OJAI VALLEY HIGHWAY 33 MULTIMODAL AND COMMUNITY ENHANCEMENT STUDY

FINAL DRAFT REPORT

January 2020

Local Government Commission
Leaders for Livable Communities

SARGENT TOWN PLANNING

NELSON NYGAARD

Table of Contents

1 INTRODUCTION

Highway 33 is a primary corridor connecting the coastal city of Ventura, CA to the city of Ojai, CA, located in the foothills of the beautiful Los Padres National Forest. Highway 33 carries approximately 21,000 vehicles per day and is a significant roadway for the entire region. Between Ventura and Ojai, the Ventura County unincorporated communities of Casitas Springs, Oak View, and Mira Monte are nestled along Highway 33.

Ventura County, the Local Government Commission, and Nelson\Nygaard collaborated on the development of the Ojai Valley Highway 33 Multimodal and Community Enhancement Study (Study) in order to understand the unique character of communities along the corridor, and develop recommendations based in community support to improve mobility. The Study provides visionary solutions to the concerns regarding traffic and mobility that Highway 33 introduces to Ojai Valley for Caltrans to consider for future implementation. Via the Caltrans Sustainable Transportation Planning Grant, Caltrans provided an opportunity for the community to express their desire for dedicated and safe facilities to enhance connectivity in community centers, primarily for people who walk, bike, and take transit.

This study is a reflection of the robust community-based planning process that engaged residents and stakeholders to generate ideas for both short term improvements and long-term changes. Conversations with community members were focused on identifying strategies and designs to improve safety, access, and mobility for all modes of transportation along the corridor and explored enhancements to support inviting, walkable areas within the three communities. A summary of the process and resulting recommendations are included in the chapters that follow.

Acknowledgements

This study was made possible with the support of a Caltrans Sustainable Transportation Planning Grant received by Ventura County in 2017 in partnership with the Local Government Commission, a nonprofit organization that works with California localities on sustainable land use, transportation, and community design solutions. A consultant team led by Nelson\Nygaard Consulting Associates with Sargent Town Planning and Crabtree Group was selected through a competitive process to provide multimodal transportation corridor planning and design expertise and prepare the concepts and recommendations included in this plan.

2 EXISTING CONDITIONS AND OPPORTUNITIES

The future of Highway 33 will support multimodal communities, providing a balance of pedestrians, bicyclists, transit users and drivers. Multimodal transportation facility designs can reduce congestion of the roadways in the long term while promoting healthy land uses and fostering community. This chapter draws attention to the constraints and opportunities present in the three communities of Mira Monte, Oak View, and Casitas Springs based on existing conditions.

PEDESTRIAN NETWORK

Existing Conditions

Highway 33 is a winding two-lane California Highway stretching 15 miles from Ventura to Ojai and rising approximately 750 feet in elevation as it reaches into the foothills of the Los Padres National Forest. The shoulders are paved for emergency use, but unlike most state highways, Highway 33 has family communities nestled closely adjacent to the roadside. As a result, the Highway shoulders have become part of the de facto pedestrian network.

Figure 1: Pedestrian crossing infrastructure at Ranch Road.

People who walk, bicycle, and take transit in the Ojai Valley use the highway shoulders as their walkways due to limited alternatives. While vehicle-to-pedestrian and vehicle-to-bicycle collisions accounted for only 6% of collisions in the study area, they accounted for 50% of the fatal collisions that occurred. The disparity in these numbers illustrates how people who walk, bike, or take transit are in critically vulnerable positions. During darker hours of the day, the lack of street lighting along the highway elevates the potential risk for pedestrians, bicyclists, and transit users.

Table of Contents

1 INTRODUCTION

Highway 33 is a primary corridor connecting the coastal city of Ventura, CA to the city of Ojai, CA, located in the foothills of the beautiful Los Padres National Forest. Highway 33 carries approximately 21,000 vehicles per day and is a significant roadway for the entire region. Between Ventura and Ojai, the Ventura County unincorporated communities of Casitas Springs, Oak View, and Mira Monte are nestled along Highway 33.

Ventura County, the Local Government Commission, and Nelson\Nygaard collaborated on the development of the Ojai Valley Highway 33 Multimodal and Community Enhancement Study (Study) in order to understand the unique character of communities along the corridor, and develop recommendations based in community support to improve mobility. The Study provides visionary solutions to the concerns regarding traffic and mobility that Highway 33 introduces to Ojai Valley for Caltrans to consider for future implementation. Via the Caltrans Sustainable Transportation Planning Grant, Caltrans provided an opportunity for the community to express their desire for dedicated and safe facilities to enhance connectivity in community centers, primarily for people who walk, bike, and take transit.

This study is a reflection of the robust community-based planning process that engaged residents and stakeholders to generate ideas for both short term improvements and long-term changes. Conversations with community members were focused on identifying strategies and designs to improve safety, access, and mobility for all modes of transportation along the corridor and explored enhancements to support inviting, walkable areas within the three communities. A summary of the process and resulting recommendations are included in the chapters that follow.

Acknowledgements

This study was made possible with the support of a Caltrans Sustainable Transportation Planning Grant received by Ventura County in 2017 in partnership with the Local Government Commission, a nonprofit organization that works with California localities on sustainable land use, transportation, and community design solutions. A consultant team led by Nelson\Nygaard Consulting Associates with Sargent Town Planning and Crabtree Group was selected through a competitive process to provide multimodal transportation corridor planning and design expertise and prepare the concepts and recommendations included in this plan.

2 EXISTING CONDITIONS AND OPPORTUNITIES

The future of Highway 33 will support multimodal communities, providing a balance of pedestrians, bicyclists, transit users and drivers. Multimodal transportation facility designs can reduce congestion of the roadways in the long term while promoting healthy land uses and fostering community. This chapter draws attention to the constraints and opportunities present in the three communities of Mira Monte, Oak View, and Casitas Springs based on existing conditions.

PEDESTRIAN NETWORK

Existing Conditions

Highway 33 is a winding two-lane California Highway stretching 15 miles from Ventura to Ojai and rising approximately 750 feet in elevation as it reaches into the foothills of the Los Padres National Forest. The shoulders are paved for emergency use, but unlike most state highways, Highway 33 has family communities nestled closely adjacent to the roadside. As a result, the Highway shoulders have become part of the de facto pedestrian network.

Figure 1: Pedestrian crossing infrastructure at Ranch Road.

People who walk, bicycle, and take transit in the Ojai Valley use the highway shoulders as their walkways due to limited alternatives. While vehicle-to-pedestrian and vehicle-to-bicycle collisions accounted for only 6% of collisions in the study area, they accounted for 50% of the fatal collisions that occurred. The disparity in these numbers illustrates how people who walk, bike, or take transit are in critically vulnerable positions. During darker hours of the day, the lack of street lighting along the highway elevates the potential risk for pedestrians, bicyclists, and transit users.

Most intersections in the study corridor lack pedestrian amenities such as sidewalks, painted crosswalks, streetlights, or ADA compliant ramps—creating a less than inviting environment for walking. The roadway design of Highway 33 shows a strong preference toward vehicular use, especially at intersections, where turning radii are large to allow vehicle turns at faster speeds. Figure 3 shows a strip mall where the sidewalk is sloped toward the street, creating a ramp that enables vehicles to cross the sidewalk and pedestrian space for a cumulative 170 feet along the 250-foot span. Intersection tightening countermeasures, such as curb extensions, would slow vehicle traffic at crossing areas and provide visibility and crossing distance relief to the pedestrians themselves.

Figure 2: Highway 33 and Park Avenue; non-ADA compliant ramp, and inconsistent sidewalk network.

Figure 3: Highway 33 East of Park Avenue; pedestrian walkway design welcomes vehicles.

Figure 4: Highway 33 does not have dedicated pedestrian space along the roadway.

Figure 5: Pedestrians and moving vehicles mix on Highway 33's shoulders.

Figure 6: Pedestrian crosses Highway 33 where no crosswalks are available.

Figure 7: Side of Highway 33 inconsistency with asphalt and natural ground.

Figure 8: Options for pedestrians in study area extremely limited, such that they are forced to use the asphalt of a parking lot as a walkway.

Figure 9: Skateboarder commuting on Highway 33 where a roadway shoulder is not available

BICYCLE NETWORK

Existing Facilities

The Ojai Valley Trail (Trail) is the primary backbone of the bicycle transportation network for the Ojai Valley area. The Trail was developed through a collaborative effort of local groups, businesses, city, county, and state agencies, and a national conservation organization, who provided a continuous network of parks, trails, and natural areas along the Ventura River, connecting users to native wildlife and plants. The Trail is a valued asset to the communities of Ojai Valley.

Figure 10: Ojai Valley Bike Trail

The nine-mile Trail services many different recreational uses. It features two types of surfaces, separated lengthwise by a post-and-rail wood fence. One half is paved and is popular amongst bicyclists, walkers, joggers, and people exercising their pets. The second half of the trail is a dirt bridle path for horseback riders.

The trail provides extensive opportunities for recreation; Friends of the Ventura River has hosted annual "Picnic in the River" events to promote the trail and raise awareness of the expanding opportunities for outdoor recreation along the river. At the Trail's intersection with Baldwin Road, in the northern area of the Ojai Valley, Trail users can access existing multi-use trails connecting-to and weaving-into the Ventura River Preserve.

The Trail also serves as a great regional connector, connecting to the City of Ventura at its southern terminus, where major employment opportunities such as Ventura Ventures Technology Center, major health service provider Community Memorial Hospital, County (of Ventura) offices, Ventura County Medical Center, and booming outdoor apparel and gear company, Patagonia, are accessible. From Ventura, there is easy access to Metrolink commuter rail and Amtrak international rail services, expanding mobility options for individuals without access to a motor vehicle.

Access Points

While the Trail provides recreational and regional benefits for longer distance trips, the Trail is inadequate for short-distance, local and non-recreational trips through much of the study area. Figure 12 shows the Highway 33 corridor and adjacent Trail with access points. This limited accessibility to the Trail inhibits the use of bicycling for short trips such as errands. Residences north of Oak View Avenue and west of Highway 33 do not have easy access to the trail due to the highway as a barrier as well as geographic barriers requiring a long ascent/descent to the path. As such, residents of Oak View may be more inclined to walk or bicycle along Highway 33, but the lack of appropriate

Figure 11: Ojai Valley Bike Trail Access

infrastructure makes driving most convenient. Walking or bicycling along Highway 33 puts residents at a greater risk of a collision with a vehicle in comparison to utilizing the local Trail, due to inadequate infrastructure. By building more access points to the Ojai Trail within the communities of Casitas Springs, Oak View, and Mira Monte, as well as developing local bicycle facilities, bicycling may become a better option for short trips in the community.

Oak View Opportunities

Residences in Oak View located North of Oak View Avenue have sufficient access to the Trail. Residences South of Oak View Avenue have limited access due to topographic differences, private land, and available gateways. There are many residences in the area with limited access, indicating building access in this area will improve mobility equality for a great portion of the community.

Several options exist for improving access south of Oak View Avenue. West of 600 Larmier Avenue there is an inconspicuous narrow dirt trail which reaches the APN 0610110040. Grande Vista Street has a capped end with low fencing separating the street from the natural vegetation; however, a network of small footpaths can be found tracing from the Ojai Trail, through APN 0610150240, to the parcel abutting Grande Vista Street, APN 0610140040. Residents in the Kunkle Street neighborhood are disconnected from the neighborhoods to the north and south. An access easement to Larmier Avenue or Oak View Avenue is recommended to gain trail access for this community. These specific trails, or otherwise similarly designed trails, are opportunities to connect residents of Oak View to the Ojai Trail. Due to grade and natural vegetation, safety features such as stop bumps and lighting are considerable.

Residents living east of Highway 33 will need to cross the Highway to gain access to the Ojai Trail. Oak View Avenue and Larmier Avenue are signalized intersections allowing for safer bicycle and pedestrian crossing. Larmier Avenue is nearly 40 feet wide with parking on both sides. The posted speed limit is 25 and there is a school located within the neighborhood at 400 Sunset Avenue. Safety countermeasures on Larmier are recommended to aid access to new trail gateways and create safer streets for students. Countermeasures can include bicycle lanes on Larmier to transition bicyclists from Highway 33 and a pedestrian activated crossing signal at Portal Street to facilitate residents crossing Highway 33 from Portal Street, Park Avenue, and Old Ventura Avenue. Additionally, sharrows and signage on Spring and Sunset for wayfinding to the Ojai Trail, and similarly, sharrows and signage on Oak View Avenue East of Highway 33 for wayfinding to the existing access points.

Mira Monte Opportunities

The Ojai Bike Trail adjoins Highway 33 throughout the Mira Monte community, allowing easy access from the backbone of the community commercial area. Access improvements include creating neighborhood greenways throughout the residential networks.

Three minor collectors extending north from CA-150, Baldwin Road are S La Luna Avenue, S Rice Road, and Tico Road. All are access routes for a significant portion of the community's residents. Posted speeds are 35, 40, and 35 mph, respectively. S La Luna and Tico Road each have two twelve-foot travel lanes with shoulders, which combined measure approximately 8 feet (though in some limited locations the shoulder dimensions narrow). Both roadways can accommodate bicycle safety facilities—such as one-way or two-way painted bicycle lanes—by repainting and re-designating lane area (though in the small, constrained sections this may involve minimum standard facilities). Ventura County is in the process of constructing bike lanes on N. Rice Road.

Implementation of bicycle facilities creates safer streets and facilitates travel to and from CA-150, Baldwin Road.

CA-150, Baldwin Road has two twelve-foot travel lanes and a center-turning lane. Shoulders can be over 16 feet-wide per side in certain sections. CA-150, Baldwin Road is the only access option from the communities connected to the three previously discussed roadways. This corridor is a key to creating a safe neighborhood pedestrian and bicycle network between the residential areas and the Ojai Trail. The generous right of way and shoulder widths allow for of a protected one-way or protected two-way bicycle lane. Building bicycle lanes from Highway 33 extending west to Rice Road avoids discontinuities in the network.

Casitas Springs Opportunities

The ratio of residents with access to the Ojai Valley Trail in Casitas Springs is high. Improvements include enhancing access to the gateway just south of Mobil Lane and the gateway connecting to Highway 33 via Ranch Road. Both locations are the only two Ojai Trail access points for the community. The recommendations for improving transit access at the former location also improves pedestrian and bicycle access to the trail due to enhanced crosswalks and direct access through the mobile home areas. Ranch Road connects to the Ojai Trail for the Casitas Springs residences further south. The intersection of Ranch Road and Highway 33 would benefit from improved crossing facilities such as overhead street lighting and additional signage to raise awareness for potential pedestrians using the existing HAWK signal. This intersection is among the top three prevalent collision locations along the study corridor. Because the Casitas Springs community is significantly smaller, investments and efforts should be focused and intensive toward their limited locations with the highest need.

[Remainder of This Page Intentionally Left Blank]

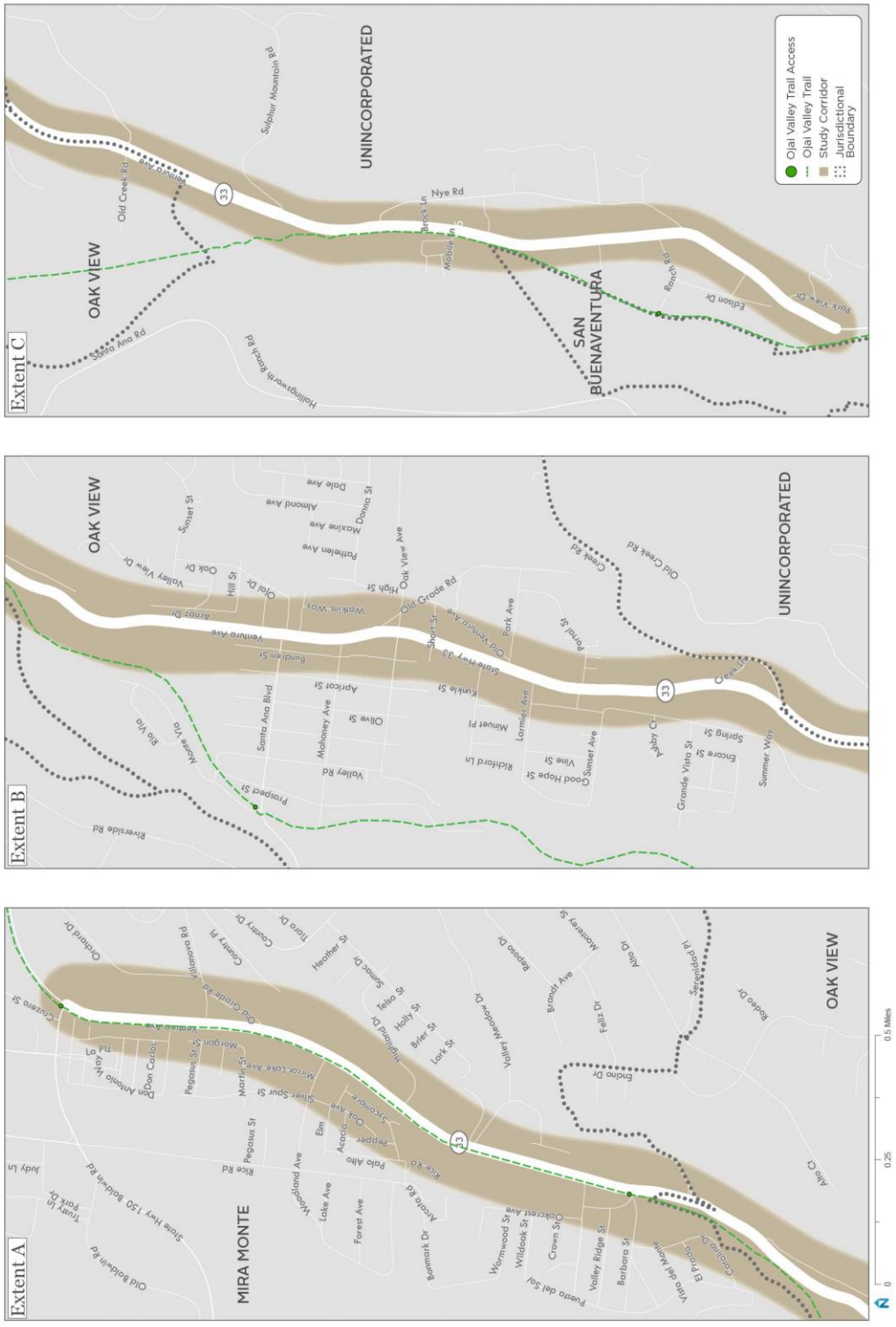


Figure 12: Ojai Valley Trail and Access Points

TRANSIT NETWORK

Existing Service

The Ojai Valley is serviced by two transit providers: Gold Coast Transit's Route 16 and the Ojai Trolley. Transfers between Route 16 and the Ojai Trolley are free with a valid transfer ticket.

Gold Coast Transit: Route 16

Figure 13: Gold Coast Route 16 bus

Gold Coast Transit's Route 16 operates Monday through Sunday, with limited services on Saturdays and Sundays. The cost to ride Route 16 is $1.50 per Single Fare or $4.00 for a Day Pass, with discounts available for seniors, disabled, and veterans, plus free rides for seniors over 75 and children under 45" tall. While Gold Coast does not provide as frequent of trips during the day and has on average longer headways than the Ojai Trolley, Gold Coast provides services earlier in the a.m. and later in the p.m., with the Highway 33 Casitas Market trip departing as early as 5:08 a.m, and a late p.m. trip operating until 9:39 p.m., Monday through Friday. Frequencies and headways for Gold Coast's Route 16 are listed in Table 1.

Table 1: Gold Coast Transit frequencies and headways, Monday through Sunday

Gold Coast : Route 16			
Monday - Sunday		Frequency	Average Headways
Monday through Friday	early a.m.	2 trips	30 minutes
	a.m.	6 trips	1 hour
	p.m.	6 trips	1 hour
	evening	3 trips	1 hour
Saturday	early a.m.	1 trip	30 minutes
	a.m.	6 trips	1 hour
	p.m.	6 trips	1 hour
	evening	2 trips	1 hour
Sunday	early a.m.	0 trips	30 minutes
	a.m.	6 trips	1 hour
	p.m.	6 trips	1 hour
	evening	2 trips	1 hour

The Ojai Trolley

Figure 14: Ojai Trolley on Highway 33

The Ojai Trolley (Trolley) is owned and operated by the City of Ojai and supported by the County of Ventura. The service operates two routes: Trolley Route A and Trolley Route B. Both routes service most stops with the exception of the east end of town out to Gridley Road. From there, Whispering Oaks is only serviced by Trolley Route A and the Ojai Valley Inn is only serviced by Trolley Route B. The cost to ride the Trolley is $1.50 per Single Fare or $4.00 for a Day Pass, with discounts available for seniors, disabled, and Medicare, plus free rides for seniors over 75, children under 45" tall, and transfers. The Trolley has higher frequencies and smaller headways than Gold Coast, making it a convenient option for transit users for local trips. The Trolley also has more stops within Ojai and less stops in the Ojai Valley, supporting the City of Ojai's businesses and commerce. Frequencies and headways for the Ojai Trolley are listed in Table 2.

Table 2: Ojai Trolley's frequencies and headways, Monday through Sunday

Ojai Trolley			
Monday - Sunday		Frequency	Average Headways
Monday through Friday	early a.m.	0 trips	n/a
	a.m.	11 trips	30 minutes
	p.m.	11 trips	30 minutes
	evening	2 trips	1 hour
Saturday	early a.m.	0 trips	n/a
	a.m.	5 trips	1 hour
	p.m.	6 trips	1 hour
	evening	2 trips	1 hour
Sunday	early a.m.	0 trips	n/a
	a.m.	5 trips	1 hour
	p.m.	6 trips	1 hour
	evening	2 trips	1 hour

Access

Bus stop infrastructure in the Ojai Valley is below ADA standards. Main concerns about bus stop amenities relate to lack of shelter from the elements, comfortable seating, lighting, and lack of pedestrian infrastructure. Limited safe pedestrian crossings on Highway 33 are a significant barrier as passengers must cross the highway on at least one leg of the trip. Existing conditions place transit users at a risk of conflict with vehicles through placing individuals in the roadway's vehicle use areas.

Figure 15: Highway 33 bus stop examples

Ridership

Four stops out of 32 on Gold Coast Transit's Route 16 are performing below ideal ridership levels. There is opportunity to relocate stops with low ridership to alternative locations, supplementing stops with high ridership or adding stops in new areas of town where there is demand for transportation. Tables 3, 4, and Figure 16 provide a high-level overview of typical ridership levels for northbound and southbound travel on Gold Coast Transit's Route 16, using data collected June 2018.

Table 3: Southbound Ridership Gold Coast Route 16

Stop Name	Southbound On	Southbound Off	Total
Highway 33 & Baldwin	5	2	7
Highway 33 & Villanova	No southbound stop	-	-
Highway 33 & Woodland	18	6	24
Highway 33 & Valley Meadows*	0	0	0
Highway 33 & Highland*	No southbound stop	-	-
Highway 33 & Country Village Mobile Home	3	1	4
Highway 33 & Barbara	2	4	6
Highway 33 & Oak Dell	0	0	0
Highway 33 & Casitas Water District	1	2	3
Highway 33 & Santa Ana	18	16	4
Highway 33 & Oak View	11	9	20
Highway 33 & Larmier	13	14	27
Highway 33 & Sulphur	0	0	0
Highway 33 & Nye	No southbound stop	-	-
Highway 33 & Arroyo Mobile Home	7	4	11
Highway 33 & Casitas	8	6	14
Highway 33 & Sycamore	2	0	2
Casitas & Highway 33	3	1	4

*Stops permanently removed from service since time of data collection due to safety concerns

Table 4: Northbound Ridership Gold Coast Route 16

Stop Name	Northbound On	Northbound Off	Total
Highway 33 & Baldwin	2	5	7
Highway 33 & Villanova	6	16	22
Highway 33 & Woodland	3	11	14
Highway 33 & Valley Meadows*	No northbound stop	-	-
Highway 33 & Highland*	0	1	1
Highway 33 & Country Village Mobile Home	0	1	1
Highway 33 & Barbara	1	3	3
Highway 33 & Oak Dell	0	1	1
Highway 33 & Casitas Water District	No northbound stop	-	-
Highway 33 & Santa Ana	11	17	28
Highway 33 & Oak View	8	12	20
Highway 33 & Larmier	16	15	31
Highway 33 & Sulphur	0	1	1
Highway 33 & Nye	1	3	4
Highway 33 & Arroyo Mobile Home	2	3	5
Highway 33 & Casitas	7	10	17
Highway 33 & Sycamore	No northbound stop	-	-
Casitas & Highway 33	No northbound stop	-	-

*Stops permanently removed from service since time of data collection due to safety concerns

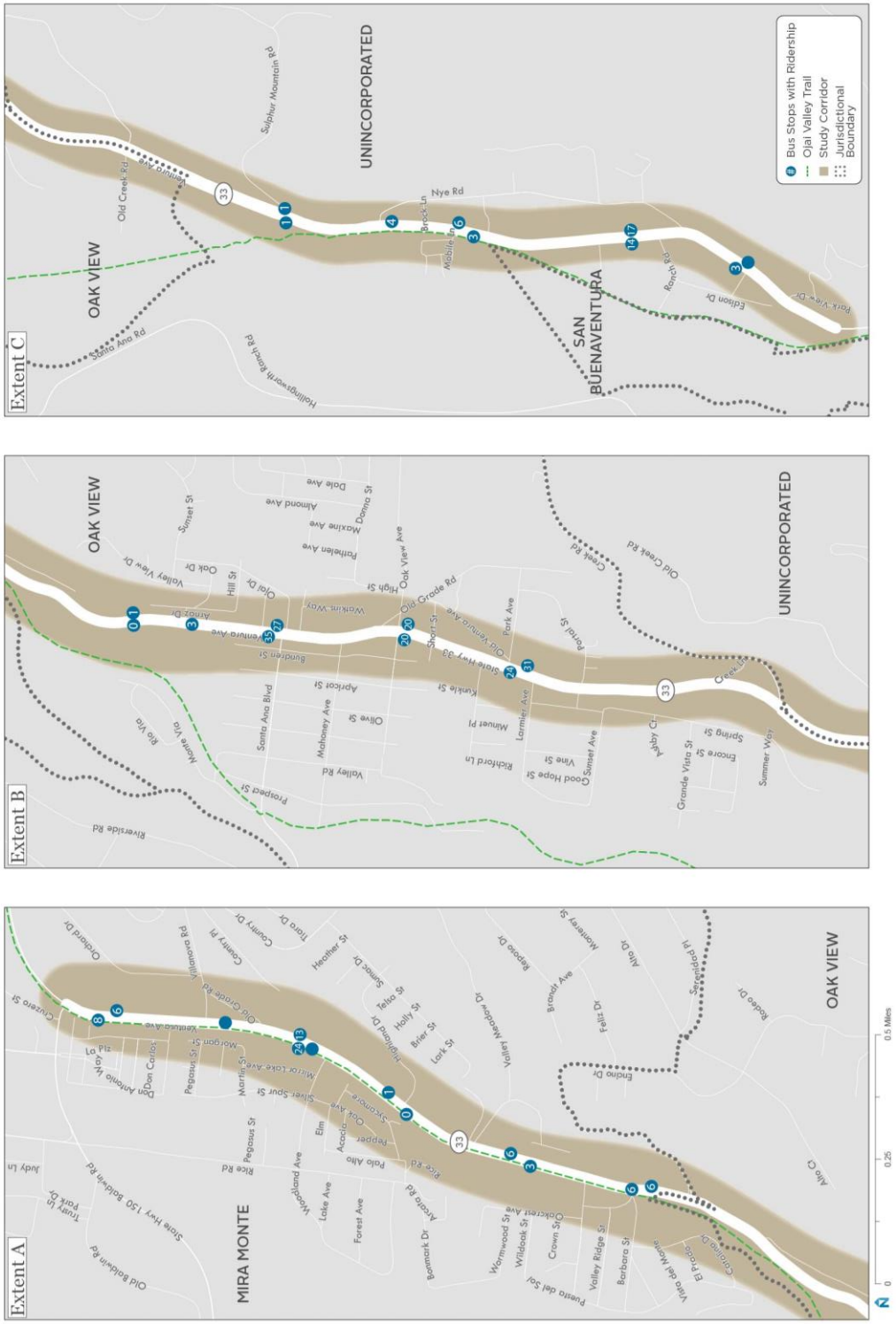


Figure 16: Gold Coast Transit Route 16 Ridership*

*Stops at Highway 33 & Highand, and Highway 33 & Valley Meadows were permanently removed from service since time of data collection due to safety concerns

TRAFFIC CONCERNS

The study corridor's primary traffic concerns relate to capacity, speed, flow, and parking.

Vehicle volumes on Highway 33 are above comfort levels for the residents of Ojai Valley. Corridor use as a thoroughfare to access Ojai and Ventura result in degradation of the small-town rural aesthetics and community values. The Team held discussions with Caltrans regarding lane reduction, including the idea of Highway 33 traffic signals potentially being replaced with roundabouts. However, any motion to pursue those ideas would be contingent upon support from the community.

Majority of collisions in the study area occur because of unsafe speeds. A three-year sample of Caltrans data shows unsafe speeds in 57% of collision reports. Wide lanes, passing lanes, and long stretches of roadway without crossings all contribute to the incidence of vehicles driving at unsafe speeds.

A range of vehicles with differing speeds share Highway 33. Tractors and hay trucks on occasion share the Highway and create disturbance in flow. Left turns onto Highway 33 become difficult during peak traffic hours and may lead to congestion on nearby streets.

Existing parking availability does not meet the needs of the community. Street parking codes and limitations prevent vehicles from utilizing existing space outside of Highway 33 corridor.

Figure 17: Recreational Vehicle and Heavy-Duty Transport Vehicle travelling Highway 33

Figure 18: Faded Stop Sign

Figure 19: Incomplete limit lines and missing pedestrian crosswalk

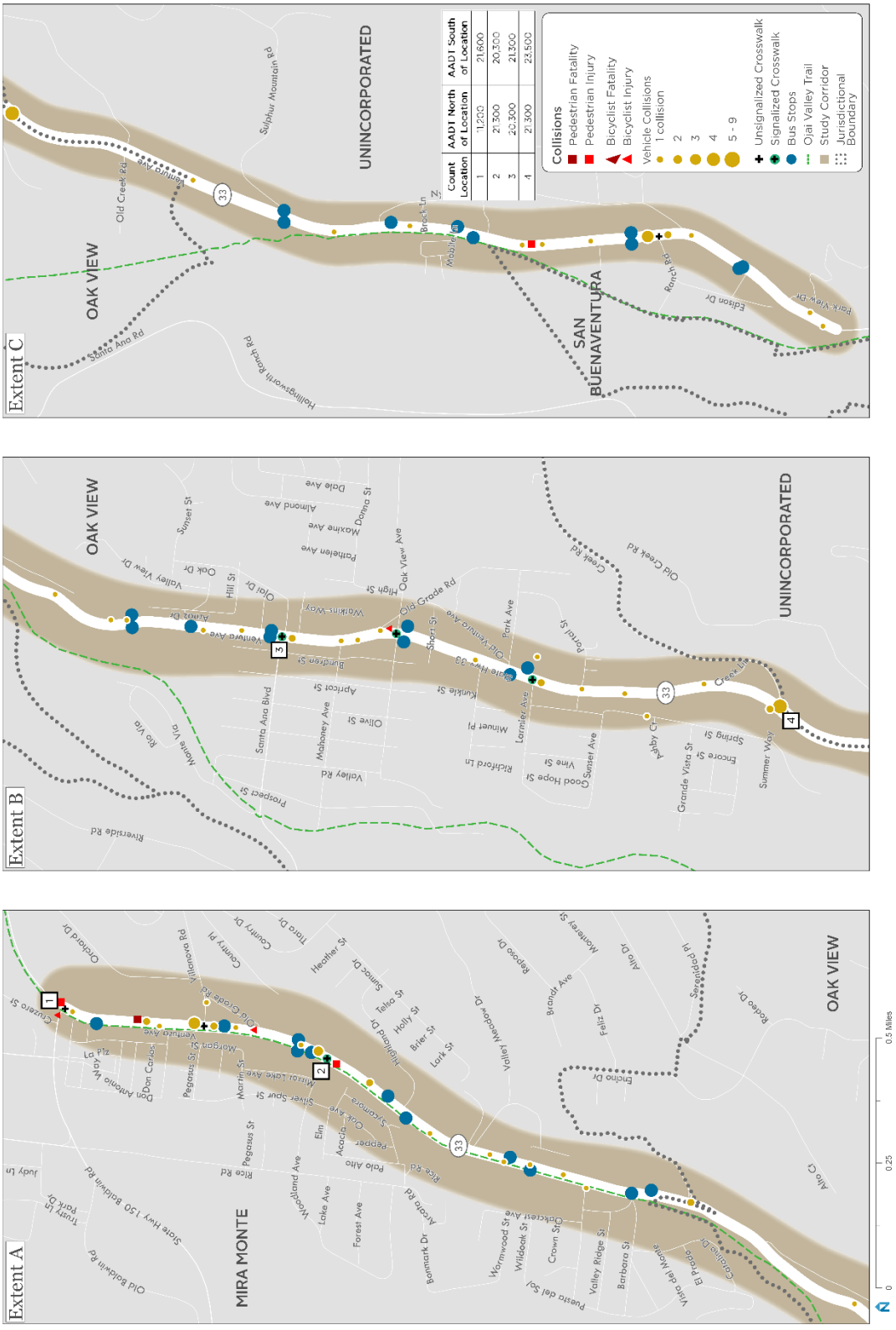


Figure 20: ADT (2016) and Collision Locations

SAFETY

This section analyzes the trends of pedestrian-involved, bicycle-involved, and vehicle-to-vehicle collisions and identifies areas with need for improvements. The County of Ventura can use this information in conversation with Caltrans to design safer walking, biking, and driving environments. The goal of compiling and analyzing this data is to make collisions less frequent and less severe, thereby making the streets safer for everyone.

Methodology

This safety analysis used the most recent three years of collisions data (2015-2017) available from the Statewide Integrated Traffic Records System (SWITRS). The dataset includes all reported collisions. During the three-year span, a total of four pedestrian-to-vehicle, three bicycle-to-vehicle, and 70 vehicle-to-vehicle collisions were reported, all of which resulted in varying levels of injury.

PEDESTRIAN-INVOLVED COLLISIONS

Primary Collision Factors

No apparent trends or factors appear in the dataset for pedestrian-involved collisions due to low rate of incidence. Table 5 provides background and Figure 21 displays location of the four reported pedestrian-involved collisions.

Table 5: Pedestrian-involved collisions summary

Accident Year	Secondary Road	Intersection	Severity	Pedestrian Action
2015	Ranch Rd	No	Other visible injury	In road, including shoulder
2015	Villanova Rd	No	Fatal	Crossing not in crosswalk
2016	SR-150 (Baldwin)	No	Other visible injury	Crossing in crosswalk at intersection
2017	Woodland Ave	Yes	Complaint of injury	Crossing in crosswalk at intersection

[Remainder of This Page Intentionally Left Blank]

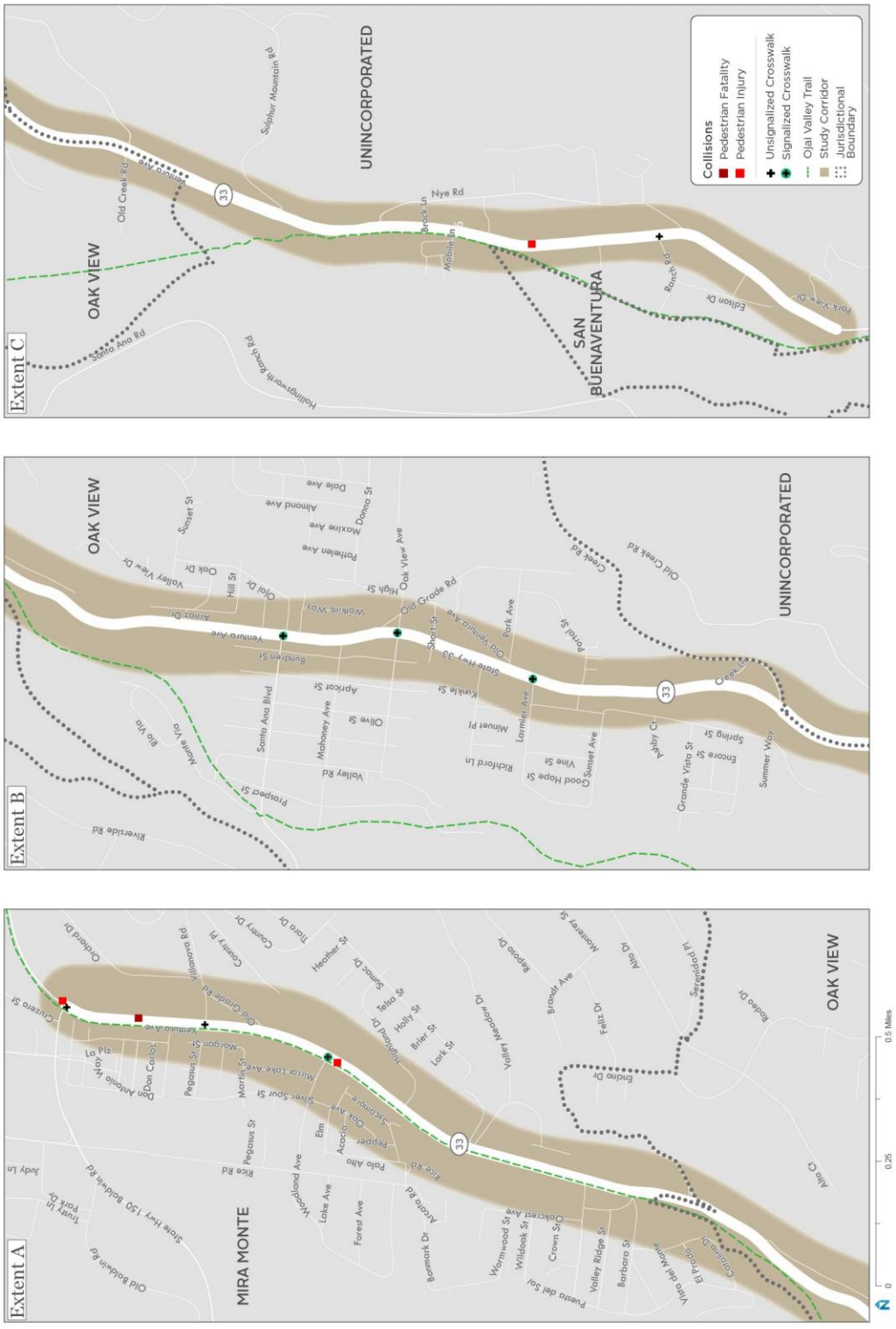


Figure 21: Pedestrian-involved collision locations

BICYCLE-INVOLVED COLLISIONS

Collision Locations

No apparent trends or factors appear in the dataset for bicyclist-involved collisions due to low rate of incidence. Table 6 provides background and Figure 22 displays location of the three reported bicycle-involved collisions.

Table 6: Bicycle-involved collisions summary

Accident Year	Secondary Road	Intersection	Severity	Vehicle Code Violation
2015	Old Grade Rd	No	Other visible injury	Wrong side of road
2015	SR-150 (Baldwin)	Yes	Severe injury	Improper turning
2017	Oakview Ave	Yes	Other visible injury	Drive/bicycling under the influence

[Remainder of This Page Intentionally Left Blank]

Figure 22: Bicycle-involved collision locations

VEHICLE-INVOLVED COLLISIONS

Collision Locations

Collisions occurring within an intersection account for 29% of reports, and collisions occurring outside of intersections account for 71% of reports. All collisions occurred on Highway 33 near secondary roads whereas the most prevalent in the results were Creek Road (16% of all collisions), Ranch Road (13%), and Villanova Road (13%).

Creek Road

Creek Road is a one-way stop-controlled T-street intersection with Highway 33. Highway 33 northbound becomes two travel lanes a few hundred feet north and south of this location to allow exiting traffic a lane to slow before turning off the Highway. Figure 12 shows the intersection and collision locations in Ojai Valley. Community feedback revealed many drivers use this secondary lane to pass slower moving traffic, leading to conflicts between vehicles. Eleven collisions occurred at this intersection, one fatal and three with severe injuries. Broadside collisions are the most common reported, amounting to 82% of reports. Caltrans has identified this location as an area of high collision incidence and is addressing concerns with street design improvements.

Table 7: Creek Road collision summary

Vehicle Code Violation	Broadside	Hit Object	Rear End	Total
Automobile Right of Way	9			**9**
DUI		1	1	**2**
Total	**9**	**1**	**1**	**11**

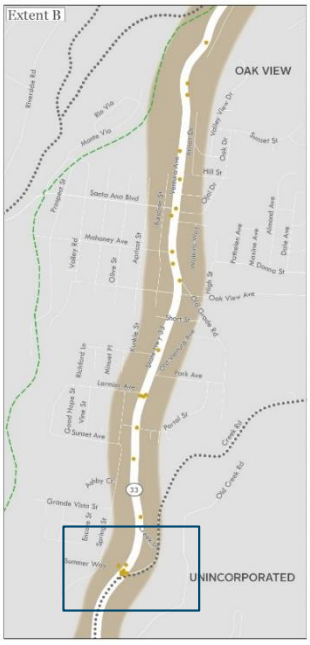


Figure 23: Highway 33 & Creek Road

[Remainder of This Page Intentionally Left Blank]

Ranch Road

Ranch Road is a T-street intersection with Highway 33. The location features a white continental pedestrian crosswalk across the Highway on the north leg of the intersection controlled by a Pedestrian Hybrid Beacon (sometimes known as a HAWK [High-Intensity Activated crosswalk] beacon). Figure 13 shows the intersection and collision locations within the Ojai Valley. Nine collisions occurred at this intersection; one was a severe injury. Rear-end collisions are the most common reported, amounting to 67% of reports.

Table 8: Ranch Road collision summary

Vehicle Code Violation	Hit Object	Rear-end	Sideswipe	Total
DUI		1		**1**
Improper Turning	2			**2**
Unsafe Speed		5		**5**
Wrong Side of Road			1	**1**
Total	**2**	**6**	**1**	**9**

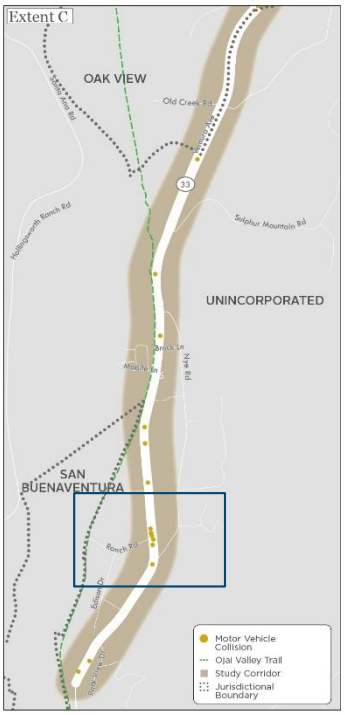


Figure 24: Highway 33 & Ranch Road

West Villanova Road

West Villanova Road is a signal-controlled T-street intersection with Highway 33. The location features two pedestrian crosswalks on the south and east legs of the intersection. Commercial businesses are located on the northeast and southeast corners. Figure 14 shows the intersection and collision locations within the Ojai Valley. Nine collisions have occurred at this intersection. Unsafe Speed collisions are the most common reported, amounting to 56% of reports.

Table 9: West Villanova Road collision summary

Vehicle Code Violation	Broadside	Head-on	Rear end	Sideswipe	Total
Automobile Right of Way		1			**1**
Other Hazardous Violation		1			**1**
Unsafe Speed			5		**5**
Total	**1**	**2**	**5**	**1**	**9**

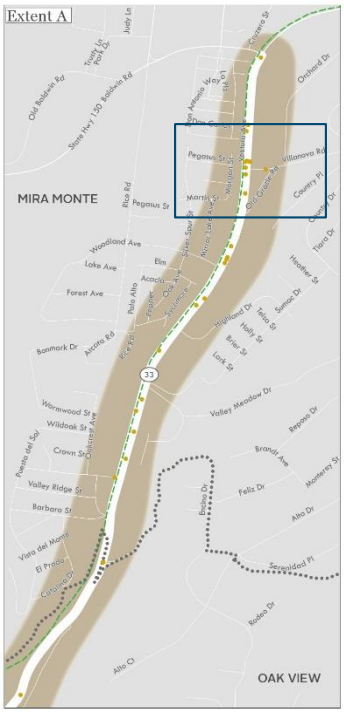


Figure 25: Highway 33 & West Villanova Road

All Collisions - Primary Collisions Factors

The most common type of collision in the study area was rear-end and broadside collision incidences, at 42% and 30% of reports, respectively. Refer to Table 10 for the collisions summary.

Table 10: Type of Collision by Violation Category and Location

	Ashby Ct.	Creek Lane	Creek Rd	Encino Dr.	Highland Dr	Kunkle Street	Larmier Avenue	Mahoney Ave.	Nye Rd	Oak View Avenue	Ojai Drive	Old Creek Rd	Old Grade Road	Parkview Dr.	Portal Street	Ranch Rd	Santa Ana Bl	Santa Ana Way	Sr-150	Valley Meadow Dr	Villanova Rd	Wiley Street	Woodland Av	**Grand Total**
Auto Right of Way			9	2		1	2					1	2	1	1		1			1	1	1		23
Broadside			9	2		1	2					1	1	1	1					1		1		20
Head-on													1								1			2
Sideswipe																	1							1
DUI	1	1	2				1	1								1								7
Head-on	1																							1
Hit Object		1	1																					2
Rear End			1				1	1								1								4
Improper Turning									1		1			1		2		1		1				7
Hit Object									1		1					2		1		1				6
Overturned														1										1
Other Hazardous Violation																					1			1
Head-on																					1			1
Traffic Signals and Signs																					1			1
Broadside																					1			1
Unsafe Lane Change																					1			1
Sideswipe																					1			1
Unsafe Speed					1			1	2	1					1	5	1	1	1	1	5	2	5	27
Overturned									1															1
Rear End					1			1	1	1					1	5	1	1	1	1	5	2	5	26
Wrong Side of Road				1												1		1						3
Head-on				1																				1
Sideswipe																1		1						2
Grand Total	1	1	11	3	1	1	3	2	3	1	1	1	2	2	2	9	2	3	1	3	9	3	5	70

	Ashby Ct	Creek Ln	Creek Rd	Encino Dr	Highland Dr	Kunkle St	Larmier Ave	Mahoney Ave	Nye Rd	Oak View Ave	Ojai Drive	Old Creek Rd	Old Grade Rd	Parkview Dr	Portal Street	Ranch Rd	Santa Ana Bl	Santa Ana Way	Sr-150	Valley Meadow Dr	Villanova Rd	Wiley Street	Woodland Av	**Grand Total**
Auto Right of Way			9	2		1	2					1	2	1	1		1			1	1	1		23
Broadside			9	2		1	2					1	1	1	1					1		1		20
Head-on													1								1			2
Sideswipe																	1							1
DUI	1	1	2				1	1								1								7
Head-on	1																							1
Hit Object		1	1																					2
Rear End			1				1	1								1								4
Improper Turning									1		1			1		2		1		1				7
Hit Object									1		1					2		1		1				6
Overturned														1										1
Other Hazardous Violation																					1			1
Head-on																					1			1
Traffic Signals and Signs																					1			1
Broadside																					1			1
Unsafe Lane Change																					1			1
Sideswipe																					1			1
Unsafe Speed					1			1	2	1					1	5	1	1	1	1	5	2	5	27
Overturned									1															1
Rear End					1			1	1	1					1	5	1	1	1	1	5	2	5	26
Wrong Side of Road				1												1		1						3
Head-on				1																				1
Sideswipe																1		1						2
Grand Total	1	1	11	3	1	1	3	2	3	1	1	1	2	2	2	9	2	3	1	3	9	3	5	70

3 PLANNING PROCESS

The project team engaged residents and stakeholders in an intensive and highly participatory public process to assess and document conditions for all travel modes (walking, bicycling, transit, and driving) and users of all ages and abilities in and around the Highway 33 corridor. This included a concentrated series of meetings, site walks, presentations, and workshops to identify concerns, priorities, and potential solutions.

OUTREACH ADVISORY GROUP

An advisory group of approximately a dozen participants convened in advance of the community events. It included community members, the County District Supervisor and staff, and staff from County and other key agencies (including Caltrans) to help guide and inform the outreach and study process. Meetings were held the Oak View Park and Resource Center in Oak View. The group met in March 2018 to begin the discussion of issues to address, stakeholders to involve, and ways to maximize participation. The group met again in June 2018 with members of the consultant team to provide input and feedback regarding existing conditions and safety, operations, and access challenges within the three communities and other hot spots along the corridor. Members of the group volunteered to help publicize the planning effort and organize food and facilities to encourage participation and create a positive environment for exchange of ideas and development of shared solutions.

MULTIDAY WORKSHOP: JULY 25-27, 2018

- Site visits with vans, stop, and walks
- Design Workshop: vision cards, complete streets presentation, and table maps
- Open Studio with Stakeholder Meetings: County public works and planning, fire and sheriff, Supervisor staff, and drop in hours open to stakeholders and community members
- Briefing with Caltrans staff at Los Angeles District Office, July 30

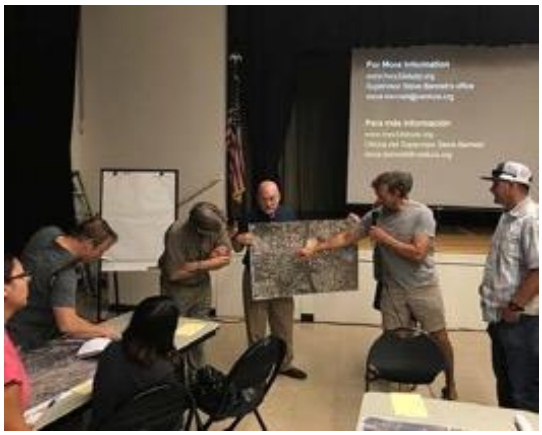
Approximately 40 people (including Caltrans representatives) participated in a series of interactive events over the course of several days in July 2018. The project team set up an open studio workspace at the Oak View Park and Resource Center. Planners, engineers, and designers worked daily in an open setting where members of the advisory group, stakeholders, and the general public could drop in and observe the work in progress and interact with project team members. Meetings were held with the County fire department and sheriff for input from a public safety perspective and ensure proposed improvements meet emergency response needs. Project team members also met with Caltrans staff at the Los Angeles District office on July 30 following the workshop to discuss the community input to date and obtain feedback regarding the feasibility of potential improvements.

The main public event took place Wednesday evening, July 25. Activities began with stop, walk, and talks at key locations in Oak View, Casitas Springs, and Mira Monte. Participants met at the Oak View Park and Resource Center, drove with project team members in vans to stop points, and walked, observed, and discussed conditions and ideas for improvements together.

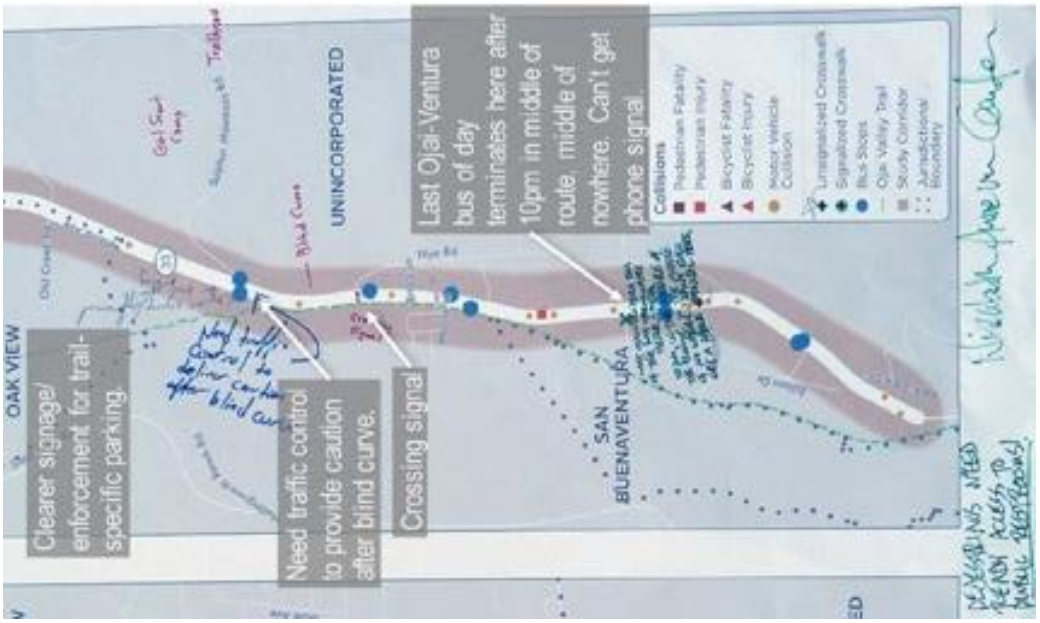
After the walks the participants returned to the Resource Center to join others for the evening community workshop. The evening began with the question: "What is your vision for the highway and your community twenty years from now?" Participants spent a few moments writing their responses on note cards. Volunteers were asked to read their visions out loud. Example language included:

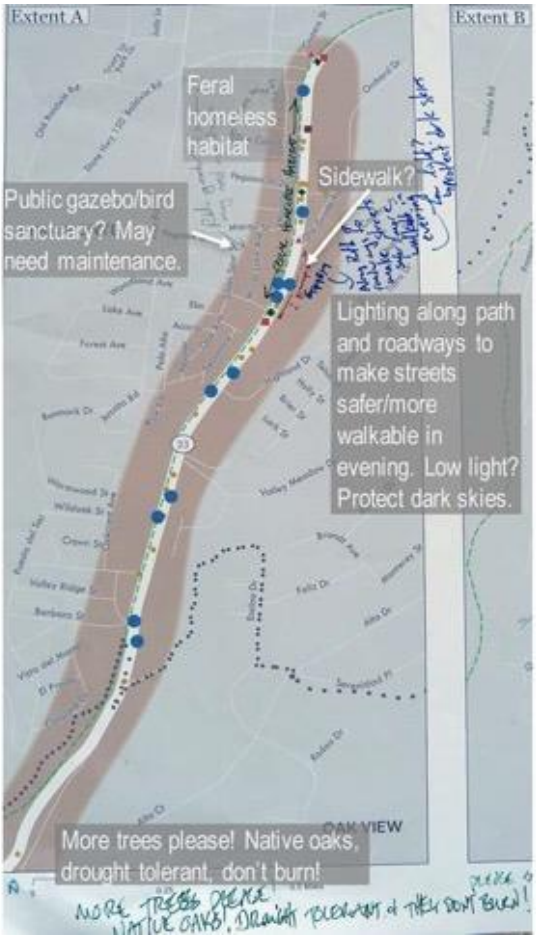
- "Calm down the Oak View traffic like the City of Ventura did on the north end of Main Street . . ."
- "Welcoming big shade trees with prosperous small business and plenty of parking for tourists and community"
- "A safe way to move into and out of the Ojai Valley that can handle the commuter traffic, but at the same time allows people to safely use all the business and private access without delay"
- "Safe travel for pedestrian, bicyclist and cars, more aesthetic, welcoming, more greenery and slower traffic . . . Business friendly"
- "Safer walking path for children"
- "Cars aren't the focus. Pedestrians, bicyclists are safe. There are trees and other greenery along the roadway. Businesses are thriving."
- "'Gateway' entrance on each end of town"
- "Main Street Scale"

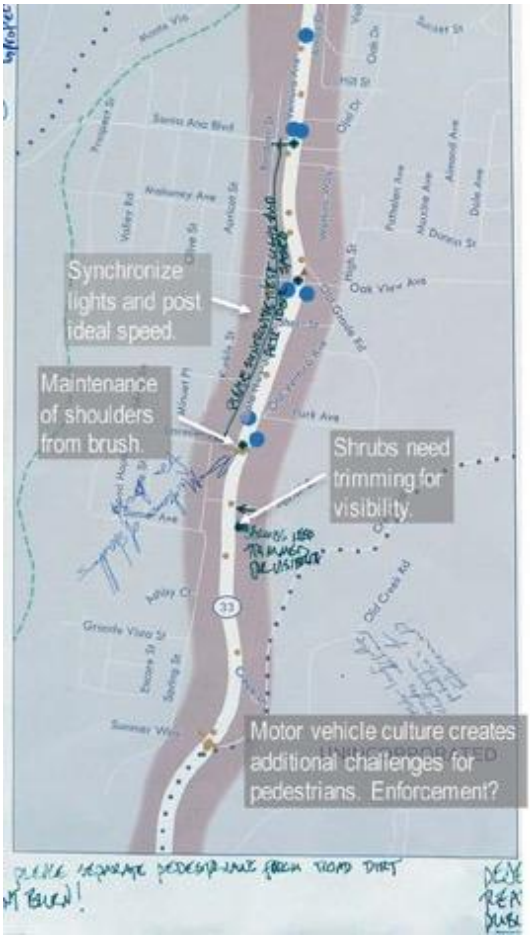
Following the visioning activity, the consultant team presented concepts and approaches for complete streets, context sensitive design and smart mobility, data, and observations about existing conditions, and examples of tools and strategies to stimulate discussion about potential improvements.



People then broke into small groups around large aerial table maps to mark up and identify issues and ideas for the corridor as shown in the following pages. Each group then shared their ideas to everyone in attendance.








OAK VIEW
More school zone signs
Fewer driveways
Wacky red & green signals on 33
Crosswalk
Box blocking sidewalk in front of Rabobank
Bus stops out of travel lane
Better visibility, Shorter crossing


We would love considering 3 roundabouts at Larmier, Oak View, Santa Ana (maybe also Kunkle or xwalk)
Roundabout
Roundabout
Roundabout
Reorganize parking, reduce curb cuts
2 lanes
OAK VIEW


OAK VIEW
Accidents occur @ signalized intersections
Sidewalks
Crosswalks
Concrete pad for bus stop
Electrical box in middle of sidewalk (not ADA compliant)
Crosswalks
Crosswalks
Pedestrian Connections
Sidewalks


OAK VIEW
Alternative bicycle route to avoid 33
Alternative bicycle route to avoid 33
Alternative bicycle route to avoid 33


MIRA MONTE
Connect Pedestrian Network
Area was landfilled in 1950s. Can wetland be restored?
Complete Network
Pedestrian Access


MIRA MONTE
Crosswalks
Crosswalk needs median @150/Old Baldwin Road
Children walk to McDonald's and Taco Bell after school
Crosswalk
MIRA MONTE
Crosswalks
Crosswalk needs median @150/Old Baldwin Road

PRESENTATION OF PRELIMINARY DESIGNS: OCTOBER 10, 2018

In the ensuing months, the consultant team processed community and stakeholder input, studied and refined proposed improvements, collected and analyzed traffic data and design standards from Caltrans and the County, and prepared design concepts for the corridor. On October 10, members of the project team presented the results to approximately 60 community members at Oak View Park and Resource Center in Oak View.

Strategies and design concepts were presented to improve multimodal access along Highway 33, moderate traffic speeds, and improve safety for motorists and non-motorists without significantly impacting throughput capacity or motorist delay, and to create gateways and a sense of place for each community. Questions, answers, and comments followed. County Supervisor Steve Bennett asked the audience if they liked the overall approach and ideas. The group exhibited strong support through a show of hands.

In addition to the community events described above, the project was documented on the County Web Site with comments. The meetings were advertised in English and Spanish with Spanish translation available at workshops. The previously mentioned Advisory Group met on:

- March 27:
  - Issues to address, stakeholders to involve, ways to maximize participation
  - Number of participants
- June 21:
  - Existing conditions discussion and feedback/input
  - Number of participants

4 CANDIDATE SOLUTIONS

This chapter is organized into some recommendations and strategies that apply throughout the corridor and some that are specific to the three village nodes (Casita Springs, Oak View, and Mira Monte). These are holistic solutions that entail transportation, land use, and urban design approaches, with the goal of making these communities safer and more comfortable for all users.

CORRIDOR WIDE STRATEGIES

Throughout the corridor, several overarching strategies apply:

- More complete multimodal access along Highway 33 should be provided to enhance pedestrian, bike, and transit options as well as improving safety.
- Walkability and access to crosswalks to all should be reflected in facility design, including features such as audible signals for the vision impaired.
- Traffic speeds should be moderated to safe levels without significantly impacting throughput capacity.
- Improve transit stops including access and visibility for increased ridership.
- Create gateways for each community along Highway 33 to provide a sense of entry to community areas.
- Space along the shoulders should be utilized to improve access and reduce pedestrian risk. This space can be used by bicycles and pedestrians.
- Reducing vehicle lanes through Oak View will help reduce pedestrian exposure, moderate high traffic speeds, and create opportunities for bike lanes. Traffic volumes along the corridor make Highway 33 a candidate for application of this strategy.
- Use excess roadway space for better edge treatments and landscaping.
- Create pathways connecting access to transit stops and access to the bike path.
- Roundabouts are a tool that could be considered along the corridor to create safer intersections while maintaining consistent traffic flow. Incorporating such a treatment was briefly discussed for intersections at N. Nye Road, Larmier Avenue, and Santa Ana Boulevard, but were not included in detail due to existing geometric limitations that would require extensive collaboration with adjacent property owners.
- Prior to implementation, all projects would coordinate with the Transportation Emergency Preparedness Plan, currently under development by the Ventura County Transportation Commission, to ensure changes to the streetscape do not create challenges during emergency egress in the event of a natural disaster.

Beyond these corridor-wide strategies, there are recommendations specific to each of the three village areas.

A Note About Planning Studies

As a visioning planning study, all proposed solutions presented are conceptual in nature and subject to changes upon final design, review and approval by Caltrans, the County of Ventura, affected transit agencies, and other stakeholders. Prior to implementation, Caltrans may consider completing a formal traffic study, including projections of roadway performance during a future horizon year (likely 2040) to consider the impacts of future growth along the corridor.

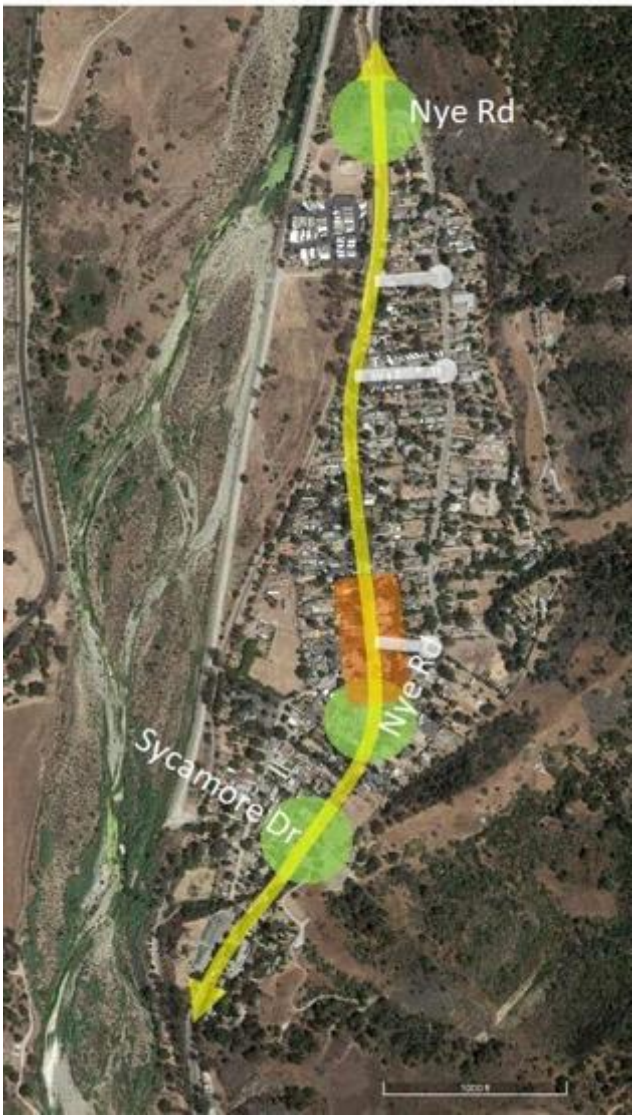
CASITAS SPRINGS

Casitas Springs is the southernmost of the three village areas along the study corridor.

The Core Village

The key goals for the recommendations within the village are to establish visual definition of the area to help moderate driving speeds and to increase safety and comfort for pedestrians. The following steps are recommended:

- Establish gateways entering Casitas Springs from the south and north integrating pedestrian and transit improvements and public open space
- Improve the bend at Nye Road and Highway 33 by introducing a neighborhood entry green
- Organize commercial frontages and parking in the commercial village stretch along Highway 33 just past the bend at Nye Road
- Consider improved bus stop amenities, including shelters, trash receptacles, and benches for improved visibility and comfort
- Look for additional pedestrian access routes from Highway 33 through to Nye Road to the east



Sycamore Drive and Highway 33

Sycamore Drive, at the southernmost end of the village area, has bus stops on each side of the street. Pedestrian crossings can be uncomfortable given the vehicle speeds and lack of a crosswalk. The following steps are recommended:

- Improve existing bus stops for better visibility
- Add a formal pedestrian crosswalk for safe crossing into the neighborhoods to the west
- Potential for public open space (trailhead park) on Watershed Protection District Site

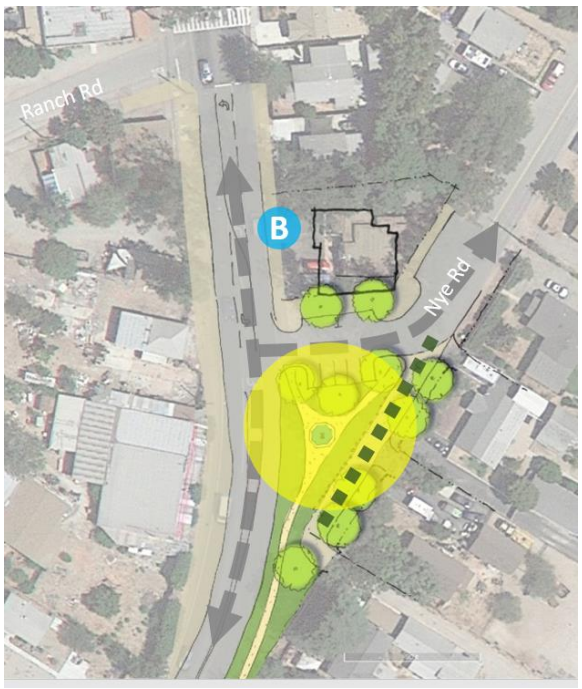
These improvements in conjunction with groupings of new major trees and potentially a "Welcome to Casitas Springs" sign combine to form a gateway that lets motorists know they are entering a community and should slow down.

The image below illustrates how these ideas when implemented might look on the ground. The graphic highlights increased pedestrian visibility and driving speed moderating elements that would improve safety and comfort for the pedestrians and transit riders that must cross at this location.

Commercial Village Entry Green

At the current Y-intersection of Highway 33 and Nye Road, there is an opportunity to create a safer, ninety-degree intersection and create space for a green urban design element:

- The change to a ninety-degree intersection improves access and visibility for turning movements at the intersection.
- The space captured via the change creates a new gateway open space for the commercial village.
- A private drive would be left for residents fronting the new open space.
- The opportunity to redesign this intersection would provide an opportunity to incorporate improved stormwater management design to address persistent flooding issues at this location.

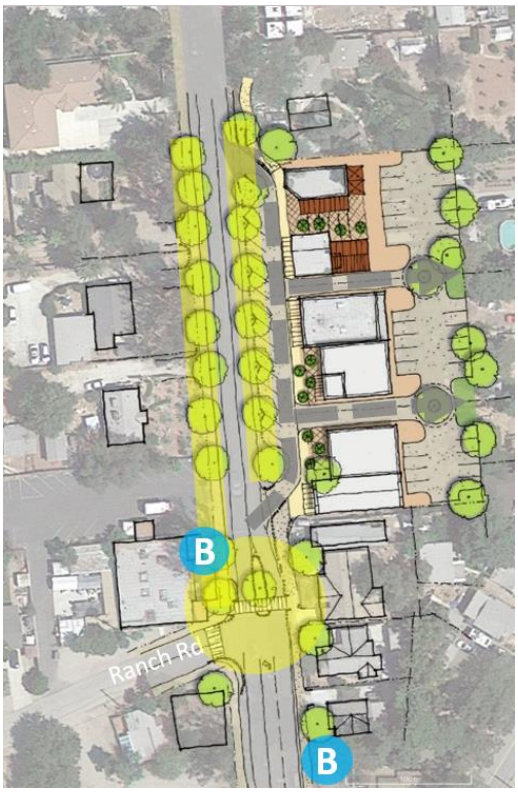


Drivers moving past the Sycamore gateway and the Nye Road green space would take those visual cues as a suggestion to change their driving behavior as they enter the core village main street area. The proposed gateway open space in Casitas Springs is located in an area prone to flooding during rainstorms.

Village Main Street

The main stretch of businesses in the core of the village is already a nice and popular area. However, some basic improvements could enhance the safety, comfort and attractiveness of the village core:

- Organize parking in front of and behind village shops with a slip lane and shared parking lot
- Enhance the crosswalk at Ranch Road with a pedestrian refuge in a small median
- Large canopy street trees along Village Frontage

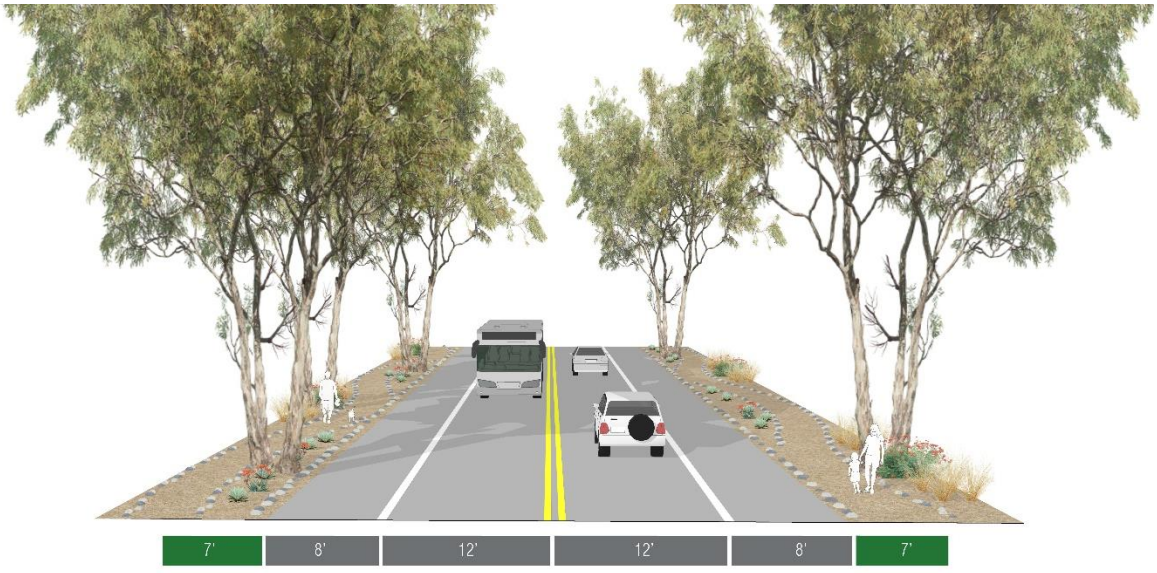


The graphic here shows how vacant and underutilized properties in the area today may develop over time with a consistent pedestrian frontage. The street edge through the village could maintain a rural character, in keeping with the businesses and look of the street currently. This would likely not only be more attractive, but by enhancing the main street character of the area, drivers would be cued to proceed more cautiously. It should be noted that this redesign assumes that the northbound bus stop located at Ranch Road would be relocated to Nye Road, about 250 feet south of its current location near the Nye Road intersection, where there is sufficient space for a bus. However, the bus stop may be relocated directly south of the Ranch Road crosswalk to maintain proximity to the southbound bus stop if agreeable to adjacent property owners.

One concern would be that, while much more accessible to those with disabilities than what is currently in place, this type of design may not specifically meet Federal ADA guidance. It may require creative solutions in either design or funding to make this unique character-based design a reality.

These rural character design elements would be appropriate not just in front of the village businesses, but along the corridor as a whole. For example, the roadway section north of the village center that currently looks like the photo below….

…could be designed for improved pedestrian accessibility, while maintaining its unique local characters in ways such as the image below. The dimensions prescribed below reflect current understanding of the roadway dimensions from Ranch Road to 200 feet south of Nye Road. It is anticipated that cooperation between Caltrans and adjacent property owners may be required to fulfil implementation.



As was the case in the core village, these enhancements to the pedestrian environment represent a marked improvement in the space and visibility provided to pedestrians. Additional compliance with ADA access requirements would need to be considered in lieu of formal sidewalk construction.

North Gateway

A gateway at the northern end of the village could help to alert southbound drivers of the special place they are entering and remind them of the expected safe driving behavior. This gateway might have several elements:

- Intersection improvements at Nye Road (north) and Highway 33 for improved visibility and safety, and to provide a gateway into Casitas Springs.
- Intersection improvements at Mobil Lane for safer entry and exit into the mobile home park, including a high visibility crosswalk to facilitate access to/from the bus stops.
- Remove northbound bus stop between Brock Lane and Nye Road. Enhanced bus stops and crosswalk at Mobil Lane would guide food traffic safely across Highway 33.
- Improve connectivity to the neighborhoods along Nye Road to bus stops and the Ojai Valley Trail with signage directing community members to travel along Brock Lane—this would require county collaboration with local landowners to create an easement for public use, as Brock Lane is a private street.

Regarding the referenced improvements at the Nye Road north intersection, several elements should be considered:

- Protected free right-turn lane at Nye Road to allow better sight-lines to facilitate turning movements onto Highway 33 and moderate vehicular speed through the community.
- Center median at the intersection for left-turn lane protection and gateway opportunities.

The photo below (left) shows the existing condition of the intersection at Nye Road, highlighting an obstructed northbound view. The drawing below (right) illustrates how the intersection might be redesigned to create a safer condition for all users by improving visibility for drivers turning out of Nye Road.

Another element of the northern gateway is a new crosswalk at Brock Lane:

- Maintain center (3rd) median lane from Mobil Lane to Nye Road
- Protected crosswalk (with pedestrian refuge in the center median) at Brock Lane for improved connectivity to neighborhoods and the Ojai Valley Trail
- Relocated bus stops for better access from neighborhoods and Arroyo Mobile Home Park
- Protected left-turn lane into Arroyo Mobile Home Park

This location is particularly important as the Ojai Valley Trail is across the street from a residential neighborhood, creating an opportunity for utilization by bicyclists and transit riders at this currently unmarked location. As noted, it would likely require collaboration between County officials and local property owners to facilitate an easement to allow public access at Brock Lane. However, this will greatly facilitate walkability to and from transit, something community members in this area may depend on. An illustration of the Brock Lane Crosswalk how that design might look is provided below:

OAK VIEW

The second village area assessed was Oak View. Oak View has a larger commercial footprint than Casitas Springs and shows some effects of suburbanization with some buildings set back from the street and a wider section of Highway 33. The recommendations for this village include:

- Streetscape improvements including possible lane reductions (five to three), landscape, bike, and pedestrian improvements focused from Larmier Avenue to Santa Ana Boulevard
- Gateway design considerations at Larmier Ave and Oak View Road, which may include features such as signage and landscaping

The most substantial transportation recommendation included here is the reduction from five lanes to three. The daily traffic volumes of about 21,300 vehicles per day are within the range of volumes that are commonly considered for three-lane cross-sections[1]. For reference, the FHWA Road Diet Informational Guide notes that road diets have been applied to streets exhibiting volumes up to 25,000 ADT.

Many communities have found that with such conversions, the right-of-way can be reallocated for other uses, such as bicycle lanes or pedestrian facilities. Further, lane reductions reduce speeds by eliminating fast lanes and driver weaving. Often such projects result in greater lateral separation between pedestrian and vehicle traffic, which may make walking more comfortable. This increased walkability can also foster economic development, as it creates a destination where residents and visitors can comfortably travel between destinations.

Road diets also clearly influence crash reduction. Converting a four- or five-lane street to a three-lane street reduces the conflicting streams of traffic and has been shown to reduce the number of collisions in most every case of implementation. The Federal Highway Administration has reported a 29% average reduction in crashes along corridors implementing a road-diet[2].

Additional concerns are often raised due to necessary access by emergency vehicles. Typically designs gain support from local emergency responders prior to implementation, and features such as curbs that accommodate wider vehicle use are incorporated. It is anticipated that the roadway design will maintain 20' of navigable space from curb to median to accommodate emergency vehicles. Features such as rounded curbs, and mountable medians (without planted trees) may be considered to facilitate use by larger emergency vehicles. Furthermore, the Ventura County Transportation Commission is currently undergoing a Transportation Emergency Preparedness Plan to better prepare regional responses to natural disasters. This study would evaluate all emergency egress patterns and alternatives, and may inform final design details for changes along Highway 33.

In the case of Oak View, the space gained via the lane reduction could be used to accommodate elements such as bike lanes and on-street parking. The drawing on the following page illustrates how such a design might look:

[1] 2016 Traffic Volume data shows an AADT of 21,300 along Highway 33 between Creek Road and Santa Ana Boulevard.

[2] FHWA. Evaluation of Lane Reduction "Road Diet" Measures on Crashes. (2010). https://www.fhwa.dot.gov/publications/research/safety/10053/

And below, an aerial view illustrates how the revised cross-section could accommodate an attractive, compact village with safe pedestrian crossings.

The changes proposed to the Oak View village represent a significant change to the character and safety of the area.

What About Roundabouts?

During the planning process, community members expressed desire and support for roundabouts at the intersections of Highway 33 and Larmier Avenue and Santa Ana Boulevard. Roundabouts were not mentioned as recommendations due to the need to acquire adjacent land at these intersections to make construction feasible, and may be considered in the future. Roundabouts have been shown by the FHWA to be successful in rural communities, and have a proven track record of reducing crashes, improve speed management, and facilitate a consistent traffic flow.

Is a Road Diet in Oak View Viable?

As noted above, the traffic volumes observed on Highway 33 through Oak View are within range to consider the corridor a candidate for a road diet. To better understand the impacts of a road diet through Oak View, a travel time model was developed (using Synchro) for the corridor from a few hundred feet north of Santa Ana Boulevard and a few hundred feet south of Larmier Avenue.

The model was run using peak turning count volume data (collected June 2018) and applying it to Synchro using two different methodologies:

- Synchro: Produces consistent output
- Simtraffic: Produces slight variations every model run

Based on these model runs, the most significant delays according to the model would be 65 seconds in the southbound direction during peak volumes in the am, as seen in Table 11. In the afternoons, delays are more significant in the northbound direction, but anticipated to be less than 30 seconds. These modeling efforts assumed traffic flowed at 35 mph during peak traffic hours.

Concerns were expressed that 35 mph, the posted speed limit, did not match the observed free flow speeds of 45 mph. While it is unlikely that peak traffic flows travel at 45 mph, the difference in travelling the length of the proposed road diet (0.5 miles) in free flow conditions assuming no stops are encountered, is 6 seconds in travel time. If vehicles during peak traffic conditions are traveling at 45 mph (unlikely), an additional 6 second delay to the above-mentioned delays could be expected. This variance between posted speed limits and observed free flow speeds were mentioned time and time again by residents throughout this planning process as a need to implement design strategies to bring speeds down to the speed limit, and create a safer environment for community members.

Lastly, as a road diet would be a roadway repurposing project, and is not adding lanes, the lane reconfiguration would not induce additional vehicle miles travelled (VMT). As such, this project would be compliant with revised California Environmental Quality Act (CEQA) guidelines to determine project impacts.

Full Synchro and Sim Traffic reports are included in the Appendix.

Table 11: Modeled Road Diet Impacts on Travel Time through Oak View

Model	Sim Traffic		Synchro	
Directional Travel Time (s)	NB	SB	NB	SB
AM – Existing Model	84.1	93	100.2	99.7
AM – Road Diet	85.8	148.2	106.5	165
Change (+ seconds)	**1.7**	**55.2**	**6.3**	**65.3**
PM – Existing Model	82.1	75.1	95	89.2
PM – Road Diet	106.3	95.9	121.6	105.7
Change (+ seconds)	**24.2**	**20.8**	**26.6**	**16.5**

MIRA MONTE

The northernmost village assessed was Mira Monte. Through this section, Highway 33 is generally a three-lane cross section with commercial uses set back from the street. Changes proposed here include:

- Improved pedestrian facilities at Highland Drive, Woodland Ave, Villanova Road, and Baldwin Road for better access to the Ojai Valley Trail.

Caltrans has planned pedestrian safety projects along this part of the corridor. It would be worth exploring with Caltrans whether their work could incorporate elements of this community plan in order to assure maximum benefit. These elements would include:

- Six-foot concrete sidewalks on the east side of Highway 33. This would require significant regrading and retaining.
- Signalized crosswalk at Highland Drive with stairs and a ramp down to Oak Valley Trail (can cross back over to the east side at Woodland Avenue using existing crosswalks)
- Complete sidewalk network north of Woodland Avenue (on the east side of Highway 33)
- Improve visibility pedestrian visibility at Highland Drive, where community members note consistent volumes of students crossing at this location.

The drawing below (at Highland Drive) illustrates some of the simple curbing and safe crossing ideas that could cost-effectively meet many of the community goals, including pedestrian safety:

Villanova Road (Village Center)

Further north, at Villanova Road, several changes are suggested:

- Improved pedestrian facilities
- Sidewalks completion, new crosswalks, and adequate sidewalk ramps to support ADA connectivity for safe access to the Ojai Valley Trail
- Improved public and private frontages along the Village Market (east) side including sidewalk and landscape improvements
- Improved bus stops on both sides of Highway 33
- Village Gateway at Villanova Road—including intersection.

The drawing below presents an aerial view of these changes include how the streetscape and increased pedestrian crossing accommodation would work together.

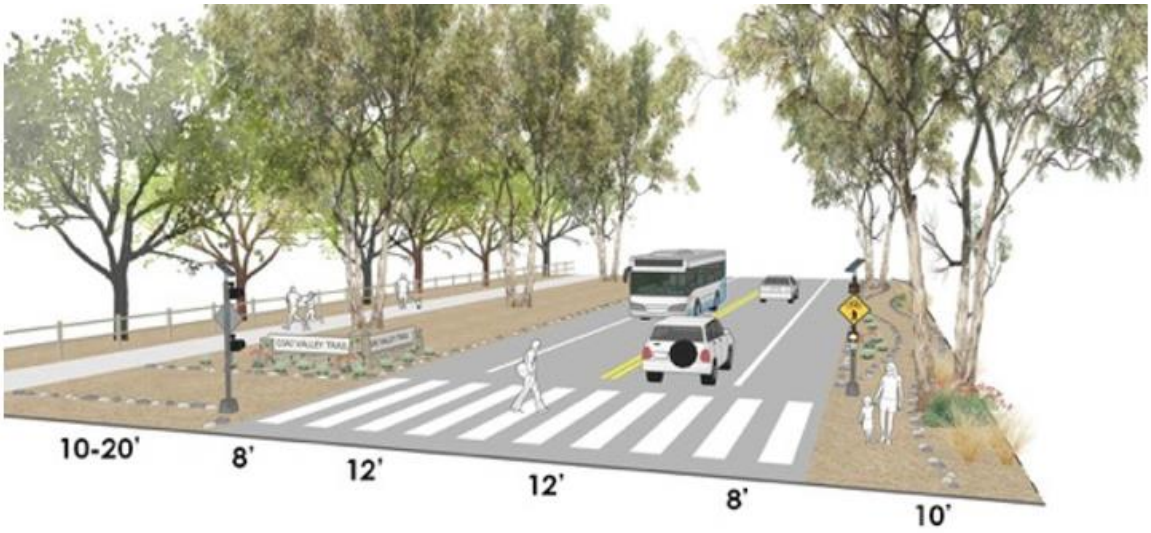
The graphic below contains a closer look at the enhanced transit shelters at Villanova Road:

This crossings would facilitate pedestrian activity and could be coupled with gateway markings, as shown below:

The view of the gateway and crossing from a driver's perspective:

And finally, as was the case along other parts of the corridor, improvements to walkability can be made while preserving the area's rural character. The photo below shows the corridor north of Villanova Road currently:

This section might be designed to better accommodate walking:



The candidate solutions presented above represent a comprehensive effort to address safety and respond to the needs of the community from both a transportation and a land use and urban design perspective.

5 ACTION PLAN

Since the recommendations in the preceding chapter were holistic—including transportation, land use and aesthetic changes—it will be important to decide who will be responsible for executing each element.

TRANSPORTATION PROJECTS

One key aspect of project completion will be funding. Several options exist for the County and the communities to pursue project funding:

- **Implementation Grants –** Several avenues are available for the types of projects recommended in this study. These include Caltrans Sustainable Communities Grants, which are focused on funding safe, sustainable, integrated and efficient transportation projects. Another option could be the USDOT's BUILD grant program, which funds projects that promise to achieve national objectives (the City of Live Oak, for example, was successful in building a coalition to win one of these grants for their rural community in 2016). The transportation-focused projects in this study meet many of the criteria for these two programs.
- **Coordination with Caltrans projects and maintenance** – Caltrans has ongoing programs of maintenance, resurfacing and safety improvement throughout their state system. These projects do not necessarily involve putting things back exactly as they were but can provide the opportunity to implement changes if they are well coordinated. Periodic meetings between Caltrans district and maintenance staff and County staff could help to daylight these opportunities.

Partner Roles:

Ventura County – It is likely that coordination of the various elements of realizing this vision will fall largely to County staff. This does not mean that staff must execute every element but will likely be in the best position to assure items are prioritized properly, moving forward and are championed. It will likely be the County that will be responsible for developing grant applications to pull in funding. Once identified it is possible that agency or private sector partners can be identified to manage the execution of those grants. Elements such as the walk paths along the current roadway shoulders likely fall into the category of projects that will need to be County-led.

Caltrans – Caltrans have the expertise and experience to manage projects that are on the state route corridor itself. Some projects such as safety improvements fall within the agency's mission and may be eligible for Caltrans funding. Others that are less directly within Caltrans' mission may need to be funded by outside partners but may potentially be managed by Caltrans.

Private Stakeholders – Some of the transportation elements that may need to be led by local community or business stakeholders include redeveloping private frontages to include elements

such as trees and on-street parking. This will require close coordination with Caltrans district office.

LAND USE/ZONING CHANGES

Rezoning Process – Some of the recommended approaches (such as the on-street parking and landscaping in Casitas Springs) will require partnership with the private property owners. Some may be achievable simply with the cooperation and consent of individual property owners. It may also be worthwhile, however, to go through a process of rezoning properties to define the desire setbacks and parking configurations should the properties ever go through redevelopment. Such a rezoning process would require some give and take regarding property entitlements, but many communities have found win-win solutions that set the table effectively for the future.

Partner Roles:

Ventura County – Efforts to rezone the properties may be led by the County or could be led by individual business groups.

Caltrans – Caltrans would likely have no role in this effort other than perhaps to review driveway and/or on-street parking standards.

Private Stakeholders – It may be that the businesses within one or multiple of the villages decided to lead this process in partnership with the County.

URBAN DESIGN/STREETSCAPE PROJECTS

Some projects involve aesthetic elements, such as community gateways, that would not fit within the mission of transportation agencies such as Caltrans or USDOT

- **Grants –** Programs such as SCAG's Sustainability Planning Grants could be programs in which projects relating to community image (but having relationships to active transportation) might be competitive.
- **Improvement District –** Some communities, particularly business districts, will band together and self-tax to create funding for common goals. The tax can be based either on business license or property tax and the members of the district have wide latitude in the spending of the funds raised.
- **Benefits District –** Some communities will find way to implement user fees, such as paid parking as a way to raise funds that are invested back into the district. This is not the right approach for all communities but can be an option for communities that want visitors from outside to help with reinvestment.

Partner Roles:

Ventura County – As was the case with transportation projects, it will likely be the County that will be responsible for developing grant applications to pull in funding for urban design elements.

Caltrans – Caltrans would likely be a project stakeholder on any project that involves right of way along the corridor. They would need to be comfortable with elements such as proximity of elements to the traveled way.

Private Stakeholders – Private businesses are a potential funding partner, so their leadership in identifying and implementing funding mechanisms will be needed.

APPENDIX I – SYNCHRO AND SIM TRAVEL TIME DELAY REPORTS

Arterial Level of Service: NB Hwy 33

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Larmier Avenue	III	35	16.7	6.5	23.2	0.13	20.2	C
Oak View Avenue	III	35	34.9	4.8	39.7	0.29	26.3	B
Santa Ana Blvd	III	35	28.2	9.1	37.3	0.23	22.7	C
Total	III		79.8	20.4	100.2	0.66	23.6	C

Arterial Level of Service: SB Hwy 33

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Santa Ana Blvd	III	35	11.2	6.2	17.4	0.08	17.2	D
Oak View Avenue	III	35	28.2	10.4	38.6	0.23	21.9	C
Larmier Avenue	III	35	34.9	8.8	43.7	0.29	23.9	C
Total	III		74.3	25.4	99.7	0.61	22.0	C

Arterial Level of Service: NB Hwy 33

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Larmier Avenue	III	35	16.7	10.2	26.9	0.13	17.4	D
Oak View Avenue	III	35	34.9	8.5	43.4	0.29	24.1	B
Santa Ana Blvd	III	35	28.2	8.0	36.2	0.23	23.4	C
Total	III		79.8	26.7	106.5	0.66	22.2	C

Arterial Level of Service: SB Hwy 33

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Santa Ana Blvd	III	35	11.2	14.7	25.9	0.08	11.5	E
Oak View Avenue	III	35	28.2	15.7	43.9	0.23	19.3	C
Larmier Avenue	III	35	34.9	58.3	93.2	0.29	11.2	E
Total	III		74.3	88.7	163.0	0.61	13.4	E

Arterial Level of Service: NB Hwy 33

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Larmier Avenue	III	35	16.7	4.5	21.2	0.13	22.1	C
Oak View Avenue	III	35	34.9	4.0	38.9	0.29	26.9	B
Santa Ana Blvd	III	35	28.2	6.7	34.9	0.23	24.2	B
Total	III		79.8	15.2	95.0	0.66	24.8	B

Arterial Level of Service: SB Hwy 33

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Santa Ana Blvd	III	35	11.2	4.9	16.1	0.08	18.5	C
Oak View Avenue	III	35	28.2	3.6	31.8	0.23	26.6	B
Larmier Avenue	III	35	34.9	6.4	41.3	0.29	25.3	B
Total	III		74.3	14.9	89.2	0.61	24.6	B

Arterial Level of Service: NB Hwy 33

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Larmier Avenue	III	30	17.5	11.7	29.2	0.13	16.1	D
Oak View Avenue	III	30	36.9	12.7	49.6	0.29	21.1	C
Santa Ana Blvd	III	30	29.8	13.0	42.8	0.23	19.8	C
Total	III		84.2	37.4	121.6	0.66	19.4	C

Arterial Level of Service: SB Hwy 33

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Santa Ana Blvd	III	30	11.7	8.9	20.6	0.08	14.5	D
Oak View Avenue	III	30	29.8	6.8	36.6	0.23	23.1	C
Larmier Avenue	III	30	36.9	11.6	48.5	0.29	21.6	C
Total	III		78.4	27.3	105.7	0.61	20.7	C

Summary of All Intervals

Start Time	6:57
End Time	7:10
Total Time (min)	13
Time Recorded (min)	10
# of Intervals	2
# of Recorded Intervals	1
Vehs Entered	375
Vehs Exited	368
Starting Vehs	65
Ending Vehs	72
Travel Distance (mi)	243
Travel Time (hr)	11.3
Total Delay (hr)	3.7
Total Stops	425
Fuel Used (gal)	8.9

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	7:10
Total Time (min)	10

Volumes adjusted by Growth Factors.

Vehs Entered	375
Vehs Exited	368
Starting Vehs	65
Ending Vehs	72
Travel Distance (mi)	243
Travel Time (hr)	11.3
Total Delay (hr)	3.7
Total Stops	425
Fuel Used (gal)	8.9

3: Hwy 33 & Oak View Avenue Performance by approach

Approach	EB	WB	NB	SB	All
Travel Time (hr)	0.0	0.3	1.4	1.8	3.5

6: Hwy 33 & Larmier Avenue Performance by approach

Approach	EB	WB	NB	SB	All
Travel Time (hr)	0.5	0.0	0.6	2.7	3.8

9: Hwy 33 & Santa Ana Blvd Performance by approach

Approach	EB	WB	NB	SB	All
Travel Time (hr)	0.3	0.1	1.3	0.6	2.3

Total Network Performance

Travel Time (hr)	11.3

Arterial Level of Service: NB Hwy 33

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Larmier Avenue	6	6.5	19.1	0.1	25
Oak View Avenue	3	4.2	32.2	0.3	32
Santa Ana Blvd	9	9.6	32.8	0.2	26
Total		20.3	84.1	0.7	28

Arterial Level of Service: SB Hwy 33

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Santa Ana Blvd	9	6.3	14.5	0.1	21
Oak View Avenue	3	10.6	32.3	0.2	26
Larmier Avenue	6	18.5	46.3	0.3	23
Total		35.5	93.0	0.6	24

Intersection: 3: Hwy 33 & Oak View Avenue

Movement	EB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	T	TR	T	TR
Maximum Queue (ft)	31	142	45	88	113	201	184
Average Queue (ft)	18	66	21	38	46	118	145
95th Queue (ft)	43	130	46	91	111	200	177
Link Distance (ft)	518	725		1453	1453	1176	1176
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			120				
Storage Blk Time (%)						11	
Queuing Penalty (veh)						0	

Intersection: 6: Hwy 33 & Larmier Avenue

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	138	28	23	125	118	22	276	300
Average Queue (ft)	118	6	14	69	38	4	171	196
95th Queue (ft)	155	24	29	134	113	19	281	294
Link Distance (ft)	617	194		645	645		1453	1453
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			165			100		
Storage Blk Time (%)							14	
Queuing Penalty (veh)							1	

Intersection: 9: Hwy 33 & Santa Ana Blvd

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	94	84	71	73	117	121	28	137	118
Average Queue (ft)	53	39	41	52	82	98	6	107	72
95th Queue (ft)	90	97	81	75	138	150	24	149	136
Link Distance (ft)	464		403		1176	1176		407	407
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		60		150			90		
Storage Blk Time (%)	8	0						9	
Queuing Penalty (veh)	13	0						0	

Network Summary

Network wide Queuing Penalty: 15

Summary of All Intervals

Start Time	6:57
End Time	7:10
Total Time (min)	13
Time Recorded (min)	10
# of Intervals	2
# of Recorded Intervals	1
Vehs Entered	401
Vehs Exited	387
Starting Vehs	81
Ending Vehs	95
Travel Distance (mi)	251
Travel Time (hr)	15.6
Total Delay (hr)	7.8
Total Stops	540
Fuel Used (gal)	10.0

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	7:10
Total Time (min)	10

Volumes adjusted by Growth Factors.

Vehs Entered	401
Vehs Exited	387
Starting Vehs	81
Ending Vehs	95
Travel Distance (mi)	251
Travel Time (hr)	15.6
Total Delay (hr)	7.8
Total Stops	540
Fuel Used (gal)	10.0

3: Hwy 33 & Oak View Avenue Performance by approach

Approach	EB	WB	NB	SB	All
Travel Time (hr)	0.1	0.3	1.5	2.7	4.6

6: Hwy 33 & Larmier Avenue Performance by approach

Approach	EB	NB	SB	All
Travel Time (hr)	0.5	0.5	3.7	4.7

9: Hwy 33 & Santa Ana Blvd Performance by approach

Approach	EB	WB	NB	SB	All
Travel Time (hr)	0.7	0.1	1.8	2.1	4.7

Total Network Performance

Travel Time (hr)	15.6

Arterial Level of Service: NB Hwy 33

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Larmier Avenue	6	5.4	17.8	0.1	27
Oak View Avenue	3	8.0	33.2	0.3	32
Santa Ana Blvd	9	11.3	34.8	0.2	24
Total		24.7	85.8	0.7	28

Arterial Level of Service: SB Hwy 33

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Santa Ana Blvd	9	28.5	45.9	0.1	8
Oak View Avenue	3	19.3	41.7	0.2	20
Larmier Avenue	6	33.0	60.7	0.3	17
Total		80.8	148.2	0.6	16

Intersection: 3: Hwy 33 & Oak View Avenue

Movement	EB	WB	NB	NB	SB
Directions Served	LTR	LTR	L	TR	TR
Maximum Queue (ft)	53	112	26	208	429
Average Queue (ft)	37	72	13	91	281
95th Queue (ft)	71	120	31	204	473
Link Distance (ft)	530	737		1458	1178
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			120		
Storage Blk Time (%)				3	19
Queuing Penalty (veh)				1	0

Intersection: 6: Hwy 33 & Larmier Avenue

Movement	EB	NB	NB	SB	SB
Directions Served	LTR	L	TR	L	TR
Maximum Queue (ft)	173	22	170	8	677
Average Queue (ft)	131	4	77	2	448
95th Queue (ft)	174	19	177	7	782
Link Distance (ft)	629		648		1458
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		165		100	
Storage Blk Time (%)			1		26
Queuing Penalty (veh)			0		3

Intersection: 9: Hwy 33 & Santa Ana Blvd

Movement	EB	EB	WB	NB	NB	SB
Directions Served	LT	R	LTR	L	TR	TR
Maximum Queue (ft)	232	85	31	118	274	442
Average Queue (ft)	180	85	24	100	130	410
95th Queue (ft)	237	85	44	136	255	471
Link Distance (ft)	476		415		1178	408
Upstream Blk Time (%)						22
Queuing Penalty (veh)						0
Storage Bay Dist (ft)		60		150		
Storage Blk Time (%)	25	17			4	34
Queuing Penalty (veh)	39	18			3	1

Network Summary

Network wide Queuing Penalty: 65

Summary of All Intervals

Start Time	6:57
End Time	7:10
Total Time (min)	13
Time Recorded (min)	10
# of Intervals	2
# of Recorded Intervals	1
Vehs Entered	368
Vehs Exited	387
Starting Vehs	74
Ending Vehs	55
Travel Distance (mi)	239
Travel Time (hr)	9.8
Total Delay (hr)	2.5
Total Stops	312
Fuel Used (gal)	8.4

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	7:10
Total Time (min)	10

Volumes adjusted by Growth Factors.

Vehs Entered	368
Vehs Exited	387
Starting Vehs	74
Ending Vehs	55
Travel Distance (mi)	239
Travel Time (hr)	9.8
Total Delay (hr)	2.5
Total Stops	312
Fuel Used (gal)	8.4

3: Hwy 33 & Oak View Avenue Performance by approach

Approach	EB	WB	NB	SB	All
Travel Time (hr)	0.0	0.2	1.6	1.2	3.0

6: Hwy 33 & Larmier Avenue Performance by approach

Approach	EB	WB	NB	SB	All
Travel Time (hr)	0.2	0.0	0.8	1.5	2.6

9: Hwy 33 & Santa Ana Blvd Performance by approach

Approach	EB	WB	NB	SB	All
Travel Time (hr)	0.3	0.1	1.7	0.6	2.6

Total Network Performance

Travel Time (hr)	9.8

Arterial Level of Service: NB Hwy 33

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Larmier Avenue	6	5.1	17.9	0.1	26
Oak View Avenue	3	5.3	32.1	0.3	33
Santa Ana Blvd	9	9.3	32.1	0.2	26
Total		19.7	82.1	0.7	29

Arterial Level of Service: SB Hwy 33

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Santa Ana Blvd	9	6.4	14.3	0.1	21
Oak View Avenue	3	4.2	26.7	0.2	32
Larmier Avenue	6	7.2	34.1	0.3	31
Total		17.7	75.1	0.6	29

Intersection: 3: Hwy 33 & Oak View Avenue

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	31	100	24	86	104	22	94	117
Average Queue (ft)	6	61	10	46	47	4	61	62
95th Queue (ft)	26	100	29	109	107	19	118	135
Link Distance (ft)	517	724		1452	1452		1175	1175
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			120			75		
Storage Blk Time (%)							5	
Queuing Penalty (veh)							0	

Intersection: 6: Hwy 33 & Larmier Avenue

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	89	32	22	208	121	22	104	119
Average Queue (ft)	52	17	13	81	40	9	52	62
95th Queue (ft)	93	41	30	207	114	26	116	130
Link Distance (ft)	616	193		645	645		1452	1452
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			165			100		
Storage Blk Time (%)				2			1	
Queuing Penalty (veh)				0			0	

Intersection: 9: Hwy 33 & Santa Ana Blvd

Movement	EB	EB	WB	NB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	T	TR
Maximum Queue (ft)	162	85	31	116	157	171	139	118
Average Queue (ft)	78	69	24	70	98	120	107	55
95th Queue (ft)	159	98	44	110	180	180	143	121
Link Distance (ft)	463		402		1175	1175	407	407
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		60		150				
Storage Blk Time (%)	17	0			1		7	
Queuing Penalty (veh)	12	0			2		0	

Network Summary

Network wide Queuing Penalty: 16

Summary of All Intervals

Start Time	6:57
End Time	7:10
Total Time (min)	13
Time Recorded (min)	10
# of Intervals	2
# of Recorded Intervals	1
Vehs Entered	374
Vehs Exited	371
Starting Vehs	74
Ending Vehs	77
Travel Distance (mi)	241
Travel Time (hr)	12.1
Total Delay (hr)	3.8
Total Stops	387
Fuel Used (gal)	8.8

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	7:10
Total Time (min)	10

Volumes adjusted by Growth Factors.

Vehs Entered	374
Vehs Exited	371
Starting Vehs	74
Ending Vehs	77
Travel Distance (mi)	241
Travel Time (hr)	12.1
Total Delay (hr)	3.8
Total Stops	387
Fuel Used (gal)	8.8

3: Hwy 33 & Oak View Avenue Performance by approach

Approach	EB	WB	NB	SB	All
Travel Time (hr)	0.1	0.1	2.4	1.5	4.2

6: Hwy 33 & Larmier Avenue Performance by approach

Approach	EB	WB	NB	SB	All
Travel Time (hr)	0.2	0.0	1.3	1.9	3.5

9: Hwy 33 & Santa Ana Blvd Performance by approach

Approach	EB	WB	NB	SB	All
Travel Time (hr)	0.3	0.0	1.7	0.8	2.9

Total Network Performance

Travel Time (hr) 12.1

Arterial Level of Service: NB Hwy 33

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Larmier Avenue	6	10.6	26.4	0.1	18
Oak View Avenue	3	14.1	46.6	0.3	22
Santa Ana Blvd	9	8.0	33.3	0.2	25
Total		32.7	106.3	0.7	22

Arterial Level of Service: SB Hwy 33

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Santa Ana Blvd	9	10.3	20.5	0.1	15
Oak View Avenue	3	7.0	33.1	0.2	26
Larmier Avenue	6	11.7	42.3	0.3	25
Total		29.1	95.9	0.6	23

Intersection: 3: Hwy 33 & Oak View Avenue

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (ft)	74	74	144	287	26	240
Average Queue (ft)	42	35	39	229	5	139
95th Queue (ft)	76	74	128	291	23	245
Link Distance (ft)	530	737		1458		1178
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			120		75	
Storage Blk Time (%)				15		7
Queuing Penalty (veh)				4		0

Intersection: 6: Hwy 33 & Larmier Avenue

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (ft)	96	49	66	306	24	394
Average Queue (ft)	68	24	20	176	5	208
95th Queue (ft)	95	51	61	290	21	376
Link Distance (ft)	629	206		648		1458
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			165		100	
Storage Blk Time (%)				6		13
Queuing Penalty (veh)				2		3

Intersection: 9: Hwy 33 & Santa Ana Blvd

Movement	EB	EB	WB	NB	NB	SB
Directions Served	LT	R	LTR	L	TR	TR
Maximum Queue (ft)	142	85	53	74	274	266
Average Queue (ft)	79	59	29	50	149	158
95th Queue (ft)	159	110	57	94	321	265
Link Distance (ft)	476		415		1178	408
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		60		150		
Storage Blk Time (%)	11	7			6	17
Queuing Penalty (veh)	8	6			7	1

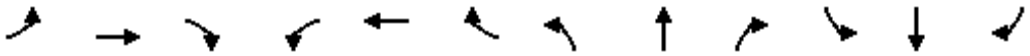
Network Summary

Network wide Queuing Penalty: 31

APPENDIX II – SYNCHRO DETAILED HCM SUMMARY

HCM 6th Signalized Intersection Summary
1: Hwy 33 & Larmier Avenue

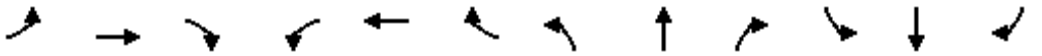
11/27/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	3	29	10	1	2	19	596	3	10	999	140
Future Volume (veh/h)	150	3	29	10	1	2	19	596	3	10	999	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.97		0.97	1.00		0.97	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1821	1894	1821	1821	1894	1821	1821	1821	1821	1821	1821	1821
Adj Flow Rate, veh/h	170	3	33	11	1	2	22	677	3	11	1135	159
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	269	3	38	267	27	37	316	2552	11	577	2201	308
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.72	0.72	0.72	0.72	0.72	0.72
Sat Flow, veh/h	1217	21	236	1212	168	230	426	3533	16	759	3047	426
Grp Volume(v), veh/h	206	0	0	14	0	0	22	332	348	11	643	651
Grp Sat Flow(s),veh/h/ln	1475	0	0	1610	0	0	426	1730	1818	759	1730	1742
Q Serve(g_s), s	11.5	0.0	0.0	0.0	0.0	0.0	2.2	6.1	6.1	0.5	15.1	15.2
Cycle Q Clear(g_c), s	12.5	0.0	0.0	0.6	0.0	0.0	17.3	6.1	6.1	6.5	15.1	15.2
Prop In Lane	0.83		0.16	0.79		0.14	1.00		0.01	1.00		0.24
Lane Grp Cap(c), veh/h	311	0	0	331	0	0	316	1250	1314	577	1250	1259
V/C Ratio(X)	0.66	0.00	0.00	0.04	0.00	0.00	0.07	0.27	0.27	0.02	0.51	0.52
Avail Cap(c_a), veh/h	531	0	0	554	0	0	316	1250	1314	577	1250	1259
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.89	0.89	0.89
Uniform Delay (d), s/veh	37.4	0.0	0.0	32.5	0.0	0.0	9.5	4.4	4.4	5.5	5.6	5.7
Incr Delay (d2), s/veh	2.4	0.0	0.0	0.1	0.0	0.0	0.4	0.5	0.5	0.1	1.4	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	0.0	0.0	0.3	0.0	0.0	0.2	1.8	1.9	0.1	4.6	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.8	0.0	0.0	32.6	0.0	0.0	9.9	4.9	4.9	5.6	7.0	7.0
LnGrp LOS	D	A	A	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h		206			14			702			1305	
Approach Delay, s/veh		39.8			32.6			5.0			7.0	
Approach LOS		D			C			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		72.5		19.5		72.5		19.5				
Change Period (Y+Rc), s		6.0		4.6		6.0		4.6				
Max Green Setting (Gmax), s		52.0		28.9		52.0		28.9				
Max Q Clear Time (g_c+I1), s		20.3		14.5		18.1		3.0				
Green Ext Time (p_c), s		8.2		0.5		18.6		0.0				

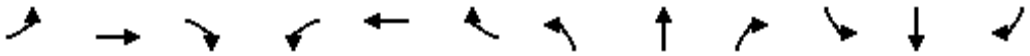
Intersection Summary												
HCM 6th Ctrl Delay			9.6									
HCM 6th LOS			A									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	1	35	95	0	1	24	684	27	1	1088	8
Future Volume (veh/h)	12	1	35	95	0	1	24	684	27	1	1088	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.97	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1821	1821	1821	1821	1821	1821	1821	1821	1821	1821	1821	1821
Adj Flow Rate, veh/h	13	1	38	104	0	1	26	752	30	1	1196	9
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	74	24	129	240	0	2	381	2602	104	565	2704	20
Arrive On Green	0.11	0.11	0.11	0.11	0.00	0.11	0.77	0.77	0.77	0.77	0.77	0.77
Sat Flow, veh/h	214	212	1155	1435	3	14	464	3388	135	691	3520	26
Grp Volume(v), veh/h	52	0	0	105	0	0	26	384	398	1	588	617
Grp Sat Flow(s),veh/h/ln	1580	0	0	1452	0	0	464	1730	1793	691	1730	1816
Q Serve(g_s), s	0.0	0.0	0.0	3.2	0.0	0.0	1.9	6.0	6.0	0.0	10.7	10.7
Cycle Q Clear(g_c), s	2.7	0.0	0.0	5.9	0.0	0.0	12.6	6.0	6.0	6.0	10.7	10.7
Prop In Lane	0.25		0.73	0.99		0.01	1.00		0.08	1.00		0.01
Lane Grp Cap(c), veh/h	227	0	0	242	0	0	381	1329	1377	565	1329	1395
V/C Ratio(X)	0.23	0.00	0.00	0.43	0.00	0.00	0.07	0.29	0.29	0.00	0.44	0.44
Avail Cap(c_a), veh/h	583	0	0	565	0	0	381	1329	1377	565	1329	1395
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.97	0.97	0.97	0.91	0.91	0.91
Uniform Delay (d), s/veh	36.7	0.0	0.0	38.0	0.0	0.0	5.9	3.1	3.1	4.0	3.7	3.7
Incr Delay (d2), s/veh	0.5	0.0	0.0	1.2	0.0	0.0	0.3	0.5	0.5	0.0	1.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.0	2.3	0.0	0.0	0.2	1.5	1.6	0.0	2.7	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.2	0.0	0.0	39.2	0.0	0.0	6.2	3.6	3.6	4.0	4.6	4.6
LnGrp LOS	D	A	A	D	A	A	A	A	A	A	A	A
Approach Vol, veh/h		52			105			808			1206	
Approach Delay, s/veh		37.2			39.2			3.7			4.6	
Approach LOS		D			D			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		75.4		14.6		75.4		14.6				
Change Period (Y+Rc), s		6.3		4.5		6.3		4.5				
Max Green Setting (Gmax), s		47.7		31.5		47.7		31.5				
Max Q Clear Time (g_c+I1), s		14.6		4.7		12.7		7.9				
Green Ext Time (p_c), s		9.9		0.1		16.9		0.3				

Intersection Summary												
HCM 6th Ctrl Delay			6.7									
HCM 6th LOS			A									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	101	2	153	28	9	8	79	629	10	4	867	48
Future Volume (veh/h)	101	2	153	28	9	8	79	629	10	4	867	48
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1821	1821	1821	1821	1821	1821	1821	1821	1821	1821	1821	1821
Adj Flow Rate, veh/h	109	2	165	30	10	9	85	676	11	4	932	52
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	319	5	284	153	50	31	410	2425	39	515	2318	129
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.47	0.47	0.47	0.70	0.70	0.70
Sat Flow, veh/h	1295	28	1531	476	268	167	572	3484	57	755	3332	186
Grp Volume(v), veh/h	111	0	165	49	0	0	85	336	351	4	484	500
Grp Sat Flow(s),veh/h/ln	1323	0	1531	912	0	0	572	1730	1811	755	1730	1787
Q Serve(g_s), s	0.0	0.0	8.9	1.3	0.0	0.0	9.1	10.7	10.7	0.2	10.6	10.6
Cycle Q Clear(g_c), s	7.1	0.0	8.9	8.4	0.0	0.0	19.7	10.7	10.7	10.9	10.6	10.6
Prop In Lane	0.98		1.00	0.61		0.18	1.00		0.03	1.00		0.10
Lane Grp Cap(c), veh/h	324	0	284	233	0	0	410	1204	1260	515	1204	1244
V/C Ratio(X)	0.34	0.00	0.58	0.21	0.00	0.00	0.21	0.28	0.28	0.01	0.40	0.40
Avail Cap(c_a), veh/h	550	0	532	454	0	0	410	1204	1260	515	1204	1244
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	0.97	0.97	0.97	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.8	0.0	33.5	32.9	0.0	0.0	16.2	10.2	10.2	8.1	5.8	5.8
Incr Delay (d2), s/veh	0.6	0.0	1.9	0.4	0.0	0.0	1.1	0.6	0.5	0.0	1.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.0	3.4	1.0	0.0	0.0	1.4	4.2	4.4	0.0	3.3	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.4	0.0	35.4	33.4	0.0	0.0	17.3	10.7	10.7	8.1	6.8	6.7
LnGrp LOS	C	A	D	C	A	A	B	B	B	A	A	A
Approach Vol, veh/h		276			49			772			988	
Approach Delay, s/veh		34.6			33.4			11.4			6.8	
Approach LOS		C			C			B			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		68.6		21.4		68.6		21.4				
Change Period (Y+Rc), s		6.0		* 4.7		6.0		* 4.7				
Max Green Setting (Gmax), s		48.0		* 31		48.0		* 31				
Max Q Clear Time (g_c+I1), s		21.7		10.9		12.9		10.4				
Green Ext Time (p_c), s		8.6		0.8		13.0		0.1				

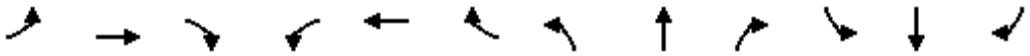
Intersection Summary												
HCM 6th Ctrl Delay			12.8									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Hwy 33 & Larmier Avenue

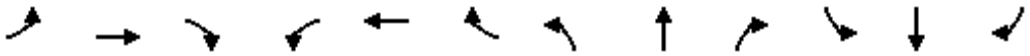
11/27/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	3	29	10	1	2	19	596	3	10	999	140
Future Volume (veh/h)	150	3	29	10	1	2	19	596	3	10	999	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.95		0.95	1.00		0.95	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1821	1894	1821	1821	1894	1821	1821	1821	1821	1821	1821	1821
Adj Flow Rate, veh/h	170	3	33	11	1	2	22	677	3	11	1135	159
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	274	4	39	275	28	39	83	1296	6	501	1117	157
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.72	0.72	0.72	0.72	0.72	0.72
Sat Flow, veh/h	1195	21	232	1210	165	229	426	1812	8	760	1562	219
Grp Volume(v), veh/h	206	0	0	14	0	0	22	0	680	11	0	1294
Grp Sat Flow(s),veh/h/ln	1448	0	0	1604	0	0	426	0	1820	760	0	1781
Q Serve(g_s), s	11.6	0.0	0.0	0.0	0.0	0.0	1.0	0.0	15.6	0.6	0.0	65.8
Cycle Q Clear(g_c), s	12.6	0.0	0.0	0.6	0.0	0.0	65.8	0.0	15.6	15.2	0.0	65.8
Prop In Lane	0.83		0.16	0.79		0.14	1.00		0.00	1.00		0.12
Lane Grp Cap(c), veh/h	317	0	0	342	0	0	83	0	1302	501	0	1274
V/C Ratio(X)	0.65	0.00	0.00	0.04	0.00	0.00	0.27	0.00	0.52	0.02	0.00	1.02
Avail Cap(c_a), veh/h	523	0	0	554	0	0	83	0	1302	501	0	1274
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.41	0.00	0.41
Uniform Delay (d), s/veh	36.9	0.0	0.0	32.0	0.0	0.0	45.9	0.0	6.0	9.2	0.0	13.1
Incr Delay (d2), s/veh	2.2	0.0	0.0	0.0	0.0	0.0	7.7	0.0	1.5	0.0	0.0	20.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	0.0	0.0	0.3	0.0	0.0	0.7	0.0	5.1	0.1	0.0	25.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.1	0.0	0.0	32.0	0.0	0.0	53.6	0.0	7.5	9.2	0.0	33.4
LnGrp LOS	D	A	A	C	A	A	D	A	A	A	A	F
Approach Vol, veh/h		206			14			702			1305	
Approach Delay, s/veh		39.1			32.0			8.9			33.2	
Approach LOS		D			C			A			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		71.8		20.2		71.8		20.2				
Change Period (Y+Rc), s		6.0		4.6		6.0		4.6				
Max Green Setting (Gmax), s		52.0		28.9		52.0		28.9				
Max Q Clear Time (g_c+I1), s		68.8		14.6		67.8		3.0				
Green Ext Time (p_c), s		0.0		1.0		0.0		0.0				

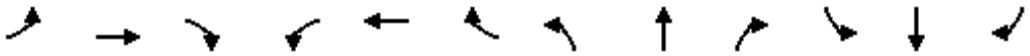
Intersection Summary												
HCM 6th Ctrl Delay			26.1									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	1	35	95	0	1	24	684	27	1	1088	8
Future Volume (veh/h)	12	1	35	95	0	1	24	684	27	1	1088	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.98	0.98		0.96	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1821	1821	1821	1821	1821	1821	1821	1821	1821	1821	1821	1821
Adj Flow Rate, veh/h	13	1	38	104	0	1	26	752	30	1	1196	9
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	75	24	131	243	0	2	435	1329	53	485	1381	10
Arrive On Green	0.11	0.11	0.11	0.11	0.00	0.11	0.77	0.77	0.77	1.00	1.00	1.00
Sat Flow, veh/h	214	208	1145	1422	3	14	464	1737	69	691	1805	14
Grp Volume(v), veh/h	52	0	0	105	0	0	26	0	782	1	0	1205
Grp Sat Flow(s),veh/h/ln	1567	0	0	1439	0	0	464	0	1807	691	0	1819
Q Serve(g_s), s	0.0	0.0	0.0	3.3	0.0	0.0	1.3	0.0	16.1	0.0	0.0	0.0
Cycle Q Clear(g_c), s	2.7	0.0	0.0	6.0	0.0	0.0	1.3	0.0	16.1	16.2	0.0	0.0
Prop In Lane	0.25		0.73	0.99		0.01	1.00		0.04	1.00		0.01
Lane Grp Cap(c), veh/h	230	0	0	245	0	0	435	0	1382	485	0	1392
V/C Ratio(X)	0.23	0.00	0.00	0.43	0.00	0.00	0.06	0.00	0.57	0.00	0.00	0.87
Avail Cap(c_a), veh/h	579	0	0	561	0	0	435	0	1382	485	0	1392
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.82	0.00	0.82	0.61	0.00	0.61
Uniform Delay (d), s/veh	36.5	0.0	0.0	37.7	0.0	0.0	2.6	0.0	4.4	1.9	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.0	1.2	0.0	0.0	0.2	0.0	1.4	0.0	0.0	4.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.0	2.3	0.0	0.0	0.1	0.0	4.4	0.0	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.0	0.0	0.0	38.9	0.0	0.0	2.8	0.0	5.8	1.9	0.0	4.7
LnGrp LOS	D	A	A	D	A	A	A	A	A	A	A	A
Approach Vol, veh/h		52			105			808			1206	
Approach Delay, s/veh		37.0			38.9			5.7			4.7	
Approach LOS		D			D			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		75.2		14.8		75.2		14.8				
Change Period (Y+Rc), s		6.3		4.5		6.3		4.5				
Max Green Setting (Gmax), s		47.7		31.5		47.7		31.5				
Max Q Clear Time (g_c+I1), s		18.1		4.7		18.2		8.0				
Green Ext Time (p_c), s		6.7		0.2		13.6		0.5				

Intersection Summary												
HCM 6th Ctrl Delay			7.5									
HCM 6th LOS			A									



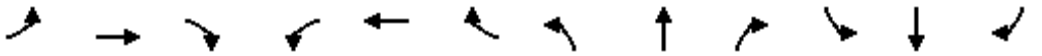
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	101	2	153	28	9	8	79	629	10	4	867	48
Future Volume (veh/h)	101	2	153	28	9	8	79	629	10	4	867	48
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1821	1821	1821	1821	1821	1821	1821	1821	1821	1821	1821	1821
Adj Flow Rate, veh/h	109	2	165	30	10	9	85	676	11	4	932	52
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	318	5	282	152	49	31	269	1243	20	605	1189	66
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	1.00	1.00	1.00	0.70	0.70	0.70
Sat Flow, veh/h	1288	28	1523	473	267	166	572	1787	29	755	1708	95
Grp Volume(v), veh/h	111	0	165	49	0	0	85	0	687	4	0	984
Grp Sat Flow(s),veh/h/ln	1316	0	1523	906	0	0	572	0	1816	755	0	1804
Q Serve(g_s), s	0.0	0.0	8.9	1.3	0.0	0.0	8.9	0.0	0.0	0.1	0.0	32.9
Cycle Q Clear(g_c), s	7.2	0.0	8.9	8.5	0.0	0.0	41.8	0.0	0.0	0.1	0.0	32.9
Prop In Lane	0.98		1.00	0.61		0.18	1.00		0.02	1.00		0.05
Lane Grp Cap(c), veh/h	323	0	282	232	0	0	269	0	1264	605	0	1255
V/C Ratio(X)	0.34	0.00	0.59	0.21	0.00	0.00	0.32	0.00	0.54	0.01	0.00	0.78
Avail Cap(c_a), veh/h	548	0	529	452	0	0	269	0	1264	605	0	1255
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	0.81	0.00	0.81	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.8	0.0	33.5	33.0	0.0	0.0	11.0	0.0	0.0	4.2	0.0	9.2
Incr Delay (d2), s/veh	0.6	0.0	1.9	0.4	0.0	0.0	2.5	0.0	1.4	0.0	0.0	5.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.0	3.4	1.0	0.0	0.0	1.1	0.0	0.5	0.0	0.0	11.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.4	0.0	35.4	33.4	0.0	0.0	13.4	0.0	1.4	4.2	0.0	14.1
LnGrp LOS	C	A	D	C	A	A	B	A	A	A	A	B
Approach Vol, veh/h		276			49			772			988	
Approach Delay, s/veh		34.6			33.4			2.7			14.1	
Approach LOS		C			C			A			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		68.6		21.4		68.6		21.4				
Change Period (Y+Rc), s		6.0		* 4.7		6.0		* 4.7				
Max Green Setting (Gmax), s		48.0		* 31		48.0		* 31				
Max Q Clear Time (g_c+I1), s		43.8		10.9		34.9		10.5				
Green Ext Time (p_c), s		2.0		1.1		6.2		0.2				

Intersection Summary												
HCM 6th Ctrl Delay			13.0									
HCM 6th LOS			B									

Notes

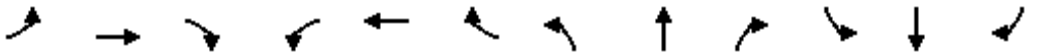
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	3	12	19	3	17	31	1005	11	21	734	53
Future Volume (veh/h)	69	3	12	19	3	17	31	1005	11	21	734	53
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.97		0.96	0.97		0.96	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1821	1894	1821	1821	1894	1821	1821	1821	1821	1821	1821	1821
Adj Flow Rate, veh/h	71	3	12	20	3	18	32	1036	11	22	757	55
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	228	14	27	143	35	91	586	2619	28	430	2442	177
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.75	0.75	0.75	1.00	1.00	1.00
Sat Flow, veh/h	1171	111	208	625	275	705	671	3507	37	539	3270	237
Grp Volume(v), veh/h	86	0	0	41	0	0	32	511	536	22	400	412
Grp Sat Flow(s),veh/h/ln	1489	0	0	1605	0	0	671	1730	1814	539	1730	1777
Q Serve(g_s), s	2.5	0.0	0.0	0.0	0.0	0.0	1.1	9.0	9.0	0.5	0.0	0.0
Cycle Q Clear(g_c), s	4.3	0.0	0.0	1.8	0.0	0.0	1.1	9.0	9.0	9.5	0.0	0.0
Prop In Lane	0.83		0.14	0.49		0.44	1.00		0.02	1.00		0.13
Lane Grp Cap(c), veh/h	269	0	0	269	0	0	586	1292	1355	430	1292	1327
V/C Ratio(X)	0.32	0.00	0.00	0.15	0.00	0.00	0.05	0.40	0.40	0.05	0.31	0.31
Avail Cap(c_a), veh/h	580	0	0	594	0	0	586	1292	1355	430	1292	1327
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.97	0.97	0.97
Uniform Delay (d), s/veh	34.0	0.0	0.0	33.1	0.0	0.0	2.9	3.9	3.9	0.7	0.0	0.0
Incr Delay (d2), s/veh	0.7	0.0	0.0	0.3	0.0	0.0	0.2	0.9	0.9	0.2	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	0.0	0.8	0.0	0.0	0.1	2.4	2.5	0.0	0.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.7	0.0	0.0	33.3	0.0	0.0	3.0	4.8	4.7	0.9	0.6	0.6
LnGrp LOS	C	A	A	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h		86			41			1079			834	
Approach Delay, s/veh		34.7			33.3			4.7			0.6	
Approach LOS		C			C			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		69.5		15.5		69.5		15.5				
Change Period (Y+Rc), s		6.0		4.6		6.0		4.6				
Max Green Setting (Gmax), s		45.0		29.4		45.0		29.4				
Max Q Clear Time (g_c+I1), s		12.0		6.3		12.5		3.8				
Green Ext Time (p_c), s		8.2		0.4		5.9		0.2				

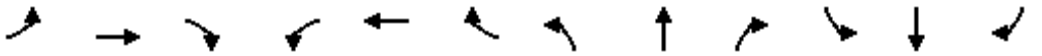
Intersection Summary												
HCM 6th Ctrl Delay			4.9									
HCM 6th LOS			A									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	3	15	43	3	3	24	1024	37	5	784	9
Future Volume (veh/h)	9	3	15	43	3	3	24	1024	37	5	784	9
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.98	0.98		0.97	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1821	1821	1821	1821	1821	1821	1821	1821	1821	1821	1821	1821
Adj Flow Rate, veh/h	9	3	15	44	3	3	25	1056	38	5	808	9
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	90	40	93	212	14	9	596	2606	94	479	2682	30
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	1.00	1.00	1.00	1.00	1.00	1.00
Sat Flow, veh/h	316	374	862	1227	134	87	668	3406	123	515	3505	39
Grp Volume(v), veh/h	27	0	0	50	0	0	25	536	558	5	399	418
Grp Sat Flow(s),veh/h/ln	1551	0	0	1448	0	0	668	1730	1799	515	1730	1814
Q Serve(g_s), s	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.3	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.33		0.56	0.88		0.06	1.00		0.07	1.00		0.02
Lane Grp Cap(c), veh/h	224	0	0	236	0	0	596	1324	1376	479	1324	1388
V/C Ratio(X)	0.12	0.00	0.00	0.21	0.00	0.00	0.04	0.41	0.41	0.01	0.30	0.30
Avail Cap(c_a), veh/h	586	0	0	574	0	0	596	1324	1376	479	1324	1388
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.93	0.93	0.93	0.96	0.96	0.96
Uniform Delay (d), s/veh	34.4	0.0	0.0	34.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.4	0.0	0.0	0.1	0.9	0.8	0.0	0.6	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	1.0	0.0	0.0	0.0	0.3	0.3	0.0	0.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.6	0.0	0.0	35.3	0.0	0.0	0.1	0.9	0.8	0.0	0.6	0.5
LnGrp LOS	C	A	A	D	A	A	A	A	A	A	A	A
Approach Vol, veh/h		27			50			1119			822	
Approach Delay, s/veh		34.6			35.3			0.8			0.5	
Approach LOS		C			D			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		71.3		13.7		71.3		13.7				
Change Period (Y+Rc), s		6.3		4.5		6.3		4.5				
Max Green Setting (Gmax), s		44.5		29.7		44.5		29.7				
Max Q Clear Time (g_c+I1), s		2.0		3.3		2.0		4.5				
Green Ext Time (p_c), s		9.1		0.1		5.8		0.2				

Intersection Summary												
HCM 6th Ctrl Delay			2.0									
HCM 6th LOS			A									



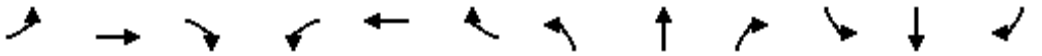
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	5	75	22	7	3	133	834	28	5	726	73
Future Volume (veh/h)	93	5	75	22	7	3	133	834	28	5	726	73
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1821	1821	1821	1821	1821	1821	1821	1821	1821	1821	1821	1821
Adj Flow Rate, veh/h	94	5	76	22	7	3	134	842	28	5	733	74
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	340	16	287	200	58	19	485	2349	78	522	2181	220
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	1.00	1.00	1.00	0.69	0.69	0.69
Sat Flow, veh/h	1378	86	1536	688	312	103	675	3417	114	636	3173	320
Grp Volume(v), veh/h	99	0	76	32	0	0	134	426	444	5	399	408
Grp Sat Flow(s),veh/h/ln	1464	0	1536	1103	0	0	675	1730	1801	636	1730	1763
Q Serve(g_s), s	0.0	0.0	3.6	0.5	0.0	0.0	3.2	0.0	0.0	0.2	8.0	8.0
Cycle Q Clear(g_c), s	4.7	0.0	3.6	5.2	0.0	0.0	11.2	0.0	0.0	0.2	8.0	8.0
Prop In Lane	0.95		1.00	0.69		0.09	1.00		0.06	1.00		0.18
Lane Grp Cap(c), veh/h	356	0	287	277	0	0	485	1189	1238	522	1189	1212
V/C Ratio(X)	0.28	0.00	0.27	0.12	0.00	0.00	0.28	0.36	0.36	0.01	0.34	0.34
Avail Cap(c_a), veh/h	580	0	529	502	0	0	485	1189	1238	522	1189	1212
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	0.93	0.93	0.93	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.0	0.0	29.6	29.6	0.0	0.0	0.8	0.0	0.0	4.2	5.4	5.4
Incr Delay (d2), s/veh	0.4	0.0	0.5	0.2	0.0	0.0	1.3	0.8	0.8	0.0	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.0	1.3	0.6	0.0	0.0	0.2	0.3	0.3	0.0	2.5	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.4	0.0	30.1	29.8	0.0	0.0	2.1	0.8	0.8	4.2	6.2	6.2
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h		175			32			1004			812	
Approach Delay, s/veh		30.3			29.8			0.9			6.1	
Approach LOS		C			C			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		64.4		20.6		64.4		20.6				
Change Period (Y+Rc), s		6.0		* 4.7		6.0		* 4.7				
Max Green Setting (Gmax), s		45.0		* 29		45.0		* 29				
Max Q Clear Time (g_c+I1), s		13.2		6.7		10.0		7.2				
Green Ext Time (p_c), s		7.6		0.7		5.7		0.1				

Intersection Summary												
HCM 6th Ctrl Delay			6.0									
HCM 6th LOS			A									

Notes

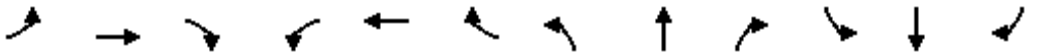
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	3	12	19	3	17	31	1005	11	21	734	53
Future Volume (veh/h)	69	3	12	19	3	17	31	1005	11	21	734	53
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.94		0.94	0.95		0.94	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1821	1894	1821	1821	1894	1821	1821	1821	1821	1821	1821	1821
Adj Flow Rate, veh/h	71	3	12	20	3	18	32	1036	11	22	757	55
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	225	14	26	142	35	89	586	1343	14	308	1252	91
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.75	0.75	0.75	1.00	1.00	1.00
Sat Flow, veh/h	1145	109	203	615	271	694	671	1799	19	539	1677	122
Grp Volume(v), veh/h	86	0	0	41	0	0	32	0	1047	22	0	812
Grp Sat Flow(s),veh/h/ln	1458	0	0	1580	0	0	671	0	1818	539	0	1799
Q Serve(g_s), s	2.5	0.0	0.0	0.0	0.0	0.0	1.1	0.0	29.2	1.6	0.0	0.0
Cycle Q Clear(g_c), s	4.4	0.0	0.0	1.8	0.0	0.0	1.1	0.0	29.2	29.9	0.0	0.0
Prop In Lane	0.83		0.14	0.49		0.44	1.00		0.01	1.00		0.07
Lane Grp Cap(c), veh/h	265	0	0	266	0	0	586	0	1357	308	0	1343
V/C Ratio(X)	0.32	0.00	0.00	0.15	0.00	0.00	0.05	0.00	0.77	0.07	0.00	0.60
Avail Cap(c_a), veh/h	569	0	0	584	0	0	586	0	1357	308	0	1343
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.82	0.00	0.82
Uniform Delay (d), s/veh	34.1	0.0	0.0	33.1	0.0	0.0	2.9	0.0	6.4	6.6	0.0	0.0
Incr Delay (d2), s/veh	0.7	0.0	0.0	0.3	0.0	0.0	0.2	0.0	4.3	0.4	0.0	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	0.0	0.8	0.0	0.0	0.1	0.0	9.3	0.2	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.8	0.0	0.0	33.3	0.0	0.0	3.0	0.0	10.7	7.0	0.0	1.7
LnGrp LOS	C	A	A	C	A	A	A	A	B	A	A	A
Approach Vol, veh/h		86			41			1079			834	
Approach Delay, s/veh		34.8			33.3			10.5			1.8	
Approach LOS		C			C			B			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		69.5		15.5		69.5		15.5				
Change Period (Y+Rc), s		6.0		4.6		6.0		4.6				
Max Green Setting (Gmax), s		45.0		29.4		45.0		29.4				
Max Q Clear Time (g_c+I1), s		31.2		6.4		32.9		3.8				
Green Ext Time (p_c), s		7.4		0.4		4.9		0.2				

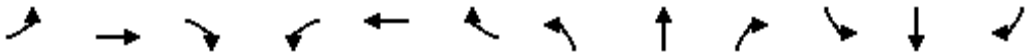
Intersection Summary												
HCM 6th Ctrl Delay			8.4									
HCM 6th LOS			A									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	3	15	43	3	3	24	1024	37	5	784	9
Future Volume (veh/h)	9	3	15	43	3	3	24	1024	37	5	784	9
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.97	0.97		0.95	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1821	1821	1821	1821	1821	1821	1821	1821	1821	1821	1821	1821
Adj Flow Rate, veh/h	9	3	15	44	3	3	25	1056	38	5	808	9
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	90	40	92	211	14	9	596	1336	48	479	1375	15
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	1.00	1.00	1.00	1.00	1.00	1.00
Sat Flow, veh/h	313	371	854	1215	133	86	668	1747	63	515	1797	20
Grp Volume(v), veh/h	27	0	0	50	0	0	25	0	1094	5	0	817
Grp Sat Flow(s),veh/h/ln	1538	0	0	1434	0	0	668	0	1810	515	0	1817
Q Serve(g_s), s	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.3	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.33		0.56	0.88		0.06	1.00		0.03	1.00		0.01
Lane Grp Cap(c), veh/h	222	0	0	234	0	0	596	0	1385	479	0	1391
V/C Ratio(X)	0.12	0.00	0.00	0.21	0.00	0.00	0.04	0.00	0.79	0.01	0.00	0.59
Avail Cap(c_a), veh/h	581	0	0	569	0	0	596	0	1385	479	0	1391
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.60	0.00	0.60	0.80	0.00	0.80
Uniform Delay (d), s/veh	34.4	0.0	0.0	34.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.5	0.0	0.0	0.1	0.0	2.9	0.0	0.0	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	1.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.6	0.0	0.0	35.3	0.0	0.0	0.1	0.0	2.9	0.0	0.0	1.5
LnGrp LOS	C	A	A	D	A	A	A	A	A	A	A	A
Approach Vol, veh/h		27			50			1119			822	
Approach Delay, s/veh		34.6			35.3			2.8			1.5	
Approach LOS		C			D			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		71.3		13.7		71.3		13.7				
Change Period (Y+Rc), s		6.3		4.5		6.3		4.5				
Max Green Setting (Gmax), s		44.5		29.7		44.5		29.7				
Max Q Clear Time (g_c+I1), s		2.0		3.3		2.0		4.5				
Green Ext Time (p_c), s		13.9		0.1		7.7		0.2				

Intersection Summary												
HCM 6th Ctrl Delay			3.5									
HCM 6th LOS			A									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	5	75	22	7	3	133	834	28	5	726	73
Future Volume (veh/h)	93	5	75	22	7	3	133	834	28	5	726	73
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1821	1821	1821	1821	1821	1821	1821	1821	1821	1821	1821	1821
Adj Flow Rate, veh/h	94	5	76	22	7	3	134	842	28	5	733	74
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	339	16	286	199	58	19	376	1205	40	522	1119	113
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	1.00	1.00	1.00	0.69	0.69	0.69
Sat Flow, veh/h	1374	85	1531	685	311	103	675	1752	58	636	1627	164
Grp Volume(v), veh/h	99	0	76	32	0	0	134	0	870	5	0	807
Grp Sat Flow(s),veh/h/ln	1459	0	1531	1099	0	0	675	0	1811	636	0	1791
Q Serve(g_s), s	0.0	0.0	3.6	0.5	0.0	0.0	8.8	0.0	0.0	0.2	0.0	21.8
Cycle Q Clear(g_c), s	4.7	0.0	3.6	5.2	0.0	0.0	30.6	0.0	0.0	0.2	0.0	21.8
Prop In Lane	0.95		1.00	0.69		0.09	1.00		0.03	1.00		0.09
Lane Grp Cap(c), veh/h	355	0	286	277	0	0	376	0	1245	522	0	1231
V/C Ratio(X)	0.28	0.00	0.27	0.12	0.00	0.00	0.36	0.00	0.70	0.01	0.00	0.66
Avail Cap(c_a), veh/h	578	0	528	500	0	0	376	0	1245	522	0	1231
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	0.60	0.00	0.60	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.0	0.0	29.6	29.6	0.0	0.0	5.7	0.0	0.0	4.2	0.0	7.6
Incr Delay (d2), s/veh	0.4	0.0	0.5	0.2	0.0	0.0	1.6	0.0	2.0	0.0	0.0	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.0	1.3	0.6	0.0	0.0	1.0	0.0	0.7	0.0	0.0	7.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.4	0.0	30.1	29.8	0.0	0.0	7.3	0.0	2.0	4.2	0.0	10.3
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	B
Approach Vol, veh/h		175			32			1004			812	
Approach Delay, s/veh		30.3			29.8			2.7			10.3	
Approach LOS		C			C			A			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		64.4		20.6		64.4		20.6				
Change Period (Y+Rc), s		6.0		* 4.7		6.0		* 4.7				
Max Green Setting (Gmax), s		45.0		* 29		45.0		* 29				
Max Q Clear Time (g_c+I1), s		32.6		6.7		23.8		7.2				
Green Ext Time (p_c), s		6.1		0.7		6.3		0.1				

Intersection Summary												
HCM 6th Ctrl Delay			8.5									
HCM 6th LOS			A									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.