



# Transportation Impact Study for the Redwood Row Project



Prepared for the City of Cotati

Submitted by  
**W-Trans**

April 4, 2025



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# Executive Summary

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The project includes construction of 178 multi-family residential units on the north side of State Route (SR) 116, also known as Gravenstein Highway, in the City of Cotati. The project includes 44 affordable units and 10,032 square feet of retail space. General access to the site would be via two driveways on SR-116. The study intersection of SR-116/West Cotati Avenue is located west of the proposed project site and is currently configured as a tee intersection. The General Plan calls for the realignment and signalization of the intersection; with the completion of this project the north leg of the realigned intersection would serve as the primary access point for the project.

The project is expected to generate an average of 1,558 new daily trips, including 85 a.m. peak hour trips and 116 p.m. peak hour trips.

Under Existing and Baseline Conditions the study intersection operates or would operate acceptably at Level of Service (LOS) A overall, both without and with trips generated by the proposed project. The minor street approach operates or would operate acceptably at LOS C in both scenarios, without and with project trips. In the future, and with the planned realignment and signalization, the study intersection would operate at LOS C or better, and with the addition of project trips it would operate at LOS D or better, which is considered acceptable under City policies.

As part of the project, a multi-use path would be constructed along the site frontage that would provide continuous pedestrian and bicycle access to adjacent properties and the area's existing sidewalk network. The project would not conflict with any policies or plans regarding pedestrian or transit modes of travel. It is recommended that the project provide bicycle parking facilities as required by the City's Municipal Code; with the inclusion of these facilities the project would not conflict with plans or policies regarding bicycle travel.

There are no underlying safety concerns at the study intersection. An eastbound left-turn lane is recommended to accommodate anticipated queues of vehicles entering the site. Sight lines at the project driveway are adequate, and it is recommended that signs, structures and landscaping be designed to maintain adequate sight lines in the vicinity of the project driveways.

The residential component of the project would have a less-than-significant impact on vehicle miles traveled (VMT) based on its location as well as consideration of the proposed density and the inclusion of 25 percent affordable units. The retail portion of the project would be considered local-serving, so it would also have a less-than-significant project impact.

The project is proposed under the State Density Bonus and the proposed parking supply for the residential portion of the project would meet the requirements for density bonus projects. The proposed parking for the retail use would meet the City's parking requirements.

# Introduction

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This report presents an analysis of the potential traffic impacts and adverse operational effects that would be associated with development of a proposed mixed-use project to be located in the City of Cotati at on the north side of State Route (SR) 116, west of the intersection with Redwood Drive and south of Lowe's. The traffic study was completed in accordance with the criteria established by the City and is consistent with standard traffic engineering techniques.

## Prelude

The purpose of a traffic impact study is to provide City staff and policy makers with data that they can use to make an informed decision regarding the potential transportation impacts of a proposed project, and any associated improvements that would be required to mitigate these impacts to an acceptable level under CEQA, the City's General Plan, or other policies. This report provides an analysis of those items that are identified as areas of environmental concern under the California Environmental Quality Act (CEQA) and that, if significant, require an EIR. Impacts associated with access for pedestrians, bicyclists, and to transit; the vehicle miles traveled (VMT) generated by the project; potential safety concerns such as increased queuing in dedicated turn lanes, adequacy of sight distance, need for turn lanes, and need for additional right-of-way controls; and emergency access are addressed in the context of the CEQA criteria. While no longer a part of the CEQA review process, vehicular traffic service levels at key intersections were evaluated for consistency with General Plan policies by determining the number of new trips that the proposed use would be expected to generate, distributing these trips to the surrounding street system based on anticipated travel patterns specific to the proposed project, then analyzing the effect the new traffic would be expected to have on the study intersections and need for improvements to maintain acceptable operation. Adequacy of parking is also addressed as a policy issue.

## Applied Standards and Criteria

The report is organized to provide background data that supports the various aspects of the analysis, followed by the assessment of CEQA issues and then evaluation of policy-related issues. The CEQA criteria evaluated are as follows.

Would the project:

- a. Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?
- b. Conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)?
- c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?
- d. Result in inadequate emergency access?

## Project Profile

The project as proposed includes 178 multi-family residential units in three-story buildings, including 44 units deed-restricted for low-income residents, plus options for 33 accessory dwelling units (ADUs). Out of the 134 market-rate units, 16 will include ground-floor commercial space totaling 10,032 square feet. The project site is located on the north side of SR-116, known as Gravenstein Highway, as shown in Figure 1.





Transportation Impact Study for the Redwood Row Residential Project  
**Figure 1 – Study Area and Existing Lane Configurations**

# Transportation Setting

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## Study Area and Periods

The study area varies depending on the topic. For pedestrian trips it consists of all streets within a half mile of the project site that would lie along primary routes of pedestrian travel, or those leading to nearby attractions. For bicycle trips it consists of all streets within one mile of the project site that would lie along primary routes of bicycle travel. For the safety and operational analyses, it consists of the project frontage and the intersection of SR 116/West Cotati Avenue.

Operating conditions during the a.m. and p.m. peak periods were evaluated to capture the highest potential impacts for the proposed project as well as the highest volumes on the local transportation network. The morning peak hour occurs between 7:00 and 9:00 a.m. and reflects conditions during the home to work or school commute, while the p.m. peak hour occurs between 4:00 and 6:00 p.m. and typically reflects the highest level of congestion during the homeward bound commute. Counts used for this study were obtained on February 23, 2022, during these peak periods and while local schools were in session.

## Study Intersection

**SR-116/West Cotati Avenue** is a tee intersection with stop controls on the northbound approach, which includes a flared right-turn pocket. The eastbound approach has a channelized right turn. The City's General Plan calls for the realignment of the West Cotati Avenue approach so that it would be relocated to the east and would intersect SR-116 at more of a right angle instead of the current skewed approach. A new driveway is proposed at the project site's westerly border (and the easterly border of the adjacent Cotati Village 1 project); ultimately this would form the north leg of the reconfigured intersection, which would be signalized. The City of Cotati is currently in the design phase of the redesigned intersection, which would provide access for both the Redwood Row and Cotati Village 1 projects. The location of the study intersection and the existing lane configurations and control are shown in Figure 1.

## Study Roadway

**SR-116** is a state route connecting US-101 in Cotati to SR-1 on the Sonoma Coast in Jenner. Within Cotati, it is known as Gravenstein Highway and is currently a four-lane facility for one-quarter mile between Old Redwood Highway and Redwood Drive, transitioning to a two-lane highway to the west and along the frontage of the proposed project's site. The posted speed limit is 45 mph between Redwood Drive and the western city limit, including along the project frontage. On-street bicycle lanes and sidewalks exist on both sides of the street between Old Redwood Highway and Redwood Drive.

## Collision History

The collision history for the study area was reviewed to determine any trends or patterns that may indicate a safety issue. Collision rates were calculated based on records available from the California Highway Patrol as published in their Statewide Integrated Traffic Records System (SWITRS) reports. The most current five-year period available is October 1, 2018, through September 30, 2023.

The calculated collision rate for the study intersection was compared to the average collision rate for similar facilities statewide, as indicated in *2021 Collision Data on California State Highways*, California Department of Transportation (Caltrans). These average rates statewide are for intersections in the same environment (urban, suburban, or rural), with the same number of approaches (three or four), and the same controls (all-way stop, two-way stop, or traffic signal). Only one collision was recorded at the intersection during the analysis period, resulting in one injury. The collision rate was substantially less than the statewide average for similar facilities, so it was determined that there was no apparent operational safety concern at the study intersection. The collision rate is provided in Table 1, and the collision rate calculations are provided in Appendix A.

**Table 1 – Collision Rates for the Study Intersections**

<b>Study Intersection</b>	<b>Number of Collisions (2018-2023)</b>	<b>Calculated Collision Rate (c/mve)</b>	<b>Statewide Average Collision Rate (c/mve)</b>
SR-116/W Cotati Ave	1	0.04	0.13

Note: c/mve = collisions per million vehicles entering

# Project Data

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The project consists of a total of 178 multi-family units, 44 of which would be affordable, as well as the potential for 33 accessory dwelling units (ADUs). All the proposed market-rate units would have three bedrooms each, per the site plans, while the affordable units would include 21 one-bedroom units, 12 two-bedroom units, and 11 three-bedroom units. First-floor commercial space totaling 10,032 square feet would be provided in sixteen of the market-rate units. The proposed project site plan is shown in Figure 2.

The project site is located in the CG (Commercial, Gravenstein Corridor) Zoning District. The zoning code allows for a density of 15 units per acre, which would allow for 159 units. However; by providing 25 percent of the residential units (44 units) as affordable (eight for very low-income households, eight for low-income households, eight for moderate/low/very low-income, and 20 for which income levels are to be determined) the project is eligible under the State Density Bonus Law to increase the allowable density to 18 units per acre, or 188 units.

## Trip Generation

The anticipated trip generation for the proposed project was estimated using standard rates published by the Institute of Transportation Engineers (ITE) in *Trip Generation Manual*, 11<sup>th</sup> Edition, 2021. Rates for “Strip Retail Plaza (<40k)” (LU #822) were applied to the first-floor commercial space and “Multifamily Housing (Low-Rise) Not Close to Rail Transit” (LU #220) were applied to the multi-family units as these descriptions most closely match the proposed project.

## Internal Capture Trips

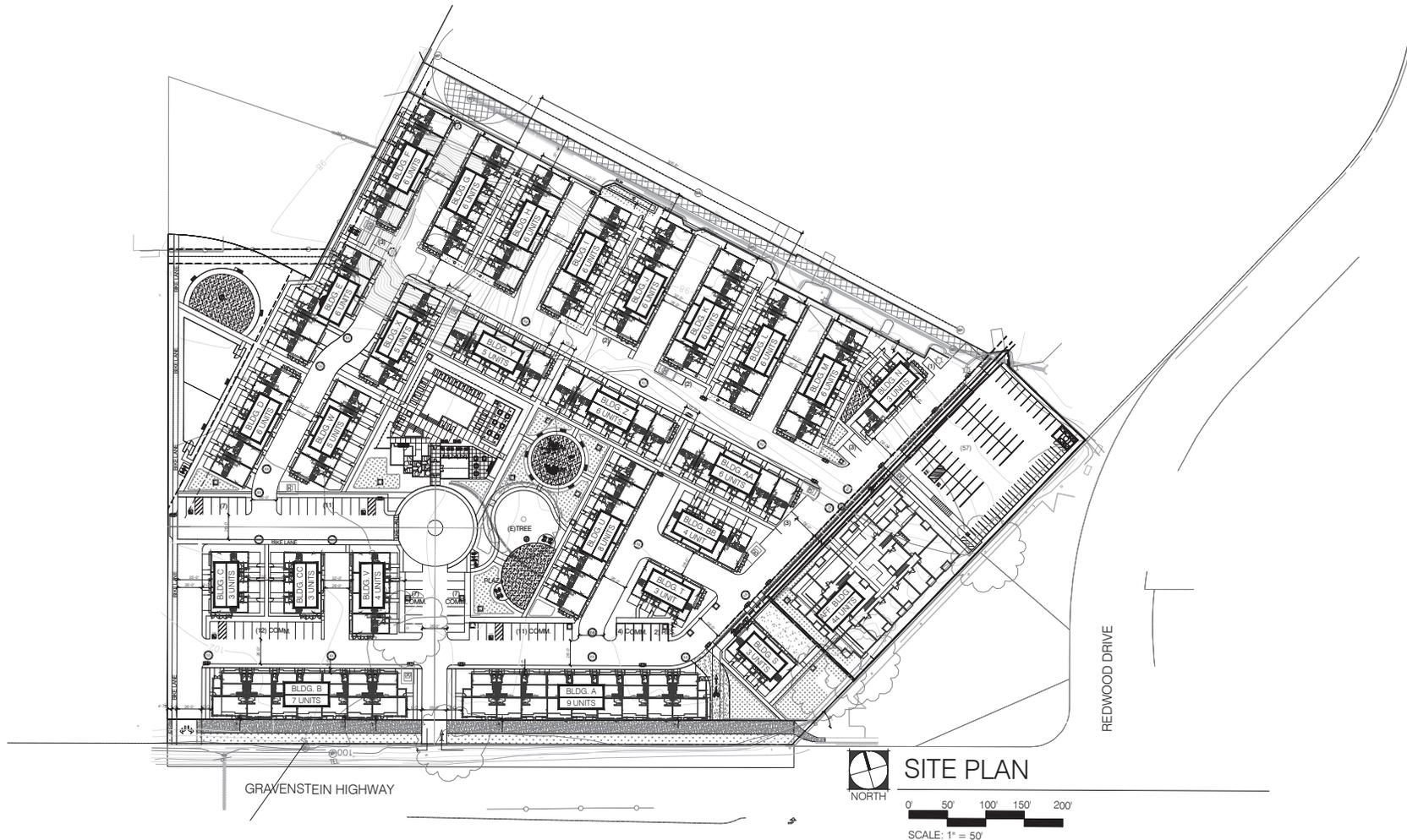
Internal trips occur at mixed-use developments, and in the case of the project would consist of residents patronizing adjacent retail uses, as well as employees of nonresidential uses patronizing other nonresidential uses. The majority of these trips would be made by walking, and any that might be made by automobile would only travel on-site, so would not affect the adjacent street network; such internal trips may also include visits to more than one business. Copies of the spreadsheets indicating the derivation of the internal capture rates are provided in Appendix B along with the projected trip generation of the proposed project.

## Pass-by Trips

As is typical of most retail uses, a portion of the trips associated with the retail area would be drawn from existing traffic on nearby streets. These vehicle trips, known as pass-by trips, are not considered new trips since they consist of drivers who are already driving on the adjacent street and choose to make an interim stop. In the case of the proposed retail area, most trips would be diverted from traffic passing by the site on SR-116. Data published in the *Trip Generation Manual* does not indicate pass-by percentages for a “Strip Retail Plaza” (Land Use #822), so data for “Shopping Center” (Land Use #821), the most similar available land use, was used instead. The pass-by trip percentages are 40 percent during the evening peak hour, and this percentage was also applied to the morning peak hour. To estimate the number of daily trips that would be pass-by, a rate of 20 percent was applied for informational purposes. The pass-by deduction was calculated after removal of the estimated internal capture trips.

## Total Project Trip Generation

Based on application of these rates and assumptions, the proposed project is expected to generate an average of 1,558 trips per day, including 85 a.m. peak hour trips and 116 trips during the p.m. peak hour. These results are summarized in Table 2.



<p><b>CITY VENTURES</b> COTATI CALIFORNIA</p>	<p><b>CITY VENTURES</b> COTATI CALIFORNIA</p>		<p>Architecture   Planning   Interiors 444 Spear Street, Suite 105 San Francisco, CA 94105 www.hunthalejones.com T. 415-512-1300 F. 415-288-0288</p>	<p>PRELIMINARY SITE PLAN <b>A0.5</b> SCALE: 1" = 50' - 0" DATE: 10.01.2024 PROJECT: 317068.00</p>
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Source: City Ventures 1/7

cot100.ai 1/25

## Transportation Impact Study for the Redwood Row Residential Project Figure 2 – Site Plan



**Table 2 – Trip Generation Summary**

Land Use	Units	Daily		AM Peak Hour				PM Peak Hour			
		Rate	Trips	Rate	Trips	In	Out	Rate	Trips	In	Out
Strip Retail Plaza	10.032 ksf	54.45	546	2.36	24	14	10	6.59	66	33	33
<i>Internal Capture</i>		-8%	-44**	-2%	0	0	0	-15%	-10	-5	-5
<b>Subtotal</b>			<b>502</b>		<b>24</b>	<b>14</b>	<b>10</b>		<b>56</b>	<b>28</b>	<b>28</b>
<i>Pass-by</i>		-20%	-100	-40%	-10	-6	-4	-40%	-22	-11	-11
MF Housing (Low-Rise)	178 du	6.74	1,200	0.40	71	17	54	0.51	91	57	34
<i>Internal Capture*</i>			-44		0	0	0		-9	-4	-5
<b>Total</b>			<b>1,558</b>		<b>85</b>	<b>25</b>	<b>60</b>		<b>116</b>	<b>70</b>	<b>46</b>

Note: du = dwelling unit; ksf = 1,000 square feet; MF = Multifamily \* Internal capture for retail use is the opposite end of trips estimated for the residential use; \*\* Daily internal trips estimated using the average percentages of a.m. and p.m. peak hour internal trips.

## Trip Distribution

The pattern used to allocate new project trips to the street network was based on assumptions applied to the transportation impact study for the Cotati Village Phase 1 project, which is proposed on the site immediately west of the Redwood Row project site. Trips were distributed such that 75 percent were assigned to/from the east and 25 percent to/from the west.

# Circulation System

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This section addresses the first transportation bullet point on the CEQA checklist, which relates to the potential for a project to conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.

The City of Cotati *General Plan* includes the following policies and actions related to circulation:

- Action CI 1b: Ensure that future development provides roadway improvements consistent with the Circulation Diagram and implement the roadway improvements identified in the Traffic Impact Fee Study to improve the safety and efficiency of the current circulation system, and to support buildout of the General Plan.
- Action CI 1f: As part of the development review and planning process, review general plan amendments, zone change requests, specific plans, and development projects to ensure that adequate circulation improvements are included, that the project addresses its proportional share of impacts to the City's circulation network, and that the project provides for complete streets to the extent feasible.
- Policy CI 1.6: When analyzing impacts to the circulation network created by new development or roadway improvements, consider the needs of all users including those with disabilities, ensuring that pedestrians, bicyclists, and transit riders are considered at an equal level to the needs of automobile drivers.
- Policy CI 1.8: Maintain safe travel conditions for all modes of travel.

The project applicant is required by the City of Cotati to contribute traffic impact fees based on the impact of the project on area facilities, as measured by the number of project-related trips. The realignment and signalization of the SR-116/West Cotati Avenue intersection has been identified as one of the projects to be funded through the City's traffic impact fee revenues. Analysis of future conditions assumed the construction of roadway and intersection improvements as called for in the General Plan.

The need for other potential improvements was assessed for pedestrian, bicycle, and transit facilities, as described below. Safety considerations were assessed based on collision history and left-turn lane warrants that were conducted for eastbound traffic that would be entering the site from SR-116; this analysis is provided in other sections of this report.

## Pedestrian Facilities

### Existing and Planned Pedestrian Facilities

Pedestrian facilities include sidewalks, crosswalks, pedestrian signal phases, curb ramps, curb extensions, and various streetscape amenities such as lighting, benches, etc. In general, access for pedestrians is limited within the vicinity of the proposed project site due to large gaps in the sidewalk system. These existing gaps and obstacles along the connecting roadways impact convenient and continuous access for pedestrians and present safety concerns in those locations where appropriate pedestrian infrastructure would address potential conflict points.

- **SR-116** – Sidewalk coverage is provided on both sides of SR-116 east of Redwood Drive and on the properties adjacent to the Redwood Drive intersection. West of Redwood Drive, including along the project frontage, no sidewalks are present, so pedestrian access is available only along the shoulders. Lighting is provided by overhead streetlights, which are more prevalent east of Redwood Drive. The approved design for Cotati Village 1 includes the addition of a Class I multi-use path along that project's frontage on SR-116 for pedestrian and bicycle access.
- **West Cotati Avenue** – Intermittent sidewalk coverage is provided on the west side of West Cotati Avenue with significant gaps throughout the section between Cohen Court and Cotati Oaks Court Village, as well as

between Maple Avenue and Clifford Street. Lighting is provided by overhead streetlights, with pedestrian-scale lighting where sidewalks are present. In general, West Cotati Avenue is a local street that provides access to residences on both sides. The *City of Cotati Active Transportation Plan* proposes improvements to the sidewalk network to eliminate gaps along West Cotati Avenue between SR-116 and Cotati Oaks Court West.

## Pedestrian Safety

The collision history for the study area was reviewed to determine any trends or patterns that may indicate a safety issue for pedestrians. Collision records available from the California Highway Patrol as published in their Statewide Integrated Traffic Records System (SWITRS) reports were reviewed for the most current five-year period available, which was October 1, 2018, through September 30, 2023, at the time of the analysis. During the five-year study period there were no reported collisions involving pedestrians at the study intersection.

## Project Impacts on Pedestrian Facilities

Given the proximity of commercial and residential destinations near the site, it is reasonable to assume that some project residents, patrons and employees would want to walk, bicycle, and/or use transit to reach the project site. Upon construction of the proposed Class I path along the project frontage on SR-116, the project site would be connected to the pedestrian facilities that currently exist to the east of the site. A network of sidewalks would be provided throughout the project site, resulting in connected on-site pedestrian circulation. Upon completion of the Class I path that would be included in the Cotati Village 1 project, Redwood Row would be linked to facilities on both sides of the project along SR-116. With the completion of the realignment and signalization of the SR-116/West Cotati Avenue intersection, a crosswalk would be provided to connect Redwood Row to the south side of SR-116; there is an existing crosswalk across SR-116 at the Redwood Drive traffic signal.

**Finding** – The project would not conflict with any policies related to pedestrian facilities.

## Bicycle Facilities

### Existing and Planned Bicycle Facilities

The *Highway Design Manual*, Caltrans, 2020, classifies bikeways into four categories:

- **Class I Multi-Use Path** – a completely separated right-of-way for the exclusive use of bicycles and pedestrians with cross flows of motorized traffic minimized.
- **Class II Bike Lane** – a striped and signed lane for one-way bike travel on a street or highway.
- **Class III Bike Route** – signing only for shared use with motor vehicles within the same travel lane on a street or highway.
- **Class IV Bikeway** – also known as a separated bikeway, a Class IV Bikeway is for the exclusive use of bicycles and includes a separation between the bikeway and the motor vehicle traffic lane. The separation may include, but is not limited to, grade separation, flexible posts, inflexible physical barriers, or on-street parking.

In the project area, Class II bike lanes exist on Alder Avenue, Commerce Boulevard, Redwood Drive, Old Redwood Highway, and SR-116 along the proposed project frontage. Class I multi-use paths are planned on SR-116 and along Tompkins Road connecting Richardson Lane and Gilman Ranch Road southwest of the proposed project. Class III bike boulevards are planned on Gilman Ranch Road and West Cotati Avenue and a Class IV separated bikeway is planned on Redwood Drive. Bicyclists ride in the roadway and/or on sidewalks along all other streets within the project study area. Table 3 summarizes the existing and planned bicycle facilities in the project vicinity, as contained in the *City of Cotati Active Transportation Plan*, 2024.

**Table 3 – Bicycle Facility Summary**

Status Facility	Class	Length (miles)	Begin Point	End Point
<b>Existing</b>				
Alder Ave	II	0.16	300' North of Ford Ln	SR-116
Commerce Blvd	II	0.10	Old Redwood Hwy	Cotati City Limits
Redwood Dr	II	0.60	Cotati City Limits	SR-116
Old Redwood Hwy	II	0.50	US 101	E Cotati Ave
SR-116	II	0.25	Redwood Dr	Old Redwood Hwy
West Cotati Ave	III	0.34	SR-116	W Cotati Oaks Ct
Gilman Ranch Rd	III	0.16	Western Terminus	W Cotati Ave
<b>Planned</b>				
W Cotati Oaks Trail	I	0.43	SR-116	W School St
SR-116	I	0.80	Redwood Dr	Cotati City Limits
Helman Ln to SR-116 Trail	I	0.14	Northern City Limits	SR-116
Gilman Ranch Rd	IIIB	0.16	Western Terminus	W Cotati Ave
West Cotati Ave	IIIB	0.43	SR-116	Maple Ave
Redwood Dr	IV	0.55	Houser Dr	SR-116

Source: *City of Cotati Active Transportation Plan, Sonoma County Transportation Authority, 2024*

## Bicyclist Safety

Collision records for the study area were reviewed to determine if there had been any bicyclist-involved crashes. During the five-year study period between October 1, 2018, through September 30, 2023, there were no reported collisions involving bicyclists at the study intersection.

## Project Impacts on Bicycle Facilities

Existing bicycle facilities, including bike lanes on streets together with shared use of minor streets, provide adequate access for bicyclists. The addition of the Class I path along the project frontage will enhance the existing Class II facilities, will contribute to the local bicycle network, and will improve access to and from the project site.

## Bicycle Storage

Based on Section 17.36.070 of the Cotati Municipal Code, multifamily residential and retail commercial projects must provide bicycle parking spaces equal to a minimum of one space for every ten motor vehicle spaces. These parking spaces must be conveniently located near the primary entrance, must include a stationary parking device, and must be at least two feet wide and six feet long. For the proposed supply of 302 spaces for the condominiums, this translates to a required supply of 30 bicycle parking spaces. For the 44 affordable units, 56 parking spaces are proposed, requiring six bicycle parking spaces. For the commercial use, 40 vehicle parking spaces are proposed, resulting in a requirement for four bicycle parking spaces. As indicated in the site plan, one bicycle parking space is proposed per garage for the condominiums, which would translate to 134 spaces. No bicycle parking spaces are indicated on the site plan for the affordable housing or commercial uses.

**Finding** – The project would not conflict with applicable policies regarding bicycle facilities.

**Recommendation** – The project should provide a minimum of six bicycle parking spaces for the affordable residential units and four bicycle parking spaces for the commercial uses.

## Transit Facilities

### Existing Transit Facilities

The Sonoma County Transit Agency (SCT) provides fixed route bus service in the City of Cotati. Existing transit routes and their operation are summarized in Table 4.

Table 4 – Transit Routes					
Transit Agency Route	Distance to Stop (mi) <sup>1</sup>	Service			Connection
		Days of Operation	Time	Frequency	
<b>Sonoma County Transit</b>					
Route 10	0.6	Mon-Fri	6:15 a.m. – 6:30 p.m.	30 – 60 min	Old Redwood Hwy/ St Joseph Wy
		Sat	8:00 a.m. – 5:30 p.m.	45 – 65 min	
Route 26	0.1	Mon – Fri (School Days)	8:00 a.m.	1 trip/day	Hwy-116/Redwood Dr
			4:00 p.m.	1 trip/day	
Route 48	0.6	Weekdays	6:00 a.m. – 11:00 p.m.	8 trips/day NB 9 trips/day SB	Old Redwood Hwy/ St Joseph Wy
			7:00 a.m. – 10:00 p.m.	5 trips/day	
<b>Golden Gate Transit</b>					
Route 101 NB	0.6	Daily	7:10 a.m. – 1:07 a.m.	60 – 90 min	Old Redwood Hwy/ St Joseph Wy
Route 101 SB	0.6	Daily	4:15 a.m. – 10:18 p.m.	60 – 90 min	

Note: <sup>1</sup> Defined as the shortest walking distance between the project site and the nearest bus stop; SF = San Francisco  
Source: [www.sctransit.com](http://www.sctransit.com), [www.goldengate.org](http://www.goldengate.org)

Two or three bicycles can be carried on the front of all SCT buses. Bike rack space is on a first come, first served basis. Riders are responsible for loading and unloading their bicycles.

Dial-a-ride, also known as paratransit, or door-to-door service, is available for those who are unable to independently use the transit system due to a physical or mental disability. SCT Paratransit is designed to serve the needs of individuals with disabilities within three quarters of a mile of their fixed-route transit services within Cotati and Sonoma County.

### Impact on Transit Facilities

Existing stops served by SCT Routes 10, 26, and 48 as well as Golden Gate Transit Route 101 are within an acceptable walking distance of the site. The project would not be expected to negatively impact transit operations and existing transit routes are adequate to accommodate project-generated transit trips. The addition of the Class I path along SR-116 will connect to adjacent pedestrian facilities, providing connectivity to bus stops in the area.

**Finding** – The project would not conflict with applicable policies regarding transit facilities.

**Significance Finding** – With the provision of required bicycle parking, the project would be compliant with City policy and have a less-than-significant impact on transportation facilities.

# Vehicle Miles Traveled (VMT)

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The potential for the project to conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b) was evaluated based the project's anticipated Vehicle Miles Traveled (VMT).

Senate Bill (SB) 743 established the change in Vehicle Miles Traveled (VMT) as a result of a project as the basis for determining California Environmental Quality Act (CEQA) impacts with respect to transportation and traffic. The project-related VMT was assessed by applying the City of Cotati's *Guidelines for Analysis of Vehicle Miles Traveled (VMT)*, adopted in September 2020. The California Governor's Office of Planning and Research (OPR) publication *Transportation Impacts (SB 743) CEQA Guidelines Update and Technical Advisory*, 2018, was also referenced. Per the City's policy, VMT for mixed use projects was assessed by applying the significance thresholds for each proposed use.

## Residential VMT

In accordance with City policy, VMT for residential projects was assessed using vehicle miles traveled per capita as estimated in the Sonoma County Transportation Authority (SCTA) travel demand model. VMT per capita measures home-based trips, or trips that have the place of residence as one of the trip ends. Based on data from the February 2022 update of the SCTA model, the City of Cotati has a baseline average residential VMT of 18.3 miles per capita. Applying the City guidelines, a residential project generating a VMT that is 15 percent or more below this value, or 15.6 miles per capita or fewer, would have a less-than-significant VMT impact. The SCTA model includes traffic analysis zones (TAZ) covering geographic areas throughout Sonoma County, and the Redwood Row project site is located within TAZ 425, which has a baseline VMT per capita of 20.2 miles. For the project to achieve the applied VMT significance threshold of 15.6 miles per capita, its VMT would need to be 22.8 percent lower than the average for existing residential development in the project TAZ.

The VMT associated with a development project is influenced by factors including density and the provision of onsite affordable housing. The publication *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity*, California Air Pollution Control Officers Association (CAPCOA), 2021, includes a methodology to determine the VMT reductions associated with increases in residential density, using conventional single-family home development as a baseline. SCTA has developed a spreadsheet tool based on the CAPCOA report to facilitate the calculation of VMT reductions for projects in Sonoma County.

The typical single-family residential development has a density of 9.1 units per acre; by comparison, the project proposes 178 units on a 10.62-acre site, or 16.8 units per acre. Applying the CAPCOA formula, this translates to a VMT reduction of 18.5 percent. The SCTA VMT tool also provides for VMT reductions based on the inclusion of affordable units as part of residential projects, as affordable units have been found to produce lower levels of VMT. Redwood Row would designate 24.7 percent of its total units as affordable, which is associated with a VMT reduction of 7.1 percent.

Applying the calculated densities of the Cotati Village project and the TAZ to the SCTA VMT tool and factoring in the affordable housing component of the project, the project's estimated VMT can be reduced by 24.3 percent; this is less than the sum of the density and affordable housing reductions because the SCTA VMT tool applies a dampening factor to avoid double counting. This is greater than the 23.2 percent reduction needed to achieve a less-than-significant impact for the project. Therefore, based on analysis of the project-generated VMT in accordance with City policy, the VMT impact for Redwood Row would be less than significant.

The VMT findings are shown in Table 5, and information including a summary of the input variables and adjustments is included in Appendix C.

**Table 5 – Vehicle Miles Traveled Analysis Summary – Residential Component**

<b>VMT Metric</b>	<b>Baseline VMT Rate</b>	<b>Significance Threshold</b>	<b>Project VMT Rate</b>	<b>Resulting Significance</b>
Residential VMT per Capita (Citywide Baseline)	18.3	15.6	15.3	Less than Significant

Note: VMT Rate is measured in VMT/Capita, or the number of daily miles driven per resident

## Commercial VMT

A retail project resulting in an increase to the region’s total VMT may reflect a significant impact. The California Office of Planning and Research (OPR) publication *Transportation Impacts (SB 743) CEQA Guidelines Update and Technical Advisory*, 2018, which recommends screening local-serving retail from VMT analysis since they introduce a greater mix of services into the urban fabric, resulting in improved proximity of retail to many residents and thereby resulting in shorter trips and a reduction in total VMT. By contrast, regional-serving retail uses would tend to draw customers from longer distances, thereby increasing VMT. OPR suggests a threshold for regional-serving retail of 50,000 square feet but notes that many local agencies provide definitions in their zoning codes and that locally-established criteria may reflect a unique understanding of local conditions. The City’s adopted VMT policy states that a retail project is considered to have a significant VMT impact if it would result in a net increase in regional total VMT, while local-serving retail up to 10,000 square feet would be screened from VMT analysis.

The project as proposed would include ground floor retail in the two project buildings with frontage along SR 116, totaling 10,032 square feet of retail space. While this is 32 square feet (0.3 percent) higher than the City’s small screening threshold for local-serving retail projects, based on the location of the site and consultation with City staff, it is expected that these retail uses would be local-serving; they would primarily cater to residents of Cotati as well as pass-by traffic from US-101 and SR-116. They would therefore not generate new regional trips. Since the proposed retail uses would be local-serving, it is assumed that they would not result in an increase in total VMT and could therefore be screened from a more detailed VMT analysis.

**Significance Finding** – The project’s VMT impact for both the residential and retail portions of the project would be presumed to be less than significant.

# Safety Issues

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The potential for the project to impact safety was evaluated in terms of the adequacy of sight distance and need for turn lanes at the project accesses as well as the adequacy of stacking space in dedicated turn lanes at the study intersection to accommodate additional queuing due to adding project-generated trips and need for additional right-of-way controls. This section addresses the third transportation bullet on the CEQA checklist which is whether or not the project would substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).

## Site Access

The proposed project site would be accessible via two driveways to be located on SR-116. There would also be two access points exclusively for emergency vehicle use, one on SR-116 at the eastern end of the site and the other via the Lowe's parking lot at the northeast corner of the site.

## Sight Distance

Sight distances along SR-116 at the project access points were evaluated based on sight distance criteria contained in the *Highway Design Manual* published by Caltrans. The recommended sight distance at intersections of public streets is based on corner sight distances, with more sight distance needed for making a left turn versus a right turn, while recommended sight distances for minor street approaches that are either a private road or a driveway are based on stopping sight distance. Both use the approach travel speeds as the basis for determining the recommended sight distance.

Sight distances were reviewed for the proposed driveway and intersection locations. For the posted 45-mph speed limit on SR-116 the minimum corner sight distance needed at the proposed north leg of SR-116/West Cotati Avenue is 495 feet and the minimum stopping sight distance needed at the proposed driveway is 360 feet. Assuming the sight triangle would be free of obstructions, approximately 550 feet of sight distance would be available in each direction, which is adequate. Sight lines should be kept free of signs, structures, and tall landscaping, and any trees associated with the project should be carefully located to avoid placement within sight triangles.

**Finding** – Sight lines are adequate to accommodate all turns into and out of the project access points.

**Recommendation** – Adequate sight lines should be maintained during the design and construction of project access points, and the placement of any signs, structures, or tall landscaping on SR-116 that would impede sight lines should be avoided.

## Access Analysis

### *Left-Turn Lane Warrants*

The need for a left-turn lane on SR-116 at the proposed project access points was evaluated based on criteria contained in the *Intersection Channelization Design Guide*, National Cooperative Highway Research Program (NCHRP) Report No. 279, Transportation Research Board, 1985, as well as an update of the methodology developed by the Washington State Department of Transportation and published in the *Method for Prioritizing Intersection Improvements*, 1997. The NCHRP report references a methodology developed by M. D. Harmelink that includes equations that can be applied to expected or actual traffic volumes to determine the need for a left-turn pocket based on safety issues. It is noted that prior to the realignment of the SR-116/West Cotati Avenue intersection, the primary access point for eastbound vehicles on SR-116 would be at the eastern project driveway where a left-turn pocket is to be provided. Once the intersection is reconstructed vehicles eastbound on SR-116 would enter the site from the western project driveway; as the number of inbound trips would remain unchanged, the left-turn lane warrant analysis applies to both locations. Using both a.m. and p.m. Existing plus Project volumes, an

eastbound left-turn lane on SR-116 would be warranted. The left-turn lane warrant spreadsheets are contained in Appendix D.

The *Traffic Impact Fee Study, 2015*, prepared by W-Trans for the City of Cotati, identifies the widening of SR-116 between Madrone Avenue and Redwood Drive as a future improvement, including the provision of turn pockets, such as an eastbound left-turn lane at the future location of the West Cotati Avenue intersection.

### *Left-Turn Lane Design Requirements*

The projected maximum left-turn queue lengths were determined using a methodology contained in "Estimating Maximum Queue Length at Unsignalized Intersections," John T. Gard, *ITE Journal*, November 2001. Using Existing plus Project volumes, the maximum eastbound left-turn queue on SR-116 at the project driveway would be no more than one vehicle; however, since SR-116 is a state highway it is recommended that the storage be provided for a minimum of two passenger cars, or 50 feet, to comply with Caltrans standards. Copies of the queue length calculations are contained in Appendix E.

**Finding** – An eastbound left-turn lane at the eastern project driveway would be warranted to serve project trips. It is noted that this driveway would serve as the primary access point prior to the realignment and signalization of the SR-116/West Cotati Avenue intersection; with the completion of that project the primary access point would shift to that intersection, which would include an eastbound left turn lane.

**Recommendation** – An eastbound left-turn lane on SR-116 with a minimum of 50 feet of storage should be provided at the eastern project driveway.

**Significance Finding** – With the installation of a left-turn lane on SR-116 and assuming the project frontage is designed to avoid and sight triangle impediments, the project would have a less-than-significant impact on safety.

# Emergency Access

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The final transportation bullet on the CEQA checklist requires an evaluation as to whether the project would result in inadequate emergency access or not.

## Adequacy of Site Access

In addition to the two proposed driveways providing access to and from the site from SR-116, right-of-way is proposed to be reserved for two emergency vehicle access (EVA) driveways. One EVA driveway would be located at the eastern part of the site and would provide access from SR-116, while the second EVA driveway would connect to the Lowe's parking lot in the northeast portion of the site where the drive aisle terminates. According to the site plan, the driveways and drive aisles would be designed to a minimum width of 26 feet. It is anticipated that all aspects of the site, including driveway and street widths, turning radii, and parking lot circulation, would be constructed in accordance with applicable standards and would be reviewed by the Fire Department; therefore, access would be expected to function acceptably for emergency response vehicles.

## Off-Site Impacts

While the project would be expected to result in a minor increase in delay for traffic on SR-116, emergency response vehicles can claim the right-of-way by using their lights and sirens; therefore, the project would be expected to have a nominal effect on emergency response times. The availability of two access points and the emergency vehicle-only access points from SR-116 and the connection to the Lowe's parking lot are also a benefit for emergency access since a different driveway could be used to gain access to the site should one of the driveways be compromised in an emergency.

**Finding** – Emergency access and circulation are anticipated to function acceptably, and traffic from the project is expected to have a less-than-significant impact on emergency response times.

**Significance Finding** – The proposed project would be designed to accommodate emergency response vehicles and would not impede emergency responders, resulting in a less-than-significant impact on emergency response.

# Capacity Analysis

## Intersection Level of Service Methodologies

Level of Service (LOS) is used to rank traffic operation on various types of facilities based on traffic volumes and roadway capacity using a series of letter designations ranging from A to F. Generally, Level of Service A represents free flow conditions and Level of Service F represents forced flow or breakdown conditions. A unit of measure that indicates a level of delay generally accompanies the LOS designation.

The study intersections were analyzed using methodologies published in the *Highway Capacity Manual (HCM)*, Transportation Research Board, 6<sup>th</sup> Edition. This source contains methodologies for various types of intersection control, all of which are related to a measurement of delay in average number of seconds per vehicle.

The Levels of Service for short-term conditions while the intersection had side street stop controls were analyzed using the “Two-Way Stop-Controlled” intersection capacity method from the HCM. This methodology determines a level of service for each minor turning movement by estimating the level of average delay in seconds per vehicle. Results are presented for individual movements together with the weighted overall average delay for the intersection.

Under planned future conditions the study intersection will be controlled by a traffic signal. These conditions were evaluated using the signalized methodology from the HCM. This methodology is based on factors including traffic volumes, green time for each movement, phasing, whether the signals are coordinated or not, truck traffic, and pedestrian activity. Average stopped delay per vehicle in seconds is used as the basis for evaluation in this LOS methodology. For purposes of this study, delays were calculated using optimized signal timing since the signal does not currently exist.

The ranges of delay associated with the various levels of service are indicated in Table 6.

<b>LOS</b>	<b>Two-Way Stop-Controlled</b>	<b>Signalized</b>
A	Delay of 0 to 10 seconds. Gaps in traffic are readily available for drivers exiting the minor street.	Delay of 0 to 10 seconds. Most vehicles arrive during the green phase, so do not stop at all.
B	Delay of 10 to 15 seconds. Gaps in traffic are somewhat less readily available than with LOS A, but no queuing occurs on the minor street.	Delay of 10 to 20 seconds. More vehicles stop than with LOS A, but many drivers still do not have to stop.
C	Delay of 15 to 25 seconds. Acceptable gaps in traffic are less frequent, and drivers may approach while another vehicle is already waiting to exit the side street.	Delay of 20 to 35 seconds. The number of vehicles stopping is significant, although many still pass through without stopping.
D	Delay of 25 to 35 seconds. There are fewer acceptable gaps in traffic, and drivers may enter a queue of one or two vehicles on the side street.	Delay of 35 to 55 seconds. The influence of congestion is noticeable, and most vehicles have to stop.
E	Delay of 35 to 50 seconds. Few acceptable gaps in traffic are available, and longer queues may form on the side street.	Delay of 55 to 80 seconds. Most, if not all, vehicles must stop and drivers consider the delay excessive.
F	Delay of more than 50 seconds. Drivers may wait for long periods before there is an acceptable gap in traffic for exiting the side streets, creating long queues.	Delay of more than 80 seconds. Vehicles may wait through more than one cycle to clear the intersection.

Reference: *Highway Capacity Manual*, Transportation Research Board, 6<sup>th</sup> Edition

## Traffic Operation Standards

According to the *Cotati General Plan, Policy C1 1.3*, the minimum acceptable Level of Service (LOS) standard for intersections is LOS D. At unsignalized intersections, Levels of Service shall be determined for both controlled movements and for the intersection overall. A significant traffic-related impact would occur if implementation of the project would cause an intersection to operate below the General Plan’s standard of LOS D.

At unsignalized intersections, controlled movements operating at LOS E or LOS F are allowable if 1) the intersection is projected to operate at LOS C or better overall, and 2) the projected traffic volume on the controlled movement is 30 vehicles or less per hour on approaches with single lanes, or on multi-lane approaches, 30 vehicles or less per hour on lanes serving left turns and through movements.

## Existing Conditions

The Existing Conditions scenario provides an evaluation of current operation based on existing traffic volumes during the a.m. and p.m. peak periods. This condition does not include project-generated traffic volumes.

Under existing conditions, the study intersection operates at LOS A overall and LOS C on the minor street approach during both peak hours. The existing traffic volumes are shown in Figure 3. A summary of the intersection Level of Service calculations is contained in Table 7, and copies of the calculations are provided in Appendix F.

**Table 7 – Existing Peak Hour Intersection Levels of Service**

Study Intersection <i>Approach</i>	AM Peak		PM Peak	
	Delay	LOS	Delay	LOS
1. SR 116/W. Cotati Ave	0.5	A	0.9	A
<i>Northbound (W. Cotati Ave) Approach</i>	<i>18.1</i>	<i>C</i>	<i>17.7</i>	<i>C</i>

Note: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*

## Baseline Conditions

Baseline (Existing plus Approved) operating conditions were determined with traffic from approved or pending projects in the study area that could be operational within the next five years added to the existing volumes.

As directed by City staff, the following projects were included in the Baseline Conditions scenario:

- Cotati Hotel, 153 rooms, to be located at the northwest corner of Old Redwood Highway/Saint Joseph Way;
- Market Hall, 5,650 square feet, to be located at the northwest corner of Old Redwood Highway/Saint Joseph Way;
- Cotati Village 1, 177 residential units and 4,700 square feet of retail spaces to be located at the northeast corner of SR 116 and Alder Avenue
- Cotati Village 2, 126 multifamily housing units and a 2,250 square foot café to be located on the west side of Alder Avenue and north off SR-116

The trip generation rates and trip distribution patterns applied in the traffic studies prepared by W-Trans and TJKM for the projects were used for the Baseline scenario; it is noted that some of the rates differ slightly from those in the 11<sup>th</sup> Edition of *Trip Generation Manual* as some reports were written before this edition was published. The trip generation potential of the approved projects is summarized in Table 8.



Transportation Impact Study for the Redwood Row Residential Project  
**Figure 3 – Existing Traffic Volumes**

**Table 8 – Trip Generation for Approved Projects**

Land Use Deduction	Units	Daily		AM Peak Hour				PM Peak Hour			
		Rate	Trips	Rate	Trips	In	Out	Rate	Trips	In	Out
Hotel	153 rm	8.36	1,279	0.47	72	42	30	0.60	92	47	45
Market Hall	5.65 ksf	106.78	603	3.82	22	14	8	9.48	54	28	26
Internal Trips***		-15%	-90	-15%	-3	-2	-1	-15%	-8	-4	-4
Pass-By Trips		-36%	-217	-36%	-8	-5	-3	-36%	-19	-10	-9
MF Housing (Low-Rise)	177 du	6.74	1,193	0.40	71	17	54	0.51	90	57	33
Strip Retail Plaza	4.7 ksf	54.45	256	2.36	11	7	4	6.59	31	16	15
Pass-By		-20%	-51	-40%	-7	-4	-3	-40%	-19	-10	-9
Coffee/Donut Shop	2.250 ksf	533.57*	1,201	93.08	209	107	102	32.29	73	36	37
Internal Capture			-34		-3	-2	-1		-3	-1	-2
Subtotal			1,167		206	105	101		70	35	35
Diverted Link			-525**	-45%	-93	-47	-46	-49%	-34	-17	-17
Multifamily Residential	126 du	4.54	572	0.37	47	11	36	0.39	49	30	19
Internal Capture			-34**	-6%	-3	-1	-2	-6%	-3	-2	-1

Note: du = dwelling units; ksf = 1,000 square feet; rm = rooms; MF = Multifamily; \* Rate is for Coffee/Donut Shop with Drive-Through Window; \*\* Daily internal trips and diverted link estimated using the average percentages for the a.m. and p.m. peak hours; \*\*\* Internal trip reduction applied to market hall trips as in TJKM traffic study.

In this scenario, the intersection would remain as currently configured, with stop controls on West Cotati Avenue. Upon adding trips associated with these projects, SR-116/West Cotati Avenue is expected to operate acceptably at LOS A overall and LOS C on the minor street approach during the a.m. and p.m. peak hours. These results are summarized in Table 9. Baseline volumes are shown in Figure 4.

**Table 9 – Baseline Peak Hour Intersection Levels of Service**

Study Intersection Approach	AM Peak		PM Peak	
	Delay	LOS	Delay	LOS
1. SR 116/W. Cotati Ave	0.5	A	0.9	A
Northbound (W. Cotati Ave) Approach	19.3	C	18.7	C

Notes: Intersection is stop controlled on the minor approach. Delay is measured in average seconds per vehicle; LOS = Level of Service

## Future Conditions

Future volumes for the horizon year 2040, as developed for the traffic analysis that was prepared for the *Cotati General Plan*, were used to project future operating conditions at the study intersection. Under Future Conditions, the General Plan indicates that the planned future widening of SR-116 would provide two through lanes in each direction between Redwood Drive and Madrone Avenue. The SR-116/West Cotati Avenue intersection would also be realigned and signalized with protected left turns on SR-116 and split phasing on West Cotati Avenue. These future improvements were assumed to have been constructed and are included as part of the Future Conditions analysis.



Transportation Impact Study for the Redwood Row Residential Project  
**Figure 4 – Baseline Traffic Volumes**

Under the anticipated Future conditions, the study intersection is expected to operate acceptably at LOS B or C. Future volumes are shown in Figure 5 and operating conditions are summarized in Table 10.

Study Intersection	AM Peak		PM Peak	
	Delay	LOS	Delay	LOS
1. SR 116/W. Cotati Ave	12.0	B	33.7	C

Note: Intersection is signalized. Delay is measured in average seconds per vehicle; LOS = Level of Service

## Project Conditions

### Existing plus Project Conditions

Upon the addition of project-related traffic to the existing volumes and assuming the existing configuration, the intersection of SR-116/West Cotati Avenue is expected to continue operating acceptably at the same Levels of Service. These results are summarized in Table 11 and project traffic volumes are shown in Figure 6.

Study Intersection <i>Approach</i>	Existing Conditions				Existing plus Project			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. SR 116/W. Cotati Ave	0.5	A	0.9	A	0.5	A	0.9	A
<i>NB (W. Cotati Ave) Approach</i>	<i>18.1</i>	<i>C</i>	<i>17.7</i>	<i>C</i>	<i>18.4</i>	<i>C</i>	<i>18.2</i>	<i>C</i>

Note: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*

**Finding** – The study intersection is expected to continue operating acceptably upon the addition of project-generated traffic.

### Baseline plus Project Conditions

With project-related traffic added to baseline volumes, the study intersection is expected to continue operating acceptably. These results are summarized in Table 12 and Baseline plus Project traffic volumes are shown in Figure 7.

Study Intersection <i>Approach</i>	Baseline Conditions				Baseline plus Project			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. SR 116/W. Cotati Ave	0.5	A	0.9	A	0.5	A	0.9	A
<i>NB (W. Cotati Ave) Approach</i>	<i>19.3</i>	<i>C</i>	<i>18.7</i>	<i>C</i>	<i>19.6</i>	<i>C</i>	<i>19.3</i>	<i>C</i>

Note: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*



Transportation Impact Study for the Redwood Row Residential Project  
**Figure 5 – Future Traffic Volumes and Lane Configurations**



Transportation Impact Study for the Redwood Row Residential Project  
**Figure 6 – Project and Existing plus Project Traffic Volumes**



Transportation Impact Study for the Redwood Row Residential Project  
**Figure 7 – Baseline plus Project Traffic Volumes**

**Finding** – The study intersection is expected to operate acceptably upon the addition of project-generated traffic to baseline volumes.

### Future plus Project Conditions

Upon the addition of project-generated traffic to the anticipated future volumes and with the planned relocation and conversion to signalized, the study intersection is expected to continue operating acceptably. The Future plus Project operating conditions are summarized in Table 13 and the estimated traffic volumes for this scenario are shown in Figure 8.

**Table 13 – Future and Future plus Project Peak Hour Intersection Levels of Service**

Study Intersection	Future Conditions				Future plus Project			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. SR 116/W. Cotati Ave	12.0	B	33.7	C	16.1	B	36.9	D

Note: Delay is measured in average seconds per vehicle; LOS = Level of Service

**Finding** – The study intersection will continue operating acceptably with project traffic added to future volumes.



Transportation Impact Study for the Redwood Row Residential Project  
**Figure 8 – Future plus Project Traffic Volumes**

# Parking

The project was analyzed to determine whether the proposed parking supply would be sufficient for the anticipated parking demand. The project site as proposed would provide a total of 302 standard parking spaces for the condominium complex, 56 spaces for the affordable residential units, and 40 standard parking spaces for the commercial retail space.

Jurisdiction parking supply requirements are based on the City of Cotati Municipal Code, Chapter 17.36; Parking and Loading. Since the project is expected to qualify for the State’s Density Bonus, it is subject to different requirements for the residential component of the project as stipulated in the California Government Code, Section 65915.

The proposed parking supply and State Density Bonus requirements are shown in Table 14; while City requirements do not apply, they are provided for information.

**Table 14 – Parking Analysis Summary**

Land Use	Units	Supply (spaces)	City Requirements		California Density Bonus Requirements	
			Rate	Spaces	Rate	Spaces
Multifamily (Low-Rise)	178 du	302	2.0 per du	268	N/A	N/A
Guest Spaces			0.25 per du	34	N/A	N/A
	480 bdr		N/A		0.5 per bdr	240
Retail Complex	10.032 ksf	40	1.0 per 250 sf	40	1.0 per 250 sf	40*
<b>Total</b>		<b>342</b>		<b>342</b>		<b>280**</b>

Note: du = dwelling unit; ksf = 1,000 square feet; bdr = bedrooms; sf = square feet; \*Density bonus requirements do not apply to commercial development; \*\*Total required number of spaces based on California Density Bonus and City requirements for the retail complex

**Finding** – The proposed parking supply for the residential and retail portions of the project would satisfy City and California Density Bonus requirements.

# Conclusions and Recommendations

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## Conclusions

- The project has the potential to result in an average of 1,558 new daily trips on local streets, with 85 new trips during the weekday a.m. peak hour and 116 new trips during the weekday p.m. peak hour.
- The Class I facility along the project's SR-116 frontage proposed as part of the project would connect to existing and planned facilities and connect the project to the surrounding pedestrian and bicycle facilities network. The project would not conflict with any City policies regarding pedestrian or transit facilities and would therefore have a less-than-significant impact.
- The project as proposed does not include the required bicycle parking for the affordable residential units or the commercial uses. This is a potentially significant impact that can be mitigated by providing the required bicycle parking supply.
- The residential component of the project would have a less-than-significant VMT impact due to the density of the proposed project and the number of proposed affordable units. The commercial uses would be local-serving and would therefore also have a less-than-significant VMT impact.
- Calculated collision rates for the existing study intersection was determined to be lower than the statewide average rate, indicating that there are no readily apparent safety issues for motorists in the vicinity of the project site. There were no collisions reported involving a pedestrian or bicyclist.
- Sight lines at the proposed project access points on SR-116 are adequate to accommodate all turns into and out of the proposed driveways.
- An eastbound left-turn lane at the intersection of SR-116 with the project driveway would be warranted with the addition of project trips to existing volumes.
- Emergency access and circulation are anticipated to function acceptably, and traffic from the proposed project is expected to have a less-than-significant impact on emergency response times.
- The study intersection is expected to operate acceptably under all conditions evaluated, with and without project-generated trips.
- The proposed parking supply would meet the State Density Bonus requirements for the residential use and would meet City requirements for the commercial use.

## Recommendations

- The project should include a minimum of six bicycle parking spaces for the affordable residential units and four bicycle parking spaces for the commercial uses. With the inclusion of the required bicycle parking, the project would not conflict with City policies regarding bicycle facilities and the impact would be less-than-significant.
- Adequate sight lines should be maintained during the design and construction of project access points, and the placement of any signs, structures, or tall landscaping on SR-116 that would impede sight lines should be avoided.
- An eastbound left-turn lane with a minimum of 50 feet of storage should be provided on SR-116 at the project driveway.

# Study Participants and References

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## Study Participants

<b>Principal in Charge</b>	Dalene J. Whitlock, PE (Civil, Traffic), PTOE
<b>Transportation Planner</b>	Barry Bergman, AICP
<b>Assistant Engineer</b>	Valerie Haines, EIT, Joseph Faria-Poynter, EIT
<b>Graphics</b>	Jessica Bender
<b>Editing/Formatting</b>	Rebecca Mansour, Jessica Bender
<b>Quality Control</b>	Dalene J. Whitlock, PE (Civil, Traffic), PTOE

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COT100





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# Appendix A

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## Collision Rate Calculations





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### Intersection Collision Rate Worksheet

#### 100COT Redwood Row

**Intersection # 1:** US 116 / Gravenstein Hwy & W Cotati Ave

**Date of Count:** Wednesday, February 23, 2022

**Number of Collisions:** 1

**Number of Injuries:** 1

**Number of Fatalities:** 0

**Average Daily Traffic (ADT):** 12700

**Start Date:** October 1, 2018

**End Date:** September 30, 2023

**Number of Years:** 5

**Intersection Type:** Tee

**Control Type:** Stop & Yield Controls

**Area:** Urban

$$\text{Collision Rate} = \frac{\text{Number of Collisions} \times 1 \text{ Million}}{\text{ADT} \times \text{Days per Year} \times \text{Number of Years}}$$

$$\text{Collision Rate} = \frac{1}{12,700} \times \frac{1,000,000}{365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
<b>Study Intersection</b>	0.04 c/mve	0.0%	100.0%
<b>Statewide Average*</b>	0.13 c/mve	1.3%	47.3%

**Notes**

ADT = average daily total vehicles entering intersection

c/mve = collisions per million vehicles entering intersection

\* 2020 Collision Data on California State Highways, Caltrans



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# Appendix B

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## Internal Capture Calculations



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NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Redwood Row	Organization:	W-Trans
Project Location:	SR 116/W Cotati Ave	Performed By:	VRH
Scenario Description:		Date:	11/11/2024
Analysis Year:	2024	Checked By:	
Analysis Period:	AM Street Peak Hour	Date:	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips <sup>3</sup>		
	ITE LUCs <sup>1</sup>	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	822	10	ksf	24	14	10
Restaurant				0		
Cinema/Entertainment				0		
Residential	228	178	du	71	17	54
Hotel				0		
All Other Land Uses <sup>2</sup>				0		
				95	31	64

Table 2-A: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. <sup>4</sup>	% Transit	% Non-Motorized	Veh. Occ. <sup>4</sup>	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses <sup>2</sup>						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		0	0	0	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	1	0	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	95	31	64
Internal Capture Percentage	2%	3%	2%
External Vehicle-Trips <sup>5</sup>	93	30	63
External Transit-Trips <sup>6</sup>	0	0	0
External Non-Motorized Trips <sup>6</sup>	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	7%	0%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	0%	2%
Hotel	N/A	N/A

<sup>1</sup>Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

<sup>2</sup>Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

<sup>3</sup>Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

<sup>4</sup>Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

<sup>5</sup>Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

<sup>6</sup>Person-Trips

\*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Redwood Row	Organization:	W-Trans
Project Location:	SR 116/W Cotati Ave	Performed By:	VRH
Scenario Description:		Date:	11/11/2024
Analysis Year:	2024	Checked By:	
Analysis Period:	PM Street Peak Hour	Date:	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips <sup>3</sup>		
	ITE LUCs <sup>1</sup>	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	822	10	ksf	66	33	33
Restaurant				0		
Cinema/Entertainment				0		
Residential	228	178	du	91	57	34
Hotel				0		
All Other Land Uses <sup>2</sup>				0		
				157	90	67

Table 2-P: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. <sup>4</sup>	% Transit	% Non-Motorized	Veh. Occ. <sup>4</sup>	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses <sup>2</sup>						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail					1000	
Restaurant						
Cinema/Entertainment						
Residential		1000				
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		0	0	8	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	3	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	157	90	67
Internal Capture Percentage	14%	12%	16%
External Vehicle-Trips <sup>5</sup>	135	79	56
External Transit-Trips <sup>5</sup>	0	0	0
External Non-Motorized Trips <sup>6</sup>	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	9%	24%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	14%	9%
Hotel	N/A	N/A

<sup>1</sup>Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

<sup>2</sup>Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

<sup>3</sup>Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

<sup>4</sup>Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-P, 6-P, 9-P, and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

<sup>5</sup>Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

<sup>6</sup>Person-Trips

\*Indicates computation that has been rounded to the nearest whole number.

# Appendix C

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## Vehicle Miles Traveled Adjustments





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# SCTA VMT Reduction Calculator Tool

## Project Information

Project Name: <b>Test</b>	Project Transportation Analysis Zone (TAZ): <b>94</b>
Project Address: <b>Test</b>	Project TAZ Place Type: <b>Suburban</b>
Project Type: <b>Residential</b>	Project Jurisdiction: <b>Sonoma County</b>
Project in transit-oriented development location?: <b>Yes</b>	

## About These Results

The following tables show the VMT reductions associated with the strategies configured in the tool. The first VMT Reduction Summary aggregates the effects into eleven buckets, one for each unique combination of strategy type, scale of application, and type of VMT affected. Then, a High-Level VMT Reduction Summary further combines those effects into the five unique combinations of scale of application and type of VMT affected. These five buckets are intended to facilitate further analysis, including evaluating whether the VMT reductions calculated by this tool are sufficient to mitigate a project's VMT impact.

Below the High-Level VMT Reduction Summary, the TDM Strategy Results section lists all strategies included in this tool, noting the change in VMT associated with each configured strategy.

## VMT Reduction Summary

Land Use	Project/Site	Project-generated trips (multiplicative damping applied)	-24.3%
Land Use	Plan/Community	All neighborhood/city trips	0.0%
Trip Reduction Programs	Project/Site	Employee commute trips	0.0%
Trip Reduction Programs	Project/Site	Project-generated trips	0.0%
Trip Reduction Programs	Plan/Community	Household trips	0.0%
Parking or Road Pricing/Management	Project/Site	Project-generated trips	0.0%
Parking or Road Pricing/Management	Plan/Community	All neighborhood/city trips	0.0%
Neighborhood Design	Plan/Community	All neighborhood/city trips	0.0%
Neighborhood Design	Plan/Community	Employee commute trips	0.0%
Neighborhood Design	Plan/Community	Household trips	0.0%
Transit	Plan/Community	All neighborhood/city trips	0.0%

## High-Level VMT Reduction Summary

Project/Site	Project-generated trips	-24.3%
Project/Site	Employee commute trips	0.0%
Plan/Community	All neighborhood/city trips	0.0%
Plan/Community	Employee commute trips	0.0%
Plan/Community	Household trips	0.0%

## TDM Strategy Results

TDM ID	Strategy Name	Strategy Type	VMT Type	Change in VMT
T-1	<a href="#">Increase Residential Density</a>	Land Use	Project-generated trips	-18.5%
T-2	<a href="#">Increase Job Density</a>	Land Use	Project-generated trips	-
T-3	<a href="#">Provide Transit-Oriented Development</a>	Land Use	Project-generated trips	-
T-4	<a href="#">Integrate Affordable and Below Market Rate Housing</a>	Land Use	Project-generated trips	-7.1%
T-5	<a href="#">Implement Commute Trip Reduction Program (Voluntary)</a>	Trip Reduction Programs	Employee commute trips	-
T-6	<a href="#">Implement Commute Trip Reduction Program (Mandatory Implementation and Monitoring)</a>	Trip Reduction Programs	Employee commute trips	-
T-7	<a href="#">Implement Commute Trip Reduction Marketing</a>	Trip Reduction Programs	Employee commute trips	-
T-8	<a href="#">Provide Ridesharing Program</a>	Trip Reduction Programs	Employee commute trips	-
T-9-A	<a href="#">Implement Subsidized or Discounted Transit Program - All Trips</a>	Trip Reduction Programs	Project-generated trips	-
T-9-B	<a href="#">Implement Subsidized or Discounted Transit Program - Work Trips Only</a>	Trip Reduction Programs	Employee commute trips	-
T-10	<a href="#">Provide End-of-Trip Bicycle Facilities</a>	Trip Reduction Programs	Employee commute trips	-
T-11	<a href="#">Provide Employer-Sponsored Vanpool</a>	Trip Reduction Programs	Employee commute trips	-
T-12	<a href="#">Price Workplace Parking</a>	Trip Reduction Programs	Employee commute trips	-
T-13	<a href="#">Implement Employee Parking Cash-Out</a>	Trip Reduction Programs	Employee commute trips	-
T-15	<a href="#">Limit Residential Parking Supply</a>	Parking or Road Pricing/Management	Project-generated trips	-
T-16	<a href="#">Unbundle Residential Parking Costs from Property Cost</a>	Parking or Road Pricing/Management	Project-generated trips	-
T-17	<a href="#">Improve Street Connectivity</a>	Land Use	All neighborhood/city trips	-
T-18	<a href="#">Provide Pedestrian Network Improvements</a>	Neighborhood Design	Household trips	-
T-19-A	<a href="#">Construct or Improve Bike Facility</a>	Neighborhood Design	All neighborhood/city trips	-
T-19-B	<a href="#">Construct or Improve Bike Boulevard</a>	Neighborhood Design	All neighborhood/city trips	-
T-20	<a href="#">Expand Bikeway Network</a>	Neighborhood Design	Employee commute trips	-
T-21	<a href="#">Implement Carshare Program</a>	Neighborhood Design	All neighborhood/city trips	-
T-22-A	<a href="#">Implement Pedal (Non-Electric) Bikeshare Program</a>	Neighborhood Design	All neighborhood/city trips	-
T-22-B	<a href="#">Implement Electric Bikeshare Programs</a>	Neighborhood Design	All neighborhood/city trips	-
T-22-C	<a href="#">Implement Scootershare Program</a>	Neighborhood Design	All neighborhood/city trips	-
T-23	<a href="#">Community-Based Travel Planning</a>	Trip Reduction Programs	Household trips	-
T-24	<a href="#">Implement Market Price Public Parking (On-Street)</a>	Parking or Road Pricing/Management	All neighborhood/city trips	-
T-25	<a href="#">Extend Transit Network Coverage or Hours</a>	Transit	All neighborhood/city trips	-
T-26	<a href="#">Increase Transit Service Frequency</a>	Transit	All neighborhood/city trips	-
T-27	<a href="#">Implement Transit-Supportive Roadway Treatments</a>	Transit	All neighborhood/city trips	-
T-28	<a href="#">Provide Bus Rapid Transit</a>	Transit	All neighborhood/city trips	-
T-29	<a href="#">Reduce Transit Fares</a>	Transit	All neighborhood/city trips	-



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# Appendix D

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## Left Turn-Lane Warrants





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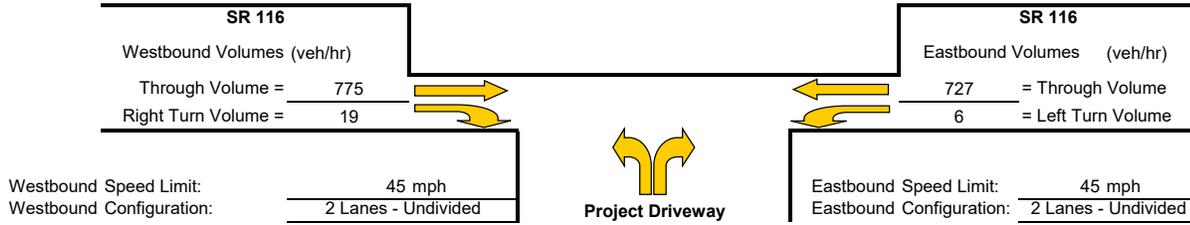
# Turn Lane Warrant Analysis - Tee Intersections

Study Intersection: SR 116/Project Driveway

Study Scenario: Existing plus Project AM

Direction of Analysis Street: East/West

Cross Street Intersects: From the North



## Westbound Right Turn Lane Warrants

1. Check for right turn volume criteria

**NOT WARRANTED Less than 40 vehicles**

2. Check advance volume threshold criteria for turn lane

Advancing Volume Threshold AV = -

Advancing Volume Va = 794

If  $AV < Va$  then warrant is met -

**Right Turn Lane Warranted: NO**

## Westbound Right Turn Taper Warrants

(evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

**NOT WARRANTED - Less than 20 vehicles**

2. Check advance volume threshold criteria for taper

Advancing Volume Threshold AV = -

Advancing Volume Va = 794

If  $AV < Va$  then warrant is met -

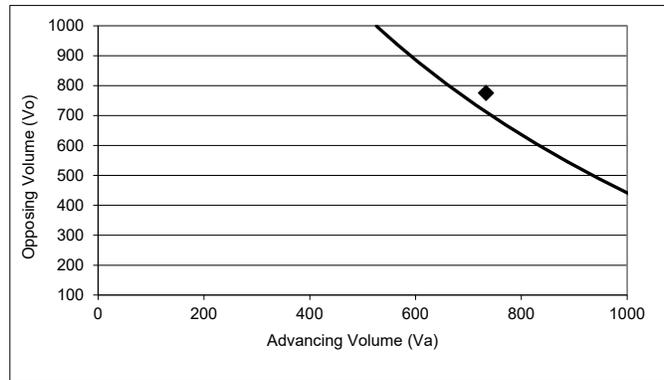
**Right Turn Taper Warranted: NO**

## Eastbound Left Turn Lane Warrants

Percentage Left Turns %lt 0.8 %

Advancing Volume Threshold AV 681 veh/hr

If  $AV < Va$  then warrant is met



◆ Study Intersection

Two lane roadway warrant threshold for: 45 mph

Turn lane warranted if point falls to right of warrant threshold line

**Left Turn Lane Warranted: YES**

Methodology based on Washington State Transportation Center Research Report *Method For Prioritizing Intersection Improvements*, January 1997.

The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.

The left turn lane analysis is based on work conducted by M.D. Harmelink in 1967, and modified by Kikuchi and Chakroborty in 1991.

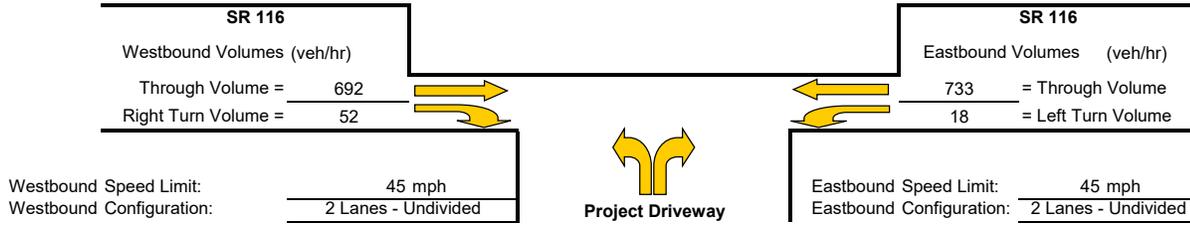
# Turn Lane Warrant Analysis - Tee Intersections

Study Intersection: SR 116/Project Driveway

Study Scenario: Existing plus Project PM

Direction of Analysis Street: East/West

Cross Street Intersects: From the North



## Westbound Right Turn Lane Warrants

1. Check for right turn volume criteria

**Thresholds not met, continue to next step**

2. Check advance volume threshold criteria for turn lane

Advancing Volume Threshold AV = 510

Advancing Volume Va = 744

If  $AV < Va$  then warrant is met Yes

**Right Turn Lane Warranted: YES**

## Westbound Right Turn Taper Warrants

(evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

**N/A**

2. Check advance volume threshold criteria for taper

Advancing Volume Threshold AV = -

Advancing Volume Va = -

If  $AV < Va$  then warrant is met -

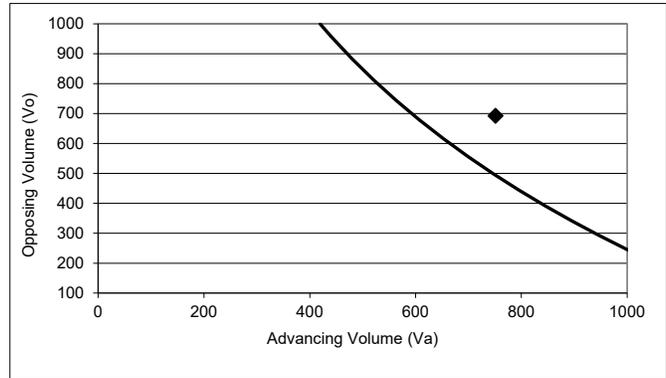
**Right Turn Taper Warranted: N/A**

## Eastbound Left Turn Lane Warrants

Percentage Left Turns %lt 2.4 %

Advancing Volume Threshold AV 598 veh/hr

If  $AV < Va$  then warrant is met



◆ Study Intersection

Two lane roadway warrant threshold for: 45 mph

Turn lane warranted if point falls to right of warrant threshold line

**Left Turn Lane Warranted: YES**

Methodology based on Washington State Transportation Center Research Report *Method For Prioritizing Intersection Improvements*, January 1997.

The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.

The left turn lane analysis is based on work conducted by M.D. Harmelink in 1967, and modified by Kikuchi and Chakroborty in 1991.

# Appendix E

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## Queuing Calculations



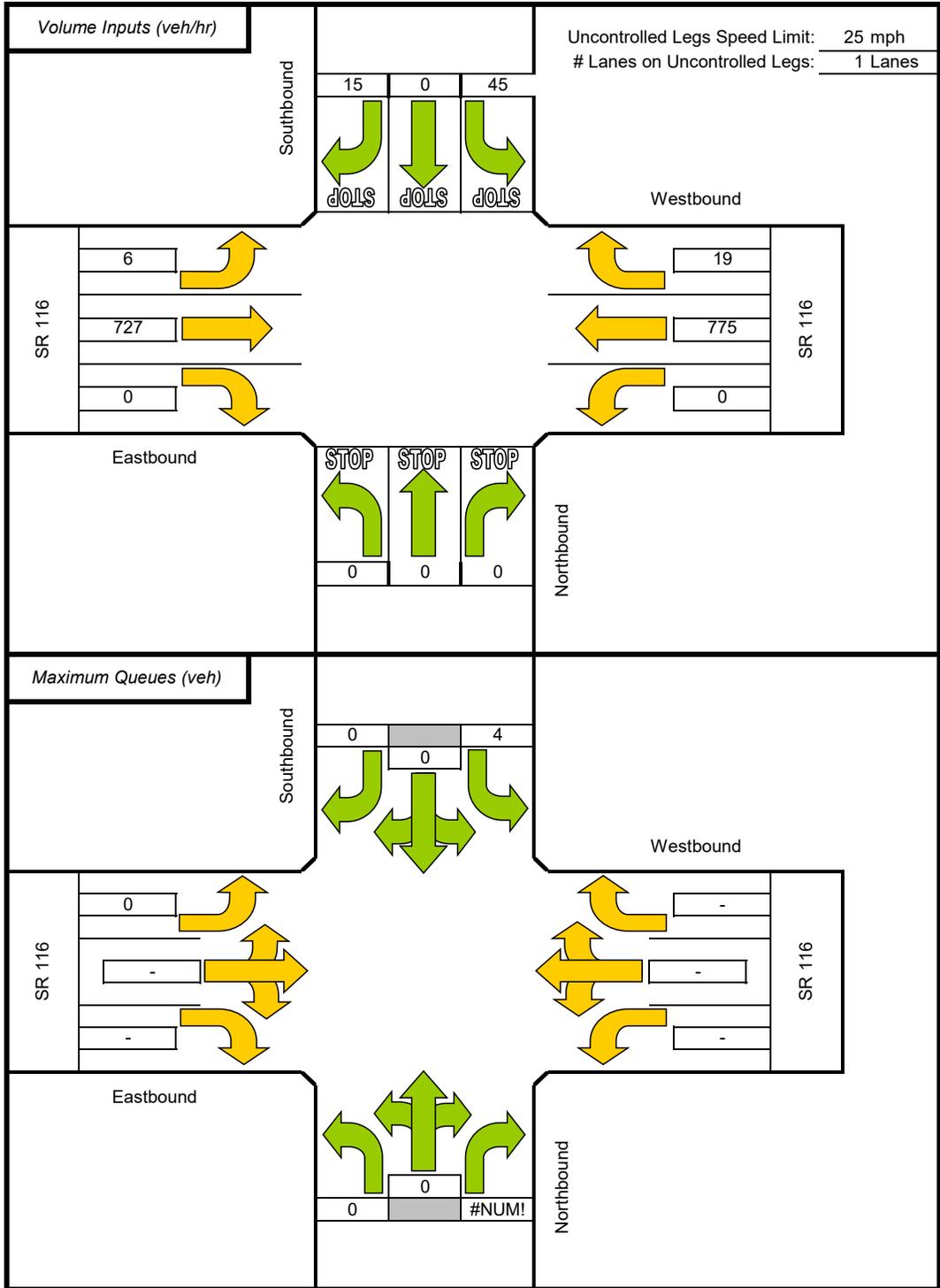


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## Maximum Queue Length Two-Way Stop-Controlled Intersections

Through Street: SR 116  
Side Street: Project Driveway

Scenario: Existing plus Project AM  
Stop Controlled Legs: North/South

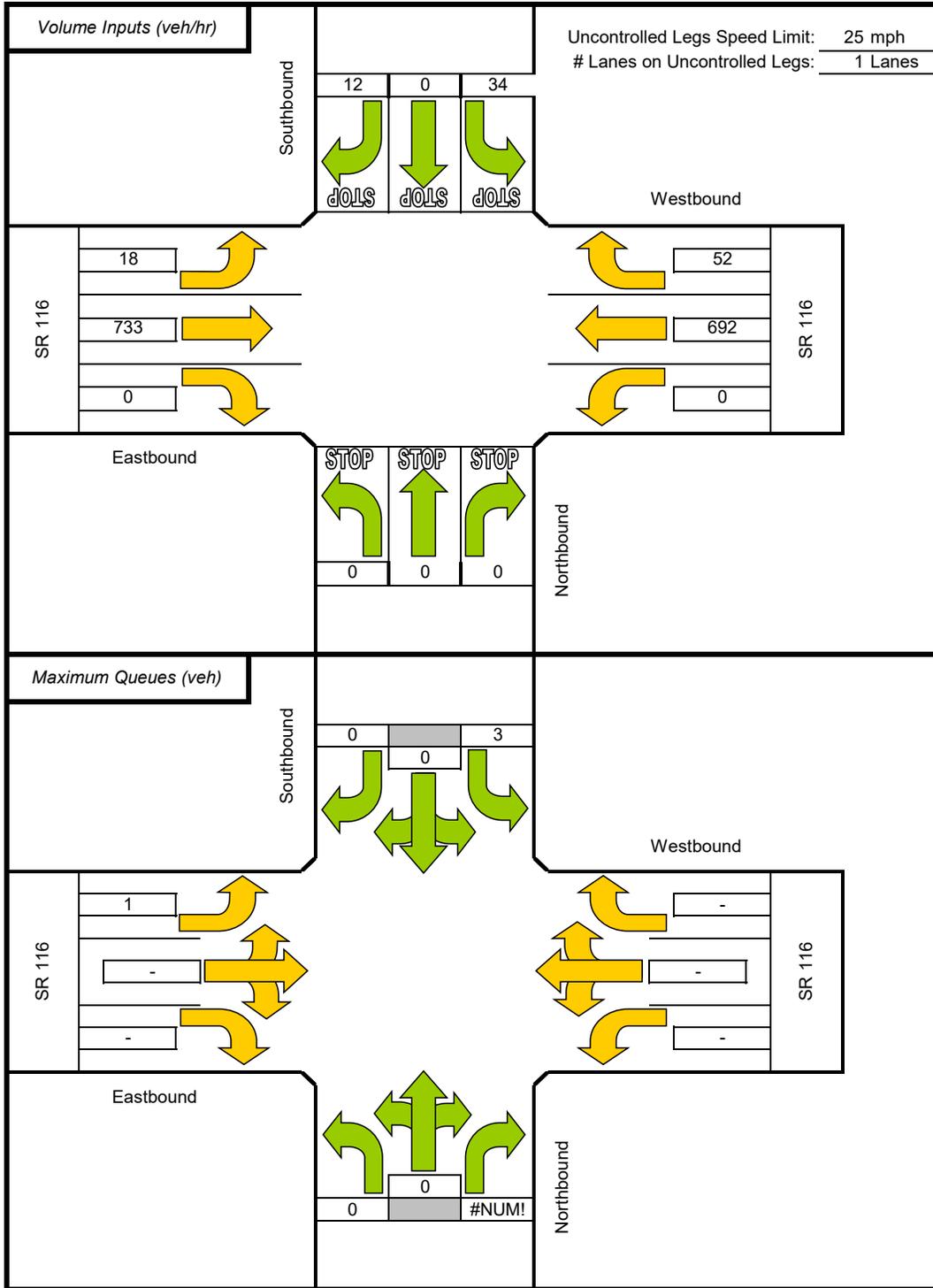


Source: John T. Gard, ITE Journal, November 2001, "Estimating Maximum Queue Length at Unsignalized Intersections"

## Maximum Queue Length Two-Way Stop-Controlled Intersections

Through Street: SR 116  
Side Street: Project Driveway

Scenario: Existing plus Project PM  
Stop Controlled Legs: North/South



Source: John T. Gard, ITE Journal, November 2001, "Estimating Maximum Queue Length at Unsignalized Intersections"

# Appendix F

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## Intersection Level of Service Calculations





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**Intersection Level Of Service Report**  
**Intersection 1: SR 116 / W Cotati Ave**

Control Type: Two-way stop  
Analysis Method: HCM 6th Edition  
Analysis Period: 1 hour  
Delay (sec / veh): 0.5  
Level Of Service: A  
Volume to Capacity (v/c): 0.044

**Intersection Setup**

Name	W Cotati Ave		SR 116		SR 116	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration	T		T		T	
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	25.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	W Cotati Ave		SR 116		SR 116	
Base Volume Input [veh/h]	6	25	702	2	14	746
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	25	702	2	14	746
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	6	176	1	4	187
Total Analysis Volume [veh/h]	6	25	702	2	14	746
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane	Yes		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.04	0.06	0.01	0.00	0.02	0.01
d_M, Delay for Movement [s/veh]	32.98	14.56	0.00	0.00	9.08	0.00
Movement LOS	D	B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.34	0.34	0.00	0.00	0.05	0.05
95th-Percentile Queue Length [ft/ln]	8.46	8.46	0.00	0.00	1.19	1.19
d_A, Approach Delay [s/veh]	18.12		0.00		0.17	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]			0.46			
Intersection LOS			A			

**Intersection Level Of Service Report**  
**Intersection 1: SR 116 / W Cotati Ave**

Control Type: Two-way stop  
Analysis Method: HCM 6th Edition  
Analysis Period: 1 hour  
Delay (sec / veh): 0.9  
Level Of Service: A  
Volume to Capacity (v/c): 0.046

**Intersection Setup**

Name	W Cotati Ave		SR 116		SR 116	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration	T		T		T	
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	25.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	W Cotati Ave		SR 116		SR 116	
Base Volume Input [veh/h]	6	34	699	5	63	617
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	34	699	5	63	617
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	9	175	1	16	154
Total Analysis Volume [veh/h]	6	34	699	5	63	617
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane	Yes		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.05	0.08	0.01	0.00	0.07	0.01
d_M, Delay for Movement [s/veh]	34.31	14.78	0.00	0.00	9.31	0.00
Movement LOS	D	B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.42	0.42	0.00	0.00	0.23	0.23
95th-Percentile Queue Length [ft/ln]	10.56	10.56	0.00	0.00	5.66	5.66
d_A, Approach Delay [s/veh]	17.71		0.00		0.86	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]			0.91			
Intersection LOS			A			

**Intersection Level Of Service Report**  
**Intersection 1: SR 116 / W Cotati Ave**

Control Type: Two-way stop  
Analysis Method: HCM 6th Edition  
Analysis Period: 1 hour  
Delay (sec / veh): 0.5  
Level Of Service: A  
Volume to Capacity (v/c): 0.051

**Intersection Setup**

Name	W Cotati Ave		SR 116		SR 116	
	Northbound		Eastbound		Westbound	
Approach						
Lane Configuration	T		T		T	
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	25.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	W Cotati Ave		SR 116		SR 116	
	Base Volume Input [veh/h]	6	25	702	2	14
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	16	0	0	80
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	25	718	2	14	826
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	6	180	1	4	207
Total Analysis Volume [veh/h]	6	25	718	2	14	826
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane	Yes		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.05	0.06	0.01	0.00	0.02	0.01
d_M, Delay for Movement [s/veh]	37.15	14.96	0.00	0.00	9.14	0.00
Movement LOS	E	B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.37	0.37	0.00	0.00	0.05	0.05
95th-Percentile Queue Length [ft/ln]	9.18	9.18	0.00	0.00	1.21	1.21
d_A, Approach Delay [s/veh]	19.25		0.00		0.15	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]			0.46			
Intersection LOS			A			

**Intersection Level Of Service Report**  
**Intersection 1: SR 116 / W Cotati Ave**

Control Type: Two-way stop  
 Analysis Method: HCM 6th Edition  
 Analysis Period: 1 hour  
 Delay (sec / veh): 0.9  
 Level Of Service: A  
 Volume to Capacity (v/c): 0.053

**Intersection Setup**

Name	W Cotati Ave		SR 116		SR 116	
	Northbound		Eastbound		Westbound	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration	T		T		T	
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	25.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	W Cotati Ave		SR 116		SR 116	
	Base Volume Input [veh/h]	6	34	699	5	63
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	21	0	0	65
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	34	720	5	63	682
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	9	180	1	16	171
Total Analysis Volume [veh/h]	6	34	720	5	63	682
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane	Yes		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.05	0.08	0.01	0.00	0.07	0.01
d_M, Delay for Movement [s/veh]	38.42	15.26	0.00	0.00	9.40	0.00
Movement LOS	E	C	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.46	0.46	0.00	0.00	0.23	0.23
95th-Percentile Queue Length [ft/ln]	11.41	11.41	0.00	0.00	5.77	5.77
d_A, Approach Delay [s/veh]	18.73		0.00		0.79	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]			0.89			
Intersection LOS			A			

**Intersection Level Of Service Report**

**Intersection 1: SR 116 / W Cotati Ave-Village Ave**

Control Type: Signalized  
 Analysis Method: HCM 6th Edition  
 Analysis Period: 1 hour  
 Delay (sec / veh): 12.0  
 Level Of Service: B  
 Volume to Capacity (v/c): 0.445

**Intersection Setup**

Name	W Cotati Ave			Village Ave			SR 116			SR 116		
	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	TT			TT			TTT			TTT		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	1	0	0	1	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00
Speed [mph]	25.00			30.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			No			No		

**Volumes**

Name	W Cotati Ave			Village Ave			SR 116			SR 116		
Base Volume Input [veh/h]	23	8	80	42	3	9	41	961	16	74	1151	180
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	23	8	80	42	3	9	41	961	16	74	1151	180
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	2	20	11	1	2	10	240	4	19	288	45
Total Analysis Volume [veh/h]	23	8	80	42	3	9	41	961	16	74	1151	180
Presence of On-Street Parking	No	No	No	No	No	No	No	No	No	No	No	No
On-Street Parking Maneuver Rate [1/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [1/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

**Phasing & Timing**

Control Type	Split	Split	Overlap	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	1	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups			1,8									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	5	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	9	23	14	9	14	0	9	53	0	14	58	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	14	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No			No			No	
Maximum Recall		No	No		No			No			No	
Pedestrian Recall		No	No		No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	L	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
I1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
I2, Clearance Lost Time [s]	0.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_l, Effective Green Time [s]	11	25	7	7	4	57	57	10	63	63
g / C, Green / Cycle	0.13	0.28	0.08	0.08	0.04	0.63	0.63	0.11	0.70	0.70
(v / s)_i Volume / Saturation Flow Rate	0.02	0.05	0.03	0.01	0.03	0.26	0.26	0.06	0.36	0.37
s, saturation flow rate [veh/h]	1468	1611	1309	1651	1309	1870	1859	1309	1870	1783
c, Capacity [veh/h]	297	455	105	136	80	1176	1169	142	1300	1239
d1, Uniform Delay [s]	34.76	24.51	44.50	38.17	45.00	8.41	8.41	43.20	6.57	6.60
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.11	0.20	2.48	0.28	5.07	1.09	1.10	2.96	1.51	1.61
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.08	0.19	0.40	0.09	0.51	0.42	0.42	0.52	0.52	0.53
d, Delay for Lane Group [s/veh]	34.87	24.72	46.98	38.45	50.07	9.50	9.50	46.16	8.08	8.22
Lane Group LOS	C	C	D	D	D	A	A	D	A	A
Critical Lane Group	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.46	1.45	1.01	0.25	1.02	4.15	4.13	1.70	4.84	4.71
50th-Percentile Queue Length [ft/ln]	11.40	36.21	25.29	6.32	25.52	103.78	103.24	42.62	121.01	117.78
95th-Percentile Queue Length [veh/ln]	0.82	2.61	1.82	0.46	1.84	7.47	7.43	3.07	8.45	8.27
95th-Percentile Queue Length [ft/ln]	20.51	65.18	45.51	11.38	45.94	186.81	185.82	76.72	211.21	206.77

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	34.87	24.72	24.72	46.98	38.45	38.45	50.07	9.50	9.50	46.16	8.13	8.22
Movement LOS	C	C	C	D	D	D	D	A	A	D	A	A
d_A, Approach Delay [s/veh]	26.82			45.09			11.13			10.15		
Approach LOS	C			D			B			B		
d_I, Intersection Delay [s/veh]	11.98											
Intersection LOS	B											
Intersection V/C	0.445											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	0.0
M_comer, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000	0.000
Crosswalk LOS	F	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	733	222	1089	1200
d_b, Bicycle Delay [s]	18.05	35.56	9.34	7.20
I_b,int, Bicycle LOS Score for Intersection	1.743	1.649	2.399	2.719
Bicycle LOS	A	A	B	B

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 1: SR 116 / W Cotati Ave-Village Ave**

Control Type:	Signalized	Delay (sec / veh):	33.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	1 hour	Volume to Capacity (v/c):	0.729

**Intersection Setup**

Name	W Cotati Ave			Village Ave			SR 116			Westbound		
	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00
Speed [mph]	25.00			30.00			45.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			No			No		

Volumes												
Name	W Cotati Ave			Village Ave			SR 116					
Base Volume Input [veh/h]	28	6	127	281	10	110	83	1501	36	142	1404	167
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	84	0	0	79	0	0	2	0	0	9
Total Hourly Volume [veh/h]	28	6	43	281	10	31	83	1501	34	142	1404	158
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	2	11	70	3	8	21	375	9	36	351	40
Total Analysis Volume [veh/h]	28	6	43	281	10	31	83	1501	34	142	1404	158
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing		0			0			0			0	
v_di, Inbound Pedestrian Volume crossing m		0			0			0			0	
v_co, Outbound Pedestrian Volume crossing		0			0			0			0	
v_ci, Inbound Pedestrian Volume crossing mi		0			0			0			0	
v_ab, Corner Pedestrian Volume [ped/h]		0			0			0			0	
Bicycle Volume [bicycles/h]		0			0			0			0	

Intersection Settings	
Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	70
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing												
Control Type	Split	Split	Overlap	Split	Split	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	1	7	4	5	5	2	0	1	6	0
Auxiliary Signal Groups			1,8			4,5						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	0	0	5	0	0	0	0	0	0	0	0
Maximum Green [s]	30	90	90	30	90	90	90	90	0	90	90	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	9	23	12	9	14	8	8	35	0	12	39	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	5	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	10	0	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No	No	No	Yes		No	Yes	
Maximum Recall		No	No		No	No	No	No		No	No	
Pedestrian Recall		No	No		No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase	
Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	C	L	C	C
C, Cycle Length [s]	70	70	70	70	70	70	70	70	70	70
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	0.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_l, Effective Green Time [s]	19	31	15	23	4	31	31	8	35	35
g / C, Green / Cycle	0.27	0.44	0.21	0.33	0.06	0.44	0.44	0.11	0.50	0.50
(v / s)_l Volume / Saturation Flow Rate	0.02	0.03	0.21	0.02	0.06	0.41	0.41	0.11	0.42	0.43
s, saturation flow rate [veh/h]	1410	1619	1356	1650	1306	1870	1855	1306	1870	1805
c, Capacity [veh/h]	507	714	325	539	121	832	825	195	938	906
d1, Uniform Delay [s]	19.02	11.29	30.51	16.29	34.95	18.37	18.41	33.45	15.03	15.25
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.04	0.04	7.39	0.06	6.99	22.83	23.80	5.27	9.67	11.30
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.06	0.07	0.86	0.08	0.69	0.92	0.93	0.73	0.84	0.86
d, Delay for Lane Group [s/veh]	19.07	11.33	37.89	16.35	41.95	41.19	42.21	38.72	24.70	26.55
Lane Group LOS	B	B	D	B	D	D	D	D	C	C
Critical Lane Group	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.33	0.42	5.33	0.44	1.62	14.76	14.92	2.71	11.80	12.11
50th-Percentile Queue Length [ft/ln]	8.37	10.56	133.13	10.94	40.50	368.91	372.98	67.70	294.99	302.82
95th-Percentile Queue Length [veh/ln]	0.60	0.76	9.11	0.79	2.92	21.06	21.25	4.87	17.43	17.82
95th-Percentile Queue Length [ft/ln]	15.06	19.01	227.75	19.70	72.90	526.40	531.34	121.86	435.83	445.51

Movement, Approach, & Intersection Results

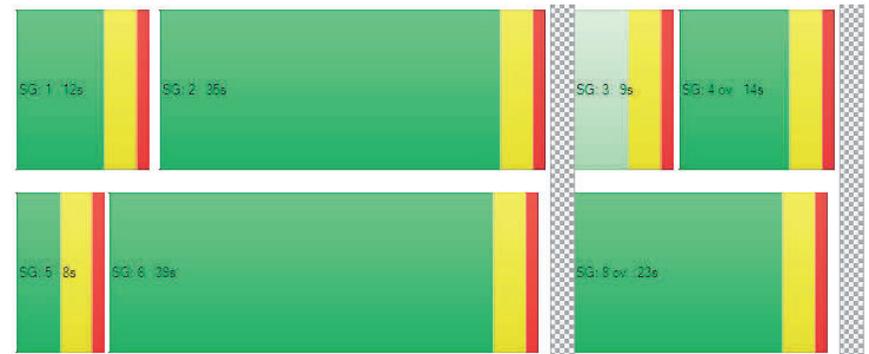
d_M, Delay for Movement [s/veh]	19.07	11.33	11.33	37.89	16.35	16.35	41.95	41.69	42.21	38.72	25.51	26.55
Movement LOS	B	B	B	D	B	B	D	D	D	D	C	C
d_A, Approach Delay [s/veh]	14.14			35.15			41.71			26.71		
Approach LOS	B			D			D			C		
d_I, Intersection Delay [s/veh]	33.70											
Intersection LOS	C											
Intersection V/C	0.729											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	35.0	0.0	0.0
M_comer, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	8.77	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	0.000	2.329	0.000	0.000
Crosswalk LOS	F	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	885	514	885	999
d_b, Bicycle Delay [s]	10.89	19.34	10.89	8.77
I_b,int, Bicycle LOS Score for Intersection	1.825	2.221	2.896	2.973
Bicycle LOS	A	B	C	C

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 1: SR 116 / W Cotati Ave**

Control Type: Two-way stop  
Analysis Method: HCM 6th Edition  
Analysis Period: 1 hour  
Delay (sec / veh): 0.5  
Level Of Service: A  
Volume to Capacity (v/c): 0.046

**Intersection Setup**

Name	W Cotati Ave		SR 116		SR 116	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration	T		T		T	
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	25.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	W Cotati Ave		SR 116		SR 116	
Base Volume Input [veh/h]	6	25	702	2	14	746
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	6	0	0	15
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	25	708	2	14	761
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	6	177	1	4	190
Total Analysis Volume [veh/h]	6	25	708	2	14	761
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane	Yes		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.05	0.06	0.01	0.00	0.02	0.01
d_M, Delay for Movement [s/veh]	33.84	14.67	0.00	0.00	9.11	0.00
Movement LOS	D	B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.34	0.34	0.00	0.00	0.05	0.05
95th-Percentile Queue Length [ft/ln]	8.62	8.62	0.00	0.00	1.20	1.20
d_A, Approach Delay [s/veh]	18.38		0.00		0.16	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]			0.46			
Intersection LOS			A			

**Intersection Level Of Service Report**  
**Intersection 1: SR 116 / W Cotati Ave**

Control Type: Two-way stop  
Analysis Method: HCM 6th Edition  
Analysis Period: 1 hour  
Delay (sec / veh): 0.9  
Level Of Service: A  
Volume to Capacity (v/c): 0.048

**Intersection Setup**

Name	W Cotati Ave		SR 116		SR 116	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration	T		T		T	
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	25.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	W Cotati Ave		SR 116		SR 116	
Base Volume Input [veh/h]	6	34	699	5	63	617
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	18	0	0	12
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	34	717	5	63	629
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	9	179	1	16	157
Total Analysis Volume [veh/h]	6	34	717	5	63	629
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane	Yes		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.05	0.08	0.01	0.00	0.07	0.01
d_M, Delay for Movement [s/veh]	35.71	15.09	0.00	0.00	9.39	0.00
Movement LOS	E	C	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.44	0.44	0.00	0.00	0.23	0.23
95th-Percentile Queue Length [ft/ln]	10.95	10.95	0.00	0.00	5.75	5.75
d_A, Approach Delay [s/veh]	18.18		0.00		0.85	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	0.91					
Intersection LOS	A					

**Intersection Level Of Service Report**  
**Intersection 1: SR 116 / W Cotati Ave**

Control Type: Two-way stop  
Analysis Method: HCM 6th Edition  
Analysis Period: 1 hour  
Delay (sec / veh): 0.5  
Level Of Service: A  
Volume to Capacity (v/c): 0.053

**Intersection Setup**

Name	W Cotati Ave		SR 116		SR 116	
	Northbound		Eastbound		Westbound	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration	T		T		T	
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	25.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	W Cotati Ave		SR 116		SR 116	
	Base Volume Input [veh/h]	6	25	702	2	14
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	22	0	0	95
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	25	724	2	14	841
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	6	181	1	4	210
Total Analysis Volume [veh/h]	6	25	724	2	14	841
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane	Yes		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.05	0.06	0.01	0.00	0.02	0.01
d_M, Delay for Movement [s/veh]	38.16	15.09	0.00	0.00	9.16	0.00
Movement LOS	E	C	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.37	0.37	0.00	0.00	0.05	0.05
95th-Percentile Queue Length [ft/ln]	9.37	9.37	0.00	0.00	1.21	1.21
d_A, Approach Delay [s/veh]	19.55		0.00		0.15	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]			0.46			
Intersection LOS			A			

**Intersection Level Of Service Report**  
**Intersection 1: SR 116 / W Cotati Ave**

Control Type: Two-way stop  
Analysis Method: HCM 6th Edition  
Analysis Period: 1 hour  
Delay (sec / veh): 0.9  
Level Of Service: A  
Volume to Capacity (v/c): 0.055

**Intersection Setup**

Name	W Cotati Ave		SR 116		SR 116	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration	T		T		T	
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	25.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	W Cotati Ave		SR 116		SR 116	
Base Volume Input [veh/h]	6	34	699	5	63	617
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	39	0	0	77
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	34	738	5	63	694
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	9	185	1	16	174
Total Analysis Volume [veh/h]	6	34	738	5	63	694
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane	Yes		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.06	0.08	0.01	0.00	0.07	0.01
d_M, Delay for Movement [s/veh]	40.05	15.59	0.00	0.00	9.49	0.00
Movement LOS	E	C	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.47	0.47	0.00	0.00	0.24	0.24
95th-Percentile Queue Length [ft/ln]	11.84	11.84	0.00	0.00	5.89	5.89
d_A, Approach Delay [s/veh]	19.26		0.00		0.79	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]			0.89			
Intersection LOS			A			

**Intersection Level Of Service Report**

**Intersection 1: SR 116 / W Cotati Ave-Village Ave**

Control Type: Signalized  
 Analysis Method: HCM 6th Edition  
 Analysis Period: 1 hour  
 Delay (sec / veh): 16.1  
 Level Of Service: B  
 Volume to Capacity (v/c): 0.473

**Intersection Setup**

Name	W Cotati Ave			Village Ave			SR 116			SR 116		
	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	TT			TT			TTT			TTT		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	1	0	0	1	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00
Speed [mph]	25.00			30.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			No			No		

**Volumes**

Name	W Cotati Ave			Village Ave			SR 116			SR 116		
Base Volume Input [veh/h]	23	8	80	44	3	13	43	959	16	74	1147	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	45	0	15	6	0	0	0	0	6
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	23	8	80	89	3	28	49	959	16	74	1147	187
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	2	20	22	1	7	12	240	4	19	287	47
Total Analysis Volume [veh/h]	23	8	80	89	3	28	49	959	16	74	1147	187
Presence of On-Street Parking	No	No	No	No	No	No	No	No	No	No	No	No
On-Street Parking Maneuver Rate [1/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [1/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

**Phasing & Timing**

Control Type	Split	Split	Overlap	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	1	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups			1,8									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	5	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	9	23	14	9	14	0	9	53	0	14	58	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	14	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No			No			No	
Maximum Recall		No	No		No			No			No	
Pedestrian Recall		No	No		No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	L	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
I1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
I2, Clearance Lost Time [s]	0.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_l, Effective Green Time [s]	17	31	13	13	5	51	51	10	56	56
g / C, Green / Cycle	0.19	0.35	0.15	0.15	0.06	0.56	0.56	0.11	0.62	0.62
(v / s)_i Volume / Saturation Flow Rate	0.02	0.05	0.07	0.02	0.04	0.26	0.26	0.06	0.36	0.37
s, saturation flow rate [veh/h]	1426	1611	1309	1613	1309	1870	1859	1309	1870	1780
c, Capacity [veh/h]	364	559	188	236	81	1055	1049	148	1158	1103
d1, Uniform Delay [s]	29.86	20.32	40.70	33.47	45.04	11.58	11.58	42.91	10.26	10.32
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.07	0.13	1.86	0.25	7.20	1.47	1.48	2.64	2.21	2.37
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.06	0.16	0.47	0.13	0.60	0.46	0.46	0.50	0.59	0.59
d, Delay for Lane Group [s/veh]	29.93	20.45	42.56	33.72	52.24	13.05	13.06	45.55	12.46	12.69
Lane Group LOS	C	C	D	C	D	B	B	D	B	B
Critical Lane Group	No	No	Yes	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.42	1.29	2.01	0.60	1.25	5.28	5.25	1.69	7.06	6.86
50th-Percentile Queue Length [ft/ln]	10.42	32.36	50.35	15.00	31.34	131.95	131.25	42.23	176.39	171.50
95th-Percentile Queue Length [veh/ln]	0.75	2.33	3.63	1.08	2.26	9.05	9.01	3.04	11.41	11.16
95th-Percentile Queue Length [ft/ln]	18.76	58.25	90.63	27.01	56.40	226.14	225.20	76.01	285.30	278.89

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	29.93	20.45	20.45	42.56	33.72	33.72	52.24	13.05	13.06	45.55	12.55	12.69
Movement LOS	C	C	C	D	C	C	D	B	B	D	B	B
d_A, Approach Delay [s/veh]	22.42			40.28			14.93			14.31		
Approach LOS	C			D			B			B		
d_I, Intersection Delay [s/veh]	16.05											
Intersection LOS	B											
Intersection V/C	0.473											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	0.0
M_comer, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000	0.000
Crosswalk LOS	F	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	733	222	1088	1199
d_b, Bicycle Delay [s]	18.07	35.58	9.35	7.21
I_b,int, Bicycle LOS Score for Intersection	1.743	1.758	2.404	2.721
Bicycle LOS	A	A	B	B

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 1: SR 116 / W Cotati Ave-Village Ave**

Control Type:	Signalized	Delay (sec / veh):	36.9
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	1 hour	Volume to Capacity (v/c):	0.757

**Intersection Setup**

Name	W Cotati Ave			Village Ave			SR 116			Westbound		
	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00
Speed [mph]	25.00			30.00			45.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			No			No		

Volumes												
Name	W Cotati Ave			Village Ave			SR 116					
Base Volume Input [veh/h]	28	6	127	284	10	118	86	1498	36	142	1396	169
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	34	0	12	18	0	0	0	0	16
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	84	0	0	79	0	0	2	0	0	9
Total Hourly Volume [veh/h]	28	6	43	318	10	51	104	1498	34	142	1396	176
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	2	11	80	3	13	26	375	9	36	349	44
Total Analysis Volume [veh/h]	28	6	43	318	10	51	104	1498	34	142	1396	176
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing		0			0			0			0	
v_di, Inbound Pedestrian Volume crossing m		0			0			0			0	
v_co, Outbound Pedestrian Volume crossing		0			0			0			0	
v_ci, Inbound Pedestrian Volume crossing mi		0			0			0			0	
v_ab, Corner Pedestrian Volume [ped/h]		0			0			0			0	
Bicycle Volume [bicycles/h]		0			0			0			0	

Intersection Settings	
Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	70
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing												
Control Type	Split	Split	Overlap	Split	Split	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	1	7	4	5	5	2	0	1	6	0
Auxiliary Signal Groups			1,8			4,5						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	0	0	5	0	0	0	0	0	0	0	0
Maximum Green [s]	30	90	90	30	90	90	90	90	0	90	90	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	9	23	12	9	14	8	8	35	0	12	39	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	5	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	10	0	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No	No	No	Yes		No	Yes	
Maximum Recall		No	No		No	No	No	No		No	No	
Pedestrian Recall		No	No		No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase	
Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	L	C	L	C	C	L	C	C
C, Cycle Length [s]	70	70	70	70	70	70	70	70	70	70
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	0.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_l, Effective Green Time [s]	19	31	15	23	4	31	31	8	35	35
g / C, Green / Cycle	0.27	0.44	0.21	0.33	0.06	0.44	0.44	0.11	0.50	0.50
(v / s)_l Volume / Saturation Flow Rate	0.02	0.03	0.23	0.04	0.08	0.41	0.41	0.11	0.42	0.43
s, saturation flow rate [veh/h]	1388	1619	1356	1630	1283	1870	1855	1283	1870	1798
c, Capacity [veh/h]	489	714	325	533	109	832	825	182	938	902
d1, Uniform Delay [s]	19.04	11.29	31.04	16.50	35.05	18.34	18.39	33.84	15.11	15.37
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.05	0.04	30.17	0.09	46.46	22.36	23.35	7.41	10.07	12.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.06	0.07	0.98	0.11	0.95	0.92	0.93	0.78	0.84	0.86
d, Delay for Lane Group [s/veh]	19.08	11.33	61.20	16.59	81.51	40.70	41.74	41.25	25.18	27.44
Lane Group LOS	B	B	E	B	F	D	D	D	C	C
Critical Lane Group	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.33	0.42	8.00	0.66	3.20	14.62	14.79	2.82	12.02	12.42
50th-Percentile Queue Length [ft/ln]	8.37	10.56	199.91	16.51	79.93	365.40	369.67	70.55	300.42	310.48
95th-Percentile Queue Length [veh/ln]	0.60	0.76	12.63	1.19	5.76	20.89	21.09	5.08	17.70	18.20
95th-Percentile Queue Length [ft/ln]	15.07	19.01	315.84	29.72	143.88	522.15	527.33	126.99	442.55	454.97

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	19.08	11.33	11.33	61.20	16.59	16.59	81.51	41.21	41.74	41.25	26.16	27.44
Movement LOS	B	B	B	E	B	B	F	D	D	D	C	C
d_A, Approach Delay [s/veh]	14.15		54.02				43.78			27.54		
Approach LOS	B		D				D			C		
d_I, Intersection Delay [s/veh]	36.89											
Intersection LOS	D											
Intersection V/C	0.757											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	35.0	0.0	0.0
M_comer, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	8.77	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	0.000	2.390	0.000	0.000
Crosswalk LOS	F	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	885	514	885	999
d_b, Bicycle Delay [s]	10.89	19.34	10.89	8.77
I_b,int, Bicycle LOS Score for Intersection	1.825	2.315	2.911	2.981
Bicycle LOS	A	B	C	C

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

