Kanan Road/Thousand Oaks Boulevard Intersection Pedestrian Evaluation

Final Report

January 2013

PREPARED BY:
Alta Planning + Design
PREPARED FOR:
City of Agoura Hills

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1 Introduction

This project focuses on improving safety and mobility at and around the intersection of Kanan Road and Thousand Oaks Boulevard in the City of Agoura Hills. The project's overall objective is to promote walking and bicycling as efficient and safe components of the City of Agoura Hills' multimodal transportation network in order to ensure mobility of all its residents regardless of age, income, or physical ability. The City has worked to achieve this objective through the adoption of its 2035 General Plan (which identifies the Complete Streets Act of 2007 as the basis for implementing a transportation system that serves all modes and meets the needs of all users) and by working with the Southern California Association of Governments (SCAG) to develop the Kanan Road/Thousand Oaks Boulevard Pedestrian Evaluation Project as a pilot project for implementing Complete Streets goals within the City. The specific objectives of the project are to develop concepts for pedestrian and bicycle improvements, including landscape and amenities, for connections within a five-minute walk of the intersection of Kanan Road and Thousand Oaks Boulevard.

This project included two main phases of work. During the Existing Conditions Phase, the project team:

- Created project base mapping to document the project area's setting, land uses, transportation infrastructure, pedestrian, bicycle, and transit facilities.
- Collected traffic data collection and analysis for the intersection of Kanan Road and Thousand Oaks Boulevard
- Collected collision data collection within a 0.5 radius of the intersection of Kanan Road and Thousand Oaks Boulevard
- Conducted community surveys and synthesized the results
- Researched and summarized the regulatory setting

During the Conceptual Design Phase, the project team:

- Examined opportunities and constraints of developing safety and mobility improvements at and around the intersection of Kanan Road and Thousand Oaks Boulevard
- Developed concept designs for on-street bicycle facilities, streetscape enhancements, a Class I trail along Medea Creek Channel, and suggested enhancements for pedestrian and bicycle access and mobility to and from the area's shopping centers (See **Figure 1** for an overview of the proposed improvements).
- Developed pedestrian/bicycle user demand projections for Medea Creek Multi-Use Trail.
- Analyzed the level of service impacts of the proposed Medea Creek Multi-Use Trail crossing at Thousands Oaks Boulevard on the intersection of Kanan Road and Thousands Oaks Boulevard.
- Developed cost estimates for the proposed pedestrian and bicycle improvements.

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Figure 1: Proposed Improvements Plan

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2 Existing Conditions

2.1 Project Area

The study intersection of Kanan Road and Thousand Oaks Boulevard is located in the City of Agoura Hills, approximately 0.6 miles to the north of the Ventura Freeway (US 101), as shown in **Figure 2**. Both Kanan Road and Thousand Oaks Boulevard are primary arterials designed to carry high traffic volumes that include both local and regional trips. Kanan Road is the only north-south roadway within Agoura Hills that crosses the entire city, and it also provides direct access to and from US 101. Thousand Oaks Boulevard provides direct connections between Agoura Hills and the neighboring city of Westlake Village to the west, and beyond to the City of Thousand Oaks. It ends approximately 0.3 miles to the east of Kanan Road, directly north of Agoura High School.

Intersection of Kanan Road and Thousand Oaks Boulevard.

Kanan Road/Thousand Oaks Boulevard is a four-legged, signalized intersection. Land uses located immediately adjacent to the intersection include community-serving retail centers located on the northwest and southwest corners, and multifamily housing located on the northeast and southeast corners. Additional land uses and local destinations located within the general study area include both multifamily and single-family housing, Agoura High School, Willow Elementary School, Sumac Elementary School, and open space including Medea Creek.

2.2 Setting

The City of Agoura Hills is located in the foothills of the Santa Monica Mountains, in the western edge of Los Angeles County, approximately 36 miles west of downtown Los Angeles. The City encompasses approximately 7.8 square miles and has a population of 20,330 residents. Agoura Hills' land use pattern is typical of single-use, low-density, and auto-oriented suburban development common during the late 20th Century. Most of the existing development within Agoura Hills was in place prior to the City's incorporation in 1982. As a result, most of the City's physical growth was not regulated by local policies.

The core study area is defined by a 1,200-foot radius (approximately five-minute walk at an average walk speed of 4 feet per second) from the Kanan Road/Thousand Oaks Boulevard intersection. The resulting area extends to the northern edge of the Agoura Hills City Mall to the north, Hillrise Drive to the south, Skyview Way to the west, and Carell Avenue to the east. The area encompasses approximately 120 acres and includes the three shopping centers; multifamily and single-family housing; and borders Agoura High School, Chumash Park, and Medea Creek. The current feel of the study area is heavily automobile-dominated, with motorists accessing the shopping centers, morning and afternoon high school traffic, and substantial through traffic from vehicles accessing US 101. However, as this study will show, there are also many pedestrians and

bicyclists within the study area, and potentially many more living in the nearby residential neighborhoods. The purpose of this study is to examine ways to improve safety, convenience and comfort for both existing and future pedestrians and bicyclists in and around the intersection. The proximity of a mix of land uses within a five-minute walk of one another, local roadways that already accommodate pedestrians, bicyclists and transit in addition to the automobile, and opportunities to improve access along Medea Creek are all factors that will allow the study area to evolve into a true multi-modal mixed-use district over time.

2.3 Housing

Housing, consisting of both single-family and multifamily units, is the dominant land use within the study area. **Table 1** shows that the concentration of both single-family and multifamily housing adjacent to the Kanan Road/Thousand Oaks Boulevard intersection results in a relatively dense development pattern when compared to the entire city. Within the 1,200 foot study area radius there are about 587 housing units.

Table 1: Housing Concentration Adjacent to Study Intersection

Housing Type	Units within Study Area	Acreage within Study Area
Single Family-Residential	184	38.7
Multi-Family Residential	403	28.0
Total	**587 units**	**66.7 acres**

2.4 Retail Centers

The three shopping centers in the study area – Agoura Hills City Mall, Twin Oaks Shopping Center, and Agoura Meadow's Shopping Center – serve as the City's primary community-serving retail district.

Figure 2: Project Site Map

Table 2: Study Area Shopping Centers

Name	Description	Site Acreage	Retail Building Area	Parking Spaces
Agoura Meadows Shopping Center	Located on the southwest corner of the intersection, and is anchored by a Vons grocery store with several smaller restaurant and retail tenants. Two stand-alone buildings with a bank and other smaller tenants are situated along Kanan Road perimeter.	10.8 acres	121,930 square feet retail / commercial space	530 spaces
Twin Oaks Shopping Center	Located on the northwest corner of the intersection, and is anchored by a Ralph's grocery store with a number of smaller retail and restaurant tenants. The center has several stand-alone buildings along the street edge of the parking area including a bank, fast-food restaurant, and a cafe.	11.1 acres	102,399 square feet retail / commercial space	420 spaces
Agoura Hills City Mall	Located along the west side of Kanan Road, immediately north of the Twin Oaks Shopping Center. The two plazas' parking areas are connected. The City Mall plaza has no large single anchor tenant but a number of community-serving retail establishments, and upper floor commercial tenants.	5.7 acres	72,370 square feet retail / commercial space	358 spaces
Total		**27.6 acres**	**296,699 square feet**	**1,308 spaces**

Together these shopping centers occupy a total of 27.6 acres of land that include an estimated 296,699 square-feet of retail and commercial uses and a total of 1,308 parking spaces. The shopping centers were developed independently from one another during the 1970s, resulting in limited pedestrian and automobile access between the three. Pedestrian access into the shopping centers from both Kanan Road and Thousand Oaks Boulevard is restricted by landscape edges, walls, and elevation changes. The three shopping centers lack designated pedestrian paths through the parking lots, meaning that pedestrians must walk among the automobile traffic in the parking lots in order to reach the shops and commercial services. Their single-use, auto-oriented design is evident in the fact that roughly two-thirds of their total land area is devoted to automobile access, circulation, and parking compared to only 4% that is used for pedestrian circulation and gathering areas and 6% for landscaping.

Table 3: Shopping Center Land Area by Use

	Agoura City Mall		Twin Oaks		Agoura Meadows		Total	
	Size (SF)	%	Size (SF)	%	Size (SF)	%	Size (SF)	%
Commercial / Retail Building Area	74,197	30%	102,983	21%	117,825	25%	295,005	25%
Auto Circulation/Parking	141,802	57%	331,333	68%	316,232	67%	789,367	66%
Pedestrian Circulation/Public Space	15,441	6%	14,222	3%	16,274	3%	45,937	4%
Landscape	17,723	7%	37,032	8%	18,438	4%	73,193	6%
Total	**249,163**	**100%**	**485,570**	**100%**	**468,769**	**100%**	**1,203,502**	**100%**

2.5 Schools

Three schools are located within a 0.5 radius of the intersection of Kanan Road and Thousand Oaks Boulevard: Agoura High School, Sumac Elementary School, and Willow Elementary. Based on outreach to the schools (discussed in **Section 3: Community Outreach**), the project team discovered that the majority of students commute to school by car and only a small percentage of student commute to school by walking and bicycling. For the elementary schools, the need for many to cross Kanan Road presents a barrier to increasing the number of children walking and bicycling to school. For the high school, a main challenge is the "culture" of driving – obtaining a drivers license is a milestone for many high school students and driving to school is viewed much more favorably than walking or biking. These challenges can be address with improvements to pedestrian and bicycle infrastructure as well as education and encouragement programs.

2.6 Transportation Infrastructure

The existing roadway configuration at the study intersection is shown in **Figure 3**. Kanan Road has a 100-foot right-of-way that includes eight-foot sidewalks on each side. The roadway itself is 84 feet wide curb-to-curb and includes Class II bike lanes and two travel lanes in each direction, and a raised center median that divides the northbound and southbound travel lanes. The median is landscaped except where left turn lanes are located. Single left-turn lanes are located at the north and south approaches to Kanan Road, and to provide access to northbound traffic to the retail centers located along the west side of Kanan Road. The posted speed limit on Kanan Road is 40 mph within the study area. On-street parking is not permitted on Kanan Road except along a 600-foot segment along the east side of the roadway, immediately north of Thousand Oaks Boulevard.

Thousand Oaks Boulevard has a 100-foot right-of-way that includes eight-foot sidewalks on each side. The roadway is 84 feet wide and includes Class II bike lanes and two travel lanes in each direction. West of Kanan Road is a two-way center turn lane that provides access to the shopping centers, becoming a raised landscaped median to the west of Medea Creek. East of Kanan Road, a raised median separates eastbound and westbound traffic. At the intersection of Kanan Road there are dual left turn lanes in the eastbound direction and a single left turn lane in the westbound direction. The posted speed limit is 40 mph west of Kanan Road and 35 mph to the east. On street parking is not permitted on Thousand Oaks Boulevard to the west of Kanan Road; to the east of Kanan Road on-street parking is permitted on the north side of the road

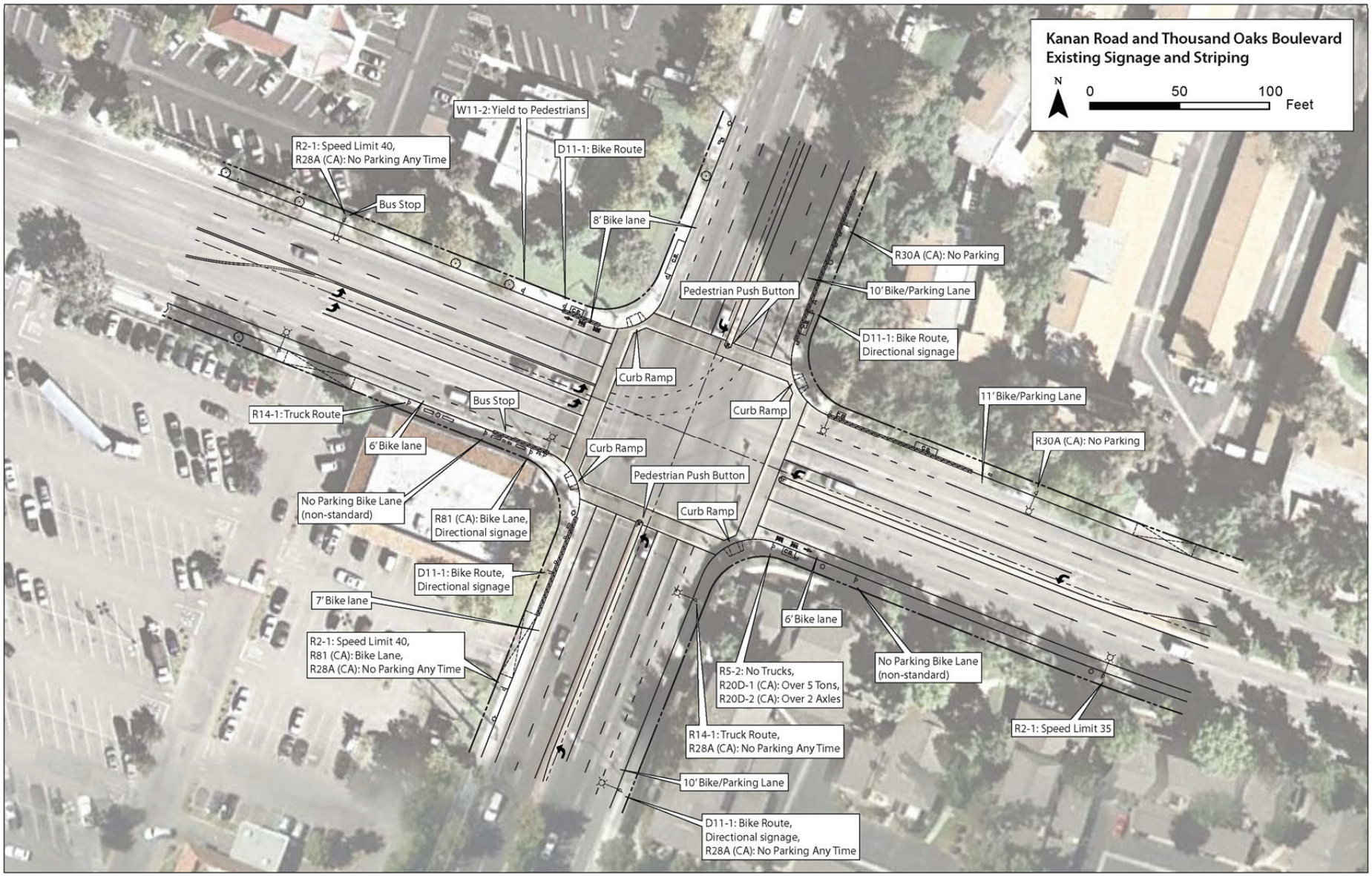
only up to Argos Street. Past Argos Street, perpendicular parking is permitted in front of Agoura High School on the south side of Thousand Oaks Boulevard.

2.7 Pedestrian Facilities

The intersection has pedestrian push buttons, pedestrian signal heads, intersection lighting, painted crosswalks, concrete sidewalks and curb ramps which facilitate the crossing of pedestrians at the intersection. Pedestrians cross the intersection to access the shopping centers, to get to the bus stops located west of the intersection, and going to and from the high school.

The intersection has painted crosswalks and other pedestrian facilities.

Figure 3: Study Intersection Existing Signage and Striping



Eight foot wide sidewalks are present along both sides of both Kanan Road and Thousand Oaks Boulevard. The sidewalks are "attached," meaning located directly adjacent to the roadway curb with no landscape buffer/parkway strip. The sidewalks are continuous without gaps and well-maintained. Their continuous 8-foot widths appear adequate to handle existing levels of pedestrians in the area. The sidewalks are generally free of barriers, with widths most constrained at the bus stop located on the south side of Thousand Oaks Boulevard immediately west of Kanan Road, along Kanan Road and Thousand Oaks Boulevard where the traffic signal control boxes are located, and immediately on the west side of Kanan Road where newspaper racks are located in front of the Starbucks Coffee shop.

Painted yellow transverse (parallel) crosswalks are located on each of the Kanan Road/Thousand Oaks Boulevard approaches. The existing striping is worn in places. The median noses on Kanan Road encroach into the painted crosswalk area and reduce the amount of width within the crosswalk limits for pedestrian access.

A single, diagonally-oriented curb ramp is present at each corner of the Kanan Road/Thousand Oaks Boulevard intersection. The curb ramps do not have tactile warning strips (i.e. truncated domes).

The traffic signal at the intersection includes older-style (non-accessible) pedestrian push buttons. The pedestrian heads only have the hand/man symbols and are not countdown type signals. During field observations, there were several instances where the pedestrian walk phase was not called even after pedestrians pushed the push button, indicating possible problems with the signal phasing. In particular, the Phase 6 pedestrian operation was intermittent, and mostly non responsive to the pedestrian push buttons. During field visits out of more than 6 attempts on each of the two pedestrian push buttons, the pedestrian phase only came up once. Pedestrian push-buttons are also located on posts on the center median noses in Kanan Road, indicating to pedestrians that these medians may be suitable places to wait as refuge if they are unable to cross in a single movement. The design of the medians does not meet current best practices for pedestrian refuge areas given that the medians do not extend on both sides of the crosswalk (with ramps / channels for accessibility) to provide a protected refuge area.

2.8 Bicycle Facilities

Class II bike lanes are located on all approaches to the intersection of Kanan Road and Thousand Oaks Boulevard. The bike lanes vary in width and whether they are located curbside (with no on-street parking allowed), or adjacent to an on-street parking lane. The curbside bike lane segments include both directions of Thousand Oaks Boulevard west of the intersection (with the exception of a short segment), and both directions of Kanan Road south of the intersection. East of the intersection there are curbside bike lanes on eastbound Thousand Oaks Boulevard that vary between 6 feet and 11 feet wide along the two roadways. Per the California Highway Design Manual, minimum bike lane width is 5 feet adjacent to a curb or parking lane. On northbound Kanan Road north of Thousand Oaks Boulevard where on-street parking is permitted, the existing bike lane next to parking is only approximately 4 feet in width (11 feet from face of curb to the inside bike lane stripe).

The bike lane striping drops as it approaches the intersection and transitions into a dashed stripe. This allows right turning vehicles to utilize the curbside space. However, because of the increased width, some drivers were observed using the bike lanes as an additional through travel lane at the intersection.

2.9 Transit

The LADOT Commuter Express lines 422 and 423 operate between Thousand Oaks and downtown Los Angeles/USC.

The Los Angeles County Metropolitan Transportation Authority (Metro) and the City of Los Angeles Department of Transportation (LADOT) provide regional transit service within Agoura Hills. Local fixed-route transit is provided by the City. Metro operates line 161 which runs between the Thousand Oaks Transit Center and the Warner Center Transit Hub. The LADOT Commuter Express lines 422 and 423 operate between Thousand Oaks and downtown Los Angeles/USC. Line 161 operates seven days a week with reduced service on weekends and holidays. Lines 422 and 423 are commuter lines that only operate during peak weekday travel periods. All three lines travel north on Kanan Road from the Ventura Freeway or Agoura Road, and continue west on Thousand Oaks Boulevard. Bus stops are located within the study area on the north and south side of Thousand Oaks Boulevard immediately west of Kanan Road. **Table 4** provides detailed information on this regional transit service.

Table 4: Regional Transit Service within Agoura Hills

Days	Hours	Route Limits	# of Buses		Headways (Minutes)	Boardings
			EB	WB		
Metro Route 161						
M-F	6:20 am – 9:00 pm*	Thousand Oaks – Warner Center	20	22	20 – Peak 60 – Off Peak	
Sat	7:25 am – 7:25 pm*	Thousand Oaks – Warner Center	15	17	40 – 60	
Sun	7:25 am – 7:25 pm*	Thousand Oaks – Warner Center	13	15	40 – 60	
LADOT Commuter Express 422						
M-F	6:14 am – 8:39 am**	Downtown LA/USC – Thousand Oaks	9		15 – 20	
	2:27 pm – 6:47 pm**	Thousand Oaks – Downtown LA/USC		13	15 – 20	
LADOT Commuter Express 422						
M-F	5:36 am – 7:04 am**	Thousand Oaks – Downtown LA/USC	5		20	
	5:07 pm – 8:15 pm**	Downtown LA/USC – Thousand Oaks		8	20	

* Indicates operating hours for Dorothy Drive/Chesebro Road bus stop as published in Metro route schedule.
** Indicates operating times from Kanan Road/Thousand Oaks Boulevard bus stops as published in LADOT Commuter Express route schedules.

2.10 Traffic Data Collection

Weekday and Saturday traffic counts were collected for Kanan Road at Thousand Oaks Boulevard. This included motor vehicle turning movement, pedestrian, and bicycle counts. The weekday counts were collected on Wednesday, May 2, 2012 from the hours of 7:00 am to 9:00 am, 11:00 am to 1:00 pm, and 4:00 pm to 6:00 pm. The Saturday counts were collected on May 5, 2012 between the hours of 8:00 am and 2:00 pm. The counts were not collected for the high school peak hours because we were to calculate the LOS (Level of Service) for the intersection during the intersection peak times (7-9 a.m. , 11-2 p.m. and 4-6 p.m.).

2.10.1 Motor Vehicle Counts

Table 5 and Table 6 summarize the weekday and weekend traffic count data.

Table 5: Weekday Counts

Peak Hour Vehicles	Kanan Road						Thousand Oaks Boulevard					
	Northbound			Southbound			Eastbound			Westbound		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
7:45 – 8:45 am	96	863	209	110	1292	83	190	344	150	207	311	205
12:00 – 1:00 pm	131	941	83	124	960	136	258	106	159	129	229	158
5:00 – 6:00 pm	146	1174	132	109	827	160	341	156	128	133	159	158

Table 6: Weekend Counts

Peak Hour Vehicles	Kanan Road						Thousand Oaks Boulevard					
	Northbound			Southbound			Eastbound			Westbound		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
11:15 – 12:15 pm	150	782	124	131	1106	167	300	129	190	157	151	124

2.10.2 Count Data Analysis

An inventory of the existing traffic signal, equipment, and timing was conducted. The existing traffic signal is a fully actuated eight phase operation with advance detection. The signal controller is a Type 90 with internal time base coordination, in a Type P cabinet. The intersection is part of an existing coordinated system along Kanan Road and generally operates on a 110 second cycle in the AM Peak period and 100 second cycle in the Midday and PM Peak periods, except during the evening, and on weekends, when it runs free. Using the existing traffic volume data collected and the current timing parameters, the traffic signal operation was modeled using Synchro 7 analysis software to determine the existing levels of service (LOS), as well as control delay. Intersection control delay is defined by Synchro as the amount of additional travel time in seconds required per vehicle to travel through an intersection during the peak period compared with an off-peak travel time. Delay can be caused by several factors such as signal cycle lengths, oversaturated lanes, and queue blockages resulting in unused green time. Both Delay and LOS are summarized in Table 7 below:

Table 7: Kanan Road/Thousand Oaks Boulevard Control Delay and Level of Service

Count Periods	Delay	Level of Service
Weekday 7:00 AM – 9:00 AM	69.5	E
11:00 AM – 1:00 PM	53.3	D
4:00PM – 6:00 PM	77.8	E
Weekend 8:00 AM - 2:00 PM	72.6	E

The level of service (LOS) definition is per the City of Agoura Hills General Plan, Chapter 3. The General Plan establishes flexible LOS criteria for the minimum acceptable LOS based on the roadway characteristics. Kanan Road and Thousand Oaks Boulevard are roadways that have a reduce level of services acceptable based on the roadway characteristics. The Synchro analysis shows the intersection is operating at unacceptable levels (LOS D or E) during the morning, evening and weekend peak hours. The weekday morning peak period accounts for both commuter traffic traveling to the Ventura Freeway and traffic generated by the local schools particularly Agoura High School.

2.10.3 Pedestrian Counts

The pedestrian count data shown **in Figure 4** and**Figure** 5 indicates a steady flow of pedestrians crossing the intersection to access the retail centers and Agoura High School. The count data shows that more pedestrians cross Kanan Road than Thousand Oaks Boulevard during both the weekday peak travel periods and on weekends. The largest number of pedestrian crossings takes place on the north leg of the intersection followed by the south leg on both weekdays and on weekends. This east-west travel pattern on both weekdays and weekends indicates that people are walking between the housing located on the east side of Kanan Road and the retail centers to the west.

Figure 4: Weekday Pedestrian Count Summary

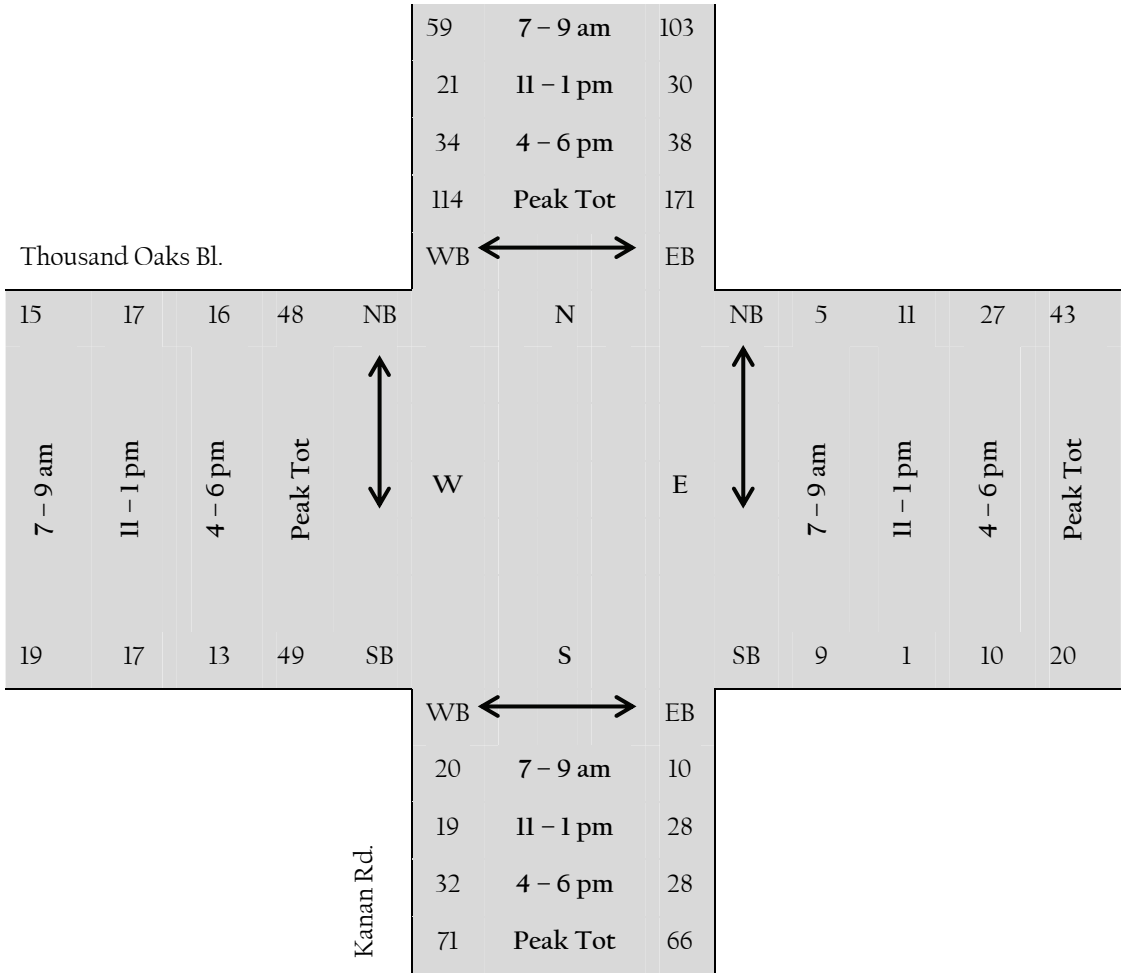
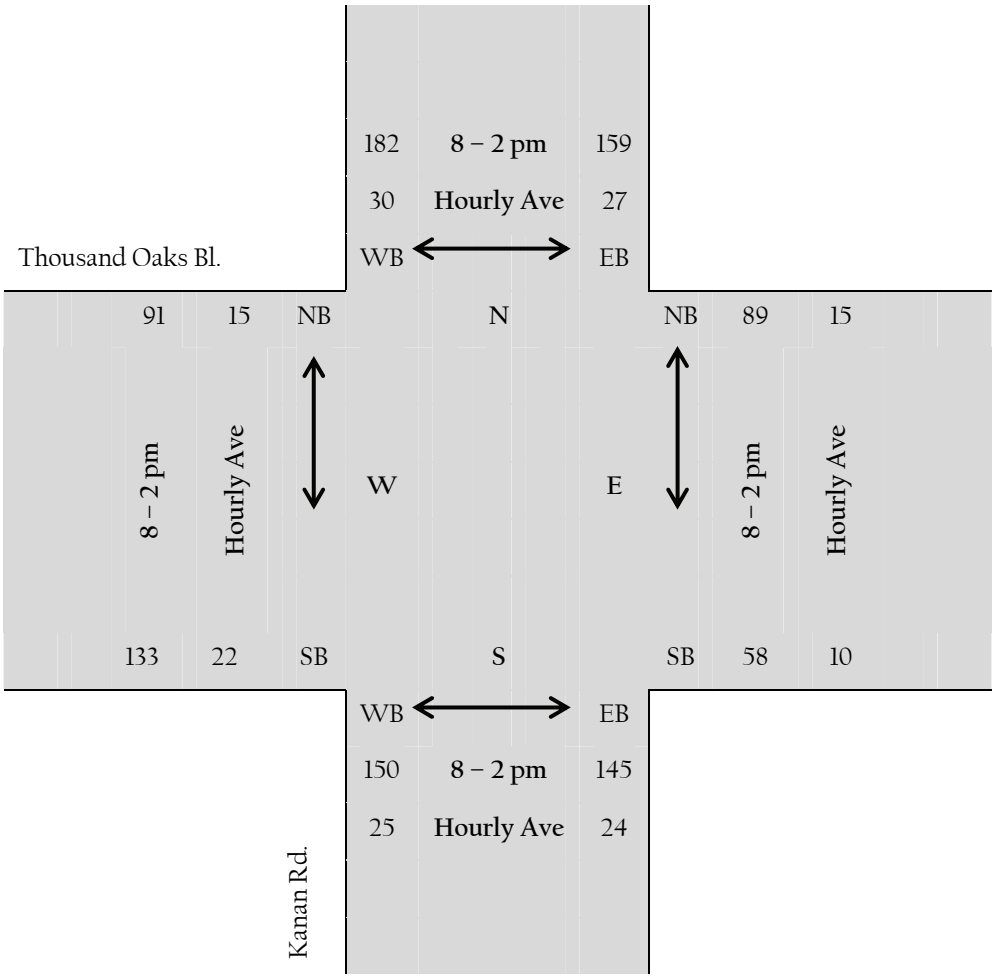


Figure 5: Weekend Pedestrian Count Summary



Although the formal pedestrian counts were conducted just at the intersection of Kanan Road / Thousand Oaks Boulevard, during our field visits the project team made observations of pedestrian activity at the intersection and at other locations within the study area. Notably, during each visit multiple people were observed crossing both Kanan Road and Thousand Oaks Boulevard at mid-block locations. Mid-block crossings of Thousand Oaks Boulevard typically occurred between Kanan Road and Medea Creek, with people crossing between the Ralphs and Vons shopping centers at the parking lot driveways rather than walking out of their way to the intersection. Others were observed crossing from the shopping centers to the bus stops in order to board buses that were waiting at the stops.

Several people were observed crossing Kanan Road at a mid-block location in the area of Starbucks Coffee. The Starbucks manager stated that people frequently cross Kanan Road north of Thousand Oaks Boulevard to get to Starbucks or the other shops at the retail centers. On Sunday, May 20, several people were observed crossing Kanan Road at Idle Drive (unmarked, uncontrolled location) in order to reach the Farmers Market that takes place in the Agoura Hills City Mall parking lot on Sunday afternoons.

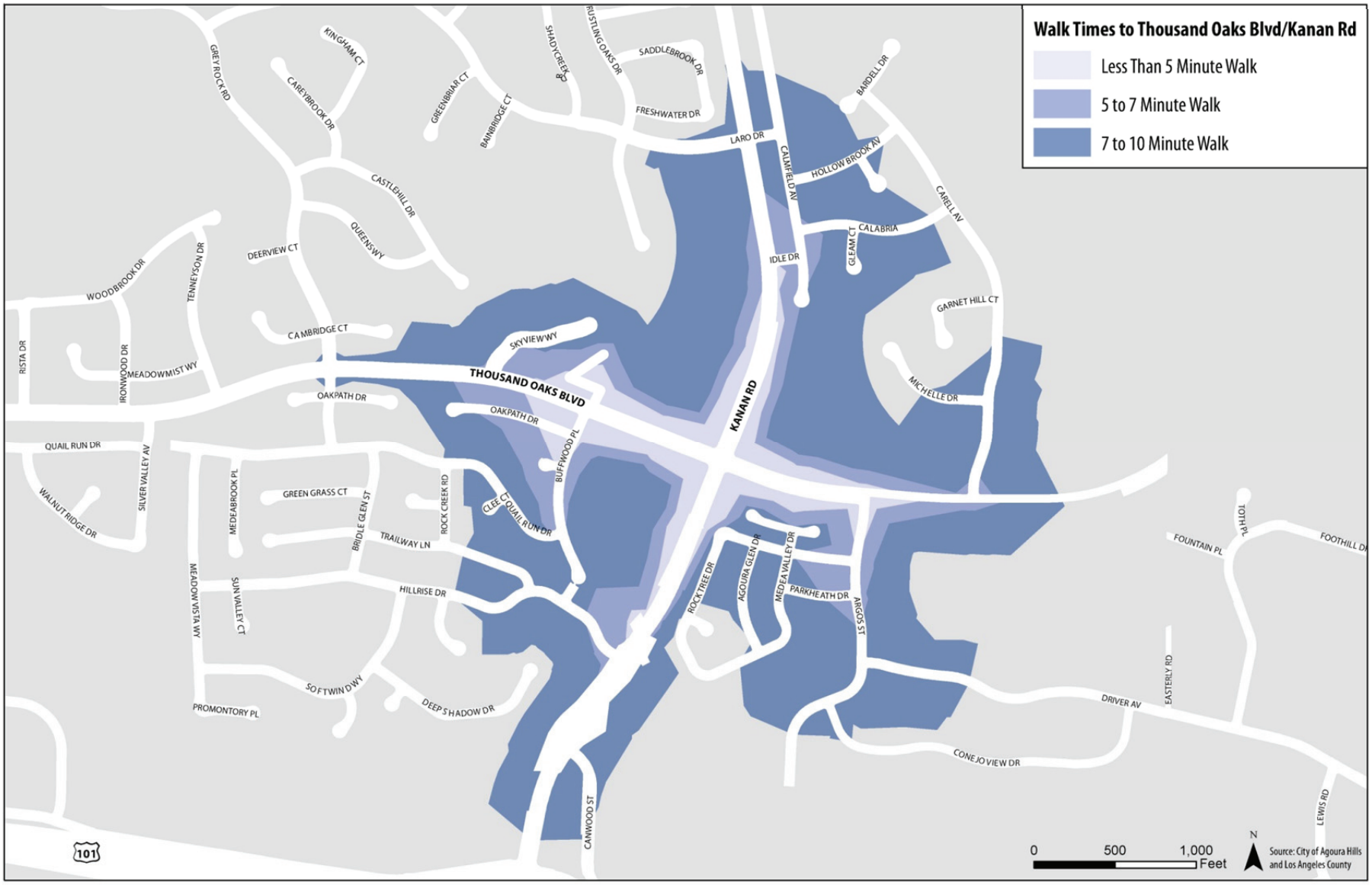
To illustrate the walking distances in the project area, and the proximity of the intersection to a mix of land uses within a 5 to 10 minute walk, a graphic was prepared showing the walking distances for a pedestrian using the existing sidewalk network. **Figure 6** displays the 5 minute, 7 minute, and 10 minute walk sheds for pedestrians accessing the project intersection. A 10 minute walk roughly translates into a ¼ mile trip, which is commonly regarded as the upper threshold a person is willing to walk to reach his or her destination. Pedestrian improvements should be focused along corridors and intersections which fall within these walk sheds.

Table 8 summarizes the weekday and weekend traffic count data for pedestrians at the Kanan Road and Thousand Oaks Boulevard intersection.

Table 8: Kanan Road/ Thousand Oaks Boulevard Pedestrian Count Summary

	North Leg		East Leg		South Leg		West Leg	
Weekday	**WB**	**EB**	**NB**	**SB**	**WB**	**EB**	**NB**	**SB**
7:00 – 9:00 am	59	103	5	9	20	10	15	19
11:00 – 1:00 pm	21	30	11	1	19	28	17	7
4:00 – 6:00 pm	34	38	27	10	32	28	16	13
Weekend								
8:00 – 2:00 pm	182	159	89	58	150	145	91	133

Figure 6: Project Intersection Walk Sheds



2.10.4 Bicycle Counts

The count data shown in **Figure** 7 and **Figure 8 i**ndicates different bicycle travel pattern on weekdays and weekend. More bicycle riders were observed traveling on Thousand Oaks Boulevard during weekdays, and Kanan Road had a higher number of bicycle riders on weekends. Overall, five times more bicycle riders were observed during the six-hour Saturday count period that during the weekday peak and mid-day periods. The higher weekday ridership numbers on Thousand Oaks Boulevard suggest that most of these trips are being generated by Agoura High School or the retail centers, whereas the higher weekend numbers on Kanan Road suggest that most of these trips are recreational in nature. Also, the count data shows that most of the bicyclists crossing the south leg of the intersection are traveling westbound, or the opposite direction of travel. This may indicate that most of the bicycle trips that take place on Thousand Oaks Boulevard, west of Kanan Road either originate at Agoura High School or the residential communities located on the southeast corner of the intersection.

Figure 7: Weekday Bicycle Count Summary

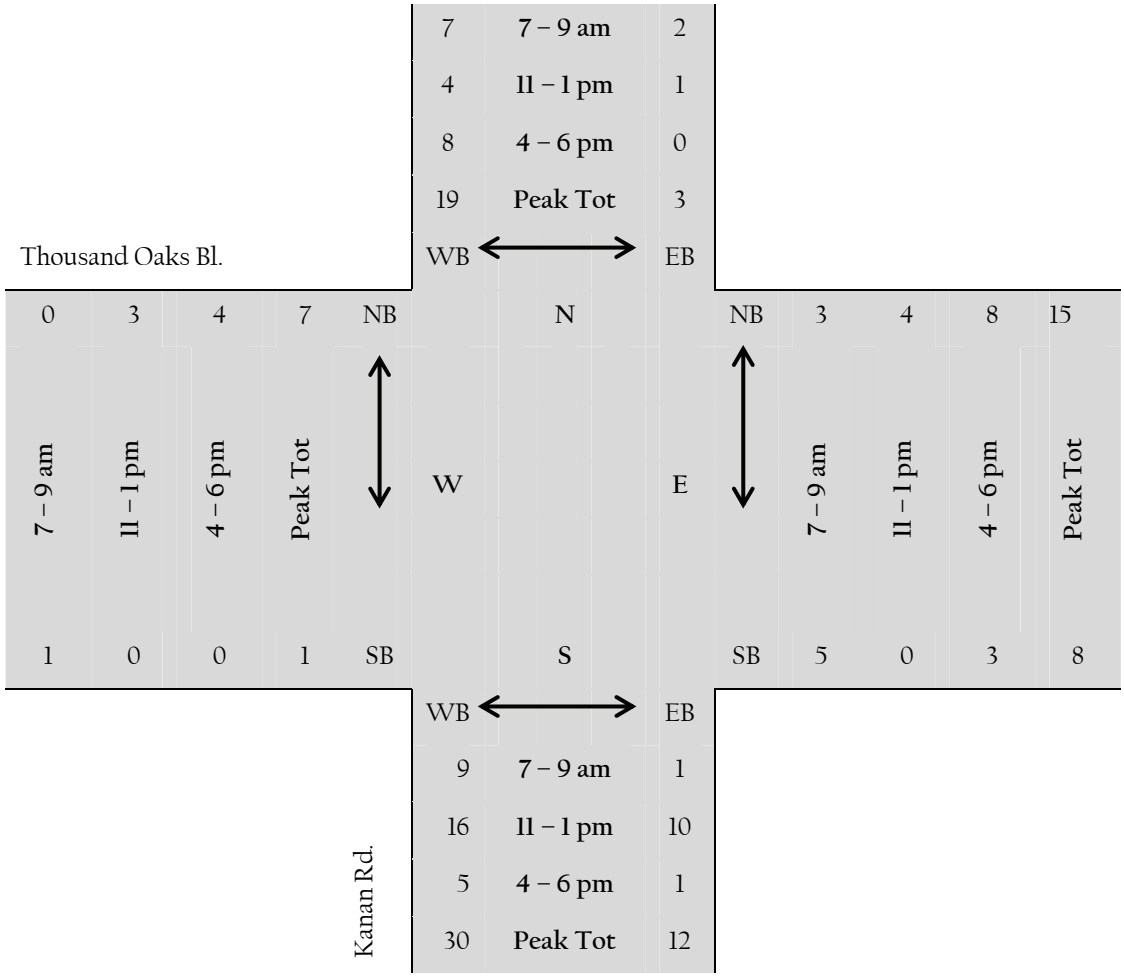


Figure 8: Weekend Bicycle Count Summary

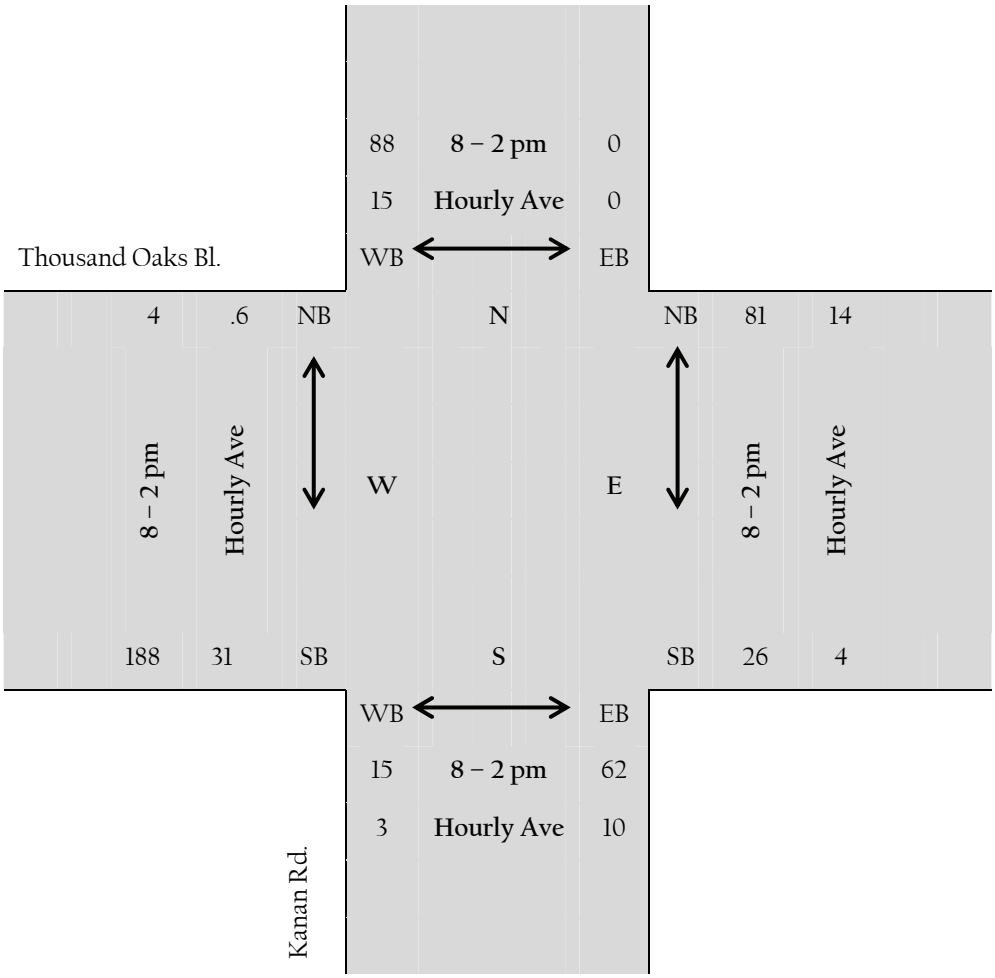


Table 9 summarizes the weekday and weekend traffic count data for Bicyclists at the Kanan Road and Thousand Oaks Boulevard intersection.

Table 9: Kanan Road/ Thousand Oaks Boulevard Bicycles Count Summary

	North Leg		East Leg		South Leg		West Leg	
Weekday	**WB**	**EB**	**NB**	**SB**	**WB**	**EB**	**NB**	**SB**
7:00 – 9:00 am	7	2	3	5	9	1	0	1
11:00 – 1:00 pm	4	1	4	0	16	10	3	0
4:00 – 6:00 pm	8	0	8	3	5	1	4	0
Weekend								
8:00 – 2:00 pm	88	0	81	26	15	62	4	188

2.12 Collision Data

Bicycle and pedestrian collision data for the City of Agoura Hills was collected from the Transportation Injury Mapping System (TIMS), which consists of Statewide Integrated Traffic Records System (SWITRS) data. Collision data includes crashes that occurred from January 1, 2001 through December 31, 2010 within a 0.5 mile radius of the intersection of Kanan Road and Thousand Oaks Boulevard and is shown on **Figure 9**.

2.12.1 Pedestrian Collisions

A total of 12 reported collisions involving pedestrians occurred within 0.5 miles of the intersection of Kanan Road and Thousand Oaks Boulevard. Eight of the 12 collisions did not occur within the intersection. Eleven of the 12 collisions were ruled as vehicle/pedestrian crashes, while one was recorded as a rear-end collision.

Table 10 displays the movements pedestrians were making at the time of the collisions and the primary collision factor violation for each of the 12 collisions. Pedestrian Collision ID refers to the numbers shown on **Figure 9**. Just under half of the collisions occurred while a pedestrian was crossing in a crosswalk an intersection[1], while another one-third of collisions occurred while a pedestrian was crossing outside of a crosswalk. Two collisions occurred while pedestrians were walking within the roadway and one pedestrian was hit outside of the roadway. One-third of collisions were attributed as pedestrian right-of-way violations.

Table 10: Pedestrian Action in Collisions Involving Pedestrians, 2001-2010

Pedestrian Collision ID	Pedestrian Action	Primary Collision Factor Violation
P1	Crossing in crosswalk at intersection	Pedestrian Right-of-Way
P2[2]	Crossing in crosswalk at intersection	Unknown
P3	Crossing in crosswalk at intersection	Pedestrian Right-of-Way
P4	Crossing not in crosswalk	Pedestrian Violation
P5	Not in road	Driving Under the Influence
P6	In road, including shoulder	Wrong Side of Road
P7	Crossing in crosswalk at intersection	Pedestrian Right-of-Way
P8	Crossing in crosswalk at intersection	Pedestrian Right-of-Way
P9	In road, including shoulder	Pedestrian Violation
P10	Crossing not in crosswalk	Unsafe Speed
P11	Crossing not in crosswalk	Unsafe Speed
P12	Crossing not in crosswalk	Pedestrian Violation

[1] Only two of these were collisions were recorded as having occurred in an intersection
[2] Collision P2 occurred in 2001 and resulted in a fatality.

Figure 9: Bicycle and Pedestrian Collision, 2001-2010

2.12.2 Bicycle Collisions

A total of 12 reported collisions involving bicyclists occurred within 0.5 miles of the intersection of Kanan Road and Thousand Oaks Boulevard, half of which were on Thousand Oaks Boulevard. There were no fatal bicycle collisions in this time period.

Table 11 shows bicycle collisions by type of collision and primary collision factor violation. Bicycle Collision ID refers to the numbers shown on **Figure 9**. Half of the bicycle collisions in the 0.5 mile buffer were broadside crashes and another one-third were reported as other. Though half of the bicycle collisions occurred along the same segment of Thousand Oaks Boulevard, there does not appear to be a pattern of collision types. The most common violation category was automobile right-of-way violations.

Table 11: Bicycle Collision Types, 2001-2010

Bicycle Collision ID	Collision Type	Primary Collision Factor Violation
B1	Head-on	Other Hazardous Violation
B2	Other	Unknown
B3	Other	Automobile Right-of-Way
B4	Other	Unsafe Speed
B5	Broadside	Wrong Side of Road
B6	Broadside	Automobile Right-of-Way
B7	Broadside	Automobile Right-of-Way
B8	Other	Automobile Right-of-Way
B9	Broadside	Improper Turning
B10	Broadside	Traffic Signals and Signs
B11	Broadside	Wrong Side of Road
B12	Sideswipe	Improper Passing

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3 Community Outreach

As a means of engaging the community in providing input about the study area's existing conditions and their desires for improvements, the project team conducted a multi-faceted outreach to local stakeholders. This included holding one-on-one meetings with representatives from the local schools, conducting direct outreach to shopping center patrons and business owners, meeting with the Los Angeles Flood Control Department, and conducting online and intercept surveys open to the general public to provide input and comments. This section summarizes the key outreach efforts.

3.1 Community Survey

An online and in-person (intercept) survey was conducted in order to gather information on local travel characteristics and which improvements the community believes are most needed in order to improve pedestrian access and safety within the study area, and increase the likelihood of people walking. The survey was available online between Friday, May 11, 2012 and Monday, June 11, 2012. Surveys were collected in person in the study area via intercept by project team staff on Monday, May 14, 2012 and Sunday, May 20, 2012. During the intercept portion 3-4 project team members circulated through the study area and administered the survey directly to pedestrians, bicyclists and others at the intersection and in the adjacent shopping areas. A table with project information and surveys was also set up in front of the Starbucks coffee shop on May 14 to gather input from patrons. A total of 120 responses were collected. The survey findings are summarized below. A full copy of the survey questionnaire can be

Chart 1: Proximity or residence to Study Area

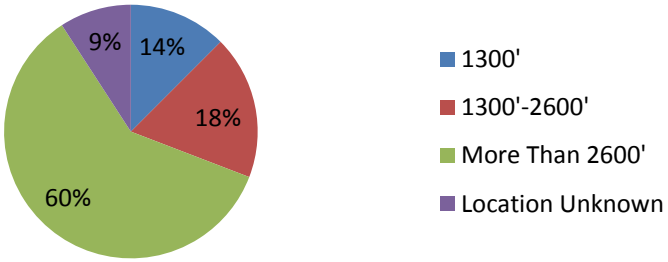
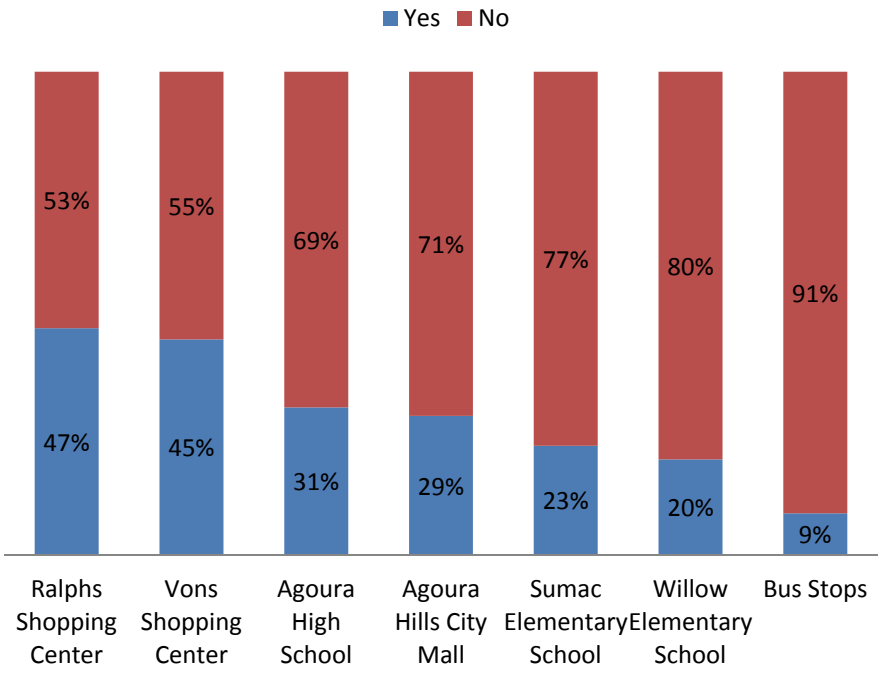


Chart 2: Do you walk to any of these local destinations?



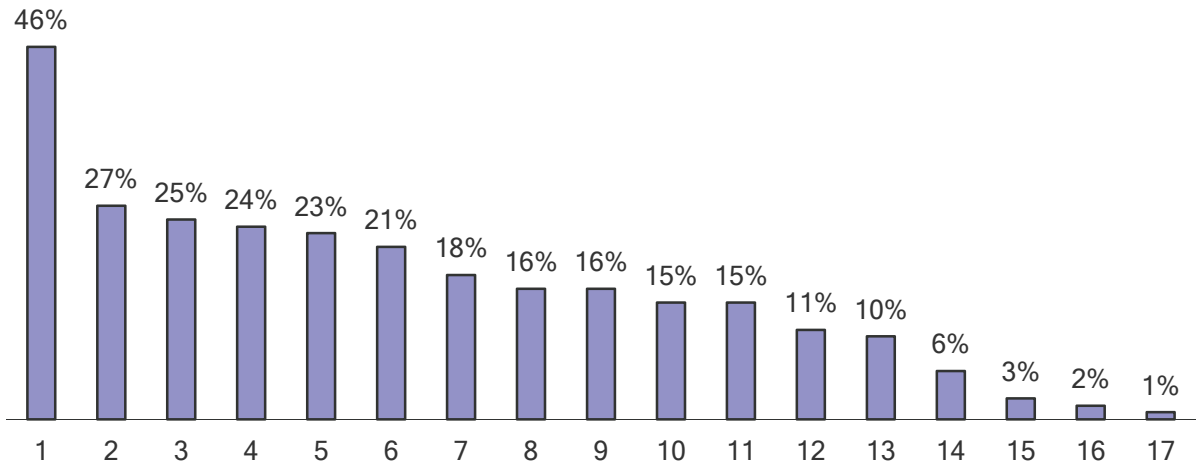
found in the appendix.

Chart 1 shows that 13 percent of all respondents stated that they live within the study area (approximately 1,300-foot radius of the intersection), and 18 percent live within 1,300 to 2,600 feet of the study area. A total of 31 percent of respondents, therefore, live within a ten-minute walk of the Kanan Road/Thousand Oaks Boulevard intersection as shown in Chart 1.

Chart 2 shows that 47 percent of respondents stated that they walk to the Ralphs shopping center, making it the local destination that generates the largest number of walk trips within the study area

The survey asked people to indicate the main reasons why they do not walk to the local destinations more often. **Chart 3** shows that 46 percent stated that driving is more convenient, and 27 percent stated that there are not direct connections between the sidewalks and the shopping centers.

Chart 3: What are the main reasons that keep you from walking to these destinations more often?



1. Driving is more convenient
2. No direct connections between sidewalks and shopping centers
3. Distances are too great to walk
4. Other
5. I walk frequently
6. Not safe to walk through shopping center parking lots
7. Not interested in walking
8. Traffic signals do not give enough time to walk across Kanan Road
9. No direct connections between homes and local destinations
10. Traffic signals do not give enough time to walk across Thousand Oaks Boulevard
11. Feel unsafe in crosswalks
12. Thousand Oaks Boulevard is too wide to cross safely
13. Kanan Road is too wide to cross safely

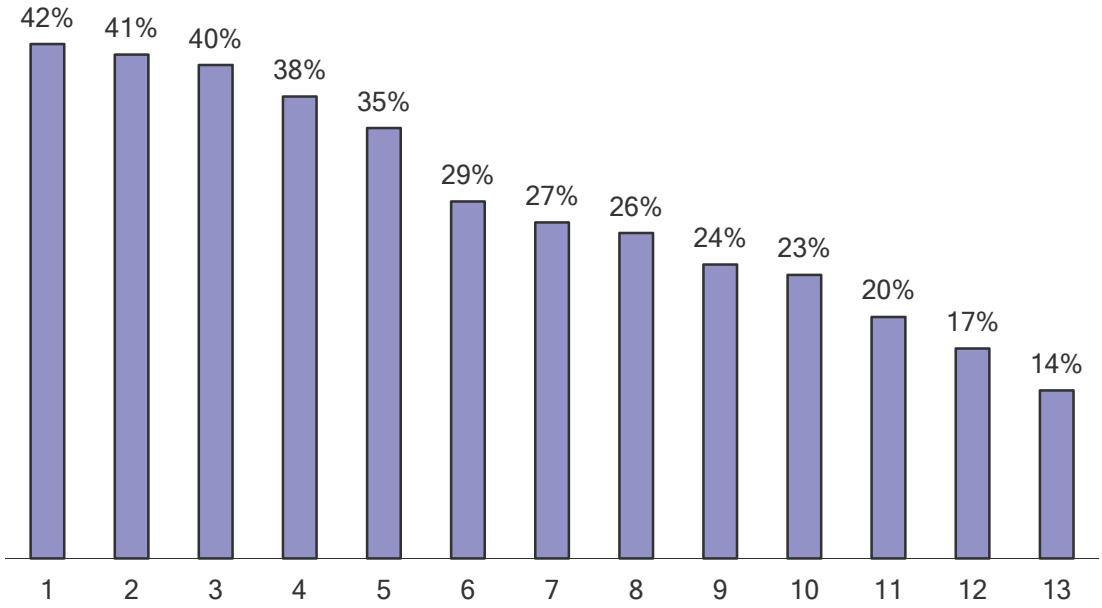
14. Poorly maintained to missing sidewalks
15. Physically unable to walk
16. Poor lighting
17. Crime or lack of security

The "Other" write-in responses given include:

More crosswalks are needed. One by Starbucks or Agoura Deli would be better.
The amount of people running red lights. Also the malls are not nice enough to sit and enjoy.
Need for bicycle routes and stands to lock up bicycles in both centers
Getting from the Vons shopping center to the Ralphs center is dangerous, the traffic lights do not give enough time to walk
The parking lots of the shopping centers are so large, they create barriers for anyone wanting to walk
Unsafe and careless drivers. Police do not do their job.
Not aesthetically pleasing enough to encourage us to walk
Trees in the middle of the sidewalk that obstructs walking
It's hot outside and I get my exercise at the gym
I live all the way in the valley...
I don't go to these places
I live in Calabasas
Laziness
I would rather go home and play video games
I have a car
Bus 161 runs only once an hour
It is so unsafe for people to cross between the two shopping centers at the driveways, especially elder citizens
Cars are moving way too fast and rarely look for pedestrians and bicyclists
Been meaning to walk to the market (either Vons or Ralphs), but carrying all my groceries home seems like a pain. Plus, I drive through that intersection at least twice a day, so I just pick up stuff on the way home from work.
I carry groceries home in the car
Need interesting destinations to make walking exciting
I like to drive
Though these are inconvenient, they do not stop me from walking.
Too many drivers ignore the traffic lights, speed, too much traffic

Chart 4 shows that more than 40 percent of all respondents indicated that improved pedestrian connections from sidewalks and the Ralphs and Vons shopping centers, and a new bicycle/pedestrian trail along Medea Creek are the most needed improvements.

Chart 4: Which of the following improvements are most needed at or near the intersection of Kanan Road/Thousand Oaks Boulevard?



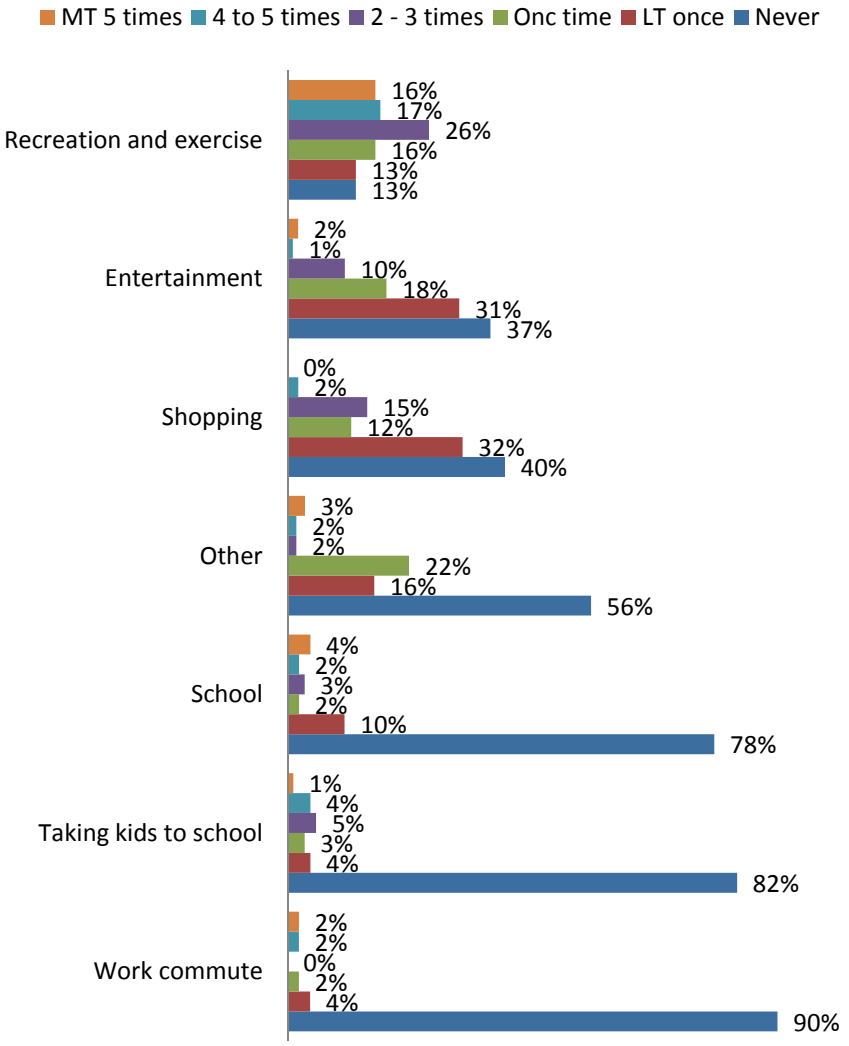
1. Improved pedestrian connections between sidewalks and Ralphs Shopping Center
2. Improved pedestrian connections between sidewalks and Vons Shopping Center
3. New bicycle path along the flood control channel west (Medea Creek) of the shopping centers
4. Improved high-visibility crosswalks
5. Improved pedestrian signals
6. Other
7. Improved pedestrian amenities (seating, signage, etc.)
8. Improved pedestrian connections between sidewalks and Agoura Hills City Mall
9. Improved landscaping along the roadways
10. Enhanced or decorative sidewalk paving
11. Shorter roadway crossing distances
12. Improved pedestrian lighting
13. Improved bus stop amenities

The "Other" write-in responses given include:

Crosswalks on Kanan Rd. between TO Blvd. and Fountainwood.
Water fountains and more landscaping
Bicycle and pedestrian path behind centers and over or under Kanan Road to connect with Chumash Park/Agoura High School
Crack down on drivers using the bike lane as a third driving lane.
Move pedestrian paths farther from roadways and moving cars, put visual barriers between roads and walkways. Reduce speed and sound of cars.
Decorative brick paving at all (4) crosswalks and specimen boxed trees in raised planters near all four corners of Kanan & T.O blvd.
Bike and pedestrian path along the flood control channel would be wonderful.
Trees and perhaps a trash can
Timing of stoplights
BETTER BIKE PATHS WOULD BE AMAZING
I don't think any improvements are necessary.
Faster lights
Traffic after school is terrible- more lanes if possible
Replace where the bus stops, the buses get in the way all the time and the drivers are inconsiderate
Shorter light signals- they are like five minutes long!
A faster light in the left turning lane from t.o onto Kanan.... there for more than 5 minutes, gets congested
Shade at bus stops
Diagonal crosswalks needed
Walk signs that give how many seconds left before light changes....
Need sidewalks desperately on Reyes Adobe near Yerba Buena. It's not safe.
Slower traffic speeds. No cars should be allowed in the bicycle lane ever. Right hand turns for automobiles should be made from the traffic lane. People just don't look. Traffic entrances to malls are a nightmare for pedestrians and bicyclists. We don't exist to someone who has to be at Vons right now and has been waiting for traffic to make a turn into the shopping center.
I don't know as I don't walk in that area very often
intersection is too busy
No buildings set back into parking lots
I do not walk.
Bigger patio seating at Starbucks. Crosswalk at Kanan Road and Starbucks. Someone is going to get hit by a car and killed.
Along Kanan, there is no place for shaded bus stop seating
Enforcement of traffic safety laws

The survey asked respondents to indicate how often they walk and for what purposes. **Chart 5** shows that nearly 60 percent of all respondents stated that they walk for recreation and exercise at least two to three times per week. Less than 30 percent stated that they walk to go shopping at least once per week. Only 11 percent stated that they walk to school at least one time per week, and 13 percent stated that they walk their children to school at least once per week. Seventy eight percent, 82 percent, and 90 percent of all respondents indicated that they never walk to school, walk their kids to school, or walk to work.

Chart 5: How often do you walk and for what purpose?



It was important to gain an understanding of the travel characteristics of school children and their parents given the proximity of Willow and Sumac Elementary Schools and Agoura High School to the study area. The survey asked respondents to indicate if they have school-age children, and if they did, what school(s) their child (ren) attend. Sixty-seven percent of all respondents stated that they do not have school-aged children as shown in **Chart 6a**. This high percentage is due, in part, because of 38 percent of the survey responses were from Agoura High School students. Most of the respondents that did have school-aged children (45 percent) indicated that they attend schools other than the three located near the study area, and 31 percent stated that their child (ren) attend Agoura High School as shown in **Chart 6b**.

Chart 6a: Do you have any school-age children

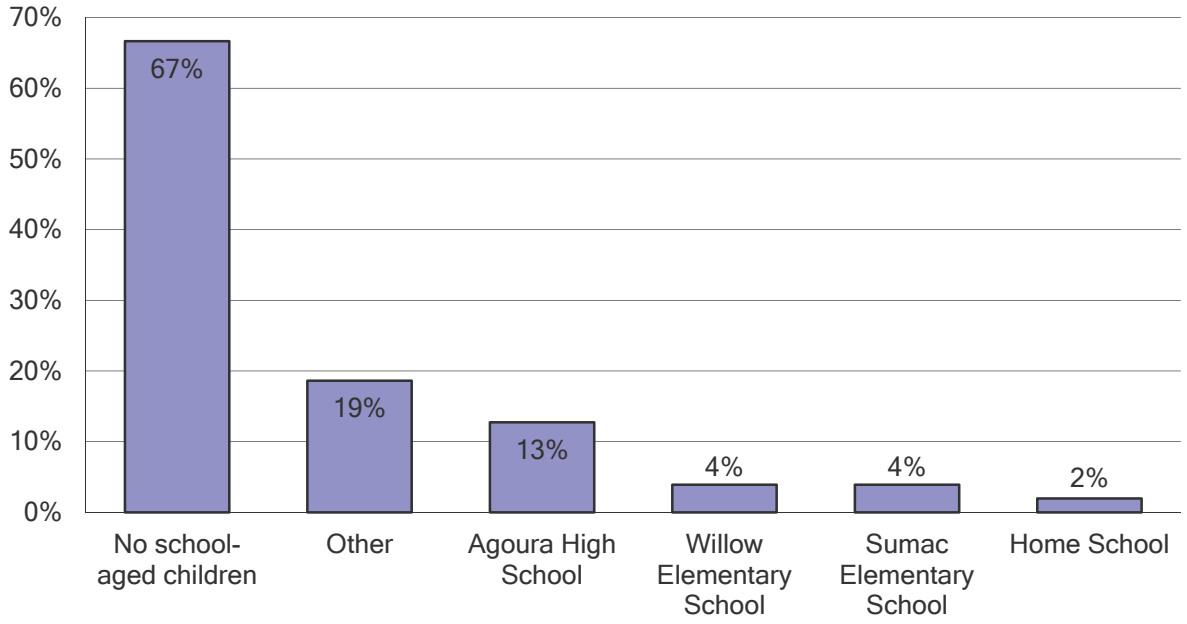
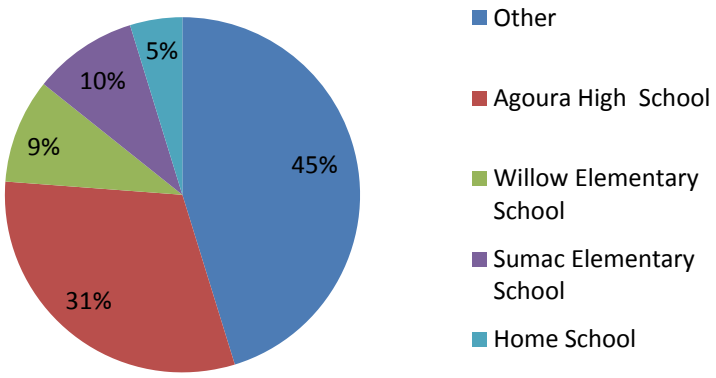


Chart 6b: Schools attended

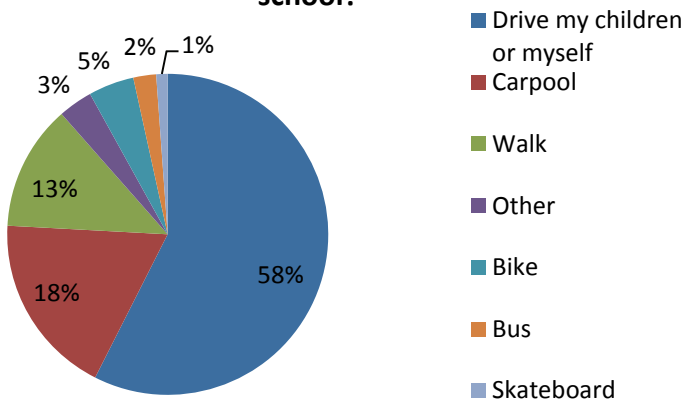


The "Other" write-in responses include:

Mariposa	Lindero Canyon Middle School
Mariposa	Lindero
Mariposa School of Global Education	Lindero
Red Oak	Lupin Hill
Red Oak	Lupin Hill
Yerba Buena Elementary	Calabasas High
Yerba Buena	Oak Park
Yerba Buena	OPHS
Pre-school - Enriching Hour	Oak Park High School
When I had school age kids, I walked them to Sumac 5 days per week.	Use to walk w/kids when at Sumac

The survey participants that responded that they either do have school-aged children, or if they attend Agoura High School were then asked how they most frequently travel to school. Seventy-six percent responded that they travel to school by car. They either drive their children, are driven by their parents, drive themselves, or carpool to school. Only 22 percent walk, ride a bike, or skateboard to school, and 2 percent ride a bus.

Chart 7: How do you most frequently travel to school?



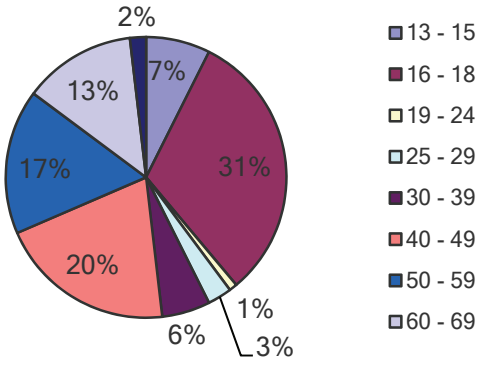
The "Other" write-in responses include:

To LCMS
Walk, drive, or carpool to home school events
We walk, carpool, and drive to various home school events

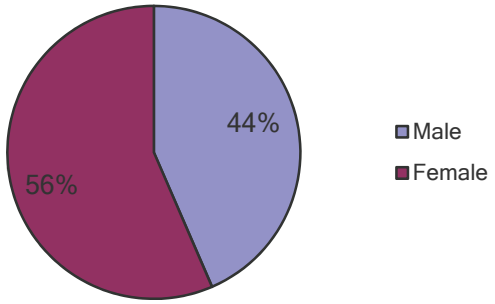
The single largest data cohort is the 16 to 18 year old age group. This is due, in part, because 38 percent of the survey participants were Agoura High School students. Another important factor regarding the 16 to 18 age group is that this is the age when most people begin to drive. This fact is reflected in the high percentage of people who indicated that they drive themselves to school and was confirmed by the high number of vehicles parked at Agoura High during school day, local travel patterns observed during field investigations, and interviews conducted with Agoura High School's principal. Another important consideration is the relatively low number (15 percent) of adults over the age of 60 who participated in the survey.

Most of the survey respondents were female as shown in **Chart 9**.

Chart 8: Age of survey respondents.



9. Gender of survey respondents.



The survey participants provided the following additional comments.

Paths for running / cross country distance needed.
The walls along Kanan and Thousand Oaks are in very poor condition and make our city look bad
Bicycle master plan to link shopping centers, library, movie theatres, and community center. Need lanes or paths over or under the 101 and Kanan Road. Lots of bicyclists use Agoura Road.
I would also like to have a safer walk going over the freeway
I have a 7 month old child, and the traffic from Agoura Hills High School is disturbingly frightening in the afternoons. Students drive recklessly, and some parents don't seem to adhere to common safety rules, therefore making me wonder what can be done to monitor and regulate traffic for pedestrians around those peak times when school gets out and parents/students avoid Kanan/TO Blvd and turn to Carell as an alternate route, but not obeying traffic laws or safety. Focusing on Kanan/TO Blvd is obviously the largest concern, but please also consider that neighboring streets (specifically Carell Ave) become speedways to avoid the intersection if it takes too long to wait at the light. Speed bumps are NOT enough.
Anything you can do to increase connectivity & open up more avenues of alternative transport is great. A path between the Vons & Ralphs centers would be wonderful. It's so silly to get in a car and drive over.
Please fix the signal timing of the traffic lights on Kanan - - it is HORRIBLE
Quite often people drive down the road using the bicycle lanes to bypass traffic. Citations need to be handed out. Traffic lights need to be synchronized in the mornings and evenings to move more traffic through. At night, kids in the shopping malls race through the lot without respect to people crossing or driving across the parking lanes. Designated markings for people walking from parked cars to the front of the stores will help as well since if you are a driver, it's like trying to drive through a herd of cattle.
It's all about keeping the cars and the pedestrians separated. The reason the Calabasas Commons and T.O. Promenade are successful is because there is a lot of "hang out" space without worry of cars.
LOVE that we are looking into making Agoura more pedestrian friendly!!! As my kids are older we are more interested in walking!
Improve the appearance of the creek at Kanan. The pipe handrail along Kanan should be replaced with fencing similar to Old Agoura - concrete fence that looks like wood or split rail. Bury power lines along Kanan. Widen sidewalks around utility poles and trees.
Thanks for taking time to improve the city!
Good to also consider the cyclists in this analysis. I don't think a separate path along the flood channel is a good idea.
The more you do for walkers, the worse it will be for traffic. Vast majority of residents drive. Please think before you act.
Cars along Kanan on the side opposite the shopping centers are parked, blocking the bike lane
The streets Kanan and Thousand Oaks are dangerous difficult problems.
Parking at AHS is a big issue especially with the new performing arts center. Could TO above Argos have parallel parking on both sides? Could Easterly have parallel parking? It would not add a lot of parking but every bit helps? Look at bus routes that run closer to AHS with incentives for student use.
PLEASE IMPLEMENT MORE AND BETTER BIKE PATHS. PEOPLE WOULD ACTUALLY USE BIKES MORE!
We need more parking at Agoura High School
The buildings look old and out of date. I'd also like to see less development and more focus put towards nature and restoring it.

I think the road is pretty much fine.
I run everywhere and am very happy with the structure of Agoura
Police obstruct the roadways too often
There is not enough time for families to cross with strollers, small bikes, etc. Have a family and older citizen walk the intersection to see how long it takes and then increase the time...
There needs to be better crosswalks/signage at Driver/TO on both sides, north/south and east/west.
Please see a need for basic sidewalks in our city before improving sidewalks. Reyes adobe doesn't have any and it's a major inconvenience and liability.
It is really dangerous to walk or bike on the sidewalk in front of the Vons or Ralphs shopping centers. Cars going to either of the shopping centers just don't look for pedestrians or bicyclists. Cars trying to enter either of the shopping centers just don't look for pedestrians or bicyclists.
I haven't noticed the intersections being a problem. I have noticed the parking in the lots of both Vons and Ralphs to be troublesome. Because cars can go in either direction on each aisle, and cars park going both directions, there are more accidents than in single directional parking lots.
Better safe pedestrian access to the malls would be appreciated. Improved exiting (for cars) from the Ralphs Mall and Agoura City Mall would be helpful.
I believe that part of the problem with the T.O. / Kanan intersection has to do with the short timing and short length of the left turn lane when leaving Agoura High School. Perhaps lengthen the timing and cut into the median in order to expand the lane? It would be much appreciated.
Pressure the developers and mall owners to make improvements to their properties.
Keep up the good work
Change timing on TO BL to allow traffic from Laro to pass TO BL without stopping
Upgrade the bus stops in Agoura. Look at Westlake. Seems like Westlake has more pride in their city. Why?
I appreciate any and all improvements for pedestrian and bicycles
Walk to the farmers market on Sundays
Kids walk to school about half the time.

The survey indicates that the automobile is the primary form of travel within the project area. This fact is confirmed by Census data as shown in Table 12.

Table 12: Means of Transportation to Work (Workers 18 and older)

Travel Mode	Agoura Hills		Los Angeles County	
	Number	Percent	Number	Percent
Car				
Drive Alone	8,794	82.9%	3,173,055	72.1%
Carpool	740	7.0%	497,964	11.3%
Subtotal	*9,534*	*89.9%*	*3,671,019*	*83.4%*
Transit				
Bus	48	0.5%	283,961	6.5%

Travel Mode	Agoura Hills		Los Angeles County	
	Number	Percent	Number	Percent
Other	18	0.2%	27,740	0.6%
Subtotal	*66*	*0.6%*	*311,701*	*7.1%*
Non-Motorized				
Bicycle	14	0.1%	32,423	0.7%
Walk	113	1.1%	125,816	2.9%
Subtotal	*127*	*1.2%*	*158,239*	*3.6%*
Taxi, motorcycle, other	142	1.3%	57,903	1.3%
Work at home	736	6.9%	200,450	4.6%
Total	**10,605**	**100%**	**4,399,399**	**100%**

Source: US Census, 2010 American Community Survey, three year estimates.

The data shows that more workers who live within Agoura Hills drive to work (both by themselves and in carpools) than the total number of workers within Los Angeles County. The percentage of workers who take transit within Agoura Hills is nearly 12 times lower than that of the County, and the percentage of workers who either walk or ride their bikes to work within Agoura Hills is three times lower than that of the County.

While this data shows that automobile travel is the dominant form of transportation within Agoura Hills for work trips, it does not show a complete picture of local travel within the project area given that the different land uses generate different types of trips, including school, shopping, and recreational trips. The relatively low number of survey participants that responded that they walk on a regular basis for shopping and school trips, along with the large percentage that responded that they feel that driving is more convenient indicates that there may be a possibility to influence travel behavior by making walking or bicycling more convenient for different trip purposes other than simply recreation. This is supported by the Mobility Element policies contained in the City's General Plan that seek to promote the use of multiple travel modes as a means of creating a balanced transportation system that ensures mobility for all of the City's residents.

3.2 Los Angeles Flood Control Department

The project team met with a representative of the Los Angeles Flood Control Department to discuss the potential for creating a multi-use trail along the Medea Creek Channel. In general, the Flood Control Department was open to the idea of creating a multi-use trail along the Medea Creek Channel and provided the following guidance:

- To create pedestrian/bike trail along the flood control channel, a flood permit, construction permit, and an agreement for work in the right- of-way is required. This would entail submitting an application to the Land Development Division. The agreement would stipulate that the City needs to do the maintenance for the trail i.e. pavement, plantings, etc.
- The City would need to summit all drawings/design for approval by County.
- May need to obtain Army Corps of Engineers approval, if originally built by Corps.

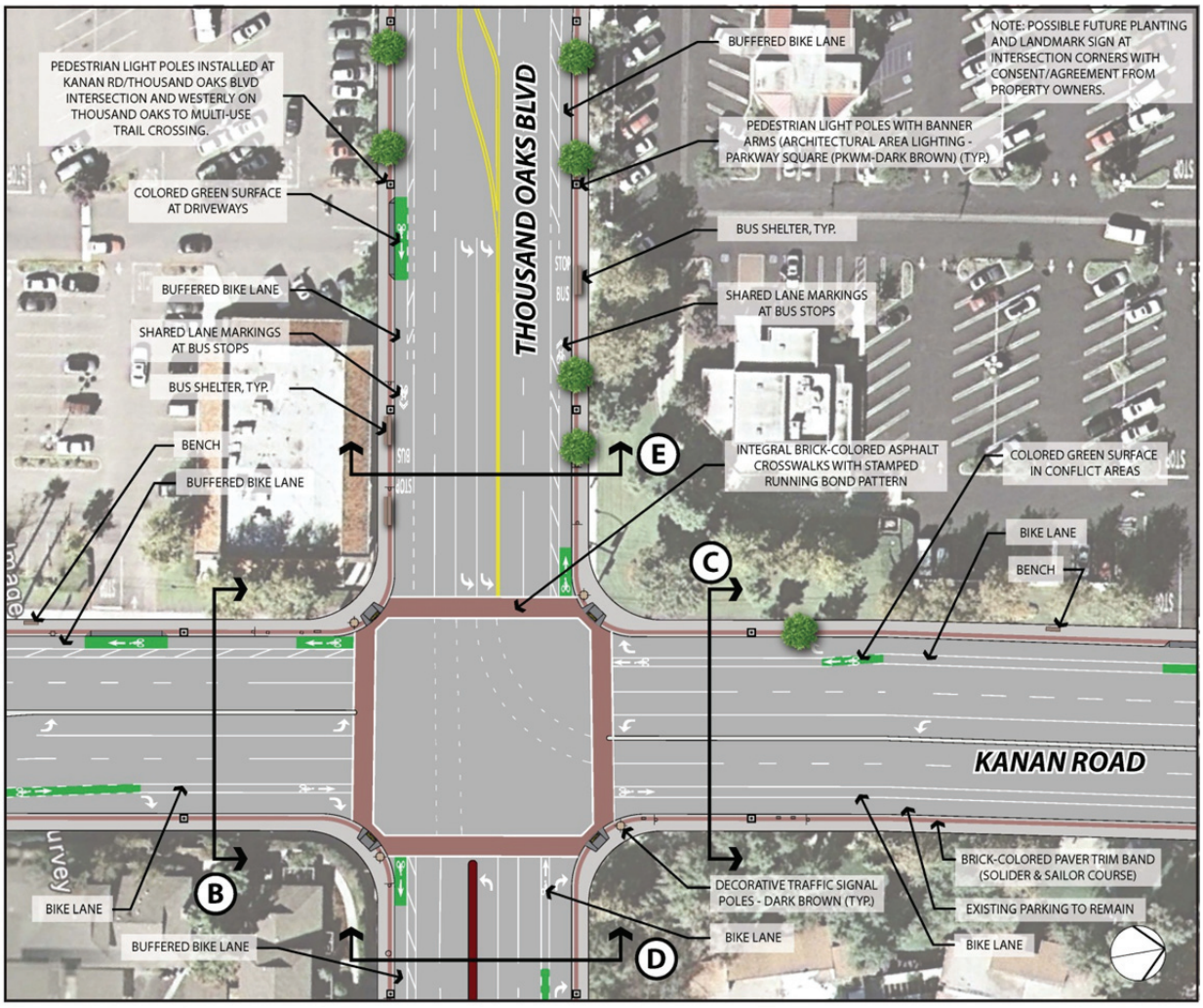
- Pedestrian bridge over channel is feasible, but would need to obtain Fish and Game and Army Corps for environmental permits. This should be easy, if the present channel is entirely concrete lined.
- It depends on the width of the channel, if flood control access is needed on both sides or just one side of the channel.
- Existing gate to channel could be opened, but a fence (4-6 feet high) may be needed to keep people out channel.
- The Flood Control Department needs 12' paved width and 15' right- of-way, but is open to having plantings/landscaping. Stamped concrete is okay, but City would need to maintain this.
- Pedestrian/bike trail under bridge could be done. A relevant example is the undercrossing of San Gabriel/Los Angeles River.
- It is possible to green a portion of the channel. The City would need to take the section over, remove County responsibility/ownership, so there would be no maintenance agreement, because City would own.
- Creating a natural side along the south side of the channel would be feasible.
- The Flood Control Department would allow un-grouted riprap with small plants on the sides of the channel, but the department hasn't seen it done to an existing concrete channel. It would probably involve close coordination with the department to get approved. The type of sides that are approved are reinforced concrete, grouted riprap, un-grouted riprap, soil/cement nail (need more space for the latter).

4 Proposed Improvements

4.1 Pedestrian Facilities

The most basic pedestrian enhancement components focus on improving the pedestrian signal timing at the Kanan / Thousand Oaks intersection. During fieldwork, the pedestrian phase was observed to operate intermittently across the west leg of the intersection. Maintenance should occur at this signal to ensure that the push button always results in a pedestrian walk phase. Countdown signal heads should be installed to give pedestrians information about remaining crossing time, and to reduce instances of pedestrians being "trapped" on the median islands between phases. To better emphasize the crosswalk a colored, stamped asphalt treatment would be installed between the transverse white crosswalk lines. This treatment will also tie to the overall streetscape improvements (discussed below) to help create a more defined sense of place within the intersection.

Figure 10: Proposed Pedestrian and Bicycle Improvements

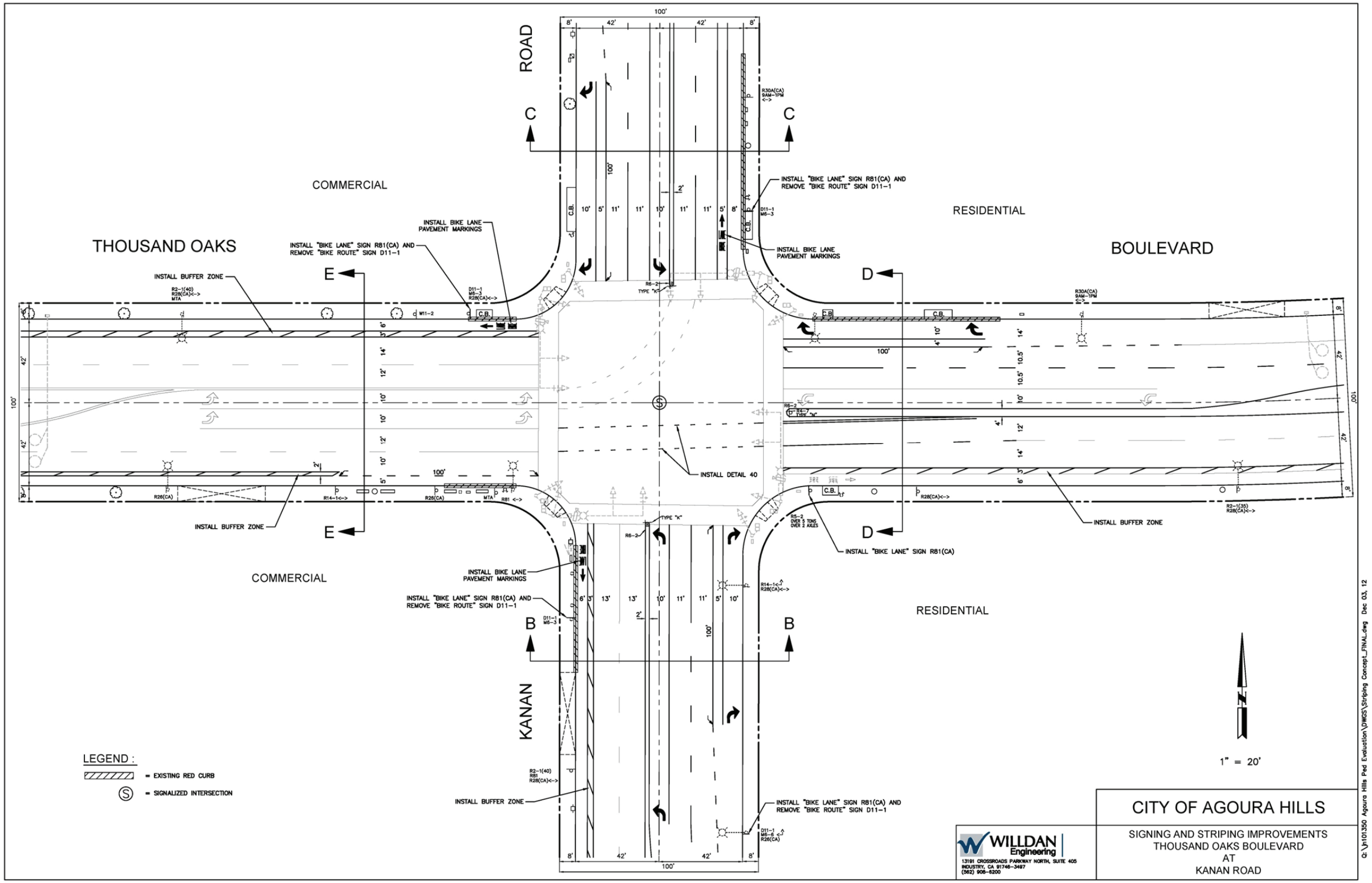


4.2 Bicycle Facilities

The bicycle facility components have been structured to improve existing bicycle circulation by reallocating excess lane space to cyclists to offer better separation and visibility. Along the roadway segments, the current bike lane and vehicle lane space is overly wide in many areas. A buffered treatment is proposed to utilize some of that available width and to provide a stronger visual separation between the vehicle lanes and cycling lanes. In areas where there is parallel on-street parking adjacent to the bike lane, additional width would be allocated so that the bike lane / parking lane combination is at least 13' wide (8' parking lane + 5' bike lane), which will help minimize bicyclist / door zone conflicts.

Approaching the intersection of Kanan Road / Thousand Oaks Boulevard, the wide shoulder / bike lane areas become de facto right turn pockets for motor vehicles. These are some of the most critical locations for cyclist safety, as proper bicyclist positioning can help to prevent "right hook" crashes (where a through bicyclist is struck by a right turning vehicle). Absent pavement markings, inexperienced cyclists often position themselves curbside at these locations, which is precisely where a right hook crash might occur since a turning motor vehicle may not understand that the cyclist intends to travel straight. For this reason having the through cyclists positioned to the left side of the rightmost lane is important, so they are clearly out in front of vehicles queuing behind them and have indicated through positioning that they intend to travel straight. Formal Right Turn Only Lanes with Bike Lane pockets at three of the intersection approaches are proposed, where lane space can be reallocated to provide 4-5' wide bike through lane to the left of a Right Turn Only lane.

Figure 11: Proposed Striping and Signage Plan



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In order to confirm that the new right turn only lanes would not negatively impact intersection operations, the intersection was modeled in Synchro 7 to determine the delay and level of service (LOS) results during the AM, Mid-Day, and PM peak hours. The analysis started with modeling the intersection using proposed lane configurations that featured de-facto right turn lanes paired with the existing signal timing. The resulting LOS and delay provide a baseline to compare alternative scenarios against. As the striping concept was finalized, the intersection was modeled with dedicated right turn lanes instead of the de-facto right turn lanes previously analyzed. This resulted in no change for the LOS and delay due to the way Synchro is programmed to model the de-facto right turns as individual turn lanes already. The next iteration of the Synchro modeling evaluated how much improvement implementing right turn overlaps would result at all three right turn lanes. By adding the right turn overlaps, there was minimal improvement to the delay during the Mid-Day peak hours, while the rest of the peak hours remained at the same LOS and delay as before. The reasons the delay did not improve significantly is due to the right turns not being the critical movements for the intersection and due to right turns being allowed during the red interval.

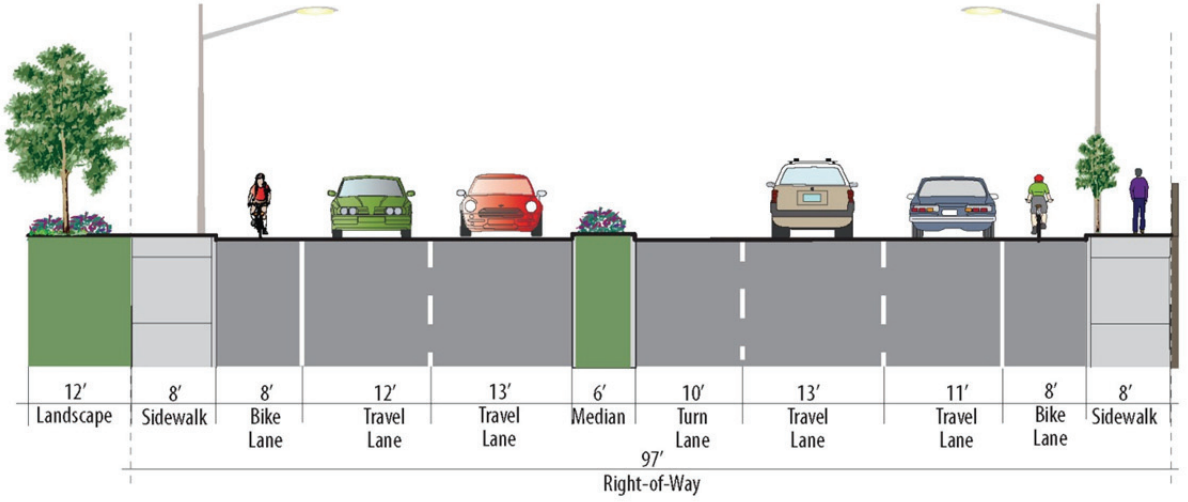
Table 13: Kanan Rd and Thousand Oaks Blvd - Delay and Level of Service Results

Scenario	Intersection Delay / Level of Service	
	With Right Turn Lanes	With Right Turn Overlaps
Weekday AM Peak Hour	69.5 / E	69.5 / E
Weekday Mid-Day Peak Hour	53.3 / D	53.2 / D
Weekday PM Peak Hour	77.8 / E	77.8 / E
Weekend Mid-Day Peal Hour	72.6 / E	72.3 / E

On the eastbound Thousand Oaks Boulevard approach, a separate Right Turn Lane plus bike lane pocket was also desired, but due to the double left turn lanes our study found that that this configuration could not be accomplished without creating too great an offset at the intersection. At this location the buffered bike lane would be dropped approximately 100' in advance of the intersection and a skip stripe (dashed line) installed to indicate the transition / merge area.

Figure 12: Proposed Bikeway Improvements, Section A – Kanan Road (South)

Existing



Proposed Improvements

- Add 3′ wide painted buffer.
- Narrow traffic lanes by 1′.

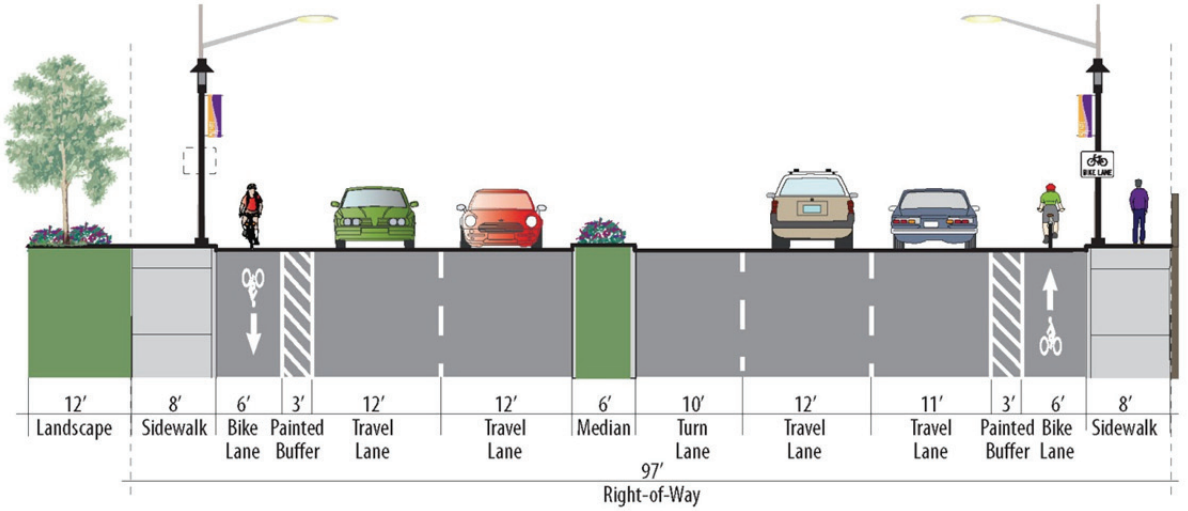
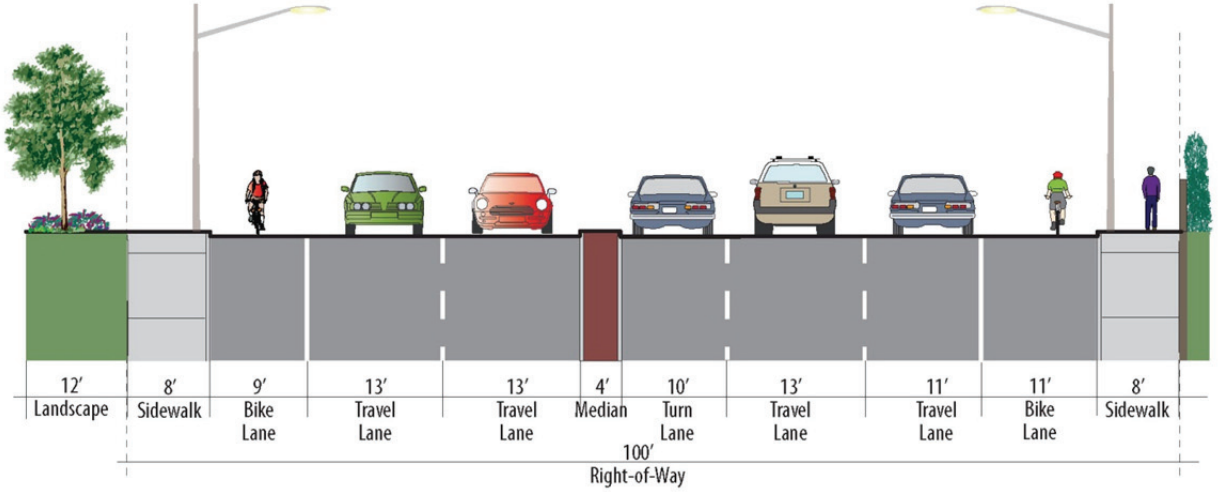


Figure 13: Proposed Bikeway Improvements, Section B – Kanan Road Intersection

Existing



Proposed Improvements

- Add 3′ wide painted buffer to the southbound bike lane.
- Narrow northbound through lane to 11′.
- Narrow median at intersection to 2′ and create right turn only lane and through bicycle lane.

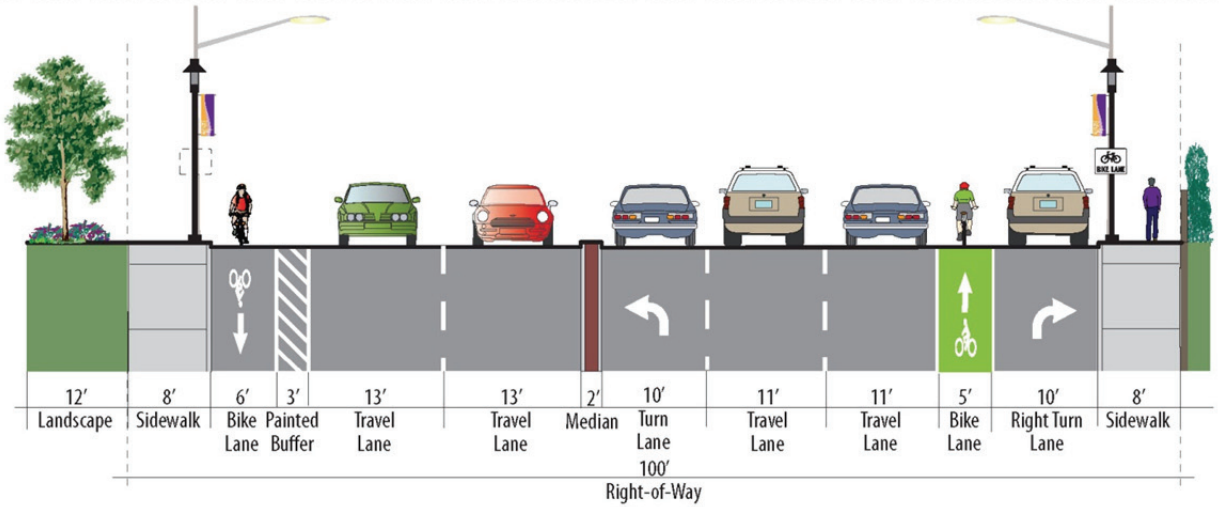
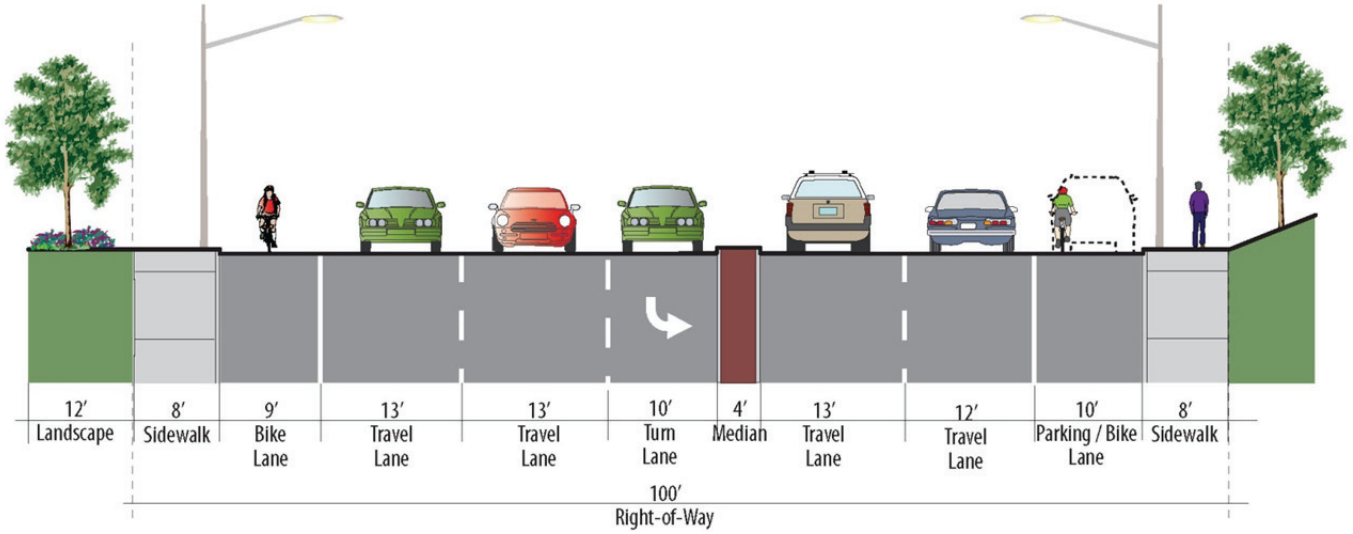


Figure 14: Proposed Bikeway Improvements, Section C – Kanan Road (North)

Existing



Proposed Improvements

- Narrow traffic lanes by 2′ and stripe 5′ bike lane adjacent to 8′ parking
- Narrow median at intersection to 2′ and create southbound right turn only lane and through bicycle lane

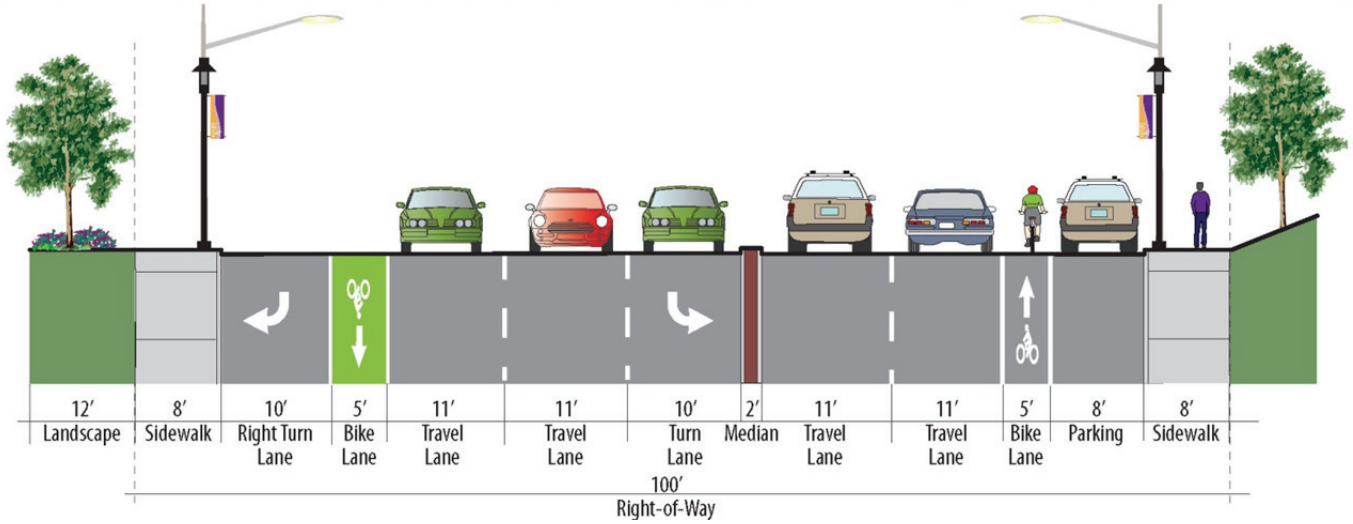
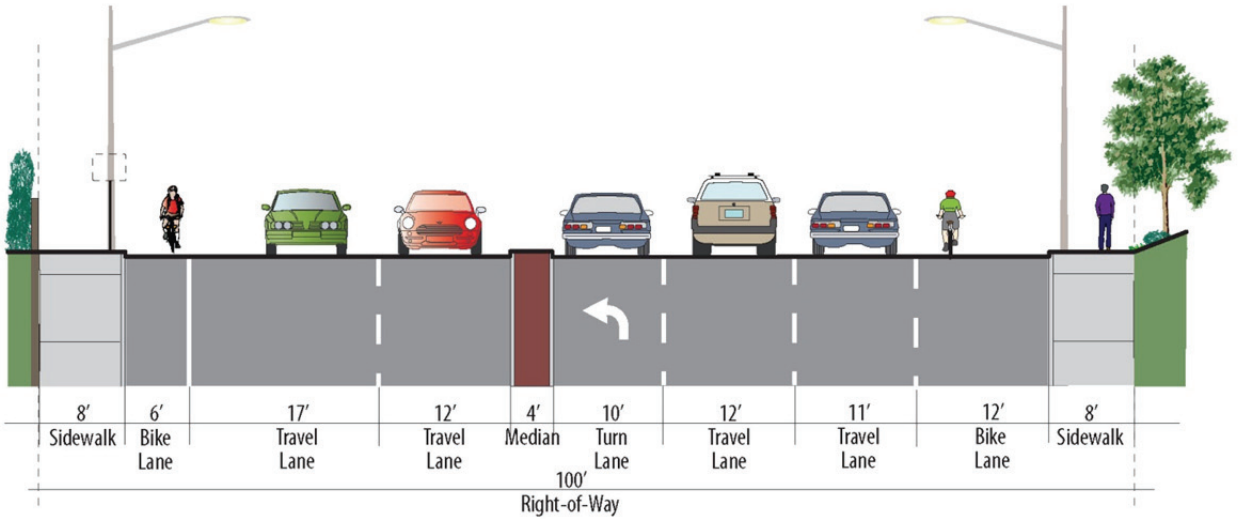


Figure 15: Proposed Bikeway Improvements, Section D – Thousand Oaks Boulevard

Existing



Proposed Improvements

- Add 3′ wide painted buffer and narrow traffic lane
- Add 4′ wide bike lane; narrow travel lanes; create right turn lane

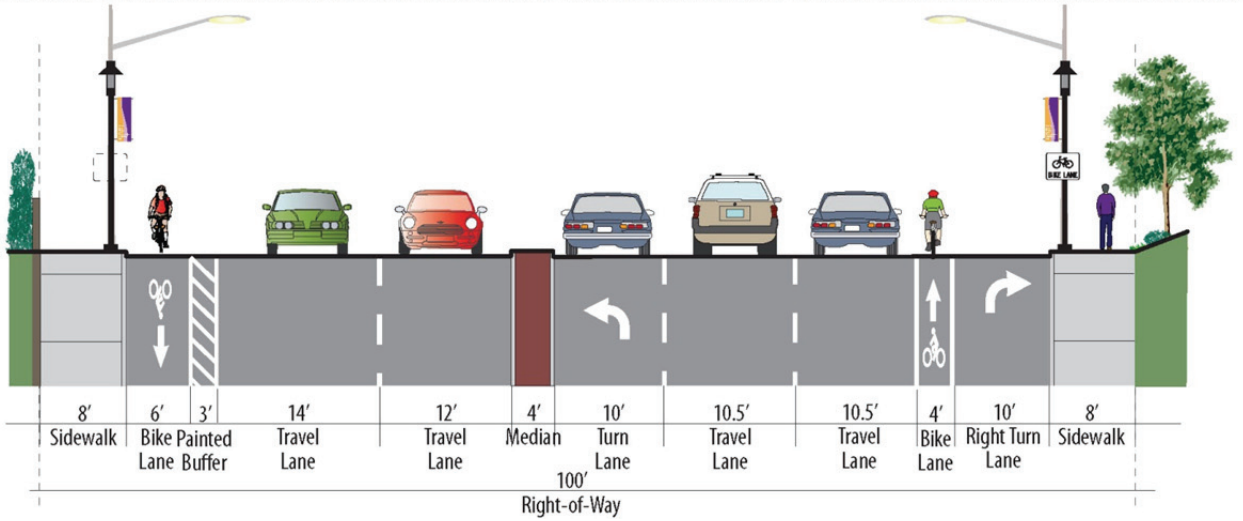
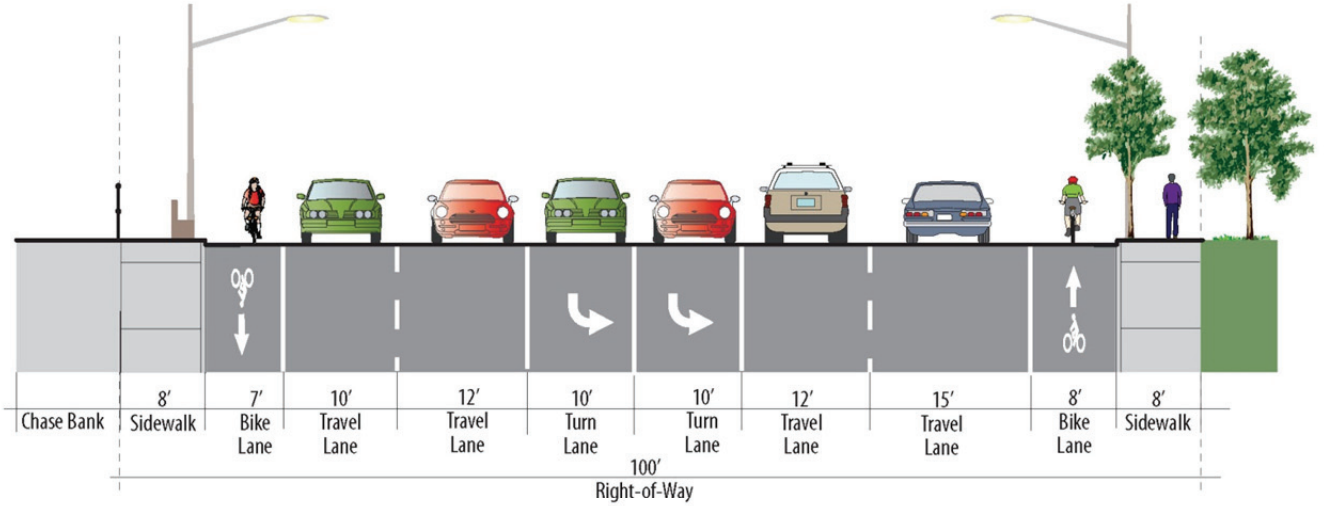


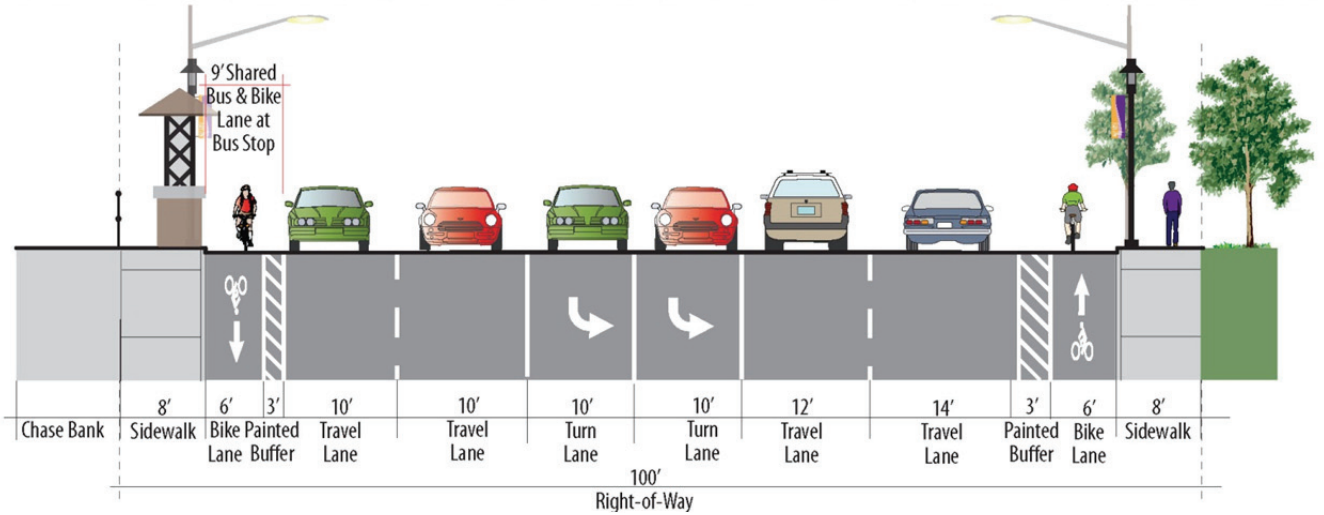
Figure 16: Proposed Bikeway Improvements, Section E – Thousand Oaks Boulevard

Existing



Proposed Improvements

- Add bike lane buffers
- Reduce outer lane width



4.3 Streetscape Enhancements

Currently, Kanan Road and Thousand Oaks Boulevard are primarily designed for vehicles. Pedestrian and bicycle recommendations described above can be coupled with streetscape enhancements to create a cohesive district aesthetic. Unifying elements that would elevate the pedestrian experience and contribute to the overall district identity include:

- Crosswalk pavement treatment with integral brick-colored asphalt with stamped running bond pattern.
- Brick-colored paver trim band (combined sailor and soldiers course) along the outer edge of the sidewalks on Thousand Oaks from the proposed multi-use trail crossing to Argos Street; and on Kanan Road from Hillrise Drive to Laro Drive.
- Pedestrian-scaled light poles (Architectural Area Lighting/ Parkway Square) with banner arms and dark brown finish at the intersection of Kanan Road and Thousand Oaks Boulevard and extending westerly to the multi-use trail crossing at Thousand Oaks Boulevard.
- Decorative traffic signal poles and mast arms in dark brown finish at intersection of Kanan Road and Thousand Oaks Boulevard and a decorative pedestrian signal pole at the proposed multi-use trail crosswalk at Thousand Oaks Boulevard.
- Planted traffic medians with drought tolerant plantings that provide multi-seasonal color and texture.
- Additional street trees in grates where there are gaps in tree plantings, but no sight line issues.
- Street furnishings such as benches and trash receptacles that tie into the new transit shelters' materials palette of metal and wood.
- Public art.
- Future potential for improvements at the back of walk, especially at the corners of Kanan Road and Thousand Oaks Boulevard, such as plantings, monument sign, and benches which would require approvals and maintenance agreements with the adjacent private property owners.

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Figure 17: District Theme

DISTRICT THEME

Conceptual Rendering

Furnishings & Lighting

Equiparc Ipe Bench: EP 1690-IPE Bench

Architectural Area Lighting: Parkway Square-PKWM

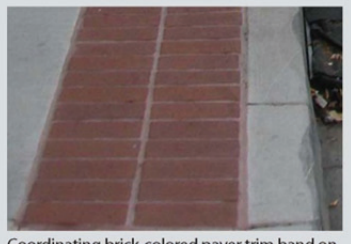
Equiparc Waste Receptacle: EP 3690- IPE

Bus Shelter

Southcoast Lighting Signal Pole (Irwindale square pole with Murrieta base and cap, Architectural Area Lighting Parkway Square Luminaire, bronze color)

Enhanced Pavement

Crosswalk with integral color, stamped asphalt



Coordinating brick-colored paver trim band on sidewalk

Figure 18: Landscape Enhancement Plan

LANDSCAPE ENHANCEMENT PLAN

Street Trees & Planted Medians

4.4 Shopping Center Enhancements

The present auto-oriented layout of the three shopping centers provides little accommodation for shoppers arriving on foot or bike. There are no sidewalks or bike lanes at the shopping centers' main ingress/egress points. There are only a few dispersed bike racks throughout the shopping centers. In addition, shoppers that arrive by car have little pedestrian accommodation once they leave their car and walk to their destination. The lack of pedestrian accommodations coupled with the vast areas of parking lots, deters people from walking from one shopping center to the next. The current tendency is for shoppers to drive from one shopping center to the next. However, many of the shopping centers' cafes and restaurants have outdoor dining that could be enhanced with better pedestrian and bicycle connectivity. There is a real opportunity for the shopping centers to collectively increase their sales by creating a destination experience – an environment that encourages shoppers to stay longer and patronize multiple retail establishments within a single visit.

Potential pedestrian and bicycle improvements are listed below in a menu of short, mid, and long-term options. These improvement options are only suggestions. Any improvements on private property would be at the owner's discretion.

Short-term improvements could include:

- Reorganizing parking bays to provide striped pedestrian walkways
- Adding sidewalks at shopping center entries
- Adding bike racks

Mid-term improvements could include:

- Creating temporary space for events such a farmers market or seasonal café
- Creating a sustainably-designed, demonstration project where asphalt is replaced with pervious pavement, lighting is solar-powered, landscape islands are composed of native plants, benches are made from recycled materials, and an interpretive panel explains the design components and environmental benefits.

Long-term improvements could include:

- Infilling parking lot area with pedestrian plazas with adjacent storefronts
- Providing tree-lined pedestrian walkways

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Figure 19: Shopping Center Potential Improvements

SHOPPING CENTERS

SHORT-TERM IMPROVEMENTS

Painted Pedestrian Walkways

MID-TERM IMPROVEMENTS

Temporary Events & Flex Spaces

LONG-TERM IMPROVEMENTS

Pedestrian Plazas

Potential short, mid, and long-term improvements are only suggestions. Any improvements on private property would be the owner's discretion.

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4.5 Medea Creek Multi-Use Path

A key component of the project is to develop the east side of the Los Angeles County Flood Control District's Medea Creek channel (canal) with a 10-foot wide multi-use path from Kanan Road/Hillrise Drive to the northern edge of the Twin Oaks shopping center with a link to Willow Elementary School. The trail would provide access points for neighborhood walking and biking trips to and from the shopping centers, as well as recreational opportunities for walkers, joggers, and cyclists. From the northern edge of the Twin Oaks shopping center, the multi-use paved trail would transition to a decomposed granite foot path along the greenway (owned by the City) to Laro Drive. A sitting area is proposed at the south end of this greenway, near the Agoura Hills City Mall. The west side of the canal would remain as flood control equipment and vehicle access. With additional connections, the trail would ultimately provide a new route for students to walk or bike to Agoura High School and Willow Elementary, as well as Chumash Park. The segment of the creek channel that runs along the west perimeter of the shopping centers and is currently paved with asphalt would be redeveloped with the following trail design features:

- Railing between the trail and canal that provides safety while allowing visibility to the canal.
- Plantings along the eastern edge of the trail to soften the hard edge between the shopping centers and the trail.
- Porous asphalt or concrete trail paving for stormwater management, with decorative elements.
- Interpretive panels.
- Benches.
- Integrated public art, i.e., custom designed gates, railings, special pavement treatments, etc.
- Gate access points between trail and shopping centers.
- Bollard lighting.
- A new signalized pedestrian crossing of Thousand Oaks Boulevard where the trail intersects with the street.
- An enhanced crosswalk at Kanan Road/Hillrise Drive with integral brick-colored asphalt with stamped running bond pattern.
- An ADA switch-back trail down the eastern embankment of Kanan Road (across from Hillrise Drive) to connect to the trail extention described below.

To the south, there is also an opportunity to naturalize a portion of the west side of Medea Creek, just east of its crossing of Kanan Road, and extend the multi-use trail. This additional segment is part of a separately proposed project. Currently, there is a concrete-lined channel. The City intends to conduct a Planning Study to explore the best means of accomplishing this project from an engineering standpoint, and then complete design and construction. The west side is preferred for multi-use trail and naturalizing project, since there is sufficient open space land for the naturalizing; the east side is constrained by the back yards of existing homes. The south slope would be planted with stabilizing, native vegetation. South of the area to be naturalized, the creek is semi-naturalized and has been restored with native riparian habitat for the full length to Canwood Street, after which it is channelized under the US-101 freeway. A future pedestrian/bike bridge is envisioned to allow for crossing of the creek from the west side to the east side to connect with an existing informal foot trail that continues north to Chumash Park and Agoura High School, and an existing trail that is located on the east side of the creek that connects to the Oak Creek Apartments and shopping centers beyond along Canwood Street.

In order to confirm that the new proposed, signalized trail crossing of Thousand Oaks Boulevard would not impact the operations of the Kanan Road / Thousand Oaks Boulevard intersection, a Synchro modeling analysis was also performed at this location. For this new trail crossing signal, the worst case scenario was modeled, which is the AM peak hour with the highest vehicular traffic. The trail crossing signal was set up with a 60 second cycle that featured a pedestrian call every 60 seconds. The analysis showed that the resulting level of service to be at LOS B with a delay of 13.0 seconds. The westbound queue length was determined to be 125 feet. The trail crossing signal was then modeled with the traffic signal at Kanan Road and Thousand Oaks Boulevard as a connected network. This resulting analysis showed no change in the delay and LOS for both signals. The traffic signal at Kanan Road / Thousand Oaks Boulevard is located approximately 700 feet away from the proposed signalized trail crossing, therefore there is no vehicle queue that backs up to the existing intersection.

Table 14: Thousand Oaks Blvd Mid-Block Pedestrian Signal - AM Peak Hour Results

Pedestrian Signal Delay / Level of Service	13.0 / B
Westbound Queue Length	125 Feet
Eastbound Queue Length	186 Feet

Figure 20: Medea Creek Multi-Use Trail

MEDEA CREEK MULTI-USE TRAIL

Existing Conditions


Canal borders Chumash Park


Canal runs behind shopping centers


Maintenance road adjacent to canal

Design Concept

Existing

Proposed

Design Ideas

Pavement Materials


Recycled Colored Glass


Colored Concrete


Colored Asphalt

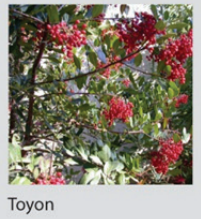

Porous Asphalt

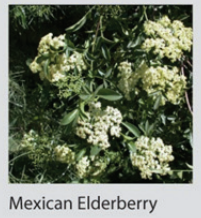
Trail Gateways

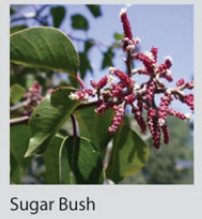
Fencing and Screening

Amenities

Native Landscape Plants

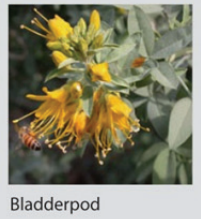

Toyon


Mexican Elderberry


Sugar Bush


California Wild Rose


Desert Grape


Bladderpod

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4.6 Demand Projections

The following methodology was used to project the additional number of commuters expected by the completion of the recommended Medea Creek multi-use trail segment:

4.6.1 Define Analysis Area

The analysis area is intended to capture geographic locations where travel behavior is likely to reflect the construction of a new trail. For this trail project, a one mile buffer was used, capturing much of the nearby neighborhood of Agoura Hills, north to the County line, east nearly to Liberty Canyon, south to the City limits, and west past Forest Cove Lane.

The trail is located directly in the center of the analysis area, and fronts moderate density residential neighborhoods and retail uses. It is thus strategically located to capture a significant percentage of neighborhood walking and bicycling trips. The analysis assumes that the proposed facility will capture 40 percent of walking and bicycling trips in the neighborhood and 30 percent of the pedestrians and bicycles counted at an adjacent intersection.

4.6.2 American Community Survey Data

American Community Survey Data were analyzed at the Census Tract level for this neighborhood, and numerically adjusted for census tracts that extend beyond the analysis area. In addition to estimates for the number of commuters by each mode, data were queried for the number of students in the study area and the current travel time to work.

To establish a baseline for the number of pedestrian and bicycle trips, the American Community Survey was complemented with assumptions regarding the number of trips for children walking and bicycling to school and the number of walking or bicycling trips that someone working at home or commuting on transit may take. A significant number of college and graduate students live in the analysis area, and a 5 percent bicycle mode split (consistent with a study of seven universities) was assumed for that population.

These modifications increased the estimated daily bicycling trips to 219 and the walking trips to 398.

4.6.3 Latent Demand

An estimate of latent bicycling demand was generated by considering the number of commuters whose travel time to work was less than 10 or 20 minutes. Such commuters are considered to have high potential for walking and bicycling to work. As the additional trail segment would add approximately 28 percent to the length of designated bicycle facilities in the analysis area, including its first designated multi-use path, it is assumed that 10 percent of commuters traveling for less than 10 minutes and 5 percent of commuters traveling between 10 and 19 minutes. This analysis concludes that the potential for walking and bicycling for these short commute trips could significantly increase (as much as 50 percent) with the implementation of the multi-use trail and other pedestrian and bicycle-related improvements at the study intersection.

4.6.4 Count Data

Commute trips represent only a fraction of all trips taken in any community. Pedestrian and bicycle count data near the trail location were considered to determine what level of discrepancy there may be between American Community Survey commuting data and peak-hour and weekend counts. Significantly higher

counts were observed than would be predicted by the Census, and higher weekend counts were observed than weekday counts, suggesting that the trail may serve an important recreational function.

464 bicyclists and 536 pedestrians were counted at the intersection during six hours of a weekend and 95 bicycles and 396 pedestrians were counted at the intersection during 6 hours of weekday peak period traffic. Using the National Bicycle and Pedestrian Documentation Project extrapolation methodology (for both paths and pedestrian districts), it is assumed that the count hours account for 40 percent of daily trips.

The count data were projected upward based on the latent demand factor considered earlier and the projected population growth for Agoura Hills (5.4 percent by 2030[3]).

4.6.5 Trail Demand Estimate

The Medea Creek trail can be expected to accommodate:

- 313 pedestrians per weekday and 424 pedestrians per weekend day
- 122 bicycles per weekday and 595 bicycles per weekend day
- 126,000 annual pedestrian trips, and 93,000 annual bicycle trips.

These trips would be primarily utilitarian transportation trips by neighborhood residents going to the shopping center. Some additional level of pure recreational use would be expected but is difficult to quantify. Expected recreational demand would increase if the trail were expanded southward and connected via a footbridge to Chumash Park.

4.7 Cost Estimates

Cost estimates for the recommended improvements are provided below. These are broken out into two tables: **Table 15** provides engineer's costs for the recommended bicycle, pedestrian and streetscape improvements within the public right-of-way in and around the study intersection; and **Table 16** provides planning-level costs related to development of the Medea Creek shared-use pathway.

[3] Southern California Association of Governments, Integrated Growth Forecast, 2012

Table 15: Kanan Rd and Thousand Oaks Blvd Enhancements - Planning Level Cost Estimate

Item Description	Unit	Qty	Unit Cost	Total
Install striping complete per plans.	LS	1	$ 7,700.00	$ 7,700.00
Install signing complete per plans.	LS	1	$ 1,200.00	$ 1,200.00
Install countdown pedestrian heads.	EA	8	$ 800.00	$ 6,400.00
Install bicyclist push buttons.	EA	4	$ 800.00	$ 3,200.00
Install decorative traffic signal poles at the intersection of Kanan Rd and Thousand Oaks Blvd.	EA	4	$ 19,000.00	$ 76,000.00
Remove and construct ADA curb ramp.	EA	4	$ 3,200.00	$ 12,800.00
Install stamped integral-color asphalt for enhanced crosswalks at the intersection of Kanan Rd at Thousand Oaks Blvd.	SF	3,900	$ 10.00	$ 39,000.00
Trim band along sidewalks – interlocking pavers	SF	9,553	$20.00	$191,060.00
Remove and construct median island curb.	LF	520	$ 50.00	$ 26,000.00
Install median landscaping and irrigation system.	SF	3,600	$ 10.00	$ 36,000.00
Construct 8-inch AC over compacted native.	SF	1,040	$ 8.00	$ 8,320.00
Install decorative paving in median.	SF	520	$ 15.00	$ 7,800.00
Install stamped integral-color asphalt for enhanced crosswalk at the intersection of Kanan Rd at Hillrise Dr.	SF	900	$ 7.00	$ 6,300.00
Install steel pedestrian luminaires.	LS	1	$ 152,000.00	$ 152,000.00
Estimated Direct Costs				**$573,780.00**
Contingency	15%			$86,067.00
Engineering / Design	15%			$86,067.00
Project Administration	10%			$57,378.00
Estimated Construction Costs (40% burden)				**$803,292.00**

Table 16: Medea Creek Shared Use Path - Planning Level Cost Estimate

Item Description	Unit	Qty	Unit Cost	Total
Install mid-block pedestrian signal on Thousand Oaks Blvd.	LS	1	$ 72,000.00	$ 72,000.00
Install signal interconnect complete from traffic signal at Kanan Rd and Thousand Oaks Blvd to Thousand Oaks mid-block pedestrian signal.	LS	1	$ 36,000.00	$ 36,000.00
Construct median island curb.	LF	850	$ 40.00	$ 34,000.00
Install class A topsoil in median.	CY	266	$ 60.00	$ 15,960.00
Construct ADA curb ramp.	EA	2	$ 3,200.00	$ 6,400.00
12' Concrete path*	LF	2,620	$200.00	$524,000.00
12' Concrete ramp and retaining wall*	LF	250	$840.00	$210,000.00
Widen sidewalk	SF	1,220	$8.00	$9,760.00
Decorative crosswalk paving - Interlocking pavers	SF	1,800	$20.00	$36,000.00
Fencing and gates	LF	4,270	$55.00	$234,850.00
Solar powered LED lighted bollard	EA	144	$1,700.00	$244,800.00
12' Decomposed granite trail*	SF	16,800	$6.00	$100,800.00
Decomposed granite shoulder and pads*	SF	5,000	$4.00	$20,000.00
Benches	EA	6	$1,000.00	$6,000.00
Bicycle Racks	EA	4	$300.00	$1,200.00
Drinking fountain, with pet fountain	EA	1	$2,500.00	$2,500.00
Trash receptacles	EA	4	$500.00	$2,000.00
Removable bollards	EA	6	$1,100.00	$6,600.00
Regulatory and warning signs	EA	6	$300.00	$1,800.00
Trail directional signs	EA	4	$350.00	$1,400.00
Interpretive signs	EA	2	$1,200.00	$2,400.00
Landscape planting*	SF	6,790	$4.50	$30,555.00
Drip irrigation	SF	6,790	$6.00	$40,740.00
Estimated Direct Costs				**$1,639,765.00**
Contingency	25%			$409,941.25
Construction / Overhead / Mobilization	15%			$225,964.75
Engineering / Design	20%			$337,953.00
Project Administration and Permitting	10%			$163,976.50
Estimated Construction Costs (70% burden)				**$2,787,600.50**

Notes:
Planning level estimates do not include ROW acquisition costs; costs for potentially required bridges or retaining
* Unit costs accounts for site prep and grading

Appendix A: Regulatory Setting

This section provides a summary of plans and policies that relate to bicycle and pedestrian activities, including the City's General Plan, Municipal Code, and Trails & Pathways Master Plan.

City of Agoura Hills General Plan, 2010

The City of Agoura Hills recognizes that the retail centers must be able to meet changing market demands in order to remain economically viable and compete with newer retail centers developed in neighboring cities. To this end, the General Plan's Land Use & Community Form Element contains the goal of "Improvement of the economic vitality of the existing commercial centers and re-positioning as a focal point of neighborhood identity, activity, and socialization." The policies for achieving this goal include:

- Working with property owners to promote the upgrade of the shopping centers for pedestrian activities and events. Such improvements may include expanded sidewalks and improved pedestrian connections between the sidewalks and the buildings, pedestrian way finding, expanded sidewalks along building frontages, improved pedestrian amenities and public spaces, and increased outdoor-oriented activities such as dining.
- Allow mixed-use development that includes a limited amount of multi-family housing to be located on the upper floors of buildings containing ground-floor commercial or retail uses.
- Improve the compatibility with neighboring residential neighborhoods by requiring that the edges of the shopping centers be designed to minimize noise and lighting impacts, and impacts associated with truck deliveries.
- Improve the pedestrian environment of adjacent streets through the implementation of sidewalk and crosswalk improvements that include decorative paving materials, improved bikeway connections, pedestrian-oriented amenities, and improved inter-connectivity between the shopping centers where feasible.
- Improved vehicular circulation among the three shopping centers including access and egress points.

Land Use and Community Form (LU)

GOAL LU-4 City Form and Structures

Structure and form of development that respects Agoura Hills' natural setting; maintains distinct and interconnected places for residents to live, shop, work, and play; and is more compact to reduce automobile dependence

Policies

LU-4.2 Connected Open Space Network – Maintain and, where incomplete, develop a citywide network of open spaces that is connected to and provides access for all neighborhoods and districts incorporating greenbelts, drainage corridors, parklands, bicycle and pedestrian paths, equestrian trails, and natural open spaces.

LU-4.6 Building Scale and Design – Encourage the development of buildings and exterior spaces that are of human scale and encourage pedestrian activity, and discourage structures that do not relate to the exterior spaces and designs that do not consider such features.

LU-4.7 Building Relationship to Public Spaces – Require buildings to be oriented to and actively engage the public realm through such features as location, incorporation of windows, avoidance of blank walls, and articulation of building elevations fronting the sidewalks and public space, and location of parking to their rear or side.

LU-4.8 Connectivity – Promote the development of complete pedestrian, bicycle, and vehicular connections that provide access for all residential neighborhoods to commercial, employment, cultural, civic, recreational, and open space destinations.

LU-4.9 Integration of Open Space Areas within Development – Incorporate sufficient open space in development projects to maintain a sense of openness, such as paths, sidewalks, gathering areas, and/or passive and active recreation.

LU-4.10 Community Identity – Provide enhanced paving, entry monuments, and other special design features at key entry points to the City.

GOAL LU-27 Community Serving Shopping Centers

Improvement of the economic vitality of the existing commercial shopping centers and re-positioning as a focal point for neighborhood identity, activity, and socialization.

Policies

LU-27.1 Development Improvements – Work with property owners to promote the upgrade of shopping centers for pedestrian activity and events, including such elements as:

- Expanded sidewalks along the building frontages and incorporation of a public plaza containing benches, trash receptacles, trees and plantings, public art, and other amenities
- Outdoor-oriented uses such as restaurants
- Pedestrian corridors connecting parking areas with buildings that are clearly defined by paving materials, landscape, lighting; and well-designed way-finding signage
- Site landscaping that contributes to the aesthetic and economic value of the center and provides a tree canopy reducing the heat island effect and greenhouse gas emissions

LU-27.2 Mixed-Use Development – Encourage the renovation of the existing shopping centers by allowing the limited development of multi-family housing on the upper floor of buildings containing ground-floor retail or office uses in accordance with Policies LU 14.1 through LU 14.5, and contingent on the development of resident-serving amenities.

LU-27.3 Compatibility with Residential Neighborhoods – Require that the edges of the shopping centers be designed to avoid noise, lighting, odor, and truck delivery and unloading impacts on adjoining residential neighborhoods.

LU-27.4 Streetscape Improvements – Improve sidewalks and crosswalks with distinctive paving materials and pedestrian-oriented amenities, provide bikeway connections, where feasible, to improve the interconnectivity of the shopping centers with one another and adjoining residential neighborhoods.

Economic Development (ED)

Goal ED-1 Economic Base

A strong and sustainable economic base that supports continued growth in City revenues

Policies

ED-1.4 Infrastructure Improvements – Enhance Agoura Hills' attractiveness to new business by identifying infrastructure improvements that facilitate business development, particularly improvements in accessibility and congestion management

Mobility (M)

Goal M-1 Local Circulation System

A safe and efficient roadway system in Agoura Hills that facilitates the movement of goods and people while utilizing advanced technologies to minimize travel delays.

Policies

M-1.1 Safety – Maintain a safe and efficient system of circulation.

M-1.3 Level of Service Standards – Establish flexible criteria for minimum acceptable level of service (LOS) based on the roadway characteristics. Maintain an LOS C on most roadways within the City. A reduced LOS standard of D, E, or F is considered acceptable in the following roadways (Year 2035 Peak Hour Segment Level of Service) as described below:

- Kanan Road, due to heavy existing and projected traffic volumes and desire to maintain existing 4-lane cross-section with sidewalks, bicycle lanes, and landscape median islands

M-1.4 Roadway Improvements – Promote effective, innovative, and safe solutions for roadway improvements and consider other solutions that would facilitate reduced reliance on physical roadway improvements, where appropriate

M-1.5 Roadway Character – Implement street beautification programs to improve roadway character and create City gateways

Goal M-2 Complete Streets

A transportation system that serves all modes of travel and meets the needs of all users, as specified in the Complete Streets Act of 2007

Policies

M-2.1 Complete Streets – Ensure that the existing and future transportation system serves multiple modes of travel, such as driving, walking, biking, and transit

M-2.2 Equal Mobility for all City Residents – Provide a transportation network that meets the needs of a wide range of users including adults, children, seniors, and the disabled.

M-2.3 Transportation Planning – Encourage desired land use patterns, such as mixed-use walk able developments, through transportation planning and design.

M-2.4 Interconnected System – Develop an interconnected mobility system that allows travel on alternate routes and modes

M-2.5 Comprehensive Bicycle and Pedestrian System – Develop and maintain a safe, integrated, and comprehensive bicycle and pedestrian system that serves all ages and abilities in Agoura Hills.

Goal M-6 Alternative Transportation

Reduce reliance on single-occupancy vehicle travel through the provision of alternative travel modes and enhanced system design

Policies

G-6.1 – Efficient System – Promote the most efficient use of the City's existing transportation network and encourage the integration of alternative modes into design standards for future improvements.

G-6.2 – Mode Choice – Expand the choices of available travel modes to increase the freedom of movement for residents and reduce reliance on the automobile. Ensure that existing and future infrastructure will be adequate for future transportation modes.

G-6.3 – Design of Alternative Modes – New roadways and future street improvement projects shall be bicycle and pedestrian-friendly in design.

G-6.4 – Design Enhancements – Enhance bus stops with amenities such as street trees, benches, bus shelters, waste receptacles, public art, and other measures.

G-6.5 Education – Promote non-motorized transportation through encouragement and education

M-6.6 Alternative Mode Funding – Identify funding sources and allocate funds, including potential formation of assessment districts, for pedestrian, bicycle, transit, and streetscape improvements in existing neighborhoods.

Goal M-7 Pedestrians

Transportation Improvements and development enhancements that promote and support walking within the community

Policies

M-7.1 Walkability – Create a pedestrian environment that is accessible to all and that is safe, attractive, and encourages walking. Maintain and promote the walkability within the City by identifying and competing efficient links within the sidewalk system.

M-7.2 Pedestrian Connectivity – Preserve and enhance pedestrian connectivity in existing neighborhoods and require a well connected pedestrian network linking new and existing developments to adjacent land uses including commercial uses, schools, and parks.

M-7.3 Pedestrian Experience – Promote walking and improve the pedestrian experience with streetscape enhancements and by orienting future development towards the street, where appropriate.

M-7.4 Walkable Developments – Encourage mixed-use development so that it is possible for a greater number of short trips to be made by walking.

M-7.5 Safe Routes to Schools – Establish and implement appropriate recommendations of the National Safe Route to Schools Program, and work with local schools to encourage more children to walk and bicycle to school.

M-7.6 Inventory of Pedestrian Facilities – Conduct an inventory of pedestrian facilities and routes in the City to identify missing in deficient links, such as pedestrian crossing or intersection treatments

Goal M-8 Bikeways

Enhance bicycle facilities throughout Agoura Hills for short trips and recreational uses.

Policies

M-8.1 Bikeway Linkages – Provide bikeway connectivity between residential and surrounding natural resources areas, parks, schools, employment centers, and other activity centers in the community.

M-8.2 – Continuous Bikeway Connectivity – Provide a bicycle network that is continuous, closes gaps in the existing system, and permits easy bicycle travel throughout the community and region.

M-8.5 Bikeway Design – Develop guidelines and standards for the design of bikeways

M-8.6 Bicycle Facility Design – Develop guidelines and standards for the design of bicycle facilities including bicycle racks.

M-8.7 Bicycle Parking – Developments shall provide for bicycle parking facilities.

City of Agoura Hills Code of Ordinances – Article IX – Zoning

Part 5. – CS-MU Commercial Shopping Center-Mixed Use District

9341 – Purpose

- Provide planned shopping centers with land and compatible retail stores and associated facilities including multi-family residential units…
- Residential units are allowed in order to encourage improvements to existing shopping centers, and to provide opportunities for an individual to participate in multiple activities on the site, thereby promoting vehicle trip reduction
- Development, remodel, and renovation of the centers shall integrate and promote pedestrian activity with pathway connections between center business areas and parking areas, and to adjoining neighborhoods and districts, as well as incorporate pedestrian amenities like seating areas and outdoor gathering spaces to accommodate pedestrians, outdoor dining, and other activities
- Pathways shall be clearly articulated with enhanced paving and other design features, landscaping, and wayfinding signage

9343.10 Required Amenities

A. Clearly articulated pedestrian paths through parking lots to the center businesses and residences with distinguishing design characteristics
B. Well-designed pedestrian pathways connecting adjoining shopping centers, and between the centers and adjacent neighborhoods and districts
C. Outdoor searing and gathering areas new the businesses, including expanded sidewalks or plazas, designed as an integral part of the overall architecture and design
D. Bike racks or other public bike storage in convenient locations in the center, integrated within the overall architectural and sign design of the center

9343.11 Required Landscaping

A. Berming (undulating or embanked) shall be required with a minimum variation of elevation beginning thirty (30) inches
B. One (1) native oak tree, twenty-four inch box in size per fifteen thousand (15,000) square feet of building area shall be provided within the said area or at alternative locations as approved by the city
C. Landscaping shall minimize the visual dominance of the parking areas, shall complement the on-site pedestrian amenities and circulation, and serve to modulate pavement temperature
D. No other uses or storage shall be permitted within the required landscaping

9343.12 Required Walls

Unless waived by the city, all development shall be screened according to the following:

A. A decorative wall at a minimum height of six (6) feet shall be provided on all property lines except for those adjacent to a public right-of-way.

City of Agoura Hills Citywide Trails & Pathways Master Plan

Purpose

To provide a pedestrian, bicycle, and equestrian system that will link homes, schools, businesses, parks, and natural resources to each other

The plan will serve as a guide for the planning, design, and construction of future trail projects.

Local Support

Approximately 85 percent of the participants of the 2006 General Plan Survey (conducted as part of the General Plan update) indicated that they would support the development of a system of pedestrian friendly paths within the city that would allow residents to walk between schools, shopping facilities, libraries, and residences; and 75 percent supported a multi-use trail network for bicycles, horses, and pedestrians.

Key Guiding Principles

Make completion of the following two trail and pathway systems a high priority when seeking grants and funding:

- Medea Creek pedestrian/bicycle system that provides access to a linear scenic pathway system traversing the entire community in a north/south direction along Medea Creek
- Old Agoura equestrian trail system that provides access to an equestrian bridle path system planned through the Old Agoura community

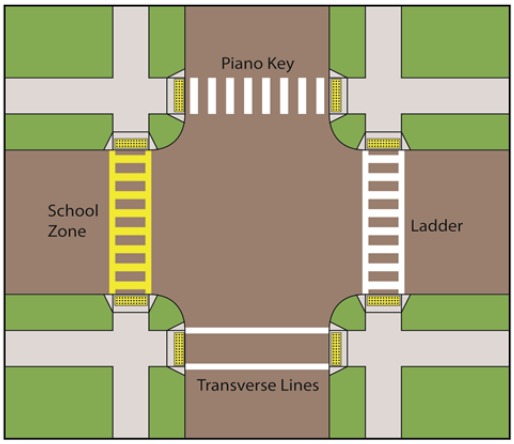
Appendix B: Technical Criteria for Bicycle and Pedestrian Facilities

Pedestrian Recommendations

Crosswalks

Per the California Vehicle Code, crosswalks, whether marked or unmarked, exist wherever two streets intersect, except where pedestrians are otherwise prohibited.

Marked crosswalks may use transverse or high-visibility ladder or piano key designs, and should be painted yellow in school zones. They may be accompanied by advance yield lines to provide additional space and visibility.



Crosswalk Design Types

An accessible pedestrian signal

Crosswalks should be marked at signalized intersections and at unsignalized intersections where they:

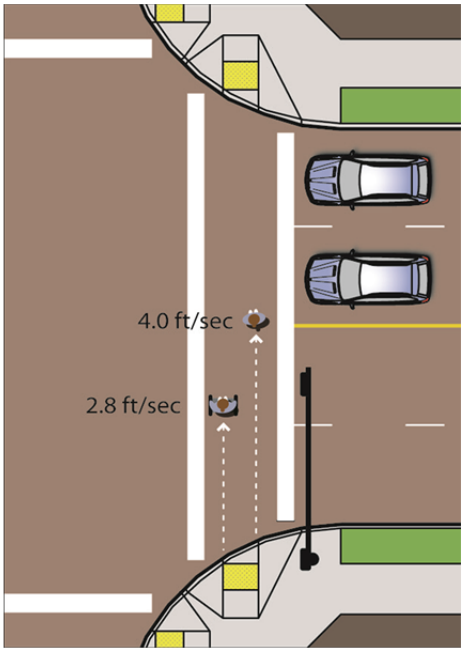
- Help to orient pedestrians through a complex intersection,
- Direct pedestrians to the shortest route across traffic with the least exposure to vehicular traffic and traffic conflicts, or
- Help position pedestrians where they can best be seen by oncoming traffic.

Crosswalks may be marked at mid-block locations where there is a demand for crossing and there are no nearby marked crosswalks.

Accessible Pedestrian Signals

Accessible pedestrian signals shall be used in combination with pedestrian signal timing. The information provided by an accessible pedestrian signal shall clearly indicate which pedestrian crossing is served by each device.

When used, accessible pedestrian signals shall be used in combination with pedestrian signal timing. The information provided by an accessible pedestrian signal shall clearly indicate which pedestrian crossing is served by each device.

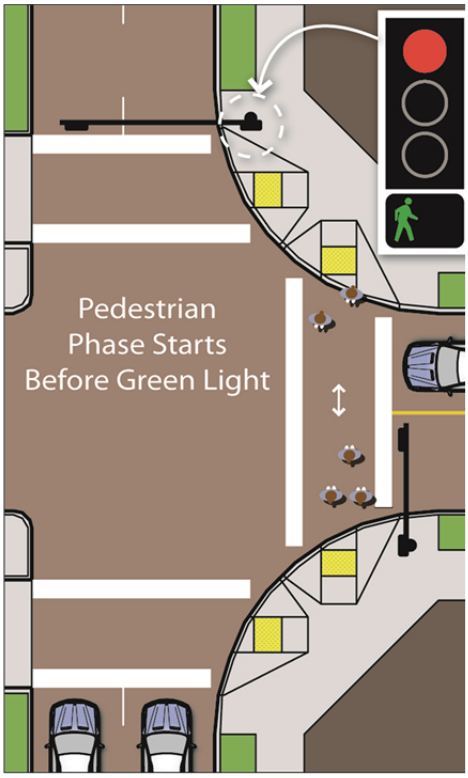


Pedestrian Signal Timing

Pedestrian Signal Timing

The California MUTCD provides guidance on the timing of pedestrian phases at signalized intersections: Pedestrian clearance time should be sufficient to allow a pedestrian crossing in the crosswalk who left the curb or shoulder at the end of the WALKING PERSON (symbolizing WALK) signal indication to travel at a walking speed of 3.5 feet per second to at least the far side of the traveled way or to a median of sufficient width for pedestrians to wait.

Where older or disabled pedestrians routinely use the crosswalk, a walking speed of 2.8 feet per second may be used in determining the pedestrian clearance time.



Leading Pedestrian Interval

Leading Pedestrian Interval

At intersections with high pedestrian volumes and high conflicting turning vehicle volumes, a brief leading pedestrian interval, during which an advance WALKING PERSON (symbolizing WALK) indication is displayed for the crosswalk while red indications continue to be displayed to parallel through and/or turning traffic, may be used to reduce conflicts between pedestrians and turning vehicles.

If a leading pedestrian interval is used, it should be at least 3 seconds in duration and should be timed to allow pedestrians to cross at least one lane of traffic or, in the case of a large corner radius, to travel far enough for pedestrians to establish their position ahead of the turning traffic before the turning traffic is released.


Pedestrian Countdown Signals

Pedestrian Countdown Signals

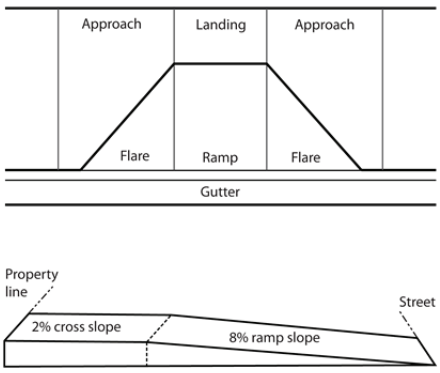
Pedestrian countdown signals display the time remaining in a pedestrian phase, providing helpful information for crossing pedestrians. Countdown heads are most beneficial at multi-lane arterial roadways where pedestrians have a long distance to cross. If a median is provided, pedestrians may rest and wait for the next pedestrian phase to cross the remaining roadway.


Pedestrian Refuge Island

Median Refuge Islands

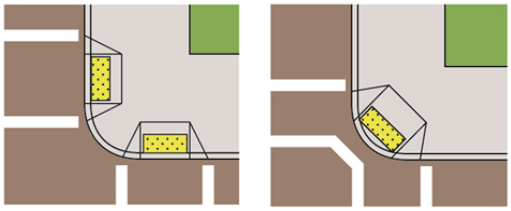
Raised islands or medians of sufficient width that are placed in the center area of a street or highway can serve as a place of refuge for pedestrians who are attempting to cross at a midblock or intersection location. Center islands or

medians allow pedestrians to find an adequate gap in one direction of traffic at a time, as the pedestrians are able to stop, if necessary, in the center island or median area and wait for an adequate gap in the other direction of traffic before crossing the second half of the street or highway. The minimum widths for accessible refuge islands and for design and placement of detectable warning surfaces are provided in the "Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG)"



Curb Ramps

Curb ramps are necessary for people who use wheelchairs to access sidewalks and crosswalks. ADA requires the installation of curb ramps in new sidewalks, as well as retrofitting existing sidewalks. Curb ramps may be placed at each end of the crosswalk (perpendicular curb ramps), or between crosswalks (diagonal curb ramps). The ramp may be formed by drawing the sidewalk down to meet the street level, or alternately building up a ramp to meet the sidewalk.



Curb Ramp Design Specifications

Bicycle Recommendations

Caltrans Bicycle Classifications

Bicycle infrastructure in Agoura Hills is governed by design standards developed by the California Department of Transportation (Caltrans). Local jurisdictions may modify the Caltrans design standards, based on sound engineering judgment, but generally the Caltrans design standards are followed. This plan categorizes bicycle infrastructure based on Caltrans standards. The figure below illustrates Caltrans' three types of bikeways as defined by the Highway Design Manual: Class I multi-use paths, Class II bike lanes, and Class III bike routes.

Multi-use Paths

Multi-use paths, or Class I facilities, allow for two-way, off-street bicycle use and may be used by pedestrians, skaters, people in wheelchairs, joggers and other non-motorized users.

Bike Lanes

Class II bicycle facilities are defined as a portion of the roadway that has been designated by striping, signage, and pavement markings for the preferential or exclusive use of bicyclists. They are generally four to six feet wide and often found in commercial, retail, and mixed-use districts.

Several publications provide guidance for the use of bike lanes. According to the Caltrans Highway Design Manual, bike lanes are intended to delineate the right of way assigned to bicyclists and motorists and to provide for more predictable movements by each. But a more important reason for constructing bike lanes is to better accommodate bicyclists through corridors where insufficient room exists for safe bicycling on

existing streets. This can be accomplished by reducing the number of lanes, reducing lane width, or prohibiting parking on given streets in order to delineate bike lanes.

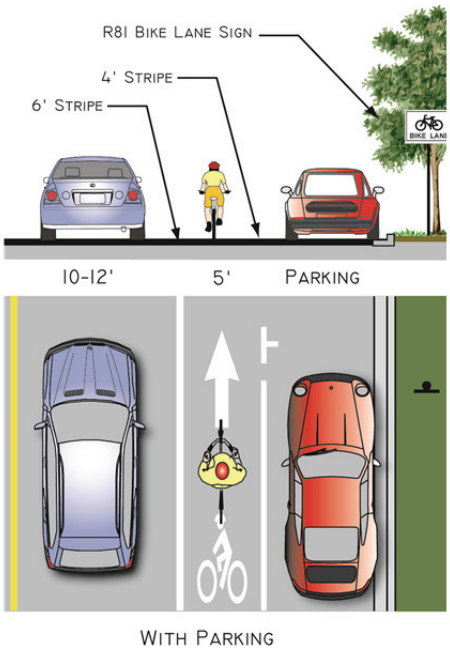
According to the AASHTO Guide for the Development of Bicycle Facilities, a bike lane should be delineated from the motor vehicle travel lanes with a 150-mm (6-inch) solid white line. Some jurisdictions have used a 200-mm (8-inch) line for added distinction.

The California MUTCD provides guidance on the placement for Bike Lane (R81 (CA)) signs: they should be placed at every arterial street and at 1/2 mile intervals of each designated Bike Lane.

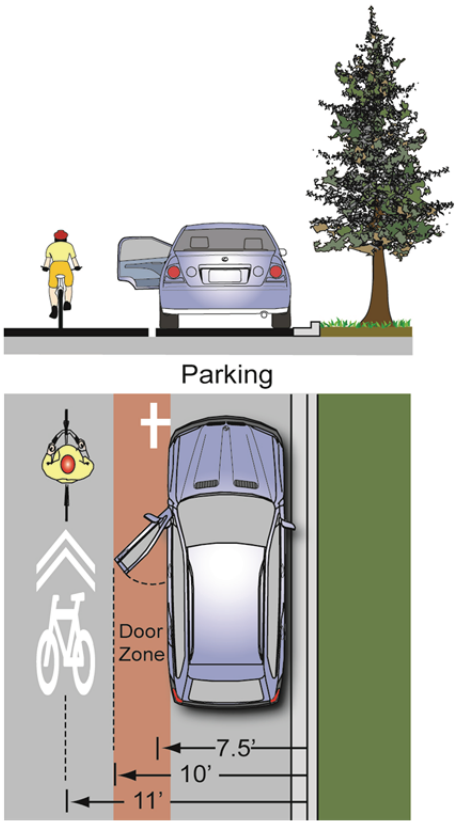
Bike Routes

Bike Routes (Class III) are facilities shared with motor vehicles and signed for bicyclists. While typically used on roads with low speeds and traffic volumes, they can be designated on higher volume roads with wide outside lanes or shoulders. Bike routes are often found on local or collector streets in residential areas. Many state routes that connect cities have Class III shoulder bikeways.

Shared Lane Marking stencils are included in the California Manual of Uniform Traffic Control Devices (2012) as an additional treatment for bike routes and are currently approved in locations with or without parking. As shown at right, the stencil can serve a number of purposes, such as making motorists aware of the need to share the road with bicyclists, showing bicyclists the direction of travel, and, with proper placement, reminding bicyclists to bike further from parked cars to prevent "dooring" collisions.



Minimum specifications for bike lanes with parking

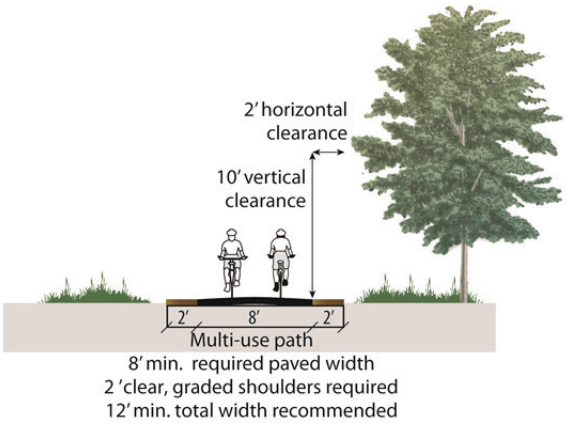


Shared Lane Marking

Figure 21: Caltrans Design Standards for Bicycle Facilities

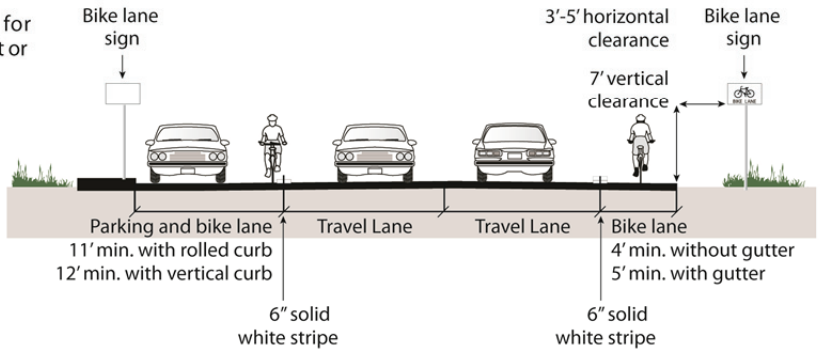
CLASS I
Multi-Use Path

Provides a completely separated right of way for the exclusive use of bicycles and pedestrians with crossflow minimized.



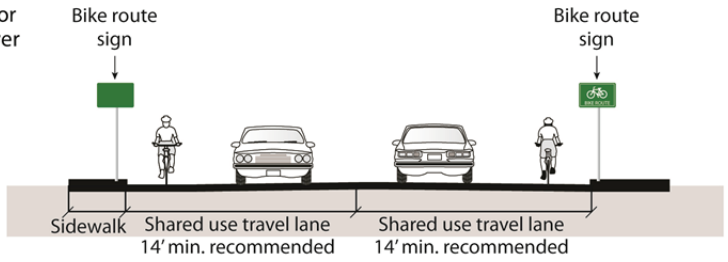
CLASS II
Bike Lane

Provides a striped lane for one-way bike travel on a street or highway.



CLASS III
Bike Route
Signed Shared Roadway

Provides for shared use with pedestrian or motor vehicle traffic, typically on lower volume roadways.



Colored Pavement

Color applied to bike lanes helps alert roadway users to the presence of bicyclists and clearly assigns right-of-way to cyclists. Motorists are expected to yield to cyclists in these areas. Some cities apply color selectively to highlight potential conflict zones, while others use it to mark all non-shared bicycle facilities in high volume traffic situations.

Green is the recommended pavement color for on-street bikeways. The Federal Highway Administration has granted interim approval for their use, though specific MUTCD guidance is not available.

Green bike lane application (Portland, OR)

Colored bike lanes are appropriate for heavy auto traffic streets, at transition points where cyclists, motorists and/or pedestrians must weave with one another, conflict areas or intersections with a record of crashes, and to emphasize bicycle space when used with design treatments that may be unfamiliar or unique.

Bicycle Detection

Bicycle loop detectors activate traffic signals at intersections, similar to standard loop detectors used for auto traffic. Where bicycle loop detectors are not present, bicyclists are forced to wait for a motor vehicle to trigger a signal; where motor vehicle traffic is infrequent, they may cross against a red signal. Type A, C, or D loop detectors best detect bicyclists. Bicycle loop detectors should be identified with pavement markings that show cyclists where to position themselves to trigger the traffic signal.

Traffic Operations Policy Directive 09-06, issued August 27, 2009 modified MUTCD 4D.105 (CA) to require bicyclists to be detected at all traffic-actuated signals on public and private roads and driveways. The Policy Directive requires a limit line detection zone in which a bicycle rider must be detected with 95% accuracy. If more than 50% of the limit line detectors need to be replaced at a signalized intersection, then the entire intersection should be upgraded so that every line has a limit line detection zone.

Bicycle detection must be confirmed when a new detection system is installed or when the detection system is modified. Where limit line detection zones are provided, minimum bicycle timing should be 14.7 feet per second, plus a 6-second start-up time. Table 4D-109(CA) provides the minimum bicyclist phase length for intersections of different lengths.

Appendix C: Survey Questionnaire

Prepared by:

Alta Planning and Design

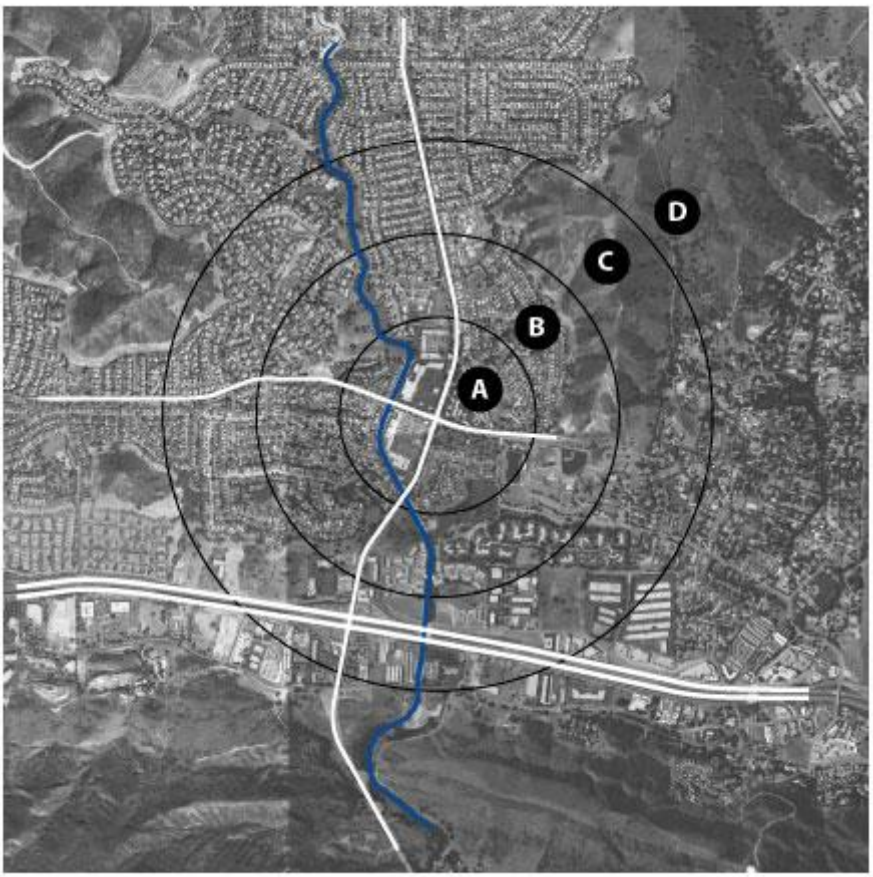
Prepared for:

City of Agoura Hills

Thank you for your interest in the Kanan Road/Thousand Oaks Boulevard Pedestrian Evaluation Plan. Please take a few minutes to fill out this short questionnaire. Your response will help the City of Agoura Hills better understand the needs of the people who live, work, shop, and go to school in this area. Your information will assist in the creation of improvements that will make it safer and more convenient to walk to and from the different neighborhoods, schools, and retail centers located near the intersection, and help encourage the increased use of active transportation within Agoura Hills. Thank you for your assistance.

Your response will be kept anonymous. Click “Next” to get started with the questionnaire.

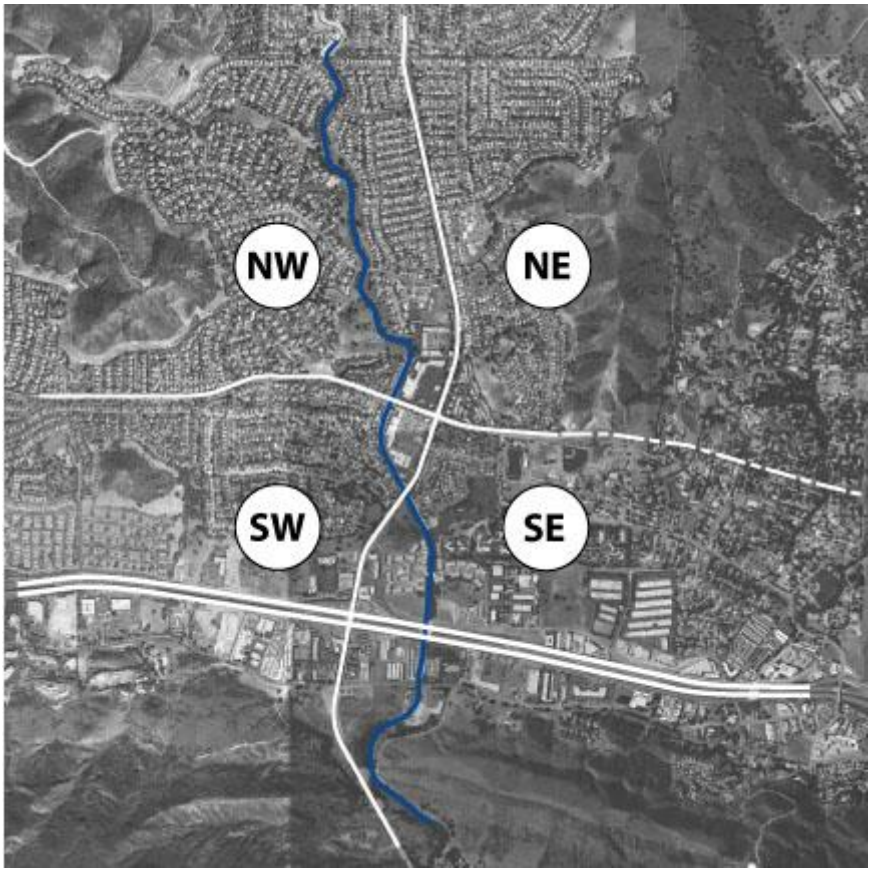
What distance do you live from the Kanan Road/Thousand Oaks Boulevard intersection?



*1. Within which of the circles shown in the map do you live?

- ◯ A
- ◯ B
- ◯ C
- ◯ D
- ◯ I do not live in the City of Agoura Hills

On what side of the Kanan Road/Thousand Oaks Boulevard do you live?



***2. On what side of the Kanan Road/Thousand Oaks Boulevard intersection do you live?**

- ◯ NW
- ◯ NE
- ◯ SW
- ◯ SE
- ◯ I do not live in the City of Agoura Hills

3. What is the nearest intersection to where you live? For example, "Thousand Oaks Boulevard and Carell Avenue"

4. Which of the following best describes you?

- ◯ I work away from my home
- ◯ I work out of my home
- ◯ I am a stay-at-home parent
- ◯ I am a student (Elementary, Middle, or High School)
- ◯ I am a college student
- ◯ I work and go to school
- ◯ I am retired

Other (please specify)

5. If you are a student, or have school-age children, what school(s) do you/they attend?

- ☐ Willow Elementary School
- ☐ Sumac Elementary School
- ☐ Agoura High School

Other (please enter the school name below)

6. Where do you travel during a typical week. Please assume that this week is during the school year and not during a holiday period if you are currently a student or have school-age children. Check all the boxes that apply.

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Work	☐	☐	☐	☐	☐	☐	☐
School	☐	☐	☐	☐	☐	☐	☐
Take kids to school	☐	☐	☐	☐	☐	☐	☐
Shopping at Vons, Ralphs, or City Mall shopping centers	☐	☐	☐	☐	☐	☐	☐
Shopping in a elsewhere in Agoura Hills or in a different city	☐	☐	☐	☐	☐	☐	☐
Errands/medical appointments	☐	☐	☐	☐	☐	☐	☐
Sports and recreation	☐	☐	☐	☐	☐	☐	☐
Entertainment	☐	☐	☐	☐	☐	☐	☐
Church/civic	☐	☐	☐	☐	☐	☐	☐

Other (please specify)

7. How do you usually travel to these destinations? Check all the boxes that apply

	Personal Car	Carpool	Transit	Walk	Bicycle
Work	☐	☐	☐	☐	☐
School	☐	☐	☐	☐	☐
Take kids to school	☐	☐	☐	☐	☐
Shopping at Vons, Ralphs, or City Mall shopping centers	☐	☐	☐	☐	☐
Shopping in a elsewhere in Agoura Hills or in a different city	☐	☐	☐	☐	☐
Errands/medical appointments	☐	☐	☐	☐	☐
Sports and recreation	☐	☐	☐	☐	☐
Entertainment	☐	☐	☐	☐	☐
Church/civic	☐	☐	☐	☐	☐

Other (please specify)

8. How often do you walk and for what purpose?

	Never	Less than once a week	Once a week	2 to 3 times a week	4 to 5 times a week	More than 5 times a week
Recreation and exercise	◯	◯	◯	◯	◯	◯
Work commute	◯	◯	◯	◯	◯	◯
School	◯	◯	◯	◯	◯	◯
Taking kids to school	◯	◯	◯	◯	◯	◯
Shopping	◯	◯	◯	◯	◯	◯
Entertainment (dinning, social visits, community events, etc)	◯	◯	◯	◯	◯	◯
Other	◯	◯	◯	◯	◯	◯

9. Please rank the following reasons that keep you from walking more often.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Distances are too long	◯	◯	◯	◯	◯
Automobile traffic and speed	◯	◯	◯	◯	◯
Feel unsafe crossing streets	◯	◯	◯	◯	◯
Damaged or missing sidewalks	◯	◯	◯	◯	◯
Feel unsafe walking through a parking lot	◯	◯	◯	◯	◯
Lack of lighting	◯	◯	◯	◯	◯
Crime or violence	◯	◯	◯	◯	◯
Driving is more convenient	◯	◯	◯	◯	◯
Lack of time	◯	◯	◯	◯	◯
Lack of interest	◯	◯	◯	◯	◯
Illness or physical disability	◯	◯	◯	◯	◯

10. Would you be more likely to walk more often if any of these conditions were changed?

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Improved pedestrian signals at intersections	◯	◯	◯	◯	◯
Improved or high-visibility crosswalks	◯	◯	◯	◯	◯
More or improved pedestrian lighting	◯	◯	◯	◯	◯
Enhanced sidewalks (special or decorative paving materials)	◯	◯	◯	◯	◯
Enhanced landscaping	◯	◯	◯	◯	◯
Improved pedestrian connections to the retail centers through parking lots	◯	◯	◯	◯	◯
Improved connections along the creek	◯	◯	◯	◯	◯
Improved safety for school children	◯	◯	◯	◯	◯
Improved bus stop amenities	◯	◯	◯	◯	◯
Improved signage	◯	◯	◯	◯	◯
Improved security and enforcement	◯	◯	◯	◯	◯
I am not interested in walking	◯	◯	◯	◯	◯
I already walk frequently	◯	◯	◯	◯	◯
I am physically unable to walk more often	◯	◯	◯	◯	◯

11. What is your age?

- ◯ 0 - 12
- ◯ 13 - 15
- ◯ 16 - 18
- ◯ 19 - 24
- ◯ 25 - 29
- ◯ 30 - 39
- ◯ 40 - 49
- ◯ 50 - 59
- ◯ 60 - 69
- ◯ 70 and older

12. Additional comments

- ◯ Male
- ◯ Female

13. Additional comments

Appendix D: Intersection Traffic Analysis

Prepared by:

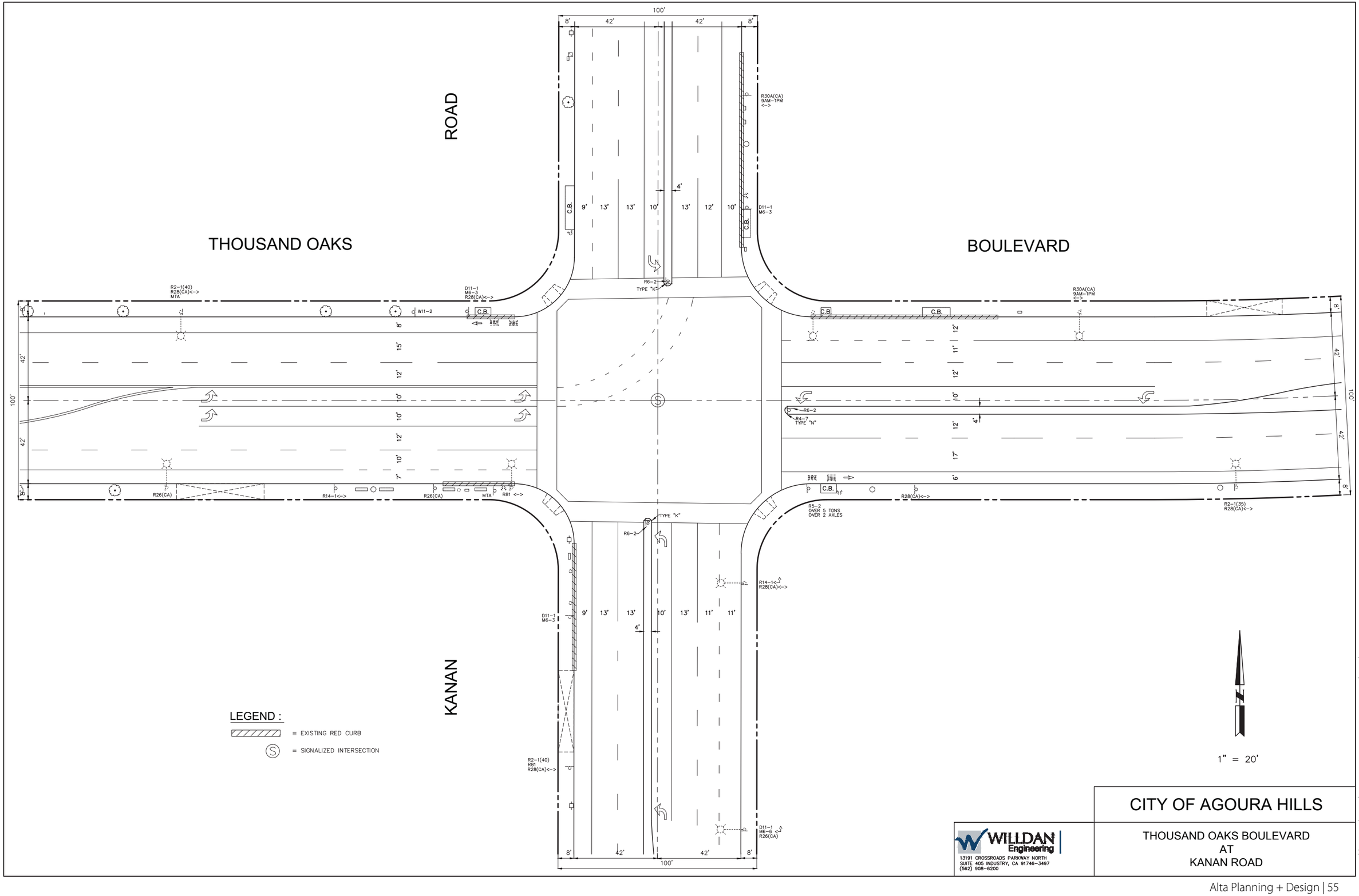
Willdan Engineering

In Partnership with:

Wiltec

Prepared for:

Alta Planning + Design and City of Agoura Hills



CITY OF AGOURA HILLS

THOUSAND OAKS BOULEVARD
AT
KANAN ROAD

WILLDAN Engineering
13191 CROSSROADS PARKWAY NORTH
SUITE 405 INDUSTRY, CA 91746–3497
(562) 908–6200

\\WND–DC1\Traffic\jn101350 Agoura Hills Ped Evaluation\DWGS\Striping Concept.dwg Jul 16, 12

APPENDIX

Counts

Synchro Analysis

Figure 1 – Existing Conditions

WILTEC

Phone: (626) 564-1944 Fax: (626) 564-0969 info@wiltecusa.com

INTERSECTION VEHICLE TURNING MOVEMENT COUNT RESULTS SUMMARY

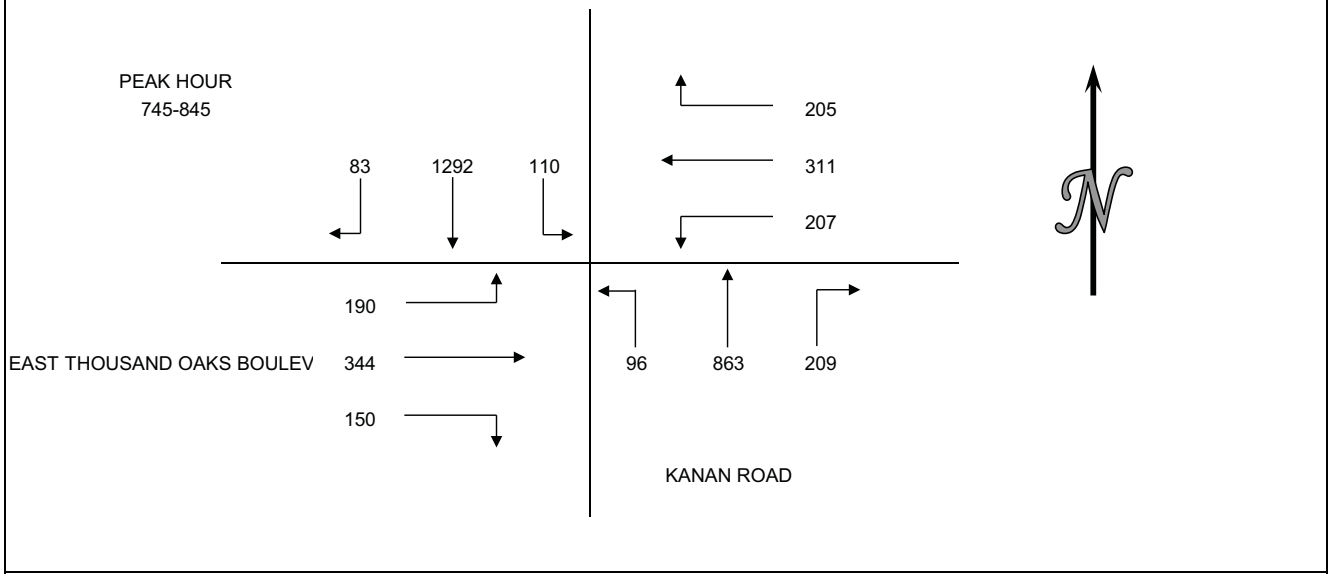
CLIENT: WILLDAN ASSOCIATES
PROJECT: AGOURA HILLS
DATE: WEDNESDAY MAY 2, 2012
PERIOD: 7:00 AM TO 9:00 AM
INTERSECTION: N/S KANAN ROAD
E/W EAST THOUSAND OAKS BOULEVARD
CITY: AGOURA HILLS

15 MIN COUNTS

PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
700-715	9	304	9	17	18	35	19	89	14	14	19	8	555
715-730	18	291	16	12	12	22	15	115	18	23	13	15	570
730-745	30	296	22	20	24	31	20	146	21	17	27	27	681
745-800	22	346	29	55	59	46	44	189	17	32	69	42	950
800-815	18	299	47	95	63	48	46	270	22	31	84	53	1076
815-830	17	321	17	31	102	60	66	224	23	39	117	46	1063
830-845	26	326	17	24	87	53	53	180	34	48	74	49	971
845-900	35	286	16	19	23	31	20	129	17	45	22	26	669

HOUR TOTALS

PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
700-800	79	1237	76	104	113	134	98	539	70	86	128	92	2756
715-815	88	1232	114	182	158	147	125	720	78	103	193	137	3277
730-830	87	1262	115	201	248	185	176	829	83	119	297	168	3770
745-845	83	1292	110	205	311	207	209	863	96	150	344	190	4060
800-900	96	1232	97	169	275	192	185	803	96	163	297	174	3779



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INTERSECTION VEHICLE TURNING MOVEMENT COUNT RESULTS SUMMARY

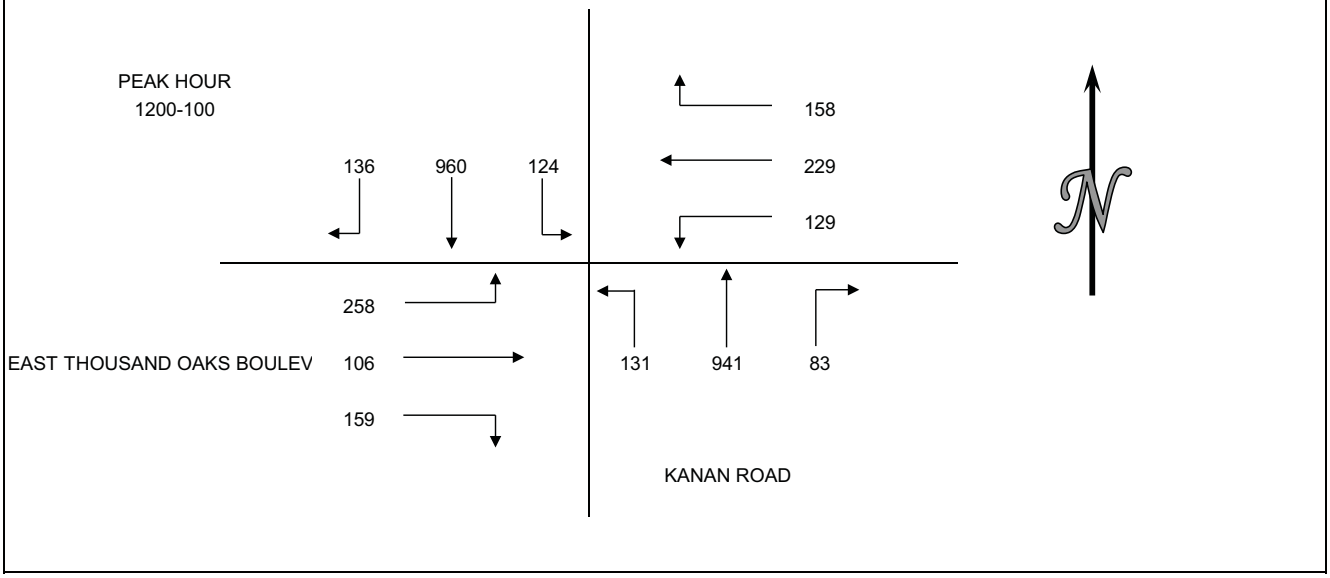
CLIENT: WILLDAN ASSOCIATES
PROJECT: AGOURA HILLS
DATE: WEDNESDAY MAY 2, 2012
PERIOD: 11:00 AM TO 1:00 PM
INTERSECTION: N/S KANAN ROAD
E/W EAST THOUSAND OAKS BOULEVARD
CITY: AGOURA HILLS

15 MIN COUNTS

PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
1100-1115	24	173	10	9	15	15	13	153	15	21	12	39	499
1115-1130	27	187	20	13	7	14	11	148	15	22	15	40	519
1130-1145	28	185	14	18	18	19	10	157	22	26	15	50	562
1145-1200	22	186	20	23	19	19	7	179	39	29	17	55	615
1200-1215	34	217	26	28	25	20	13	211	34	39	16	61	724
1215-1230	29	185	20	50	66	37	24	257	25	35	27	62	817
1230-1245	43	290	43	59	118	51	23	237	35	45	23	71	1038
1245-100	30	268	35	21	20	21	23	236	37	40	40	64	835

HOUR TOTALS

PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
100-1200	101	731	64	63	59	67	41	637	91	98	59	184	2195
1115-1215	111	775	80	82	69	72	41	695	110	116	63	206	2420
1130-1230	113	773	80	119	128	95	54	804	120	129	75	228	2718
1145-1245	128	878	109	160	228	127	67	884	133	148	83	249	3194
1200-100	136	960	124	158	229	129	83	941	131	159	106	258	3414



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INTERSECTION VEHICLE TURNING MOVEMENT COUNT RESULTS SUMMARY

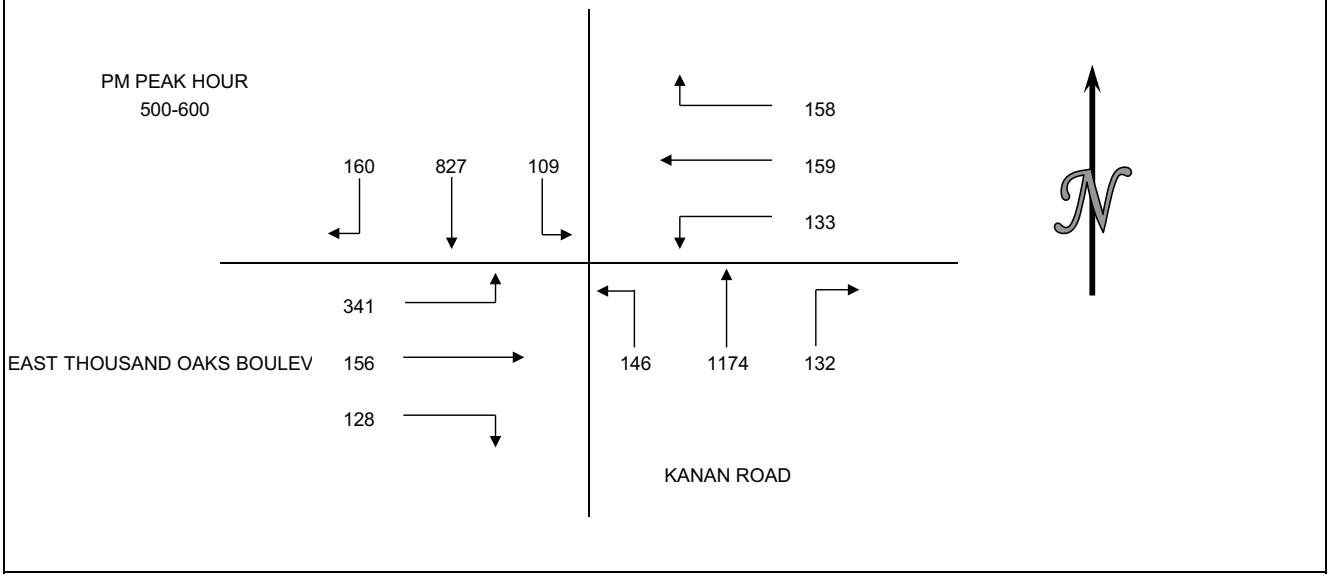
CLIENT: WILLDAN ASSOCIATES
PROJECT: AGOURA HILLS
DATE: WEDNESDAY MAY 2, 2012
PERIOD: 4:00 PM TO 6:00 PM
INTERSECTION: N/S KANAN ROAD
E/W EAST THOUSAND OAKS BOULEVARD
CITY: AGOURA HILLS

15 MIN COUNTS

PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
400-415	32	223	20	27	23	31	21	239	40	38	32	86	812
415-430	36	193	26	35	25	27	21	272	38	34	35	76	818
430-445	44	211	49	40	29	28	31	232	34	37	45	68	848
445-500	38	210	27	23	25	23	35	266	35	37	42	79	840
500-515	44	210	27	41	48	33	29	311	32	29	35	79	918
515-530	46	212	25	38	21	25	30	293	36	39	39	66	870
530-545	38	221	32	39	34	36	30	310	42	34	54	94	964
545-600	32	184	25	40	56	39	43	260	36	26	28	102	871

HOUR TOTALS

PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
400-500	150	837	122	125	102	109	108	1009	147	146	154	309	3318
415-515	162	824	129	139	127	111	116	1081	139	137	157	302	3424
430-530	172	843	128	142	123	109	125	1102	137	142	161	292	3476
445-545	166	853	111	141	128	117	124	1180	145	139	170	318	3592
500-600	160	827	109	158	159	133	132	1174	146	128	156	341	3623



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PEDESTRIAN AND BICYCLE COUNT SUMMARY

CLIENT: WILLDAN ASSOCIATES
PROJECT: AGOURA HILLS
DATE: WEDNESDAY MAY 2, 2012
PERIOD: 7:00 AM TO 9:00 AM
INTERSECTION: N/S KANAN ROAD
E/W EAST THOUSAND OAKS BOULEVARD

PEDESTRIANS

PERIOD	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG	
15 MIN COUNTS	WB	EB	NB	SB	WB	EB	NB	SB
700-715	1	0	0	0	0	0	0	0
715-730	2	7	0	0	2	0	0	0
730-745	0	3	0	0	0	0	0	0
745-800	5	1	1	1	1	1	2	0
800-815	7	11	0	0	3	0	1	4
815-830	2	6	0	0	0	1	1	0
830-845	0	7	0	2	0	0	0	1
845-900	0	0	1	1	0	3	0	1
HOUR TOTALS								
700-800	8	11	1	1	3	1	2	0
715-815	14	22	1	1	6	1	3	4
730-830	14	21	1	1	4	2	4	4
745-845	14	25	1	3	4	2	4	5
800-900	9	24	1	3	3	4	2	6
	59	103	5	9	20	10	15	19

BICYCLES

PERIOD	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG	
15 MIN COUNTS	WB	EB	NB	SB	WB	EB	NB	SB
700-715	0	0	0	0	0	0	0	0
715-730	0	0	0	0	1	0	0	0
730-745	1	0	0	0	0	0	0	0
745-800	0	0	0	0	0	0	0	0
800-815	1	0	0	1	0	0	0	0
815-830	0	0	1	0	1	0	0	0
830-845	0	1	0	0	2	0	0	0
845-900	0	0	0	1	0	1	0	1
HOUR TOTALS								
700-800	1	0	0	0	1	0	0	0
715-815	2	0	0	1	1	0	0	0
730-830	2	0	1	1	1	0	0	0
745-845	1	1	1	1	3	0	0	0
800-900	1	1	1	2	3	1	0	1

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PEDESTRIAN AND BICYCLE COUNT SUMMARY

CLIENT: WILLDAN ASSOCIATES
PROJECT: AGOURA HILLS
DATE: WEDNESDAY MAY 2, 2012
PERIOD: 11:00 AM TO 1:00 PM
INTERSECTION: N/S KANAN ROAD
E/W EAST THOUSAND OAKS BOULEVARD

PEDESTRIANS

PERIOD	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG	
15 MIN COUNTS	WB	EB	NB	SB	WB	EB	NB	SB
1100-1115	1	1	0	1	0	1	0	0
1115-1130	0	0	0	0	1	0	1	0
1130-1145	0	1	0	0	0	0	1	0
1145-1200	0	2	0	0	0	3	3	0
1200-1215	1	2	1	0	1	1	0	1
1215-1230	0	1	1	0	2	1	0	1
1230-1245	7	1	2	0	2	4	0	0
1245-100	2	5	0	0	3	0	0	0
HOUR TOTALS								
100-1200	1	4	0	1	1	4	5	0
1115-1215	1	5	1	0	2	4	5	1
1130-1230	1	6	2	0	3	5	4	2
1145-1245	8	6	4	0	5	9	3	2
1200-100	10	9	4	0	8	6	0	2
	21	30	11	1	19	28	17	7

BICYCLES

PERIOD	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG	
15 MIN COUNTS	WB	EB	NB	SB	WB	EB	NB	SB
1100-1115	0	0	0	0	1	0	0	0
1115-1130	0	0	0	0	0	0	0	0
1130-1145	1	0	0	0	0	0	1	0
1145-1200	0	0	1	0	0	1	0	0
1200-1215	0	0	0	0	2	1	0	0
1215-1230	0	0	0	0	2	0	0	0
1230-1245	0	0	0	0	0	1	0	0
1245-100	1	1	0	0	1	0	0	0
HOUR TOTALS								
100-1200	1	0	1	0	1	1	1	0
1115-1215	1	0	1	0	2	2	1	0
1130-1230	1	0	1	0	4	2	1	0
1145-1245	0	0	1	0	4	3	0	0
1200-100	1	1	0	0	5	2	0	0

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PEDESTRIAN AND BICYCLE COUNT SUMMARY

CLIENT: WILLDAN ASSOCIATES
PROJECT: AGOURA HILLS
DATE: WEDNESDAY MAY 2, 2012
PERIOD: 4:00 PM TO 6:00 PM
INTERSECTION: N/S KANAN ROAD
E/W EAST THOUSAND OAKS BOULEVARD

PEDESTRIANS

PERIOD	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG	
15 MIN COUNTS	WB	EB	NB	SB	WB	EB	NB	SB
400-415	3	4	0	2	2	2	2	4
415-430	2	3	0	0	2	2	3	0
430-445	1	0	1	0	1	2	0	0
445-500	4	2	2	0	2	2	2	0
500-515	1	4	3	1	0	2	0	2
515-530	0	0	0	1	5	0	0	0
530-545	0	1	2	0	0	0	0	0
545-600	4	2	0	1	0	0	0	1
HOUR TOTALS								
400-500	10	9	3	2	7	8	7	4
415-515	8	9	6	1	5	8	5	2
430-530	6	6	6	2	8	6	2	2
445-545	5	7	7	2	7	4	2	2
500-600	5	7	5	3	5	2	0	3
	34	38	27	10	32	28	16	13

BICYCLES

PERIOD	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG	
15 MIN COUNTS	WB	EB	NB	SB	WB	EB	NB	SB
400-415	0	0	0	0	1	0	1	0
415-430	0	0	1	1	2	0	0	0
430-445	2	0	1	0	0	0	1	0
445-500	0	0	0	0	0	0	0	0
500-515	0	0	0	0	0	0	0	0
515-530	0	0	1	0	0	0	0	0
530-545	1	0	0	0	0	0	0	0
545-600	0	0	0	1	0	1	0	0
HOUR TOTALS								
400-500	2	0	2	1	3	0	2	0
415-515	2	0	2	1	2	0	1	0
430-530	2	0	2	0	0	0	1	0
445-545	1	0	1	0	0	0	0	0
500-600	1	0	1	1	0	1	0	0

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INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: WILLDAN ASSOCIATES
PROJECT: AGOURA HILLS
DATE: SATURDAY MAY 5, 2012
PERIOD: 8:00 AM TO 2:00 PM
INTERSECTION: N/S KANAN ROAD
E/W EAST THOUSAND OAKS BOULEVARD
CITY: AGOURA HILLS

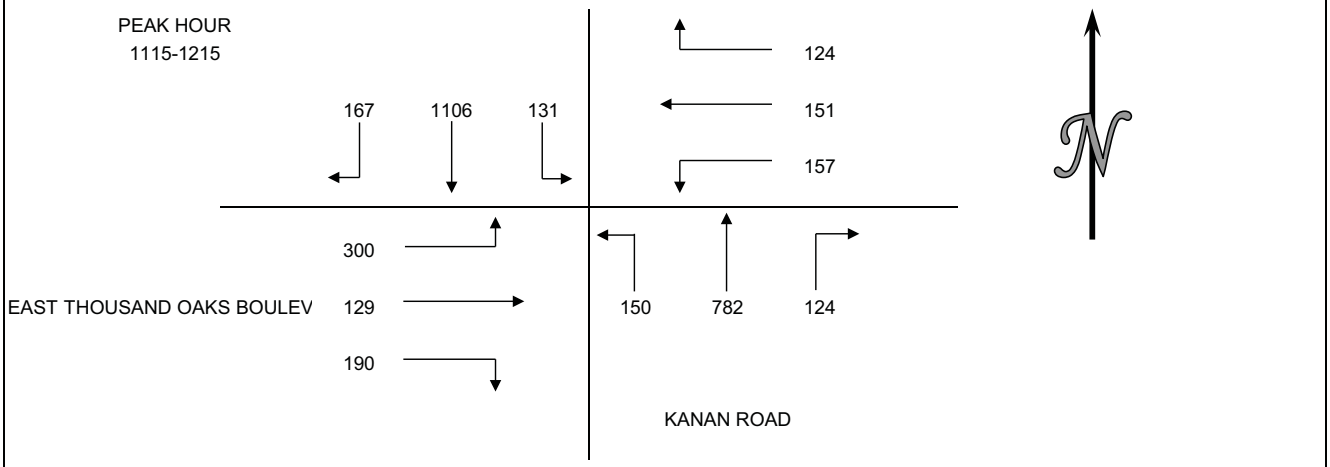
15 MIN COUNTS

PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
800-815	19	143	22	11	11	14	54	97	13	19	18	19	440
815-830	10	182	23	16	18	20	55	101	16	22	21	20	504
830-845	23	190	32	10	10	22	80	135	22	29	26	30	609
845-900	31	179	26	18	26	33	63	166	19	26	36	53	676
900-915	32	215	38	19	17	28	45	133	18	32	24	42	643
915-930	27	193	27	19	18	30	32	115	25	20	18	34	558
930-945	25	262	31	21	22	30	37	126	22	33	25	47	681
945-1000	32	254	36	29	27	44	37	148	33	42	29	48	759
1000-1015	51	231	38	21	39	56	31	193	39	41	30	36	806
1015-1030	47	253	32	30	24	37	36	159	22	45	25	51	761
1030-1045	39	268	35	24	22	41	22	150	39	39	29	53	761
1045-1100	41	232	45	45	81	65	30	192	27	41	29	60	888
1100-1115	60	289	48	33	46	51	17	179	34	37	18	52	864
1115-1130	36	270	39	38	45	42	32	204	49	42	27	79	903
1130-1145	42	248	32	27	32	33	19	174	28	39	26	59	759
1145-1200	44	317	25	24	29	31	31	212	37	49	38	71	908
1200-1215	45	271	35	35	45	51	42	192	36	60	38	91	941
1215-1230	37	244	27	27	25	41	27	174	32	45	23	70	772
1230-1245	48	275	43	23	30	41	30	174	56	41	32	58	851
1245-100	33	234	32	27	33	40	24	167	52	40	31	75	788
100-115	43	274	27	48	49	61	29	187	39	43	19	64	883
115-130	28	261	25	36	30	64	25	191	35	43	34	71	843
130-145	19	172	21	23	27	37	32	220	52	41	23	83	750
145-200	33	247	22	32	37	59	25	191	39	51	37	78	851

HOUR TOTALS

TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
800-900	83	694	103	55	65	89	252	499	70	96	101	122	2229
815-915	96	766	119	63	71	103	243	535	75	109	107	145	2432
830-930	113	777	123	66	71	113	220	549	84	107	104	159	2486
845-945	115	849	122	77	83	121	177	540	84	111	103	176	2558
900-1000	116	924	132	88	84	132	151	522	98	127	96	171	2641
915-1015	135	940	132	90	106	160	137	582	119	136	102	165	2804
930-1030	155	1000	137	101	112	167	141	626	116	161	109	182	3007
945-1045	169	1006	141	104	112	178	126	650	133	167	113	188	3087
1000-1100	178	984	150	120	166	199	119	694	127	166	113	200	3216
1015-1115	187	1042	160	132	173	194	105	680	122	162	101	216	3274
1030-1130	176	1059	167	140	194	199	101	725	149	159	103	244	3416
1045-1145	179	1039	164	143	204	191	98	749	138	159	100	250	3414
1100-1200	182	1124	144	122	152	157	99	769	148	167	109	261	3434
1115-1215	167	1106	131	124	151	157	124	782	150	190	129	300	3511
1130-1230	168	1080	119	113	131	156	119	752	133	193	125	291	3380
1145-1245	174	1107	130	109	129	164	130	752	161	195	131	290	3472
1200-100	163	1024	137	112	133	173	123	707	176	186	124	294	3352
1215-115	161	1027	129	125	137	183	110	702	179	169	105	267	3294
1230-130	152	1044	127	134	142	206	108	719	182	167	116	268	3365

1245-145	123	941	105	134	139	202	110	765	178	167	107	293	3264
100-200	123	954	95	139	143	221	111	789	165	178	113	296	3327



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PEDESTRIAN AND BICYCLE COUNT SUMMARY

CLIENT: WILLDAN
PROJECT: AGOURA HILLS
DATE: SATURDAY MAY 5, 2012
PERIOD: 8:00 AM TO 2:00 PM
INTERSECTION: N/S KANAN ROAD
E/W EAST THOUSAND OAKS BOULEVARD

PEDESTRIANS

PERIOD	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG	
15 MIN COUNTS	WB	EB	NB	SB	WB	EB	NB	SB
800-815	0	1	0	0	1	1	2	2
815-830	3	3	0	0	4	4	2	2
830-845	3	1	2	2	1	1	1	1
845-900	4	2	3	1	4	1	1	0
900-915	1	1	0	1	0	4	0	3
915-930	1	0	2	1	1	1	1	2
930-945	1	0	2	0	0	2	2	1
945-1000	1	4	0	0	0	3	1	0
1000-1015	1	2	0	1	2	0	1	1
1015-1030	3	1	2	2	5	3	1	2
1030-1045	3	2	2	0	1	1	3	1
1045-1100	6	0	0	0	1	0	0	0
1100-1115	3	2	2	0	2	0	0	4
1115-1130	0	6	0	4	5	0	0	0
1130-1145	3	4	2	0	0	0	0	0
1145-1200	3	1	0	0	1	2	0	1
1200-1215	2	3	0	1	3	4	0	0
1215-1230	4	1	1	1	1	0	0	1
1230-1245	3	2	0	0	4	0	3	3
1245-100	0	1	0	0	2	6	2	3
100-115	0	3	0	0	1	1	3	6
115-130	3	1	5	1	0	6	2	3
130-145	0	2	2	0	2	1	2	1
145-200	2	2	0	1	2	1	0	1
HOUR TOTALS								
800-900	10	7	5	3	10	7	6	5
815-915	11	7	5	4	9	10	4	6
830-930	9	4	7	5	6	7	3	6
845-945	7	3	7	3	5	8	4	6
900-1000	4	5	4	2	1	10	4	6
915-1015	4	6	4	2	3	6	5	4
930-1030	6	7	4	3	7	8	5	4
945-1045	8	9	4	3	8	7	6	4
1000-1100	13	5	4	3	9	4	5	4
1015-1115	15	5	6	2	9	4	4	7
1030-1130	12	10	4	4	9	1	3	5
1045-1145	12	12	4	4	8	0	0	4
1100-1200	9	13	4	4	8	2	0	5
1115-1215	8	14	2	5	9	6	0	1
1130-1230	12	9	3	2	5	6	0	2
1145-1245	12	7	1	2	9	6	3	5
1200-100	9	7	1	2	10	10	5	7
1215-115	7	7	1	1	8	7	8	13
1230-130	6	7	5	1	7	13	10	15
1245-145	3	7	7	1	5	14	9	13
100-200	5	8	7	2	5	9	7	11
	182	159	89	58	150	145	91	133

BICYCLES

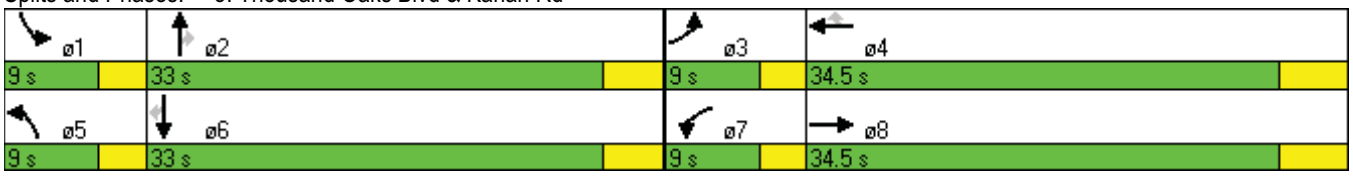
PERIOD	NORTH LEG		EAST LEG		SOUTH LEG		WEST LEG	
15 MIN COUNTS	WB	EB	NB	SB	WB	EB	NB	SB
800-815	0	0	0	0	0	3	0	0
815-830	0	0	0	0	0	4	0	2
830-845	0	0	2	1	0	0	0	2
845-900	1	0	0	0	0	0	0	3
900-915	3	0	0	0	0	3	0	5
915-930	4	0	1	0	1	0	1	17
930-945	0	0	1	1	0	0	0	5
945-1000	0	0	2	1	0	1	0	2
1000-1015	2	0	2	0	0	1	0	1
1015-1030	0	0	2	0	0	1	0	1
1030-1045	0	0	3	0	0	0	0	0
1045-1100	2	0	1	1	0	0	0	2
1100-1115	0	0	0	0	0	1	0	3
1115-1130	0	0	0	0	0	3	0	1
1130-1145	1	0	1	0	0	0	0	0
1145-1200	1	0	2	0	0	0	0	1
1200-1215	7	0	2	2	2	0	0	0
1215-1230	0	0	1	0	0	1	0	0
1230-1245	1	0	0	0	0	0	0	1
1245-100	0	0	0	0	0	1	0	0
100-115	0	0	0	0	0	0	0	1
115-130	0	0	1	1	1	1	0	0
130-145	0	0	0	0	0	0	0	3
145-200	0	0	0	0	0	0	0	0
HOUR TOTALS								
800-900	1	0	2	1	0	7	0	7
815-915	4	0	2	1	0	7	0	12
830-930	8	0	3	1	1	3	1	27
845-945	8	0	2	1	1	3	1	30
900-1000	7	0	4	2	1	4	1	29
915-1015	6	0	6	2	1	2	1	25
930-1030	2	0	7	2	0	3	0	9
945-1045	2	0	9	1	0	3	0	4
1000-1100	4	0	8	1	0	2	0	4
1015-1115	2	0	6	1	0	2	0	6
1030-1130	2	0	4	1	0	4	0	6
1045-1145	3	0	2	1	0	4	0	6
1100-1200	2	0	3	0	0	4	0	5
1115-1215	9	0	5	2	2	3	0	2
1130-1230	9	0	6	2	2	1	0	1
1145-1245	9	0	5	2	2	1	0	2
1200-100	8	0	3	2	2	2	0	1
1215-115	1	0	1	0	0	2	0	2
1230-130	1	0	1	1	1	2	0	2
1245-145	0	0	1	1	1	2	0	4
100-200	0	0	1	1	1	1	0	4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	344	150	207	311	205	96	863	209	110	1292	83
Ideal Flow (vphpl)	1440	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Lane Width (ft)	10	11	8	10	12	11	10	12	12	10	13	9
Storage Length (ft)	175		0	205		100	150		100	185		100
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (ft)	110		25	105		25	90		25	50		25
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.954				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2428	2749	0	1391	2831	1289	1391	2980	1333	1391	3080	1200
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2428	2749	0	1391	2831	1289	1391	2980	1333	1391	3080	1200
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		88				189			147			39
Link Speed (mph)		40			35			40			40	
Link Distance (ft)		340			325			440			370	
Travel Time (s)		5.8			6.3			7.5			6.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking (#/hr)					0							
Shared Lane Traffic (%)												
Lane Group Flow (vph)	190	494	0	207	311	205	96	863	209	110	1292	83
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		20			14			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		10			10			10			10	
Two way Left Turn Lane		Yes										
Headway Factor	1.54	1.30	1.48	1.35	1.33	1.30	1.35	1.24	1.24	1.35	1.19	1.42
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases						4			2			6
Detector Phase	3	8		7	4	4	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	9.0	33.5		9.0	34.5	34.5	9.0	33.0	33.0	9.0	33.0	33.0
Total Split (s)	9.0	34.5	0.0	9.0	34.5	34.5	9.0	33.0	33.0	9.0	33.0	33.0
Total Split (%)	10.5%	40.4%	0.0%	10.5%	40.4%	40.4%	10.5%	38.6%	38.6%	10.5%	38.6%	38.6%
Yellow Time (s)	3.0	4.5		3.0	4.5	4.5	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	4.5	4.0	3.0	4.5	4.5	3.0	4.0	4.0	3.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	6.0	18.6		6.0	18.6	18.6	11.3	33.3	33.3	13.1	35.2	35.2
Actuated g/C Ratio	0.07	0.22		0.07	0.22	0.22	0.13	0.39	0.39	0.15	0.41	0.41
v/c Ratio	1.12	0.74		2.11	0.51	0.48	0.52	0.74	0.34	0.52	1.02	0.16

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	143.7	32.2		557.2	31.6	9.1	45.5	28.5	8.7	43.7	58.4	12.1
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	143.7	32.2		557.2	31.6	9.1	45.5	28.5	8.7	43.7	58.4	12.1
LOS	F	C		F	C	A	D	C	A	D	E	B
Approach Delay		63.1			175.7			26.3			54.7	
Approach LOS		E			F			C			D	
Queue Length 50th (ft)	~61	107		~179	77	7	48	206	21	55	~398	14
Queue Length 95th (ft)	#127	146		#313	106	57	#100	#330	76	#125	#587	48
Internal Link Dist (ft)		260			245			360			290	
Turn Bay Length (ft)	175			205		100	150		100	185		100
Base Capacity (vph)	170	1022		98	993	575	183	1161	609	213	1267	517
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.12	0.48		2.11	0.31	0.36	0.52	0.74	0.34	0.52	1.02	0.16

Intersection Summary			
Area Type:	Other		
Cycle Length: 85.5			
Actuated Cycle Length: 85.5			
Offset: 15 (18%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 2.11			
Intersection Signal Delay: 69.5		Intersection LOS: E	
Intersection Capacity Utilization 93.1%		ICU Level of Service F	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Thousand Oaks Blvd & Kanan Rd

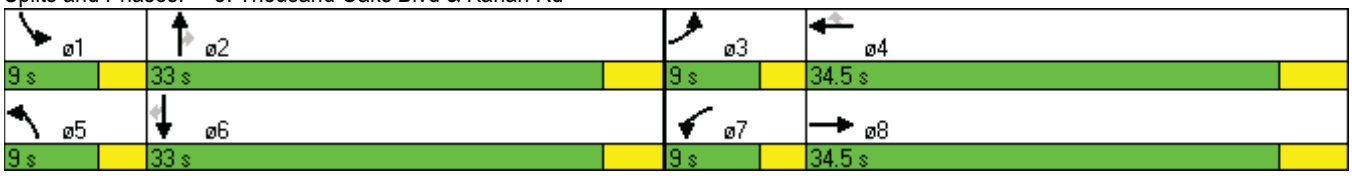


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	258	106	159	129	229	158	131	941	83	124	960	136
Ideal Flow (vphpl)	1440	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Lane Width (ft)	10	11	8	10	12	11	10	12	11	10	13	9
Storage Length (ft)	175		0	205		100	150		100	185		100
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (ft)	110		25	105		25	90		25	90		25
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.910				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2428	2622	0	1391	2831	1289	1391	2980	1289	1391	3080	1200
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2428	2622	0	1391	2831	1289	1391	2980	1289	1391	3080	1200
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		159				158			53			86
Link Speed (mph)		40			35			40			40	
Link Distance (ft)		340			325			440			370	
Travel Time (s)		5.8			6.3			7.5			6.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking (#/hr)					0							
Shared Lane Traffic (%)												
Lane Group Flow (vph)	258	265	0	129	229	158	131	941	83	124	960	136
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		20			14			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		10			10			10			10	
Two way Left Turn Lane		Yes										
Headway Factor	1.54	1.30	1.48	1.35	1.33	1.30	1.35	1.24	1.30	1.35	1.19	1.42
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases						4			2			6
Detector Phase	3	8		7	4	4	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	9.0	33.5		9.0	34.5	34.5	9.0	33.0	33.0	9.0	33.0	33.0
Total Split (s)	9.0	34.5	0.0	9.0	34.5	34.5	9.0	33.0	33.0	9.0	33.0	33.0
Total Split (%)	10.5%	40.4%	0.0%	10.5%	40.4%	40.4%	10.5%	38.6%	38.6%	10.5%	38.6%	38.6%
Yellow Time (s)	3.0	4.5		3.0	4.5	4.5	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	4.5	4.0	3.0	4.5	4.5	3.0	4.0	4.0	3.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	6.0	12.4		6.0	12.4	12.4	17.2	36.4	36.4	16.1	35.4	35.4
Actuated g/C Ratio	0.07	0.15		0.07	0.15	0.15	0.20	0.43	0.43	0.19	0.41	0.41
v/c Ratio	1.52	0.51		1.32	0.56	0.49	0.47	0.74	0.14	0.47	0.75	0.25

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	291.8	16.9		232.9	38.7	11.0	37.0	26.0	8.5	37.9	26.8	8.8
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	291.8	16.9		232.9	38.7	11.0	37.0	26.0	8.5	37.9	26.8	8.8
LOS	F	B		F	D	B	D	C	A	D	C	A
Approach Delay		152.5			78.8			26.0			25.9	
Approach LOS		F			E			C			C	
Queue Length 50th (ft)	~101	27		~91	61	0	64	210	9	61	217	16
Queue Length 95th (ft)	#175	59		#200	92	50	118	#354	40	113	#361	58
Internal Link Dist (ft)		260			245			360			290	
Turn Bay Length (ft)	175			205		100	150		100	185		100
Base Capacity (vph)	170	1023		98	993	555	279	1270	580	262	1275	547
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.52	0.26		1.32	0.23	0.28	0.47	0.74	0.14	0.47	0.75	0.25

Intersection Summary	
Area Type:	Other
Cycle Length: 85.5	
Actuated Cycle Length: 85.5	
Offset: 15 (18%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.52	
Intersection Signal Delay: 53.3	Intersection LOS: D
Intersection Capacity Utilization 71.9%	ICU Level of Service C
Analysis Period (min) 15	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 3: Thousand Oaks Blvd & Kanan Rd



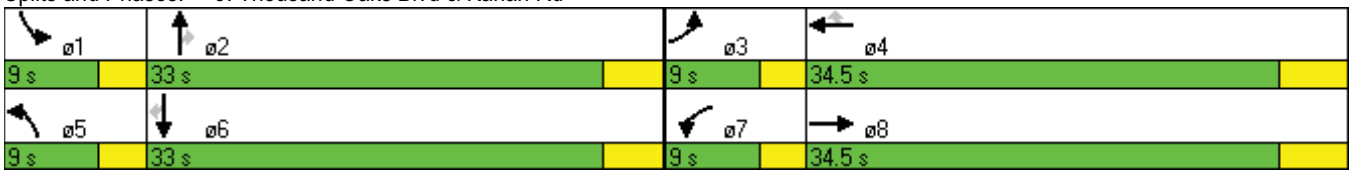
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	341	156	128	133	159	158	146	1174	132	109	827	160
Ideal Flow (vphpl)	1440	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Lane Width (ft)	10	11	8	10	12	11	10	12	11	10	13	9
Storage Length (ft)	175		0	205		100	150		100	185		100
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (ft)	110		25	105		25	90		25	90		25
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.932				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2428	2685	0	1391	2980	1289	1391	2980	1289	1391	3080	1200
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2428	2685	0	1391	2980	1289	1391	2980	1289	1391	3080	1200
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		128				158			68			117
Link Speed (mph)		40			35			40			40	
Link Distance (ft)		340			325			440			370	
Travel Time (s)		5.8			6.3			7.5			6.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)												
Lane Group Flow (vph)	341	284	0	133	159	158	146	1174	132	109	827	160
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		20			14			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		10			10			10			10	
Two way Left Turn Lane												
Headway Factor	1.54	1.30	1.48	1.35	1.24	1.30	1.35	1.24	1.30	1.35	1.19	1.42
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases						4			2			6
Detector Phase	3	8		7	4	4	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	9.0	33.5		9.0	34.5	34.5	9.0	33.0	33.0	9.0	33.0	33.0
Total Split (s)	9.0	34.5	0.0	9.0	34.5	34.5	9.0	33.0	33.0	9.0	33.0	33.0
Total Split (%)	10.5%	40.4%	0.0%	10.5%	40.4%	40.4%	10.5%	38.6%	38.6%	10.5%	38.6%	38.6%
Yellow Time (s)	3.0	4.5		3.0	4.5	4.5	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	4.5	4.0	3.0	4.5	4.5	3.0	4.0	4.0	3.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	6.0	10.8		6.0	10.8	10.8	19.4	40.3	40.3	13.9	34.8	34.8
Actuated g/C Ratio	0.07	0.13		0.07	0.13	0.13	0.23	0.47	0.47	0.16	0.41	0.41
v/c Ratio	2.01	0.63		1.36	0.42	0.52	0.46	0.84	0.21	0.48	0.66	0.29
Control Delay	497.7	25.1		247.9	37.1	12.4	35.2	27.9	8.8	40.2	23.9	7.5

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	497.7	25.1		247.9	37.1	12.4	35.2	27.9	8.8	40.2	23.9	7.5
LOS	F	C		F	D	B	D	C	A	D	C	A
Approach Delay		283.0			90.7			26.9			23.1	
Approach LOS		F			F			C			C	
Queue Length 50th (ft)	~149	41		~95	42	0	70	273	18	54	176	13
Queue Length 95th (ft)	#232	77		#205	68	51	128	#471	59	103	268	58
Internal Link Dist (ft)		260			245			360			290	
Turn Bay Length (ft)	175			205		100	150		100	185		100
Base Capacity (vph)	170	1025		98	1046	555	315	1404	643	226	1254	558
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	2.01	0.28		1.36	0.15	0.28	0.46	0.84	0.21	0.48	0.66	0.29

Intersection Summary

Area Type: Other
Cycle Length: 85.5
Actuated Cycle Length: 85.5
Offset: 15 (18%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 2.01
Intersection Signal Delay: 77.8 Intersection LOS: E
Intersection Capacity Utilization 78.2% ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Thousand Oaks Blvd & Kanan Rd

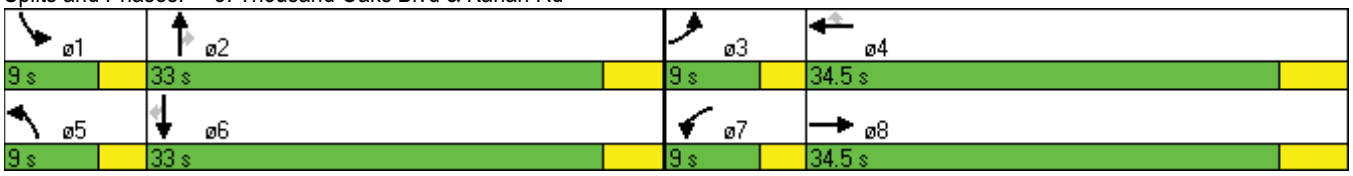


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	300	129	190	157	151	124	150	782	124	131	1106	167
Ideal Flow (vphpl)	1440	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Lane Width (ft)	10	11	8	10	12	11	10	12	11	10	13	9
Storage Length (ft)	175		0	205		100	150		100	185		100
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (ft)	110		25	105		25	90		25	90		25
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.911				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2428	2625	0	1391	2831	1289	1391	2980	1289	1391	3080	1200
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2428	2625	0	1391	2831	1289	1391	2980	1289	1391	3080	1200
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		177				124			96			91
Link Speed (mph)		40			35			40			40	
Link Distance (ft)		340			325			440			370	
Travel Time (s)		5.8			6.3			7.5			6.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking (#/hr)					0							
Shared Lane Traffic (%)												
Lane Group Flow (vph)	300	319	0	157	151	124	150	782	124	131	1106	167
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		20			14			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		10			10			10			10	
Two way Left Turn Lane		Yes										
Headway Factor	1.54	1.30	1.48	1.35	1.33	1.30	1.35	1.24	1.30	1.35	1.19	1.42
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases						4			2			6
Detector Phase	3	8		7	4	4	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	9.0	33.5		9.0	34.5	34.5	9.0	33.0	33.0	9.0	33.0	33.0
Total Split (s)	9.0	34.5	0.0	9.0	34.5	34.5	9.0	33.0	33.0	9.0	33.0	33.0
Total Split (%)	10.5%	40.4%	0.0%	10.5%	40.4%	40.4%	10.5%	38.6%	38.6%	10.5%	38.6%	38.6%
Yellow Time (s)	3.0	4.5		3.0	4.5	4.5	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	4.5	4.0	3.0	4.5	4.5	3.0	4.0	4.0	3.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	6.0	10.8		6.0	10.8	10.8	19.9	37.1	37.1	17.2	34.3	34.3
Actuated g/C Ratio	0.07	0.13		0.07	0.13	0.13	0.23	0.43	0.43	0.20	0.40	0.40
v/c Ratio	1.76	0.66		1.60	0.42	0.46	0.46	0.61	0.20	0.47	0.89	0.31

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	394.6	22.0		343.4	37.3	12.1	34.8	21.6	6.5	37.0	35.4	10.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	394.6	22.0		343.4	37.3	12.1	34.8	21.6	6.5	37.0	35.4	10.4
LOS	F	C		F	D	B	C	C	A	D	D	B
Approach Delay		202.6			141.3			21.7			32.5	
Approach LOS		F			F			C			C	
Queue Length 50th (ft)	~125	37		~123	40	0	72	157	8	64	269	24
Queue Length 95th (ft)	#205	75		#242	65	46	131	248	45	118	#451	75
Internal Link Dist (ft)		260			245			360			290	
Turn Bay Length (ft)	175			205		100	150		100	185		100
Base Capacity (vph)	170	1036		98	993	533	324	1292	613	279	1237	536
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.76	0.31		1.60	0.15	0.23	0.46	0.61	0.20	0.47	0.89	0.31

Intersection Summary	
Area Type:	Other
Cycle Length: 85.5	
Actuated Cycle Length: 85.5	
Offset: 15 (18%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.76	
Intersection Signal Delay: 72.6	Intersection LOS: E
Intersection Capacity Utilization 81.8%	ICU Level of Service D
Analysis Period (min) 15	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 3: Thousand Oaks Blvd & Kanan Rd



ROAD

THOUSAND OAKS

BOULEVARD

KANAN

100'
8'
42'
42'
8'
4'
9'
13'
13'
10'
13'
12'
10'
C.B.
R30A(CA)
9AM-1PM
<->
D11-1
M6-3
R6-2
TYPE "K"
R2-1(40)
R28(CA)<->
MTA
W11-2
15'
12'
10'
7'
R26(CA)
R14-1<->
R81 <->
R4-7
TYPE "N"
11'
17'
6'
R5-2
OVER 5 TONS
OVER 2 AXLES
R28(CA)<->
R2-1(35)
R28(CA)<->
R14-1<
R28(CA)<->
11'
R2-1(40)
R81
R28(CA)<->
D11-1
M6-6
R26(CA)

LEGEND :

= EXISTING RED CURB

= SIGNALIZED INTERSECTION

1" = 20'

WILLDAN Engineering
13191 CROSSROADS PARKWAY NORTH
SUITE 405 INDUSTRY, CA 91746-3497
(562) 908-6200

CITY OF AGOURA HILLS

THOUSAND OAKS BOULEVARD AT KANAN ROAD

\\WND-DC1\Traffic\jn101350 Agoura Hills Ped Evaluation\DWGS\Striping Concept.dwg Jul 16, 12

Synchro Analysis

The intersection of Kanan Road and Thousand Oaks Boulevard was modeled in Synchro 7 to determine the delay and level of service (LOS) results during the AM, Mid-Day, and PM peak hours. The analysis started with modeling the intersection using proposed lane configurations that featured de-facto right turn lanes paired with the existing signal timing. The resulting LOS and delay would provide us with a baseline to compare alternative scenarios against. As the striping concept was finalized, the intersection was modeled with dedicated right turn lanes instead of the de-facto right turn lanes previously analyzed. This resulted in no change for the LOS and delay due to the way Synchro is programmed to model the de-facto right turns as individual turn lanes already. The next iteration of the Synchro modeling was to see how much of an improvement implementing right turn overlaps to all three right turn lanes. By adding the right turn overlaps, there was minimal improvement to the delay during the Mid-Day peak hours, while the rest of the peak hours remained at the same LOS and delay as before. The reasons the delay did not improve significantly is due to the right turns not being the critical movements for the intersection and due to right turns being allowed during the red interval.

Kanan Rd and Thousand Oaks Blvd - Delay and Level of Service Results

Scenario	Intersection Delay / Level of Service	
	With Right Turn Lanes	With Right Turn Overlaps
Weekday AM Peak Hour	69.5 / E	69.5 / E
Weekday Mid-Day Peak Hour	53.3 / D	53.2 / D
Weekday PM Peak Hour	77.8 / E	77.8 / E
Weekend Mid-Day Peal Hour	72.6 / E	72.3 / E

A Synchro modeling analysis was also performed on the proposed mid-block pedestrian signal on Thousand Oaks Boulevard. For this pedestrian signal, we modeled the worst case scenario which is the AM peak hour with the highest vehicular traffic. The pedestrian signal was setup with a 60 second cycle that featured a pedestrian call every 60 seconds. The analysis showed that the resulting level of service to be at level B with a delay of 13.0 seconds. The westbound queue length was determined to be 125 feet. The mid-block pedestrian signal was then modeled with the traffic signal at Kanan Road and Thousand Oaks Boulevard as a connected network. This resulting analysis showed no change in the delay and LOS for both signals. The traffic signal is located approximately 700 feet away from the pedestrian signal, therefore there is no vehicle queue that backs up to the signalized intersection.

Thousand Oaks Blvd Mid-Block Pedestrian Signal - AM Peak Hour Results

Pedestrian Signal Delay / Level of Service	13.0 / B
Westbound Queue Length	125 Feet
Eastbound Queue Length	186 Feet

Kanan Rd and Thousand Oaks Blvd
Delay and Level of Service Results

Scenario	Intersection Delay/LOS
Weekday AM Peak Hour	69.5/E
Weekday AM Peak Hour - With RT Overlaps	69.5/E
Weekday Mid-Day Peak Hour	53.3/D
Weekday Mid-Day Peak Hour - With RT Overlaps	53.2/D
Weekday PM Peak Hour	77.8/E
Weekday PM Peak Hour - With RT Overlaps	77.8/E
Weekend Mid-Day Peak Hour	72.6/E
Weekend Mid-Day Peak Hour - With RT Overlaps	72.3/E

Thousand Oaks Blvd Mid-Block Pedestrian Signal
AM Peak Hour Analysis Results

Pedestrian Signal Delay/LOS	13.0/B
Westbound Queue Length	125 ft
Eastbound Queue Length	186 ft

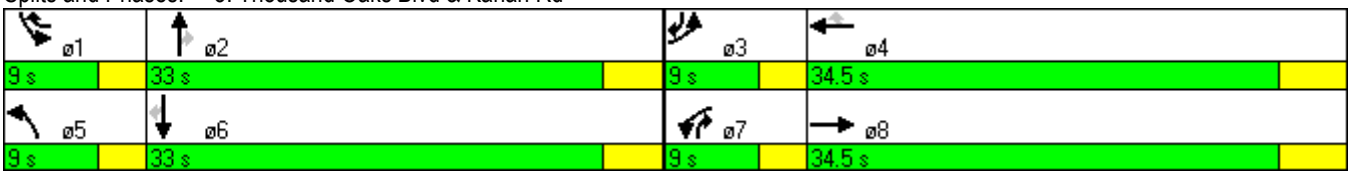
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	344	150	207	311	205	96	863	209	110	1292	83
Ideal Flow (vphpl)	1440	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Lane Width (ft)	10	11	8	10	12	11	10	12	12	10	13	9
Storage Length (ft)	175		0	205		100	150		100	185		100
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (ft)	110		25	105		25	90		25	50		25
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.954				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2428	2749	0	1391	2831	1289	1391	2980	1333	1391	3080	1200
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2428	2749	0	1391	2831	1289	1391	2980	1333	1391	3080	1200
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		88				34			178			47
Link Speed (mph)		40			35			40			40	
Link Distance (ft)		340			325			440			370	
Travel Time (s)		5.8			6.3			7.5			6.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking (#/hr)					0							
Shared Lane Traffic (%)												
Lane Group Flow (vph)	190	494	0	207	311	205	96	863	209	110	1292	83
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		20			14			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		10			10			10			10	
Two way Left Turn Lane		Yes										
Headway Factor	1.54	1.30	1.48	1.35	1.32	1.30	1.35	1.24	1.24	1.35	1.19	1.42
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot			Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	3	8		7	4	1	5	2	7	1	6	3
Permitted Phases						4			2			6
Detector Phase	3	8		7	4	1	5	2	7	1	6	3
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	9.0	33.5		9.0	34.5	9.0	9.0	33.0	9.0	9.0	33.0	9.0
Total Split (s)	9.0	34.5	0.0	9.0	34.5	9.0	9.0	33.0	9.0	9.0	33.0	9.0
Total Split (%)	10.5%	40.4%	0.0%	10.5%	40.4%	10.5%	10.5%	38.6%	10.5%	10.5%	38.6%	10.5%
Yellow Time (s)	3.0	4.5		3.0	4.5	3.0	3.0	4.0	3.0	3.0	4.0	3.0
All-Red Time (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	4.5	4.0	3.0	4.5	3.0	3.0	4.0	3.0	3.0	4.0	3.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	6.0	18.6		6.0	18.6	36.2	11.3	33.3	43.3	13.1	35.2	45.2
Actuated g/C Ratio	0.07	0.22		0.07	0.22	0.42	0.13	0.39	0.51	0.15	0.41	0.53
v/c Ratio	1.12	0.74		2.11	0.51	0.36	0.52	0.74	0.27	0.52	1.02	0.13

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	143.7	32.2		557.2	31.6	15.1	45.5	28.5	4.3	43.7	58.4	7.1
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	143.7	32.2		557.2	31.6	15.1	45.5	28.5	4.3	43.7	58.4	7.1
LOS	F	C		F	C	B	D	C	A	D	E	A
Approach Delay		63.1			177.4			25.6			54.4	
Approach LOS		E			F			C			D	
Queue Length 50th (ft)	~61	107		~179	77	59	48	206	8	55	~398	9
Queue Length 95th (ft)	#127	146		#313	106	102	#100	#330	47	#125	#587	36
Internal Link Dist (ft)		260			245			360			290	
Turn Bay Length (ft)	175			205		100	150		100	185		100
Base Capacity (vph)	170	1022		98	993	565	183	1161	763	213	1267	656
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.12	0.48		2.11	0.31	0.36	0.52	0.74	0.27	0.52	1.02	0.13

Intersection Summary

Area Type: Other
Cycle Length: 85.5
Actuated Cycle Length: 85.5
Offset: 15 (18%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 2.11
Intersection Signal Delay: 69.5 Intersection LOS: E
Intersection Capacity Utilization 93.1% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Thousand Oaks Blvd & Kanan Rd

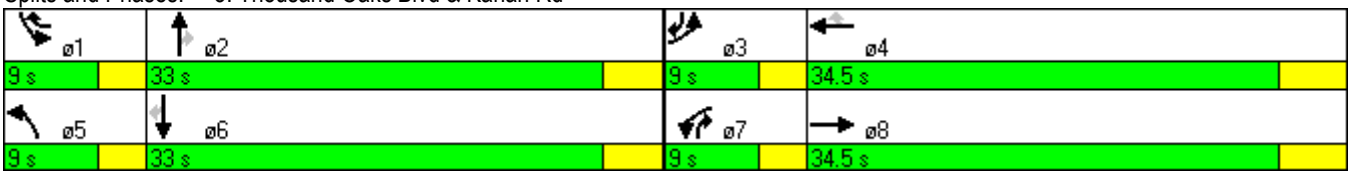


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	258	106	159	129	229	158	131	941	83	124	960	136
Ideal Flow (vphpl)	1440	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Lane Width (ft)	10	11	8	10	12	11	10	12	12	10	13	9
Storage Length (ft)	175		0	205		100	150		100	185		100
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (ft)	110		25	105		25	90		25	90		25
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.910				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2428	2622	0	1391	2831	1289	1391	2980	1333	1391	3080	1200
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2428	2622	0	1391	2831	1289	1391	2980	1333	1391	3080	1200
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		159				22			65			104
Link Speed (mph)		40			35			40			40	
Link Distance (ft)		340			325			440			370	
Travel Time (s)		5.8			6.3			7.5			6.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking (#/hr)					0							
Shared Lane Traffic (%)												
Lane Group Flow (vph)	258	265	0	129	229	158	131	941	83	124	960	136
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		20			14			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		10			10			10			10	
Two way Left Turn Lane		Yes										
Headway Factor	1.54	1.30	1.48	1.35	1.32	1.30	1.35	1.24	1.24	1.35	1.19	1.42
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot			Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	3	8		7	4	1	5	2	7	1	6	3
Permitted Phases						4			2			6
Detector Phase	3	8		7	4	1	5	2	7	1	6	3
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	9.0	33.5		9.0	34.5	9.0	9.0	33.0	9.0	9.0	33.0	9.0
Total Split (s)	9.0	34.5	0.0	9.0	34.5	9.0	9.0	33.0	9.0	9.0	33.0	9.0
Total Split (%)	10.5%	40.4%	0.0%	10.5%	40.4%	10.5%	10.5%	38.6%	10.5%	10.5%	38.6%	10.5%
Yellow Time (s)	3.0	4.5		3.0	4.5	3.0	3.0	4.0	3.0	3.0	4.0	3.0
All-Red Time (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	4.5	4.0	3.0	4.5	3.0	3.0	4.0	3.0	3.0	4.0	3.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	6.0	12.3		6.0	12.3	32.9	17.2	36.6	46.6	16.1	35.6	45.6
Actuated g/C Ratio	0.07	0.14		0.07	0.14	0.38	0.20	0.43	0.55	0.19	0.42	0.53
v/c Ratio	1.52	0.52		1.32	0.56	0.31	0.47	0.74	0.11	0.47	0.75	0.20

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	291.8	17.2		232.9	39.2	17.0	37.0	25.6	4.5	37.9	26.4	4.6
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	291.8	17.2		232.9	39.2	17.0	37.0	25.6	4.5	37.9	26.4	4.6
LOS	F	B		F	D	B	D	C	A	D	C	A
Approach Delay		152.7			80.8			25.4			25.1	
Approach LOS		F			F			C			C	
Queue Length 50th (ft)	~101	27		~91	61	50	64	210	4	61	217	7
Queue Length 95th (ft)	#175	60		#200	93	88	118	#328	27	113	#335	38
Internal Link Dist (ft)		260			245			360			290	
Turn Bay Length (ft)	175			205		100	150		100	185		100
Base Capacity (vph)	170	1023		98	993	510	279	1276	756	262	1281	688
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.52	0.26		1.32	0.23	0.31	0.47	0.74	0.11	0.47	0.75	0.20

Intersection Summary		
Area Type:	Other	
Cycle Length: 85.5		
Actuated Cycle Length: 85.5		
Offset: 15 (18%), Referenced to phase 2:NBT and 6:SBT, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.52		
Intersection Signal Delay: 53.2	Intersection LOS: D	
Intersection Capacity Utilization 71.9%	ICU Level of Service C	
Analysis Period (min) 15		
~ Volume exceeds capacity, queue is theoretically infinite.		
Queue shown is maximum after two cycles.		
# 95th percentile volume exceeds capacity, queue may be longer.		
Queue shown is maximum after two cycles.		

Splits and Phases: 3: Thousand Oaks Blvd & Kanan Rd



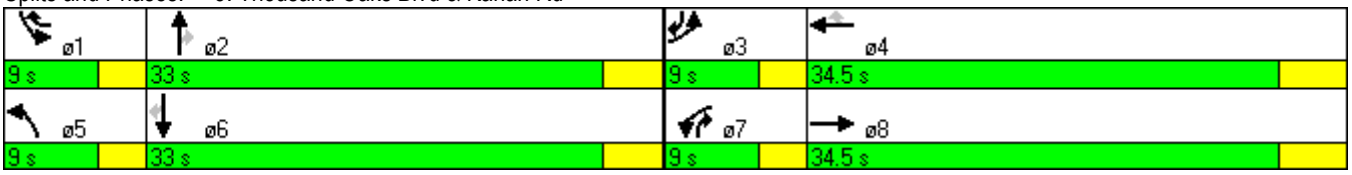
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	341	156	128	133	159	158	146	1174	132	109	827	160
Ideal Flow (vphpl)	1440	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Lane Width (ft)	10	11	8	10	12	11	10	12	12	10	13	9
Storage Length (ft)	175		0	205		100	150		100	185		100
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (ft)	110		25	105		25	90		25	90		25
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.932				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2428	2685	0	1391	2980	1289	1391	2980	1333	1391	3080	1200
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2428	2685	0	1391	2980	1289	1391	2980	1333	1391	3080	1200
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		128				8			83			142
Link Speed (mph)		40			35			40			40	
Link Distance (ft)		340			325			440			370	
Travel Time (s)		5.8			6.3			7.5			6.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Shared Lane Traffic (%)												
Lane Group Flow (vph)	341	284	0	133	159	158	146	1174	132	109	827	160
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		20			14			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		10			10			10			10	
Two way Left Turn Lane												
Headway Factor	1.54	1.30	1.48	1.35	1.24	1.30	1.35	1.24	1.24	1.35	1.19	1.42
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot			Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	3	8		7	4	1	5	2	7	1	6	3
Permitted Phases						4			2			6
Detector Phase	3	8		7	4	1	5	2	7	1	6	3
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	9.0	33.5		9.0	34.5	9.0	9.0	33.0	9.0	9.0	33.0	9.0
Total Split (s)	9.0	34.5	0.0	9.0	34.5	9.0	9.0	33.0	9.0	9.0	33.0	9.0
Total Split (%)	10.5%	40.4%	0.0%	10.5%	40.4%	10.5%	10.5%	38.6%	10.5%	10.5%	38.6%	10.5%
Yellow Time (s)	3.0	4.5		3.0	4.5	3.0	3.0	4.0	3.0	3.0	4.0	3.0
All-Red Time (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	4.5	4.0	3.0	4.5	3.0	3.0	4.0	3.0	3.0	4.0	3.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	6.0	10.8		6.0	10.8	29.2	19.4	40.3	50.3	13.9	34.8	44.8
Actuated g/C Ratio	0.07	0.13		0.07	0.13	0.34	0.23	0.47	0.59	0.16	0.41	0.52
v/c Ratio	2.01	0.63		1.36	0.42	0.35	0.46	0.84	0.16	0.48	0.66	0.23
Control Delay	497.7	25.1		247.9	37.1	21.5	35.2	27.9	4.7	40.2	23.9	3.7

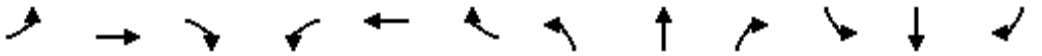
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	497.7	25.1		247.9	37.1	21.5	35.2	27.9	4.7	40.2	23.9	3.7
LOS	F	C		F	D	C	D	C	A	D	C	A
Approach Delay		283.0			93.9			26.5			22.6	
Approach LOS		F			F			C			C	
Queue Length 50th (ft)	~149	41		~95	42	60	70	273	10	54	176	4
Queue Length 95th (ft)	#232	77		#205	68	98	128	#471	41	103	268	37
Internal Link Dist (ft)		260			245			360			290	
Turn Bay Length (ft)	175			205		100	150		100	185		100
Base Capacity (vph)	170	1025		98	1046	446	315	1404	818	226	1254	696
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	2.01	0.28		1.36	0.15	0.35	0.46	0.84	0.16	0.48	0.66	0.23

Intersection Summary

Area Type: Other
Cycle Length: 85.5
Actuated Cycle Length: 85.5
Offset: 15 (18%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 2.01
Intersection Signal Delay: 77.9 Intersection LOS: E
Intersection Capacity Utilization 78.2% ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Thousand Oaks Blvd & Kanan Rd



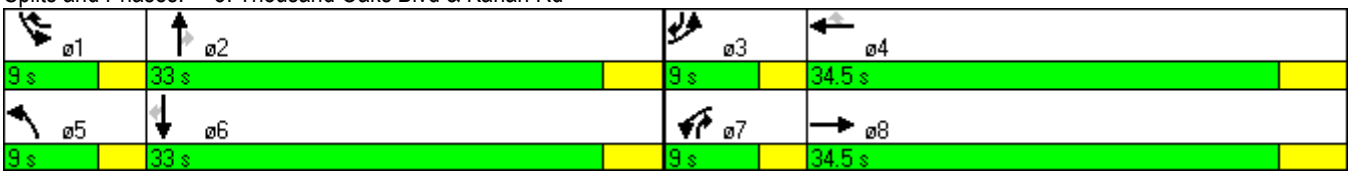


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	300	129	190	157	151	124	150	782	124	131	1106	167
Ideal Flow (vphpl)	1440	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Lane Width (ft)	10	11	8	10	12	11	10	12	12	10	13	9
Storage Length (ft)	175		0	205		100	150		100	185		100
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (ft)	110		25	105		25	90		25	90		25
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.911				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2428	2625	0	1391	2831	1289	1391	2980	1333	1391	3080	1200
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2428	2625	0	1391	2831	1289	1391	2980	1333	1391	3080	1200
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		177				41			117			111
Link Speed (mph)		40			35			40			40	
Link Distance (ft)		340			325			440			370	
Travel Time (s)		5.8			6.3			7.5			6.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking (#/hr)					0							
Shared Lane Traffic (%)												
Lane Group Flow (vph)	300	319	0	157	151	124	150	782	124	131	1106	167
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		20			14			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		10			10			10			10	
Two way Left Turn Lane		Yes										
Headway Factor	1.54	1.30	1.48	1.35	1.32	1.30	1.35	1.24	1.24	1.35	1.19	1.42
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot			Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	3	8		7	4	1	5	2	7	1	6	3
Permitted Phases						4			2			6
Detector Phase	3	8		7	4	1	5	2	7	1	6	3
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	9.0	33.5		9.0	34.5	9.0	9.0	33.0	9.0	9.0	33.0	9.0
Total Split (s)	9.0	34.5	0.0	9.0	34.5	9.0	9.0	33.0	9.0	9.0	33.0	9.0
Total Split (%)	10.5%	40.4%	0.0%	10.5%	40.4%	10.5%	10.5%	38.6%	10.5%	10.5%	38.6%	10.5%
Yellow Time (s)	3.0	4.5		3.0	4.5	3.0	3.0	4.0	3.0	3.0	4.0	3.0
All-Red Time (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	4.5	4.0	3.0	4.5	3.0	3.0	4.0	3.0	3.0	4.0	3.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	6.0	10.8		6.0	10.8	32.4	19.9	37.1	47.1	17.2	34.3	44.3
Actuated g/C Ratio	0.07	0.13		0.07	0.13	0.38	0.23	0.43	0.55	0.20	0.40	0.52
v/c Ratio	1.76	0.66		1.60	0.42	0.24	0.46	0.61	0.16	0.47	0.89	0.25

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	394.6	22.0		343.4	37.3	13.0	34.8	21.6	3.1	37.0	35.4	5.6
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	394.6	22.0		343.4	37.3	13.0	34.8	21.6	3.1	37.0	35.4	5.6
LOS	F	C		F	D	B	C	C	A	D	D	A
Approach Delay		202.6			141.6			21.3			32.0	
Approach LOS		F			F			C			C	
Queue Length 50th (ft)	~125	37		~123	40	30	72	157	2	64	269	13
Queue Length 95th (ft)	#205	75		#242	65	61	131	248	29	118	#451	51
Internal Link Dist (ft)		260			245			360			290	
Turn Bay Length (ft)	175			205		100	150		100	185		100
Base Capacity (vph)	170	1036		98	993	514	324	1292	787	279	1237	676
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.76	0.31		1.60	0.15	0.24	0.46	0.61	0.16	0.47	0.89	0.25

Intersection Summary			
Area Type:	Other		
Cycle Length: 85.5			
Actuated Cycle Length: 85.5			
Offset: 15 (18%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.76			
Intersection Signal Delay: 72.3		Intersection LOS: E	
Intersection Capacity Utilization 81.8%		ICU Level of Service D	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Thousand Oaks Blvd & Kanan Rd



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø2
Lane Configurations							
Volume (vph)	684	0	0	490	0	0	
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00	
Frt							
Flt Protected							
Satd. Flow (prot)	2980	0	0	2980	0	0	
Flt Permitted							
Satd. Flow (perm)	2980	0	0	2980	0	0	
Right Turn on Red		No				No	
Satd. Flow (RTOR)							
Link Speed (mph)	40			40	30		
Link Distance (ft)	1500			700	50		
Travel Time (s)	25.6			11.9	1.1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Adj. Flow (vph)	684	0	0	490	0	0	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	684	0	0	490	0	0	
Turn Type							
Protected Phases	4			8			2
Permitted Phases							
Detector Phase	4			8			
Switch Phase							
Minimum Initial (s)	4.0			4.0			4.0
Minimum Split (s)	20.0			20.0			34.0
Total Split (s)	26.0	0.0	0.0	26.0	0.0	0.0	34.0
Total Split (%)	43.3%	0.0%	0.0%	43.3%	0.0%	0.0%	57%
Maximum Green (s)	21.0			21.0			29.0
Yellow Time (s)	4.5			4.5			4.5
All-Red Time (s)	0.5			0.5			0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	4.0	4.0	5.0	4.0	4.0	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0			3.0			3.0
Recall Mode	None			None			None
Walk Time (s)							10.0
Flash Dont Walk (s)							19.0
Pedestrian Calls (#/hr)							60
Act Effct Green (s)	24.6			24.6			
Actuated g/C Ratio	0.61			0.61			
v/c Ratio	0.38			0.27			
Control Delay	13.4			12.4			
Queue Delay	0.0			0.0			
Total Delay	13.4			12.4			
LOS	B			B			
Approach Delay	13.4			12.4			
Approach LOS	B			B			
Queue Length 50th (ft)	107			70			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø2
Queue Length 95th (ft)	186			125			
Internal Link Dist (ft)	1420			620	1		
Turn Bay Length (ft)							
Base Capacity (vph)	1826			1826			
Starvation Cap Reductn	0			0			
Spillback Cap Reductn	0			0			
Storage Cap Reductn	0			0			
Reduced v/c Ratio	0.37			0.27			

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 40.6			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.38			
Intersection Signal Delay: 13.0		Intersection LOS: B	
Intersection Capacity Utilization 26.6%		ICU Level of Service A	
Analysis Period (min) 60			

Splits and Phases: 1: Thousand Oaks Blvd &