ATTACHMENT 2

Final
Transportation Impact Study for Estia at Rocklin

Prepared for:
City of Rocklin

April 13, 2022

RS21-4090

FEHR PEERS

This page intentionally left blank.

Table of Contents

Appendices

List of Figures

List of Tables

This page intentionally left blank.

I. Introduction

Purpose

This study analyzes the transportation impacts associated with the proposed Estia at Rocklin project in northwest Rocklin, CA. This study analyzes project impacts under existing, existing plus approved projects, and cumulative conditions. The analysis covers the roadway, bicycle, pedestrian, and transit networks, and evaluates project access and circulation.

Overview of Proposed Project

Project Location

Figure 1 provides the general location of the project within the broader study area. The proposed project would be located at the northwest corner of the University Avenue / Sunset Boulevard intersection in northwest Rocklin, CA on an approximately 30-acre site. The site is bounded by a vacant parcel to the north, University Avenue to the east, Sunset Boulevard to the south, and the State Route 65 (SR 65) freeway to the west. The William Jessup University campus is located opposite the project site on the east side of University Avenue. The Atherton Tech Center business park is located to the south of the project site on the south side of Sunset Boulevard.

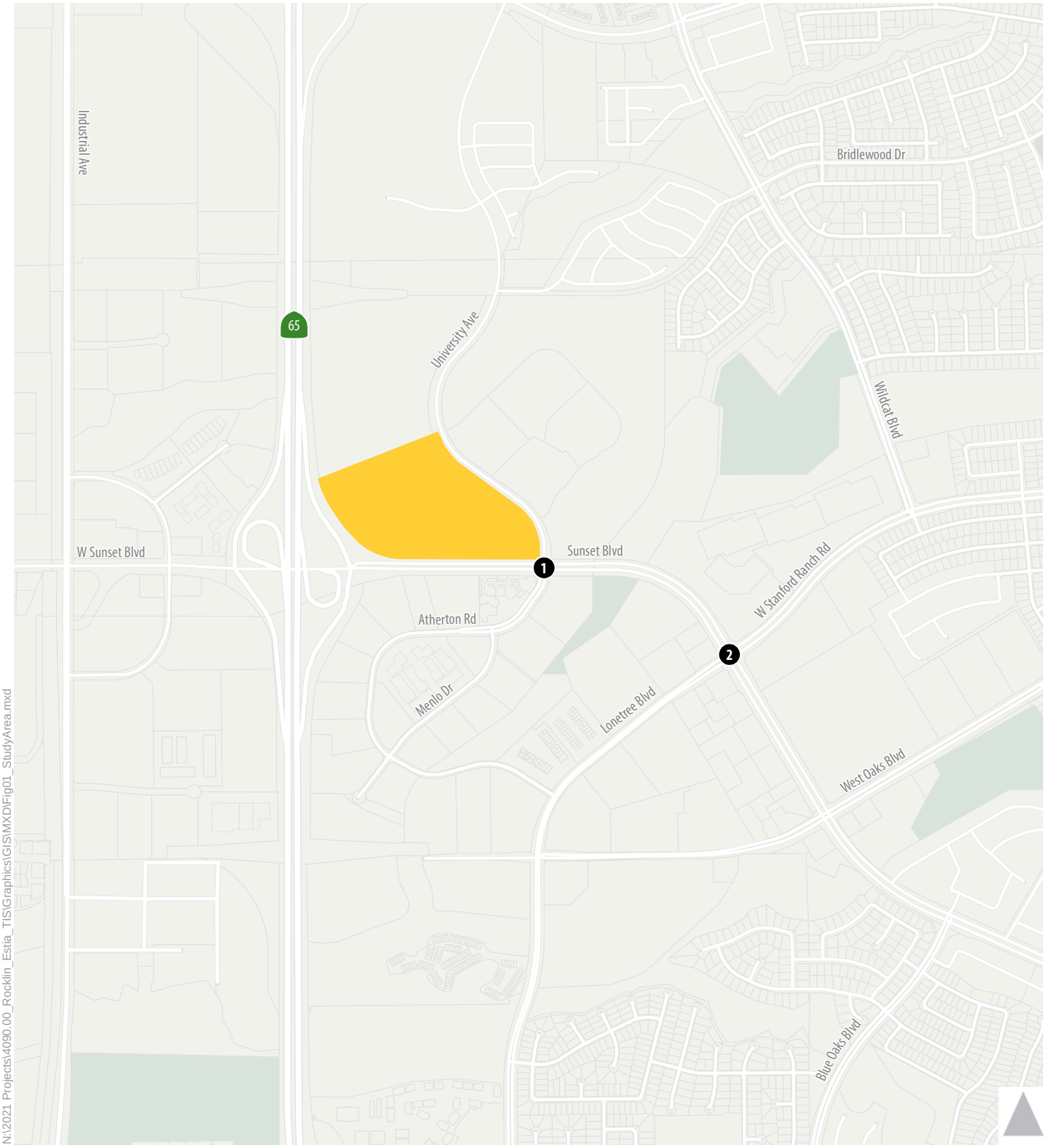
Project Land Use & Access

Figure 2 shows the project site plan and proposed vehicular access points analyzed for this transportation impact study. The proposed project would consist of multifamily residential and commercial uses.

The site plan indicates 181 multifamily residential dwelling units would cover approximately 20 acres on the north and west sides of the site. A clubhouse, pool, and other outdoor amenities are interior to the residential site near a northern access to University Avenue.

The commercial uses would cover approximately 10 acres at the southeast corner of the site. This study analyzes the following land uses for the commercial site:

- A 70,000 square-foot hotel with 5 levels and 104 rooms
- A 10,000 square-foot daycare facility
- 15,600 square-feet of general commercial retail space
- A 2,500 square-foot fast food restaurant with drive-through window
- A 1,000 square-foot coffee shop with drive-through window and no indoor seating
- A gas station with 16 fueling positions and a 4,500 square-foot convenience store

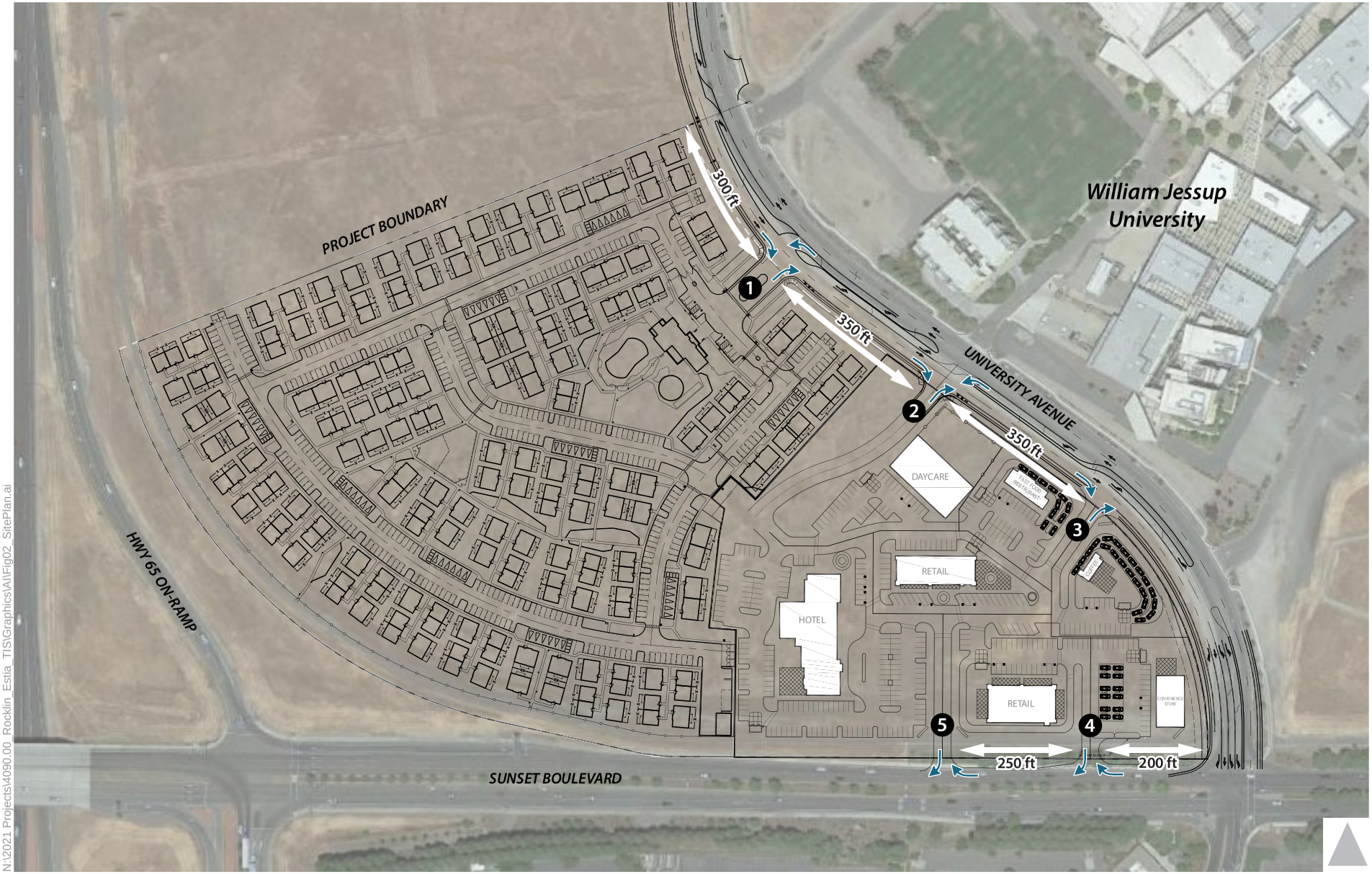


1 Study Intersection

Project Site

Figure 1

Study Area



N:\2021 Projects\4090.00_Rocklin_Estia_TIS\Graphics\AI\Fig02_SitePlan.ai

1 Project Driveway

Permitted Turning Movement

Figure 2

Project Site Plan

It should be noted that the project applicant provided an updated site plan to the City of Rocklin after completion of the traffic analysis. The updated site plan shows several changes to the proposed commercial land uses. For example, the hotel size and number of rooms increased (up to 123 rooms from 104 rooms), a second fast food restaurant with drive-through was added to replace the proposed drive-through coffee shop, and an outdoor food court/biergarten area was added. The evaluation of this updated commercial site plan and land uses is provided as an addendum to this Final Transportation Impact Study. Specifically, the addendum presents the estimated change in vehicle trip generation, and the resulting changes in driveway queues and traffic operations when compared to the commercial land uses analyzed in this final transportation impact study.

This final transportation impact study presents the traffic analysis results that reflect the commercial land uses listed on page 1 and the project site plan shown in **Figure 2.** Chapter III describes the commercial uses analyzed for this study in more detail.

Figure 2 shows the project's proposed vehicular access points and permitted turn movements at each driveway. Below is a description of each proposed project access. This report uses the following project driveway numbering for reference purposes only.

- **Driveway 1:** on University Avenue approximately 350 feet north of Driveway 2. This driveway would serve as the primary access for the multifamily residential site. This driveway is proposed with left-in, right-in, and right-out access, but no left-out access.
- **Driveway 2:** on University Avenue opposite the central driveway into William Jessup University. This driveway would provide access to the commercial site as well as the secondary entrance to the multifamily residential site. This driveway is proposed with left-in, right-in, and right-out access, but no left-out access.
- **Driveway 3:** on University Avenue approximately 350 feet south of Driveway 2 and 550 feet north of Sunset Boulevard. This right-in/right-out driveway would provide access to the commercial site and be located between the proposed fast food restaurant and drive-through coffee shop.
- **Driveway 4:** on Sunset Boulevard approximately 200 feet west of University Avenue. This right-in/right-out driveway would primarily serve the proposed gas station/convenience market and retail building at the southeast corner of the site.
- **Driveway 5:** on Sunset Boulevard approximately 450 feet west of University Avenue. This right-in/right-out driveway would provide access to the commercial site.

Note that all distances shown on **Figure 2** and presented above are approximate distances between driveway or roadway centerlines. Also note that the updated commercial site plan removed Driveway 4 and consolidated access into a single driveway on Sunset Boulevard. The addendum presents the evaluation of this change to project access.

Based on the site plan presented in **Figure 2** and discussions with City staff, this study assumes that the project would improve University Avenue and Sunset Boulevard along the project frontage to meet City standards for arterial roadways and consistent with the ultimate number of travel lanes identified for each

roadway in the Rocklin General Plan Circulation Element. This would include widening University Avenue to include two travel lanes in each direction separated by a raised landscaped median; and dedicating right-of-way along the project's Sunset Boulevard frontage such that curb, gutter, and sidewalk are placed at their ultimate location, which enables Sunset Boulevard to be widened to three lanes in each direction (including a dual eastbound left-turn lane onto University Avenue in the median). In addition, class II (on-street with appropriate striping and pavement markings) bike lanes and public sidewalks would be provided consistent with City standards for arterial roadways. This would include adding class II bike lanes to the southbound (i.e., west) side of University Avenue and maintaining the existing class II bike lanes along westbound (i.e., the north side of) Sunset Boulevard along the project frontage. City standards at arterial intersections along roadways with bus transit service identify a bus pull-out on the far side of intersections (i.e., at the northwest corner of the University Avenue/Atherton Road / Sunset Boulevard intersection for westbound travel). This bus pull-out would be immediately east of Driveway 4 on Sunset Boulevard.

The project site plan in **Figure 2** suggests that the residential area would be fenced and gated. Pedestrian walkways and crosswalks are shown internal to the residential and commercial portions of project site, providing walking paths between buildings. An evaluation of the project access and on-site circulation is provided in chapter VII of this report.

Study Area and Periods

This study analyzes potential transportation and traffic impacts to transportation facilities that would be used by project trips. The study focuses on transportation facilities within the City of Rocklin. Specifically, this study analyzes traffic conditions at the following two study intersections during the weekday AM and PM peak hours (see **Figure 1**).

1. University Avenue/Atherton Road / Sunset Boulevard
2. Sunset Boulevard / Lonetree Boulevard/W. Stanford Ranch Road

These intersections were selected for analysis in consultation with City of Rocklin staff and consider the project's size, location, and generation and spatial distribution of vehicle trips.

Study Scenarios

This study analyzes traffic conditions for the following scenarios:

- Existing Conditions: represents current conditions and the existing setting upon which project-specific impacts are judged.

- Existing Plus Project: represents existing conditions plus the proposed Estia at Rocklin project.

- Existing Plus Approved Projects: represents existing conditions plus approved (but not yet constructed) land development projects in the study area.

- Existing Plus Approved Projects Plus Project: adds the proposed Estia at Rocklin project to the existing plus approved projects scenario.

- Cumulative No Project: represents future (i.e., 2040) conditions, including the completion of reasonably foreseeable land development projects and transportation projects. This includes land development consistent with the current Rocklin General Plan (assumes the project site would remain vacant). This scenario also includes land development in adjacent communities (i.e., Roseville, Lincoln, Placer County, etc.) according to approved land use plans in those jurisdictions.

- Cumulative Plus Project: represents cumulative no project conditions plus the proposed Estia at Rocklin project.

Standards of Significance

Policy Considerations

Policy C-10 of the *City of Rocklin General Plan Circulation Element* (2012) states the following:

A. Maintain a minimum traffic Level of Service "C" for all signalized intersections during the PM peak hour on an average weekday, except in the circumstances described in C-10.B and C. below.

B. Recognizing that some signalized intersections within the City serve and are impacted by development located in adjacent jurisdictions, and that these impacts are outside the control of the City, a development project which is determined to result in a Level of Service worse than "C" may be approved, if the approving body finds (1) the diminished level of service is an interim situation which will be alleviated by the implementation of planned improvements or (2) based on the specific circumstances described in Section C. below, there are no feasible street improvements that will improve the Level of Service to "C" or better as set forward in the Action Plan for the Circulation Element.

C. All development in another jurisdiction outside of Rocklin's control which creates traffic impacts in Rocklin should be required to construct all mitigation necessary in order to maintain a LOS C in Rocklin unless the mitigation is determined to be infeasible by the Rocklin City Council. The standard for determining the feasibility of the mitigation would be whether or not the improvements create unusual economic, legal, social, technological, physical or other similar burdens and considerations".

This report does not identify significant intersection LOS impacts and mitigation measures for those impacts per se. Instead, it identifies the intersection's operating goal (per the Rocklin General Plan LOS

policy), and then determines whether operations are acceptable or deficient for all analysis scenarios. At both study intersections, deficiencies are only identified for PM peak hour conditions because the General Plan LOS policy pertains to this time period (and not the AM peak hour).

The *City of Rocklin General Plan Circulation Element* (2012) also includes the following relevant policies for transit, trails, bikeways, and pedestrian ways:

- Policy C-50: Work with transit providers to plan, fund and implement additional transit services that are cost-effective and responsive to existing and future transit demand.
- Policy C-55: Require Class II bike lanes in the design and construction of major new streets and to establish bike lanes on those City streets wide enough to accommodate bicycles safely.
- Policy C-59: Promote pedestrian convenience and recreational opportunities through development conditions requiring sidewalks, walking paths, or hiking trails connecting various land uses including residential areas, commercial areas, schools, parks, employment centers and open space.

Thresholds of Significance

Section 15064.3 of the CEQA Guidelines specify that a project's effect on automobile delay is no longer a consideration when identifying a significant impact; therefore, the impact of the project on delay-based traffic operations is not addressed in this study. However, LOS is reported to evaluate the project's consistency with Policy C-10 of the *City of Rocklin General Plan Circulation Element* (2012) pertaining to intersection LOS.

With respect to non-auto travel modes, a significant impact would occur if the project would:

1. Disrupt or interfere with existing or planned bicycle or pedestrian facilities.
2. Disrupt or interfere with existing or planned transit facilities or services.
3. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
4. Result in inadequate emergency access.

This study refers to the *Rocklin Parks and Trails Master Plan* (2017) to identify planned bicycle and pedestrian facilities and review whether the project would affect any planned facilities. It also considers Policy C-50, C-55, and C-59 when reviewing potential project impacts to transit, bicycle, and pedestrian travel.

Analysis Methodologies

This study analyzes traffic operating conditions using level of service (LOS) as the primary measure of operational performance. Vehicle LOS is a qualitative measure of traffic flow from the perspective of motorists and is an indication of the comfort and convenience associated with driving.

Signalized Intersections

Page 4.4-38 of the *City of Rocklin General Plan Update DEIR* (2011) identifies the need to analyze signalized intersections in the City using the *Interim Materials on Highway Capacity – Circular 212* (Transportation Research Board, 1980) methodology. As part of an ongoing update to its Circulation Element, the City is migrating away from 'Circular 212' to use the state-of-the-practice *Highway Capacity Manual* (HCM) methodology. Therefore, this study analyzes both study intersections using the Circular 212 methodology in addition to HCM methods. Appendix A presents the Circular 212 results for all scenarios.

At signalized intersections, the HCM methodology determines LOS by the average control delay per vehicle experienced by all motorists travelling through the intersection, as described in Volume 3 of the HCM, 6th Edition (Transportation Research Board, 2016). This study analyzes traffic operations at signalized intersections using the procedures described in Chapter 19 of the HCM 6th Edition. Signalized intersection LOS is based on the weighted average control delay measured in seconds per vehicle for the overall intersection. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration.

Table 1 presents the volume-to-capacity (v/c) ratio ranges using Circular 212 and the HCM-based delay ranges for each LOS category for signalized intersections. The body of this report includes the HCM-based analysis results, which are described in detail below.

The study analyzes traffic operations at study intersections using the PTV Vistro traffic engineering software and Synchro 11 traffic operations software program. The PTV Vistro traffic engineering software uses the peak hour traffic volumes, lane configurations, and signal phasing to calculate the volume-to-capacity ratio using the Circular 212 methodology.

Synchro 11 software applies the methodologies presented in the HCM 6th Edition. The program considers peak hour traffic volumes, lane configurations, signal timings, signal coordination, and other pertinent parameters of intersection operations.

Table 1: Level of Service Thresholds – Signalized Intersections

Level of Service	Circular 212	Highway Capacity Manual (HCM)	
	Volume-to-Capacity (V/C) Ratio	Description	Average Control Delay (seconds per vehicle)[1]
A	≤ 0.60	Volume-to-capacity ratio is low and either progression is exceptionally favorable or cycle length is very short. Most vehicles arrive during the green phase and travel through the intersection without stopping.	≤ 10 sec/veh
B	0.61 – 0.70	Volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.	> 10 to 20 sec/veh
C	0.71 – 0.80	Progression is favorable or the cycle length is moderate. Individual cycle failures (i.e., one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle) may begin to appear at this level. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.	> 20 to 35 sec/veh
D	0.81 – 0.90	Volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.	> 35 to 55 sec/veh
E	0.91 – 1.00	Volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.	> 55 to 80 sec/veh
F	> 1.0	Volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.	> 80 sec/veh

Notes:

1. Control delay values rounded to the nearest second and evaluated for LOS based on the above thresholds (i.e., 10 seconds per vehicle = LOS A).

Source: Transportation Research Board, 1980. Interim Materials on Highway Capacity – Circular 212.
Transportation Research Board, 2016. Highway Capacity Manual, 6th Edition.

Traffic Forecasting

This study utilizes the City of Rocklin travel demand model to forecast traffic volumes in the study area. A travel demand model is a computer program that forecasts traffic levels and travel patterns for a specific geographic area. The City of Rocklin travel model is run in Citilabs Cube software and consists of input files that summarize the area's land use and roadway network. The output includes projections of traffic volumes on major roads and peak hour turning movements at key intersections.

The City of Rocklin travel demand model includes a base year model that represents 2016 conditions and a future year model that represents build out of the Rocklin General Plan (roughly corresponding to Year

2040 conditions). This study updated the 2016 base year model to include land development and transportation network improvements that has occurred in the immediate study area since 2016. This includes:

- Recent development in northwest Rocklin, such as single family residential neighborhoods in Whitney Ranch and along the University Avenue corridor;
- The Whitney Ranch Parkway westerly extension and partial interchange at SR 65;
- The Whitney Ranch Parkway easterly extension and connection to Park Drive at Whitney Oaks Drive, which recently opened in May 2021.

This study uses the City of Rocklin travel demand model to prepare traffic forecasts for several scenarios. These applications and associated modifications to the travel demand model are noted in the appropriate chapters in this report.

II. Existing Conditions

This chapter describes the existing transportation system including the roadway, bicycle, pedestrian, and transit systems within the study area.

Roadway System

Vehicular access to the project site would be provided by University Avenue and Sunset Boulevard. Regional access to the project is provided by State Route 65 (SR 65), which is a four-lane freeway within the study area. SR 65 has an interchange at Sunset Boulevard immediately to the southwest of the project site and a partial interchange at Whitney Ranch Parkway approximately one mile north of the project site. The key arterial and collector roadways in the study area are described below.

Sunset Boulevard is an arterial roadway that travels from Foothills Boulevard North at its western terminus to Woodside Drive (just east of Pacific Street) at its eastern terminus. It features a full interchange with SR 65 immediately southwest of the project site. It generally has three travel lanes in each direction separated by a raised landscaped median, except along the project frontage and immediately east of the University Avenue/Atherton Road intersection, where it has two travel lanes in each direction. It has a posted speed limit of 45 miles per hour (MPH). The Rocklin General Plan Circulation Element indicates that Sunset Boulevard will ultimately be widened to six lanes (three travel lanes in each direction) between SR 65 and Lonetree Boulevard.

University Avenue is a north-south arterial roadway that extends from Sunset Boulevard north to West Ranch View Drive in northwest Rocklin. Along the project frontage, it is a two-lane roadway with a center two-way left-turn lane (TWLTL) and a posted speed limit 40 MPH. North of the project site, it widens to two travel lanes in each direction separated by a raised landscaped median. The Rocklin General Plan Circulation Element indicates that University Avenue will ultimately be widened to four lanes (two travel lanes in each direction) for its entire length. The segment of University Avenue along the project frontage includes both horizontal and vertical curvature, which are discussed in more detail later.

Atherton Road is a two-lane collector roadway that primarily travels through the Atherton Tech Center in northwest Rocklin. It winds through the business park campus connecting to Sunset Boulevard at the north and Lonetree Boulevard at the south. It has a posted speed limit of 25 MPH.

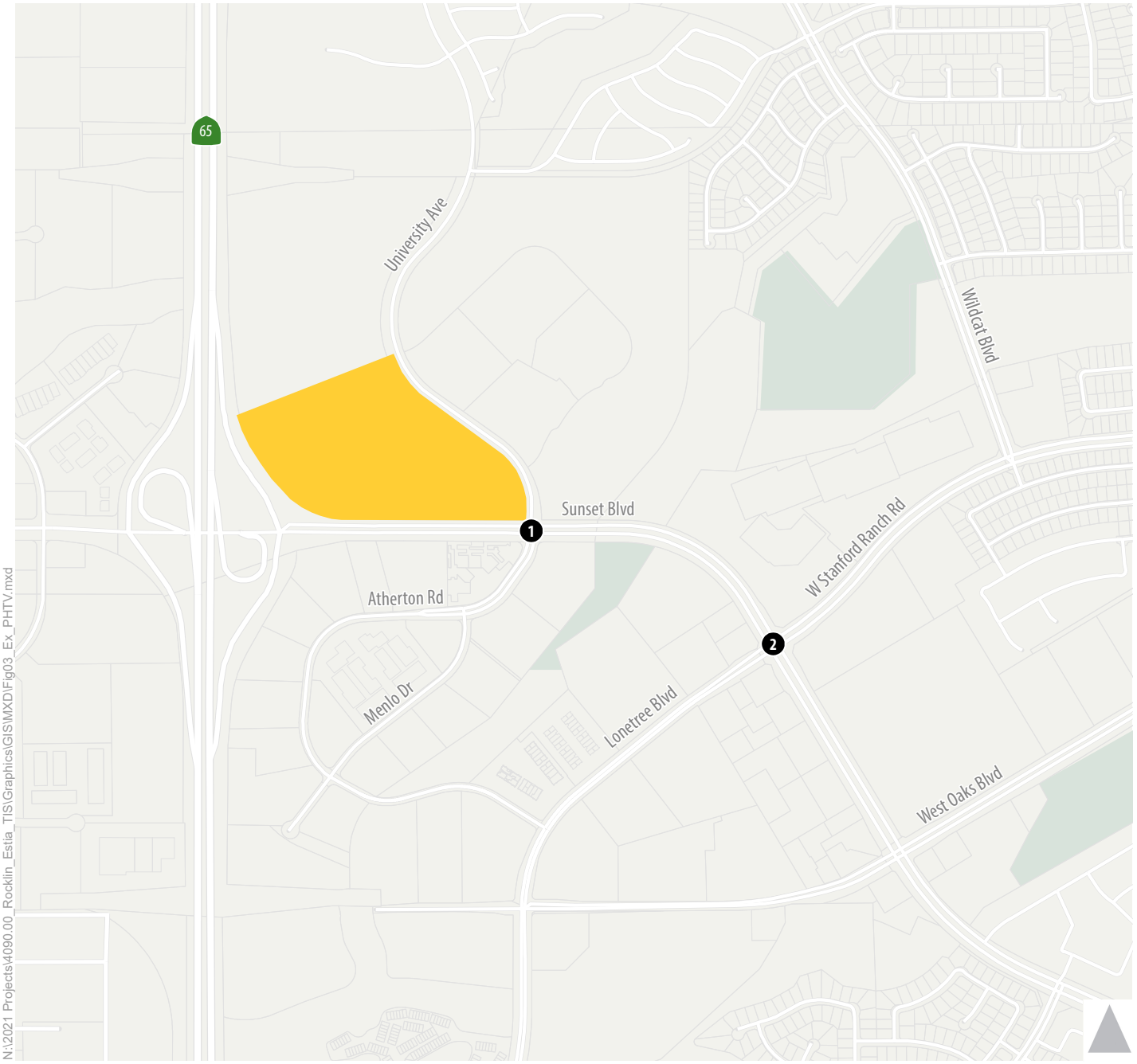
Peak Hour Traffic Volumes

Traffic counts were collected at the two study intersections on Wednesday, September 15, 2021. Schools were operating with in-person instruction at the time of the counts and typical traffic conditions were observed. **Appendix B** provides the traffic count data sheets.

The September 2021 traffic counts were compared to traffic counts collected at the study intersections in September 2016, which are the most recently available traffic counts prior to the COVID-19 pandemic. Generally, the September 2021 traffic counts were comparable to or higher than the September 2016 traffic counts with one exception. Peak commute traffic volumes to and from the Atherton Tech Center at the University Avenue/Atherton Drive/Sunset Boulevard intersection were about 20 to 45 percent lower (depending on the peak hour) in 2021 compared to 2016. In addition, eastbound (AM peak hour only) and westbound (PM peak hour only) traffic volumes on Sunset Boulevard at the University Avenue/ Atherton Drive intersection were similarly 20 to 30 percent lower in 2021.

Since the Atherton Tech Center and area on Sunset Boulevard between Atherton Drive and Lonetree Boulevard features many office buildings, it is likely these buildings were generating fewer trips in September 2021 due to increased teleworking in response to the on-going COVID-19 pandemic. These office buildings may eventually return to generating similar peak hour traffic volumes as more workers return to their offices in the future. Therefore, this study uses the higher September 2016 AM and PM peak hour traffic volumes at the Sunset Boulevard / University Avenue/Atherton Road intersection for peak commute pattern movements on Sunset Boulevard and to/from the Atherton Tech Center. The September 2021 traffic counts are used for all other movements (i.e., to/from the north on University Avenue and non-commute pattern movements) at the University Avenue/Atherton Drive/Sunset Boulevard intersection and the Sunset Boulevard / Lonetree Boulevard/West Stanford Ranch Road study intersection.

Figure 3 presents the existing weekday AM and PM peak hour traffic volumes, lane configurations, and traffic controls at each study intersection.



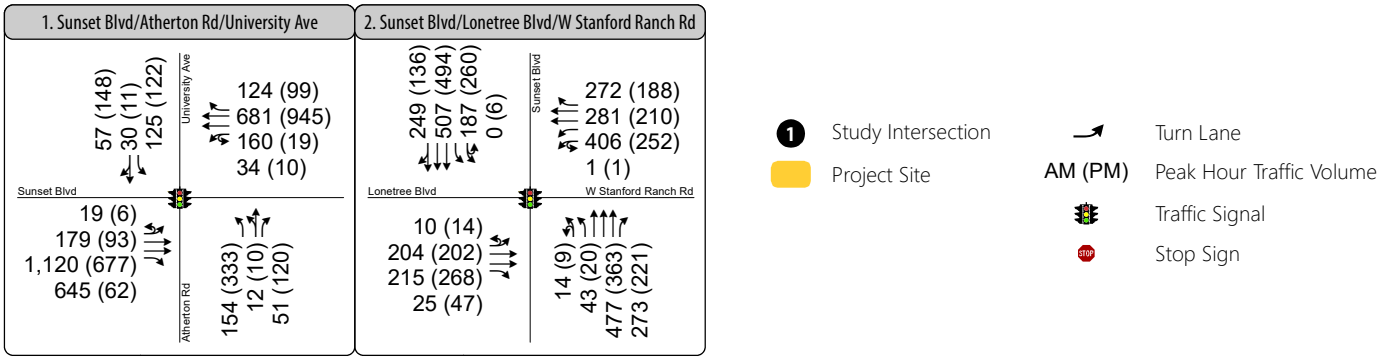


Figure 3

Peak Hour Traffic Volumes and Lane Configurations - Existing Conditions

Intersection Operations

Table 2 presents the existing weekday AM and PM peak hour traffic operations analysis results at the study intersections (refer to **Appendix B** for detailed calculations). This table shows that both study intersections operate at LOS C or better during the weekday AM and PM peak hours.

Table 2: Peak Hour Intersection Operations – Existing Conditions

Intersection	Traffic Control	Peak Hour	Existing Conditions	
			Delay[1]	LOS[2]
1. University Ave./Atherton Rd. / Sunset Blvd.	Signal	AM	26	C
		PM	21	C
2. Sunset Blvd. / Lonetree Blvd./W. Stanford Ranch Rd.	Signal	AM	23	C
		PM	20	C

Notes:

1. Average control delay (rounded to nearest second) for signalized intersections is the weighted average for all movements.
2. LOS = level of service

Source: Fehr & Peers, 2022.

The Circular 212 results shown in Appendix A indicate that both study intersections operate at LOS A or LOS B during the weekday AM and PM peak hours under existing conditions. The HCM and Circular 212 methodologies are known to generate different results for several reasons. Whereas HCM reflects conditions during the busiest 15-minutes of the peak hour, Circular 212 results represent hourly conditions. Other factors that explain differences relate to the more operational nature of the HCM methods versus the planning-level nature of Circular 212. HCM results are considered more accurate.

Bicycle and Pedestrian System

Figure 4 displays the existing pedestrian and bicycle facilities located near the project site. As shown, Class II bike lane facilities (designated on-street bikeways with appropriate signing and striping) exist on Sunset Boulevard and the northbound (east) side of University Avenue.

Figure 4 shows that sidewalks are generally present along Sunset Boulevard and along the east side of University Avenue. However, sidewalks are not present along the west side of University Avenue (i.e., along the project frontage); and the sidewalks along both sides of Sunset Boulevard end about 100 feet west of the University Avenue/Atherton Road intersection. The sidewalk on the north side of Sunset Boulevard similarly ends about 400 feet east of the University Avenue/Atherton Road intersection, leaving a gap between the University Avenue sidewalk and the existing bus stop on westbound Sunset Boulevard east of the intersection. However, there is a paved utility path that runs parallel to Sunset Boulevard that pedestrians could use to travel most of the distance between University Avenue and the existing bus stop.

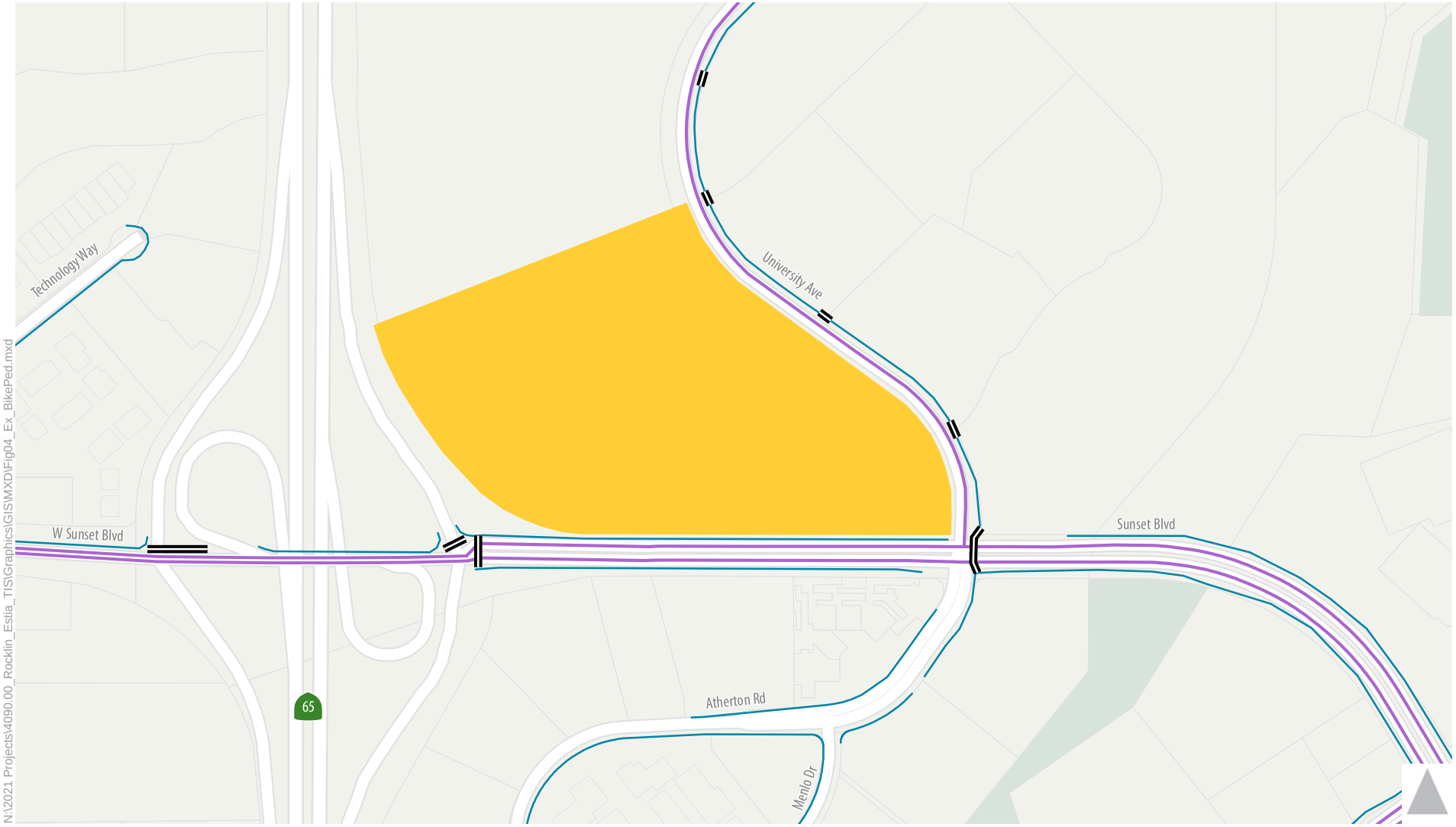


Figure 4

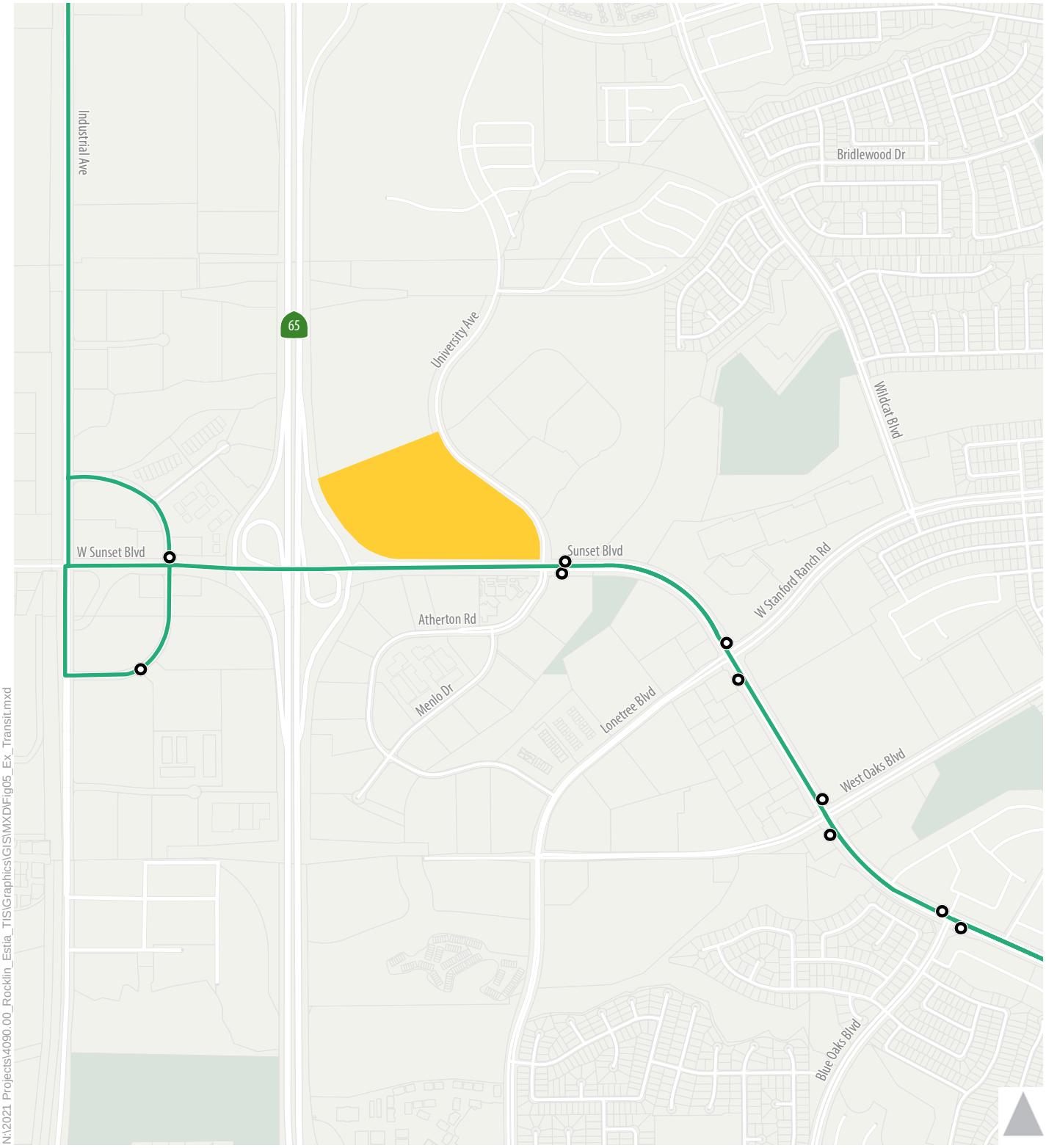
Existing Bicycle and Pedestrian Network

Figure 4 shows a marked crosswalk across the east leg of the University Avenue/Atherton Road / Sunset Boulevard intersection. This crosswalk has pedestrian heads and push buttons to facilitate north-south pedestrian travel across the intersection. However, there are no marked crosswalks or pedestrian heads for east-west pedestrian travel at this intersection (and no receiving curb ramp or sidewalk at the northwest or southwest corners). The east-west sidewalk gaps immediately surrounding the intersection and lack of pedestrian facilities (i.e., no marked crosswalk, pedestrian heads/push buttons, etc.) at the traffic signal creates a notable gap in facilities to serve those walking east-west along Sunset Boulevard.

Transit System

Transit service in the area is provided by Placer County Transit. **Figure 5** displays the fixed route transit service provided in the study area. As shown in **Figure 5**, the closest transit stops are located along Sunset Boulevard immediately east of University Avenue. These stops are marked by signage but do not have full turnouts for passenger boarding/alighting, or benches or shelters for waiting passengers. The stops are served by Placer County Transit Route 20 fixed route bus service, which generally serves Lincoln and Rocklin. Some destinations along Route 20 include the Twelve Bridges Library and Thunder Valley Casino to the north, and the Westfield Galleria at Roseville mall (transfer point to multiple other transit routes), Rocklin Commons and Rocklin Crossings shopping centers, and Sierra College campus to the south and east. The service generally operates on one-hour headways Monday through Saturday.

The project area is also served by the Rocklin/Loomis Dial-a-Ride demand-response transit service. Since April 2020, the Rocklin/Loomis Dial-a-Ride service operates Monday through Friday from 6 AM to 6 PM and on Saturday from 9 AM to 4 PM. The Dial-a-Ride service area generally covers the City of Lincoln, City of Rocklin, and Town of Loomis. To request a ride, users must call the South Placer Transit Information Center at least a day before the desired trip time.



Bus Stop

Placer County Transit (Sierra College - Lincoln Route)

Project Site

Figure 5

Existing Transit Service

III. Existing Plus Project

This chapter describes the project's travel characteristics and evaluates the proposed project's transportation impacts under existing conditions.

Trip Generation

For analysis purposes, the proposed project was assumed to consist of 181 multifamily residential dwelling units and the following commercial land uses:

- A 70,000 square-foot hotel with 5 levels and 104 rooms
- A 10,000 square-foot daycare facility
- 15,600 square feet of general commercial retail space
- A 2,500 square-foot fast food restaurant with drive-through window
- A 1,000 square-foot coffee shop with drive-through window and no indoor seating
- A gas station with 16 fueling positions and a 4,500 square-foot convenience store

As noted previously, the project applicant provided an updated site plan that shows several changes to the above commercial land uses. An addendum to this final Transportation Impact Study report provides an evaluation of this updated commercial site plan and land uses.

The project applicant did not identify specific commercial tenants associated with the project programming. Therefore, this study generally applies trip generation data contained in the *Trip Generation Manual, 10th Edition* (Institute of Transportation Engineers, 2017) to estimate the project's vehicle trip generation (unless otherwise noted). This method presumes that the project's commercial tenants, particularly for the fast-food pad, would generate vehicle trips consistent with typical uses (i.e., not unique, ultra-popular brands such as In-N-Out Burger, Chick-Fil-A, or Raising Canes that generate trips at higher rates). If unique, ultra-popular uses are proposed, the City may require supplemental traffic analysis to confirm the findings in this study are still applicable.

Table 3 presents the estimated daily, AM peak hour, and PM peak hour vehicle trip generation for the proposed project as analyzed in this transportation impact study. **Table 3** shows the gross vehicle trip generation (i.e., the total number of trips that would travel to/from the project site), the amount of "pass-by" trips to the site, internal trip capture, and the net new external vehicle trips generated by the project. As shown, the project would generate approximately 9,545 gross daily vehicle trips, 930 gross AM peak hour vehicle trips, and 880 gross PM peak hour vehicle trips. After accounting for pass-by trips that are already on the transportation network and internal trip capture, the project is estimated to generate approximately 5,591 net new daily vehicle trips, 468 net new AM peak hour vehicle trips, and 482 net new PM peak hour vehicle trips.

Table 3: Estia at Rocklin Vehicle Trip Generation Estimate

ITE Land Use (Code)	Units	Vehicle Trip Generation Estimate						
		Daily	AM Peak Hour			PM Peak Hour		
		Total	Total	In	Out	Total	In	Out
Multifamily Housing (Low-Rise) (220)[1]	181 DUs	1,328	84	19	65	100	63	37
Hotel (310)[1]	104 Rooms	869	49	29	20	62	32	30
Daycare (565)[1]	10.0 KSF	476	110	58	52	111	52	59
Retail (820)[1]	15.6 KSF	589	15	9	6	59	28	31
Fast Food with Drive-Through (934)[1]	2.5 KSF	1,177	100	51	49	82	43	39
Coffee Shop with Drive-Through[2]	N/A	1,512	122	61	61	98	49	49
Gas Station with Convenience Market (960)	16 Fueling Positions	3,688	450	225	225	368	184	184
Total Gross Trip Generation[3]		9,639	930	452	478	880	451	429
Pass-by Trips[4]		3,745	406	203	203	324	162	162
Internal Trip Capture[5]		264	56	28	28	74	37	37
Net New External Project Trips[6]		**5,630**	**468**	**221**	**247**	**482**	**252**	**230**

Notes:

DUs = dwelling units

KSF = thousand square feet

1. Vehicle trip generation estimate calculated using trip generation fitted curve equations or average rates obtained from *Trip Generation Manual, 10th Edition* (Institute of Transportation Engineers, 2017). See discussion below for explanation.
2. Vehicle trip generation estimate for the coffee shop with drive-through calculated using the average inbound trip data collected in November 2020 at two Dutch Bros drive through coffee shops in Roseville, CA.
3. Gross trip generation = total trips to/from the project site.
4. Pass-by trips = existing trips on adjacent roadways that would access the project en route to their primary destination. Estimated using the average pass-by percentages contained in the ITE *Trip Generation Handbook, 3rd Edition*:
   Retail (820): 17% Daily and AM peak hour, 34% PM peak hour
   Fast-food with drive-through (934): 49% Daily & AM peak hour, 50% PM peak hour
   Gas station with convenience market (945): 59% Daily, 62% AM peak hour, 56% PM peak hour
5. Internal trip capture = trips that remain internal to the project site. Estimated using the MXD+ mixed-use development trip generation model. Daily: 2.8%; AM Peak Hour: 6.0%, PM Peak Hour: 8.4%
6. Net new trips = Gross trip generation – pass-by trips – internal trip capture. Reflects the number of new trips added to the transportation network by the proposed project.

Source: Fehr & Peers, 2022.

Table 3 shows that the project trip generation estimate uses inbound trip generation counts at two Dutch Bros coffee locations in Roseville to estimate the trip generation for the proposed coffee shop with drive-through. A review of the *Trip Generation Manual* data for coffee shop with drive-through and no indoor seating (ITE code 938) showed the national ITE data was substantially lower than the locally collected

Dutch Bros. data. The trip generation data at the Dutch Bros. Roseville locations is provided in **Appendix C**.

The trip generation data at the Dutch Bros. Roseville locations was collected from 7 AM to 7 PM. The study identified the highest hourly volume between 7 AM and 9 AM to determine the weekday AM peak hour vehicle trip generation; and the highest hourly volume between 4 PM and 6 PM to determine the weekday PM peak hour vehicle trip generation. The operating hours of these Dutch Bros. locations were 5 AM to 11 PM. This study assumes that 75 percent of daily trips occurred between 7 AM and 7 PM since these hours are likely busier than the beginning and end of the operating day.

Pass-by trips are estimated using the average pass-by percentages contained in the ITE *Trip Generation Handbook, 3rd Edition* for most commercial uses (i.e., commercial retail, fast food with drive through, gas station with convenience market). The *Trip Generation Handbook* pass-by data for coffee shop with drive-through window and no indoor seating was collected in the 1990s and appears overly aggressive (90 to 98 percent for the weekday AM and PM peak periods) to apply to current-day drive-through coffee shop operations (i.e., businesses like Dutch Bros. or Starbucks drive-throughs are more likely to be destinations than the small coffee drive-throughs that were more common in the 1990s). However, this study recognizes that many coffee drive-throughs are frequently patronized by vehicles that pass-by on the adjacent roadway. Therefore, this study applies the pass-by percentage for fast-food with drive-through, a similar type of establishment that tends to both be a destination and serve vehicles that pass-by on the adjacent roadway, for the drive-through coffee shop.

Table 3 shows that the vehicle trip generation estimate also accounts for internal trips between complementary land uses within the project (e.g., a trip between the day care and coffee shop; or a trip between the residential and gas station). The internal trip capture is estimated using the MXD+ trip generation model, whose outputs are provided in **Appendix C**. The MXD+ trip generation model forecasts the following amount of project trips would remain internal to the project site: 2.8 percent of daily trips, 6 percent of AM peak hour trips, and 8.4 percent of PM peak hour trips.

The trip generation analysis was completed in September 2021 for use in the air quality analysis prior to the release of the *Trip Generation Manual, 11th Edition*. The 11th Edition rates would have yielded 480 net new AM peak hour vehicle trips and 507 net new PM peak hour vehicle trips. This is 12 more AM peak hour trips and 25 more PM peak hour trips than shown in **Table 3** and used in this analysis. When these added trips are distributed across the project driveways and study intersections, their effect is diminished. Therefore, this minor difference would likely not result in different conclusions than those presented in this study.

Trip Distribution/Assignment

This study estimates the distribution of project trips considering a number of factors, including:

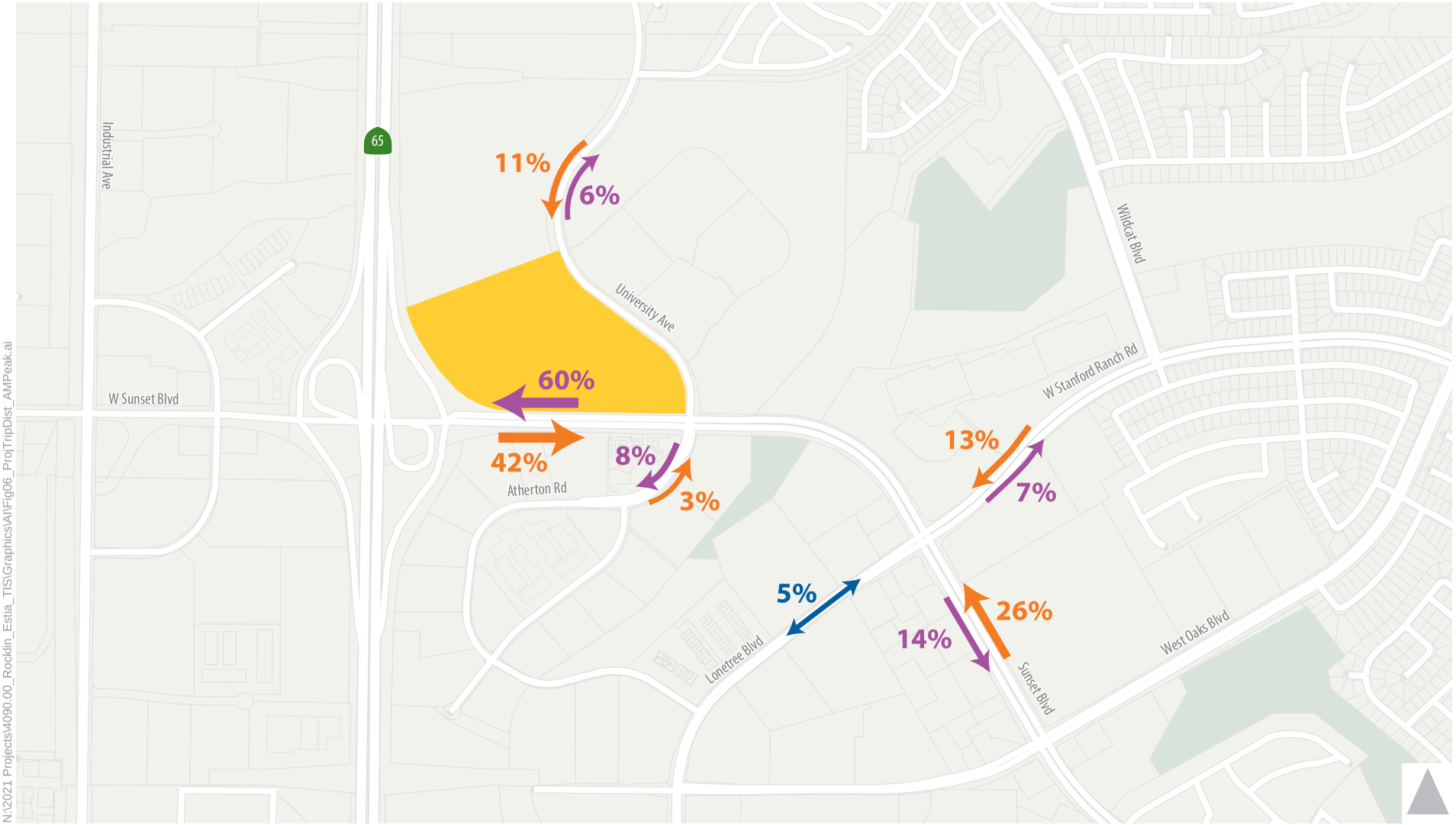
- Project-only traffic assignments from the City of Rocklin travel forecasting model.
- Location of potential destinations for residents, including job centers, shopping, schools, etc.
- Rocklin Unified School District school boundaries for elementary, middle, and high schools.
- Location of potential customers for the commercial uses (e.g., residential distribution in the area, and nearby neighborhoods without access to local neighborhood commercial uses, such as those proposed in the project).

Figure 6 presents the forecasted project trip distribution during the weekday AM peak hour. **Figure 7** presents the forecasted project trip distribution during the weekday PM peak hour.

Figure 6 and **Figure 7** show that about 40 to 60 percent of project trips (depending on peak hour and direction of travel) are forecast to travel to/from the west towards the SR 65 / Sunset Boulevard interchange. These percentages specifically consider the fact that the majority of external peak hour trips would be made by the project's commercial uses. A portion of those external trips would be "diverted link trips", which are made by motorists already on SR 65 that depart the freeway to access the retail uses (and returning to the freeway after shopping).

About 15 to 25 percent (depending on peak hour and direction of travel) would travel to/from the southeast towards the geographic center of Rocklin, Twin Oaks Elementary School, and the surrounding neighborhoods.

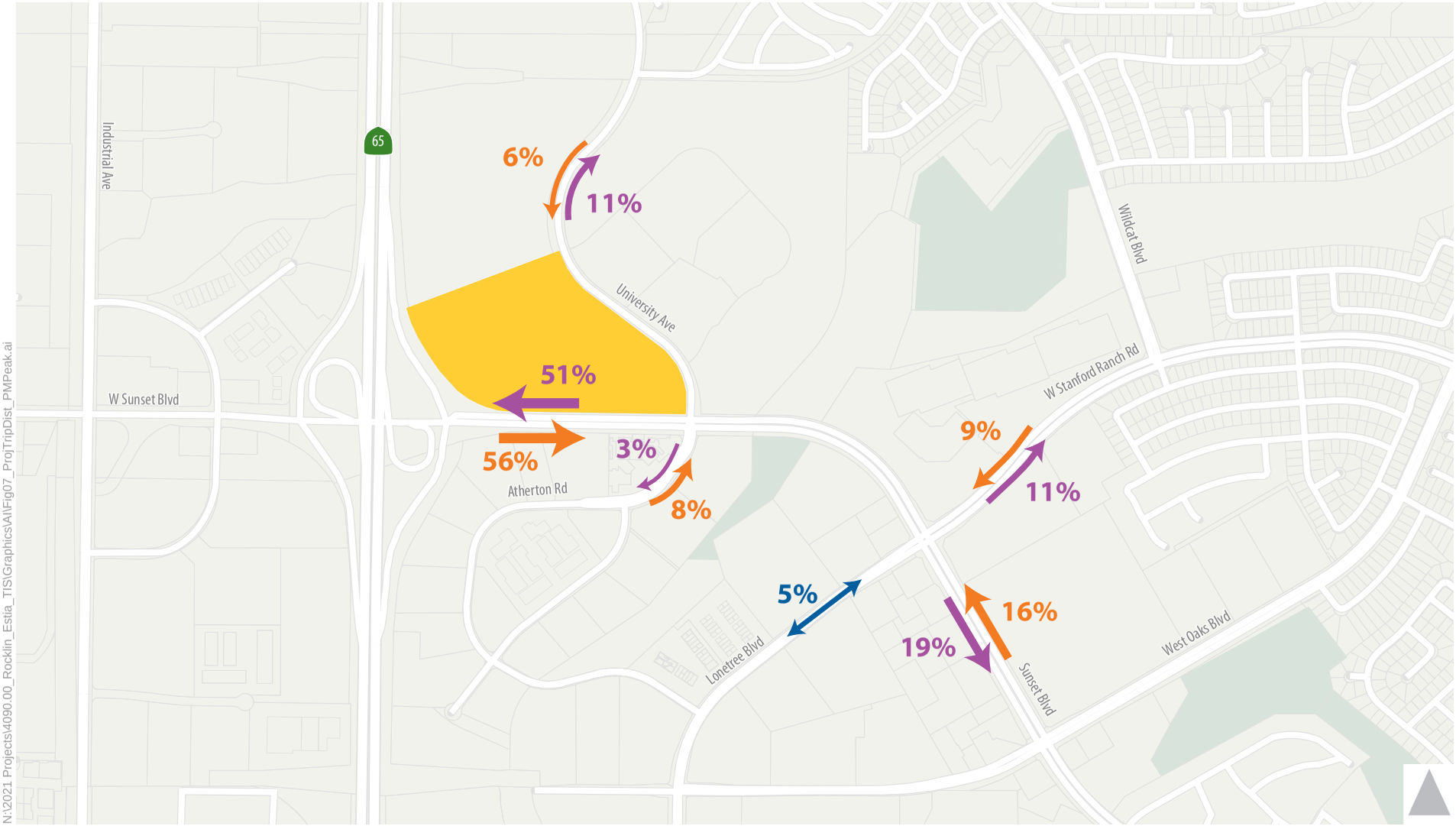
The remaining project trips are expected to travel in a variety of directions where there are complementary land uses such as residential, employment, and schools.



N:\2021 Projects\4090.00_Rocklin_Estia_TIS\Graphics\AI\Fig06_ProjTripDist_AMPeak.ai

Figure 6

Project Trip Distribution - AM Peak Hour



N:\2021 Projects\4090.00_Rocklin_Estia_TIS\Graphics\AI\Fig07_ProjTripDist_PMPeak.ai

Figure 7

Project Trip Distribution - PM Peak Hour

The net new external project vehicle trips are assigned to the study intersections and project driveways in accordance with the trip distribution percentages shown in **Figure 6** and **Figure 7**. The net new project trips are added to the existing volumes to yield initial existing plus project turning movement forecasts.

Pass-by trips are assigned to project driveways based on the existing traffic volumes and travel routes on Sunset Boulevard and University Avenue. **Table 4** presents the pass-by trips that are expected to travel to the proposed project by their direction of travel.

Table 4: Project Pass-By Trips by Direction of Travel

Direction of Travel	Peak Hour	Existing Volume	Pass-by Trips[1]
Westbound on Sunset Boulevard at University Avenue	AM	854	88
	PM	1,284	74
Eastbound on Sunset Boulevard at University Avenue	AM	1,765	61
	PM	739	32
Southbound on University Avenue approaching Sunset Boulevard	AM	212	21
	PM	281	27
Northbound on University Avenue north of Sunset Boulevard[2]	AM	315	33
	PM	202	29

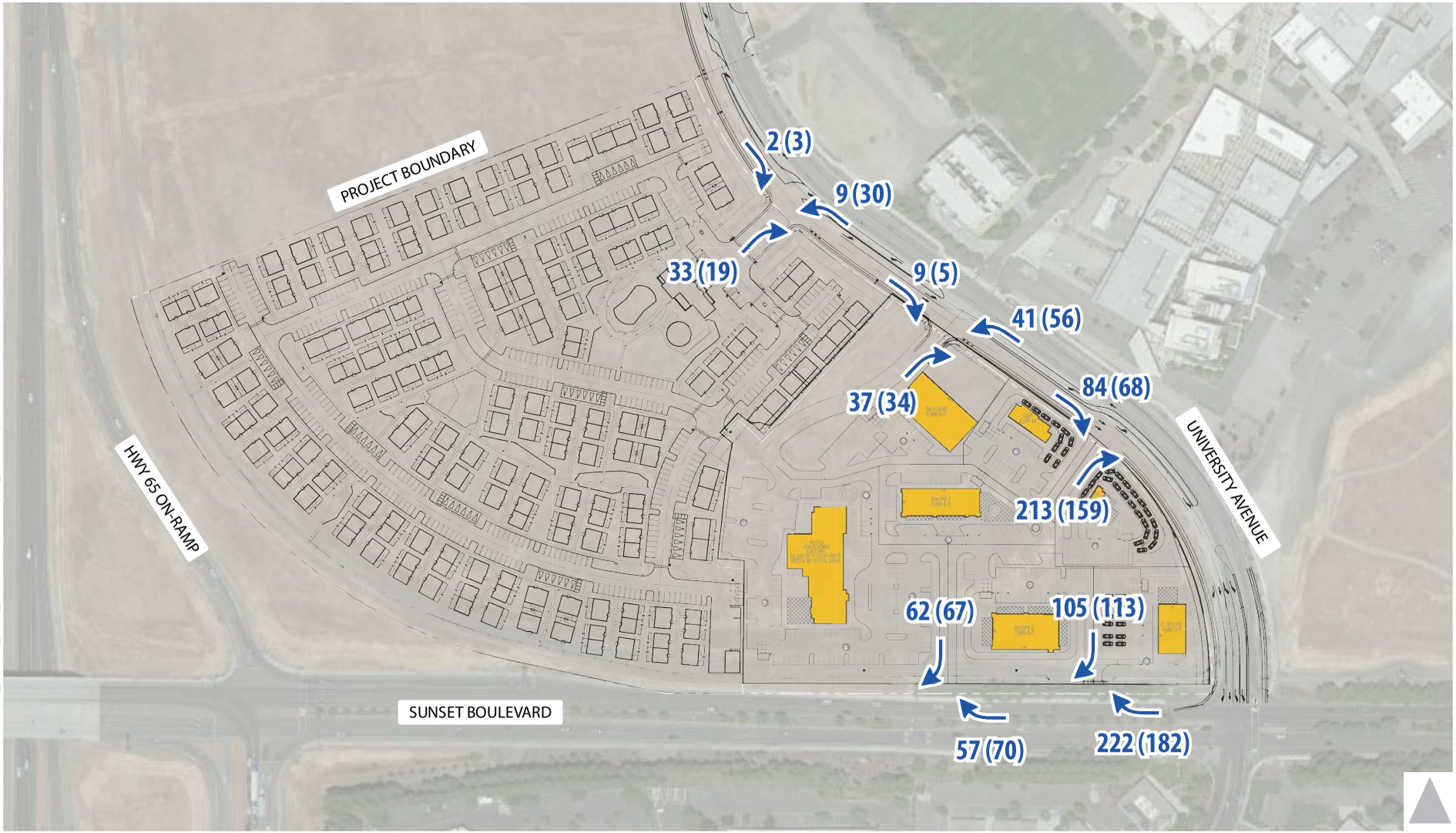
Notes:

1. Pass-by trips calculated by proportional assignment according to existing turning movement volumes at the University Avenue/ Atherton Road / Sunset Boulevard intersection, with slightly greater weighting for the westbound and southbound movements recognizing the relative ease of right-turns into and out of the project site compared to left-ins and left-outs.
2. Higher percentage of pass-by trips on northbound University Avenue largely driven by volume of westbound right-turn movements from Sunset Boulevard onto University Avenue.

Source: Fehr & Peers, 2022.

The project trip assignment also considers the permitted movements at project driveways. For example, project trips leaving the site and traveling to the east are assumed to use the driveways on University Avenue and make a southbound left-turn at the University Avenue / Sunset Boulevard intersection, as the driveways on Sunset Boulevard are right-out (i.e., towards the west) only. Project trips leaving the site and traveling to the north are forced to initially make a right-out movement onto University Avenue. These project trips are assumed to make a U-turn at their first opportunity. For example, a trip leaving Driveway 1 and wanting to head northbound on University Avenue would make a U-turn at the William Jessup University center driveway opposite project Driveway 2. Finally, some trips headed for the commercial uses at the project site from the west (i.e., on eastbound Sunset Boulevard) would make a U-turn at the University Avenue / Sunset Boulevard intersection since there is no direct left-in opportunity at Driveways 4 and 5.

Figure 8 shows the resulting weekday AM and PM peak hour project vehicle trip assignment at the project driveways.



N:\2021 Projects\4090.00_Rocklin_Estia_TIS\Graphics\AI\Fig08_TripAssignment.ai

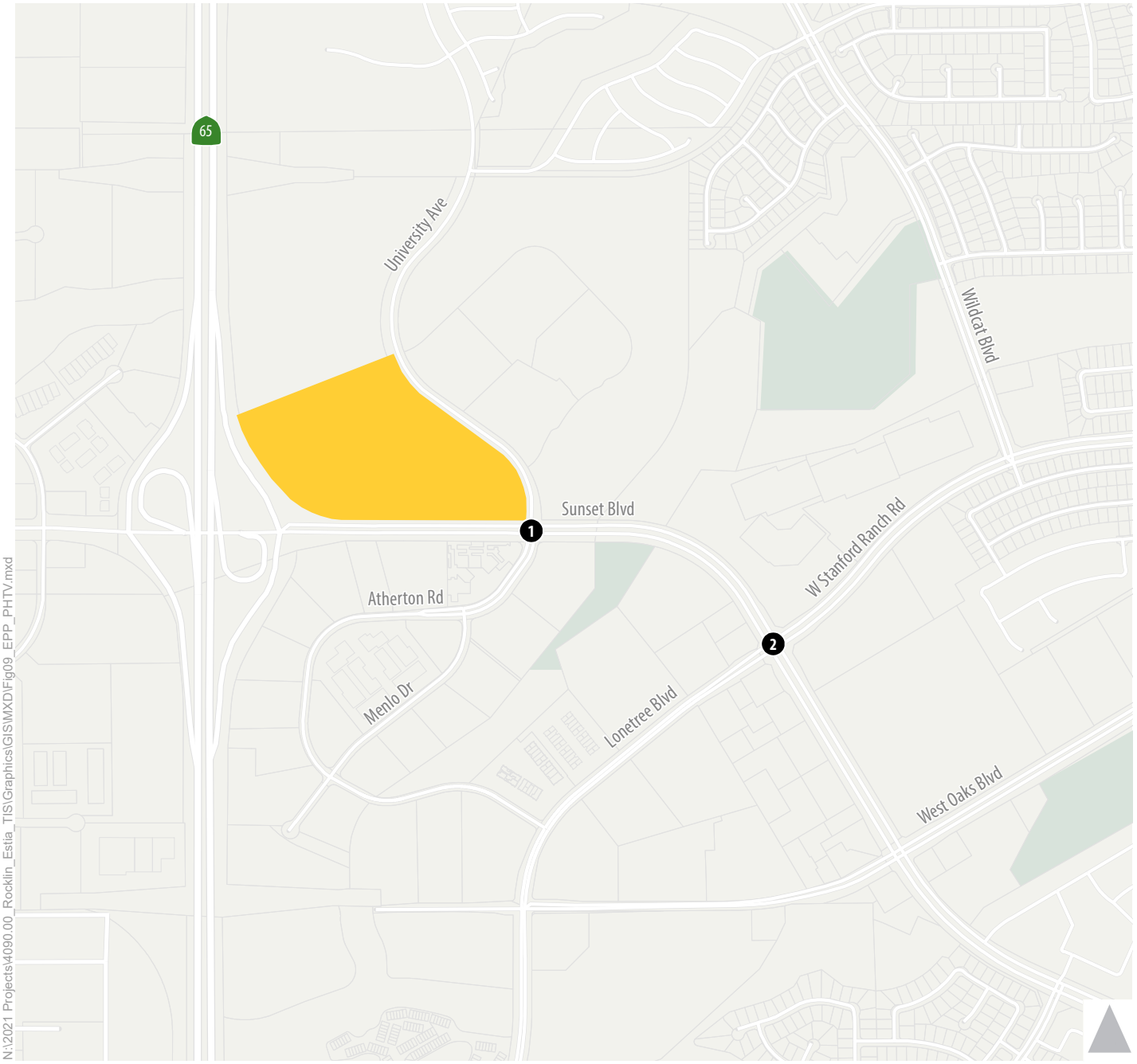
AM (PM) Peak Hour Turning Movement Volume

Permitted Turning Movement

Figure 8

Project Trip Assignment

The routing of pass-by trips causes some changes to the existing volumes at the University Avenue/ Atherton Road / Sunset Boulevard intersection based on permitted turning movements at the project driveways. For example, pass-by trips on eastbound Sunset Boulevard would make a U-turn at the University Avenue/Atherton Road signal to enter the project driveway on Sunset Boulevard, then exit using a driveway on University Avenue and make a southbound left-turn to continue eastbound on Sunset Boulevard. **Figure 9** shows the resulting existing plus project turning movement forecasts at the study intersections.



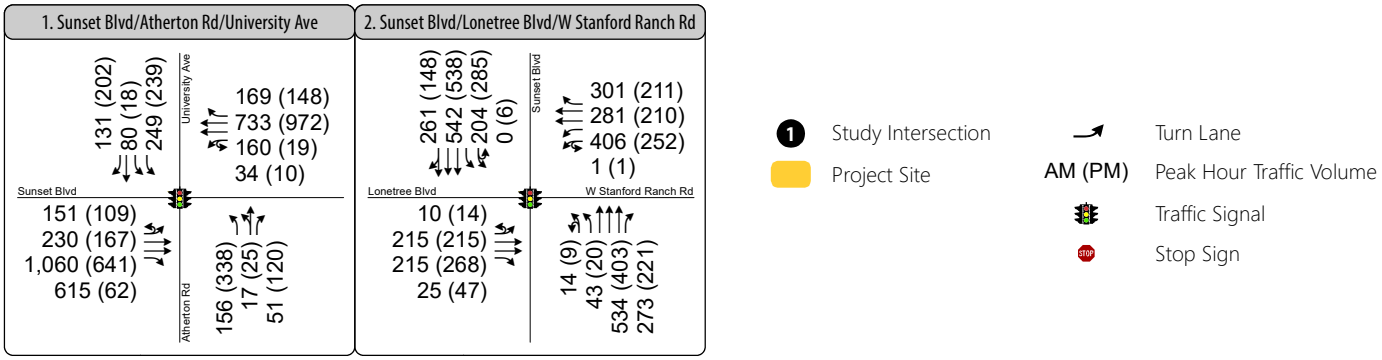


Figure 9

Peak Hour Traffic Volumes and Lane Configurations - Existing Plus Project Conditions

Intersection Operations

Table 5 presents the weekday AM and PM peak hour traffic operations analysis results at the study intersections under existing plus project conditions (refer to **Appendix C** for detailed calculations). This table shows that both study intersections continue to operate at LOS C or better during the weekday AM and PM peak hours.

Table 5: Peak Hour Intersection Operations – Existing Plus Project Conditions

Intersection	Traffic Control	Peak Hour	Existing Conditions		Existing + Project	
			Delay[1]	LOS[2]	Delay[1]	LOS[2]
1. University Ave./Atherton Rd. / Sunset Blvd.	Signal	AM	26	C	28	C
		PM	21	C	25	C
2. Sunset Blvd. / Lonetree Blvd./W. Stanford Ranch Rd.	Signal	AM	23	C	24	C
		PM	20	C	21	C

Notes:

1. Average control delay (rounded to nearest second) for signalized intersections is the weighted average for all movements.
2. LOS = level of service

Source: Fehr & Peers, 2022.

It should be noted that the operations at the University Avenue/Atherton Road / Sunset Boulevard intersection presume that the project would widen University Avenue and Sunset Boulevard along the project frontage. This analysis presumes the northbound, eastbound, and westbound approaches to the intersection would retain their existing lane configurations since the project does not front these approaches. However, the southbound approach on University Avenue would be widened to have two left-turn lanes, a single through lane, and a single right-turn lane. The northbound and southbound approaches would operate with split phasing due to the shared left/through lane on the northbound approach. The westbound departure on Sunset Boulevard would be widened to three travel lanes, though this does not impact LOS calculation since HCM and Circular 212 methodologies do not consider the effects of an additional receiving lane.

The analysis also presumes these changes to the University Avenue/Atherton Road / Sunset Boulevard intersection would prompt the addition of a marked crosswalk along the north leg of the intersection and a pedestrian phase for operating concurrently with the westbound though movement. This would serve east-west pedestrian movements along Sunset Boulevard, and between the proposed project and the surrounding area to the east and south.

The Circular 212 results shown in Appendix A indicate that both study intersections would continue to operate at LOS A or LOS B during the weekday AM and PM peak hour under existing plus project conditions. Appendix A shows that the University Avenue/Atherton Road / Sunset Boulevard intersection

would see a reduction in volume-to-capacity ratio and improvement in LOS in existing plus project conditions. This is the result of additional travel lanes on the southbound approach constructed as part of the project's frontage improvements. As noted in the existing conditions analysis, the HCM and Circular 212 methodologies are known to generate different results for several reasons; and the HCM results are considered more accurate.

IV. Existing Plus Approved Projects

This chapter analyzes the potential impacts of the proposed project under a scenario that considers development of various approved (but not yet constructed) land development projects in the study area.

Approved Projects

City of Rocklin staff provided a list of approved land development projects to include in the "existing plus approved projects" scenario. These projects are comprised of the following types: (1) are approved and under construction, but not yet occupied; or (2) have recently been approved. Since none of these projects were constructed at the time of the traffic counts (in September 2021), their trips are not reflected in the existing volumes. Best efforts were undertaken using date-stamped aerial imagery to estimate how many units were unoccupied at the time of the counts.

Table 6 presents the list of projects that are approved, but not yet constructed. This is not a comprehensive list of all approved projects in the City of Rocklin but represents those projects whose trips may affect traffic volumes at the study intersections.

Table 6: Approved Projects List

Name	Land Use Type/Quantity	Location
West Oaks Townhomes	20 Residential Townhome Units	South side of West Oaks Boulevard, directly east of Kathy Lund Park.
Domum and SDG Headquarters	9,000 SF Office with Integrated Shop	South side of West Oaks Boulevard, approximately 800 feet northeast of Sunset Boulevard.
Stanford Ranch Storage	86,469 SF of storage buildings; 1,200 SF office building; 1,280 SF live-in manager's unit; 239 RV and boat storage spaces	Located at 1440 West Stanford Ranch Road, with access to both West Stanford Ranch Road and West Oaks Boulevard approximately 800 to 1,000 feet northeast of Sunset Boulevard.
James Apartments	118 residential apartment units already constructed; 68 residential apartment units to be constructed.	SW corner of West Oaks Boulevard / Lonetree Boulevard.
Strikes Outdoor Volleyball	Addition of three outdoor sand volleyball courts, bar, restrooms, and outdoor seating	5681 Lonetree Boulevard – south side of Lonetree Boulevard approximately 1,000 feet west of Sunset Boulevard.
Maverik Gas Station	5,637 SF convenience store/gas station with 7 fueling positions	NW corner of Lonetree Boulevard / Sunset Boulevard.
Whitney Ranch Chevron and Gas Station	4,500 SF convenience store/ retail building, gas station with 12 fueling positions, automated car wash with vacuum stations.	SW corner of Wildcat Boulevard / Whitney Ranch Parkway.

Table 6: Approved Projects List

Name	Land Use Type/Quantity	Location
Terracina at Whitney Ranch	288 multifamily residential units	Between Wildcat Boulevard and University Avenue approximately 1,200 feet north of Whitney Ranch Parkway.
Tractor Supply	22,136 SF retail store with 12,308 SF of outdoor storage; 4,000 SF retail/restaurant pad	South side of Lonetree Boulevard approximately 250 feet west of Sunset Boulevard.
Whitney Ranch Single Family Developments	Approximately 500 additional single family residential units	Along Whitney Ranch Parkway generally between Old Ranch House Road and Whitney Oaks Drive.

Notes:

List of approved but not yet constructed/occupied projects whose trips may have an effect on traffic volumes at the study intersections provided by City of Rocklin staff via email on September 22, 2021.

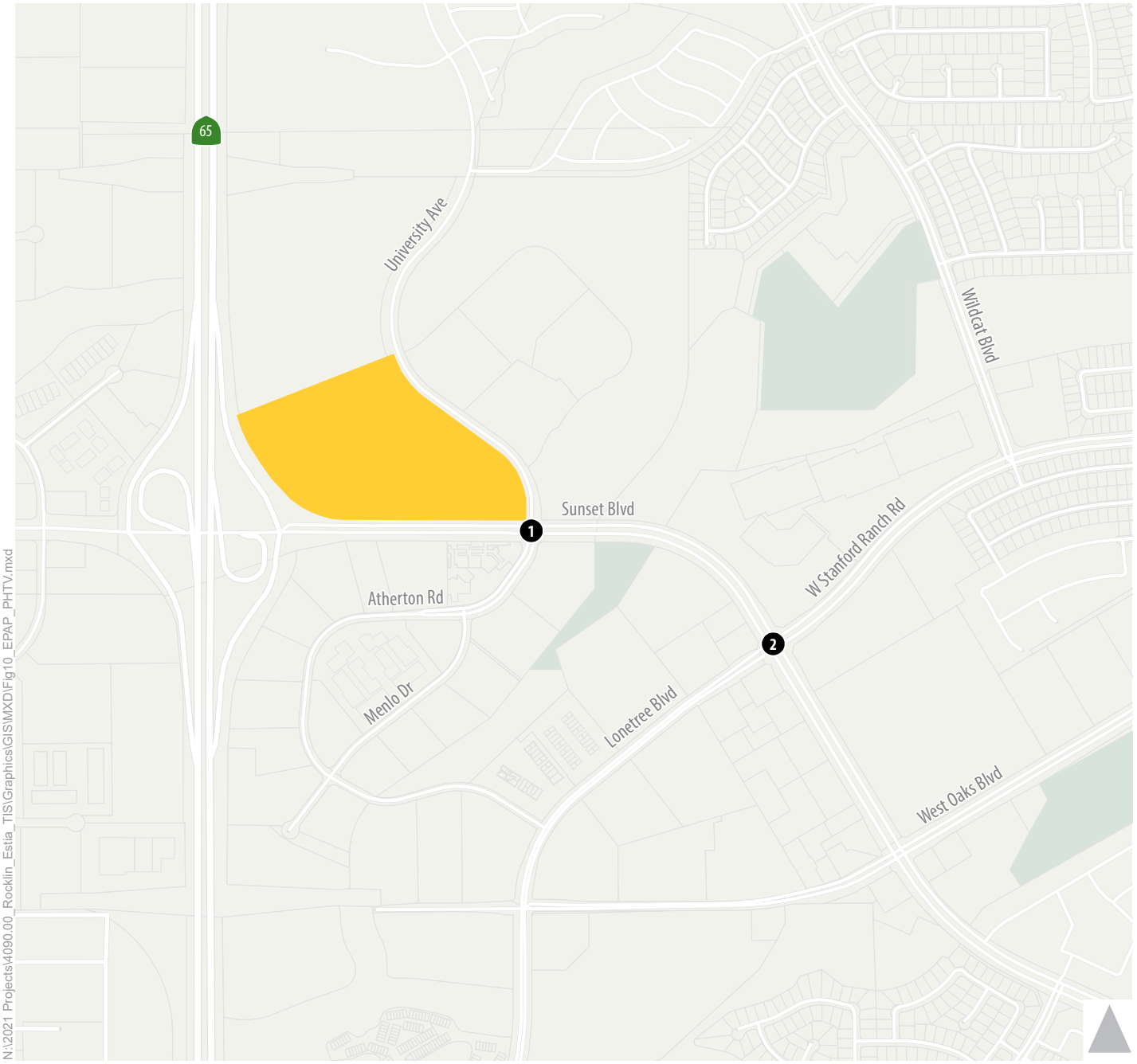
Source: City of Rocklin, 2021.

In addition to the land development projects listed in **Table 6**, the City of Rocklin directed Fehr & Peers to include Placer Parkway Phase 1 in the existing plus approved projects scenario. Placer Parkway would be constructed as a new four-lane expressway from the SR 65 / Whitney Ranch Parkway interchange westerly to Foothills Boulevard North. Placer Parkway Phase 1 would also include completion of a full SR 65 / Whitney Ranch Parkway/Placer Parkway interchange. Currently, this is a partial interchange with only access to Whitney Ranch Parkway on the east side of SR 65. The current partial interchange does not have access from southbound SR 65 to Whitney Ranch Parkway. Under existing plus approved projects conditions, the southbound off-ramp from SR 65 to Whitney Ranch Parkway/Placer Parkway would be added, as would ramp movements to/from Placer Parkway to the west.

Traffic Forecasts

All approved projects shown in **Table 6** and Placer Parkway Phase I were added to the updated base year version of the City of Rocklin travel demand model. The model was then run and changes in traffic volumes at the study intersections (caused by the addition of these projects) were calculated. These changes in traffic volume are applied to the existing volumes to yield the "existing plus approved projects" turning movement forecasts, which are shown in **Figure 10**.

Project trips are added to the existing plus approved projects forecasts using the same trip generation and distribution analysis procedures presented in the Existing Plus Project chapter, including the accounting for pass-by trips and internal trip capture. The resulting "existing plus approved projects plus project" turning movement forecasts are shown in **Figure 11**.



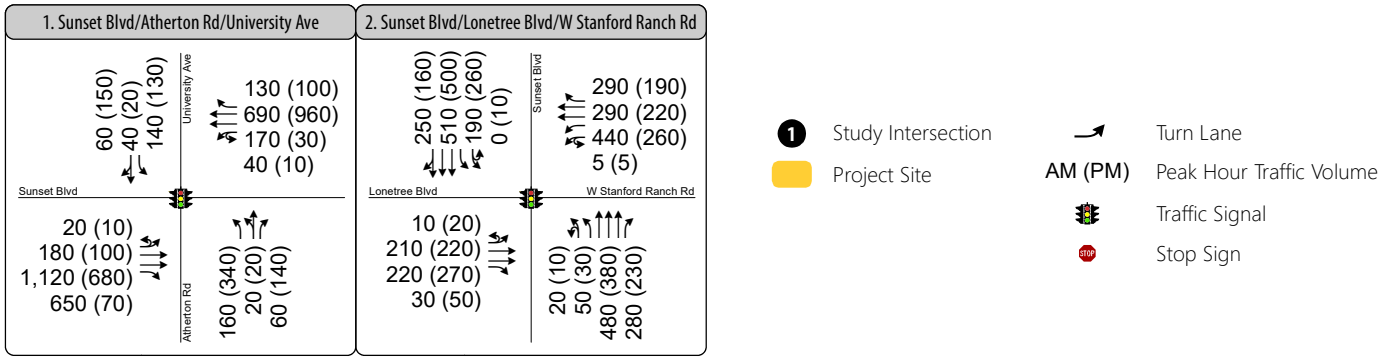
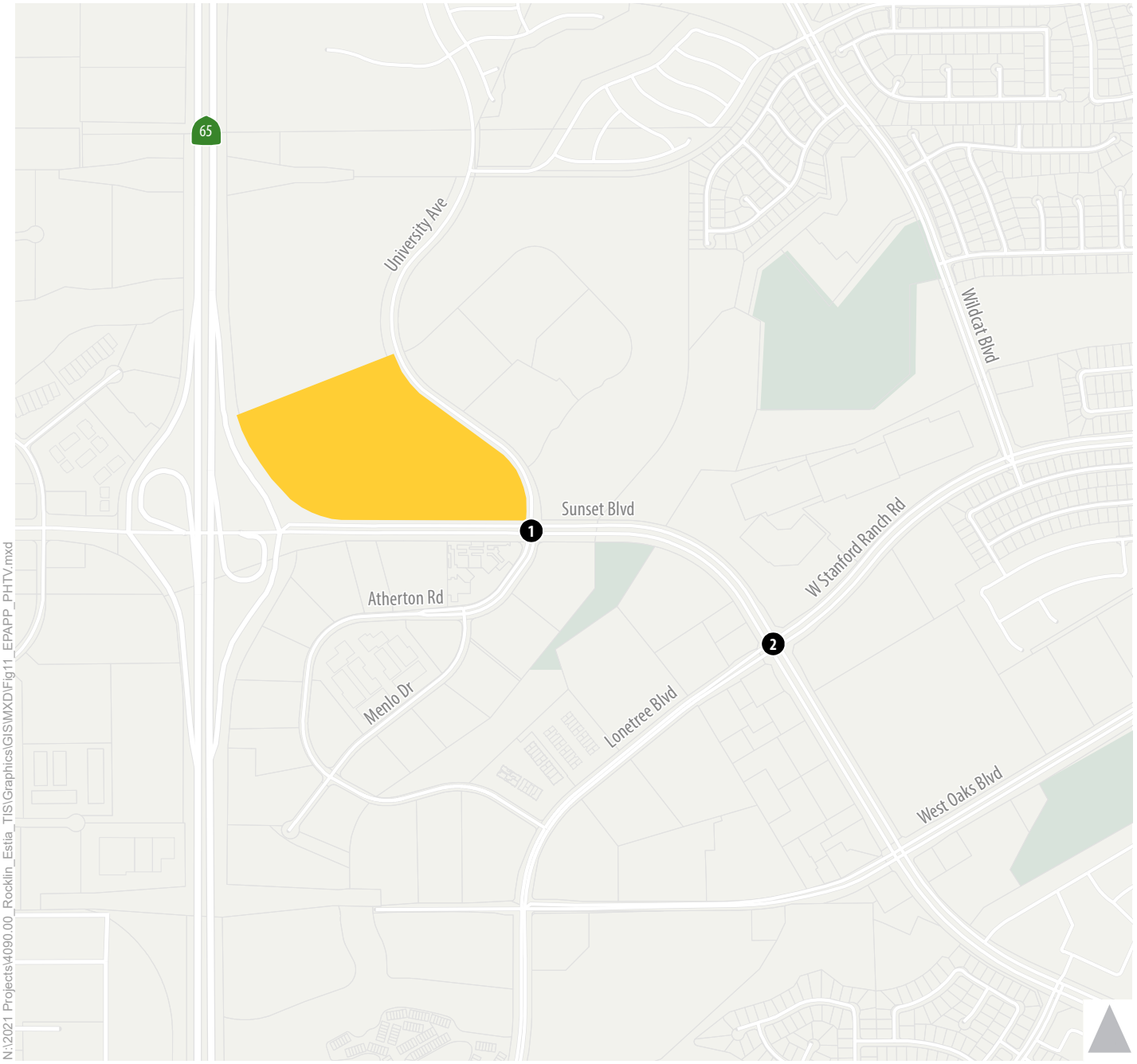


Figure 10

Peak Hour Traffic Volumes and Lane Configurations - Existing Plus Approved Projects Conditions



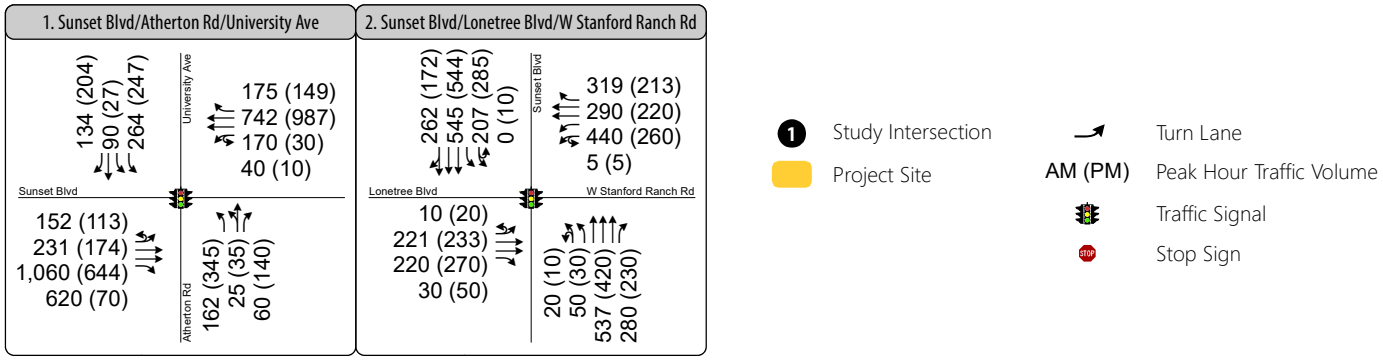


Figure 11

Peak Hour Traffic Volumes and Lane Configurations - Existing Plus Approved Projects Plus Project Conditions

Intersection Operations

Table 7 presents the weekday AM and PM peak hour traffic operations analysis results at the study intersections under existing plus approved projects conditions with and without the proposed project (refer to **Appendix D** for detailed calculations). This table shows that both study intersections continue to operate at LOS C or better during the weekday AM and PM peak hours.

Table 7: Peak Hour Intersection Operations – Existing Plus Approved Projects Conditions

Intersection	Traffic Control	Peak Hour	Existing Plus Approved Projects Conditions		Existing Plus Approved Projects + Project Conditions	
			Delay[1]	LOS[2]	Delay[1]	LOS[2]
1. University Ave./Atherton Rd. / Sunset Blvd.	Signal	AM	28	C	30	C
		PM	22	C	27	C
2. Sunset Blvd. / Lonetree Blvd./W. Stanford Ranch Rd.	Signal	AM	24	C	25	C
		PM	21	C	22	C

Notes:

1. Average control delay (rounded to nearest second) for signalized intersections is the weighted average for all movements.
2. LOS = level of service

Source: Fehr & Peers, 2022.

The Circular 212 results shown in Appendix A indicate that both study intersections would operate at LOS C or better during the weekday AM and PM peak hours under existing approved projects conditions both with and without the proposed project.

Similar to the existing plus project scenario, the existing plus approved projects plus project conditions analysis includes widening of University Avenue and Sunset Boulevard along the project frontage, and the corresponding changes to lane configurations on the southbound approach of University Avenue and addition of a crosswalk and pedestrian phase concurrent with the westbound through movement.

V. Cumulative Conditions

This chapter presents the traffic forecasts and traffic operations analysis under cumulative conditions. The cumulative conditions analysis consists of two scenarios that represent projected future conditions based on anticipated land development and planned roadway improvements. These scenarios include:

- Cumulative No Project: represents future (i.e., 2040) conditions, including the completion of reasonably foreseeable land development projects and transportation projects. This includes land development associated with Rocklin General Plan buildout (assumes the project site would remain vacant). This scenario also includes land development in adjacent communities (i.e., Roseville, Lincoln, Placer County, etc.) according to approved land use plans in those jurisdictions.
- Cumulative Plus Project: adds the proposed Estia at Rocklin project to cumulative no project conditions.

The cumulative conditions analysis is conducted to assess the proposed projects' incremental contribution to future transportation and traffic conditions. This study determines whether the proposed projects' contribution is cumulatively considerable by comparing the cumulative transportation and traffic conditions with the proposed project against the cumulative transportation and traffic conditions without the proposed project.

Cumulative Setting

Land Use Inputs

The cumulative analysis uses the City of Rocklin future year travel demand model that represents build out of the Rocklin General Plan (roughly corresponding to Year 2040 conditions). This model was used most recently for the I-80/Rocklin Road Project Approval & Environmental Document (PA&ED). The 2040 land use inputs include buildout of vacant and partially developed parcels throughout Rocklin. It includes all the approved projects listed in the previous chapter.

This study also updated the 2040 land use inputs to reflect the land development in the recently approved Placer Ranch Specific Plan and Sunset Area Plan in unincorporated Placer County west of SR 65 from the project site. The land use inputs reflect buildout of the Placer Ranch Specific Plan and approximately 20 years of development in the remainder of the Sunset Area Plan based on a market analysis prepared by EPS in 2017. This includes:

- Placer Ranch Specific Plan:
    - 5,636 residential dwelling units
    - University campus with 3,000,000 square feet of building space serving 30,000 students

- 5,440,513 square feet of non-residential development (e.g., office, commercial retail, research & development space, industrial, etc.)

- Sunset Area Plan (20 years of development):
  - 320 residential dwelling units
  - 7,288,900 square feet of non-residential development (e.g., office, commercial retail, industrial, entertainment mixed-use, etc.)

Roadway Network Inputs

The future changes to the transportation network are primarily based on the Rocklin General Plan and the Sacramento Area Council of Governments (SACOG) 2020 Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS) Tier 1 project list. The Tier 1 project list is a financially constrained list of funded transportation enhancements and expansions to the roadway, transit, and bicycle and pedestrian facilities in the SACOG region that are expected to occur over the life of the plan (i.e., by 2040).

Major roadway improvements identified in the SACOG 2020 MTP/SCS Tier 1 project list for the South Placer County region include:

- I-80 improvements including new auxiliary (i.e., weaving) lanes on I-80 eastbound from SR 65 to Rocklin Road and on I-80 westbound from Douglas Boulevard to Riverside Avenue.
- Full construction of the I-80 / SR 65 Interchange Improvement project, including widening of all four freeway-to-freeway ramps, new auxiliary lanes on SR 65 northbound and southbound from I-80 to Pleasant Grove Boulevard, and a new HOV-to-HOV direct connector.
- State Route 65 is widened to six continuous lanes and auxiliary lanes in each direction between I-80 and Blue Oaks Boulevard.
- New auxiliary (weaving) lanes on State Route 65 from Blue Oaks Boulevard to Lincoln Boulevard.
- Placer Parkway Phase 1: new four-lane expressway from SR 65 to Foothills Boulevard. This is also included in the existing plus approved projects scenario. Phase 1 of Placer Parkway includes completion of the SR 65 / Whitney Ranch Parkway/Placer Parkway interchange, as described in the existing plus approved projects chapter (chapter IV).
- Placer Parkway Phases 2 and 3: extend Placer Parkway as a four-lane expressway between Foothills Boulevard and Watt Avenue (Santucci Boulevard).

Other roadway and intersection improvements in the study area include the following:

- Sunset Boulevard is widened to have six continuous travel lanes from SR 65 to West Stanford Ranch Road, per the City's adopted Circulation Element.
- University Avenue is widened to have four continuous travel lanes north of Sunset Boulevard, per the City's adopted Circulation Element.

- University Avenue/Atherton Road / Sunset Boulevard:
    - Intersection is widened to accommodate the planned widening of Sunset Boulevard and University Avenue described above.
    - Additional turn lanes (e.g., dual northbound, southbound, and eastbound left-turn lanes; and dedicated southbound and westbound right-turn lanes) are assumed based on recommendations in the *Final Transportation Impact Analysis for the Northwest Rocklin Area General Development Plan* (Fehr & Peers, 2016).[1]
    - With the intersection widening and dedicated left-turn lanes (i.e., no longer a shared northbound through-left lane), the signal is assumed to be reconstructed with protected left-turn phasing for northbound and southbound movements.
    - A marked crosswalk is assumed across the north leg of the intersection with a pedestrian phase operating concurrently with the westbound though movement.
- Sunset Boulevard / West Stanford Ranch Road/Lonetree Boulevard:
    - Additional travel lanes and turn lanes per mitigation measure 4.4.1 of the Rocklin General Plan Update Environmental Impact Report. This includes:
        - Addition of third through lane on southwest West Stanford Ranch Road approach.
        - Addition of a second left-turn lane on northeast Lonetree Boulevard approach.

The improvements at the Sunset Boulevard / West Stanford Ranch Road/Lonetree Boulevard intersection would not require any roadway widening. Rather, the third through lane would be striped using available pavement. The second left-turn lane would be provided by converting the 12-foot raised median to a left-turn lane.

Traffic Forecasts

The City of Rocklin travel demand model is used to forecast cumulative traffic volumes at study intersections. This study applies a forecasting procedure known as the "difference method" to develop future year forecasts. The difference method takes the difference between future year and base year traffic volumes from the model and adds them to existing traffic volumes at the study intersections to develop future year forecasts. This method corrects any potential anomalies within the model. This forecasting procedure is calculated as follows:

Cumulative No Project Forecast = Existing Traffic Count +
("Cumulative No Project" Raw Model Volume – Base Year Raw Model Volume)

[1] Although these geometric improvements were assumed under cumulative conditions in that study, the concept of the improvements themselves dates back to the City's General Plan EIR in 2011. To date, no known detailed engineering drawings have been completed for these improvements.

Figure 12 presents the cumulative intersection turning lane configurations and cumulative no project weekday AM and PM peak hour traffic forecasts for the six study intersections.

Cumulative Project Trip Distribution

The anticipated land development in the region in the future is expected to affect the project trip distribution. For example, additional development is anticipated to the north of the project along University Avenue, in Whitney Ranch, and southern Lincoln. As a result, the project's commercial tenants may attract more patrons to/from the north via University Avenue than under current conditions.

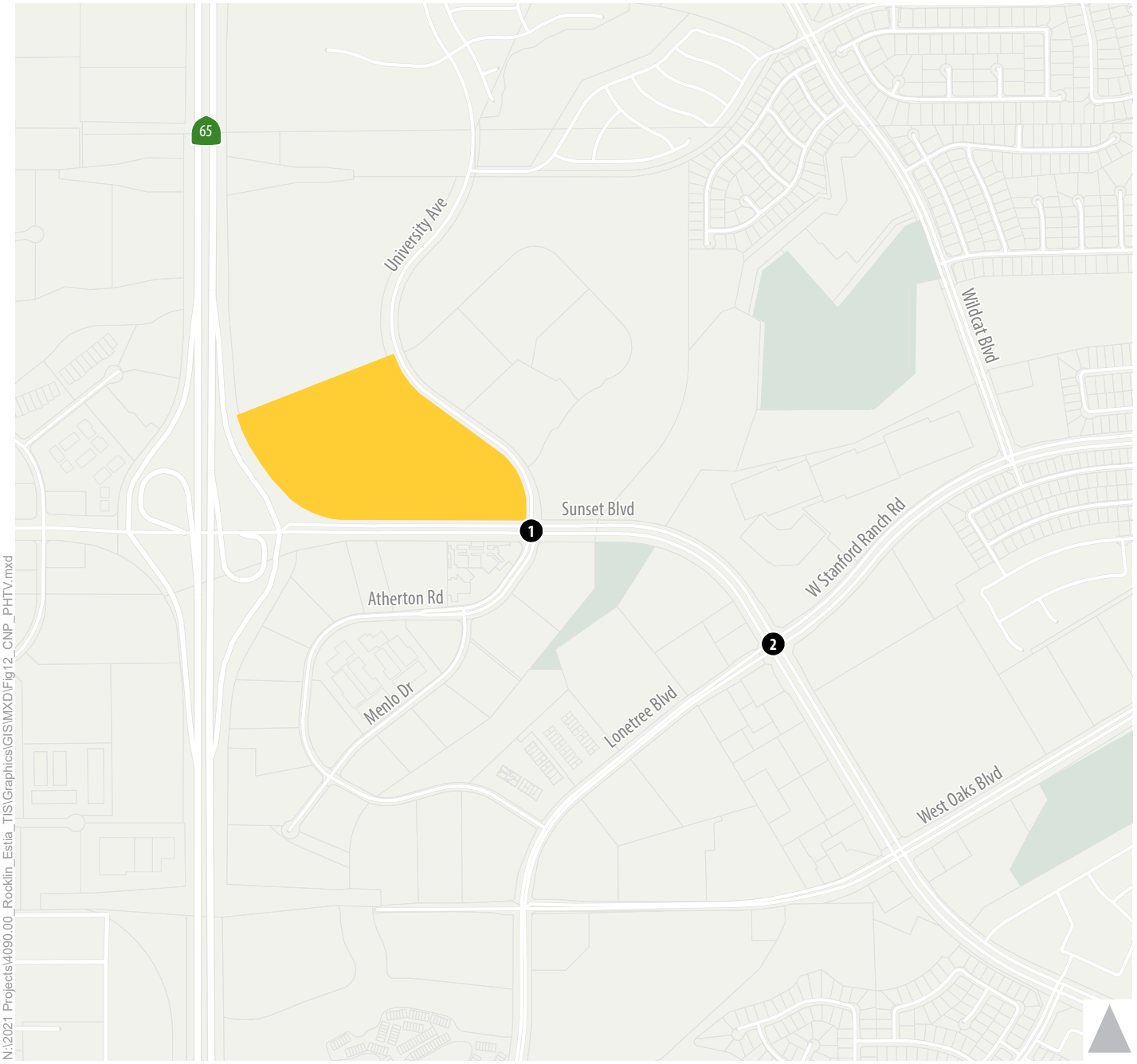
Similar to the existing plus project analysis, the project trip distribution under cumulative conditions considers several factors, including:

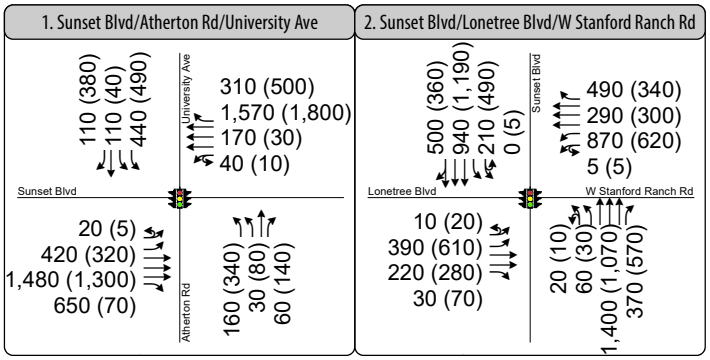
- Project-only traffic assignments from the City of Rocklin 2030 travel forecasting model.
- Location of potential destinations in the future, including job centers, shopping, schools, etc., both those that exist today and would be constructed in the future based on the land use assumptions under the cumulative conditions.
- Location of potential customers for the commercial uses (e.g., future residential distribution in the area, and nearby neighborhoods without planned local neighborhood commercial uses).

Figure 13 presents the cumulative project trip distribution during the weekday AM peak hour. **Figure 14** presents the cumulative project trip distribution during the weekday PM peak hour.

For cumulative plus project conditions, the net new external project vehicle trips are assigned to the study intersections and project driveways in accordance with the trip distribution percentages shown in **Figure 13** and **Figure 14**. Pass-by trips are assigned to project driveways based on the cumulative no project traffic volumes and travel routes on Sunset Boulevard and University Avenue. **Figure 15** shows the resulting weekday AM and PM peak hour project vehicle trip assignment at the project driveways under cumulative conditions.

Similar to existing plus project conditions, the routing of pass-by trips causes some changes to the cumulative no project forecasts at the University Avenue/ Atherton Road / Sunset Boulevard intersection based on permitted turning movements at the project driveways. These changes caused by the pass-by trips along with the net new external project trips are added to the cumulative no project forecasts presented in **Figure 12** to yield the cumulative plus project turning movement forecasts shown in **Figure 16**.





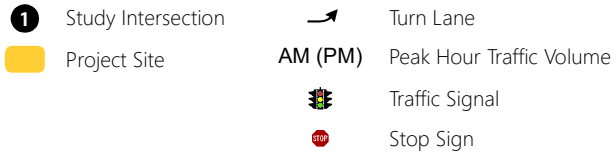
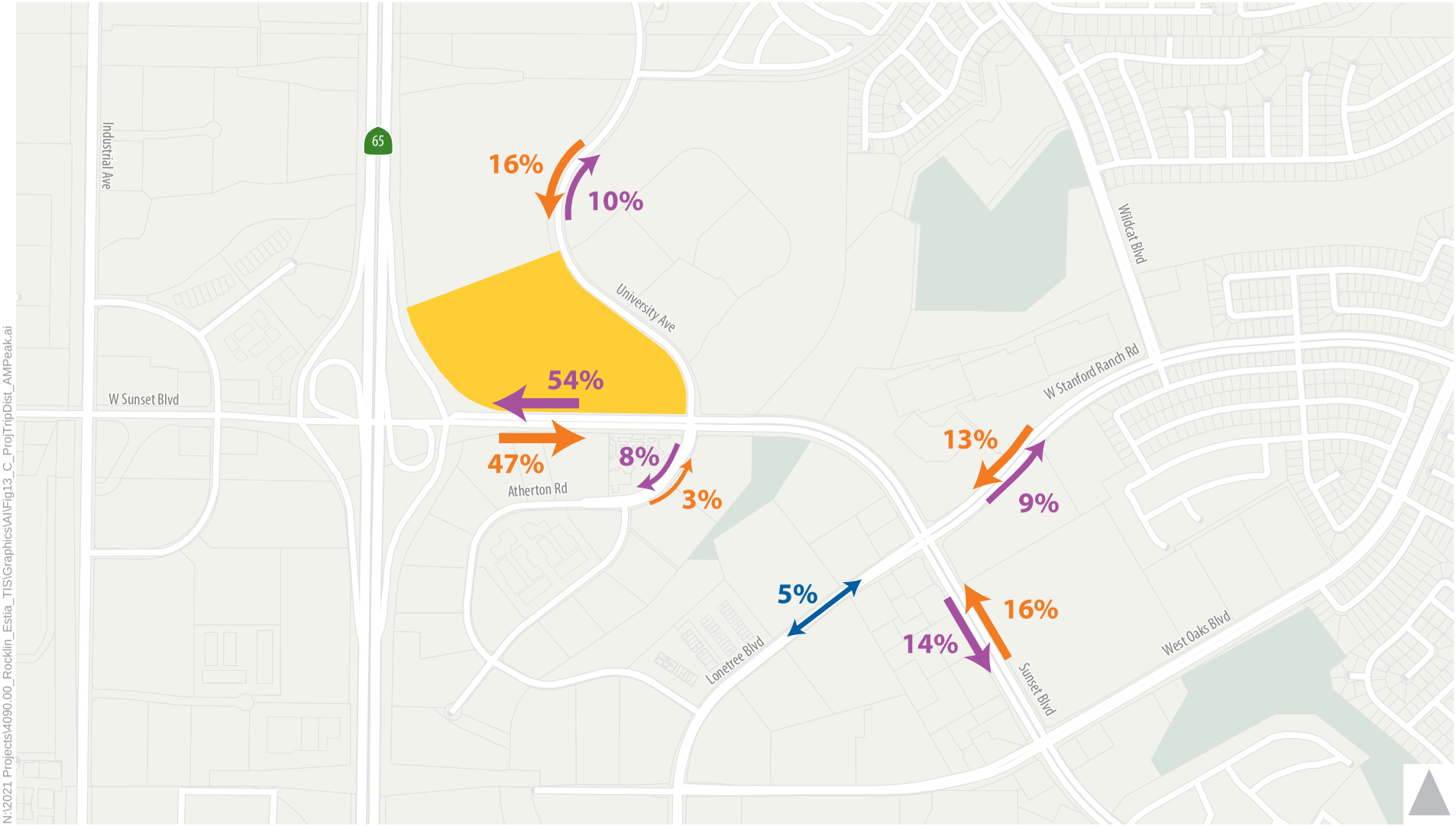


Figure 12

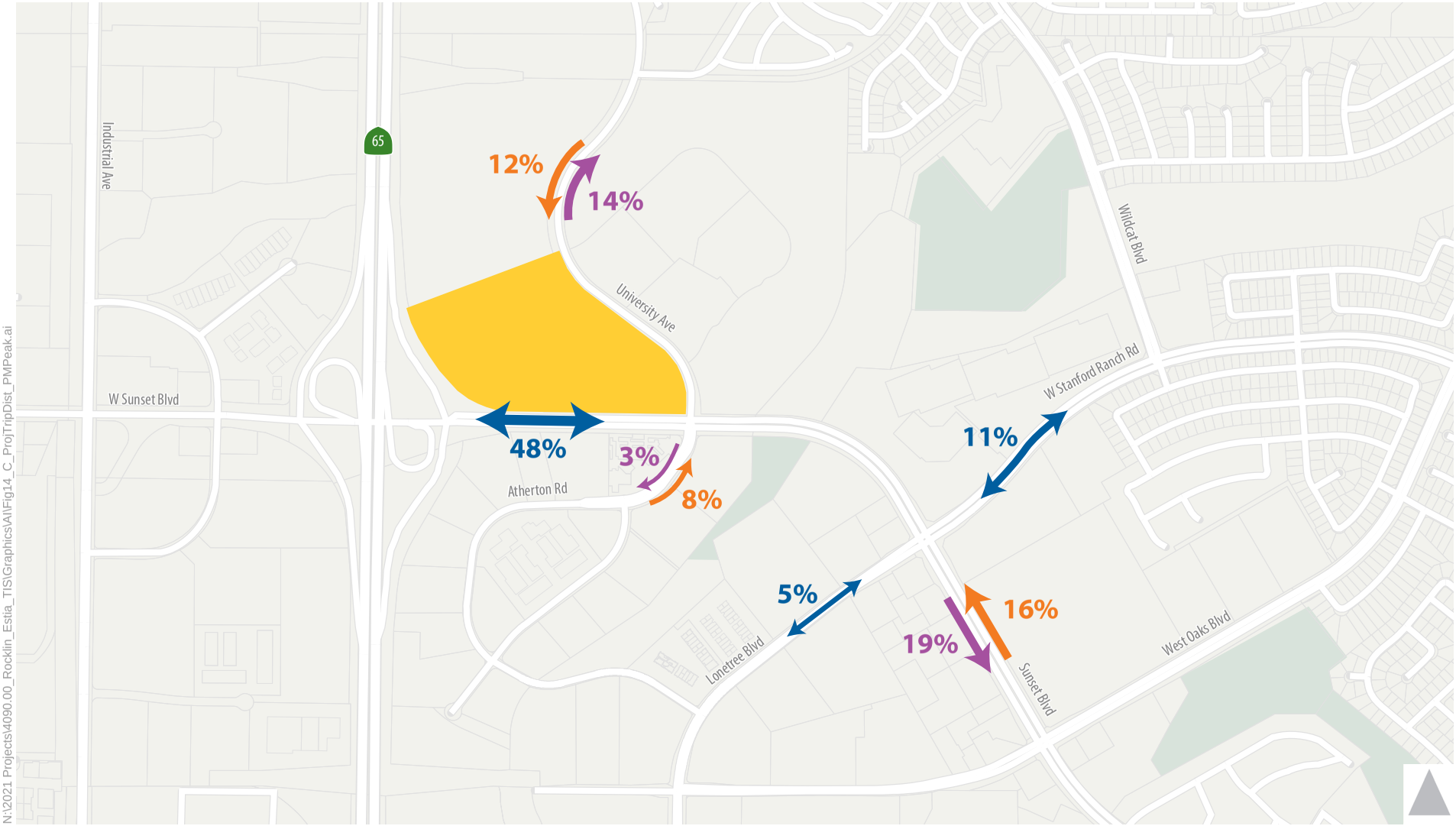
Peak Hour Traffic Volumes and Lane Configurations - Cumulative No Project Conditions



N:\2021 Projects\4090.00_Rocklin_Estia_TIS\Graphics\AI\Fig13_C_ProjTripDist_AMPeak.ai

Figure 13

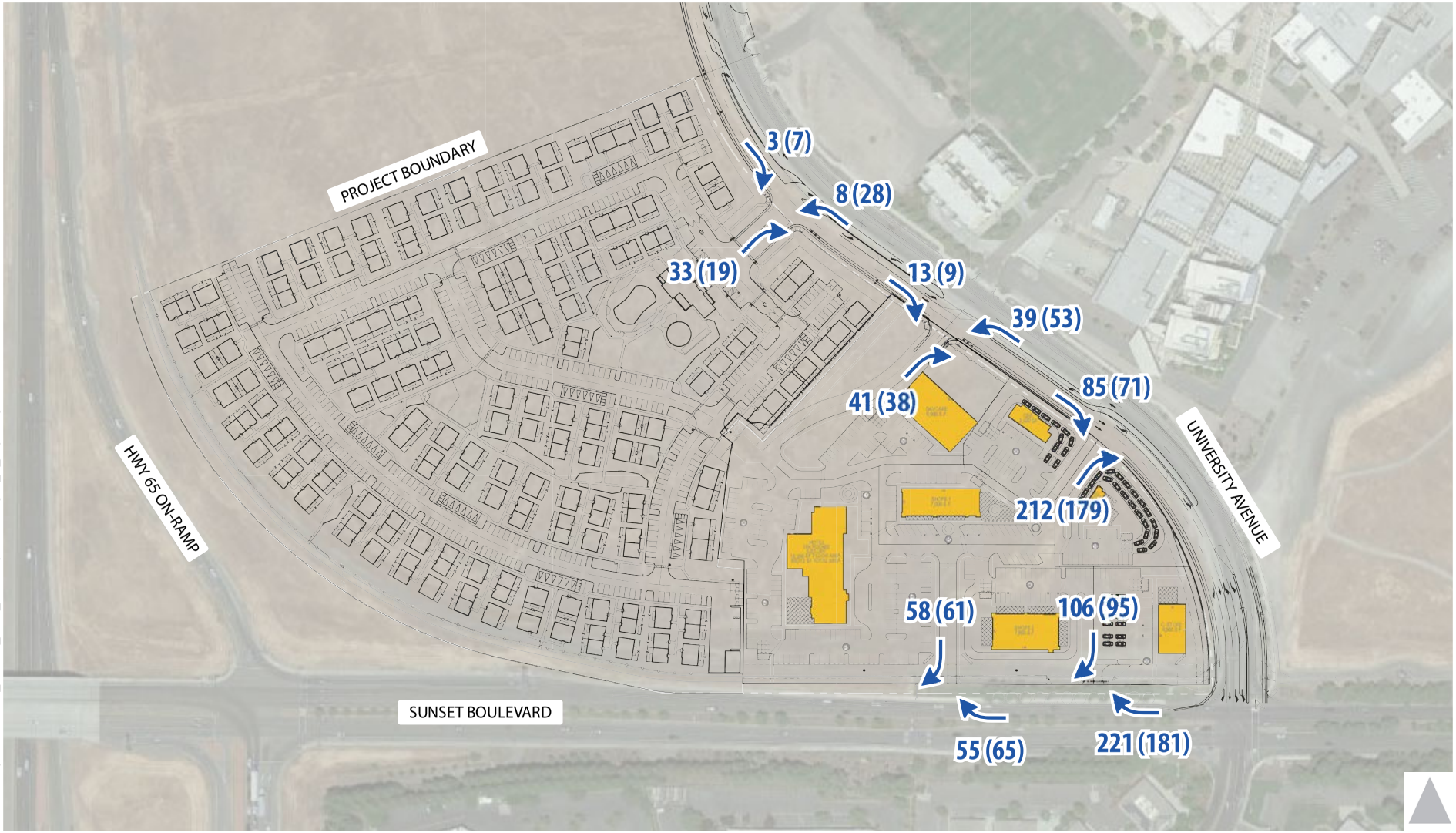
Cumulative Project Trip Distribution - AM Peak Hour



N:\2021 Projects\4090.00_Rocklin_Estia_TIS\Graphics\AI\Fig14_C_ProjTripDist_PMPeak.ai

Figure 14

Cumulative Project Trip Distribution - PM Peak Hour



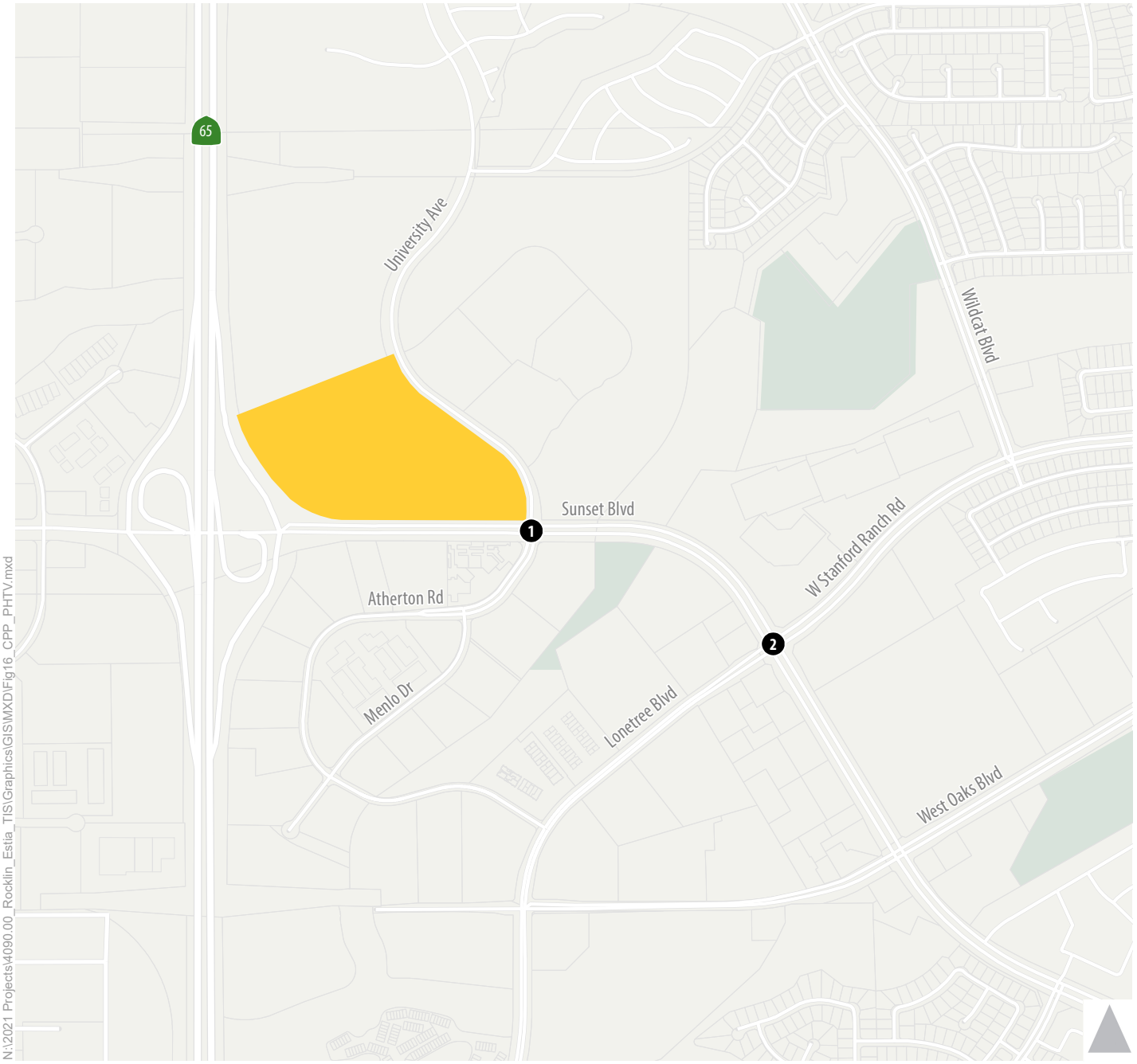
N:\2021 Projects\4090.00_Rocklin_Estia_TIS\Graphics\AI\Fig15_C_TripAssignment.ai

AM (PM) Peak Hour Turning Movement Volume

Permitted Turning Movement

Figure 15

Cumulative Project Trip Assignment



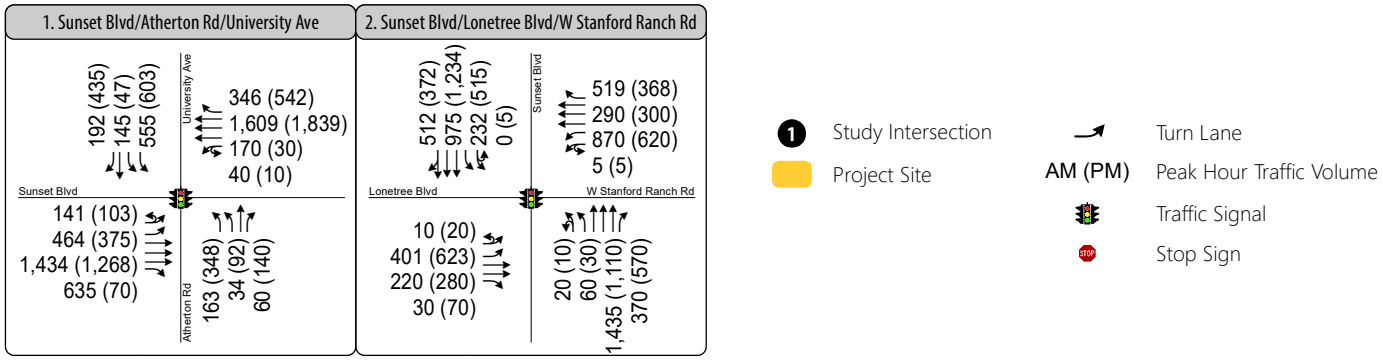


Figure 16

Peak Hour Traffic Volumes and Lane Configurations - Cumulative Plus Project Conditions

Intersection Operations

Table 8 presents the weekday AM and PM peak hour traffic operations analysis results at the study intersections under cumulative conditions with and without the proposed project (refer to **Appendix E** for detailed calculations). **Table 8** shows that the study intersections would operate at LOS D during the weekday PM peak hour:

- University Avenue/Atherton Road / Sunset Boulevard would operate at operate at LOS C without the project and degrade to LOS D with the project during the PM peak hour under cumulative conditions. This is largely driven by an increase in the eastbound left-turn/U-turn and southbound right-turn delay. The eastbound left-turn/U-turn delay increase is caused by a substantial increase in U-turns traveling towards the project. The increase in the eastbound U-turn and westbound through movements reduce the number of southbound right-turns that can occur during the southbound red phase, which would lead to an increase in the southbound right-turn delay.
- Sunset Boulevard / Lonetree Boulevard/W. Stanford Ranch Road would operate at LOS D during the PM peak hour under cumulative conditions both with and without the proposed project. The project would increase the average delay by four seconds per vehicle. Under previous City of Rocklin guidance, an increase of average control delay of less than five seconds per vehicle was not considered significant.

Chapter VII presents potential operational enhancements to address deficient (i.e., worse than LOS C) operations at each intersection.

Table 8: Peak Hour Intersection Operations – Cumulative Conditions

Intersection	Traffic Control	Peak Hour	Cumulative No Project Conditions		Cumulative Plus Project Conditions	
			Delay[1]	LOS[2]	Delay[1]	LOS[2]
1. University Ave./Atherton Rd. / Sunset Blvd.	Signal	AM	31	C	40	D
		PM	30	C	**52**	**D**
2. Sunset Blvd. / Lonetree Blvd./W. Stanford Ranch Rd.	Signal	AM	53	D	58	E
		PM	**40**	**D**	**44**	**D**

Notes:

1. Average control delay (rounded to nearest second) for signalized intersections is the weighted average for all movements.
2. LOS = level of service

Bold indicates deficient operations. Operating goal only applies to PM peak hour conditions.

Source: Fehr & Peers, 2022.

The Circular 212 results shown in Appendix A indicate that the following study intersections would operate at LOS D or E during the weekday PM peak hour under cumulative conditions:

- University Avenue/Atherton Road / Sunset Boulevard would operate at operate at LOS D without the project and degrade to LOS E with the project under cumulative conditions, with the v/c ratio increasing from 0.85 to 0.91.
- Sunset Boulevard / Lonetree Boulevard/W. Stanford Ranch Road would operate at LOS D without the project and degrade to LOS E with the project under cumulative conditions, with the v/c ratio increasing from 0.88 to 0.91.

As noted earlier in this report, the HCM and Circular 212 methodologies are known to generate different results for several reasons; and the HCM results are considered more accurate.

The above LOS results differ considerably from the findings contained in the *Final Transportation Impact Analysis for the Northwest Rocklin Area General Development Plan* (Fehr & Peers, 2016). Specifically, that report concluded that both intersections would operate at LOS C during the PM peak hour under cumulative (2030) conditions. In contrast, this study has found that operations would be at LOS E with the same lane configurations at each intersection (assuming Circular 212 analysis). The following reasons explain the difference in results:

1. Traffic forecasts for the *2016 Northwest Rocklin Area General Development Plan* were developed in 2015 prior to the City initiating an update to its base year model. Thus, the forecasting inputs used in that study are fundamentally different than in this study.
2. Whereas the *2016 Northwest Rocklin Area General Development Plan* had not assumed any development of Placer Ranch (as the City of Roseville development application had just been pulled), this study assumes buildout of the Placer Ranch Specific Plan and approximately 20 years of development in the remainder of the Sunset Area Plan.

VI. Impacts and Mitigation Measures

This chapter evaluates the significance of project impacts using the thresholds of significance described in the Introduction chapter.

Evaluation of Transportation System Impacts

Intersection LOS is no longer applicable as a significance criterion under CEQA. However, policies exist within the City's General Plan related to LOS. The project would not worsen a study intersection from LOS C or better to LOS D or worse under existing plus project conditions. However, under cumulative conditions, the project traffic is expected to contribute to deficient LOS D operations at the University Avenue/Atherton Road / Sunset Boulevard and Sunset Boulevard / Lonetree Boulevard/West Stanford Ranch Road intersections. Chapter VII discusses potential operational enhancements to address the deficient LOS operations.

Evaluation of Bicycle Impacts

As noted in the Overview of Proposed Project in Chapter I of this report, this study assumes that the project would improve University Avenue and Sunset Boulevard along the project frontage to meet City standards for arterial roadways and be consistent with the ultimate planned transportation network identified for each roadway in the Rocklin General Plan Circulation Element. This would include widening University Avenue and adding a class II bike lane that is planned but currently absent on the southbound side of the road. The widening of westbound Sunset Boulevard along the project frontage would shift the existing class II bike lane to accommodate a third westbound travel lane but would maintain this existing bike facility.

As discussed above, the project would not disrupt or interfere with an existing bicycle facility and would not preclude construction of any planned bicycle facilities identified in the *City of Rocklin Parks and Trails Master Plan* (2017). The addition of class II bike lanes on University Avenue and maintaining existing class II bike lanes on Sunset Boulevard would be consistent with Policy C-55 in the City of Rocklin General Plan Circulation Element. Therefore, this impact is considered ***less than significant***, and no mitigation is required.

Evaluation of Pedestrian Impacts

- Impact TR-1: *The project would potentially generate pedestrian travel that is not adequately served by existing pedestrian facilities.*

As noted above, this study assumes that the project would construct improvements to meet City standards for both University Avenue and Sunset Boulevard along the project frontage. This would include new sidewalks along the west side of University Avenue, where no sidewalks currently exist, and extending

the existing sidewalk on the north side of Sunset Boulevard along the project frontage to the University Avenue/Atherton Road intersection.

The frontage improvements on University Avenue and Sunset Boulevard would also trigger improvements at the University Avenue/Atherton Road / Sunset Boulevard intersection. Specifically, the southbound approach and westbound departure would be widened to accommodate the ultimate planned number of travel lanes. This would require moving existing signal equipment and resetting the northwest and northeast corners to their ultimate location.

As noted in Chapter II (Existing Conditions) of this report, the University Avenue/Atherton Road / Sunset Boulevard intersection does not have east-west marked crosswalks or pedestrian heads/push buttons to facilitate east-west pedestrian travel across the intersection. Assuming no additional pedestrian improvements (i.e., no changes to the north-south crosswalk at University Avenue/Atherton Road / Sunset Boulevard or sidewalks beyond the project frontage), there would be no facility for pedestrians to walk between the project and existing development to the east and south. This lack of pedestrian connectivity would be potentially inconsistent with Policy C-59 of the Rocklin General Plan Circulation Element. Therefore, this impact is considered ***significant***.

Mitigation Measure TR-1: *The project applicant shall implement the following pedestrian facilities with the improvements at the University Avenue/Atherton Road / Sunset Boulevard intersection:*

- *Add a marked crosswalk and corresponding pedestrian equipment (pedestrian head, push buttons, etc.) for pedestrian travel across the north leg of the University Avenue/ Atherton Road / Sunset Boulevard intersection when the project frontage and intersection improvements described above are implemented. This crosswalk would be necessary to provide pedestrians with a crossing location to travel between the project to destinations to the east (i.e., William Jessup University). Pedestrians could then use the existing crosswalk across the east leg of the intersection to travel to the Atherton Tech Center.*

Ideally, a crosswalk would ultimately be added across the south leg or west leg of the intersection to facilitate pedestrian travel to the southwest corner of the intersection. However, the lack of existing pedestrian facilities (i.e., ramp, sidewalk, etc.) and private property ownership at the southwest corner make these improvements infeasible for the project to implement. Therefore, the pedestrian improvements identified for the north leg of the intersection combined with the existing crosswalk on the east leg of the intersection will suffice in the near-term.

This mitigation would reduce this impact to ***less than significant.***

Evaluation of Transit Impacts

- Impact TR-2: *The project would potentially disrupt or interfere with existing or planned transit facilities.*

The project would trigger improvements at the University Avenue/Atherton Road / Sunset Boulevard intersection, as described above. If constructed to City standards (see DWG#3-10 and DWG#3-11 in **Appendix F**), a bus turnout would be provided northwest of the intersection along the project frontage near the proposed right-in/right-out driveway on Sunset Boulevard that would primarily serve the proposed gas station/ convenience market.

Policy C-50 of the *City of Rocklin General Plan (2012)* calls for the City to work with transit providers to plan, fund, and implement additional transit services that are cost-effective and responsive to existing and future resident needs.

It is possible that the existing bus stop on westbound Sunset Boulevard east of University Avenue could be relocated to this location with implementation of the intersection improvements and the proposed project. In that case, the project driveway would be situated near the relocated bus stop. Because of the introduction of a project driveway near a potential planned bus stop could introduce conflicts between buses and passenger vehicles (if not properly planned for), this impact is considered ***significant.***

> Mitigation Measure TR-2: *The project applicant shall coordinate with the City of Rocklin and Placer County Transit regarding the placement and design of the project driveway(s) on Sunset Boulevard to ensure that they do not interfere with planned transit operations. Preferred driveway designs should provide sufficient distance between the bus stop location and the driveway to provide adequate sight distance. If sufficient space is available, this could potentially include a continuous bus turnout / deceleration lane to accommodate ingress to the project driveway; or locating the bus turnout between the project's proposed driveways on Sunset Boulevard.*

This mitigation would reduce this impact to ***less than significant.***

Evaluation of Impacts Due to Hazardous Design Features

- Impact TR-3: *The project would potentially result in turn movements with inadequate sight distance for drivers to see approaching vehicles.*

Chapter VII of this report presents a summary of a sight distance analysis prepared by King Engineering (see **Appendix F**). The sight distance analysis applies stopping sight-distance standards for left-turn ingress movements and corner sight-distance standards for egress movements, as outlined in the Highway Design Manual (HDM) to assess whether drivers would have adequate time to see approaching vehicles on conflicting movements. This analysis indicates that the proposed location of left turn movements on University Avenue into and out of the project site and William Jessup University would potentially have sight distance limitations that could possibly interfere with drivers' ability to adequately see approaching vehicles. Therefore, this impact is considered **significant**.

> Mitigation Measure TR-3: *The project applicant shall coordinate with the City of Rocklin and William Jessup University regarding the placement and design of left-turn accesses on University Avenue. The project applicant's civil engineer shall demonstrate to the satisfaction of the City's Public Works*

Department that adequate sight distance would be provided for left/right-turn egress movements and left-turn ingress movements at project driveways on University Avenue. Driveway sight distance shall meet applicable HDM standards. Driveway location, spacing, permitted turn movements, and turn pocket design shall meet applicable City design standards. Potential feasible options to address sight distance limitations include modifying traffic control, such as installing a roundabout or traffic signal at access points to the project and/or William Jessup University, restricting turn movements (i.e., eliminate left-turn access), or relocating driveways. The selection of the specific treatment(s) to address sight distance shall be determined in collaboration with the project applicant, City of Rocklin, and William Jessup University.

This mitigation would reduce this impact to ***less than significant.***

Evaluation of Impacts Due to Inadequate Emergency Access

Rocklin Fire Station 25 is located on Wildcat Boulevard north of West Stanford Ranch Road. This station is within a five-minute drive to the project site. Emergency vehicle pre-emption devices are present at traffic signals along Wildcat Boulevard, West Stanford Ranch Road, and Lonetree Boulevard. Therefore, this impact is considered ***less than significant,*** and no mitigation is required.

VII. Other Considerations

This chapter discusses several important topics including potential operational enhancements to reduce delay at study intersections that would operate at a deficient LOS as well as an evaluation of the project access points and on-site circulation.

Potential Operational Enhancements

Table 8 identified potential future deficient LOS D operations during the weekday PM peak hour at the following two study intersections under cumulative plus project conditions:

- University Avenue/Atherton Road / Sunset Boulevard
- Sunset Boulevard / Lonetree Boulevard/West Stanford Ranch Road

It should be noted that the Sunset Boulevard / Lonetree Boulevard/West Stanford Ranch Road intersection is forecasted to operate at LOS D without the project. The proposed project is expected to increase cumulative delay by four seconds per vehicle. Under previous City of Rocklin guidance, an increase of average control delay of less than five seconds per vehicle was not considered significant; and may not be perceptible to most motorists.

To reduce delay at the above study intersections, the following operational enhancements could be considered:

- University Avenue/Atherton Road / Sunset Boulevard:
    - The deficient operations during the PM peak hour is in part driven by increased delay for the eastbound left-turn/U-turn and southbound right-turn movement, as described in Chapter V (Cumulative Conditions). Channelizing the southbound right-turn lane and adding a receiving acceleration lane on westbound Sunset Boulevard to allow free southbound right turn movements was considered and would reduce overall intersection delay from 53 seconds per vehicle to 37 seconds per vehicle during the PM peak hour according to the HCM analysis. However, this free-right turn would create a potentially hazardous weaving section between University Avenue and the project driveway that the HCM calculation does not consider. Southbound right-turn vehicles would be merging onto westbound Sunset Boulevard as vehicles traveling to the project driveway would be attempting to use the acceleration lane as a right-turn deceleration area. This would create conflicts between vehicles that are accelerating and decelerating in the same lane within a short distance along with periodical conflicts with buses using the bus pull out. For these reasons, this enhancement is not recommended.

- Sunset Boulevard / Lonetree Boulevard/West Stanford Ranch Road:
    - Add a southbound right-turn pocket on Sunset Boulevard. This right-turn movement, which is forecasted to serve 512 AM peak hour and 372 PM peak hour vehicles under cumulative plus project conditions, would otherwise be made from a shared through/right-turn lane. Assuming the right-of-way is at the existing back of sidewalk on Sunset Boulevard, this improvement would require the acquisition of additional right-of-way to implement. The City recently approved a project on the adjacent property, which would suggest acquiring the necessary right-of-way to construct this right-turn lane may not be feasible.
    - Convert the inside (#1) westbound through lane to a third westbound left-turn lane on West Stanford Ranch Road approaching the intersection. The third westbound left-turn lane would be achieved by trapping the inside westbound through lane. This movement is forecasted to serve 870 AM peak hour and 620 PM peak hour vehicles under cumulative plus project conditions and would otherwise be made from dual left-turn lanes. This change would result in one right-turn lane, two through lanes (reduced from three), and three left-turn lanes (increased from two) on the westbound approach. This can be accommodated within the existing right-of-way since it is a striping modification and would not affect the location of the existing curb, gutter, and sidewalk.
    - Channelize the westbound right-turn lane and add a receiving acceleration lane on northbound Sunset Boulevard to allow free westbound right turn movements. This right-turn movement is forecasted to serve 519 AM peak hour and 368 PM peak hour vehicles under cumulative plus project conditions. Note that an existing bus stop is located at this corner. The City of Rocklin should coordinate with Placer County Transit to confirm that a free right-turn treatment at this location would not interfere with bus transit operations at this bus stop. This improvement would require expanding the footprint of the intersection at its northeast quadrant. Assuming the right-of-way is at the existing back of sidewalk, this improvement may require the acquisition of additional right-of-way at the northeast corner of the intersection to implement.
    - Add a third eastbound left-turn lane on Lonetree Boulevard approaching the intersection. This movement is forecasted to serve 401 AM peak hour and 623 PM peak hour vehicles under cumulative plus project conditions. The cumulative conditions assumes a second eastbound left-turn lane is added from the existing raised median as identified in the Rocklin General Plan Update EIR. This proposed enhancement would add a third eastbound left-turn lane, which would require the median be shifted north. This would eliminate one of the three existing westbound receiving lanes. This is feasible since the westbound approach would be reduced to two westbound through lanes and a third westbound receiving lane is not necessary. Furthermore, the face of curb to face of curb width is approximately 110 feet, which is sufficient to accommodate two westbound receiving lanes, three eastbound left-turn lanes, two eastbound through lanes, and a right-turn lane plus two class II bike lanes. Assuming the right-of-way is at the existing back of sidewalk, it appears that this modification can be made within the existing right-of-way without affecting the existing curb, gutter, and sidewalk.

- The eastbound and westbound left-turn phases would need to operate with lead-lag signal phasing, such that the eastbound and westbound left-turn movements do not operate concurrently (see northbound and southbound left-turn movements at Galleria Boulevard / Roseville Parkway intersection in Roseville, CA for example).
- See **Figure 17** for an illustration of these improvements.

Table 9 shows how these operational enhancements would reduce delay under cumulative plus project conditions (refer to **Appendix F** for detailed calculations). This table shows that the Sunset Boulevard / Lonetree Boulevard/West Stanford Ranch Road intersection would improve to acceptable LOS C operations. The recommendation of a westbound free right-turn lane at this intersection is now considered an atypical design feature, as agencies now emphasize multi-modal travel and reduced vehicle speeds at multimodal conflict points. The free right-turn treatment can create potentially uncomfortable conditions for bicyclists in the bike lane of the receiving roadway as bicycles would be placed between vehicles in through travel lanes and accelerating vehicles in the merge lane. The free right-turn could also result in higher vehicle speeds at the pedestrian crosswalk. However, testing of the addition of alternate strategies (e.g., westbound overlap arrow) did not reveal the necessary delay reduction that would enable an overall LOS C result to be achieved. Thus, the westbound free right-turn would be necessary for purposes of achieving LOS C.

Table 9: Peak Hour Intersection Operations – Cumulative Conditions with Potential Operational Enhancements

Intersection	Traffic Control	Peak Hour	Cumulative No Project Conditions		Cumulative Plus Project Conditions			
					Without Enhancements		With Enhancements	
			Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]
2. Sunset Blvd. / Lonetree Blvd./ W. Stanford Ranch Rd.	Signal	AM	53	D	58	E	35	C
		PM	**40**	**D**	**44**	**D**	33	C

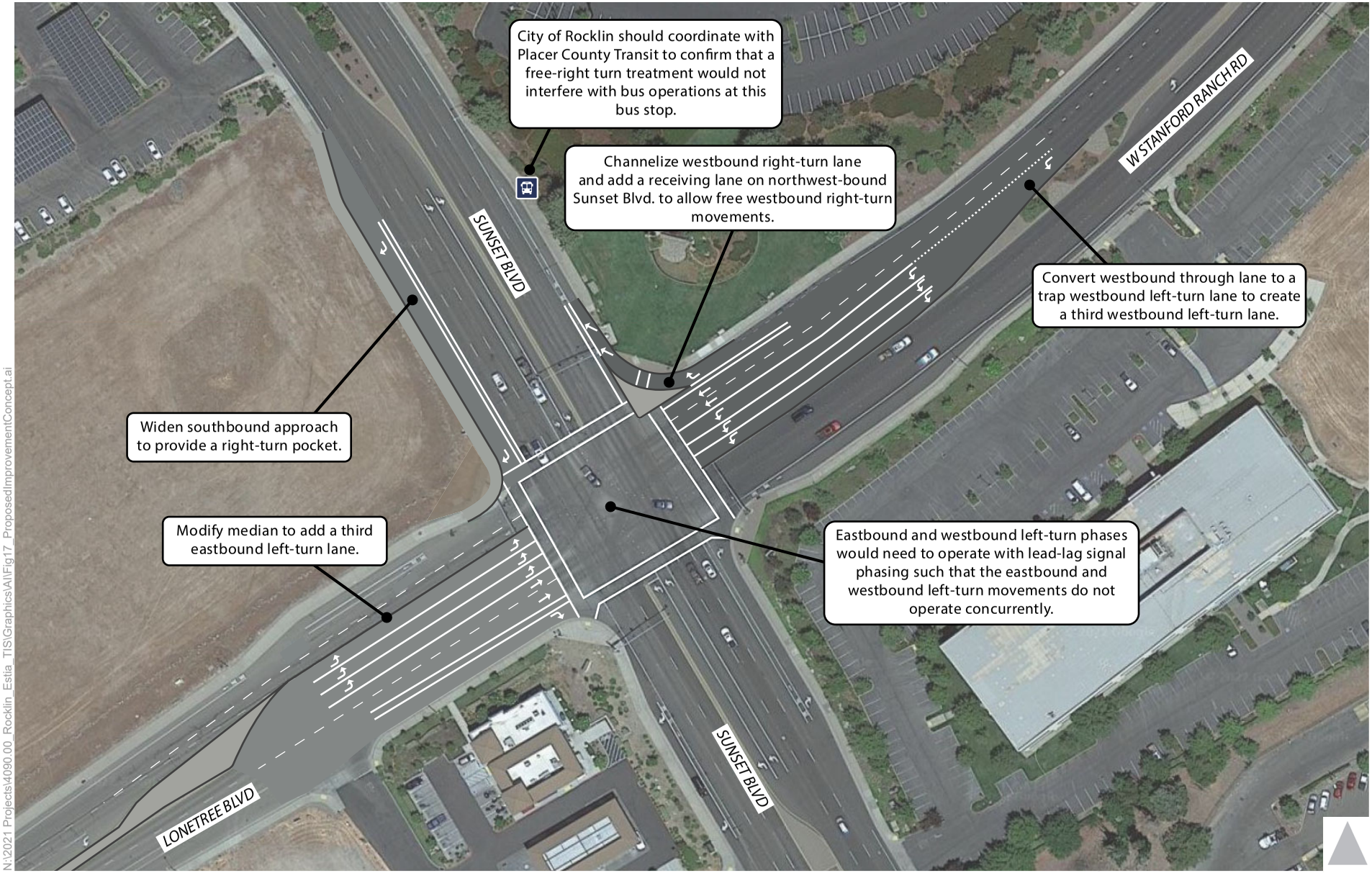
Notes:

1. Average control delay (rounded to nearest second) for signalized intersections is the weighted average for all movements.
2. LOS = level of service

Bold indicates deficient operations. Operating goal only applies to PM peak hour conditions.

Source: Fehr & Peers, 2022.

These operational enhancements at the Sunset Boulevard / Lonetree Boulevard/West Stanford Ranch Road intersection would also improve operations to LOS C during the PM peak hour according to the Circular 212 methodology, which indicates the operational enhancements would only improve the operations from LOS E to LOS C, with the v/c ratio decreasing from 0.91 to 0.74.



N:\2021 Projects\4090.00_Rocklin_Estia_TIS\Graphics\AI\Fig17_ProposedImprovementConcept.ai

Figure 17

Sunset Boulevard / Lonetree Boulevard / West Standford Ranch Road
Proposed Improvement Concept

Project Access Review

The review of the proposed project access focuses on the adequacy of project access, locations of project driveways, a review of the sight distance analysis prepared by King Engineering, and multimodal on-site circulation. **Figure 18** illustrates the project access and on-site circulation recommendations. Specifics of these recommendations are incorporated into the Conditions of Approval that follow.

Project Driveways

Sunset Boulevard Frontage

City design standards indicate that no driveways are allowed within 240 feet of an intersection on arterial roadways (see Zone 1 in DWG#3-38 in **Appendix F**). The project's proposed eastern driveway on Sunset Boulevard (Driveway 4 in **Figure 2** and **Figure 18**) is approximately 200 feet west of the University Avenue curb return, which would place the driveway within this 240-foot zone. The project site plan should be updated to eliminate this driveway. This study recommends consolidating access to a single driveway on Sunset Boulevard that is at least 240 feet from the University Avenue to be consistent with City standards.

The project access on Sunset Boulevard would be restricted to right-in/right-out movements. As currently designed, Driveway 5 has a throat depth of approximately 250 feet, while Driveway 4 has a throat depth of approximately 50 feet. **Table 10** presents the forecasted maximum outbound vehicle queues at each of these driveways (refer to **Appendix F** for calculations).

Table 10: Maximum Outbound Vehicle Queues at Project Driveways on Sunset Boulevard

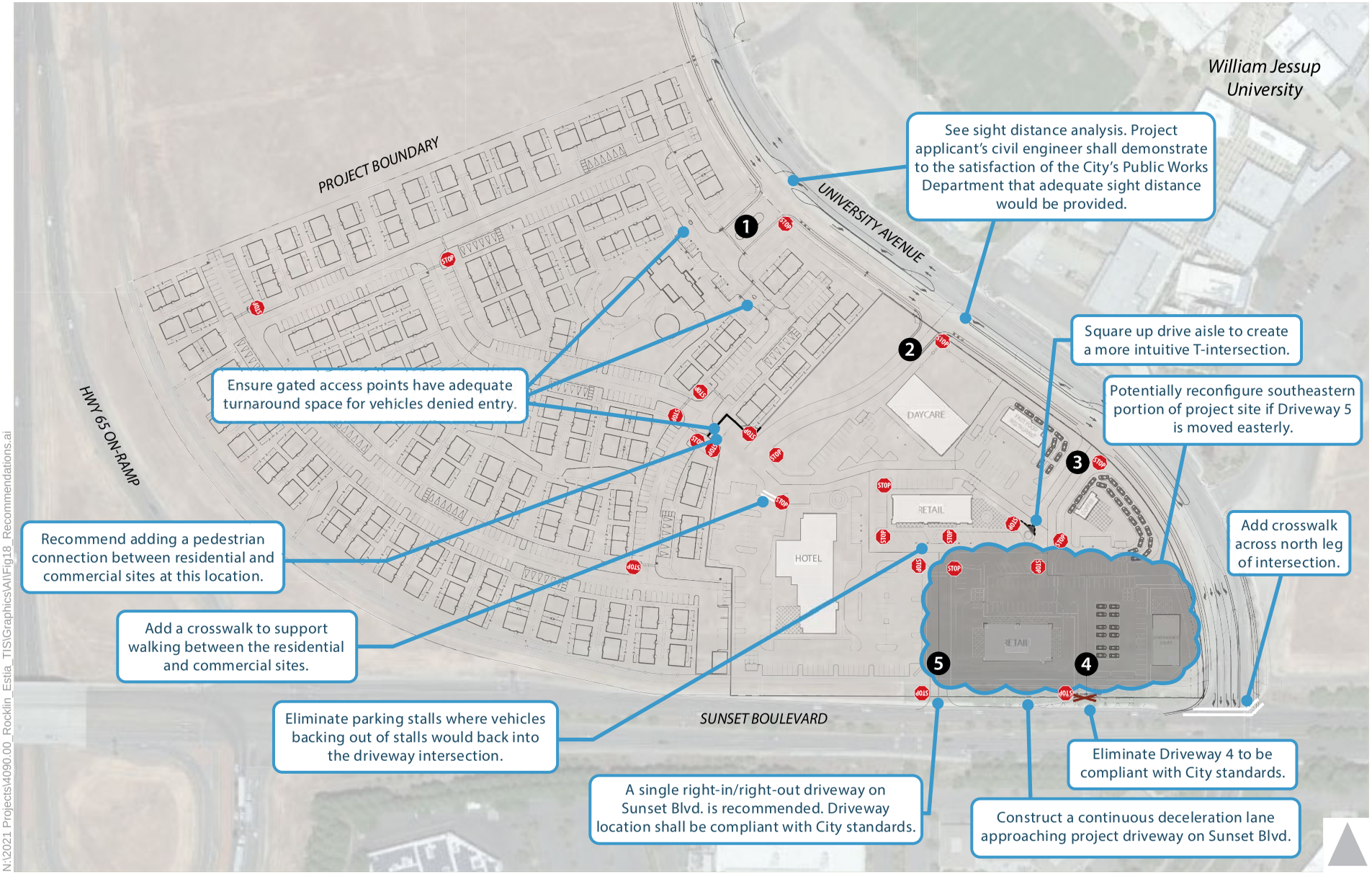
Driveway	Throat Depth[1]	Peak Hour	Maximum Vehicle Queue Length[2]
Driveway 4 (adjacent to gas station/ convenience market)	50 feet	AM	**100 feet**
		PM	**100 feet**
Driveway 5 (east of hotel)	250 feet	AM	75 feet
		PM	75 feet

Notes:

1. Driveway throat depths estimated based on project site plan provided by project applicant.
2. Maximum queue based on Maximum Queue Estimates for Unsignalized Right-Turn Driveways spreadsheet (see **Appendix F**). Queue length in feet estimated assuming each vehicle occupies on average 25 feet of space.

Bold indicates maximum vehicle queue exceeds the driveway throat length.

Source: Fehr & Peers, 2022.



N:\2021 Projects\4090.00_Rocklin_Estia_TIS\Graphics\AI\Fig18_Recommendations.ai

1 Project Driveway

STOP Stop Sign

Figure 18

Project Access & Circulation Recommendations

Table 10 shows that Driveway 5 has adequate storage to accommodate the maximum outbound queue of 3 vehicles (approximately 75 feet). However, the maximum outbound queue at Driveway 4 would extend beyond the driveway into the gas station site. Refer to **Appendix F** for queue calculation spreadsheets.

It should be noted that the commercial site plan evaluated in the addendum to this study was updated to remove Driveway 4 and consolidate access to a single driveway. The vehicle queueing and driveway throat depth analysis presented above reflects the two-driveway configuration as shown in the site plan presented in **Figure 2**. The addendum to this study provides a vehicle queueing and driveway throat depth analysis of the updated commercial site plan with the single consolidated driveway.

University Avenue Frontage

The project site plan presented in **Figure 2** indicates that all three project driveways on University Avenue would be side-street stop-control (i.e., stop signs for the project and William Jessup University driveways with free-flowing traffic on University Avenue). Outbound travel from all three project driveways on University Avenue would be restricted to right-turn movements only (i.e., no left-outs). **Table 11** presents the forecasted maximum outbound vehicle queues at each of these driveways along with the proposed throat depths at each driveway (refer to **Appendix F** for detailed calculations).

Table 11: Maximum Outbound Vehicle Queues at Project Driveways on University Avenue

Driveway	Throat Depth[1]	Peak Hour	Maximum Vehicle Queue	
			Length (vehicles)[2]	Length (feet)[3]
Driveway 1 (northern driveway at multifamily residential)	130 feet	AM	2 vehicles	50 feet
		PM	2 vehicles	50 feet
Driveway 2 (center driveway serving both residential and commercial uses)	380 feet	AM	2 vehicles	50 feet
		PM	2 vehicles	50 feet
Driveway 3 (southern driveway serving commercial uses)	160 feet	AM	6 vehicles	150 feet
		PM	6 vehicles	150 feet

Notes:

1. Driveway throat depths estimated based on project site plan provided by project applicant.
2. Maximum queue based on Maximum Queue Estimates for Unsignalized Right-Turn Driveways spreadsheet (see **Appendix F**).
3. Queue length in feet estimated assuming each vehicle occupies on average 25 feet of space.

Source: Fehr & Peers, 2022.

Table 11 shows that the project driveways on University Avenue are forecasted to have adequate storage to accommodate the maximum outbound vehicle queues. The southern driveway is forecasted to have the highest outbound traffic volume of the three driveways, and correspondingly is forecasted to have the longest maximum vehicle queue. The maximum queue is forecasted to extend almost the full length of

the driveway throat and may occasionally cause a driver to wait to enter the back of queue. Refer to **Appendix F** for queue calculation spreadsheets.

Inbound travel into Driveways 1 and 2 are proposed with left-in and right-in. Driveway 3 would be right-in only. The left turn pockets at Driveways 1 and 2 would be constructed with widening improvements to University Avenue. **Table 12** presents the forecasted maximum vehicle queues for these two left-turn pockets at the project driveways (refer to **Appendix F** for queue calculations). **Table 12** uses the University Avenue roadway design provided by the project applicant's civil engineer to estimate the future left-turn pocket storage lengths.

Table 12: Maximum Inbound Vehicle Queues at Project Driveways on University Avenue

Driveway	Storage[1]	Peak Hour	Maximum Vehicle Queue	
			Length (vehicles)[2]	Length (feet)[3]
Driveway 1 (northern driveway at multifamily residential)	215 feet	AM	1 vehicle	25 feet
		PM	2 vehicles	50 feet
Driveway 2 (center driveway)	215 feet	AM	3 vehicles	75 feet
		PM	3 vehicles	75 feet

Notes:

1. Left-turn pocket storage lengths estimated based on the University Avenue roadway design provided by the project applicant's civil engineer.
2. Maximum queue based on Estimation of Maximum Queue Lengths at Unsignalized Intersections (ITE Journal, November 2021) methodology. See **Appendix F** for calculations.
3. Queue length in feet estimated assuming each vehicle occupies on average 25 feet of space.

Source: Fehr & Peers, 2022.

Table 12 shows that the inbound left-turn pockets at the project driveways on University Avenue would have sufficient storage to accommodate the maximum queues.

Please note that the ingress movements from University Avenue would also be affected by the updated site plan, and are evaluated accordingly in the addendum to this study.

Sight Distance along University Avenue

University Avenue features both horizontal and vertical curvature along the project frontage. This may limit the distance that drivers can see vehicles as they attempt to turn movements from or onto University Avenue. The images below show the view of University Avenue from roughly the proposed project's southern driveway (i.e., Driveway 3) location on University Avenue.

Looking north along University Avenue from the project site.

Looking south along University Avenue from the project site.

The vertical and horizontal curvature of University Avenue and frequent driveway spacing of the existing driveways into William Jessup University (WJU) and proposed project driveways could cause a variety of potential sight distance constraints. The project applicant provided sight distance exhibits prepared by their civil engineer (see **Appendix F**) of the proposed left-turn ingress movements and driveway egress movements along this corridor. These exhibits apply stopping sight-distance standards for left-turn ingress movements and corner sight-distance standards for egress movements, as outlined in the

Highway Design Manual (HDM) to assess whether drivers would have adequate time to see approaching vehicles on conflicting movements.

These sight distance exhibits demonstrate several potential sight line conflicts along the corridor, including for the left-turn ingress movements at the project access points (i.e., Driveways 1 and 2 on University Avenue). The project applicant's civil engineer summarized these sight distance conflicts as follows:

- At the existing WJU northern driveway, the sight line for drivers exiting the driveway extends over the University's private property.
    - The sight line analysis indicates drivers exiting the WJU northern driveway would be able to see an object 4.25-feet high on northbound University Avenue, assuming no vegetation or other objects obstruct the sight line. However, this sight line just clears the proposed grade at the sight line.
- The left-turn into Driveway 1 may have a potential sight line conflict depending on the placement of a future left-turn pocket to access the neighboring property to the north (APN 017-277-006). Vehicles waiting to turn left into the future development to the north may obstruct the view of on-coming vehicles for drivers waiting to turn left into Driveway 1. The extent of the obstruction (if any) will depend on the ultimate location of the future northbound left-turn pocket into this property.
- The left-turn into Driveway 2 would have a potential sight line conflict with vehicles waiting to turn left into the existing center WJU driveway. Vehicles waiting to turn left into the project's center driveway or the center WJU driveway would potentially obstruct each other's vision of on-coming vehicles.
- The left-turn into the existing southern WJU driveway would have a potential sight line conflict with vehicles waiting in the southbound left turn lanes at the University Avenue/Atherton Road / Sunset Boulevard intersection. Vehicles queued in the southbound left-turn lanes on University Avenue at Sunset Boulevard would potentially obstruct the view of on-coming vehicles for drivers waiting to turn left into the southern WJU driveway.
- The left-turn out of the existing southern WJU driveway would have a potential sight line conflict with vehicles waiting in the left turn lane entering the southern WJU driveway.

Due to these potential sight distance limitations, this study recommends that the project applicant's civil engineer demonstrate to the satisfaction of the City's Public Works Department that adequate sight distance would be provided for left/right-turn egress movements and left-turn ingress movements at project driveways on University Avenue, as outlined in Mitigation Measure TR-3 in Chapter VI. Driveway sight distance shall meet applicable HDM standards. Driveway location, spacing, permitted turn movements, and turn pocket design shall meet applicable City design standards. Potential feasible options to address sight distance limitations include modifying traffic control, such as installing a roundabout or traffic signal at access points to the project and/or William Jessup University, restricting turn movements (i.e., eliminate left-turn access), or relocating driveways. The selection of the specific

treatment(s) to address sight distance would require collaboration with the City of Rocklin and William Jessup University.

Each treatment option would have potential benefits and trade-offs. For example, a roundabout would eliminate the need for drivers to see vehicles approaching from both the driver's right and left. Vehicles approaching or circulating in a roundabout are traveling slower than on a major street straight-away, reducing the distance that a driver would need to have visual contact with an approaching vehicle. Roundabouts have several operational and environmental benefits, such as less idling and delay which lower air pollution and fuel consumption. They also have fewer conflict points and have slower vehicle speeds, which can reduce collision severity and frequency, However, a roundabout may have a larger footprint than a typical intersection and may require right-of-way acquisition or dedication. Due to its larger footprint, it may also require some grading and/or utility work. The roundabout would also need to consider proximity to adjacent traffic signals so that vehicle queues at the traffic signals do not spill back to the roundabout and cause the traffic flow around the roundabout to become locked.

Traffic signals clearly designate the right-of-way for movements at an intersection with green, amber, and red phases. This can allow vehicles to make left-turn ingress or egress movements while conflicting movements are controlled by the traffic signal. Traffic signals also provide clear designation for pedestrian movements via pedestrian phases that inform pedestrians when they are permitted to cross the street. Traffic signals would need adequate spacing from adjacent intersections and other traffic signals to operate effectively.

Eliminating access points would remove the sight distance limitation entirely for that movement. However, it can result in less direct access for emergency response (i.e., fire, medical, etc.), inconvenient access routes (i.e., out of direction travel), and increased U-turn movements.

The treatment options should be selected comprehensively with consideration for how they would impact circulation on the University Avenue corridor. For example, one set of treatment options to address the sight distance limitations may include:

- Installing a roundabout on University Avenue at the southern WJU driveway.
- Installing a traffic signal or roundabout at University Avenue / Driveway 2.
- Eliminating the left-turn ingress into Driveway 1.

The addendum to this final transportation impact study analyzes the traffic operational and queueing aspects of this specific example. However, these treatments or any other access treatments would require further study to confirm feasibility considering other factors, such as potential impacts on utilities, grading, environmental conditions, and emergency response.

On-Site Circulation

The project site plan in **Figure 2** shows the project's internal multimodal circulation system. This includes drive aisles, gated access points, and parking aisles. The residential portion of the project site generally

has a drive aisle that loops near the perimeter of the site, with a center drive aisle that bisects the residential site along a west to northwest axis. The commercial site features several drive aisles serving the proposed commercial buildings on the site.

The site plan also shows proposed internal sidewalks and crosswalks where the walkways cross the drive aisles. However, there is no direct pedestrian connection between the multifamily residential community and the commercial site.

The drive aisle layout results in several internal intersections. The site plan received from the project applicant does not indicate any proposed traffic control signage (i.e., yield or stop signs). At key drive aisle intersections, this study recommends adding traffic control signage (i.e., stop signs) to clearly designate the right-of-way. Clearly designating the right-of-way would be particularly important at the entry points to the site since they would serve the highest traffic volumes. See **Figure 18** for specific recommended locations.

The gated access points to the multifamily residential community are generally set back into the project site and would not cause queues that back onto University Avenue. For example, the main driveway (Driveway 1) does not have a gate as it leads up to community building from University Avenue. The gated access points are setback approximately 75 to 100 feet to the north and south of the main driveway, providing sufficient space for queued vehicles waiting to enter the gate without hindering circulation on the main driveway.

Similarly, the secondary gated access to the residential community is located just north of Driveway 2, and approximately 400 feet to the southwest of University Avenue. This provides sufficient space for vehicles at the gate to queue without causing queueing impacts to Driveway 2 at University Avenue.

The residential gated access points should have adequate turnaround space should a vehicle be denied entry at the gate. The design should be semi-circular with adequate space for a bypass lane for a resident to pass a vehicle stopped at the kiosk.

Figure 18 also shows recommended modifications to facilitate access and on-site circulation, particularly on the east side of the commercial site. These modifications include:

- At the commercial site, eliminate Driveway 4 at the southeast corner of the site to comply with City standards for driveway placement on arterial roadways.
- A single right-in/right-out driveway on Sunset Boulevard is recommended for the commercial site. If Driveway 5 is located too far from the uses at the southeast corner of the site, the project site plan could be reconfigured to place the Sunset Boulevard driveway at least 240 feet from the University Avenue to be consistent with City standards. This would likely require relocating the proposed commercial retail building and adjusting the parking lot and drive aisle design.
- Construct a continuous deceleration lane approaching the Sunset Boulevard driveway for the commercial site that accommodates a bus turnout and deceleration space for vehicles turning right into the project driveway.

- Ensure the gated access points to the multifamily residential community have adequate turnaround space should a vehicle be denied entry at the gate. The design should be semi-circular with adequate space for a bypass lane for a resident to pass a vehicle stopped at the kiosk.
- Square up the drive aisle from the fast-food restaurant with the Driveway 3 from University Avenue on the commercial site.
- Eliminate a few of the parking stalls fronting Shops 1 building in the commercial site, where vehicles exiting the parking stalls would back into the driveway.
- Recommend adding a pedestrian walkway within the commercial site north of the proposed hotel that connects to the multifamily residential site. This would include adding a crosswalk north of the parking lot at the northwest corner of the hotel.

Conditions of Approval

The following transportation and circulation-related Conditions of Approval are recommended for the proposed project.

- Construct frontage roadway improvements along University Avenue and Sunset Boulevard consistent with the ultimate number of travel lanes planned for each roadway facility in the Rocklin General Plan Circulation Element. The frontage improvements should be constructed to City standards for arterial roadways, and include sidewalks and class II bike lanes on both University Avenue and Sunset Boulevard consistent with planned bicycle facilities identified in the *City of Rocklin Parks and Trails Master Plan* (2017).
- Construct improvements at the University Avenue/ Atherton Road / Sunset Boulevard intersection associated with the project frontage roadway improvements. Specifically:
    - Widen the southbound approach to accommodate the ultimate planned number of travel lanes (two southbound travel lanes, two northbound travel lanes, and a raised median north of the intersection; one southbound right-turn lane, one southbound through lane, and dual southbound left-turn lanes approaching Sunset Boulevard).
    - Dedicate right-of-way along the project's Sunset Boulevard frontage west of University Avenue such that curb, gutter, and sidewalk are placed at the ultimate location, which enables Sunset Boulevard to be widened to three lanes in each direction (including a dual eastbound left-turn lane onto University Avenue in the median) as identified in the Rocklin General Plan Circulation Element.
- Implement the following pedestrian facilities with the improvements at the University Avenue/ Atherton Road / Sunset Boulevard intersection:
    - Add a marked crosswalk and corresponding pedestrian equipment (pedestrian head, push buttons, etc.) for pedestrian travel across the north leg of the University Avenue/ Atherton

Road / Sunset Boulevard intersection. This should include curb ramps that comply with applicable design standards at the northwest and northeast corners of the intersection.

- Extend the existing sidewalk on the north side of Sunset Boulevard along the project frontage easterly to University Avenue.

- Coordinate with the City of Rocklin and Placer County Transit regarding the placement and design of the project driveway(s) on Sunset Boulevard to ensure that they do not interfere with planned transit operations and/or a potential relocation of the bus stop to a possible bus turnout near the northwest corner of the University Avenue/Atherton Road / Sunset Boulevard intersection.
- Coordinate with the City of Rocklin and William Jessup University regarding the placement and design of left-turn accesses on University Avenue. The project applicant's civil engineer shall demonstrate to the satisfaction of the City's Public Works Department that adequate sight distance would be provided for egress and left-turn ingress movements at project driveways on University Avenue.
- Ensure the gated access points to the multifamily residential community have adequate turnaround space should a vehicle be denied entry at the gate. The design should be semi-circular with adequate space for a bypass lane for a resident to pass a vehicle stopped at the kiosk.
- Install stop signs at the project driveways approaches to public city streets (i.e., University Avenue and Sunset Boulevard).

Appendix A:
Circular 212 Intersection LOS Calculations

Appendix B:
Traffic Counts and Existing Conditions LOS Calculations

Appendix C:
Dutch Bros Trip Generation Data, Mixed-Use Trip Generation, and Existing Plus Project LOS Calculations

Appendix D:
Existing Plus Approved Projects
LOS Calculations

Appendix E:
Cumulative Conditions
LOS Calculations

Appendix F:
City Standards Documents,
Sight Distance Analysis, &
Potential Operational Enhancements
LOS Calculations

From: Robert Hananouchi <R.Hananouchi@fehrandpeers.com>
Sent: Thursday, June 30, 2022 5:25 PM
To: Bret Finning <Bret.Finning@rocklin.ca.us>
Cc: David Mohlenbrok <David.Mohlenbrok@rocklin.ca.us>; Chris Dickinson <CDickinson@hbtsac.com>
Subject: RE: Estia - University Corridor Analysis

Hi Bret,

Per our call last Friday, below is a summary of our analysis findings regarding the following questions for the Estia at Rocklin project, and the LOS at Sunset Blvd. / University Ave. intersection.

1. How much would the upstream signals meter traffic demand?

Fehr & Peers expanded the Vissim microsimulation model to include the Sunset Blvd. / W. Stanford Ranch Rd. signal. This analysis showed about 5% of travel demand is metered by congestion at the Sunset Blvd. / W. Stanford Ranch Rd. signal during the PM peak hour. In other words, approximately 95% of travel demand on westbound Sunset Blvd. would reach the University Ave. intersection during the PM peak hour under cumulative plus project conditions.

2. What effect does the metering have on LOS at Sunset / University?

Reducing the westbound demand by 5% results in a slight reduction in delay (36 seconds per vehicle vs. 38 seconds per vehicle). However, this still represents LOS D conditions – see table below.

Note that the cutoff between LOS C/LOS D is 35 seconds of delay (LOS C is 20-35 and LOS D is 35-55), so the intersection is operating at the cusp of LOS C/D.

Intersection Operations PM Peak Hour – With Sunset Boulevard Driveway

Intersection	Traffic Control	Full Demand		Metered Demand	
		Delay	LOS	Delay	LOS
Sunset Blvd. / University Ave./Atherton Rd.	Signal	38	D	36	D

Source: Fehr & Peers, 2022.

3. What improvements would be necessary to achieve LOS C?

As noted in our email last month, a fourth westbound through lane on Sunset Blvd. would be needed at the Sunset Blvd. / University Ave./Atherton Rd to achieve LOS C. However, right-of-way constraints may hinder the ability to implement a fourth westbound through lane.

4. What is the trip generation difference between the current General Plan Land Use designation and the proposed Estia project?

The Northwest Rocklin General Development Plan and the City of Rocklin travel forecasting model show 328,000 SF of general commercial retail for the project site. The table below presents the trip generation for this site per the City of Rocklin travel model. The table below also compares this to the trip generation estimate for the Estia at Rocklin project. Note that this trip generation estimate for the Estia project reflects the latest commercial site plan and differs slightly from the TIS trip generation table.

The table below shows that the Estia at Rocklin project generates fewer daily, AM, and PM peak hour trips than the current General Plan land use designation for the site.

Vehicle Trip Generation Comparison – General Plan vs. Estia Project

Project	Land Use	Vehicle Trip Generation[1]						
		Daily	AM Peak Hour			PM Peak Hour		
		Total	Total	In	Out	Total	In	Out
General Plan Land Use[1]	Commercial Retail – 328,000 SF	11,480	459	329	130	812	319	493
Estia at Rocklin[2]	Mixed-Use – Residential, Commercial	5,843	433	210	223	443	247	196
Trip Generation Difference[3]		-5,637	-26	-119	+93	-369	-72	-297

Notes:

1. Vehicle trip generation for general plan land use based on the model's documented daily trip rates; and trips assigned to the roadway network during the AM and PM peak hours.
2. Vehicle trip generation estimate for Estia at Rocklin project based on trip generation analysis using data obtained from *Trip Generation Manual, 11th Edition*.
3. Difference between the proposed Estia at Rocklin project and the current General Plan land use designation, per outputs from the City of Rocklin travel forecasting model. A negative value indicates the Estia at Rocklin project generates fewer trips than the General Plan land use designation.

Source: Fehr & Peers, 2022.

5. What does the trip generation difference mean for LOS at Sunset / University?

The Estia at Rocklin project is forecasted to generate fewer PM peak hour trips than the current General Plan

land use designation. Therefore, the Sunset / University intersection would experience less delay with the proposed Estia project when compared to the General Plan land use designation. That means while Sunset / University would operate at LOS D with the Estia at Rocklin project, it would also operate at LOS D (or worse) with the current General Plan land use.

Conclusions

The analysis above indicates the Sunset / University would operate at LOS D (or worse) during the PM peak hour under cumulative conditions whether the project site develops according to the current General Plan land use or as the proposed Estia project. The amount of delay at the Sunset / University intersection would be less with the proposed Estia project than if developed per the land use assumptions in the City of Rocklin travel forecasting model. The LOS D condition is largely driven by traffic demand on Sunset Blvd. The traffic demand on Sunset Blvd. is higher than in previous studies due to updates to the cumulative land use inputs for unincorporated Placer County west of SR 65 in the Sunset Area/Placer Ranch.

We will be formally documenting these results in a forthcoming technical memorandum, but wanted to send via email for your reference ahead of time.

Let us know if you have any questions.

Thank you,

Rob Hananouchi, AICP
Associate
Fehr & Peers | 916.262.7410

Time-Off Alert: I will be out July 7-8 and returning on July 11th.