



OLD AUBURN ROAD COMPLETE STREETS PLAN

Prepared for:
The City of Citrus Heights

February 28, 2020

Old Auburn Road

Complete Street Plan

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Prepared for:

City of Citrus Heights

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Made possible by a California Department of Transportation Community-Based Transportation Planning Grant

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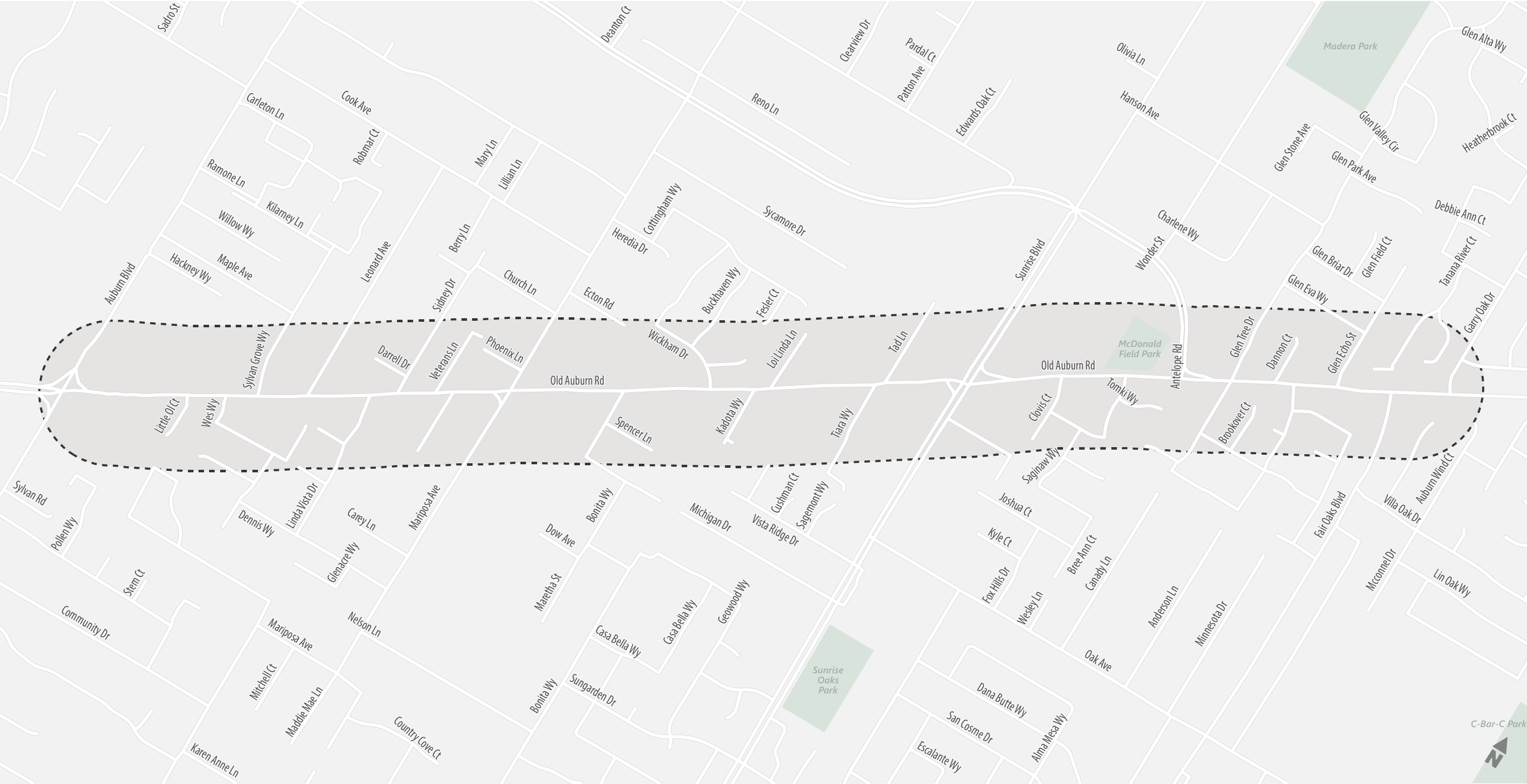
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Introduction

The Old Auburn Road Complete Streets Plan (the Plan) addresses the challenging transportation conditions including excessive speeds, skewed intersections, inadequate bicycle, pedestrian and transit infrastructure, and a history of collisions along nearly 2-miles of Old Auburn Road between Sylvan Road and Garry Oak Drive. Between 2013 and 2017, there were 163 reported collisions along this corridor, several of which involved bicyclists and pedestrians, including three fatalities and three severe injuries. The extents of the Plan are shown in Figure 1.

The city routinely receives concerns from residents regarding safety along Old Auburn Road. Specifically, concerns are primarily regarding vehicle speeds, lack of pedestrian infrastructure, and safe crossings. This creates a barrier between neighborhoods north and south of the project corridor. Portions of this segment of Old Auburn Road are lacking bicycle and pedestrian infrastructure leaving disconnected, intimidating and incomplete facilities, forcing users to ride or walk on the pavement adjacent to high volume, high speed vehicles (Old Auburn carries between 18,000 and 27,000 vehicles per day, with an 85th percentile speed of 39 mph).

Although the city has converted other roadways into Complete Streets, many residents indicate they are intimidated by roadways dividing the community, including Old Auburn Road. Fifty-nine percent of residents surveyed during the development of the city's Pedestrian Master Plan indicated they are willing to use active transportation. However, improvements including separation from roadways, safe crossings and connectivity to key destinations are necessary. This plan is the first step toward implementation of a Complete Street on Old Auburn Road.




 Study Area

Figure 1
Old Auburn Road Complete Street Plan Extents

Objectives

OVERALL PROJECT OBJECTIVES: The Plan will be a critical first step in creating a safer Old Auburn Road. It will enable the City of Citrus Heights to align with the following federal and state goals:

- 1) **Improve Public Safety:** The Plan will evaluate and recommend the best countermeasures to calm traffic and enhance safety without interfering with emergency response.
- 2) **Create Livable, Healthy Communities, & Social Equity:** The Plan will be context sensitive and help the city systematically improve conditions for multi-modal transportation in a disadvantaged community that is nearly built-out. The Plan will complement the city's previous planning efforts including the General Plan, Bikeway Master Plan and Pedestrian Master Plan.
- 3) **Support Economic Vitality:** The Plan will enable Smart and Sustainable economic growth by identifying necessary investments in the aging, existing transportation system. A multi-faceted and robust economy in Citrus Heights will create "ladders of opportunity" for greater prosperity for its residents. This cannot occur without planning for the future of transportation.

Related Planning Documents

City Planning Documents

The city is committed to implementing Complete Streets. In 2011, the city adopted General Plan Policy Goal 29: "Plan, design, construct, and manage a Complete Streets transportation network that accommodates the needs of all mobility types, users and ability levels." Within the context of the General Plan, the City Council decided that the segments of Old Auburn Road that are currently two lanes will remain as two lanes (rather than widen to four lanes) to retain its neighborhood character. While the city has made great strides in reaching this goal, the Old Auburn Road Complete Streets Plan is the first step to seeing this reality on Old Auburn Road.

Pedestrian Master Plan & Bikeway Master Plan

Old Auburn Road has been identified as an important corridor for all modes of transportation even prior to the city's incorporation in 1997. Current community concerns include speeding, lack of safe pedestrian crossings, lack of sidewalks, lack of lighting, high number of collisions, high volume of cut-through traffic and overall safety concerns. The irregular, non-perpendicular configuration crossing several arterial roadways presents visibility, truck/large vehicle turning, and bicycle/pedestrian crossing challenges. In 2015, the city adopted a Pedestrian Master Plan (PMP) which identified this corridor as a Priority 1 (most important) corridor in need of a Focus Area Plan. The Old Auburn Road Complete Streets Plan is the next step to further develop the concept identified in the PMP. The corridor is also identified in the city's Bikeway Master Plan with proposed Class II (on-street) bikeways along the corridor, connecting to the city's existing Class I (separated) bikeway on the east side of the Plan area. The connection to the Class I trail on the north side of Old Auburn Road presents unique challenges that requires careful planning.

General Plan & Greenhouse Gas Reduction Plan

This Plan stems from the city's 2011 General Plan and Greenhouse Gas Reduction Plan which were adopted, in part, to comply with the State's GHG reduction targets and state goals. The Plan specifically implements several city policies supportive of the States targets:

Goal 29: Plan, design, construct, and manage a Complete Streets transportation network that accommodates the needs of all mobility types, users and ability levels.

Policy 29.4: Support safe, complete and well-connected neighborhood street, bicycle, and pedestrian access and connections that balance circulation needs with the neighborhood context.

Measure 3-1.B: Work with SACOG's Community Design and Caltrans' Safe Routes to School programs to identify grant opportunities to improve public transit, bicycle and pedestrian networks to serve the community center, libraries, schools, recreational areas and other public gathering spaces.

Measure 3-5.A: Maximize pedestrian and bicycle use through high-quality design, enhanced infrastructure, and enforcing bike and pedestrian travel rights.

Regional Planning Documents

Old Auburn Road is an important corridor serving Citrus Heights, Roseville, Granite Bay and beyond. This project will take an existing roadway suited primarily to cars and transform it into a Complete Street that serves all users equally. This plan considers existing and future traffic volumes and will enhance mobility and safety for all users. This approach is consistent and supportive of the Sacramento Area Council of Governments (SACOG) Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS), which has several policies related to Complete Streets.



Existing Conditions

Old Auburn Road runs northeast / southwest, parallel to Interstate 80 (I-80), serving Citrus Heights, Roseville, and Granite Bay. At the Sylvan Road / Auburn Boulevard intersection, the roadway continues southwest as Auburn Boulevard to Sacramento County. The study segment of Old Auburn Road, between Sylvan Road / Auburn Boulevard and Garry Oak Drive, serves mostly residential land uses but connects to commercial corridors like Auburn Boulevard and Sunrise Boulevard.

Currently, this segment of Old Auburn Road has a posted speed limit of 35 miles per hour. The segment is between two and four travel lanes, and there are scattered sidewalks and Class II bike lanes on the north and south side of the roadway. As the roadway shifts between the number of lanes and presence of bike and pedestrian facilities, the segments develop their own unique feel and characteristics. These segments are broken up as shown in Table 1.

Table 1: Old Auburn Road Characteristics

Segment	Characteristics
Old Auburn Road between Sylvan Road/Auburn Boulevard and 400 feet east of Sylvan Road/Auburn Boulevard	<ul style="list-style-type: none"> • Four lanes • Sidewalks on both sides of the street with a landscape buffer on the south side • Class II bike lanes • Median divider in center of the street • Commercial land uses
Old Auburn Road between 400 feet east of Sylvan Road/Auburn Boulevard and Mariposa Avenue	<ul style="list-style-type: none"> • Three lanes, including a two-way left-turn (TWLT) median • Sidewalks on southern side of the street only • Class II bike lanes • Residential land uses
Old Auburn Road between Mariposa Avenue and Tiara Way	<ul style="list-style-type: none"> • Between two and four lanes, some segments with a TWLT median • On north side, sidewalk is present between 350-feet east of Wickham Drive and Tiara Way. On south side, sidewalk is present between Kadota Way and 130-feet east of Kadota Way as well as 150-feet east of Tiara Way and Tiara Way. • Class II bike lanes • Residential land uses
Old Auburn Road between Tiara Way and Antelope Road	<ul style="list-style-type: none"> • Three lanes including TWLT lane with extra lanes/capacity by Sunrise Boulevard • Sidewalks on both sides of the street • Class II bike lanes; protected Class IV bike lane with striped buffer and bollards between Tiara Way and Sunrise Boulevard on the south side of the street • Mix of land uses including residential, religious/school, public park, and commercial
Old Auburn Road between Antelope Road and Fair Oaks Boulevard	<ul style="list-style-type: none"> • Five lanes including TWLT lane • Sidewalks on both sides of streets • Class II bike lanes • Mostly residential land uses

Source: Fehr & Peers, 2020.

Driver Experience



This section describes the experience driving on Old Auburn Road. As mentioned previously, Old Auburn Road varies between two and five lanes along the 1.75-mile corridor. The posted speed limit is 35 miles per hour.

Traffic counts were conducted January 23, 2019 and included intersection turning movements, heavy vehicles, cyclists, and pedestrian crossings. During the time of counts, weather conditions were dry, schools were in session, and no unusual traffic events occurred. The traffic counts showed that the segment of Old Auburn Road between Tiara Way and Loi Linda Lane carries 18,100 vehicles per day. The segment between Antelope Road and Fair Oaks Boulevard carries 26,800 vehicles per day.

Driver Origin/Destination Patterns (Big Data)

As regional freeways get busier during commute hours, cell phone navigation apps like Waze and GoogleMaps are more likely to recommend “cut-through” routes that run parallel to freeways. While Old Auburn Road provides access to Antelope Road that connects to I-80, it also runs parallel to I-80 between Placer County and Sacramento County. To investigate the amount of cut-through trips that travel through the study segment of Old Auburn Road, origin-destination (OD) data of trips traveling through this segment were gathered during the months of March, April, September, and October in 2018 from StreetLight Data, Inc. StreetLight data categorizes the origins and destinations of trips using the corridor by user-defined zones using the GPS of cell phones traveling along the corridor. This data represents a sampling size of 55 percent of overall trips on Old Auburn Road just west of Fair Oaks Boulevard.

The zones of the origins and destinations of trips on Old Auburn Road indicate whether the trip is associated with a neighborhood adjacent to Old Auburn Road, with Citrus Heights, or with an area outside of Citrus Heights.

This data showed the following regarding trips on Old Auburn Road during commute hours:

AM Peak Period (6:00 to 10:00 AM)

- Sixty-two percent of trips start within Citrus Heights, and 26 percent of trips start east of Citrus Heights in Placer County or Folsom.
- Twenty-five percent of the trips using Old Auburn Road ended east of Citrus Heights, and 29 percent of trips ended to the west of Citrus Heights in Sacramento County.
- Up to 25 percent of trips that pass through the west end of Old Auburn Road start and end outside of the City of Citrus Heights.

PM Peak Hour (3:00 to 7:00 PM)

- Fifty-three percent of the trips using Old Auburn Road started in Citrus Heights, and 60 percent of trips end in Citrus Heights.
- Thirty percent of the trips start east of Citrus Heights and 17 percent start west of Citrus Heights in Sacramento and Elk Grove.
- Up to 21 percent of trips that pass through the west end of Old Auburn Road start and end outside the City of Citrus Heights.

The percentages of neighborhood trips, trips within Citrus Heights, trips that begin or end in Citrus Heights, and trips that begin and end outside of Citrus Heights are summarized for checkpoints along the corridor in Figure 2.



The proposed complete streets concepts have the potential to change the future travel behavior along the corridor. By creating low stress, continuous bikeways and sidewalks, shorter trips within the neighborhood and commuting trips within Citrus Heights could be accomplished by people walking and biking. Additional trips within the city could be replaced by transit if connected pedestrian infrastructure to the fixed route buses was provided or if use of the SmaRT ride service was increased. Finally, the lane reduction at the east end of the project may eliminate excess capacity that is drawing regional commuters via navigation applications. Those trips should be rerouted to faster larger arterials and freeways. It is important to note that as the project is implemented, it will be critical that the city monitors potential impacts to neighborhood streets that may see an increase in traffic or require traffic calming features.

Peak Hour Level of Service Analysis

This section analyzes peak hour traffic conditions at the following study intersections under existing conditions:

1. Old Auburn Road/Sylvan Road/Auburn Boulevard
2. Old Auburn Road/Mariposa Avenue
3. Old Auburn Road/Bonita Way
4. Old Auburn Road/Tiara Way
5. Old Auburn Road/Sunrise Boulevard
6. Old Auburn Road/Antelope Road
7. Old Auburn Road/Fair Oaks Boulevard

Delay and level of service (LOS) are the primary measure of operational performance. LOS is a qualitative measure of traffic flow from the perspective of motorists and is an indication of comfort while driving. Empirical LOS criteria and methods of calculation have been documented in the *Highway Capacity Manual, 6th Edition*. Descriptions of level of service are shown in Table 2.

Table 2: Descriptions of Level of Service

Level of Service	Description	Signalized Intersection Delay (s)	Unsignalized Intersection Delay (s)
A	Progression is extremely favorable, and most vehicles arrive during the green phase if signalized. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	< 10.0	< 10.0
B	Progression is good, cycle lengths are short, or both. More vehicle stop than with LOS A, causing higher levels of average delay.	> 10.0 to 20.0	> 10.0 to 15.0
C	Higher congestion may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level, though many still pass through the intersection without stopping.	> 20.0 to 35.0	> 15.0 to 25.0
D	The influence of congestion becomes more noticeable. Longer delays may results from some combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	> 35.0 to 55.0	> 25.0 to 35.0
E	This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	> 55.0 to 80.0	> 35.0 to 50.0
F	This level is considered unacceptable with oversaturation, which is when arrival flow rates exceed the capacity of the intersection. This level may also occur at high V/C ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be contributing favors to such delay levels.	> 80.0	> 50.0

Source: *Highway Capacity Manual, 6th Edition* (Transportation Research Board, 2016).

The methodologies outlined in the *Highway Capacity Manual, 6th Edition* were implemented using SimTraffic 10 simulation software to replicate traffic conditions during the AM and PM peak hour. SimTraffic 10 accounts for how intersections interact with one another, queue spillback, and pedestrian crossings, among other factors. The results reported for the SimTraffic analysis represent averages of ten runs with outliers omitted, per standard practice.

Intersection turning movements were collected on January 23, 2019. The AM peak hour occurred 7:15 to 8:15 AM, and the PM peak hour occurred between 5:00 and 6:00 PM. The peak hour factor (PHF), a measure of intensity of the peak 15-minutes, was measured at 0.94 and 0.96 during the AM and PM peak hours, respectively. The observed heavy vehicle percentage was one percent during the AM peak hour and two percent during the PM peak hour. The AM and PM peak hour level of service is shown in Table 3. Appendix C includes detailed calculations of these results.

Table 3: Peak Hour Level of Service - Existing Conditions

Intersection	Control ¹	LOS ² / Delay ³ (s)	
		AM Peak Hour	PM Peak Hour
Old Auburn Road / Sylvan Road / Auburn Boulevard	Signal	C / 34	D / 43
Old Auburn Road / Mariposa Avenue	Signal	B / 19	C / 24
Old Auburn Road / Bonita Way	SSSC	A (E) / 4 (44)	A (F) / 6 (73)
Old Auburn Road / Tiara Way	SSSC	A (C) / 7 (21)	A (D) / 7 (31)
Old Auburn Road / Sunrise Boulevard	Signal	D / 47	E / 64
Old Auburn Road / Antelope Road	Signal	B / 13	B / 19
Old Auburn Road / Fair Oaks Boulevard ⁴	Signal	C / 25	D / 41

Notes:

1. "Signal" represents a traffic signal-controlled intersection. "SSSC" represents a side-street stop-controlled intersection.
2. "LOS" represents level of service, calculated based on methodologies contained in the *Highway Capacity Manual, 6th Edition* (Transportation Research Board, 2016).
3. Average control delay for intersections is the weighted average for all movements. For SSSC intersections, the delay and LOS for the highest movement delay is shown in parentheses.
4. The lane configurations for this analysis at this intersection represent 2018 conditions, so the northbound approach includes one left-turn lane and one shared left/right-turn lane. Since then, modifications have been made to restripe the approach to one left-turn lane and one right-turn lane.

Source: Fehr & Peers, 2020.

Policy 29.2 of the *Citrus Heights General Plan* (City of Citrus Heights, 2011), indicates that the city will strive for LOS E or better conditions on city roadways and intersections during peak hours. As shown in Table 3, all intersections operate acceptably during the peak hours. However, it is important to note that the *General Plan* makes an exemption for the LOS E policy for Old Auburn Road between Sylvan Road and Fair Oaks Boulevard, stating that no road widening to provide additional capacity will be permitted.

Currently, vehicles traveling on Old Auburn Road experience the most congestion at the Sylvan Road / Auburn Boulevard, Sunrise Boulevard, Antelope Road, and Fair Oaks Boulevard intersections. Since vehicles can access I-80 using Antelope Road, a popular route involves traveling between Antelope Road and Fair Oaks Boulevard via Old Auburn Road. Therefore, the northbound left-turn and eastbound right-turn at Old Auburn / Fair Oaks Boulevard, as well as the westbound right-turn and southbound left-turn at Old Auburn / Antelope Road are heavy movements during both the AM and PM peak hours. Additionally, during the PM peak hour, there is congestion on Sunrise Boulevard traveling northbound and southbound as well as traveling eastbound on Old Auburn Road through Sylvan Road/Auburn Boulevard, as the roadway drops down to two lanes directly east of that intersection.

Travel Time Analysis

The table below shows the existing travel time estimates during the most heavily traveled portion of the project during commute hours along Antelope Road, Old Auburn Road, and Fair Oaks Boulevard. Technical calculations are in Appendix C.

Table 4: Peak Hour Travel Times - Existing Conditions

Route	AM Peak Hour Travel Time	PM Peak Hour Travel Time
Southbound on Antelope Road to southbound on Fair Oaks Boulevard	1 minute 29 seconds	1 minute 53 seconds
Westbound on Old Auburn Road between Garry Oak Road and Sunrise Boulevard	3 minutes 14 seconds	3 minutes 31 seconds
Northbound on Fair Oaks Boulevard to northbound on Antelope Road ¹	1 minute 50 seconds	1 minute 42 seconds

Notes:

1. The lane configurations for this analysis at this intersection represent 2018 conditions, so the northbound approach includes one left-turn lane and one shared left/right-turn lane. Since then, modifications have been made to restripe the approach to one left-turn lane and one right-turn lane.

Source: Fehr & Peers, 2020.

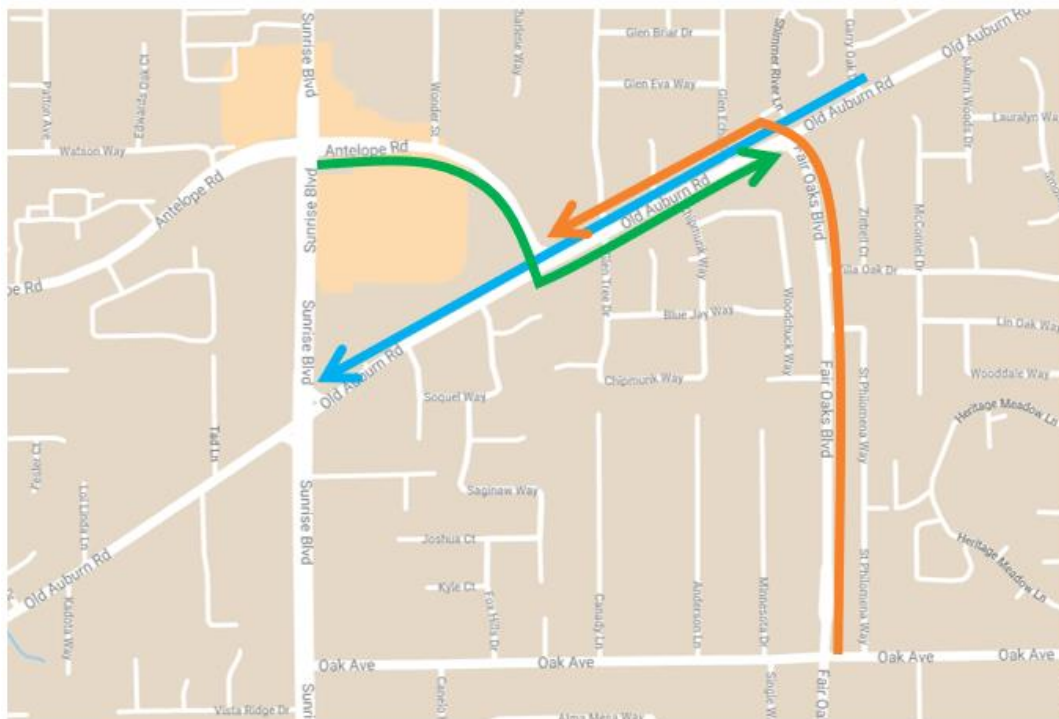


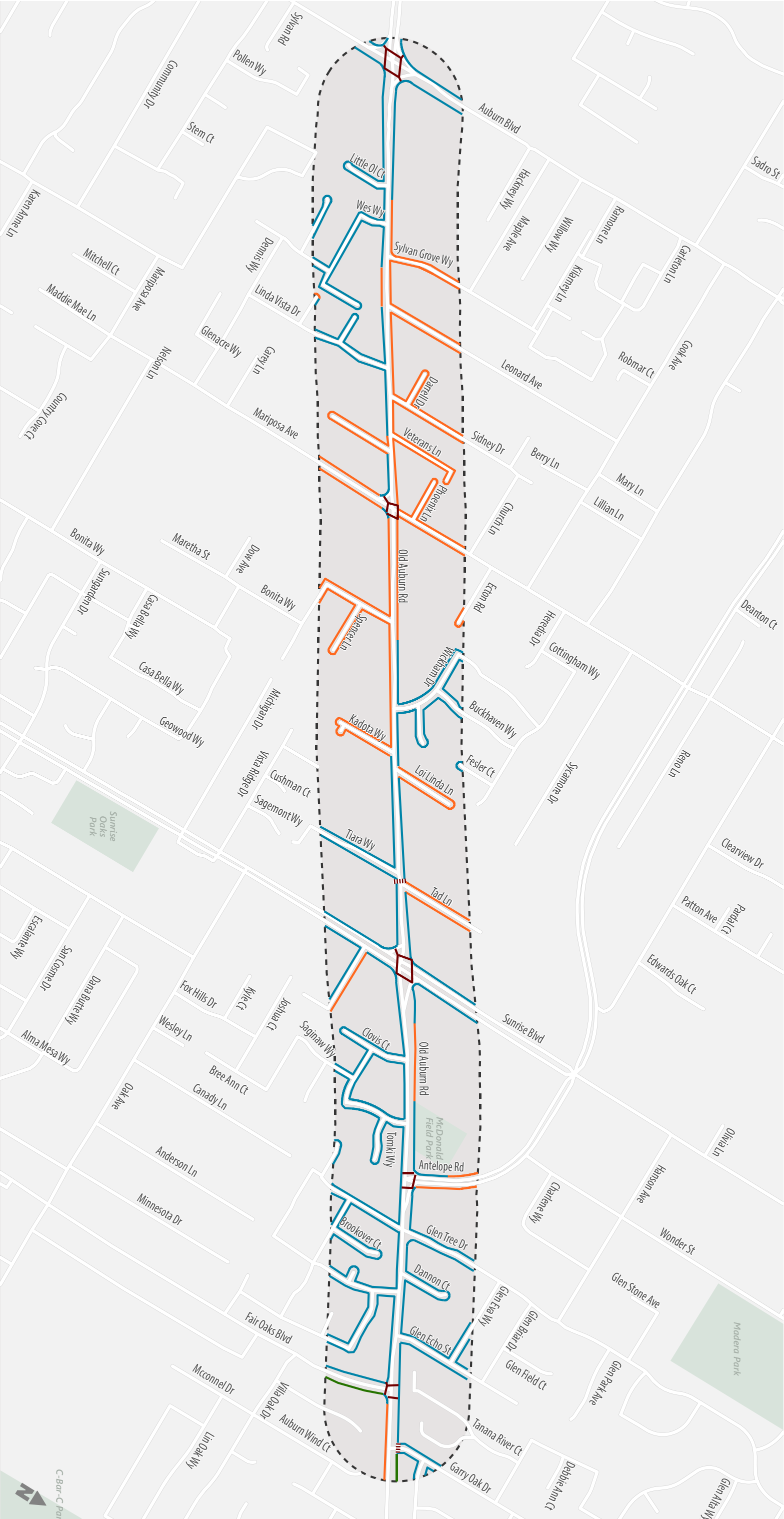
Figure 3: Travel Time Routes

Pedestrian Experience



The pedestrian environment varies dramatically along the length of the corridor. There are typically sidewalks on both sides of Old Auburn Road near the major intersections, but it is not continuous between. The largest sidewalk gaps along the study corridor on both the north and south side of the street are typically found on the western half of the corridor. Even though sidewalks exist along the eastern part of the corridor, they are typically narrow and lack separation from high speed traffic. Figure 4 shows the existing pedestrian facilities on Old Auburn Road.





- Striped Crosswalk
- Sidewalk
- Separated Multi-Use Path
- Crosswalk
- No Sidewalk
- Study Area

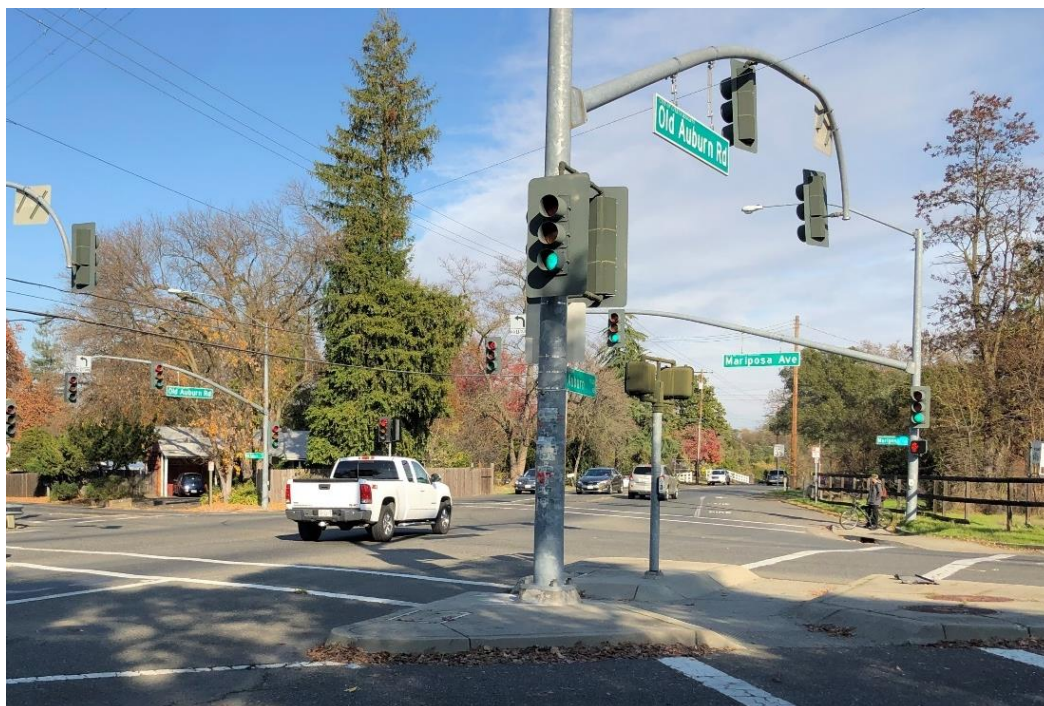
Figure 4
Old Auburn Road Existing Pedestrian Facilities

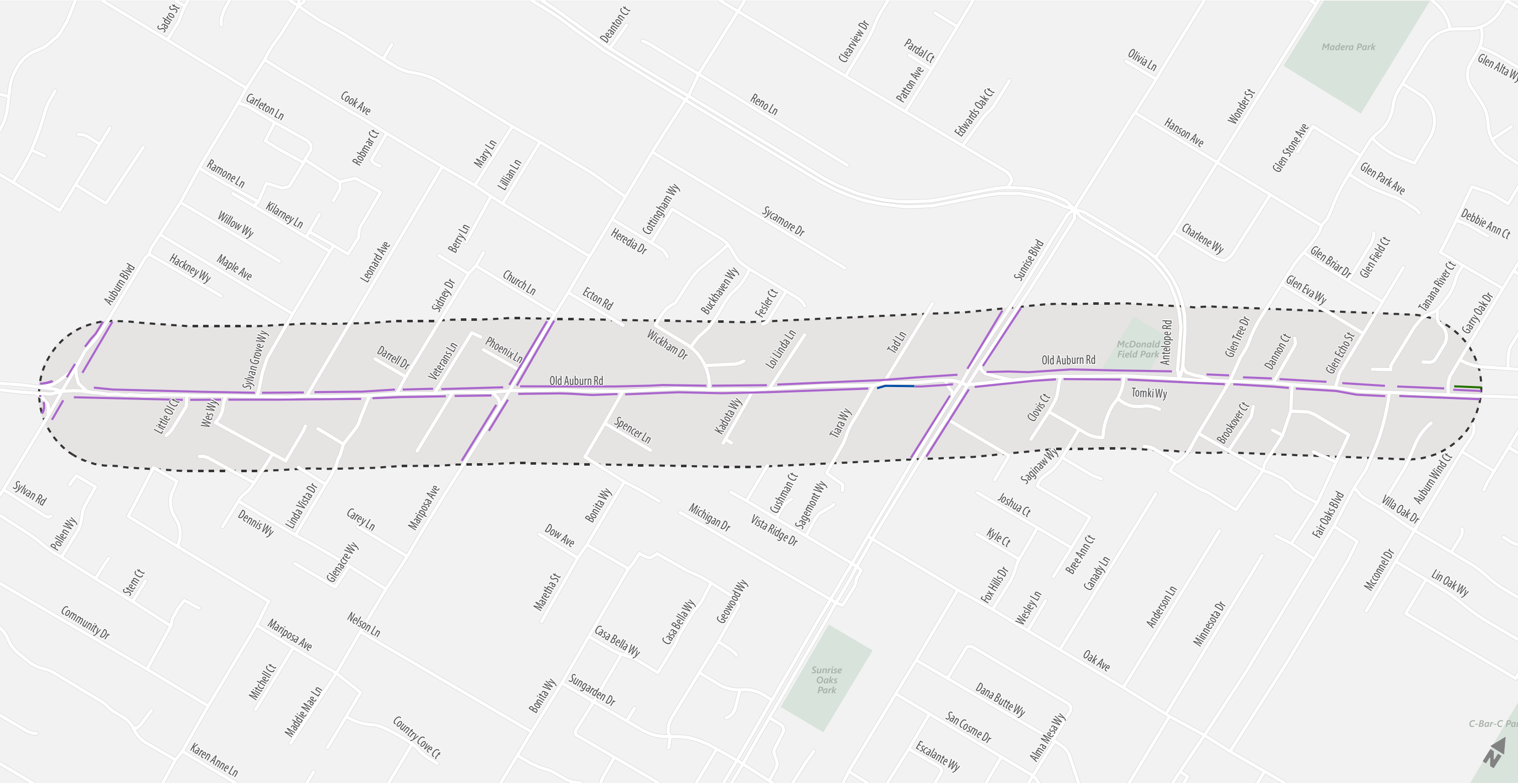
Bicyclist Experience



There are Class II bike lanes on both the north and south sides of the study segment. Heading east, the corridor connects to a raised two-way multi-use path at Garry Oak Drive. Between Tiara Way and Sunrise Boulevard, the bike lane is protected (Class IV) with a striped and vertical (delineators) buffer.

Figure 5 shows the existing bike facilities on Old Auburn Road.





- Class II Bike Lane
- Class IV Separated Bikeway
- Separated Multi-Use Path
- Study Area

Figure 5
Old Auburn Road Existing Bicycle Facilities

StreetScore+ Analysis

The bicycle StreetScore+ is an index that measures the comfort level of cycling on a roadway segment. The tool, developed by Fehr & Peers, is based on the Level of Traffic Stress (LTS) methodology that describes the user tolerance along a given bikeway including the NACTO *Urban Bikeway Guide, 2nd Edition*. Factors that affect the bicycle StreetScore+ of a segment include the number of traffic lanes, presence of a bike lane and/or physical barrier, width of bike lanes, etc.

Bicycle riders vary in experience, skill, ability, and confidence. As such, they rely on the bikeway system to cater to their specific needs and abilities. Some cyclists are more comfortable riding in traffic and value bikeways and routes that are direct and limit unnecessary delay. People with limited bicycling confidence and lower or developing skills may desire more separation of traffic to feel comfortable enough to ride.

Recent research has correlated these different bicycle riders with the level of “traffic stress” they are willing to experience while cycling. Bicycle StreetScore+ index criteria span from 1 to 4, with 1 being the least stressful and 4 being the most stressful.

- Streetscore+ 1: Most children and elderly riders can tolerate this level of stress and feel safe and comfortable.
- Streetscore+ 2: This is the highest level of stress that the mainstream adult population will tolerate while still feeling safe.
- Streetscore+ 3: Bicyclists who are considered “enthused and confident” but still prefer having their own dedicated space for riding will tolerate this level of stress while bicycling.
- Streetscore+ 4: For bicyclists, this is tolerated only by those characterized as “strong and fearless” which comprises a small percentage of the population. These roadways have high speed limits, multiple travel lanes, limited or non-existent bike lanes and signage, and large distances to cross at intersections.

Table 5 shows the bicycle StreetScore+ for the study segments of Old Auburn Road. The majority of the corridor has Class II bike lanes which have a bicycle StreetScore+ of 3. The eastbound direction between Old Tiara Way and Sunrise Boulevard has a protected bike lane with striping and vertical delineators, and this segment has a StreetScore+ of 2. East of Garry Oak Drive, there is a separated, multi-use path, so the segment has a StreetScore+ of 1.

The findings below echo sentiments from previous city efforts including the Bicycle Master Plan update and Pedestrian Master Plan, and indicate that vehicle speeds, volumes, etc. create a high stress environment for bicyclists. This has resulted in a strong community desire for the implementation of low stress bikeways with physical separation.

Table 5: Bicycle StreetScore+ - Existing Conditions

Segment	Direction	Bicycle StreetScore+
Old Auburn Road between Auburn Blvd/Sylvan Rd and Wes Wy	EB	3
	WB	3
Old Auburn Road between Wes Wy and Mariposa Av	EB	3
	WB	3
Old Auburn Road between Mariposa Av and Wickham Dr	EB	3
	WB	3
Old Auburn Road between Wickham Dr and Kadota Wy	EB	3
	WB	3
Old Auburn Road between Kadota Wy and Loi Linda Ln	EB	3
	WB	3
Old Auburn Road between Loi Linda Lane and Tiara Way	EB	3
	WB	3
Old Auburn Road between Tiara Way and Sunrise Boulevard	EB	2
	WB	3
Old Auburn Road between Sunrise Boulevard and Soquel Way W	EB	3
	WB	3
Old Auburn Road between Soquel Way W and Soquel Way E	EB	3
	WB	3
Old Auburn Road between Soquel Way E and Antelope Road	EB	3
	WB	3
Old Auburn Road between Antelope Road and Fair Oaks Boulevard	EB	3
	WB	3
Old Auburn Road between Fair Oaks Blvd and Garry Oak Rd	EB	3
	WB	3
Old Auburn Road between Garry Oak Dr and Auburn Woods Dr	EB	1
	WB	1

Source: Fehr & Peers, 2020.

Access to Transit



Sacramento Regional Transit (SacRT) provides transit service to the City of Citrus Heights and surrounding region. There are no fixed route lines on the study corridor. However, Route 21 runs on Sunrise Boulevard through the Old Auburn Road/Sunrise Boulevard intersection, and Route 25 runs on Auburn Boulevard through the Old Auburn Road/Sylvan Road/Auburn Boulevard intersection. Both routes run on half-hour headways on weekdays between 5:30 AM and 10:00 PM.

The City of Citrus Heights is also served by SacRT's SmARt Ride, an on-demand, microtransit service that operates similar to ride-share. Customers can request a ride that will pick-up and drop-off within service boundaries, using an app on their smartphones.



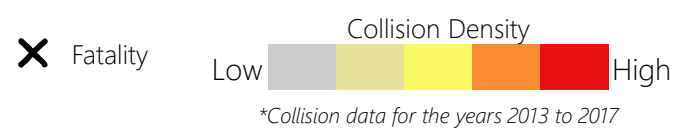
Safety Analysis

Fehr & Peers analyzed the collisions along the corridor using data for the five-year period from 2013 to 2017. Data was gathered from the Statewide Integrated Traffic Records System (SWITRS), managed by California Highway Patrol (CHP), and the Transportation Injury Mapping System (TIMS), managed by Safe Transportation Research and Education Center (SafeTREC) at University of California, Berkeley. The SWITRS data includes collisions that resulted in injuries, fatalities, and property damage. The TIMS data does not include property damage only collisions; however, the data is geolocated. The SWITRS data was useful for analyzing all collisions on the corridor. The TIMS data was valuable for mapping and identifying patterns for the injury collisions.

Collision History

There were 163 collisions reported along the study corridor between 2013 and 2017, 78 of which resulted in injuries. Three of the collisions were fatal, one of which involved a pedestrian. Another three people, including two pedestrians, were severely injured during this period. In total, six pedestrians and eight bicyclists were injured over the five-year period.

The heat map shown in Figure 6 displays the location of collisions that resulted in injury. The vast majority of collisions occurred at the intersection of Old Auburn Road / Sunrise Boulevard, but Old Auburn Road / Sylvan Road / Auburn Boulevard and Old Auburn Road / Fair Oaks Boulevard also have high collision density. All three collisions that resulted in a fatality between 2013 and 2017 occurred at Old Auburn Road / Sunrise Boulevard.



The most common crash factors for the injury collisions along this corridor include:

- Unsafe Speed
- Improper Turning
- Automobile Right of Way
- Driving or Bicycling Under the Influence of Alcohol
- Pedestrian Violation

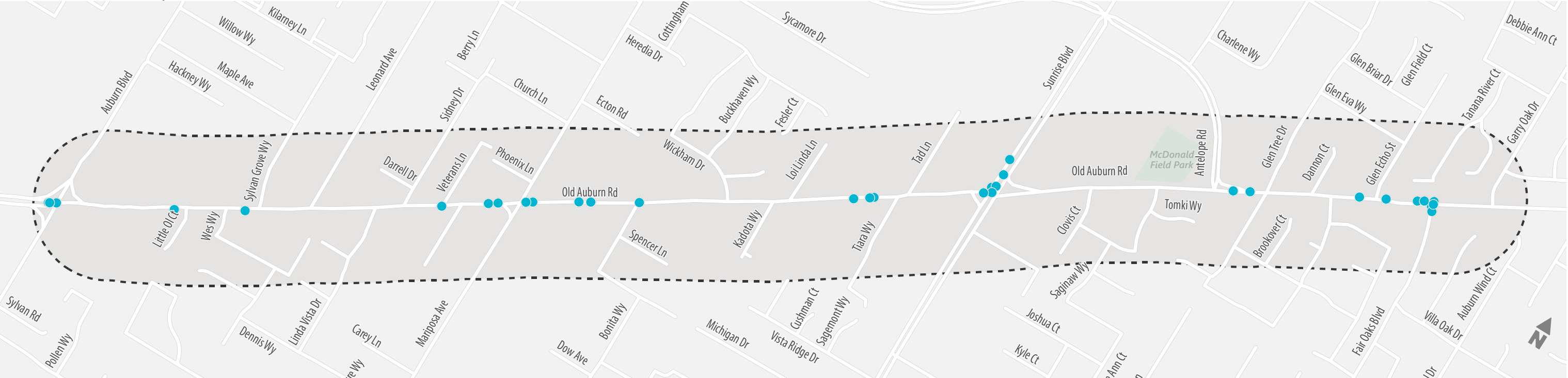
Unsafe Speed & Rear-End Collisions

Of the injury crashes, 51 percent were rear-end collisions and 38 percent were attributed to unsafe speed. Citywide, 42 percent of injury collisions were rear-end collisions and 38 percent of collisions were attributed to unsafe speed. The maps in Figure 7 show the locations of injury collisions between 2013 and 2017 attributed to unsafe speed and injury collisions that are rear-end collisions on Old Auburn Road. As shown, there is a strong correlation between unsafe speed and rear-ends.

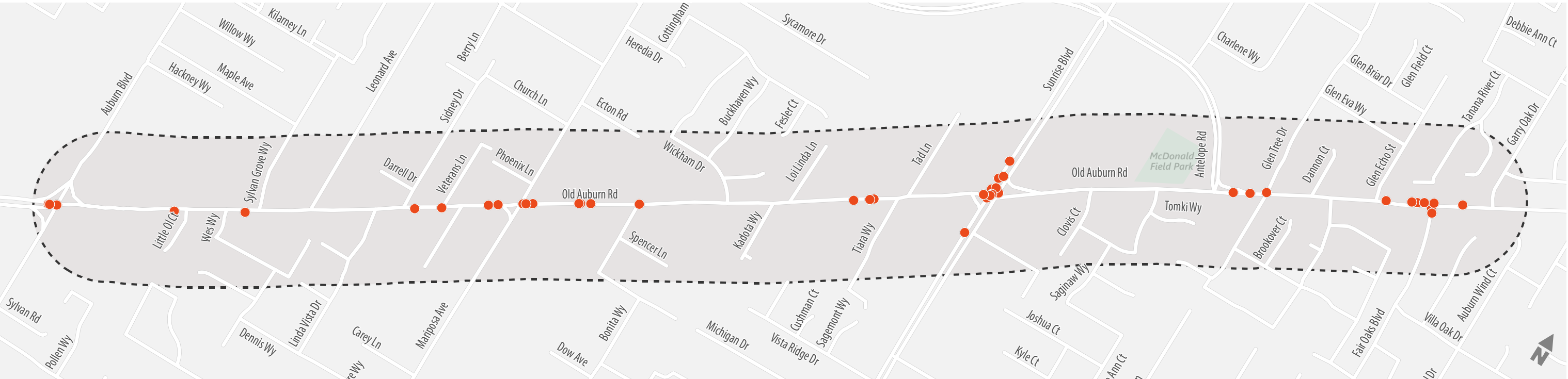
Stopping Sight Distance at Vertical Curvers

Based on community complaints and site observations, the project team reviewed the sight distance and design speed related to a number of the crest curves along the roadway. According to the roadway plans a number of the crest curves do not meet a consistent design speed for the corridor. Towards the west end, near Leonard Avenue, the available stopping sight distance results in a design speed of 20 or 25 mph, which is less than the posted 35 mph speed limit. At the east end of the project, between Antelope Road and Fair Oaks Boulevard the stopping distance for the crest curve results in a design speed of 30 mph, which is also less than the 35 mph posted speed. The design of these crest curves may contribute to some of the rear-end collisions as drivers may be exceeding the appropriate speed, and create difficulty for drivers entering the roadway from cross streets such as Leonard Avenue, Glen Tree Drive, and Chipmunk Way. Future design phases may consider vertical curve corrections to create a consistent driving experience.

Collisions Attributed to Unsafe Speeds



Rear-End Collisions



- Rear-End Collision
- Study Area
- Collisions Attributed to Unsafe Speeds

Old Auburn Road/Fair Oaks Boulevard

In conjunction to the analysis for this project, a focused study was conducted to evaluate collisions at the intersection of Old Auburn Road and Fair Oaks Boulevard. Between 2006 and 2018, there were 16 reported collisions at this intersection involving northbound left-turning vehicles crashing into residential fences and planter barriers on the north side of the intersection. The analysis revealed that the majority of these collisions occurred during wet and rainy conditions.

The study identified the following primary concerns:

- Majority of the collisions involved a single vehicle
- High speeds while turning were attributed to many of the collisions
- Geometric configuration of the northbound dual left-turn lanes creates an uncomfortable turning radius
- Pavement conditions contribute to water ponding on the roadway during heavy rain conditions

Since the study, the following improvements have been implemented:

1. The northbound approach has been restriped to a single left-turn lane and a right-turn lane, instead of a left-turn lane and a shared left/right-turn lane.
2. The "T-intersection" warning sign (W2-4) has been replaced and relocated the on northbound approach of Fair Oaks Boulevard.
3. Reflective, red Type N markers have been installed on the north side of the intersection.
4. A permanent speed radar sign has been placed on Fair Oaks Boulevard for the northbound direction.
5. The four-section signal head located on the mast arm for the northbound approach has been replaced with a three-section signal head featuring a left-turn arrow.
6. Retroreflective yellow tape has been installed around the border of the traffic signal indications in the northbound direction
7. 'Slippery When Wet' signs installed at northbound and westbound approaches to intersection

These enhancements at this intersection were installed recently and information on their effectiveness has yet to be determined. Appendix E contains the schematic of the near term improvements.



Public Engagement

Walkability Audit

On December 10, 2018, the consultant team met with neighborhood association representatives and city staff to walk the 1.75-mile segment. Attendees included representatives from Fehr & Peers, City of Citrus Heights, Bennett Engineering, Callander Associates, and the Citrus Heights neighborhood associations adjacent to the corridor. Key themes from the walkability audit included:

- The need for continuous sidewalks
- The difficulty of turning onto Old Auburn Road from unsignalized, neighborhood side-streets, especially when making a left-turn
- Drivers speeding and behaving recklessly
- The use of Old Auburn Road, Mariposa Avenue, and Bonita Way as cut-through routes
- The desire to reduce congestion on Old Auburn Road

Additional information and detailed comments can be found in the Walkability Audit Summary, located in Appendix D.



Community Workshop #1

In addition to engaging community members in the walk audit, an open house event was held for the project at Holy Family Catholic Church located at 7817 Old Auburn Road in Citrus Heights. The purpose of this workshop was to provide an opportunity for community members to learn about the Old Auburn Road Complete Streets Plan, provide input on their experience traveling on the corridor between Sylvan Road/Auburn Boulevard and Garry Oak Drive and provide ideas for potential changes to the corridor. This workshop was held Tuesday, March 26, 2019, and 94 community members attended.

Many of the boards for this open house were designed to solicit input via comments left by participants on post-it notes. Guests were also invited to place stickers on a map to indicate the location of their home and / or work. Boards also had participants vote on community objectives for the corridor. Additionally, a strip map was prepared showing an aerial of the study segment. Participants were encouraged to leave comments on post-it notes placed directly on the strip map.

A detailed summary of Community Workshop #1 is located in Appendix D of this report.

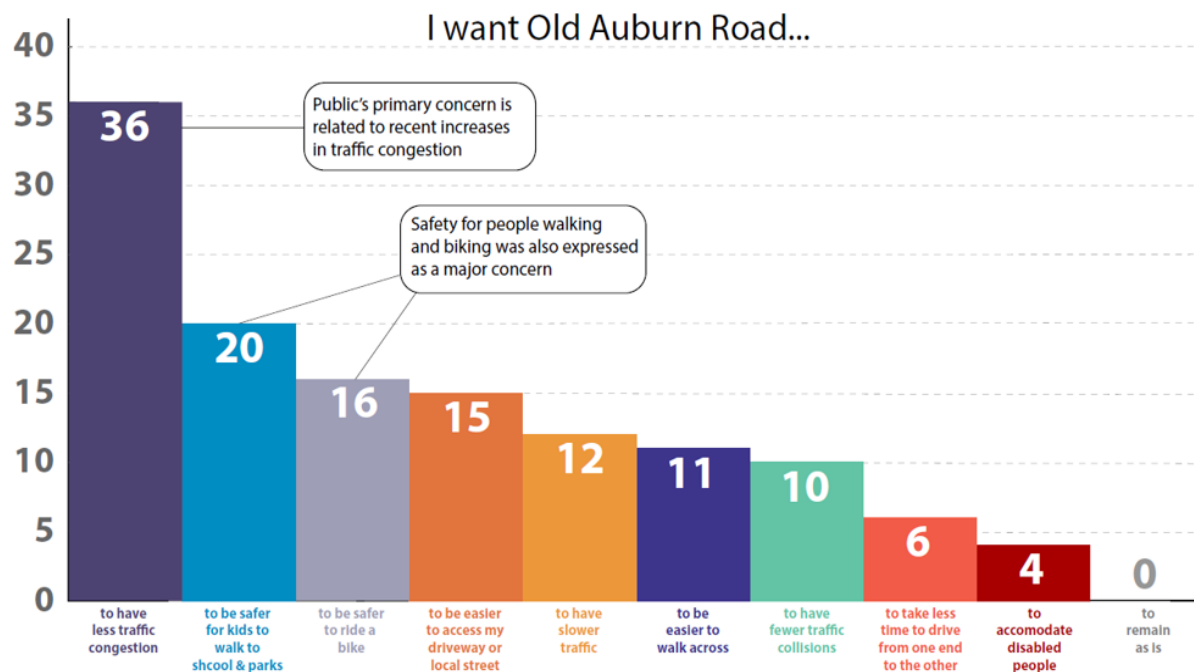


Figure 8: Feedback from Community Workshop #1 – Community Objectives

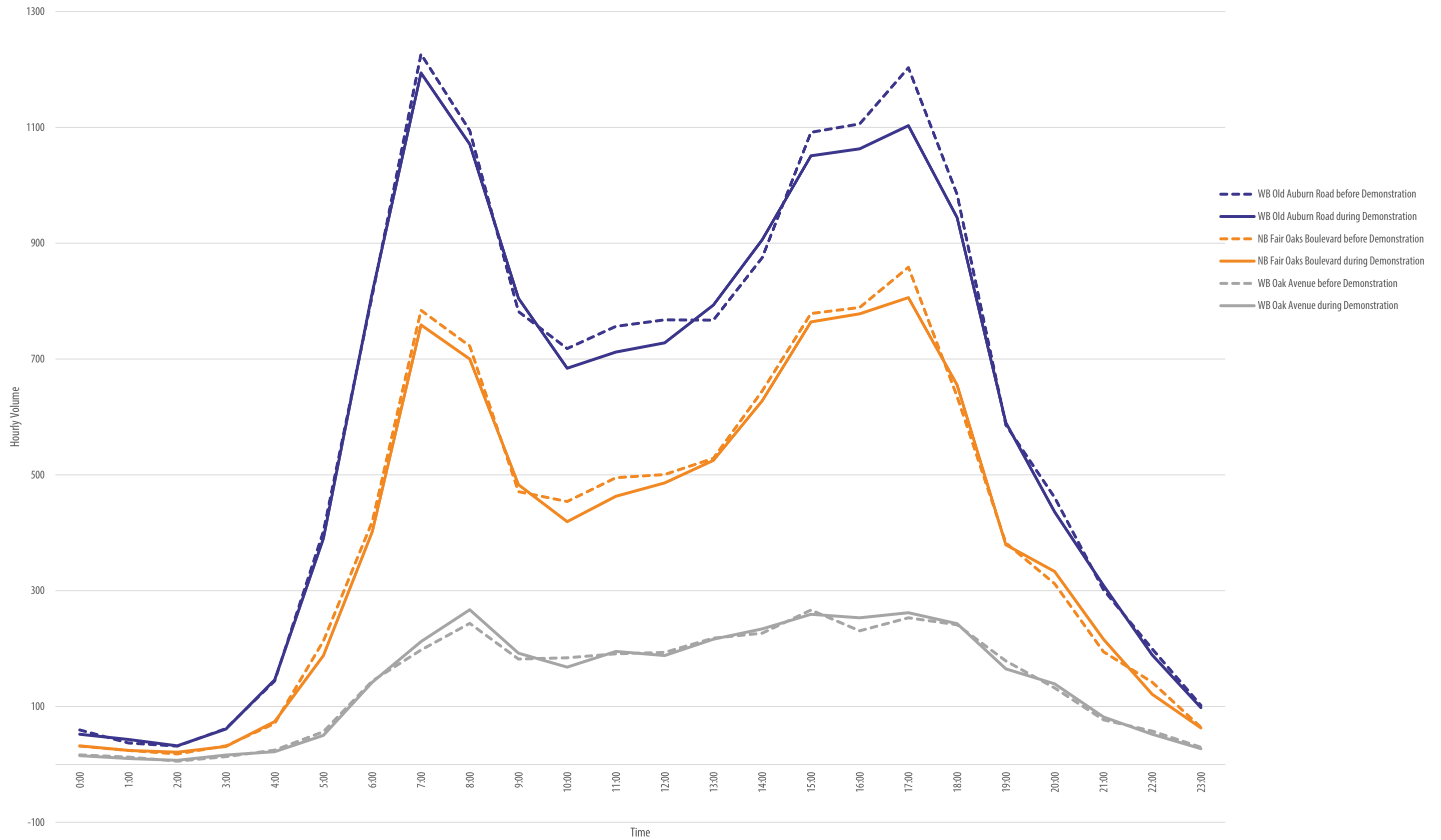
Demonstration Project



Between October 19 and October 27, 2019, the City of Citrus Heights converted one westbound lane on Old Auburn Road between Glen Tree Drive and Garry Oak Drive to a two-way separated bikeway. This involved restriping the lanes at Old Auburn Road/Fair Oaks Boulevard to one northbound left-turn lane and one right-turn lane. Concept drawings of the demonstration project are located in Appendix E.

The demonstration project included a one-day pedestrian safety fair with family fun activities that drew a steady stream of visitors. During the demonstration, the project team heard from parents that they felt safe with children riding on the separated bikeway along the busy roadway. The project team heard from children that they felt safe riding on the separated bikeway as well.

Before and during the demonstration project, 24-hour traffic counts were conducted on Fair Oaks Boulevard south of Old Auburn Road and on Old Auburn Road west of Fair Oaks Boulevard. This would document any changes in traffic that result from the lane reduction. These volumes are shown on an hourly basis in Figure 9.



Previous studies have concluded that reducing the number of lanes on Old Auburn Road between Antelope Road and Fair Oaks Boulevard would divert traffic from Old Auburn Road to Oak Avenue (Kimley-Horn Associates, 2015). In addition to the data collection described above, 24-hour traffic counts were also conducted before and during the demonstration project on Oak Avenue west of Fair Oaks Boulevard to determine if any traffic would reroute from Old Auburn Road to Oak Avenue. These volumes are also shown in Figure 9.

There was a slight reduction in vehicular traffic along Old Auburn Road and Fair Oaks Boulevard during commute hours, but during non-commute hours, the traffic volumes were consistent with previous conditions. Traffic along Oak Avenue did not increase significantly during the demonstration.

Drone footage recording maximum queue lengths and in person field observations were conducted during the weeklong demonstration project to monitor traffic operations and inform the ultimate project design.

Community Workshop #2

A second open house engagement event was held Tuesday, December 17, 2019 at Holy Family Catholic Church. More than 70 community members attended. The purpose of this workshop was to present and obtain feedback on the proposed road diet concept and the temporary demonstration project. The event began with a presentation that outlined the project's purpose and benefits as well as the input received from Community Workshop #1. The workshop also had an open-house format where participants could view boards that explained the project objectives and alternatives. A strip map that showed the proposed concept was prepared, and community members at the event were encouraged to leave comments on post-it notes placed directly on the map. Additionally, existing peak hour traffic operations were shown with video of the simulation models as well as peak hour operations with a road diet implemented. Participants were encouraged to vote on their preferred type of bikeway separation. Two boards had information specifically about the collisions at Old Auburn Road/Fair Oaks Boulevard and called out proposed near-term improvements which have since been implemented at that intersection.

A detailed summary of this workshop can be provided in Appendix D of this report.

Planning Commission and City Council Study Sessions

On February 26th and 27th of 2020, the project team presented The Plan during special study sessions with the City of Citrus Heights Planning Commission and City Council. The study sessions consisted of a 20-minute presentation of the Plan development with recommendations and 25 minutes of comments and questions from the commissioners and councilmembers. The planning commissioners were generally in support of the concepts presented. Questions focused on design details of separated bikeways and landscape buffers. The councilmembers were also supportive of the project and provided direction to the project team to pursue the three-lane section along the project length, including between Antelope Road and Fair Oaks Boulevard, highlighting the need for safe facilities for all roadway users.



Corridor Vision

Complete Street Toolkit

The complete street toolkit describes potential improvements considered for Old Auburn Road. Analysis of each measures is provided where appropriate.

Separated Sidewalks

Sidewalks that are six to eight feet wide and separated from vehicular lanes with a landscape buffer create a safer and more comfortable environment for people walking. The ultimate width of the sidewalk and planter along Old Auburn Road should be maximized based on available roadway right of way, adjacent land use, and the type of trees to be planted.

Class IV Separated Bikeways

A separated bikeway or cycle track is a bicycle facility that is physically separated from vehicle traffic by both a horizontal and vertical buffer. These facilities are located in the street right-of-way, separate from the sidewalk and designed for exclusive bicycle use. Separated bikeways allow riders who are less confident to feel more comfortable on busy roadways. The recommended bike lane width for a separated bikeway is seven feet, with five feet being the minimum, with a two to three-foot horizontal buffer per Caltrans Design Information Bulletin 89, Class IV Bikeway Guidance.

Examples of vertical buffers include raised medians, flexible posts, or planter boxes/planter islands.



Bicycle Zone Conflict Markings

Green pavement may call visual attention to conflict areas between bicyclists and motorists. These conflict areas include areas adjacent to driveways, areas through intersections involving a stop-controlled side-street, and areas where drivers must weave right to access a right-turn lane. To maximize effectiveness, the green conflict markings should be used sparingly and prioritize high conflict areas. Skipped green coloring should be used in weaving areas.

Road Diet

A road diet involves reducing the width of the road reserved for vehicular travel through reducing the number of lanes or reducing the width of the travel lanes. The additional space on the roadway leftover from a road diet is often dedicated to wider footpaths/sidewalks or cycle lanes. In the case of Old Auburn Road, a road diet would restripe a four-lane or five lane-section of the roadway to three-lanes, generally a lane in each direction with a center two way left turn lane. The extra space created by removing a lane would be used for enhanced bicycle facilities, wider sidewalks, etc. Road diets improve the safety for all users by reducing average vehicular speeds and associated collisions and increasing comfort of pedestrians and bicyclists.

Narrowed Travel Lanes

Reduction in lane width can produce a traffic calming effect by encouraging drivers to travel at lower speeds, lowering the risk of collisions with bicyclists, pedestrians, and other drivers. The additional space can be redistributed for wider bike lanes or sidewalks, which can further reduce conflicts with other modes.

Median Refuge Islands

Refuge islands provide a protected area for pedestrians and/or bicyclists at the center of the roadway. This allows the user to stop halfway while crossing to wait for a sufficient gap in traffic or their designated signal phase to complete their crossing. Refuge islands are particularly helpful in larger crosswalks or for older adults, children, and people with disabilities who may require more time to cross the street.

Curb Extensions

Curb extensions shorten crossing distances by widening the sidewalk at an intersection. This may provide better pedestrian visibility at intersections. A curb extension can calm traffic since it involves narrowing the vehicular travel lanes or shoulders and tightening the turn radii.

Lighting Improvements

Appropriate quantity and placement of lighting can increase visibility for all roadway users while enhancing the surrounding environment. Lighting improvements can involve adding intersection lighting to make drivers more aware of their surroundings at an intersection, enhance driver's sight distances, and improve visibility of non-motorists. Lighting improvements can also involve the installation of pedestrian-scale lighting, which is lower in height than a standard streetlight and is spaced closer together.

Landscaping and Gateways

In addition to mobility improvements, landscaping and gateway treatments provide an opportunity to transform underutilized public right of way into more inviting public space. There are several opportunities on the Old Auburn Road that could be used for additional landscaping and gateway treatments. Potential gateway locations include the major intersections of north/south roadways and the future Cripple Creek Tributary 1 and 2 creek corridor trails.

Roundabouts

Roundabouts are unsignalized intersection treatments where traffic flows from all approaches in a continuous circular direction around a center island. Roundabouts can reduce vehicle speeds and are sometimes an appropriate treatment for skewed intersections or intersections with high left-turn volumes.

OLD AUBURN RD & TIARA WAY LOOKING EAST



- ① SIDEWALK TREE
- ② SEPARATED BIKE WAY
- ③ INTERSECTION BIKE CROSSING MARKINGS
- ④ RAISED BUFFER
- ⑤ PLANTER STRIP
- ⑥ SIDEWALK
- ⑦ CROSSWALK
- ⑧ RAISED MEDIAN
- ⑨ CROSSING SIGNS WITH RECTANGULAR RAPID FLASHING BEACONS
- ⑩ TRAVEL LANE

OLD AUBURN RD & FAIR OAKS BLVD LOOKING WEST



OLD AUBURN RD & FAIR OAKS BLVD LOOKING WEST





Old Auburn Road Concept

Based on input from community workshops and the walkability audit as well as analysis of peak hour traffic conditions, pedestrian facilities, and bike facilities, the project team created a concept plan for the Old Auburn Road corridor. The concept plan includes the measures described in the Complete Street Toolkit, including separated bike lanes, separated sidewalks, and a road diet. This section describes the analysis results of the concept plan. Plan drawings are located in Appendix A of this report.

Roadway Segments and Key Intersections

Two sub-concepts were created for the segment of Old Auburn Road between Antelope Road and Fair Oaks Boulevard. Based on input from City of Citrus Heights City Council, the preferred concept reduces the segment of Old Auburn Road between Antelope Road and Fair Oaks Boulevard to three lanes (one lane in each direction and one two-way left-turn lane), whereas the sub-alternative narrows the segment to two lanes eastbound, one lane westbound, and a two-way left-turn lane.

This section describes the proposed changes of the Old Auburn Road concept plan with the two sub-concepts for the segment between Antelope Road and Fair Oaks Boulevard.

Old Auburn Road/Sylvan Road/Auburn Boulevard

The concept plan would remove one left-turn lane on the westbound approach. The single left-turn lane would be extended to around 300-feet in length. The westbound and eastbound left-turns would operate with lead-lag left-turn phasing instead of split phasing. The channelized right-turns on the southbound, eastbound, and westbound approaches would be signalized and operate with permissive phasing.

Old Auburn Road/Mariposa Avenue

The concept plan would remove the right-turn channelization on the eastbound approach, squaring up the right turn pocket and improving sight lines. The changes at this intersection would improve pedestrian and bicycle crossings at the intersection. Old Auburn would be widened to add a two-way left turn lane between Mariposa Avenue and Wickham Drive.

Old Auburn Road/Tiara Way

At Tiara Way, the concept plan would install a curb extension on the southeast corner. Additionally, the crosswalk that is currently located on the east leg of the intersection would be moved to its west leg. A refuge island would be constructed in the center of the roadway.

Old Auburn Road/Sunrise Boulevard

Traffic analyses of these concepts included coordinated signal timings on Sunrise Boulevard, which will alleviate some of the congestion experienced in the northbound and southbound directions.

The concept plan would extend the right-turn pocket on the eastbound approach. The westbound approach would be re-stripped to one left-turn lane, one through lane, and one right-turn lane removing the merge on the west leg. The channelized right-turns on the eastbound and westbound approaches would be signalized and operate with permissive phasing.

Currently, the east leg of the intersection has two receiving lanes with a lane drop approximately 340-feet east of the intersection. The project would remove the second receiving lane and lane drop, removing a common conflict location for merging automobiles.

Old Auburn Road/Antelope Road

The concept plan would restripe the eastbound approach to one left-turn lane and one through lane. The channelized right-turn would be removed from the westbound approach, and the right-turn would operate with permissive and overlap phasing to make it safer for people crossing at the crosswalk.

As mentioned previously, two sub-concepts were developed for the segment of Old Auburn Road between Antelope Road and Fair Oaks Boulevard.

The preferred concept, as indicated by City of Citrus Heights City Council, would restripe the southbound approach to one left-turn lane and one right turn lane. On the east leg, there would only be one receiving lane.

A sub-alternative was evaluated for the southbound approach. This alternative would retain the dual southbound left turns and there would be two receiving lanes on the east leg. These two lanes would continue eastbound to Fair Oaks Boulevard. Although the sub-alternative reduced overall traffic delay during the peak periods, the tradeoffs related to improved safety and better bicycle and sidewalk facilities were ultimately prioritized.

During future phases of project development, additional analysis may be needed to analyze the operations and safety of Glen Tree Drive. Numerous collisions have been recorded at this intersection related to the difficulty of entering Old Auburn Road from Glen Tree Drive. The adjacent land uses at this location include two preschools that have a high peak demand during pick up and drop off time. The city may consider adding a south leg at the Antelope Road traffic signal into the parking lot of the schools. The intersection of Old Auburn Road and Chipmunk Way may be an alternative location to add a new signal to improve left turn access from Old Auburn Road.

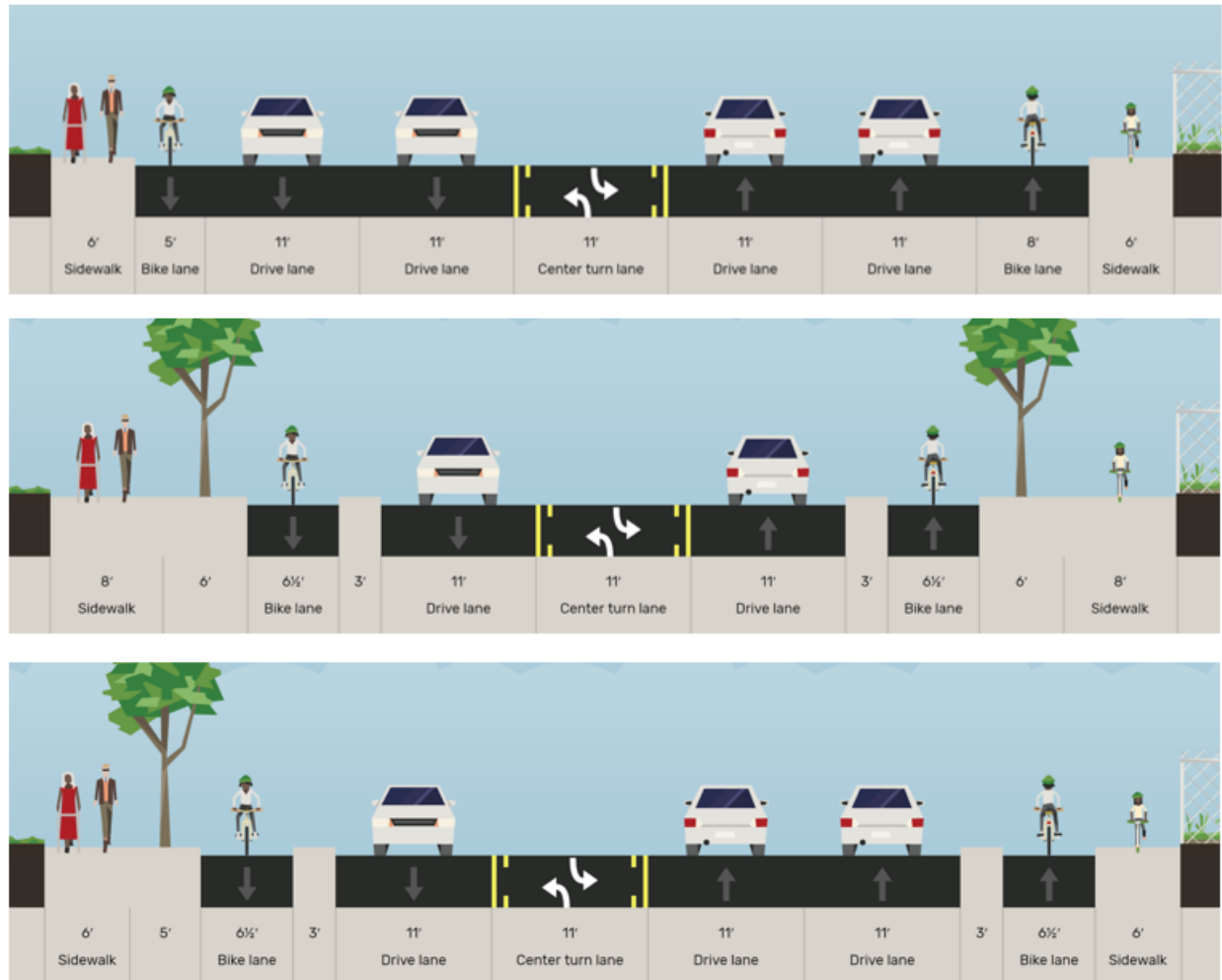


Figure 13: Old Auburn Road Cross Sections - Existing, Preferred Concept, and Sub-Alternative

Old Auburn/Fair Oaks Boulevard

In 2019, Fair Oaks Boulevard was re-striped on the northbound approach to provide one left-turn and one right-turn lane in an effort to reduce the potential for collisions into the existing planter barriers. The westbound approach would be re-striped to include two left-turn lanes and one through lane. The dual

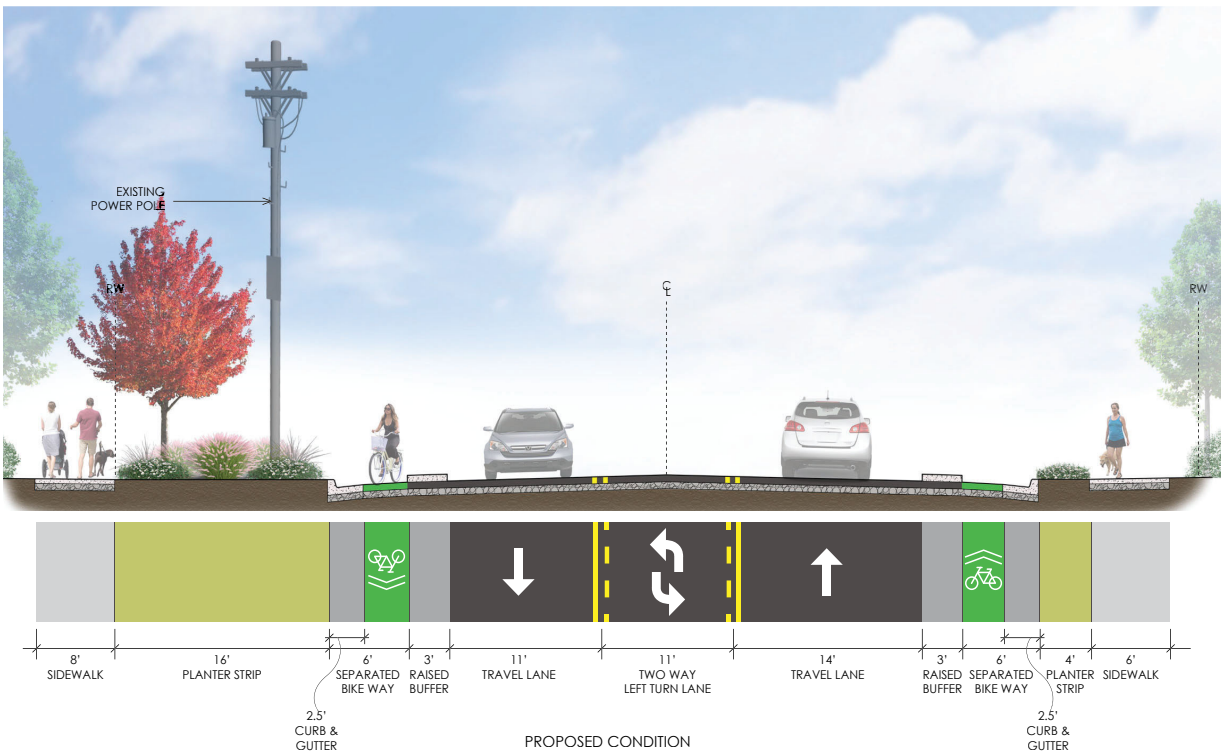
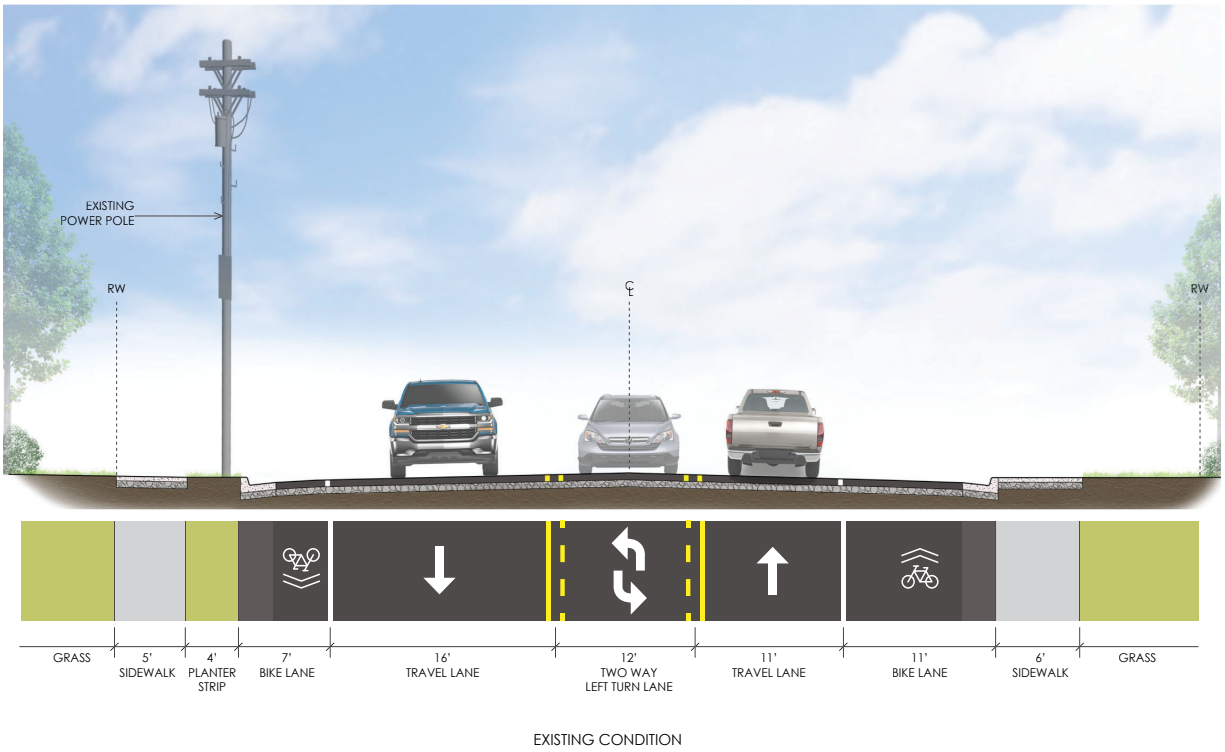
left-turn lanes would each have approximately 170-feet of storage, accommodating twelve vehicles, to help minimize the left turn queues blocking the westbound through movement.

The right-turn channelization on the eastbound approach would be removed, and the right-turn would operate with permissive and overlap phasing. The proposed concept would include a 300-foot right-turn pocket, whereas the sub-alternative would have a right-turn lane connected to the second eastbound lane from Antelope Road.

A roundabout was considered at this intersection as one of the safety countermeasures. It was determined that the high volume of left turning traffic degraded operations and created unacceptable conditions, so this option was removed from consideration.

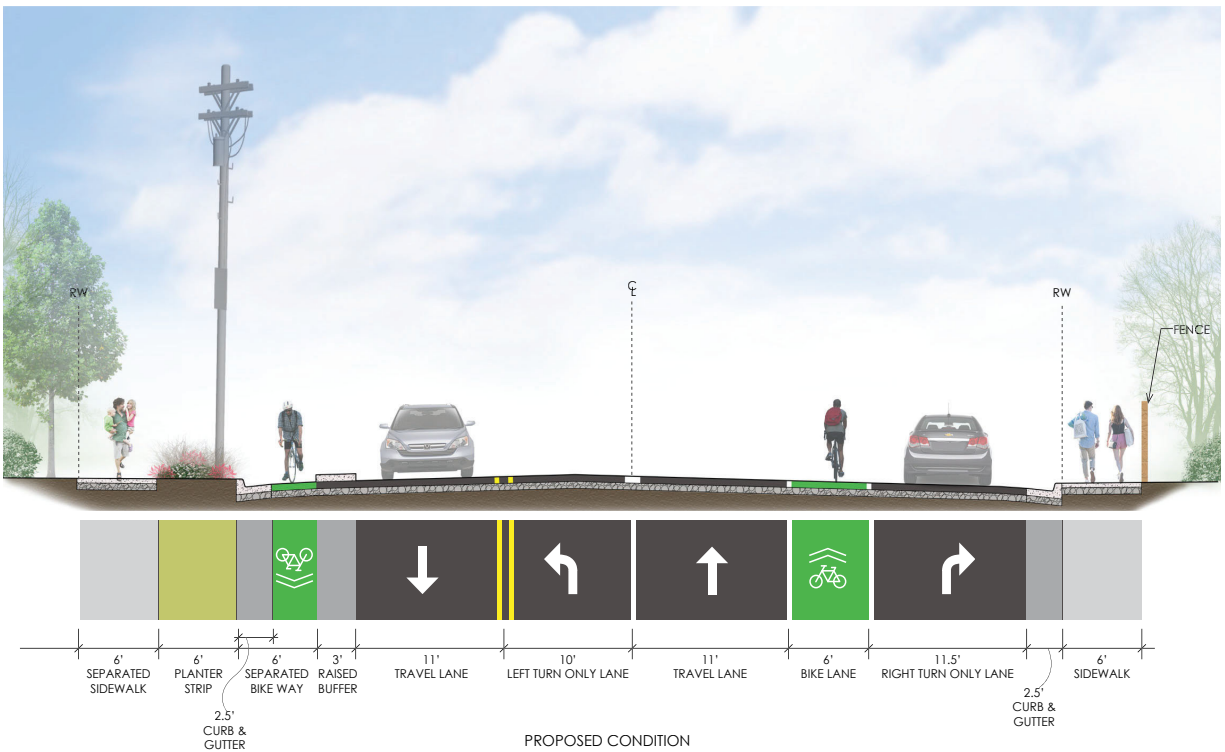
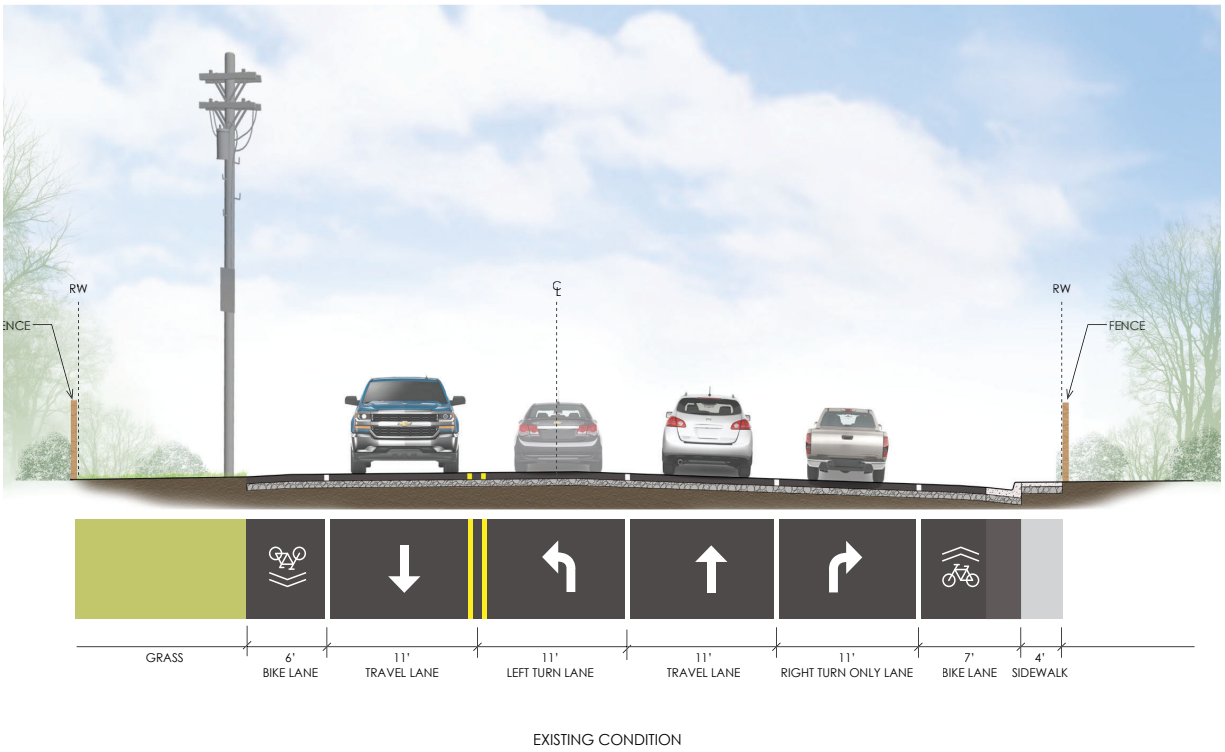
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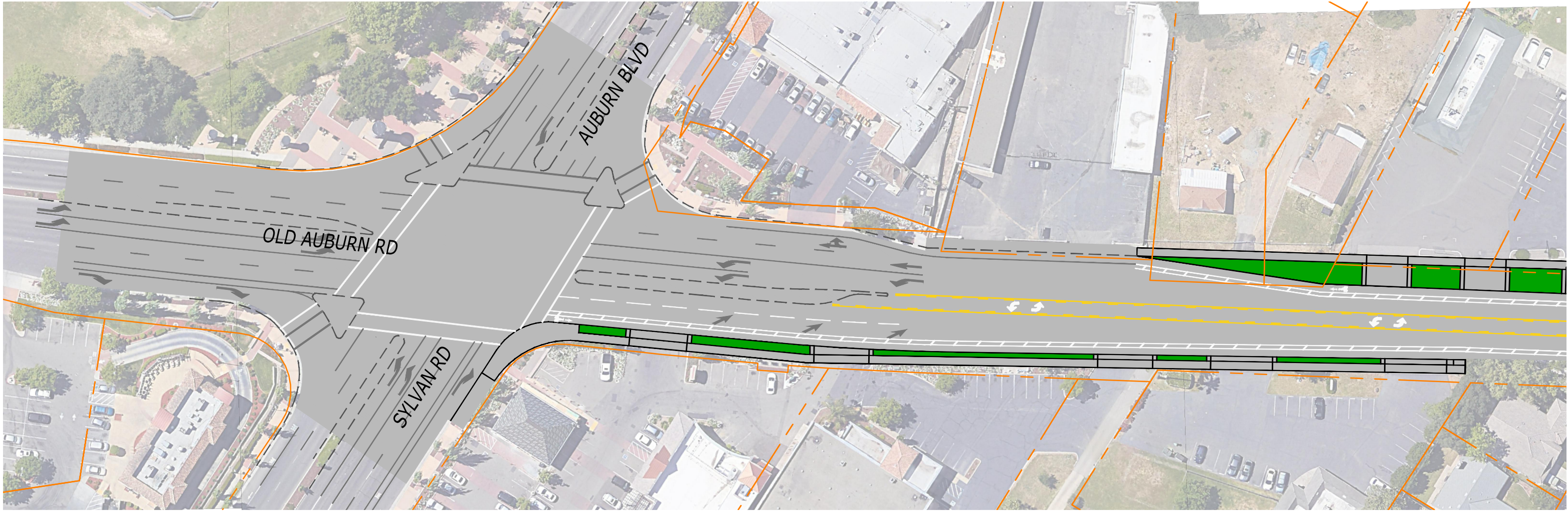
OLD AUBURN RD. AT SYLVAN AVE.











SECTION AA

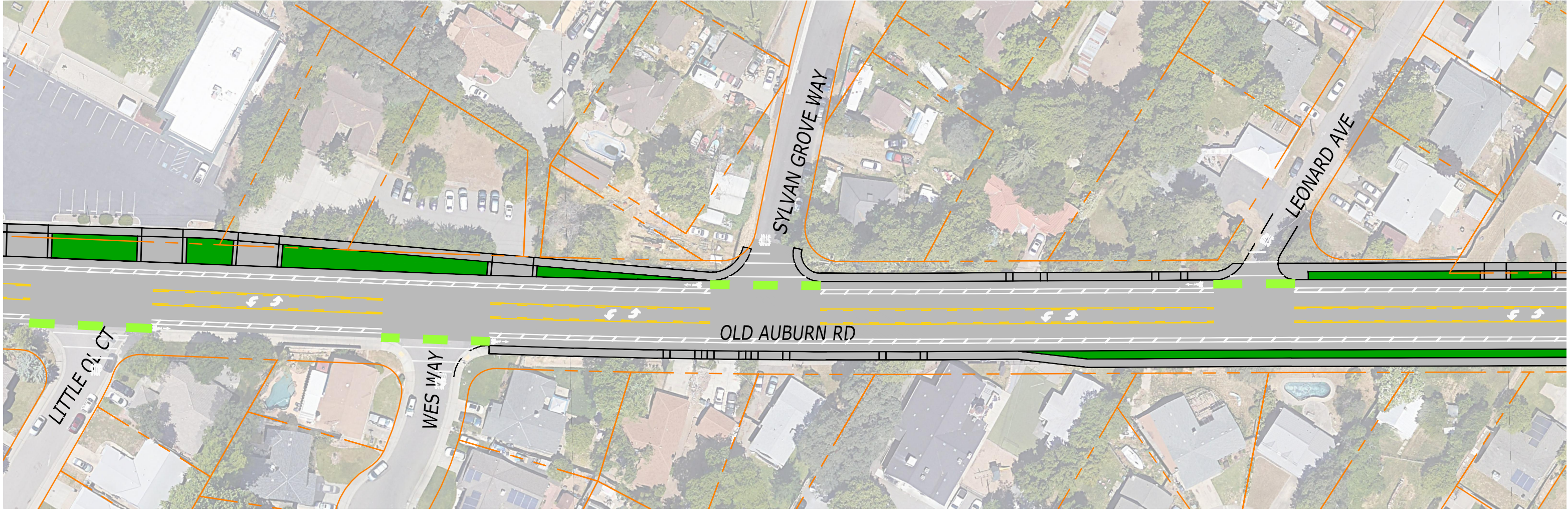
OLD AUBURN RD. AT MARIPOSA AVE,













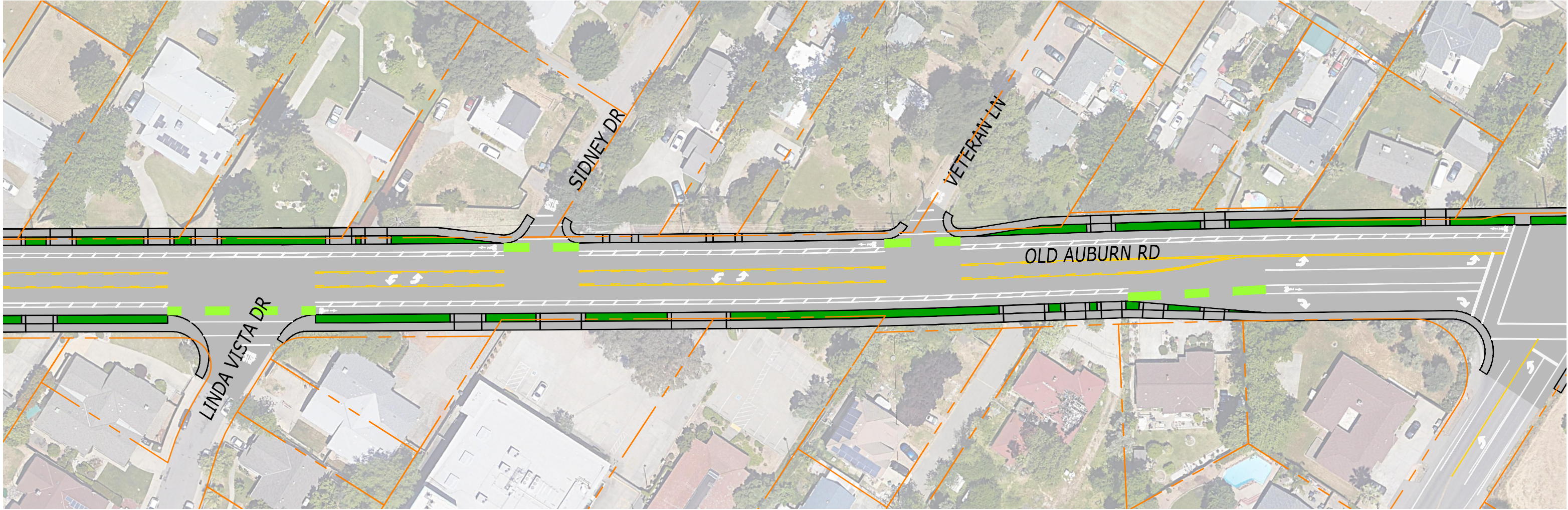
LEGEND:

	MOUNTABLE TRUCK APRON
	RAISED CONCRETE MEDIAN
	LANDSCAPE AREA
	BIKEWAY CROSSWALK AT UNCONTROLLED CROSSINGS
	BIKEWAY SYMBOL AND ARROW
	SCHOOL ZONE PEDESTRIAN CROSSWALK
	PEDESTRIAN CROSSWALK
	RIGHT-OF-WAY











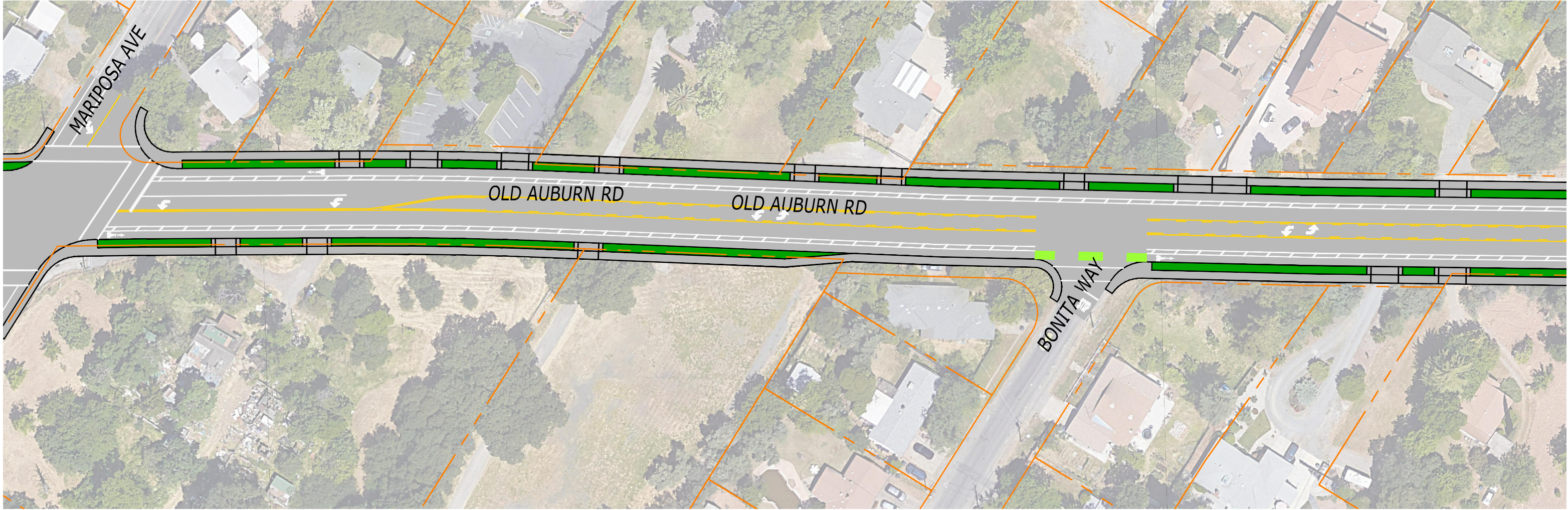
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	SCHOOL ZONE PEDESTRIAN CROSSWALK
	PEDESTRIAN CROSSWALK
	RIGHT-OF-WAY











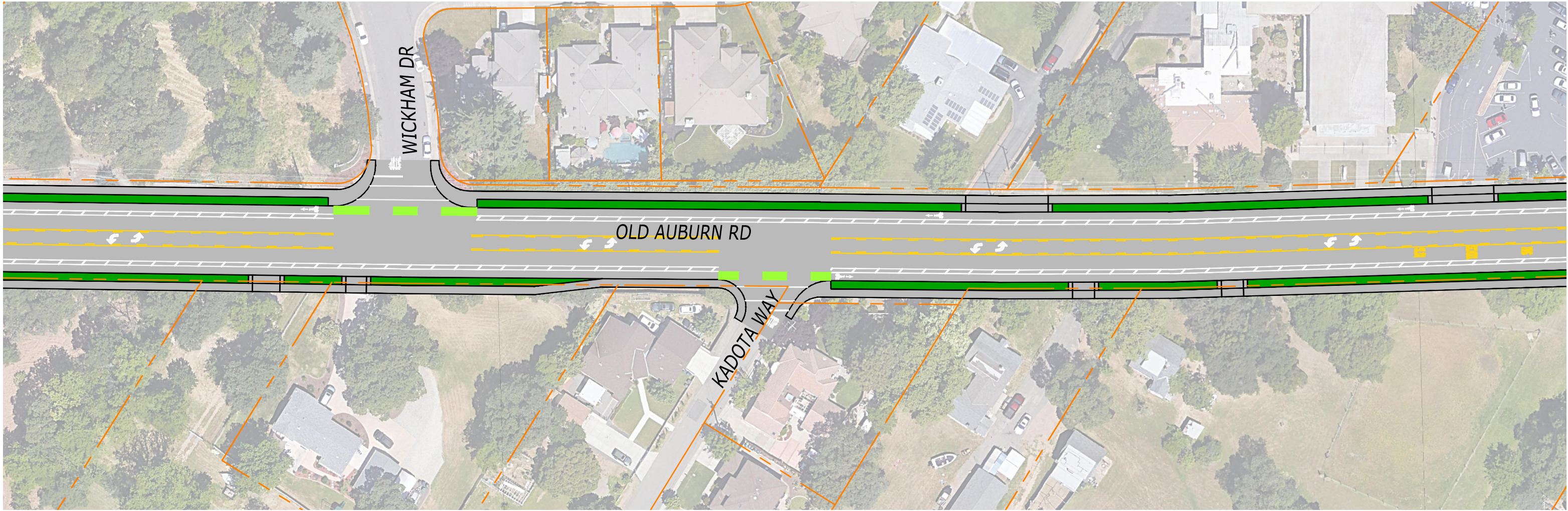
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	PEDESTRIAN CROSSWALK
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	PEDESTRIAN CROSSWALK
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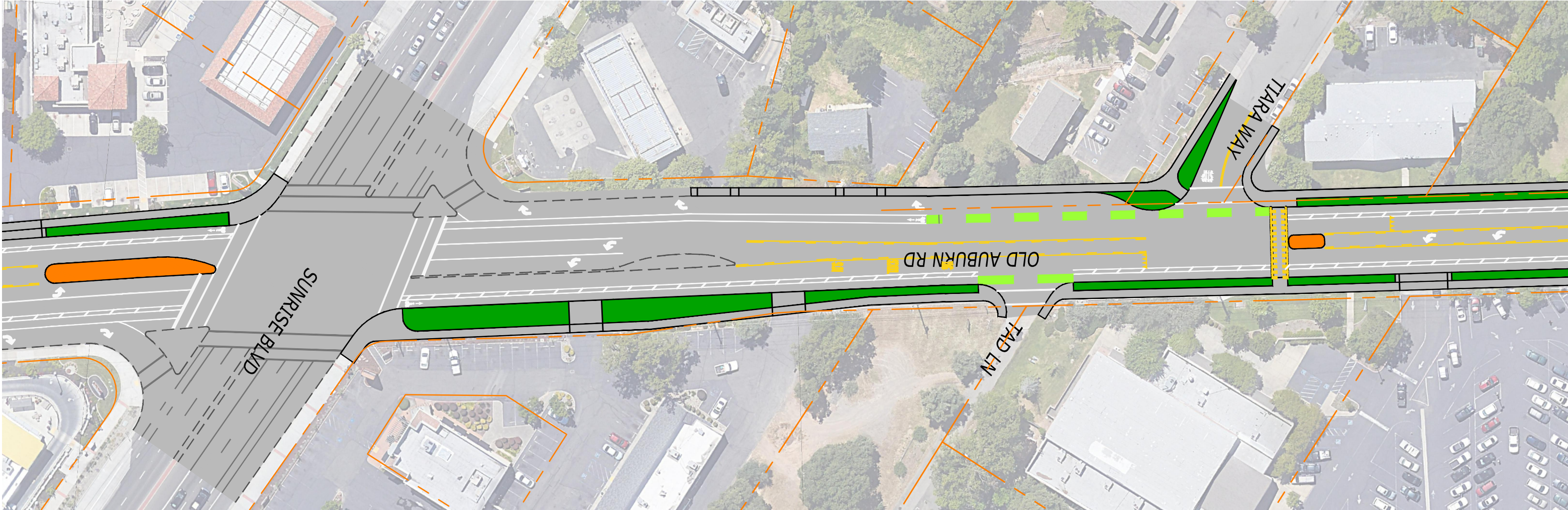
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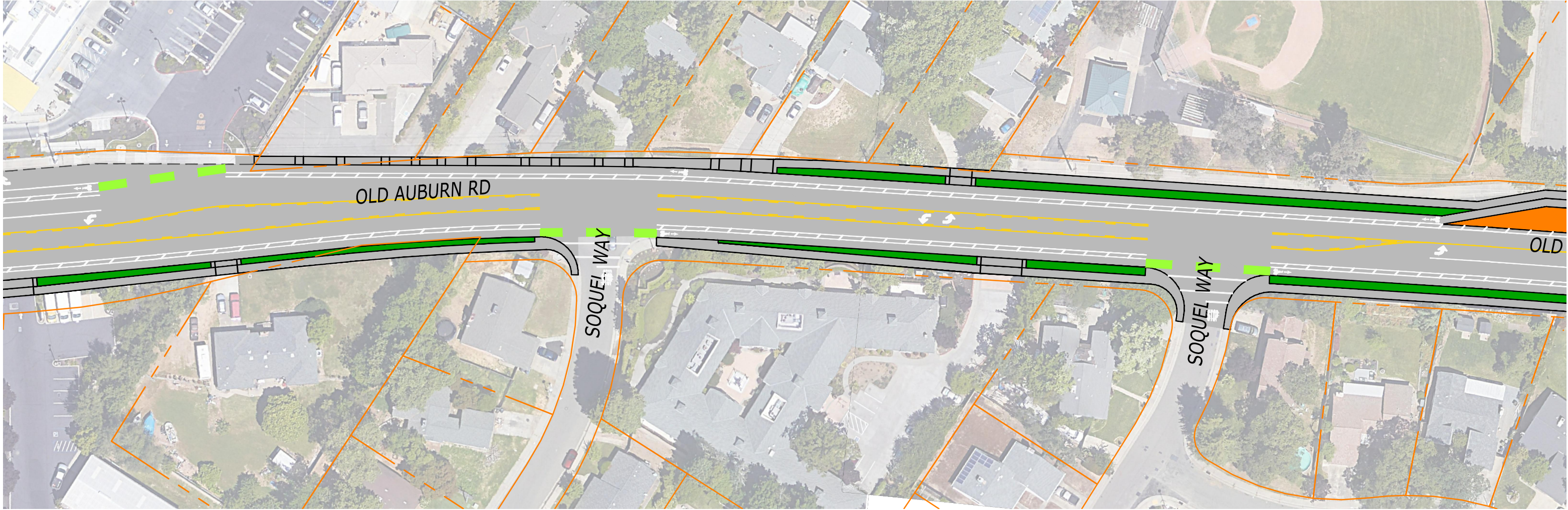
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	SCHOOL ZONE PEDESTRIAN CROSSWALK
	PEDESTRIAN CROSSWALK
	RIGHT-OF-WAY



LEGEND:

- MOUNTABLE TRUCK APRON
- RAISED CONCRETE MEDIAN
- LANDSCAPE AREA
- BIKEWAY CROSSWALK AT UNCONTROLLED CROSSINGS
- BIKEWAY SYMBOL AND ARROW
- SCHOOL ZONE PEDESTRIAN CROSSWALK
- PEDESTRIAN CROSSWALK
- RIGHT-OF-WAY











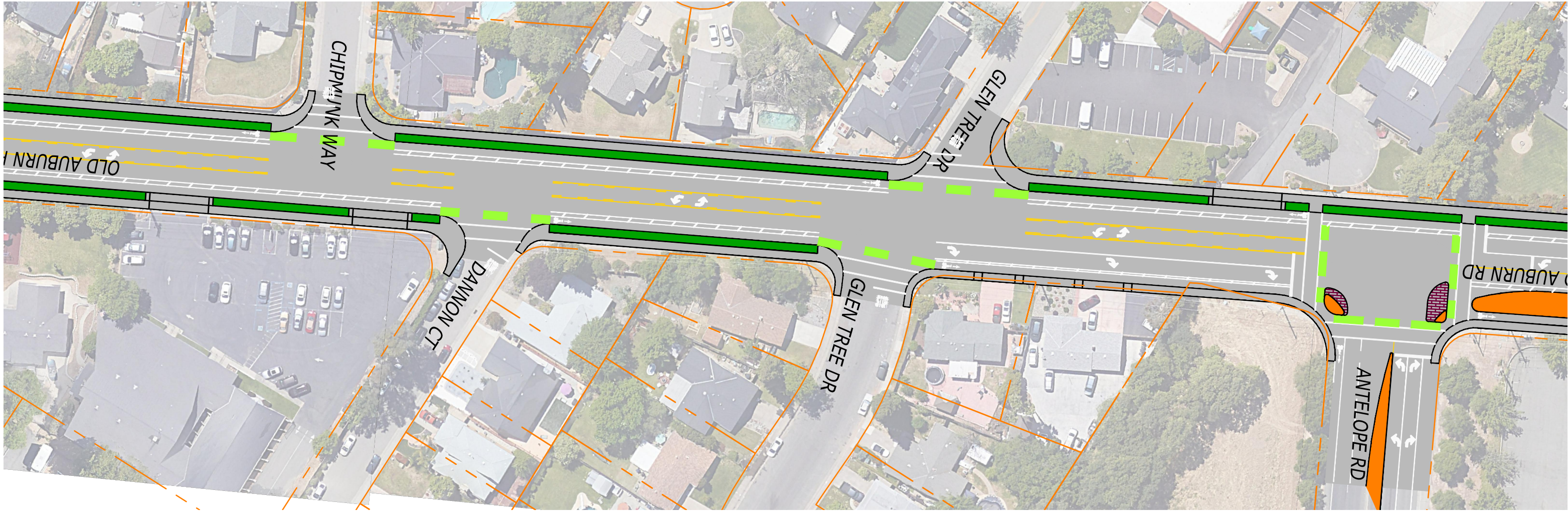


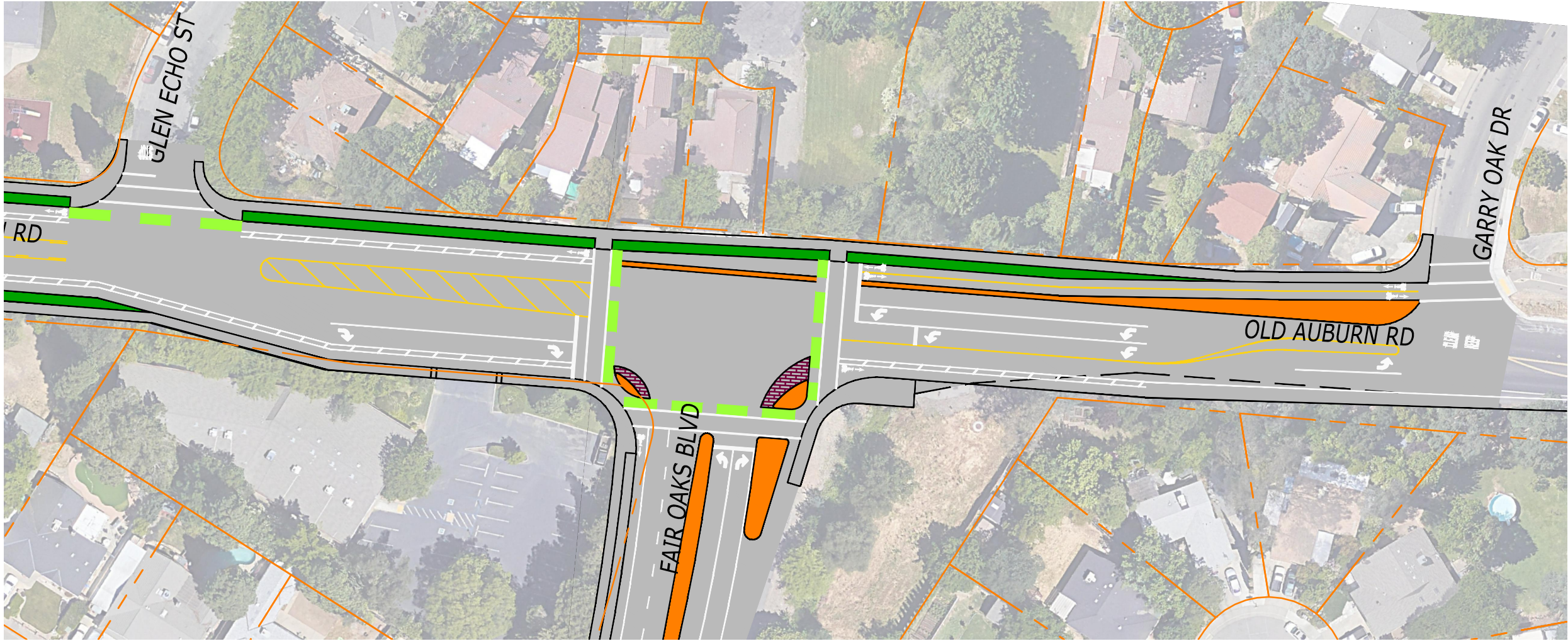
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	PEDESTRIAN CROSSWALK
	RIGHT-OF-WAY

LEGEND:

MOUNTABLE TRUCK APRON	
RAISED CONCRETE MEDIAN	
LANDSCAPE AREA	
BIKEWAY CROSSWALK AT UNCONTROLLED CROSSINGS	
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SCHOOL ZONE PEDESTRIAN CROSSWALK	
PEDESTRIAN CROSSWALK	
RIGHT-OF-WAY	





LEGEND:

	MOUNTABLE TRUCK APRON
	RAISED CONCRETE MEDIAN
	LANDSCAPE AREA
	BIKEWAY CROSSWALK AT UNCONTROLLED CROSSINGS
	BIKEWAY SYMBOL AND ARROW
	SCHOOL ZONE PEDESTRIAN CROSSWALK
	PEDESTRIAN CROSSWALK
	RIGHT-OF-WAY

Analysis of Concepts

Peak Hour Level of Service Analysis

The preferred concept and sub-alternative were modeled in SimTraffic 10 software using the existing peak hour volumes. It is important to note that if the concept plan were implemented, the amount of traffic during peak hours would likely decrease, so this analysis presents a worst-case scenario. The peak hour delay and level of service results are shown in Table 6. Technical calculations are provided in Appendix C.

Table 6: Peak Hour Level of Service - Road Diet Concepts

Intersection	Control ¹	LOS ² / Delay ³ (s)					
		Existing Conditions		Preferred Road Diet Option 1		Sub-alternative Road Diet Option 2	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Old Auburn Rd / Sylvan Rd / Auburn Blvd	Signal	C / 34	D / 43	D / 40	E / 58	D / 40	E / 58
Old Auburn Rd / Mariposa Ave	Signal	B / 19	C / 24	B / 19	C / 23	C / 20	C / 21
Old Auburn Rd / Bonita Wy	SSSC	A (E) / 4 (44)	A (F) / 6 (73)	A (E) / 5 (45)	A (F) / 6 (54)	A (E) / 4 (40)	A (E) / 5 (47)
Old Auburn Rd / Tiara Wy	SSSC	A (C) / 7 (21)	A (D) / 7 (31)	A (B) / 1 (12)	A (C) / 1 (19)	A (C) / 1 (16)	A (C) / 1 (19)
Old Auburn Rd / Sunrise Blvd	Signal	D / 47	E / 64	D / 49	E / 65	D / 44	E / 71
Old Auburn Rd / Antelope Rd	Signal	B / 13	B / 19	C / 23	E / 56	B / 18	C / 24
Old Auburn Rd / Fair Oaks Blvd ⁴	Signal	C / 25	D / 41	D / 35	D / 53	D / 41	D / 45

Notes:

1. "Signal" represents a traffic signal-controlled intersection. "SSSC" represents a side-street stop-controlled intersection.
2. "LOS" represents level of service, calculated based on methodologies contained in the *Highway Capacity Manual, 6th Edition* (Transportation Research Board, 2016).
3. Average control delay for intersections is the weighted average for all movements. For SSSC intersections, the delay and LOS for the highest movement delay is shown in parentheses.
4. For Existing Conditions, the lane configurations for this analysis at this intersection represent 2018 conditions, so the northbound approach includes one left-turn lane and one shared left/right-turn lane. Since then, modifications have been made to restripe the approach to one left-turn lane and one right-turn lane.

Source: Fehr & Peers, 2020.

With preferred concept striping, the southbound queue at Old Auburn Road/Antelope Road occasionally spills back to Sunrise Boulevard along Antelope Road during the PM peak hour. Additionally, the westbound queue at this intersection occasionally spills back to Fair Oaks Boulevard along Old Auburn Road, which can

affect the operations of the westbound through and northbound left-turn at that intersection. The LOS at Old Auburn Road/Antelope Road degrades to LOS E with the preferred concept during the PM peak hour but operates at LOS C conditions during the PM peak hour with the sub-alternative implemented.



Travel Time Analysis

Table 7 compares the estimated peak 15-minute travel times with both road diet options. Technical calculations are in the Appendix C. The table shows that with the preferred concept, the travel time increases by about one minute in the southbound to eastbound direction during the AM peak hour. This coincides with the peak commute direction, as the travel time of the northbound to westbound route increases during the PM peak hour.

Table 7: Peak Hour Travel Times - Road Diet Concepts

Route	Existing Conditions		Preferred Road Diet Option 1		Sub-alternative Road Diet Option 2	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Southbound on Antelope Road to southbound on Fair Oaks Boulevard	1 minute 29 seconds	1 minute 53 seconds	2 minutes 27 seconds	2 minutes 26 seconds	1 minute 39 seconds	1 minutes 43 seconds
Westbound on Old Auburn Road between Garry Oak Road and Sunrise Boulevard	3 minutes 14 seconds	3 minutes 31 seconds	3 minutes 47 seconds	4 minutes 49 seconds	3 minutes 47 seconds	4 minutes 50 seconds
Northbound on Fair Oaks Boulevard to northbound on Antelope Road	1 minute 50 seconds	1 minute 42 seconds	1 minute 54 seconds	2 minutes 51 seconds	1 minute 41 seconds	2 minutes 15 seconds

Source: Fehr & Peers, 2020.

Bicyclist StreetScore+

The bicycle StreetScore+ analysis results of the concept plan are shown in Table 8. The inclusion of separated bikeways on Old Auburn Road improves many segments from a bicycle StreetScore+ of 3 to 2, increasing the probability that less confident riders will use Old Auburn Road.

Table 8: Bicycle StreetScore+ - Road Diet Concepts

Segment	Direction	Existing Bicycle StreetScore+	Old Auburn Road Complete Streets Bicycle StreetScore+
Old Auburn Road between Auburn Blvd/Sylvan Rd and Wes Wy	EB	3	2
	WB	3	2
Old Auburn Road between Wes Wy and Mariposa Av	EB	3	2
	WB	3	2
Old Auburn Road between Mariposa Av and Wickham Dr	EB	3	2
	WB	3	2
Old Auburn Road between Wickham Dr and Kadota Wy	EB	3	2
	WB	3	2
Old Auburn Road between Kadota Wy and Loi Linda Ln	EB	3	2
	WB	3	2
Old Auburn Road between Loi Linda Lane and Tiara Way	EB	3	2
	WB	3	2
Old Auburn Road between Tiara Way and Sunrise Boulevard	EB	2	3
	WB	3	2
Old Auburn Road between Sunrise Boulevard and Soquel Way W	EB	3	2
	WB	3	2
Old Auburn Road between Soquel Way W and Soquel Way E	EB	3	2
	WB	3	2
Old Auburn Road between Soquel Way E and Antelope Road	EB	3	2
	WB	3	2
Old Auburn Road between Antelope Road and Fair Oaks Boulevard	EB	3	2
	WB	3	2
Old Auburn Road between Fair Oaks Blvd and Garry Oak Rd	EB	3	2
	WB	3	2
Old Auburn Road between Garry Oak Dr and Auburn Woods Dr	EB	1	1
	WB	1	1

Source: Fehr & Peers, 2020.



Implementation

The Old Auburn Road Complete Street Plan is a planning document that has taken a holistic look at safety and mobility on Old Auburn Road between Sylvan Road and Garry Oak Drive in the City of Citrus Heights. The recommendations described in the document do not have specific funding sources identified for implementation like those in typical Capital Improvement Programs or Regional Transportation Plans. However, there are several ways that the improvements in the Plan can be implemented with assistance from transportation grant funding.

Construction cost estimates are located in Appendix B of this report.

Grant Funding

For many of its transportation projects, the City of Citrus Heights is dependent on competing for local, regional, State, or Federal grants programs. There are a number of funding sources that may be applicable for Old Auburn Road. The Old Auburn Road Complete Street Master Plan is a critical piece in being competitive for these various regional funding sources. Local funding is available through SACOG's Regional Flexible Funding Programs including the Regional Bicycle & Pedestrian, Community Design, and Regional/Local Programs. The Plan will also compete well for statewide Active Transportation Program funds. This project's competitiveness will be enhanced by building from the momentum of the other complete street and safety projects on Auburn Boulevard and Sunrise Boulevard.

An important implementation tool for complete streets projects are low cost trial implementation and proof of concept. The Old Auburn Road project included a week-long demonstration project of the lane reduction. The demonstration project served multiple purposes including informing the public of the potential change, observing how traffic and patterns in the area were affected, and testing the future bikeway facilities. The

findings from the demonstration project will help refine the ultimate design of the Old Auburn Road improvements and identify necessary modifications to adjacent intersections to accommodate the changes in traffic patterns.

The concept plan was adopted by the City Council on March 26, 2020. The next steps for the city include seeking funding for the preliminary engineering and environmental clearance of the project. During this phase, additional community outreach will occur to help refine the design concepts and provide insight on the changing conditions along the corridor. After the project has been environmentally cleared, final design will occur while construction dollars are being sought. This time period will be another critical time for community engagement, especially with the property owners along the corridor, to coordinate specific opportunities and constraints. The final design will enable the project to be constructed as a whole or in phases dependent on funding availability.



Potential Project Phasing

The 1.75-mile-long Old Auburn Road Complete Street project has a projected construction cost between \$15 and \$25 million depending on final design components. It is anticipated that the project will need to be constructed in multiple phases that align with available funding sources. For the purpose of the Plan, the project has been divided into two phases, shown in Figure 17.

Phase 1 spans Old Auburn Road between Tiara Way and Garry Oak Drive and will address some of the highest collision concentrations near Sunrise Boulevard and Fair Oak Boulevard. A majority of Phase 1 can be completed within the existing right of way with minimal impacts to adjacent properties.

Table 9: Cost Estimate - Phase 1

Phase 1 (Tiara Way to Garry Oak Drive)		
Construction Cost		\$ 7,406,000
Environmental Clearance	10%	\$ 740,600
Design	15%	\$ 1,110,900
Construction Management	15%	\$ 1,110,900
Total Cost		\$ 10,368,400
<i>Right of way</i>		
Number of Parcels		2
Total Area		1200 sf

Source: Bennett Engineering Services, 2020.


Phase 2 consists of the remainder of the Plan from the Sylvan Road to Tiara Way. This phase will generally widen the roadway, adding the two-way left turn lane and filling bikeway and sidewalk gaps. This phase of the project will require additional drainage analysis when replacing roadside ditches and may require sliver right of way acquisitions between two and eight feet of up to 24 parcels.

Table 10: Cost Estimate - Phase 2

Phase 2 (Sylvan Road to Tiara Way)		
Construction Cost		\$ 8,303,000
Environmental Clearance	10%	\$ 830,300
Design	15%	\$ 1,245,450
Construction Management	15%	\$ 1,245,450
Total Cost		\$ 11,624,200
<i>Right of way</i>		
Number of Parcels		24
Total Area		25000 sf

Source: Bennett Engineering Services, 2020.



 Study Area