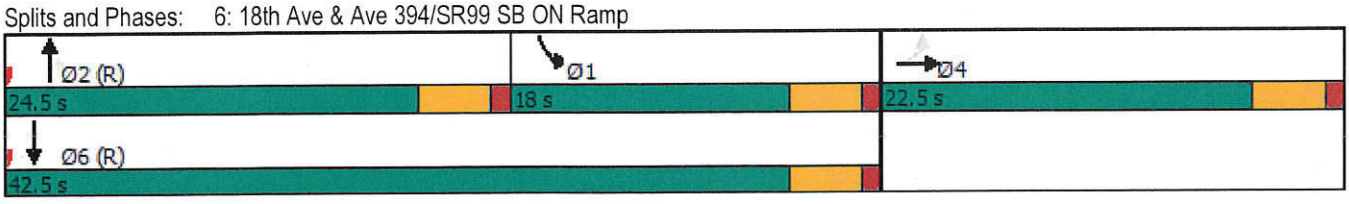
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	7	13	0	0	0	0	387	87	232	327	0
Future Volume (vph)	89	7	13	0	0	0	0	387	87	232	327	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	100		150	100		0
Storage Lanes	1		1	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.905							0.850			
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1770	1686	0	0	0	0	0	1863	1583	1770	1863	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1770	1686	0	0	0	0	0	1863	1583	1770	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14							101			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1553			1706			1221			671	
Travel Time (s)		35.3			38.8			27.8			15.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	97	8	14	0	0	0	0	421	95	252	355	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	97	22	0	0	0	0	0	421	95	252	355	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2						2	1	1	2	
Detector Template	Left	Thru						Thru	Right	Left	Thru	
Leading Detector (ft)	20	100						100	20	20	100	
Trailing Detector (ft)	0	0						0	0	0	0	
Detector 1 Position(ft)	0	0						0	0	0	0	
Detector 1 Size(ft)	20	6						6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex						Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94						94			94	
Detector 2 Size(ft)		6						6			6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA						NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4								2			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4						2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0						5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5						22.5	22.5	9.5	22.5	
Total Split (s)	22.5	22.5						24.5	24.5	18.0	42.5	
Total Split (%)	34.6%	34.6%						37.7%	37.7%	27.7%	65.4%	
Maximum Green (s)	18.0	18.0						20.0	20.0	13.5	38.0	
Yellow Time (s)	3.5	3.5						3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0						1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5						4.5	4.5	4.5	4.5	
Lead/Lag								Lead	Lead	Lag		
Lead-Lag Optimize?								Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0						3.0	3.0	3.0	3.0	
Recall Mode	None	None						C-Max	C-Max	None	C-Max	
Walk Time (s)	7.0	7.0						7.0	7.0		7.0	
Flash Dont Walk (s)	11.0	11.0						11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0	0						0	0		0	
Act Effct Green (s)	8.9	8.9						31.1	31.1	13.5	50.0	
Actuated g/C Ratio	0.14	0.14						0.48	0.48	0.21	0.77	
v/c Ratio	0.40	0.09						0.47	0.12	0.69	0.25	
Control Delay	29.8	15.6						15.3	3.3	28.7	1.3	
Queue Delay	0.0	0.0						0.0	0.0	0.0	0.0	
Total Delay	29.8	15.6						15.3	3.3	28.7	1.3	
LOS	C	B						B	A	C	A	
Approach Delay		27.2						13.1			12.7	
Approach LOS		C						B			B	

Intersection Summary

Area Type: Other
Cycle Length: 65
Actuated Cycle Length: 65
Offset: 64 (98%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 14.2 Intersection LOS: B
Intersection Capacity Utilization 49.4% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 6: 18th Ave & Ave 394/SR99 SB ON Ramp



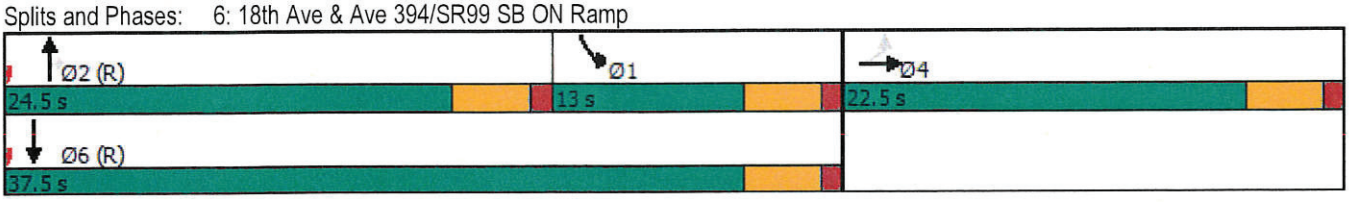
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	13	5	0	0	0	0	441	100	148	250	0
Future Volume (vph)	81	13	5	0	0	0	0	441	100	148	250	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	100		150	100		0
Storage Lanes	1		1	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.961							0.850			
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1770	1790	0	0	0	0	0	1863	1583	1770	1863	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1770	1790	0	0	0	0	0	1863	1583	1770	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5							109			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1553			1706			1221			671	
Travel Time (s)		35.3			38.8			27.8			15.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	88	14	5	0	0	0	0	479	109	161	272	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	88	19	0	0	0	0	0	479	109	161	272	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2						2	1	1	2	
Detector Template	Left	Thru						Thru	Right	Left	Thru	
Leading Detector (ft)	20	100						100	20	20	100	
Trailing Detector (ft)	0	0						0	0	0	0	
Detector 1 Position(ft)	0	0						0	0	0	0	
Detector 1 Size(ft)	20	6						6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex						Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94						94			94	
Detector 2 Size(ft)		6						6			6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA						NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4								2			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4						2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0						5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5						22.5	22.5	9.5	22.5	
Total Split (s)	22.5	22.5						24.5	24.5	13.0	37.5	
Total Split (%)	37.5%	37.5%						40.8%	40.8%	21.7%	62.5%	
Maximum Green (s)	18.0	18.0						20.0	20.0	8.5	33.0	
Yellow Time (s)	3.5	3.5						3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0						1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5						4.5	4.5	4.5	4.5	
Lead/Lag								Lead	Lead	Lag		
Lead-Lag Optimize?								Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0						3.0	3.0	3.0	3.0	
Recall Mode	None	None						C-Max	C-Max	None	C-Max	
Walk Time (s)	7.0	7.0						7.0	7.0		7.0	
Flash Dont Walk (s)	11.0	11.0						11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0	0						0	0		0	
Act Effct Green (s)	8.4	8.4						35.1	35.1	8.2	45.5	
Actuated g/C Ratio	0.14	0.14						0.58	0.58	0.14	0.76	
v/c Ratio	0.36	0.07						0.44	0.11	0.67	0.19	
Control Delay	26.7	18.8						11.9	2.8	33.4	1.8	
Queue Delay	0.0	0.0						0.0	0.0	0.0	0.0	
Total Delay	26.7	18.8						11.9	2.8	33.4	1.8	
LOS	C	B						B	A	C	A	
Approach Delay		25.3						10.2			13.5	
Approach LOS		C						B			B	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 16 (27%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.67
Intersection Signal Delay: 12.9 Intersection LOS: B
Intersection Capacity Utilization 47.1% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 6: 18th Ave & Ave 394/SR99 SB ON Ramp

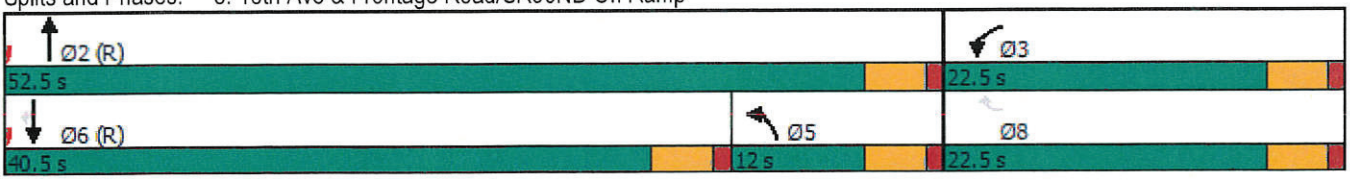


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	62	0	206	81	511	0	0	633	158
Future Volume (vph)	0	0	0	62	0	206	81	511	0	0	633	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	100		0	100		0	0		100
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	0	1583	1770	1863	0	0	1863	1583
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	1770	0	1583	1770	1863	0	0	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						224						115
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		700			1631			671			641	
Travel Time (s)		15.9			37.1			15.3			14.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	67	0	224	88	555	0	0	688	172
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	67	0	224	88	555	0	0	688	172
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	1
Detector Template				Left		Right	Left	Thru			Thru	Right
Leading Detector (ft)				20		20	20	100			100	20
Trailing Detector (ft)				0		0	0	0			0	0
Detector 1 Position(ft)				0		0	0	0			0	0
Detector 1 Size(ft)				20		20	20	6			6	20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Prot		Perm	Prot	NA			NA	Perm
Protected Phases				3			5	2			6	
Permitted Phases						8						6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				3		8	5	2			6	6
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	5.0
Minimum Split (s)				9.5		22.5	9.5	22.5			22.5	22.5
Total Split (s)				22.5		22.5	12.0	52.5			40.5	40.5
Total Split (%)				30.0%		30.0%	16.0%	70.0%			54.0%	54.0%
Maximum Green (s)				18.0		18.0	7.5	48.0			36.0	36.0
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	3.5
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	1.0
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	4.5
Lead/Lag							Lag				Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	3.0
Recall Mode				None		None	None	C-Max			C-Max	C-Max
Walk Time (s)						7.0		7.0			7.0	7.0
Flash Dont Walk (s)						11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)						0		0			0	0
Act Effct Green (s)				8.5		8.5	7.1	57.5			47.9	47.9
Actuated g/C Ratio				0.11		0.11	0.09	0.77			0.64	0.64
v/c Ratio				0.33		0.59	0.52	0.39			0.58	0.16
Control Delay				34.1		11.5	32.1	0.8			11.8	3.3
Queue Delay				0.0		0.0	0.0	0.0			0.0	0.0
Total Delay				34.1		11.5	32.1	0.8			11.8	3.3
LOS				C		B	C	A			B	A
Approach Delay					16.7			5.1			10.1	
Approach LOS					B			A			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 75			
Actuated Cycle Length: 75			
Offset: 72 (96%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.59			
Intersection Signal Delay: 9.4		Intersection LOS: A	
Intersection Capacity Utilization 58.7%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 3: 18th Ave & Frontage Road/SR99NB Off Ramp

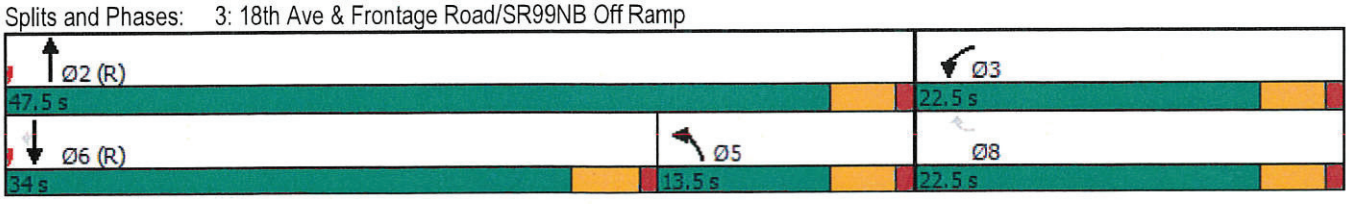


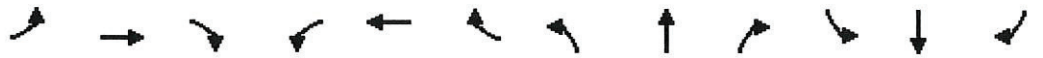
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	52	0	278	81	568	0	0	443	106
Future Volume (vph)	0	0	0	52	0	278	81	568	0	0	443	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	100		0	100		0	0		100
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	0	1583	1770	1863	0	0	1863	1583
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	1770	0	1583	1770	1863	0	0	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						296						106
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		700			1631			671			641	
Travel Time (s)		15.9			37.1			15.3			14.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	57	0	302	88	617	0	0	482	115
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	57	0	302	88	617	0	0	482	115
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	1
Detector Template				Left		Right	Left	Thru			Thru	Right
Leading Detector (ft)				20		20	20	100			100	20
Trailing Detector (ft)				0		0	0	0			0	0
Detector 1 Position(ft)				0		0	0	0			0	0
Detector 1 Size(ft)				20		20	20	6			6	20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Prot		Perm	Prot	NA			NA	Perm
Protected Phases				3			5	2			6	
Permitted Phases						8						6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				3		8	5	2			6	6
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	5.0
Minimum Split (s)				9.5		22.5	9.5	22.5			22.5	22.5
Total Split (s)				22.5		22.5	13.5	47.5			34.0	34.0
Total Split (%)				32.1%		32.1%	19.3%	67.9%			48.6%	48.6%
Maximum Green (s)				18.0		18.0	9.0	43.0			29.5	29.5
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	3.5
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	1.0
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	4.5
Lead/Lag							Lag				Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	3.0
Recall Mode				None		None	None	C-Max			C-Max	C-Max
Walk Time (s)						7.0		7.0			7.0	7.0
Flash Dont Walk (s)						11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)						0		0			0	0
Act Effct Green (s)				8.6		8.4	8.3	52.6			41.8	41.8
Actuated g/C Ratio				0.12		0.12	0.12	0.75			0.60	0.60
v/c Ratio				0.26		0.67	0.42	0.44			0.43	0.12
Control Delay				29.3		12.0	23.5	1.1			11.1	2.9
Queue Delay				0.0		0.0	0.0	0.0			0.0	0.0
Total Delay				29.3		12.0	23.5	1.1			11.1	2.9
LOS				C		B	C	A			B	A
Approach Delay					14.7			3.9			9.5	
Approach LOS					B			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 16 (23%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 8.3		Intersection LOS: A	
Intersection Capacity Utilization 55.9%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 3: 18th Ave & Frontage Road/SR99NB Off Ramp



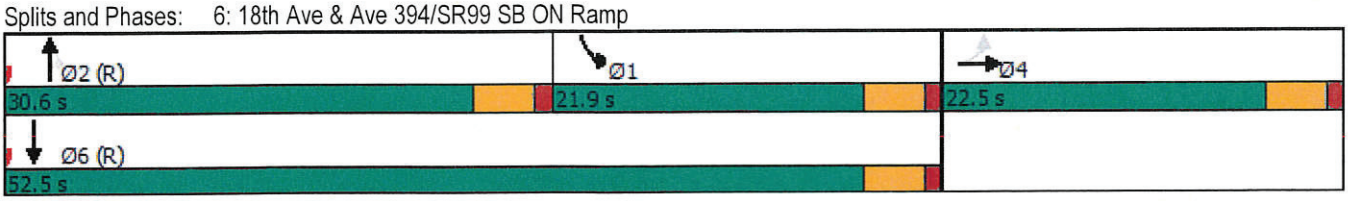


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	111	9	16	0	0	0	0	481	108	288	407	0
Future Volume (vph)	111	9	16	0	0	0	0	481	108	288	407	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	100		150	100		0
Storage Lanes	1		1	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.906							0.850			
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1770	1688	0	0	0	0	0	1863	1583	1770	1863	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1770	1688	0	0	0	0	0	1863	1583	1770	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17							115			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1553			1706			1221			671	
Travel Time (s)		35.3			38.8			27.8			15.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	121	10	17	0	0	0	0	523	117	313	442	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	121	27	0	0	0	0	0	523	117	313	442	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2						2	1	1	2	
Detector Template	Left	Thru						Thru	Right	Left	Thru	
Leading Detector (ft)	20	100						100	20	20	100	
Trailing Detector (ft)	0	0						0	0	0	0	
Detector 1 Position(ft)	0	0						0	0	0	0	
Detector 1 Size(ft)	20	6						6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex						Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94						94			94	
Detector 2 Size(ft)		6						6			6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA						NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4								2			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4						2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0						5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5						22.5	22.5	9.5	22.5	
Total Split (s)	22.5	22.5						30.6	30.6	21.9	52.5	
Total Split (%)	30.0%	30.0%						40.8%	40.8%	29.2%	70.0%	
Maximum Green (s)	18.0	18.0						26.1	26.1	17.4	48.0	
Yellow Time (s)	3.5	3.5						3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0						1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5						4.5	4.5	4.5	4.5	
Lead/Lag								Lead	Lead	Lag		
Lead-Lag Optimize?								Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0						3.0	3.0	3.0	3.0	
Recall Mode	None	None						C-Max	C-Max	None	C-Max	
Walk Time (s)	7.0	7.0						7.0	7.0		7.0	
Flash Dont Walk (s)	11.0	11.0						11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0	0						0	0		0	
Act Effct Green (s)	10.4	10.4						35.9	35.9	17.4	58.7	
Actuated g/C Ratio	0.14	0.14						0.48	0.48	0.23	0.78	
v/c Ratio	0.49	0.11						0.59	0.14	0.76	0.30	
Control Delay	36.0	17.0						19.4	3.8	32.0	0.8	
Queue Delay	0.0	0.0						0.0	0.0	0.0	0.0	
Total Delay	36.0	17.0						19.4	3.8	32.0	0.8	
LOS	D	B						B	A	C	A	
Approach Delay		32.5						16.6			13.7	
Approach LOS		C						B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 75			
Actuated Cycle Length: 75			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 16.7		Intersection LOS: B	
Intersection Capacity Utilization 58.7%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 6: 18th Ave & Ave 394/SR99 SB ON Ramp



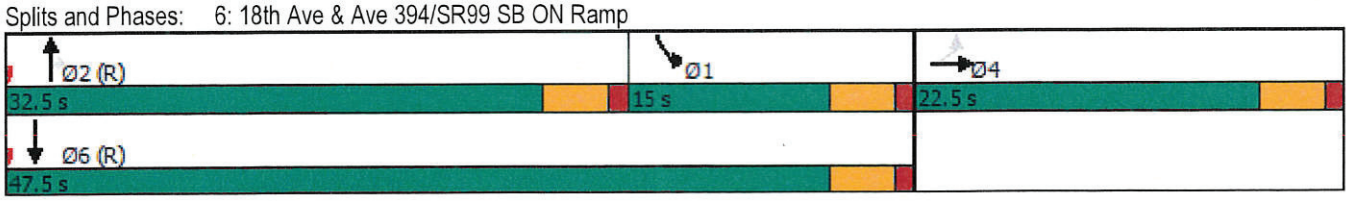
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	101	16	6	0	0	0	0	548	124	184	311	0
Future Volume (vph)	101	16	6	0	0	0	0	548	124	184	311	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	100		150	100		0
Storage Lanes	1		1	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.956							0.850			
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1770	1781	0	0	0	0	0	1863	1583	1770	1863	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1770	1781	0	0	0	0	0	1863	1583	1770	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7							135			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1553			1706			1221			671	
Travel Time (s)		35.3			38.8			27.8			15.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	110	17	7	0	0	0	0	596	135	200	338	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	110	24	0	0	0	0	0	596	135	200	338	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2						2	1	1	2	
Detector Template	Left	Thru						Thru	Right	Left	Thru	
Leading Detector (ft)	20	100						100	20	20	100	
Trailing Detector (ft)	0	0						0	0	0	0	
Detector 1 Position(ft)	0	0						0	0	0	0	
Detector 1 Size(ft)	20	6						6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex						Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94						94			94	
Detector 2 Size(ft)		6						6			6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA						NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4								2			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4						2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0						5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5						22.5	22.5	9.5	22.5	
Total Split (s)	22.5	22.5						32.5	32.5	15.0	47.5	
Total Split (%)	32.1%	32.1%						46.4%	46.4%	21.4%	67.9%	
Maximum Green (s)	18.0	18.0						28.0	28.0	10.5	43.0	
Yellow Time (s)	3.5	3.5						3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0						1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5						4.5	4.5	4.5	4.5	
Lead/Lag								Lead	Lead	Lag		
Lead-Lag Optimize?								Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0						3.0	3.0	3.0	3.0	
Recall Mode	None	None						C-Max	C-Max	None	C-Max	
Walk Time (s)	7.0	7.0						7.0	7.0		7.0	
Flash Dont Walk (s)	11.0	11.0						11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0	0						0	0		0	
Act Effct Green (s)	9.7	9.7						38.4	38.4	10.5	54.3	
Actuated g/C Ratio	0.14	0.14						0.55	0.55	0.15	0.78	
v/c Ratio	0.45	0.10						0.58	0.15	0.75	0.23	
Control Delay	32.9	20.6						15.0	2.6	40.5	0.8	
Queue Delay	0.0	0.0						0.0	0.0	0.0	0.0	
Total Delay	32.9	20.6						15.0	2.6	40.5	0.8	
LOS	C	C						B	A	D	A	
Approach Delay		30.7						12.8			15.5	
Approach LOS		C						B			B	

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 16 (23%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 15.5 Intersection LOS: B
Intersection Capacity Utilization 55.9% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 6: 18th Ave & Ave 394/SR99 SB ON Ramp

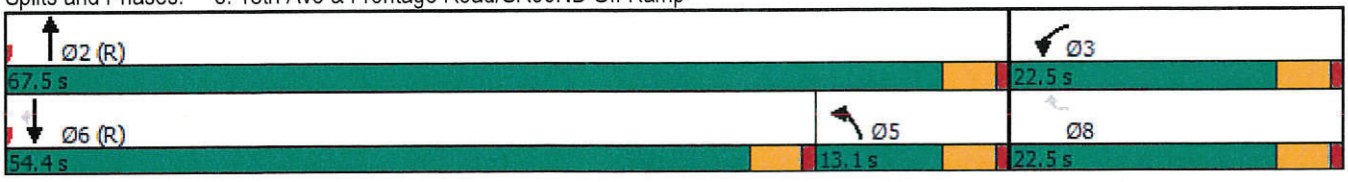


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	77	0	257	100	635	0	0	787	186
Future Volume (vph)	0	0	0	77	0	257	100	635	0	0	787	186
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	100		0	100		0	0		100
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	0	1583	1770	1863	0	0	1863	1583
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	1770	0	1583	1770	1863	0	0	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						279						106
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		700			1631			671			641	
Travel Time (s)		15.9			37.1			15.3			14.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	84	0	279	109	690	0	0	855	202
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	84	0	279	109	690	0	0	855	202
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	1
Detector Template				Left		Right	Left	Thru			Thru	Right
Leading Detector (ft)				20		20	20	100			100	20
Trailing Detector (ft)				0		0	0	0			0	0
Detector 1 Position(ft)				0		0	0	0			0	0
Detector 1 Size(ft)				20		20	20	6			6	20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Prot		Perm	Prot	NA			NA	Perm
Protected Phases				3			5	2			6	
Permitted Phases						8						6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				3		8	5	2			6	6
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	5.0
Minimum Split (s)				9.5		22.5	9.5	22.5			22.5	22.5
Total Split (s)				22.5		22.5	13.1	67.5			54.4	54.4
Total Split (%)				25.0%		25.0%	14.6%	75.0%			60.4%	60.4%
Maximum Green (s)				18.0		18.0	8.6	63.0			49.9	49.9
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	3.5
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	1.0
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	4.5
Lead/Lag							Lag				Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	3.0
Recall Mode				None		None	None	C-Max			C-Max	C-Max
Walk Time (s)						7.0		7.0			7.0	7.0
Flash Dont Walk (s)						11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)						0		0			0	0
Act Effct Green (s)				9.8		9.8	8.6	71.2			58.1	58.1
Actuated g/C Ratio				0.11		0.11	0.10	0.79			0.65	0.65
v/c Ratio				0.44		0.66	0.64	0.47			0.71	0.19
Control Delay				43.5		12.9	46.5	0.8			15.4	4.0
Queue Delay				0.0		0.0	0.0	0.2			0.0	0.0
Total Delay				43.5		12.9	46.5	1.0			15.4	4.0
LOS				D		B	D	A			B	A
Approach Delay					20.0			7.2			13.3	
Approach LOS					B			A			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 88 (98%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 12.2		Intersection LOS: B	
Intersection Capacity Utilization 70.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 3: 18th Ave & Frontage Road/SR99NB Off Ramp



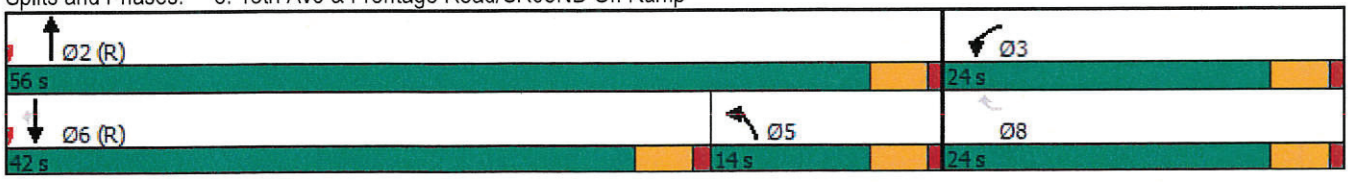
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	65	0	346	100	706	0	0	550	131
Future Volume (vph)	0	0	0	65	0	346	100	706	0	0	550	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	100		0	100		0	0		100
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	0	1583	1770	1863	0	0	1863	1583
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	1770	0	1583	1770	1863	0	0	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						230						101
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		700			1631			671			641	
Travel Time (s)		15.9			37.1			15.3			14.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	71	0	376	109	767	0	0	598	142
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	71	0	376	109	767	0	0	598	142
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	1
Detector Template				Left		Right	Left	Thru			Thru	Right
Leading Detector (ft)				20		20	20	100			100	20
Trailing Detector (ft)				0		0	0	0			0	0
Detector 1 Position(ft)				0		0	0	0			0	0
Detector 1 Size(ft)				20		20	20	6			6	20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Prot		Perm	Prot	NA			NA	Perm
Protected Phases				3			5	2			6	
Permitted Phases						8						6

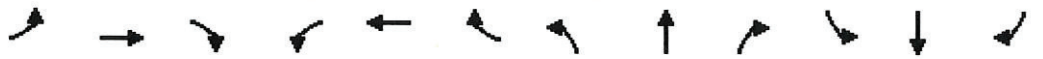
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				3		8	5	2			6	6
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	5.0
Minimum Split (s)				9.5		22.5	9.5	22.5			22.5	22.5
Total Split (s)				24.0		24.0	14.0	56.0			42.0	42.0
Total Split (%)				30.0%		30.0%	17.5%	70.0%			52.5%	52.5%
Maximum Green (s)				19.5		19.5	9.5	51.5			37.5	37.5
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	3.5
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	1.0
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	4.5
Lead/Lag							Lag				Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	3.0
Recall Mode				None		None	None	C-Max			C-Max	C-Max
Walk Time (s)						7.0		7.0			7.0	7.0
Flash Dont Walk (s)						11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)						0		0			0	0
Act Effct Green (s)				13.3		13.3	8.9	57.7			46.5	46.5
Actuated g/C Ratio				0.17		0.17	0.11	0.72			0.58	0.58
v/c Ratio				0.24		0.83	0.56	0.57			0.55	0.15
Control Delay				28.5		27.8	29.9	1.6			15.5	4.6
Queue Delay				0.0		0.0	0.0	0.1			0.0	0.0
Total Delay				28.5		27.8	29.9	1.7			15.5	4.6
LOS				C		C	C	A			B	A
Approach Delay					27.9			5.2			13.4	
Approach LOS					C			A			B	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 16 (20%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 13.1 Intersection LOS: B
Intersection Capacity Utilization 66.7% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 3: 18th Ave & Frontage Road/SR99NB Off Ramp





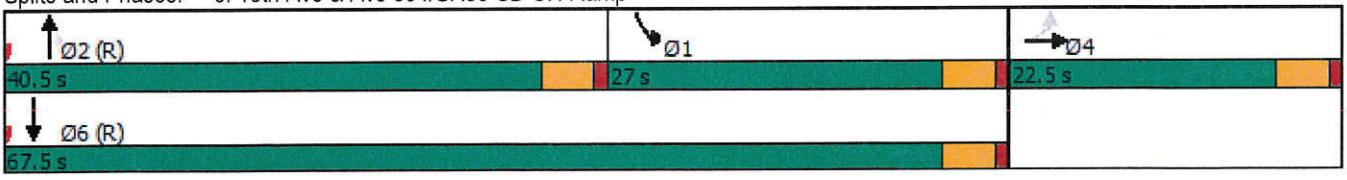
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	138	11	20	0	0	0	0	597	134	359	505	0
Future Volume (vph)	138	11	20	0	0	0	0	597	134	359	505	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	100		150	100		0
Storage Lanes	1		1	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.903							0.850			
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1770	1682	0	0	0	0	0	1863	1583	1770	1863	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1770	1682	0	0	0	0	0	1863	1583	1770	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22							105			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1553			1706			1221			671	
Travel Time (s)		35.3			38.8			27.8			15.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	150	12	22	0	0	0	0	649	146	390	549	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	150	34	0	0	0	0	0	649	146	390	549	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2						2	1	1	2	
Detector Template	Left	Thru						Thru	Right	Left	Thru	
Leading Detector (ft)	20	100						100	20	20	100	
Trailing Detector (ft)	0	0						0	0	0	0	
Detector 1 Position(ft)	0	0						0	0	0	0	
Detector 1 Size(ft)	20	6						6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex						Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94						94			94	
Detector 2 Size(ft)		6						6			6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA						NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4								2			

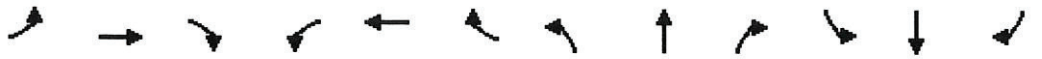
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4						2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0						5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5						22.5	22.5	9.5	22.5	
Total Split (s)	22.5	22.5						40.5	40.5	27.0	67.5	
Total Split (%)	25.0%	25.0%						45.0%	45.0%	30.0%	75.0%	
Maximum Green (s)	18.0	18.0						36.0	36.0	22.5	63.0	
Yellow Time (s)	3.5	3.5						3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0						1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5						4.5	4.5	4.5	4.5	
Lead/Lag								Lead	Lead	Lag		
Lead-Lag Optimize?								Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0						3.0	3.0	3.0	3.0	
Recall Mode	None	None						C-Max	C-Max	None	C-Max	
Walk Time (s)	7.0	7.0						7.0	7.0		7.0	
Flash Dont Walk (s)	11.0	11.0						11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0	0						0	0		0	
Act Effct Green (s)	12.9	12.9						41.1	41.1	22.5	68.1	
Actuated g/C Ratio	0.14	0.14						0.46	0.46	0.25	0.76	
v/c Ratio	0.59	0.13						0.76	0.19	0.88	0.39	
Control Delay	45.3	18.3						28.9	6.4	43.1	1.0	
Queue Delay	0.0	0.0						0.0	0.0	0.0	0.0	
Total Delay	45.3	18.3						28.9	6.4	43.1	1.0	
LOS	D	B						C	A	D	A	
Approach Delay		40.3						24.8			18.5	
Approach LOS		D						C			B	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 23.2 Intersection LOS: C
Intersection Capacity Utilization 70.2% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 6: 18th Ave & Ave 394/SR99 SB ON Ramp





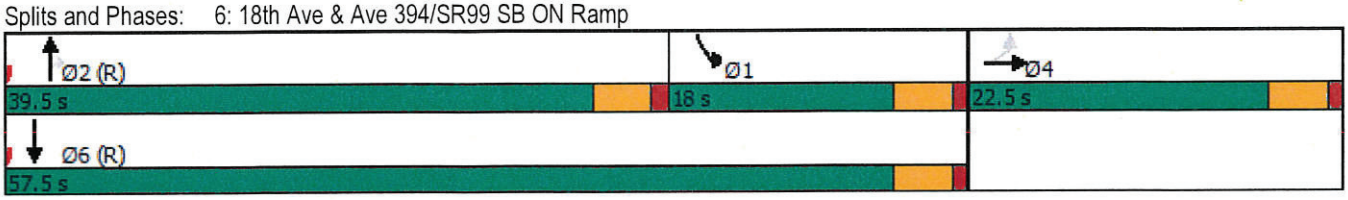
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	20	8	0	0	0	0	681	155	229	386	0
Future Volume (vph)	125	20	8	0	0	0	0	681	155	229	386	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	100		150	100		0
Storage Lanes	1		1	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.956							0.850			
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1770	1781	0	0	0	0	0	1863	1583	1770	1863	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1770	1781	0	0	0	0	0	1863	1583	1770	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9							127			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1553			1706			1221			671	
Travel Time (s)		35.3			38.8			27.8			15.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	136	22	9	0	0	0	0	740	168	249	420	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	136	31	0	0	0	0	0	740	168	249	420	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2						2	1	1	2	
Detector Template	Left	Thru						Thru	Right	Left	Thru	
Leading Detector (ft)	20	100						100	20	20	100	
Trailing Detector (ft)	0	0						0	0	0	0	
Detector 1 Position(ft)	0	0						0	0	0	0	
Detector 1 Size(ft)	20	6						6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex						Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94						94			94	
Detector 2 Size(ft)		6						6			6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA						NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4								2			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4						2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0						5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5						22.5	22.5	9.5	22.5	
Total Split (s)	22.5	22.5						39.5	39.5	18.0	57.5	
Total Split (%)	28.1%	28.1%						49.4%	49.4%	22.5%	71.9%	
Maximum Green (s)	18.0	18.0						35.0	35.0	13.5	53.0	
Yellow Time (s)	3.5	3.5						3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0						1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0						0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5						4.5	4.5	4.5	4.5	
Lead/Lag								Lead	Lead	Lag		
Lead-Lag Optimize?								Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0						3.0	3.0	3.0	3.0	
Recall Mode	None	None						C-Max	C-Max	None	C-Max	
Walk Time (s)	7.0	7.0						7.0	7.0		7.0	
Flash Dont Walk (s)	11.0	11.0						11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0	0						0	0		0	
Act Effct Green (s)	11.4	11.4						41.6	41.6	13.5	59.6	
Actuated g/C Ratio	0.14	0.14						0.52	0.52	0.17	0.74	
v/c Ratio	0.54	0.12						0.76	0.19	0.84	0.30	
Control Delay	39.2	23.0						23.2	4.4	45.7	0.9	
Queue Delay	0.0	0.0						0.0	0.0	0.0	0.0	
Total Delay	39.2	23.0						23.2	4.4	45.7	0.9	
LOS	D	C						C	A	D	A	
Approach Delay		36.2						19.8			17.6	
Approach LOS		D						B			B	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 16 (20%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 20.5 Intersection LOS: C
Intersection Capacity Utilization 66.7% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 6: 18th Ave & Ave 394/SR99 SB ON Ramp



Mendocino Avenue Intersections

Alternative 6

Cul-de-sac Avenue 394 to eliminate access to SB off-ramp and cul-de-sac frontage Road to eliminate access to NB on-ramp and construct Roundabouts at the intersections SB on and NB off Ramps Terminals

2025 Level of Service Reports

2035 Level of Service Reports

2045 Level of Service Reports

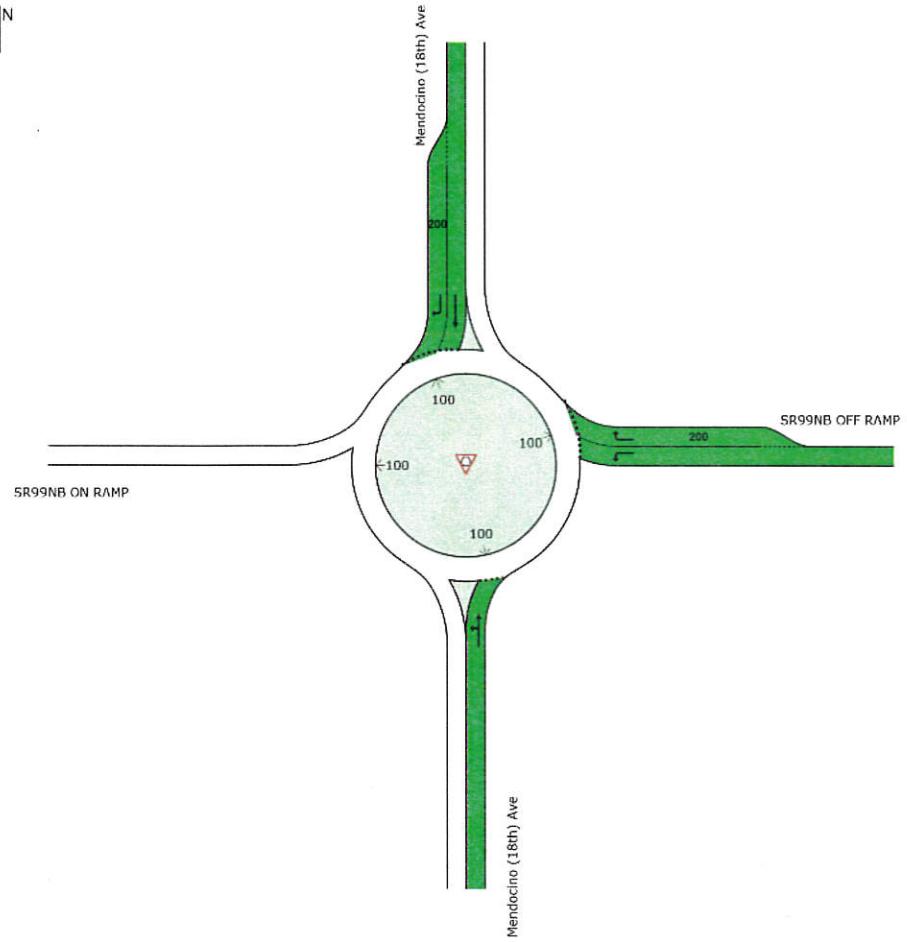
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [ALT6-SR99NB-2025-AM-eliminte Ave394&Frontage Rd access]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	South	East	North	
LOS	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [ALT6-SR99NB-2025-AM-eliminte Ave394&Frontage Rd access]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Mendocino (18th) Ave													
Lane 1[d]	517	3.0	1340	0.386	100	6.3	LOS A	0.0	0.0	Full	700	0.0	0.0
Approach	517	3.0		0.386		6.3	LOS A	0.0	0.0				
East: SR99NB OFF RAMP													
Lane 1	54	3.0	849	0.064	100	4.9	LOS A	0.2	6.0	Full	1600	0.0	0.0
Lane 2[d]	180	3.0	849	0.213	100	6.4	LOS A	0.9	21.9	Short	200	0.0	NA
Approach	235	3.0		0.213		6.1	LOS A	0.9	21.9				
North: Mendocino (18th) Ave													
Lane 1[d]	553	3.0	1226	0.451	100	7.6	LOS A	2.7	69.8	Full	700	0.0	0.0
Lane 2	138	3.0	1226	0.113	100	3.9	LOS A	0.5	11.8	Short	200	0.0	NA
Approach	691	3.0		0.451		6.8	LOS A	2.7	69.8				
Intersection	1443	3.0		0.451		6.5	LOS A	2.7	69.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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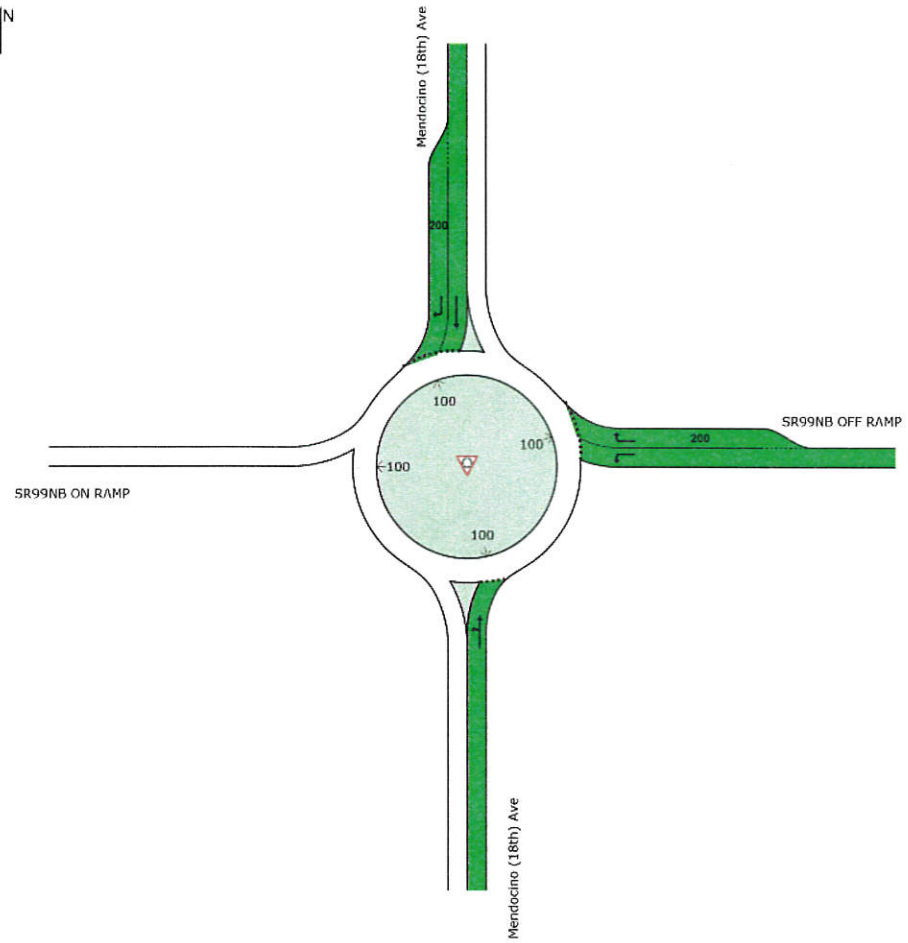
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [ALT6-SR99NB-2025-PM-eliminte Ave394&Frontage Rd access]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	South	East	North	
LOS	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [ALT6-SR99NB-2025-PM-eliminte Ave394&Frontage Rd access]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Mendocino (18th) Ave													
Lane 1[d]	567	3.0	1340	0.423	100	6.8	LOS A	0.0	0.0	Full	700	0.0	0.0
Approach	567	3.0		0.423		6.8	LOS A	0.0	0.0				
East: SR99NB OFF RAMP													
Lane 1	46	3.0	810	0.056	100	5.0	LOS A	0.2	5.2	Full	1600	0.0	0.0
Lane 2[d]	243	3.0	810	0.301	100	7.8	LOS A	1.3	32.5	Short	200	0.0	NA
Approach	289	3.0		0.301		7.4	LOS A	1.3	32.5				
North: Mendocino (18th) Ave													
Lane 1[d]	387	3.0	1236	0.313	100	5.8	LOS A	1.6	40.7	Full	700	0.0	0.0
Lane 2	92	3.0	1236	0.075	100	3.5	LOS A	0.3	7.6	Short	200	0.0	NA
Approach	479	3.0		0.313		5.4	LOS A	1.6	40.7				
Intersection	1336	3.0		0.423		6.4	LOS A	1.6	40.7				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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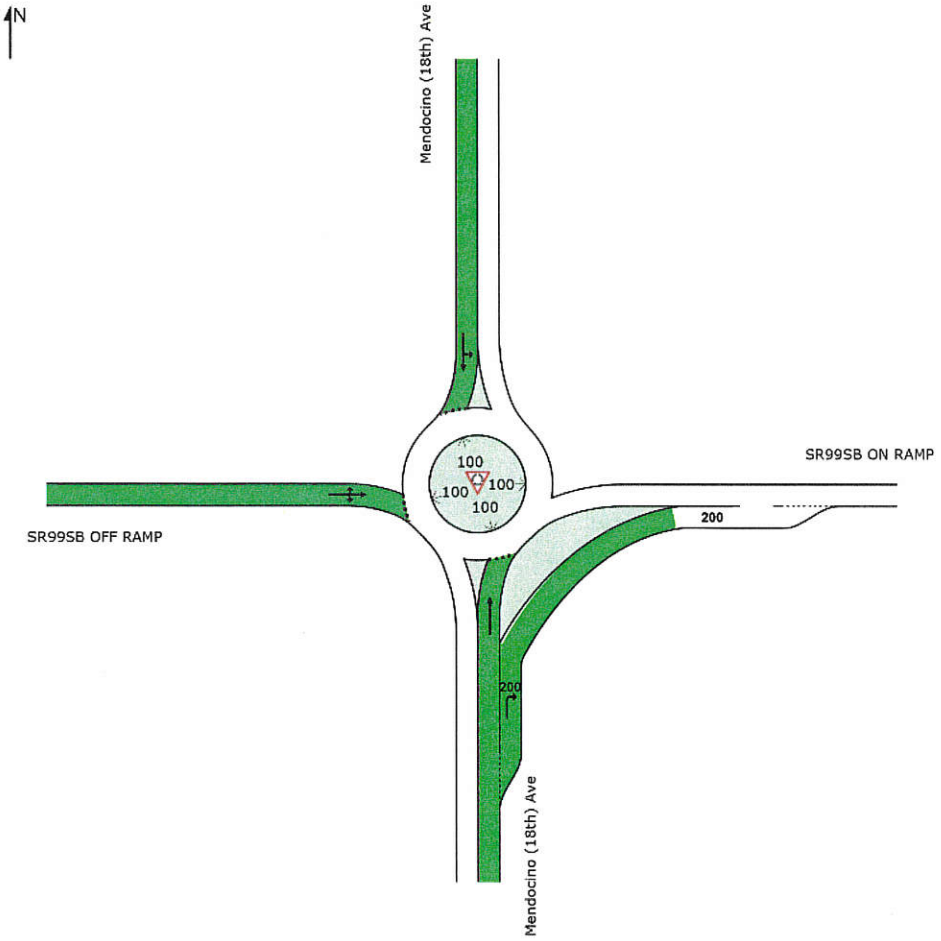
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [ALT6-SR99SB-2025-AM-eliminte Ave394&Frontage Rd access]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	South	North	West	
LOS	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [ALT6-SR99SB-2025-AM-eliminte Ave394&Frontage Rd access]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Mendocino (18th) Ave													
Lane 1[d]	421	3.0	987	0.426	100	8.5	LOS A	2.2	55.7	Full	700	0.0	0.0
Lane 2	95	3.0	1626	0.058	100	0.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	515	3.0		0.426		6.9	LOS A	2.2	55.7				
North: Mendocino (18th) Ave													
Lane 1[d]	608	3.0	1340	0.454	100	7.2	LOS A	0.0	0.0	Full	700	0.0	0.0
Approach	608	3.0		0.454		7.2	LOS A	0.0	0.0				
West: SR99SB OFF RAMP													
Lane 1[d]	118	3.0	708	0.167	100	6.9	LOS A	0.7	17.3	Full	1600	0.0	0.0
Approach	118	3.0		0.167		6.9	LOS A	0.7	17.3				
Intersection	1241	3.0		0.454		7.0	LOS A	2.2	55.7				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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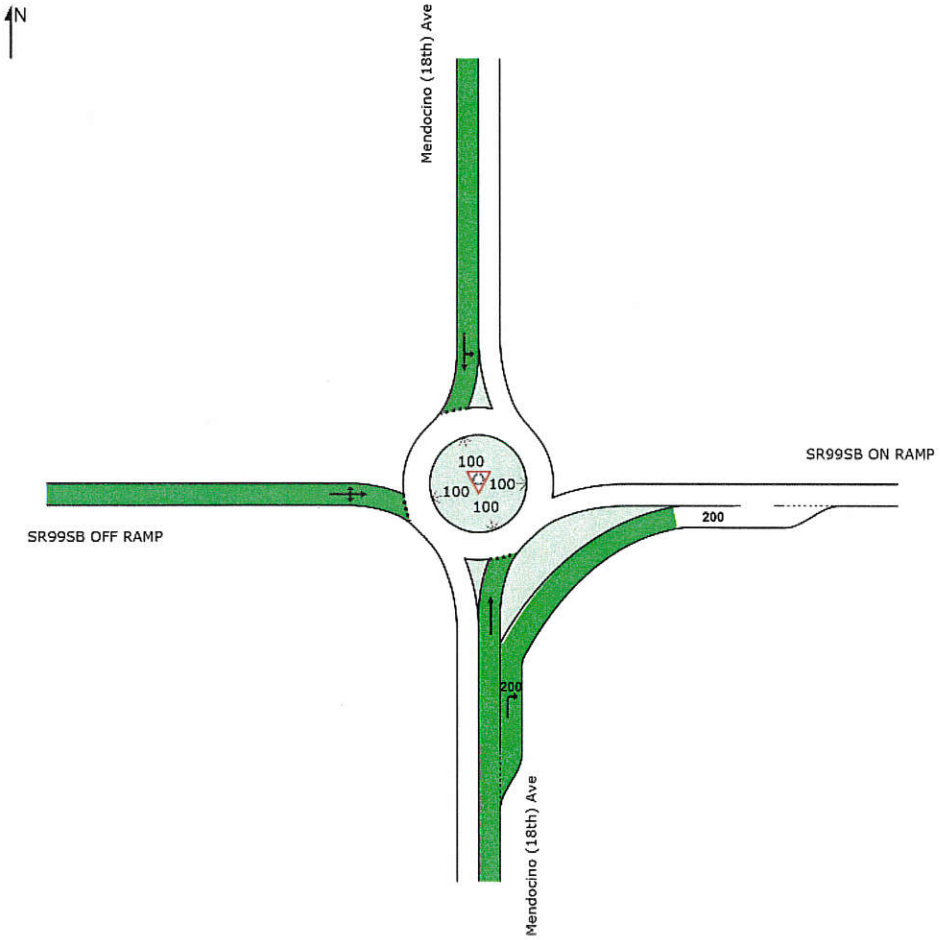
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [ALT6-SR99SB-2025-PM-eliminte Ave394&Frontage Rd access]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	South	North	West	
LOS	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [ALT6-SR99SB-2025-PM-eliminte Ave394&Frontage Rd access]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Mendocino (18th) Ave													
Lane 1[d]	479	3.0	1077	0.445	100	8.2	LOS A	2.4	62.5	Full	700	0.0	0.0
Lane 2	109	3.0	1626	0.067	100	0.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	588	3.0		0.445		6.7	LOS A	2.4	62.5				
North: Mendocino (18th) Ave													
Lane 1[d]	433	3.0	1340	0.323	100	5.6	LOS A	0.0	0.0	Full	700	0.0	0.0
Approach	433	3.0		0.323		5.6	LOS A	0.0	0.0				
West: SR99SB OFF RAMP													
Lane 1[d]	108	3.0	850	0.127	100	5.5	LOS A	0.5	13.4	Full	1600	0.0	0.0
Approach	108	3.0		0.127		5.5	LOS A	0.5	13.4				
Intersection	1128	3.0		0.445		6.2	LOS A	2.4	62.5				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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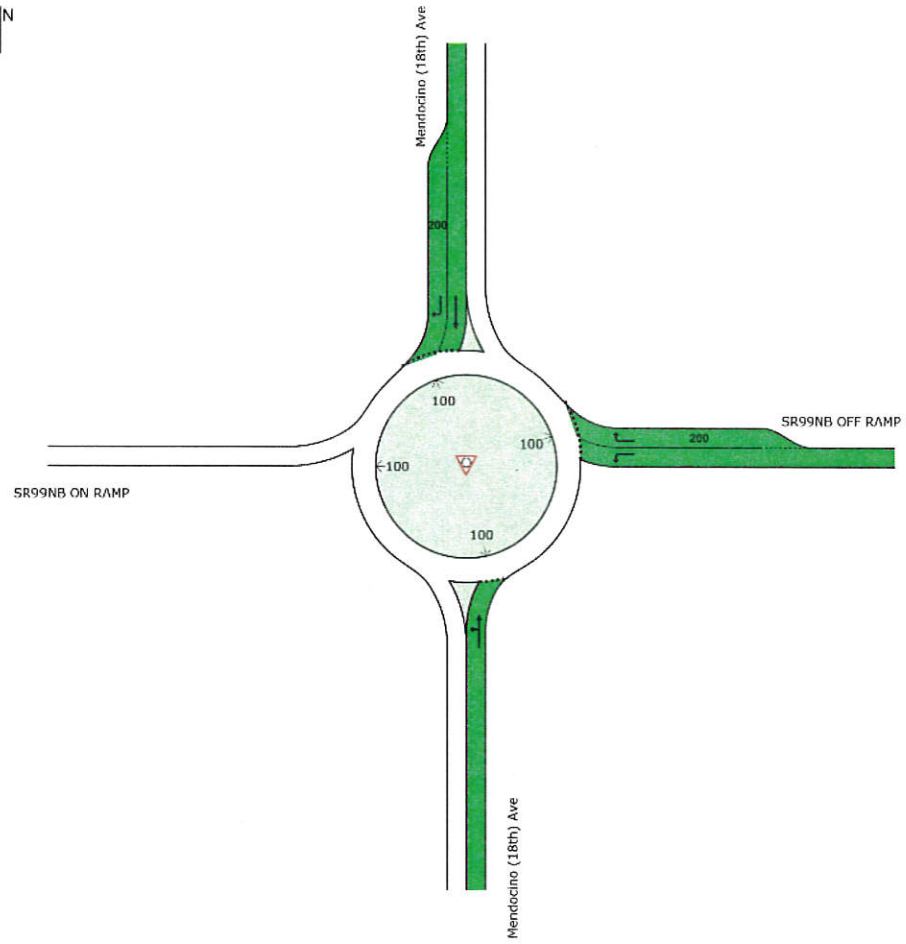
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [ALT6-SR99NB-2035-AM-eliminte Ave394&Frontage Rd access]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	South	East	North	
LOS	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
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HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [ALT6-SR99NB-2035-AM-eliminte Ave394&Frontage Rd access]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Mendocino (18th) Ave													
Lane 1[d]	643	3.0	1340	0.480	100	7.5	LOS A	0.0	0.0	Full	700	0.0	0.0
Approach	643	3.0		0.480		7.5	LOS A	0.0	0.0				
East: SR99NB OFF RAMP													
Lane 1	67	3.0	754	0.089	100	5.7	LOS A	0.3	8.3	Full	1600	0.0	0.0
Lane 2[d]	224	3.0	754	0.297	100	8.3	LOS A	1.2	31.3	Short	200	0.0	NA
Approach	291	3.0		0.297		7.7	LOS A	1.2	31.3				
North: Mendocino (18th) Ave													
Lane 1[d]	688	3.0	1192	0.577	100	9.9	LOS A	4.1	105.5	Full	700	0.0	0.0
Lane 2	172	3.0	1192	0.144	100	4.2	LOS A	0.6	15.4	Short	200	0.0	NA
Approach	860	3.0		0.577		8.8	LOS A	4.1	105.5				
Intersection	1795	3.0		0.577		8.2	LOS A	4.1	105.5				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

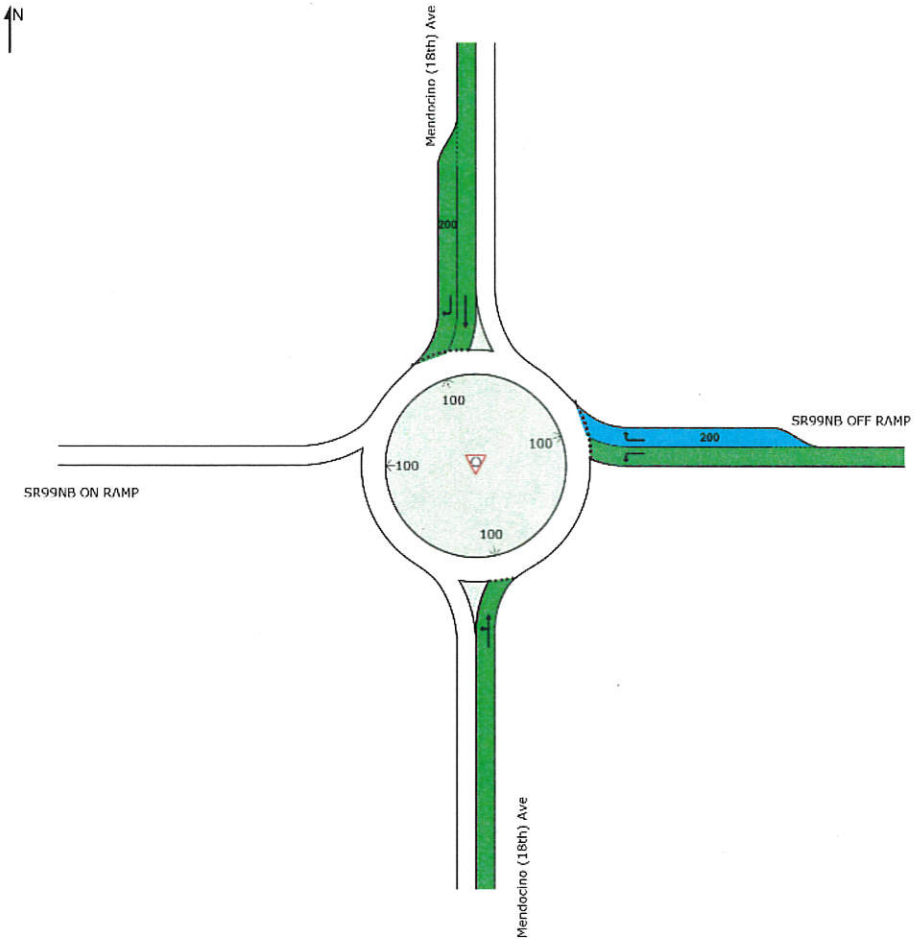
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [ALT6-SR99NB-2035-PM-eliminte Ave394&Frontage Rd access]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	South	East	North	
LOS	A	B	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [ALT6-SR99NB-2035-PM-eliminte Ave394&Frontage Rd access]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Mendocino (18th) Ave													
Lane 1[d]	705	3.0	1340	0.527	100	8.3	LOS A	0.0	0.0	Full	700	0.0	0.0
Approach	705	3.0		0.527		8.3	LOS A	0.0	0.0				
East: SR99NB OFF RAMP													
Lane 1	57	3.0	712	0.079	100	5.9	LOS A	0.3	7.3	Full	1600	0.0	0.0
Lane 2[d]	302	3.0	712	0.425	100	10.9	LOS B	2.2	57.2	Short	200	0.0	NA
Approach	359	3.0		0.425		10.1	LOS B	2.2	57.2				
North: Mendocino (18th) Ave													
Lane 1[d]	482	3.0	1204	0.400	100	7.0	LOS A	2.2	57.1	Full	700	0.0	0.0
Lane 2	115	3.0	1204	0.096	100	3.8	LOS A	0.4	9.8	Short	200	0.0	NA
Approach	597	3.0		0.400		6.4	LOS A	2.2	57.1				
Intersection	1661	3.0		0.527		8.0	LOS A	2.2	57.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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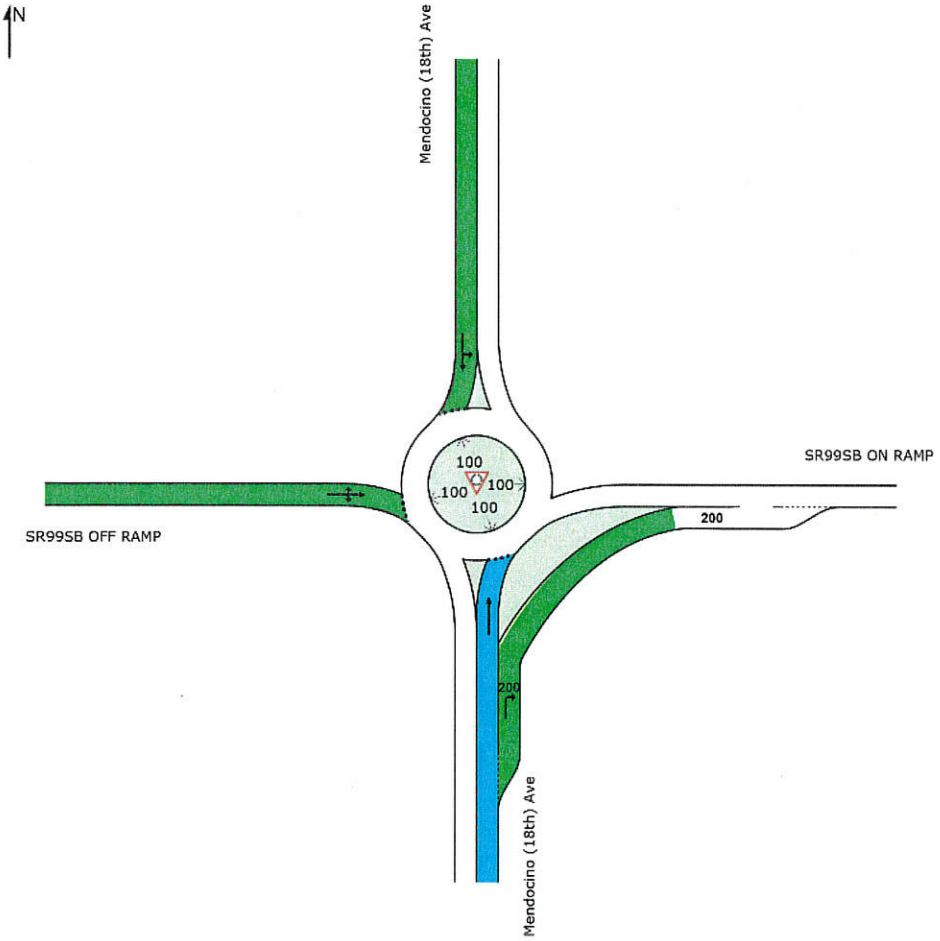
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [ALT6-SR99SB-2035-AM-eliminte Ave394&Frontage Rd access]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	South	North	West	
LOS	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [ALT6-SR99SB-2035-AM-eliminte Ave394&Frontage Rd access]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Mendocino (18th) Ave													
Lane 1[d]	523	3.0	910	0.575	100	12.0	LOS B	5.0	127.1	Full	700	0.0	0.0
Lane 2	117	3.0	1626	0.072	100	0.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	640	3.0		0.575		9.8	LOS A	5.0	127.1				
North: Mendocino (18th) Ave													
Lane 1[d]	754	3.0	1340	0.563	100	8.9	LOS A	0.0	0.0	Full	700	0.0	0.0
Approach	754	3.0		0.563		8.9	LOS A	0.0	0.0				
West: SR99SB OFF RAMP													
Lane 1[d]	148	3.0	607	0.244	100	9.1	LOS A	1.0	25.2	Full	1600	0.0	0.0
Approach	148	3.0		0.244		9.1	LOS A	1.0	25.2				
Intersection	1542	3.0		0.575		9.3	LOS A	5.0	127.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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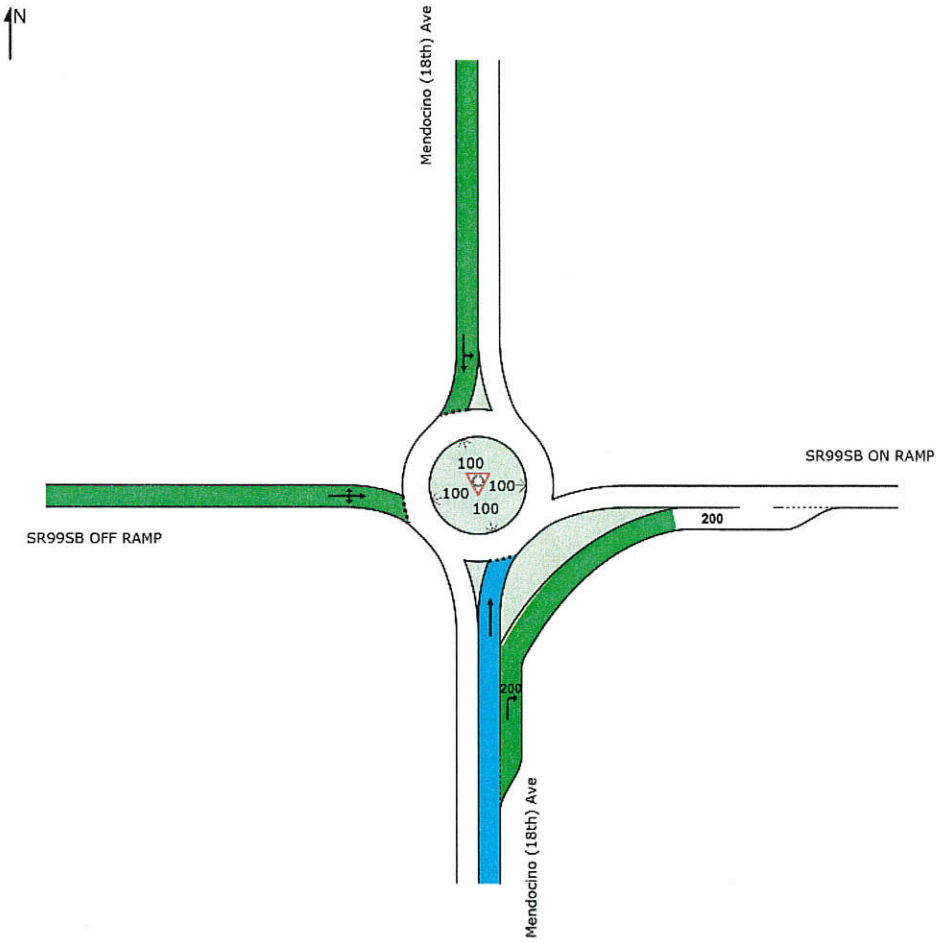
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [ALT6-SR99SB-2035-PM-eliminte Ave394&Frontage Rd access]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	South	North	West	
LOS	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [ALT6-SR99SB-2035-PM-eliminte Ave394&Frontage Rd access]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Mendocino (18th) Ave													
Lane 1[d]	596	3.0	1015	0.587	100	11.4	LOS B	5.6	142.5	Full	700	0.0	0.0
Lane 2	135	3.0	1626	0.083	100	0.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	730	3.0		0.587		9.3	LOS A	5.6	142.5				
North: Mendocino (18th) Ave													
Lane 1[d]	538	3.0	1340	0.402	100	6.5	LOS A	0.0	0.0	Full	700	0.0	0.0
Approach	538	3.0		0.402		6.5	LOS A	0.0	0.0				
West: SR99SB OFF RAMP													
Lane 1[d]	134	3.0	761	0.176	100	6.6	LOS A	0.7	18.6	Full	1600	0.0	0.0
Approach	134	3.0		0.176		6.6	LOS A	0.7	18.6				
Intersection	1402	3.0		0.587		8.0	LOS A	5.6	142.5				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

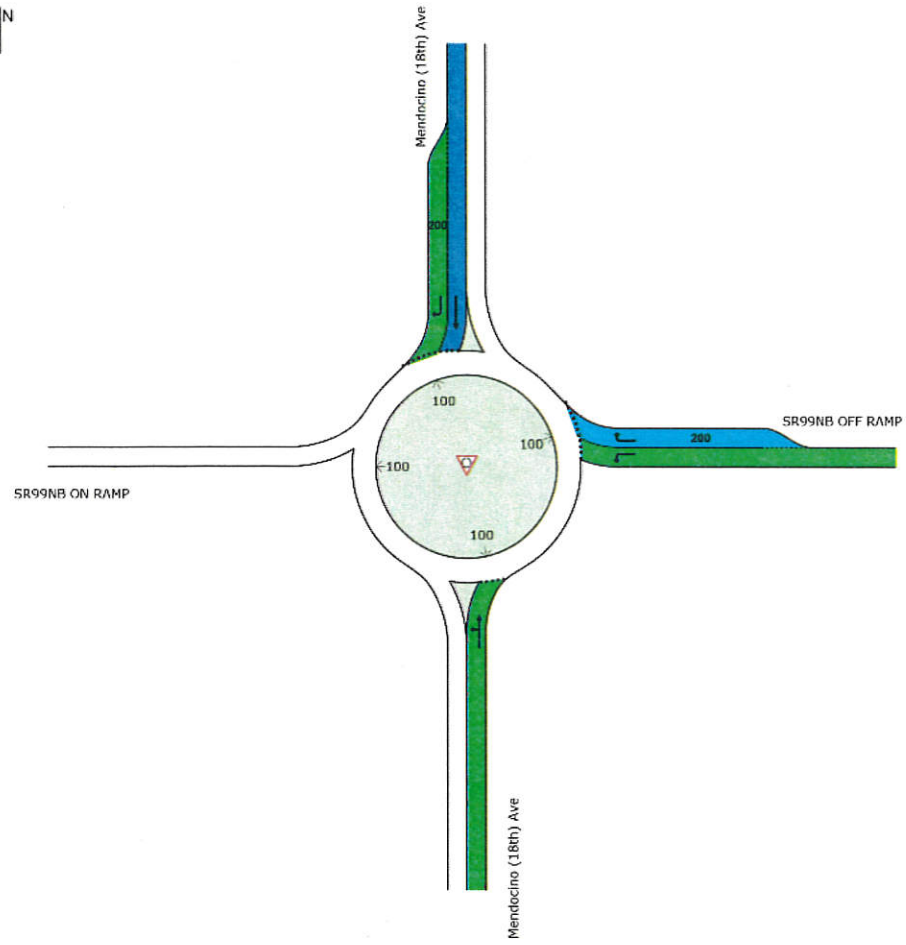
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [ALT6-SR99NB-2045-AM-eliminte Ave394&Frontage Rd access]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	South	East	North	
LOS	A	B	B	B



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
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HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [ALT6-SR99NB-2045-AM-eliminte Ave394&Frontage Rd access]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Mendocino (18th) Ave													
Lane 1[d]	799	3.0	1340	0.596	100	9.6	LOS A	0.0	0.0	Full	700	0.0	0.0
Approach	799	3.0		0.596		9.6	LOS A	0.0	0.0				
East: SR99NB OFF RAMP													
Lane 1	84	3.0	652	0.128	100	7.0	LOS A	0.5	11.9	Full	1600	0.0	0.0
Lane 2[d]	279	3.0	652	0.428	100	11.7	LOS B	2.2	56.1	Short	200	0.0	NA
Approach	363	3.0		0.428		10.6	LOS B	2.2	56.1				
North: Mendocino (18th) Ave													
Lane 1[d]	855	3.0	1151	0.743	100	15.3	LOS C	13.6	347.7	Full	700	0.0	0.0
Lane 2	213	3.0	1151	0.185	100	4.8	LOS A	0.8	20.4	Short	200	0.0	NA
Approach	1068	3.0		0.743		13.2	LOS B	13.6	347.7				
Intersection	2230	3.0		0.743		11.5	LOS B	13.6	347.7				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
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Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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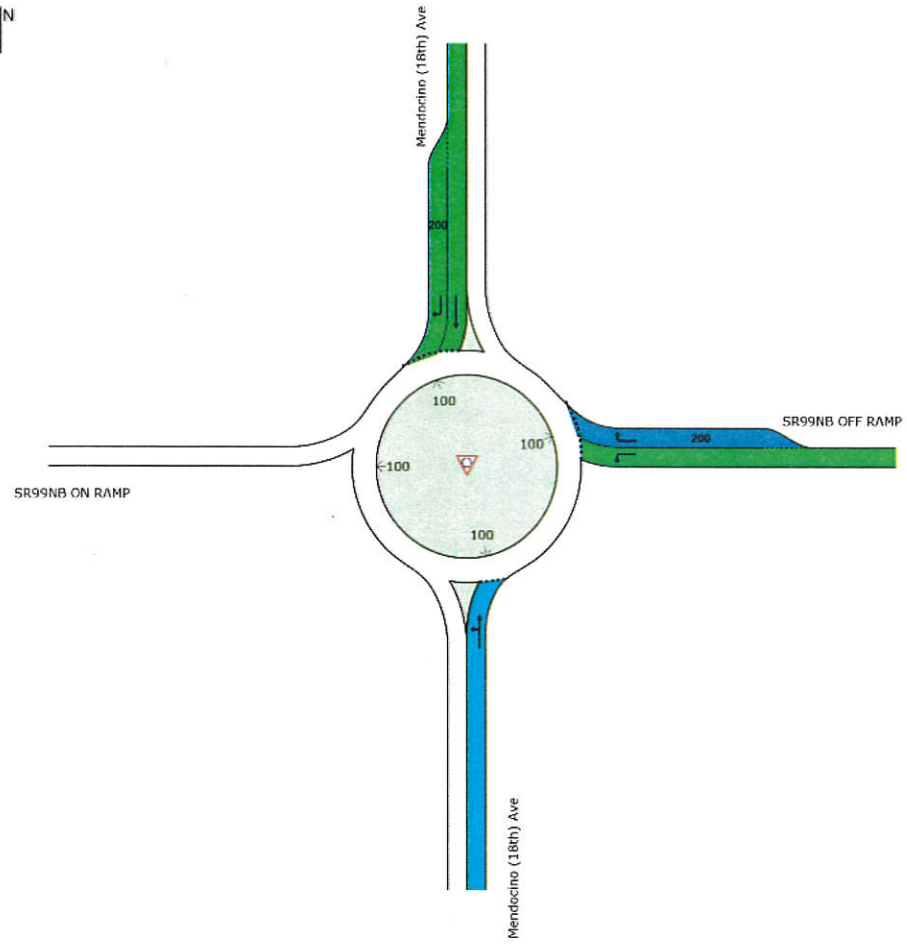
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [ALT6-SR99NB-2045-PM-eliminte Ave394&Frontage Rd access]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	South	East	North	
LOS	B	C	A	B



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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LANE SUMMARY

Site: 101 [ALT6-SR99NB-2045-PM-eliminte Ave394&Frontage Rd access]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Mendocino (18th) Ave													
Lane 1[d]	876	3.0	1340	0.654	100	10.9	LOS B	0.0	0.0	Full	700	0.0	0.0
Approach	876	3.0		0.654		10.9	LOS B	0.0	0.0				
East: SR99NB OFF RAMP													
Lane 1	71	3.0	606	0.116	100	7.3	LOS A	0.4	10.6	Full	1600	0.0	0.0
Lane 2[d]	376	3.0	606	0.620	100	18.2	LOS C	4.3	109.2	Short	200	0.0	NA
Approach	447	3.0		0.620		16.5	LOS C	4.3	109.2				
North: Mendocino (18th) Ave													
Lane 1[d]	598	3.0	1165	0.513	100	8.9	LOS A	3.3	83.2	Full	700	0.0	0.0
Lane 2	142	3.0	1165	0.122	100	4.1	LOS A	0.5	12.8	Short	200	0.0	NA
Approach	740	3.0		0.513		8.0	LOS A	3.3	83.2				
Intersection	2063	3.0		0.654		11.0	LOS B	4.3	109.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
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Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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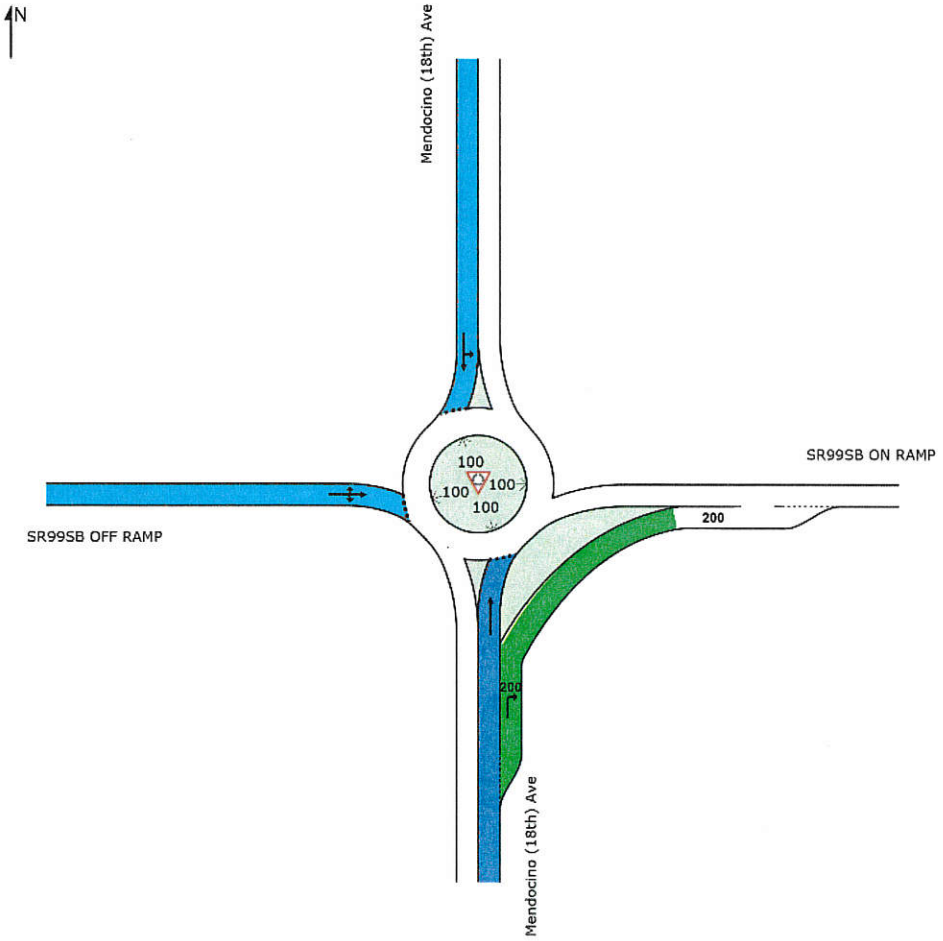
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [ALT6-SR99SB-2045-AM-eliminte Ave394&Frontage Rd access]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	South	North	West	
LOS	C	B	B	B



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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LANE SUMMARY

Site: 101 [ALT6-SR99SB-2045-AM-eliminte Ave394&Frontage Rd access]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Mendocino (18th) Ave													
Lane 1[d]	650	3.0	822	0.791	100	22.7	LOS C	11.5	294.9	Full	700	0.0	0.0
Lane 2	146	3.0	1626	0.090	100	0.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	796	3.0		0.791		18.6	LOS C	11.5	294.9				
North: Mendocino (18th) Ave													
Lane 1[d]	939	3.0	1340	0.701	100	12.2	LOS B	0.0	0.0	Full	700	0.0	0.0
Approach	939	3.0		0.701		12.2	LOS B	0.0	0.0				
West: SR99SB OFF RAMP													
Lane 1[d]	184	3.0	500	0.368	100	13.2	LOS B	1.7	42.5	Full	1600	0.0	0.0
Approach	184	3.0		0.368		13.2	LOS B	1.7	42.5				
Intersection	1918	3.0		0.791		14.9	LOS B	11.5	294.9				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
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Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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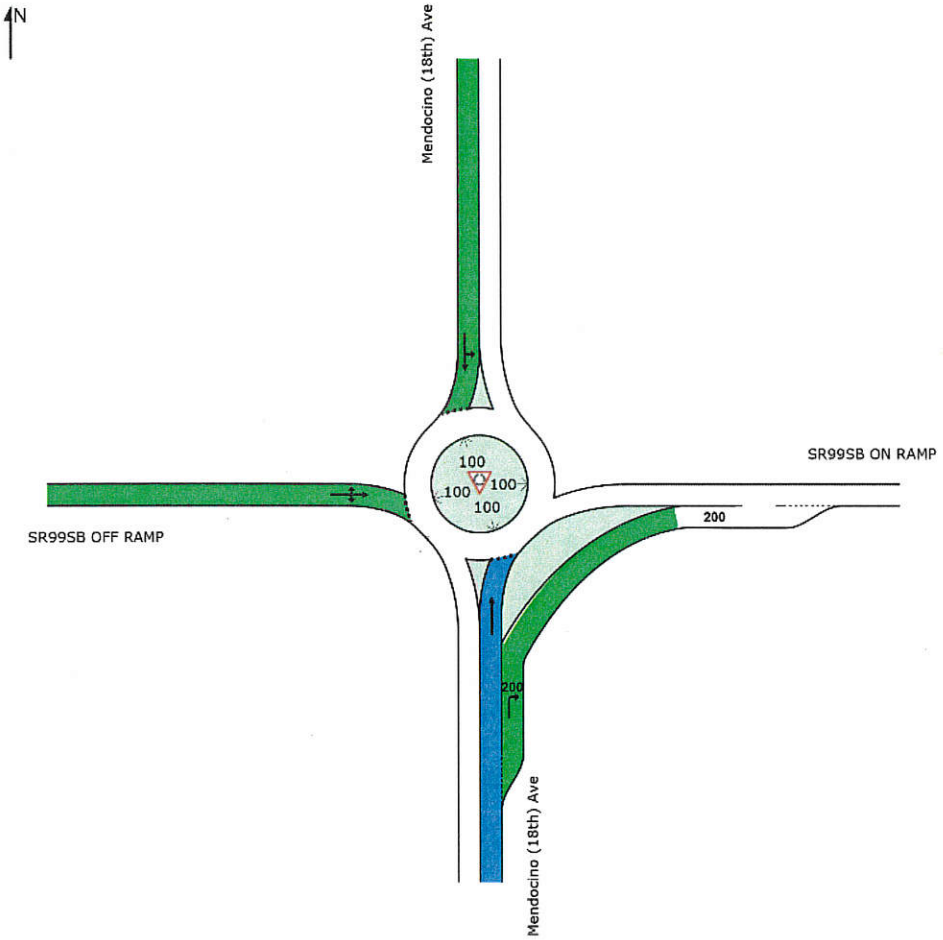
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [ALT6-SR99SB-2045-PM-eliminte Ave394&Frontage Rd access]

New Site
Site Category: (None)
Roundabout

	Approaches			Intersection
	South	North	West	
LOS	C	A	A	B



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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LANE SUMMARY

Site: 101 [ALT6-SR99SB-2045-PM-eliminte Ave394&Frontage Rd access]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Mendocino (18th) Ave													
Lane 1[d]	740	3.0	942	0.786	100	20.2	LOS C	13.9	356.3	Full	700	0.0	0.0
Lane 2	168	3.0	1626	0.104	100	0.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	909	3.0		0.786		16.4	LOS C	13.9	356.3				
North: Mendocino (18th) Ave													
Lane 1[d]	672	3.0	1340	0.501	100	7.9	LOS A	0.0	0.0	Full	700	0.0	0.0
Approach	672	3.0		0.501		7.9	LOS A	0.0	0.0				
West: SR99SB OFF RAMP													
Lane 1[d]	166	3.0	662	0.251	100	8.5	LOS A	1.0	26.8	Full	1600	0.0	0.0
Approach	166	3.0		0.251		8.5	LOS A	1.0	26.8				
Intersection	1747	3.0		0.786		12.4	LOS B	13.9	356.3				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
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HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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Meeting Date:	03/04/2020
Agenda Item:	5.2

CITY COUNCIL MEETING STAFF REPORT

REPORT TO: **Mayor Roman & City Council**

REPORT FROM: **David Peters, City Engineer** **REVIEWED BY**: AP

AGENDA ITEM: W**arlow Rest Stop Extraterritorial Water Service Connection**

ACTION REQUESTED: ___Ordinance ____Resolution ____ Motion __√__Receive/File

EXECUTIVE SUMMARY

Caltrans is developing a project to upgrade the water system at the Warlow Rest Stop on Highway 99 south of Kingsburg. Currently the facility is served by a water well and small distribution system. Caltrans desires to connect to the City of Kingsburg's water system and extend it approximately two miles to the rest stop site. Water from the City's distribution system will be used for domestic and potentially fire protection uses.

In order for the City to provide this service, an extraterritorial water service agreement must be approved by the Council, as well as Fresno and Tulare County LAFCO's. A connection as remote as the rest stop would likely require a special service rate. which has not yet been determined.

RECOMMENDED ACTION BY CITY COUNCIL

1. Staff requests Council direction regarding potentially providing this requested service.

POLICY ALTERNATIVE(S)

Deny the request for an extraterritorial water service connection.

REASON FOR RECOMMENDATION/KEY METRIC

Promote Sustainable Growth.

FINANCIAL INFORMATION

FISCAL IMPACT:

1. Is There A Fiscal Impact?	Yes
2. Is it Currently Budgeted?	No
3. If Budgeted, Which Line?	N/A

FINANCIAL SUMMARY

None

PRIOR ACTION/REVIEW
None

BACKGROUND INFORMATION
Please see Executive Summary.

ANNUAL REPORT 2019
DANIEL C. PERKINS
FIRE CHIEF

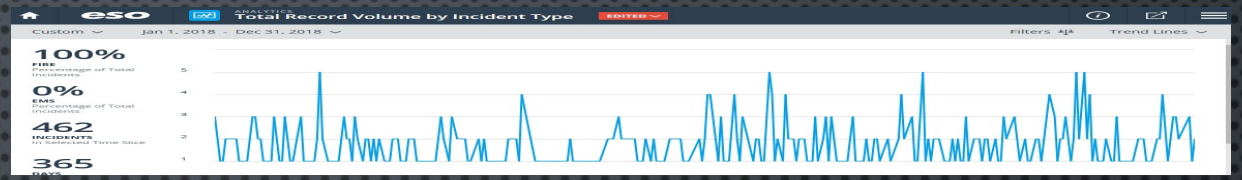
FIRE DEPARTMENT TOPICS

- DEPARTMENT STATISTICS
- RESERVE PROGRAM
- FIRE PREVENTION
- HYDRANTS
- TRAINING
- STATION 2 / SECOND AMBULANCE

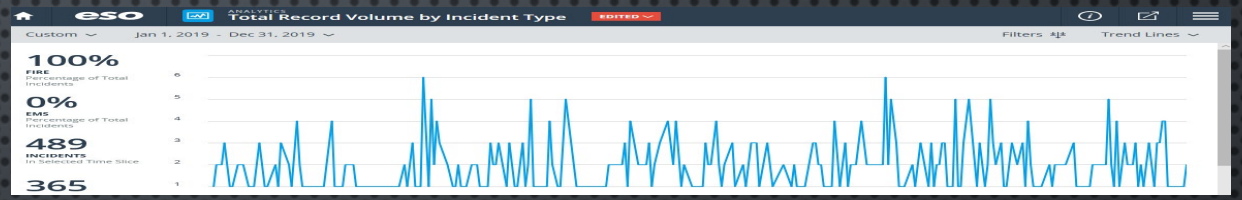
DEPARTMENT STATISTICS

- **FIRE**

2018: 462 Incidents



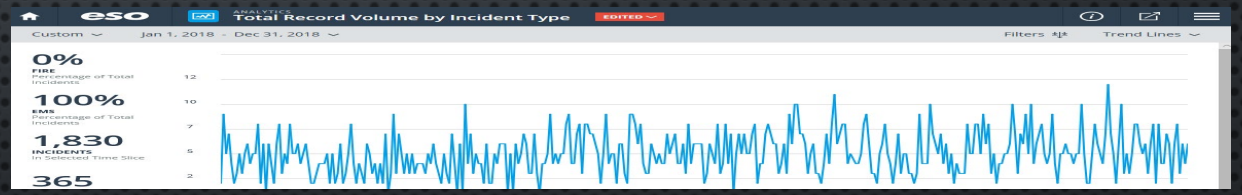
2019: 489 Incidents



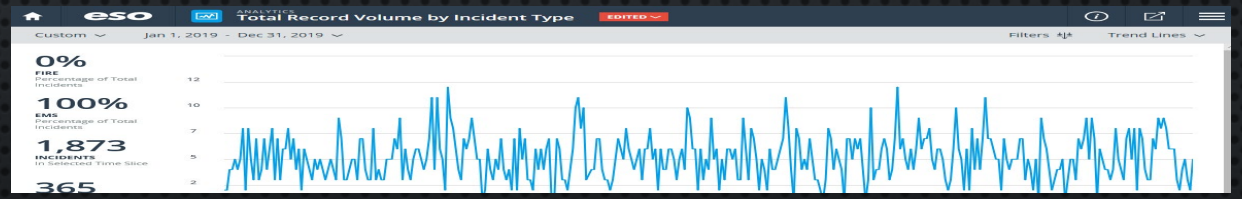
4.8% INCREASE

- **EMS**

2018: 1830 Incidents



2019: *1892 Incidents



3.4% INCREASE

DEPARTMENT STATISTICS

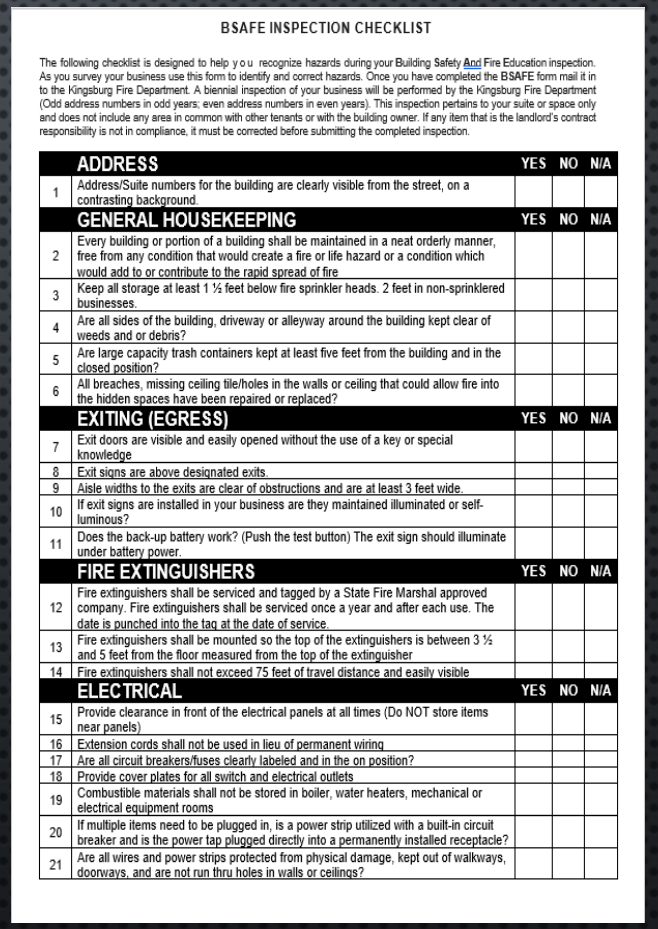
- OUTREACH

RESERVE PROGRAM

- Began year with many inactive
- Retained 6 reserves from old
- Hired 11 new reserves
- Roster of 16
- 5 of which have differing duties

FIRE PREVENTION

- 1129 MAILERS IN BILLS WITH BUSINESS LICENSES
- ONLY 8% TOTAL WERE RETURNED
- LESS THAN 2% RETURNED CORRECTLY
- 1/1/20 BSFE (BSAFE) BEGINS
- 2/1/20 BSAFE INSPECTIONS BY KFD PERSONNEL BEGIN- ODD ADDRESSES ONLY



BSAFE INSPECTION CHECKLIST

The following checklist is designed to help you recognize hazards during your Building Safety And Fire Education inspection. As you survey your business use this form to identify and correct hazards. Once you have completed the BSAFE form mail it in to the Kingsburg Fire Department. A biennial inspection of your business will be performed by the Kingsburg Fire Department (Odd address numbers in odd years; even address numbers in even years). This inspection pertains to your suite or space only and does not include any area in common with other tenants or with the building owner. If any item that is the landlord's contract responsibility is not in compliance, it must be corrected before submitting the completed inspection.

	ADDRESS	YES	NO	N/A
1	Address/Suite numbers for the building are clearly visible from the street, on a contrasting background.			
	GENERAL HOUSEKEEPING	**YES**	**NO**	**N/A**
2	Every building or portion of a building shall be maintained in a neat orderly manner, free from any condition that would create a fire or life hazard or a condition which would add to or contribute to the rapid spread of fire			
3	Keep all storage at least 1 ½ feet below fire sprinkler heads. 2 feet in non-sprinklered businesses.			
4	Are all sides of the building, driveway or alleyway around the building kept clear of weeds and or debris?			
5	Are large capacity trash containers kept at least five feet from the building and in the closed position?			
6	All breaches, missing ceiling tile/holes in the walls or ceiling that could allow fire into the hidden spaces have been repaired or replaced?			
	EXITING (EGRESS)	**YES**	**NO**	**N/A**
7	Exit doors are visible and easily opened without the use of a key or special knowledge			
8	Exit signs are above designated exits.			
9	Aisle widths to the exits are clear of obstructions and are at least 3 feet wide.			
10	If exit signs are installed in your business are they maintained illuminated or self-luminous?			
11	Does the back-up battery work? (Push the test button) The exit sign should illuminate under battery power.			
	FIRE EXTINGUISHERS	**YES**	**NO**	**N/A**
12	Fire extinguishers shall be serviced and tagged by a State Fire Marshal approved company. Fire extinguishers shall be serviced once a year and after each use. The date is punched into the tag at the date of service.			
13	Fire extinguishers shall be mounted so the top of the extinguishers is between 3 ½ and 5 feet from the floor measured from the top of the extinguisher			
14	Fire extinguishers shall not exceed 75 feet of travel distance and easily visible			
	ELECTRICAL	**YES**	**NO**	**N/A**
15	Provide clearance in front of the electrical panels at all times (Do NOT store items near panels)			
16	Extension cords shall not be used in lieu of permanent wiring			
17	Are all circuit breakers/fuses clearly labeled and in the on position?			
18	Provide cover plates for all switch and electrical outlets			
19	Combustible materials shall not be stored in boiler, water heaters, mechanical or electrical equipment rooms			
20	If multiple items need to be plugged in, is a power strip utilized with a built-in circuit breaker and is the power tap plugged directly into a permanently installed receptacle?			
21	Are all wires and power strips protected from physical damage, kept out of walkways, doorways, and are not run thru holes in walls or ceilings?			

FIRE HYDRANTS

- 650 + HYDRANTS
- NOT MAINTAINED IN OVER 5 YEARS
- WORKING WITH VOLUNTEER GROUPS AND KFD STAFF TO PAINT, FLOW, PERFORM MAINTENANCE
- CRITICAL TO INFRASTRUCTURE

TRAINING

- Increase in operational readiness
- 300 % increase in training hours in FY19
- 2 -year training plan in effect
- ISA agreement increase in funding
- CAL JAC Agreement

STATION 2 / SECOND AMBULANCE

- STATION #2
- 2019- 104 CALLS
- 155 CALLS - 9/11/19 TO DATE