



# HEXAGON TRANSPORTATION CONSULTANTS, INC.

## Memorandum

---

**Date:** July 19, 2023

**To:** Mr. David Stillman, City of Cupertino

**From:** Ollie Zhou, T.E.

**Subject:** Lawson Middle School Bikeway Feasibility Study

---

Hexagon Transportation Consultants, Inc. has completed a Lawson Middle School bikeway feasibility study for the City of Cupertino. This memorandum provides a summary of the study that included data collection, community outreach, stakeholder meetings, and alternatives development.

### Overview

As shown in Figure 1, Lawson Middle School is located in a mostly residential setting. It is bounded to the north by Merritt Drive (Merritt Drive dead-ends at the school), to the east by Vista Drive, to the south by Forest Avenue, and to the west by neighboring residential and commercial properties.

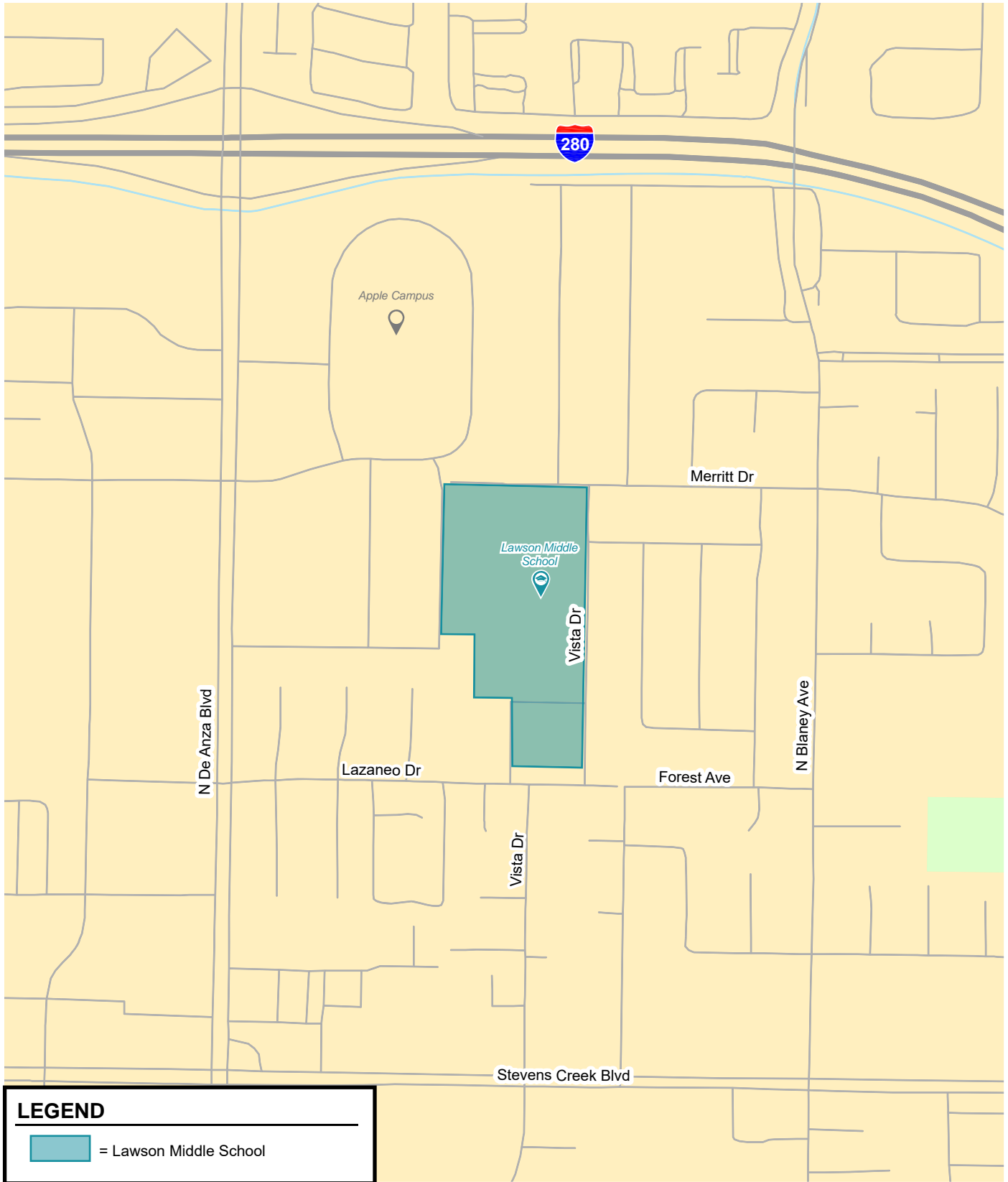
The City of Cupertino conducted a citywide school walk audit in 2016/2017, which identified a need to improve bicycle safety at the Lawson school. From 2016 to 2022, per City staff, the percentage of Lawson students biking to school has grown from 3% to 17%. The City contracted with Hexagon in late 2022 to evaluate existing conditions and conduct a feasibility study to determine the feasibility of potential improvements for bicycle safety.

The purpose of this study is to accommodate the growing number of cyclists and keep all road users safe by providing a safe route to access bike cages on campus, while minimizing impacts to the neighborhood.

### Existing Context

#### Nearby Roadways

Merritt Drive is an east-west two-lane residential street with speed tables. It is a signed and marked bike route. Merritt Drive has on-street parking on both sides but most of which is permit parking during daytime (8 AM to 4 PM Monday to Friday). The school's parking lot has two driveways on Merritt Drive. This parking lot also serves as one of the two main loading areas for parents dropping off/picking up their children. The Apple campus is located directly northwest of the school. Mariani Avenue provides access to the Apple campus, but Mariani Avenue is not connected with Merritt Drive. However, there are multiple pedestrian/bicycle paths that connect Mariani Avenue and Merritt Drive.



**Figure 1**  
**Project Location**

Vista Drive extends southward from Merritt Drive to Forest Avenue. Vista Drive continues south past Forest Avenue with an offset road that is approximately 200 feet west of the northern stretch. Vista Drive is a two-lane residential street. It is currently not signed or marked as a bicycle facility. On-street parking is allowed. The school’s parking lot also has one driveway on Vista Drive. The second main loading area for the school is located along Vista Drive as well, accessed via two driveways.

Forest Avenue/Lazaneo Drive is an east-west two-lane residential street with speed tables. It does not have bike facility signage or markings. Lazaneo Drive extends from west of De Anza Boulevard to the southern stretch of Vista Drive, and transitions to Forest Avenue to continue eastward. On-street parking is allowed on both sides of the street. Forest Avenue is blocked off to vehicular traffic just east of the northern stretch of Vista Drive. However, bicycles and pedestrians can continue east on Forest Avenue. The Cupertino Unified School District (CUSD) is located between the Lawson school and Forest Avenue/Lazaneo Drive. The CUSD has a parking lot with a driveway onto Forest Avenue/Lazaneo Drive, at the location of the southern stretch of Vista Drive.

**School Operations**

During the school calendar year of 2022/2023, Lawson Middle School operated with two sets of bell schedules (see Table 1), with a late start on Wednesdays. During the morning drop-off and afternoon pick-up periods, parents can utilize either the school parking lot, or utilize the drop-off loop located on Vista Drive.

**Table 1  
Lawson Middle School Bell Schedule, School Year 2022/2023**

	Monday/ Tuesday/ Thursday/ Friday	Wednesday (Late Start)
Early Start (optional Period 0)	7:30 AM	9:01 AM
School Start	8:26 AM	9:44 AM
School Ends	3:00 PM	3:00 PM
<u>Notes:</u> Lawson Middle School Bell Schedule for School Year 2022/2023		

There are also two bike cages for students to park their bikes. One bike cage is located at the northwest corner of the school, accessible via Merritt Drive. The other bike cage is located just north of the school’s track field, accessible via Vista Drive. The school has multiple pedestrian entrances located on the north side and east side of the school. During the school calendar year of 2022/2023, there was a crossing guard at the intersection of Vista Drive and Merritt Drive. These details are also graphically shown on Figure 2.

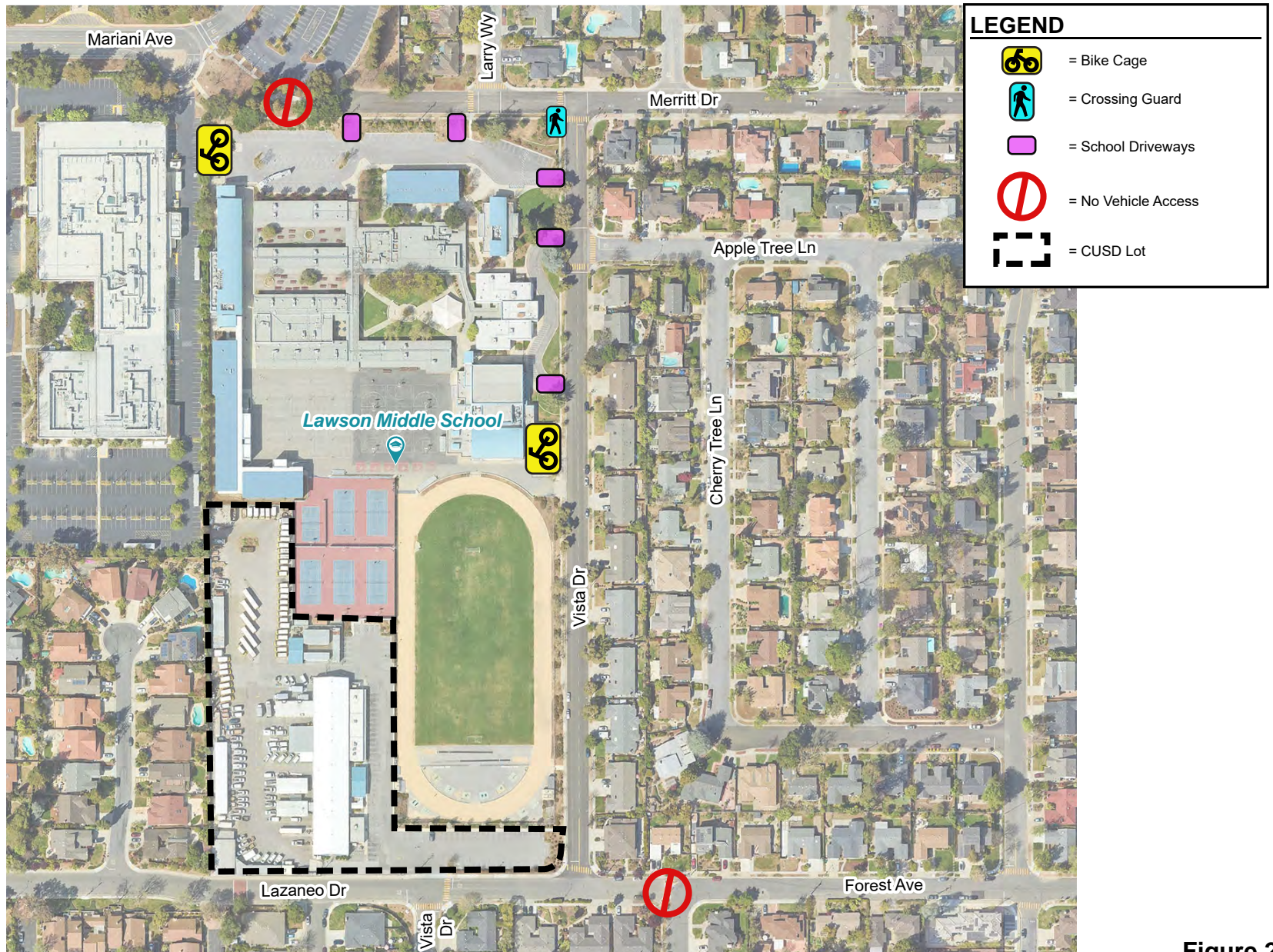


Figure 2  
Existing Lawson Multimodal Operations

## Existing Conditions

Data collection and analysis of existing conditions was conducted to understand existing school operations, identify potential safety issues, and assess on-street parking usage. The scope of the data collection is identified below:

### Scope of Data Collection

Intersection volumes during the peak one-hour of school drop-off and pick-up operations were conducted at 5 locations (see list below). These counts included vehicular turning movements, as well as bicycle and pedestrian counts.

1. Blaney Avenue & Merritt Drive
2. Vista Drive & Merritt Drive
3. Vista Drive & Apple Tree Lane
4. Vista Drive & Forest Avenue
5. Vista Drive & Lazaneo Drive

The school's 5 driveways were also counted during the peak one-hour of school drop-off and pick-up operations.

On-street parking utilization counts were conducted on a typical weekday and a typical weekend on Merritt Drive west of Blaney Avenue, Vista Drive between Forest Avenue and Merritt Drive, and on Apple Tree Lane. The weekday count was conducted to capture peak demand during peak school drop-off and pick-up operations (7 AM to 10 AM, and 2 PM to 5PM), as well as during peak residential usage (8 PM to 12 AM). The weekend count was conducted between 7 AM and 12 AM to capture peak demand during residential weekend usage. All counts are shown in Appendix A.

Field observations were also conducted during a typical Tuesday and Wednesday (trash day in the neighborhood) on Merritt Drive, Mariani Avenue, Vista Drive and Forest Avenue to understand typical behaviors during drop-off and pick-up, as well as identify potential safety issues related to bicycle/pedestrian, bicycle/vehicle, and pedestrian/vehicle conflicts surrounding the school.

### General Vehicular Operations

Data collection showed that vehicular traffic near the school site is generally low during the peak drop-off and pick-up operations, with less than 500 vehicles per hour, and less than 200 vehicles per direction. During the morning drop-off peak period, parents used both the Lawson parking lot on Merritt Drive as well as the drop-off zone on Vista Drive to drop-off their children. Hexagon also observed parents using the CUSD parking lot as well as the Apple campus parking lot at the end of Mariani Avenue for drop-off. Some parents also elected to park on-street on Vista Drive and neighboring streets for drop-off. Temporary queues would form on Merritt Drive and Vista Drive, but they would dissipate relatively quickly once school starts.

During the school pick-up time, Hexagon observed that many parents arrived early. Some parked on-street on Vista Drive and neighboring streets. Some parked inside the Apple parking lot or the CUSD parking lot. Some queued inside the Lawson parking lot. Just prior to students leaving the school, the queue inside the Lawson parking lot would spill out onto Merritt Drive and back up towards Vista Drive. However, queues would quickly dissipate once pick-up operations began.

## On-Street Parking

On-street parking utilization counts showed that during a normal school weekday, on-street parking utilization on Vista Drive picks up at around 8 AM, and generally stays consistent at around 20 to 30 vehicles parked during the school day. At 3 PM, when parents pick up their children, on-street parking utilization peaks on Vista Drive at 75 parked vehicles. Counted data showed that Vista Drive's parking utilization dropped down to 10 parked vehicles or less after 4 PM. On-street parking utilization during the weekend was relatively low throughout the day.

Hexagon also counted on-street parking utilization on Merritt Drive and Apple Tree Lane. Both streets experienced similar patterns in parking utilization during the school days and weekends. However, the peak parking demand on both streets did not exceed 60% of the available on-street parking spaces.

## Bike and Pedestrian Operations

Pedestrian counts showed that in general, before school starts and after school ends, there were more than 100 pedestrians on Vista Drive south and north of the Vista bike cage. The marked crosswalks across Vista Drive at Forest Avenue received heavy pedestrian crossing volume. The marked crosswalks at Vista Drive and Merritt Drive also received heavy pedestrian crossing volumes; this intersection also had a crossing guard directing orderly flows of pedestrians. Some students were dropped off and/or picked up by parents who parked on the east side of Vista Drive. They generally crossed Vista Drive midblock.

Bike counts showed that bike volume south of the Vista bike cage was relatively high before school starts and after school ends. North of the Vista bike cage, bike volumes were generally low on Merritt Drive. Students who used the Merritt bike cage generally came from Mariani Avenue.

## Observed Conflict Areas

During Hexagon's field observations, we observed many potential bicycle/vehicle, bicycle/pedestrian, and pedestrian/vehicle conflict areas (see Figures 3 to 5).

Bicycle/pedestrian conflicts generally included students biking on sidewalks (mostly along the west side of Vista Drive), and students biking across crosswalks swirling around crossing pedestrian without yielding.

Pedestrian/vehicle conflicts generally included students crossing Vista Drive midblock because their parents parked on the east side of Vista Drive to drop them off or pick them up. At the intersection of Vista Drive and Forest Avenue, eastbound vehicles turning left onto Vista Drive do not have a stop sign, but these vehicles are turning into a marked crosswalk. Hexagon observed some instances where pedestrians began walking across the crosswalk when a vehicle is also turning into the crosswalk. However, these vehicles all noticed the pedestrians and yielded.



Figure 3  
Section 1 Conflicts

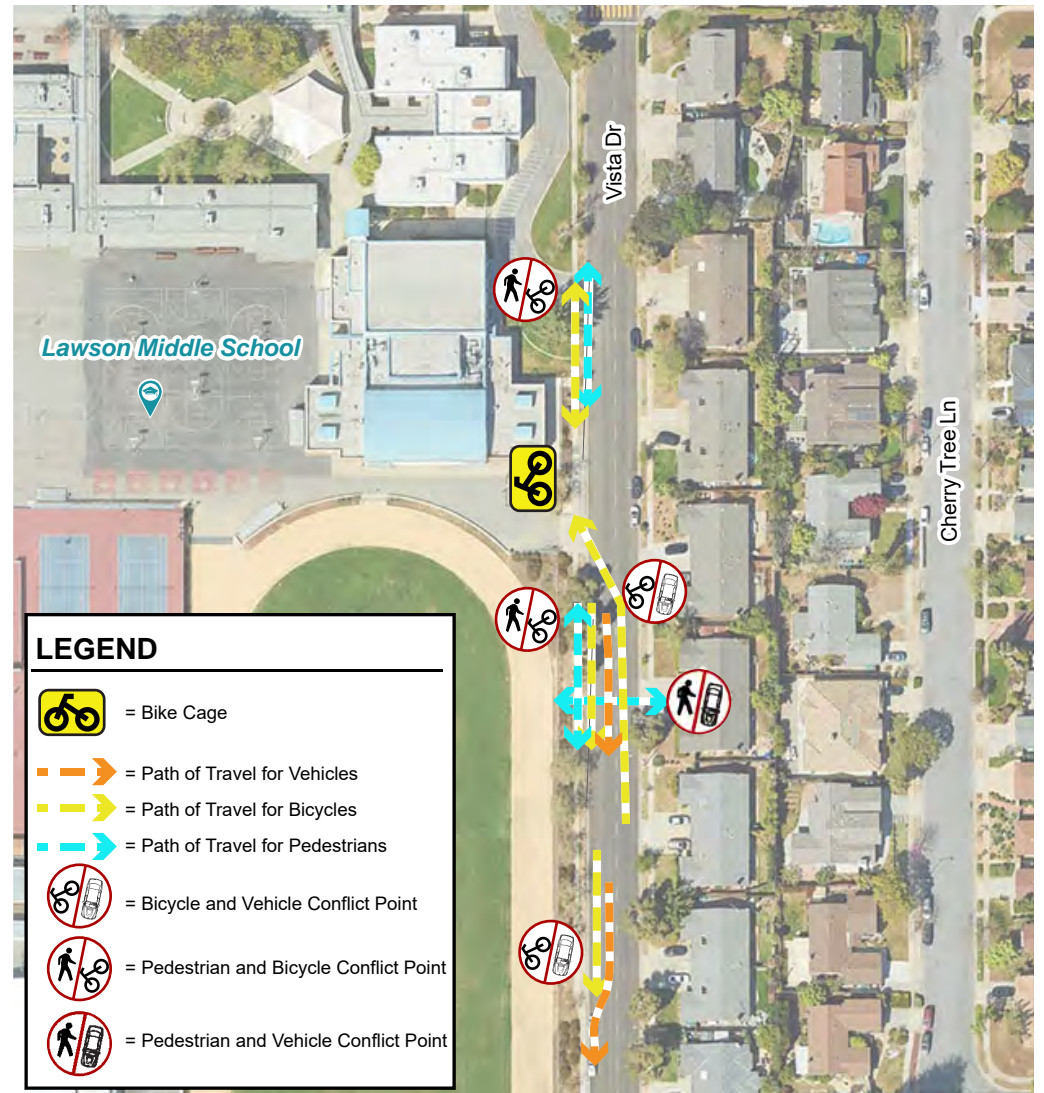


Figure 4  
Section 2 Conflicts



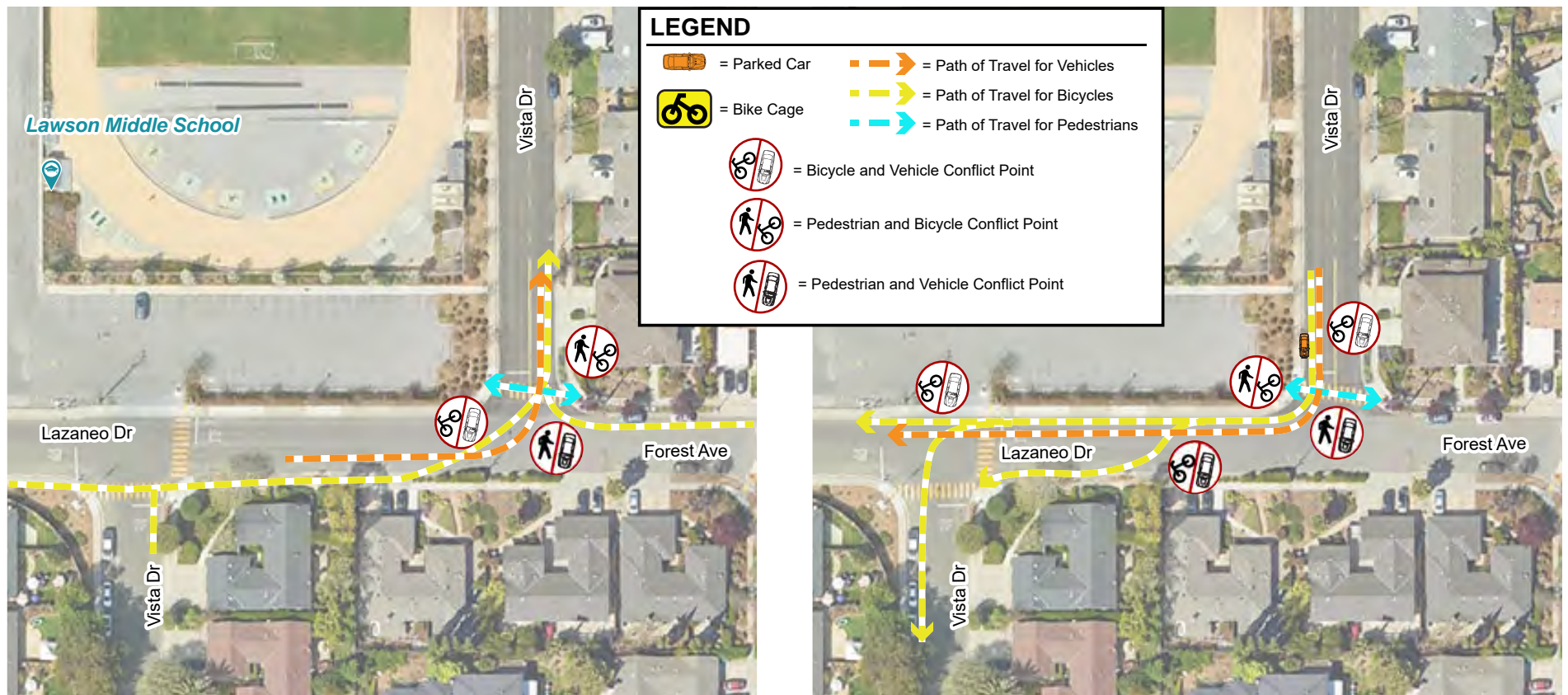


Figure 5  
Section 3 Conflicts

For bicycle/vehicle conflicts, because bicycles are sharing the road with vehicles, Hexagon observed many conflict areas:

- During the morning period, some bikes on eastbound Lazaneo Drive turning left onto Vista Drive were observed to ride on the sidewalk, and take one of the driveway curb cuts to maneuver diagonally across the street and onto Vista Drive. Sometimes, these maneuvers positioned the bikes right in front of an oncoming vehicle.
- During the morning period, bikes that are riding on northbound Vista Drive all need to find a way to cross southbound Vista Drive traffic because the Vista bike cage is located on the west side of Vista Drive. Therefore, many bikes were observed looking for gaps in the southbound traffic to quickly maneuver to the west side of Vista Drive. Bikes were generally crossing Vista Drive midblock at many different locations.
- During the afternoon period, there are many parents who park along southbound Vista Drive to pick up their children. Bikes on southbound Vista Drive sometimes needed to maneuver around vehicles driving into and out of the southbound Vista Drive parking lane.
- During the afternoon period, at the intersection of Vista Drive and Forest Avenue, southbound vehicles are generally turning right onto westbound Forest Avenue. Many vehicles are already positioned at an angle at the southbound stop sign, ready to make a right-turn as soon as they can. However, when there are also vehicles parked along southbound Vista Drive at this location, the right-turning vehicles sometimes leave no room for bicycles. When this happens, bicycles have to stop on southbound Vista Drive before they reach the stop bar.
- During the afternoon period, at the intersection of Vista Drive and Lazaneo Drive, westbound bikes that are turning left onto southbound Vista Drive were generally observed to be riding on the right-hand side of vehicles until the intersection, which is all-way stop-controlled. At the stop bar, these westbound bikes are still positioned on the right-hand side of vehicles. When it's their turn to move, the bikes then maneuver in front of the stopped vehicle to make the left-turn. Vehicles travelling straight through the intersection may not be expecting a bike on the right-hand side to cross in front of it to make a left-turn. If this driver didn't see this bike, the driver would have thought it was their turn to proceed straight through the intersection.

It should be noted that Hexagon also observed some conflict areas on Mariani Drive. However, because Mariani Drive is outside of the study scope, those issues are not explicitly discussed or addressed in this study and report.

## Community Engagement

As part of this study, extensive outreach with the public and stakeholders was conducted. City staff established a project webpage, and conducted outreach efforts to neighbors, parents, students, and other interested members of the public. Hexagon and City staff facilitated three community meetings, a stakeholder meeting, and a Bicycle Pedestrian Commission meeting. A brief discussion of each meeting is provided below, in chronological order.

### Community Meeting #1

Hexagon and City staff hosted the first community meeting on November 10, 2022 at the Lawson school. The purpose of this meeting was to introduce the project to the public. The public provided input on experienced multimodal transportation issues, as well as provided comments on data collection. This meeting informed Hexagon's scope in data collection and field observations.

### Stakeholder Meeting

Hexagon and City staff hosted a stakeholder meeting on February 9, 2023 with representatives from the CUSD and the Lawson school. The purpose of this meeting was to introduce Hexagon’s analysis, present preliminary alternatives, and determine if there is general support from the stakeholders. The preliminary alternatives were (see Appendix B for conceptual drawings):

- Alternative 1: Bike route and sharrow signage and pavement markings
- Alternative 2: Two-way mixed-use trail to replace existing sidewalk
- Alternative 2A: A variant of Alternative 2 with RRFB
- Alternative 3: On-street two-way Class IV bike facility

The stakeholders were generally supportive of the study’s direction and the presented alternatives.

### Community Meeting #2

Hexagon and City staff hosted the second community meeting on March 16, 2023 virtually via Zoom. The purpose of this meeting was to introduce Hexagon’s analysis and present the preliminary alternatives presented during the stakeholder meeting.

The team collected public comments, answered questions, and polled the meeting attendees with a series of in-meeting survey questions to identify their preferences for the alternatives. Based on in-meeting surveys as well as inbound email submissions of preferences after the meeting, the alternatives were narrowed down to three alternatives: Alternative 2, Alternative 2A and Alternative 3 (see Table 2). Alternative 2A was originally created due to the uncertainty over relocation of a light pole. City staff has since confirmed the feasibility of relocating that pole. As a result, Alternative 2A was not carried forward in the study process. Alternative 1 was also not carried forward due to its lack of public support.

**Table 2  
Polled Preferences for Alternatives**

Alternatives	1st Preference	1st or 2nd Preference
Alternative 1	7%	7%
Alternative 2/2A	29%	86%
Alternative 3	50%	57%
No Change Alternative	4%	7%

Notes:

- Preferences obtained from virtual in-meeting polls and email submissions received after the meeting (from people who did not vote during the meetin
- Starting at the BPC Hearing, Alternative 2 is renamed to Alternative A, and Alternative 3 is renamed to Alternative B during public meetings.

### Community Meeting #3

Hexagon and City staff hosted the third community meeting on April 17, 2023 virtually via Zoom. The purpose of this meeting was to provide more details on Alternative 2 and Alternative 3 and gauge public support for the presented alternatives. Similar to the second community meeting, the team collected public comments, answered questions, and polled the audience on a series of questions. These questions were designed to identify the public’s preferred alternative. The same

poll questions were also published on the project website in Google Form format. Since the online poll was anonymous, to avoid double counting, the in-meeting poll results and the online poll results are shown separately in Table 3. As shown, both alternatives received support.

**Table 3  
Polled Support for Alternative 2 and Alternative 3**

	In-Meeting Poll Results		Online Survey Results	
	Alternative 2	Alternative 3	Alternative 2	Alternative 3
Preferred Alternative	37%	63%	7%	87%
Oppose This Alternative	52%	34%	80%	7%

Notes:

- Starting at the BPC Hearing, Alternative 2 is renamed to Alternative A, and Alternative 3 is renamed to Alternative B during public meetings.
- Online Survey Results also allowed participants to choose the "No Change" Alternative.

**Bicycle Pedestrian Commission (BPC) Meeting**

Hexagon and City staff presented an overview of the study as well as the two preferred alternatives to the Cupertino BPC during its May 4, 2023 meeting. The purpose of the meeting was to gather feedback on the presented alternatives and for the BPC to make a recommendation to City Council. The BPC moved to recommend Alternative 3 (presented to the BPC as Alternative B) as the preferred alternative for further development by staff and Council consideration.

**Alternatives Analysis**

As discussed above, Hexagon initially developed four preliminary alternatives based on data collection, field work, and community input. However, since only Alternative 2 and Alternative 3 are studied in detail, the discussion below is provided for only these two alternatives. Conceptual drawings for Alternative 1 and Alternative 2A are provided in Appendix B.

**Alternative 2: Two-way mixed-use trail to replace existing sidewalk**

**Alternative Description**

This alternative proposes to build a Class I two-way mixed-use trail along the west side of Vista Drive from Merritt Drive to Forest Avenue, and along the north side of Forest Avenue between Vista Drive (north portion) and Vista Drive (south portion). The proposed mixed-use trail would generally be 10-foot in width, with a 2-foot shoulder on either side. This design could be maintained south of the Vista bike cage. North of the Vista bike cage until Merritt Drive, because of utility constraints, the trail would require narrowing to 8-foot in width, with a 2-foot shoulder on either side. This reduced width would still require minorly narrowing Vista Drive, but would retain on-street parking.

At the intersection of Vista Drive and Merritt Drive, as well as the intersection of Vista Drive (south portion) and Lazaneo Drive, bicycle crossing enhancements would be provided to facilitate bicycles getting onto and off of the multi-use trail. Wayfinding signage would also be installed per design standards.

Other minor design details are shown on the alternative’s conceptual plans in Appendix B.

**Benefits of this Alternative**

This alternative would allow bikes to be physically separated from vehicles. By using the trail, bikes also have a convenient way to access the Vista bike cage without having to cross vehicle lanes. The bicycle crossing enhancements at the terminals of this trail would also provide additional guidance for bikes to cross the intersection safely and provide additional visibility and awareness of bike presence to vehicles.

It should be noted that this alternative would not require removal of on-street parking.

**Downsides of this Alternative**

South of the Vista bike cage, this alternative would require relocation of various minor utilities and removal of trees. North of the Vista bike cage, while major utility relocation is avoided, this alternative would still require removal of trees, as well as extending the curb into the street. In total, 19 small trees and 9 mature trees would need to be removed. Although it is possible to plant 28 trees in other locations, it is anticipated that these new trees would all be relatively small trees.

**Cost**

Due to the extensive pavement required as well as curb extension, the preliminary cost estimate for this alternative is approximately \$1.5 million.

**Alternative 3: On-street two-way Class IV bike facility****Alternative Description**

This alternative proposes to build a Class IV two-way bike facility along the west side of Vista Drive from Merritt Drive to Forest Avenue, and along the north side of Forest Avenue between Vista Drive (north portion) and Vista Drive (south portion). The proposed two-way bike facility would be 8-foot wide (4 feet in each direction) with a 3-foot buffer with a physical vertical separation that would physically separate the bike facility from the vehicle lanes. This alternative would remove on-street parking on the west side of Vista Drive and north side of Forest Avenue within the limits of the bike facility.

Same as Alternative 2, at the terminal intersections, bicycle crossing enhancements would be provided to facilitate bicycles getting onto and off of the bike facility. Wayfinding signage would also be installed per design standards.

Other minor design details are shown on the alternative's conceptual plans in Appendix B.

**Benefits of this Alternative**

This alternative would allow bikes to be physically separated from both vehicles and pedestrians. By using the bike facility, bikes also have a convenient way to access the Vista bike cage without having to cross vehicle lanes. The bicycle crossing enhancements at the terminals of this bike facility would also provide additional guidance for bikes to cross the intersection safely and provide additional visibility and awareness of bike presence to vehicles.

It should be noted that this alternative does not require removal of trees or relocation of utilities.

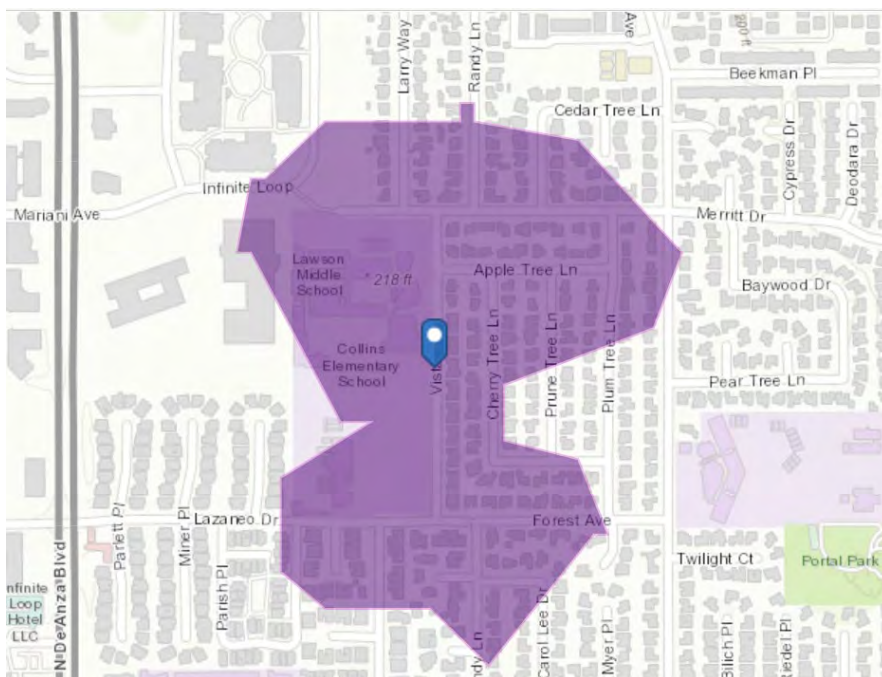
**Downsides of this Alternative**

As noted above, this alternative would require the removal of approximately 59 on-street parking spaces (approximately 51 spaces on the west side of Vista Drive, and 8 spaces on the north side of

Forest Avenue). We observed that on-street parking in front of the school is heavily utilized during school hours, especially immediately prior to school pick up time. We also learned from the school and the neighbors that there are after-school sports activity that occurs 3-4 times a week, ending between 5pm and 6pm. There are also approximately 12 evening school-wide events within a school year. These evening school-wide events as well as some after-school sports events could also attract a considerable amount of on-street parking demand.

Data collection showed that typical on-street parking demand after school hours (with no school events) is relatively low. Within a 5-minute walkshed of the school, there are approximately 500 on-street parking spaces (see Figure 6). While the CUSD parking lot is not technically a public parking lot, CUSD staff has also indicated that they are open to allowing parents parking in their parking lot during after-school events. Therefore, it is anticipated that with this alternative, on-street parking demand related to the school would disperse into the CUSD parking lot as well as neighboring streets. Vista Drive's on-street parking demand would instead be reduced during the school pick-up time because of the reduced on-street parking supply.

**Figure 6**  
**5-Minute Walkshed of the Lawson School**



### **Cost**

This alternative does not require extensive pavement or construction in comparison to Alternative 2. Preliminary cost estimate for this alternative is approximately \$115,000.

## Alternative Comparison

As shown in Table 4 below, both alternatives improve bicycle safety by eliminating bicycle/vehicle conflicts. Both alternatives have their benefits and downsides related to on-street parking, utility relocation, tree removal, and costs.

**Table 4**  
**Summary Comparison of Alternative 2 and Alternative 3**

	Alternative 2	Alternative 3
Addresses Bike/Pedestrian/Vehicle Conflicts	Yes	Yes
Relocate Utilities	Yes	None
Remove Trees	28	None
Remove On-street Parking Spaces	None	59
Cost to Implement	~\$1,500,000	~\$115,000
<u>Notes:</u>		
Starting at the BPC Hearing, Alternative 2 is renamed to Alternative A, and Alternative 3 is renamed to Alternative B during public meetings.		

**Appendix A:  
Data Collection**



**Peak-Hour Count / Occupancy Count - 22OZ12**

Date: 12/1/22 & 12/3/22  
 Counters: Matt, Jo, Kathy, Jana  
 Intersection Name: Vista, Merrit, Apple Tree, Cupertino  
 Weather: Rain

**AUTO CENSUS**  
*Traffic Monitoring and Analysis*  
 7536 Lighthouse Drive  
 Stockton, CA 95219  
 Phone 408-533-3398

Thursday 12/1/22

Time	Dwy 1		Dwy 2		Dwy 3		Dwy 4			Dwy 5	
	Left In	Right Out	Right Out	Right In	Thru	Left In	Right Out	Left In	Right Out	Left In	Right Out
8:00 AM	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	62	66	7	10	7	46	58				
8:30 AM	160	87	24	23	25	91	139				
8:45 AM	163	90	26	23	26	91	140				
9:00 AM	166	91	28	23	26	91	140				

Time	Dwy 1		Dwy 2		Dwy 3		Dwy 4			Dwy 5	
	Left In	Right Out	Right Out	Right In	Thru	Left In	Right Out	Left In	Right Out	Left In	Right Out
2:45 PM	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	34	28	3	9	3	6	0				
3:15 PM	62	57	15	9	9	49	57				
3:30 PM	91	82	33	13	11	57	81				
3:45 PM	97	90	45	13	11	58	82				

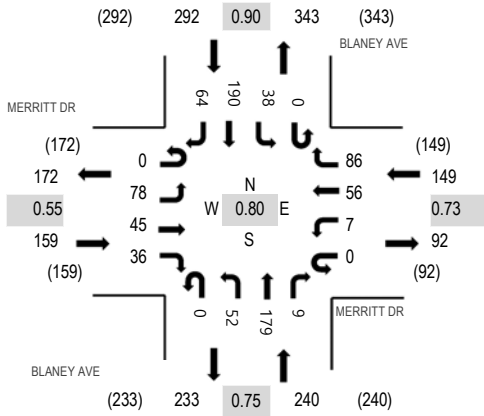
Thursday 12/1/22

Time	Merritt		Vista		Apple Tree	
	North	South	East	West	North	South
7:00 AM	3	4	2	2	7	3
8:00 AM	4	5	4	7	6	3
9:00 AM	4	4	8	19	6	3
10:00 AM	4	6	7	19	5	2
2:00 PM	3	6	4	18	6	2
3:00 PM	6	10	34	41	10	12
4:00 PM	4	5	1	10	4	2
5:00 PM	3	7	1	4	4	3
8:00 PM	4	5	1	3	6	5
9:00 PM	4	5	1	2	6	4
10:00 PM	3	5	1	2	6	4
11:00 PM	3	6	1	2	6	4
12:00 AM	4	6	1	2	6	4

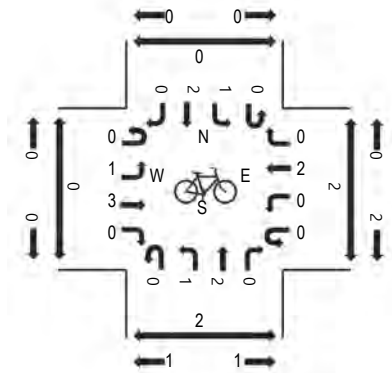
Saturday 12/3/22

Time	Merritt		Vista		Apple Tree	
	North	South	East	West	North	South
7:00 AM	5	5	1	2	6	4
8:00 AM	5	5	1	2	5	4
9:00 AM	5	5	1	2	6	4
10:00 AM	5	5	1	2	6	3
11:00 AM	5	5	1	2	5	4
12:00 PM	4	5	1	2	6	4
1:00 PM	3	5	1	2	6	4
2:00 PM	3	5	1	2	6	3
3:00 PM	3	5	1	2	5	3
4:00 PM	4	6	1	2	6	4
5:00 PM	2	5	1	1	6	3
6:00 PM	3	8	3	4	6	2
7:00 PM	4	8	2	4	5	2
8:00 PM	4	7	3	3	4	2
9:00 PM	3	5	4	3	5	3
10:00 PM	4	5	3	2	6	2
11:00 PM	4	5	3	2	6	3
12:00 AM	4	6	2	2	6	3

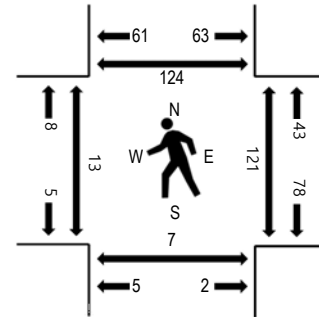
### Peak Hour - Motorized Vehicles



### Peak Hour - Bicycles



### Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

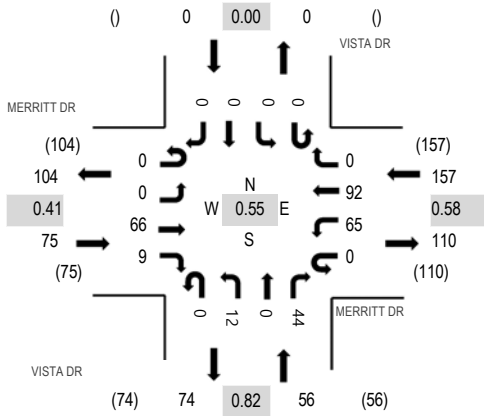
### Traffic Counts - Motorized Vehicles

Interval Start Time	MERRITT DR Eastbound				MERRITT DR Westbound				BLANEY AVE Northbound				BLANEY AVE Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
8:00 AM	0	10	12	9	0	1	23	14	0	25	24	2	0	14	45	19	198	840	0	2	2	28
8:15 AM	0	19	31	22	0	4	29	18	0	15	38	4	0	8	53	20	261		3	41	4	39
8:30 AM	0	33	2	3	0	1	3	26	0	10	67	3	0	8	43	18	217		7	70	1	49
8:45 AM	0	16	0	2	0	1	1	28	0	2	50	0	0	8	49	7	164		3	8	0	8

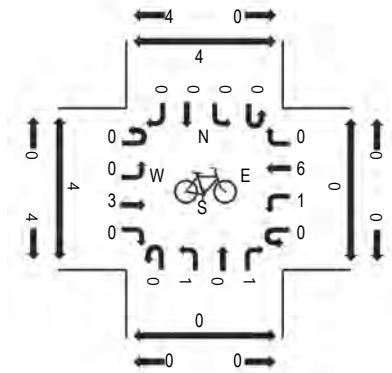
### Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total	
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lights	0	78	44	36	0	7	56	86	0	50	176	9	0	38	190	62	832	
Mediums	0	0	1	0	0	0	0	0	0	2	3	0	0	0	0	2	8	
Total	0	78	45	36	0	7	56	86	0	52	179	9	0	38	190	64	840	

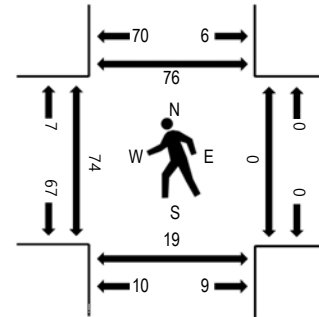
### Peak Hour - Motorized Vehicles



### Peak Hour - Bicycles



### Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

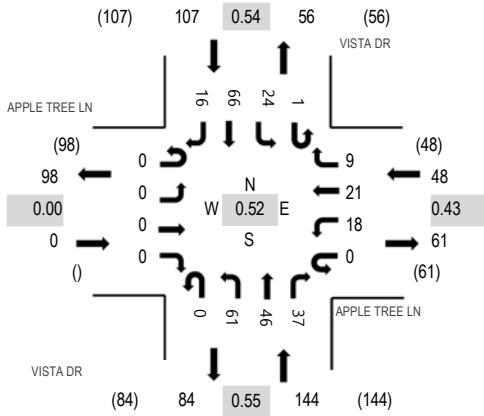
### Traffic Counts - Motorized Vehicles

Interval Start Time	MERRITT DR Eastbound				MERRITT DR Westbound				VISTA DR Northbound				VISTA DR Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
8:00 AM	0	0	20	1	0	16	43	0	0	5	0	8	0	0	0	0	93	288	18	0	3	17
8:15 AM	0	0	42	4	0	23	45	0	0	4	0	13	0	0	0	0	131		50	0	5	49
8:30 AM	0	0	3	2	0	16	3	0	0	3	0	12	0	0	0	0	39		1	0	6	3
8:45 AM	0	0	1	2	0	10	1	0	0	0	0	11	0	0	0	0	25		5	0	5	7

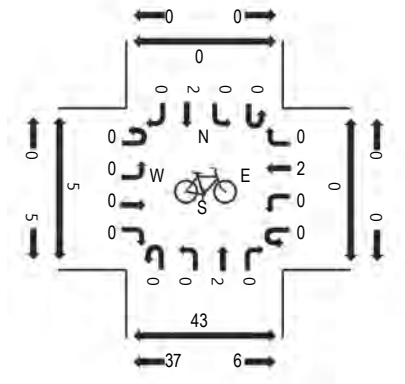
### Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total					
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right						
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Lights	0	0	66	9	0	61	91	0	0	12	0	43	0	0	0	0	282					
Mediums	0	0	0	0	0	4	1	0	0	0	0	1	0	0	0	0	6					
Total	0	0	66	9	0	65	92	0	0	12	0	44	0	0	0	0	288					

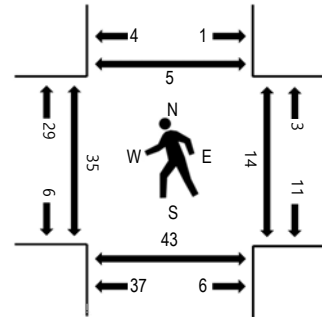
### Peak Hour - Motorized Vehicles



### Peak Hour - Bicycles



### Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

### Traffic Counts - Motorized Vehicles

Interval Start Time	APPLE TREE LN Eastbound				APPLE TREE LN Westbound				VISTA DR Northbound				VISTA DR Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
8:00 AM	0	0	0	0	0	4	5	2	0	22	11	10	0	8	8	6	76	299	10	3	14	2
8:15 AM	0	0	0	0	0	7	16	5	0	38	11	16	1	14	25	10	143		18	3	29	3
8:30 AM	0	0	0	0	0	5	0	1	0	1	14	9	0	2	20	0	52		2	4	0	0
8:45 AM	0	0	0	0	0	2	0	1	0	0	10	2	0	0	13	0	28		5	4	0	0

### Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total	
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lights	0	0	0	0	0	18	21	9	0	61	45	37	1	21	61	16	290	
Mediums	0	0	0	0	0	0	0	0	0	0	1	0	0	3	5	0	9	
Total	0	0	0	0	0	18	21	9	0	61	46	37	1	24	66	16	299	



(303) 216-2439  
www.alltrafficdata.net

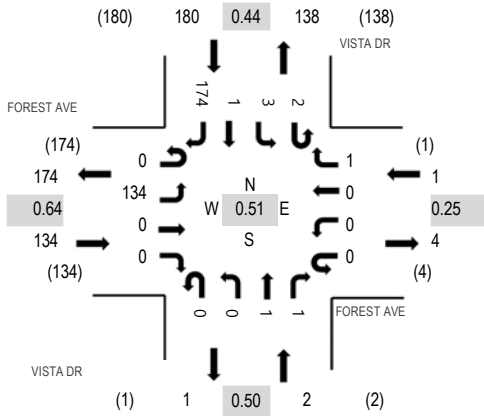
**Location:** 4 VISTA DR & FOREST AVE AM

**Date:** Thursday, November 17, 2022

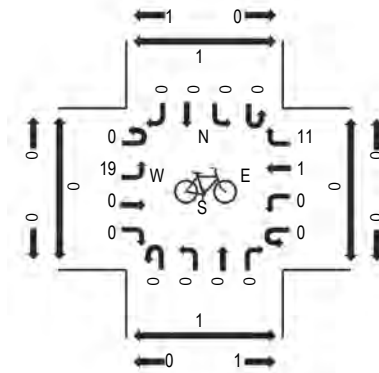
**Peak Hour:** 08:00 AM - 09:00 AM

**Peak 15-Minutes:** 08:15 AM - 08:30 AM

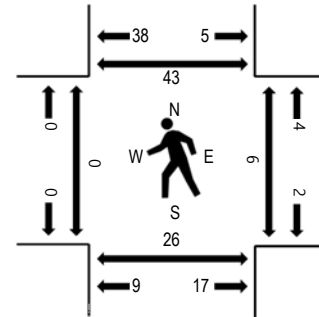
### Peak Hour - Motorized Vehicles



### Peak Hour - Bicycles



### Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

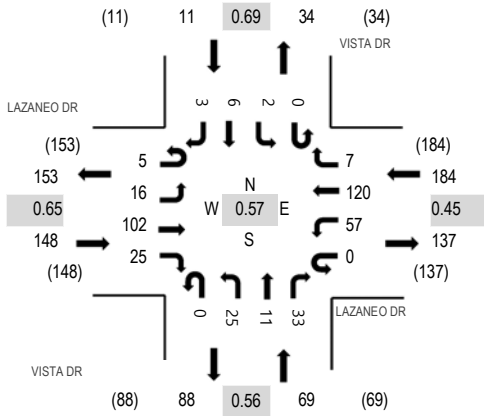
### Traffic Counts - Motorized Vehicles

Interval Start Time	FOREST AVE Eastbound				FOREST AVE Westbound				VISTA DR Northbound				VISTA DR Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
8:00 AM	0	52	0	0	0	0	0	1	0	0	0	1	2	2	1	35	94	317	0	2	2	22
8:15 AM	0	51	0	0	0	0	0	0	0	0	1	0	0	1	0	101	154	0	2	10	14	
8:30 AM	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	24	44	0	0	10	6	
8:45 AM	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	14	25	0	2	4	1	

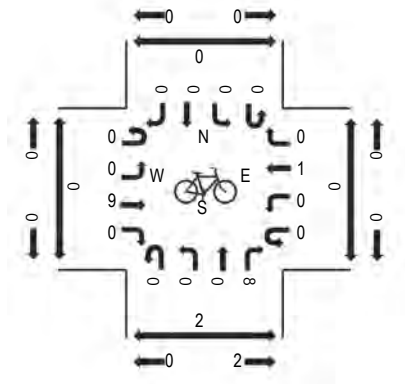
### Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2
Lights	0	133	0	0	0	0	0	1	0	0	1	1	0	3	1	171	311
Mediums	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	4
Total	0	134	0	0	0	0	0	1	0	0	1	1	2	3	1	174	317

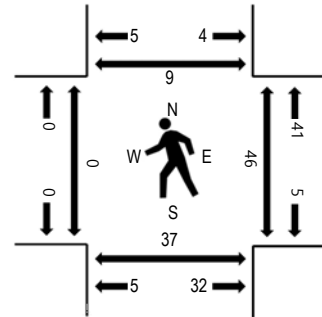
### Peak Hour - Motorized Vehicles



### Peak Hour - Bicycles



### Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

### Traffic Counts - Motorized Vehicles

Interval Start Time	LAZANEO DR Eastbound				LAZANEO DR Westbound				VISTA DR Northbound				VISTA DR Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
8:00 AM	1	3	45	8	0	11	25	2	0	7	1	9	0	0	2	0	114	412	0	25	11	2
8:15 AM	2	3	29	9	0	35	67	0	0	8	2	21	0	0	2	2	180		0	19	21	4
8:30 AM	1	1	19	2	0	9	16	2	0	5	4	3	0	1	0	1	64		0	1	3	3
8:45 AM	1	9	9	6	0	2	12	3	0	5	4	0	0	1	2	0	54		0	1	2	0

### Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Lights	0	5	101	25	0	56	119	3	0	25	5	33	0	1	2	2	377
Mediums	5	11	1	0	0	1	1	3	0	0	6	0	0	1	4	1	34
Total	5	16	102	25	0	57	120	7	0	25	11	33	0	2	6	3	412

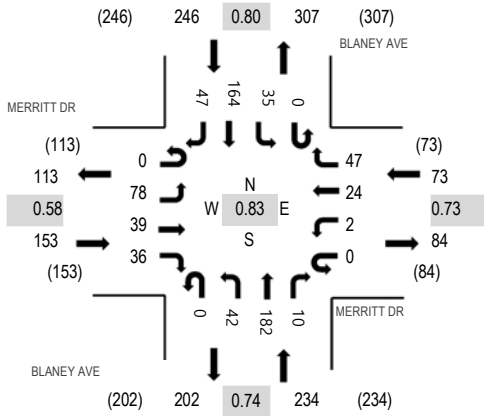
**Location:** 1 BLANEY AVE & MERRITT DR PM

**Date:** Thursday, November 17, 2022

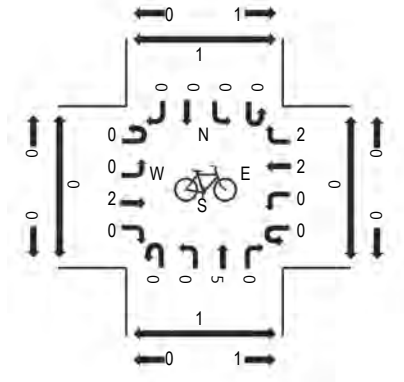
**Peak Hour:** 02:45 PM - 03:45 PM

**Peak 15-Minutes:** 02:45 PM - 03:00 PM

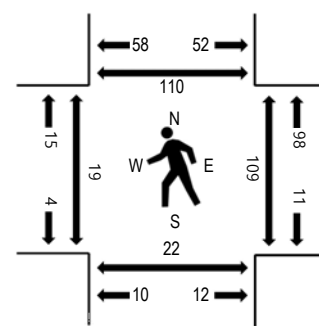
### Peak Hour - Motorized Vehicles



### Peak Hour - Bicycles



### Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

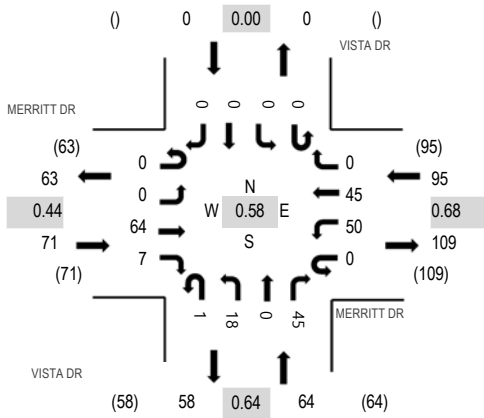
### Traffic Counts - Motorized Vehicles

Interval Start Time	MERRITT DR Eastbound				MERRITT DR Westbound				BLANEY AVE Northbound				BLANEY AVE Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
2:45 PM	0	31	3	5	0	0	5	12	0	12	61	6	0	9	40	28	212	706	7	68	2	43
3:00 PM	0	28	22	16	0	1	14	10	0	19	33	3	0	10	35	9	200		5	18	14	39
3:15 PM	0	13	11	11	0	1	2	11	0	10	50	0	0	7	36	7	159		5	22	0	25
3:30 PM	0	6	3	4	0	0	3	14	0	1	38	1	0	9	53	3	135		2	1	6	3

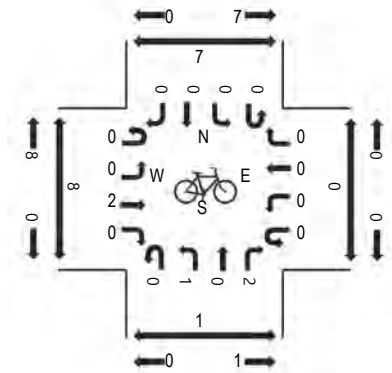
### Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total					
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right						
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lights	0	75	39	36	0	2	24	47	0	40	181	8	0	34	162	44	692					
Mediums	0	3	0	0	0	0	0	0	0	2	1	2	0	1	2	3	14					
Total	0	78	39	36	0	2	24	47	0	42	182	10	0	35	164	47	706					

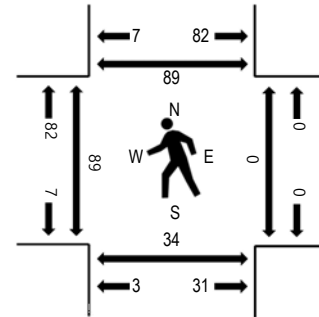
### Peak Hour - Motorized Vehicles



### Peak Hour - Bicycles



### Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

### Traffic Counts - Motorized Vehicles

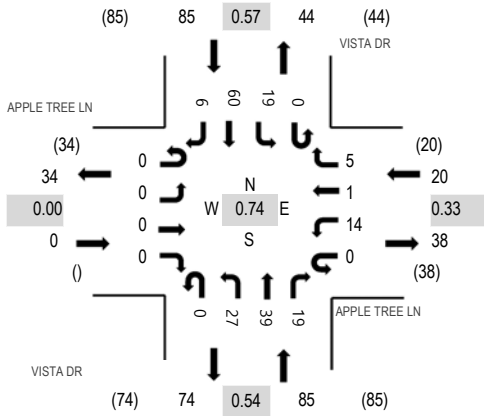
Interval Start Time	MERRITT DR Eastbound				MERRITT DR Westbound				VISTA DR Northbound				VISTA DR Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
2:45 PM	0	0	7	2	0	15	20	0	0	8	0	10	0	0	0	0	62	230	4	0	5	3
3:00 PM	0	0	37	3	0	17	17	0	0	7	0	18	0	0	0	0	99		74	0	21	73
3:15 PM	0	0	16	2	0	11	6	0	1	1	0	11	0	0	0	0	48		8	0	3	7
3:30 PM	0	0	4	0	0	7	2	0	0	2	0	6	0	0	0	0	21		3	0	5	6

### Peak Rolling Hour Flow Rates

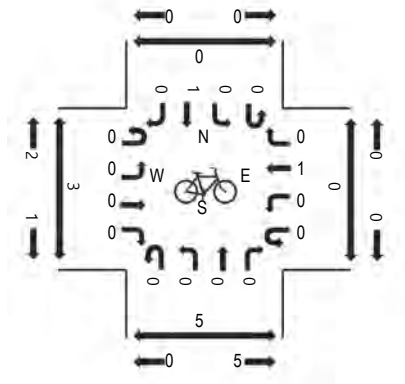
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total					
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right						
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Lights	0	0	64	7	0	47	42	0	1	18	0	45	0	0	0	0	224					
Mediums	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	6					
Total	0	0	64	7	0	50	45	0	1	18	0	45	0	0	0	0	230					



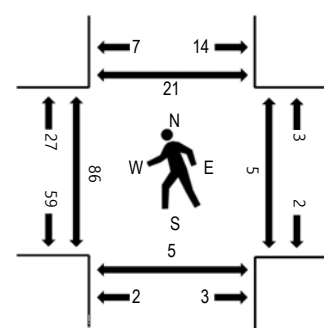
### Peak Hour - Motorized Vehicles



### Peak Hour - Bicycles



### Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

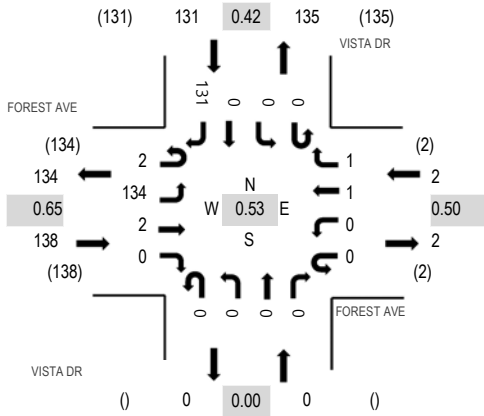
### Traffic Counts - Motorized Vehicles

Interval Start Time	APPLE TREE LN Eastbound				APPLE TREE LN Westbound				VISTA DR Northbound				VISTA DR Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
2:45 PM	0	0	0	0	0	3	1	1	0	12	19	8	0	4	15	1	64	190	6	2	3	4
3:00 PM	0	0	0	0	0	11	0	4	0	6	0	2	0	12	22	3	60		73	0	0	10
3:15 PM	0	0	0	0	0	0	0	0	0	8	12	3	0	3	17	1	44		7	1	2	4
3:30 PM	0	0	0	0	0	0	0	0	0	1	8	6	0	0	6	1	22		0	2	0	3

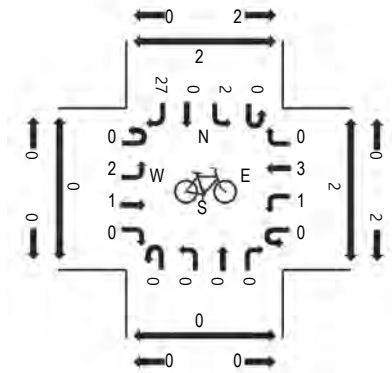
### Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total					
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right						
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lights	0	0	0	0	0	14	1	5	0	27	39	19	0	19	60	6	190					
Mediums	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
Total	0	0	0	0	0	14	1	5	0	27	39	19	0	19	60	6	190					

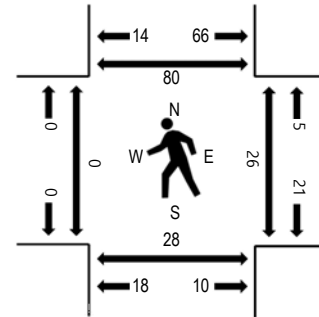
### Peak Hour - Motorized Vehicles



### Peak Hour - Bicycles



### Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

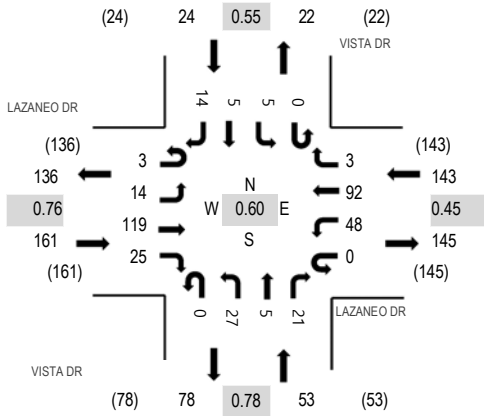
### Traffic Counts - Motorized Vehicles

Interval Start Time	FOREST AVE Eastbound				FOREST AVE Westbound				VISTA DR Northbound				VISTA DR Southbound				Total	Rolling Hour	Pedestrian Crossings				
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North	
2:45 PM	1	52	0	0	0	0	1	0	0	0	0	0	0	0	0	0	7	61	271	0	4	8	7
3:00 PM	1	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	127		0	17	2	65
3:15 PM	0	19	1	0	0	0	0	1	0	0	0	0	0	0	0	0	35	56		0	0	7	4
3:30 PM	0	15	1	0	0	0	0	0	0	0	0	0	0	0	0	0	11	27		0	5	11	4

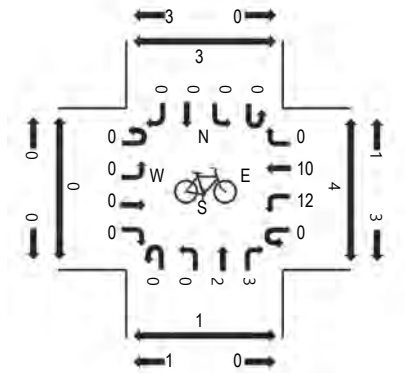
### Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total					
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right						
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lights	2	134	2	0	0	0	1	1	0	0	0	0	0	0	0	0	131	271				
Mediums	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	134	2	0	0	0	1	1	0	0	0	0	0	0	0	0	131	271				

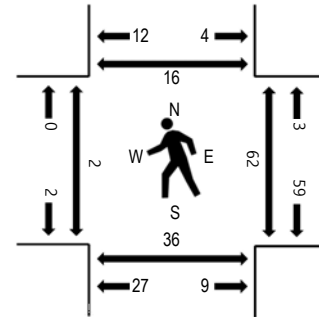
### Peak Hour - Motorized Vehicles



### Peak Hour - Bicycles



### Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

### Traffic Counts - Motorized Vehicles

Interval Start Time	LAZANEO DR Eastbound				LAZANEO DR Westbound				VISTA DR Northbound				VISTA DR Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
2:45 PM	1	2	40	5	0	7	7	0	0	4	3	10	0	1	0	3	83	381	0	1	5	2
3:00 PM	2	2	45	4	0	26	53	1	0	8	1	7	0	2	2	7	160		0	47	14	6
3:15 PM	0	0	19	7	0	10	26	0	0	7	0	3	0	0	0	0	72		1	14	10	7
3:30 PM	0	10	15	9	0	5	6	2	0	8	1	1	0	2	3	4	66		1	0	7	1

### Peak Rolling Hour Flow Rates

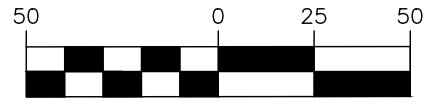
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Lights	3	6	119	25	0	47	92	1	0	26	5	21	0	4	5	14	368
Mediums	0	8	0	0	0	1	0	2	0	0	0	0	0	1	0	0	12
Total	3	14	119	25	0	48	92	3	0	27	5	21	0	5	5	14	381

**Appendix B:  
Conceptual Plans for Alternatives 1, 2, 2A, and 3**

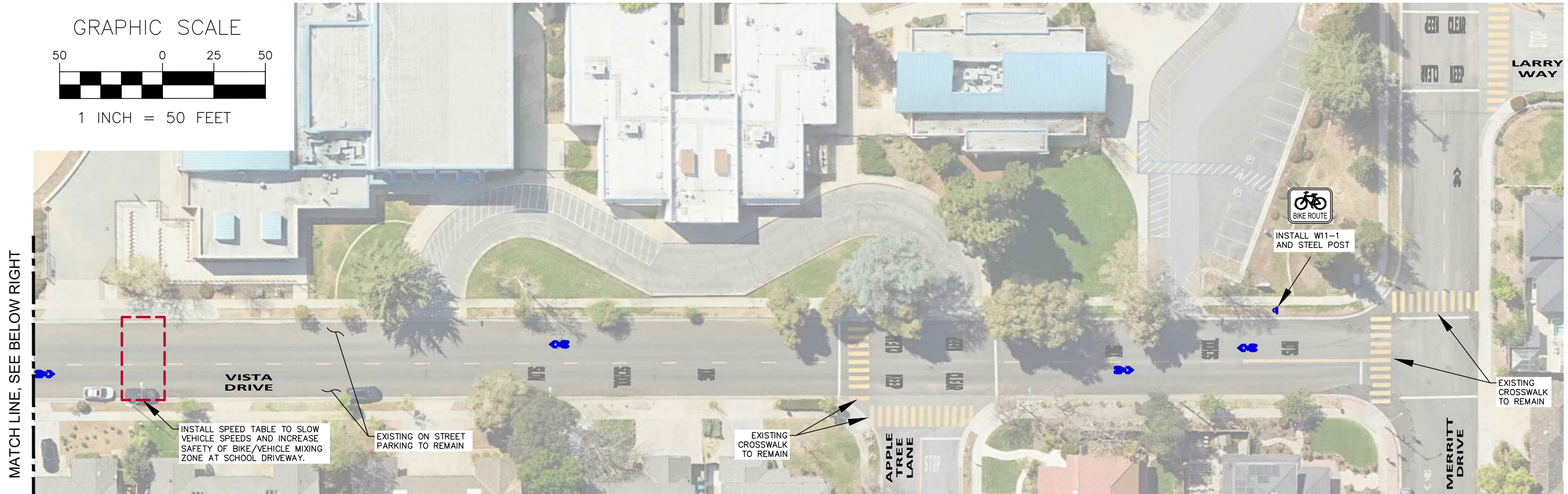
**OUTDATED. PLAN DROPPED FROM FURTHER REFINEMENT AFTER THE SECOND COMMUNITY MEETING ON MARCH 16, 2023.**



GRAPHIC SCALE



1 INCH = 50 FEET



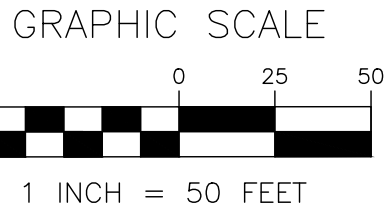
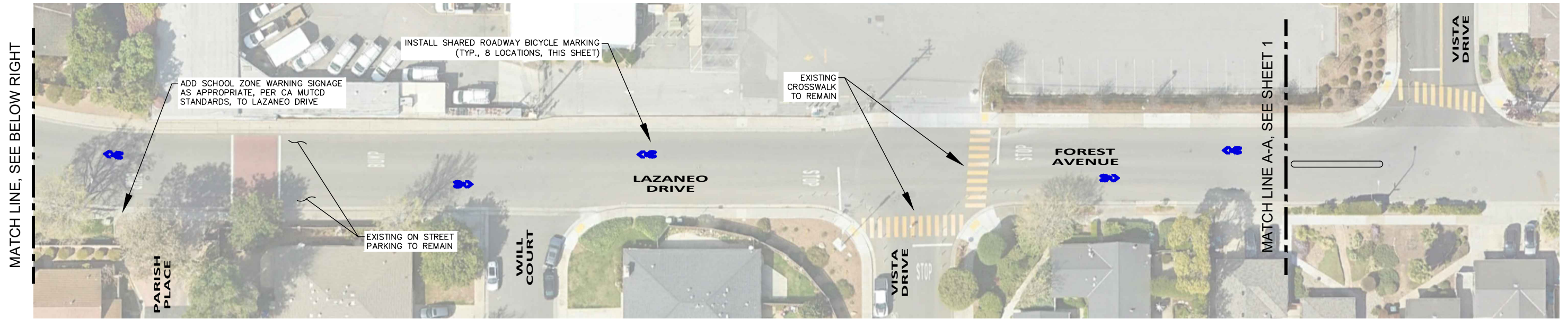
**ALTERNATIVE 1 - BIKE ROUTE AND SHARROW SIGNAGE AND PAVEMENT MARKINGS**

**CONCEPTUAL PLAN**  
JANUARY 2023  
NOT FOR CONSTRUCTION

MATCH LINE A-A, SEE SHEET 2



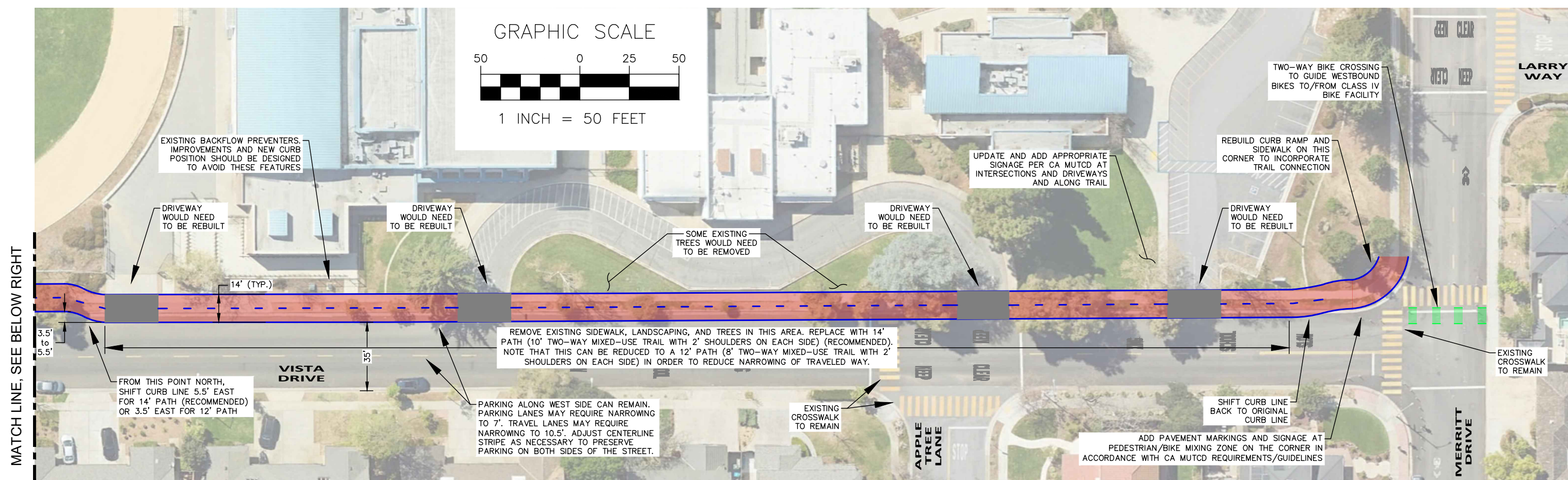
OUTDATED. PLAN DROPPED FROM FURTHER REFINEMENT AFTER THE SECOND COMMUNITY MEETING ON MARCH 16, 2023.



ALTERNATIVE 1 - BIKE ROUTE AND SHARROW SIGNAGE AND PAVEMENT MARKINGS

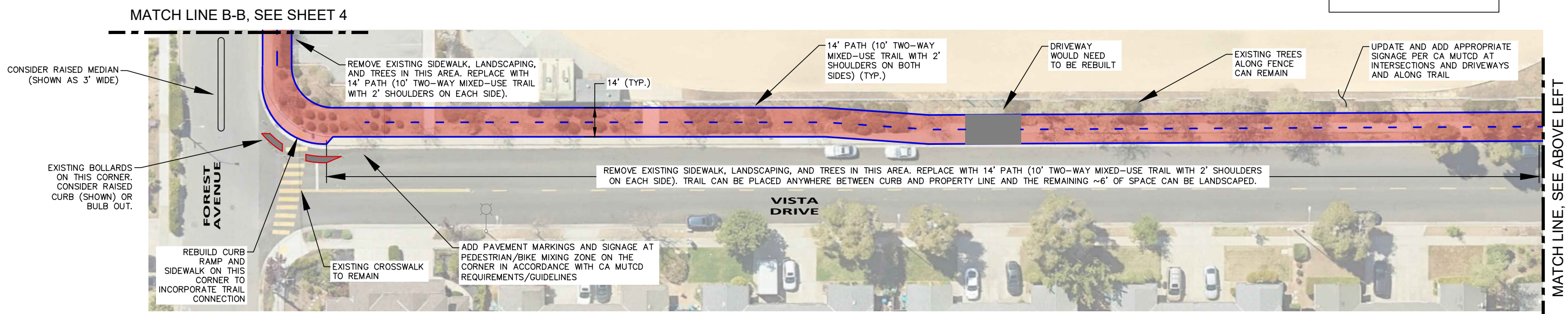
CONCEPTUAL PLAN  
JANUARY 2023  
NOT FOR CONSTRUCTION

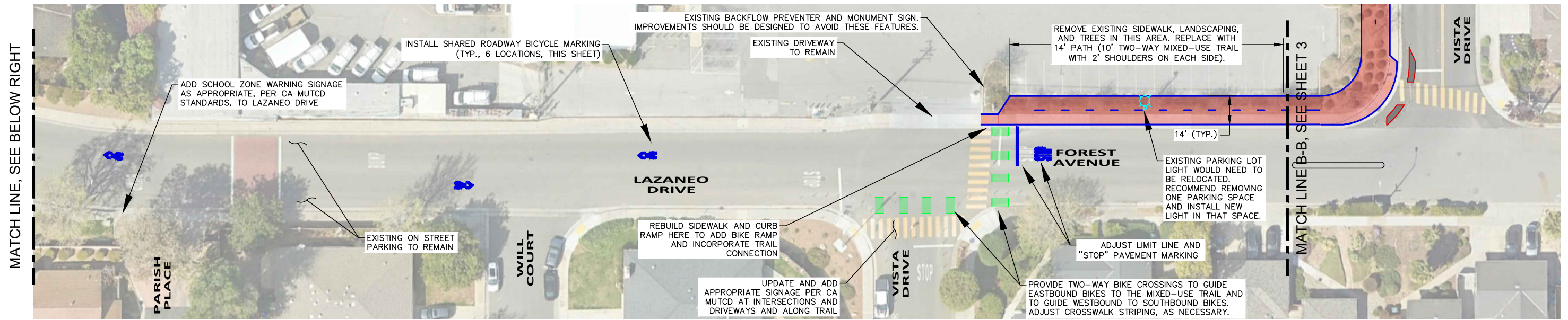




**ALTERNATIVE 2 - TWO-WAY MIXED-USE TRAIL TO REPLACE EXISTING SIDEWALK**

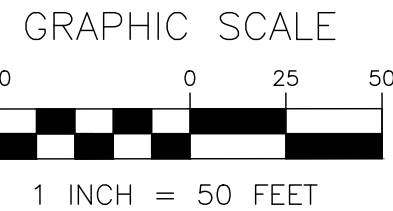
**CONCEPTUAL PLAN**  
APRIL 2023  
NOT FOR CONSTRUCTION





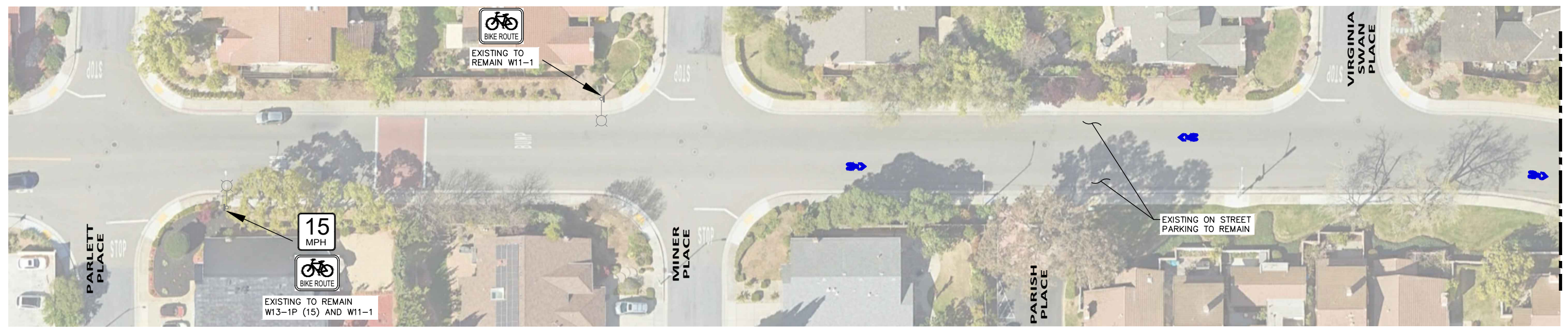
MATCH LINE, SEE BELOW RIGHT

MATCH LINE B-B, SEE SHEET 3



**ALTERNATIVE 2 - TWO-WAY MIXED-USE TRAIL TO REPLACE EXISTING SIDEWALK**

**CONCEPTUAL PLAN**  
APRIL 2023  
NOT FOR CONSTRUCTION

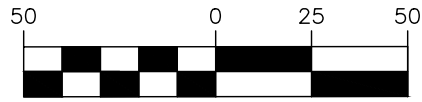


MATCH LINE, SEE ABOVE LEFT

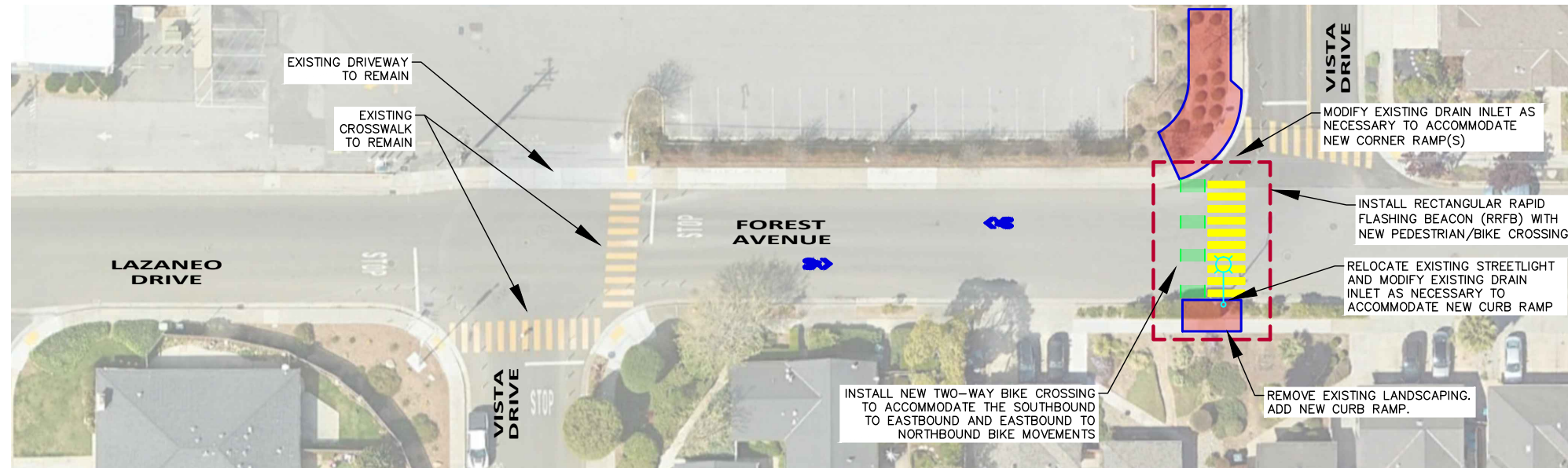


OUTDATED. PLAN DROPPED FROM FURTHER REFINEMENT AFTER THE SECOND COMMUNITY MEETING ON MARCH 16, 2023.

GRAPHIC SCALE

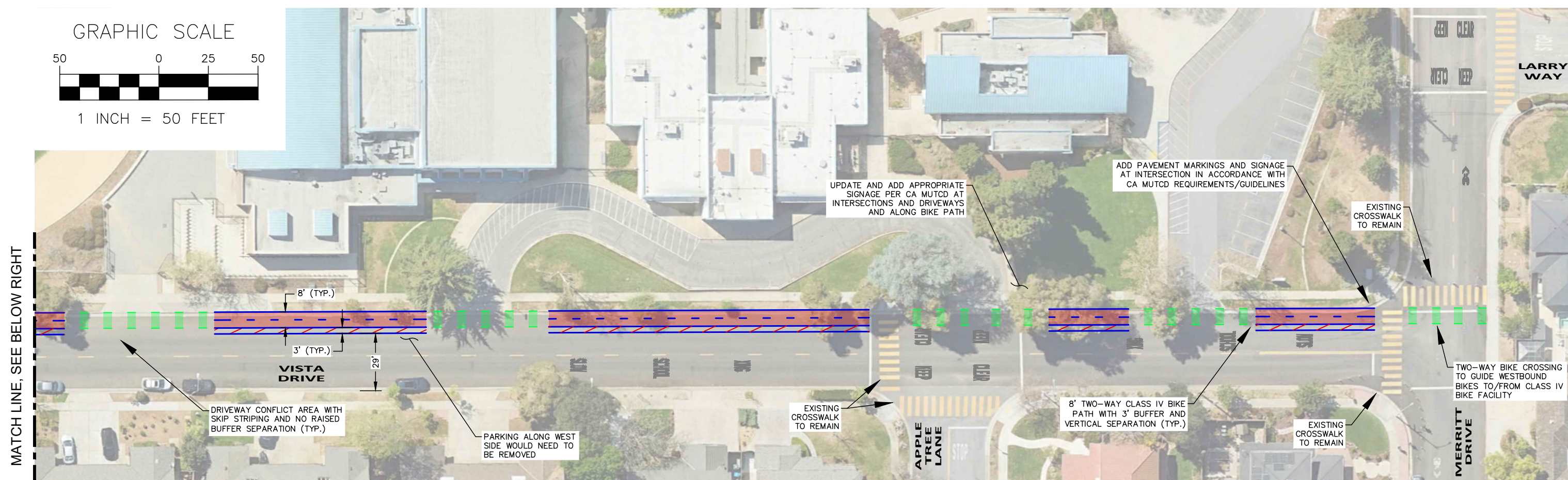
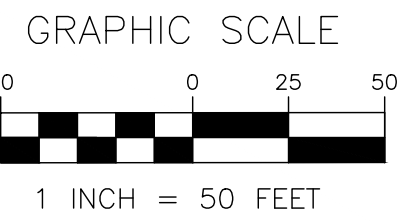


1 INCH = 50 FEET



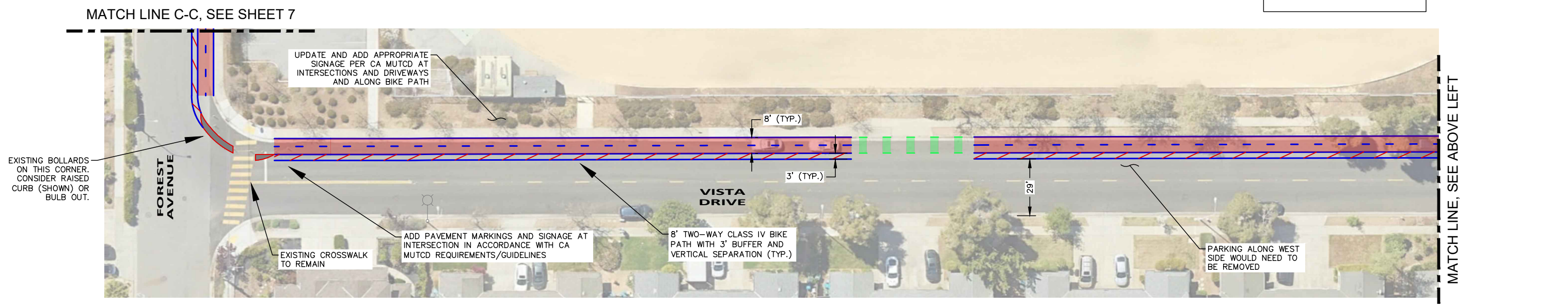
ALTERNATIVE 2A - TWO-WAY MIXED-USE TRAIL TO REPLACE EXISTING SIDEWALK - ALTERNATIVE TREATMENT AT FOREST AVENUE AND VISTA DRIVE

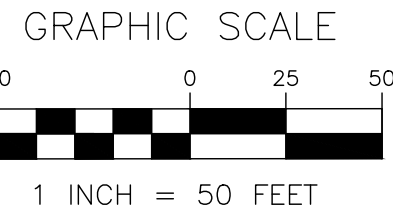
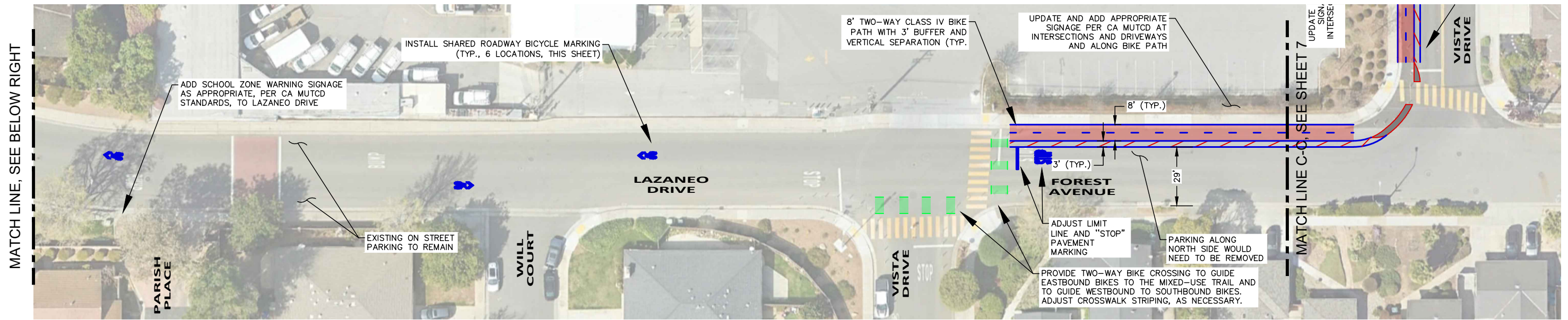
CONCEPTUAL PLAN  
JANUARY 2023  
NOT FOR CONSTRUCTION



**ALTERNATIVE 3 - ON-STREET TWO-WAY CLASS IV BIKE FACILITY**

**CONCEPTUAL PLAN**  
 APRIL 2023  
 NOT FOR CONSTRUCTION





ALTERNATIVE 3 - ON-STREET TWO-WAY CLASS IV BIKE FACILITY

CONCEPTUAL PLAN  
APRIL 2023  
NOT FOR CONSTRUCTION

