Appendix H:
Transportation Supporting Information

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Acacia Pointe
GPA 23-05247, ZC 23-05245
PDO 23-05246, TPM 38775
Traffic Impact Analysis

City of Perris, California

August 18, 2024

TJW ENGINEERING, INC.
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August 18, 2024

TJW ENGINEERING, INC.
TRAFFIC ENGINEERING &
TRANSPORTATION PLANNING
CONSULTANTS

Mr. Ryan Woosley
D.R. Horton
2280 Wardlow Circle, Suite 100
Corona, CA 92880

Subject: Traffic Impact Analysis – Acacia Pointe (GPA 23-05247, ZC 23-05245, PDO 23-05246, TPM 38775)
City of Perris

Dear Mr. Woosley:

TJW ENGINEERING, INC. (TJW) is pleased to present you with this traffic impact analysis for the proposed residential project, Acacia Pointe (GPA 23-05247, ZC 23-05245, PDO 23-05246, TPM 38775), located south of East Nuevo Road along the east side of Wilson Avenue in the City of Perris.

This traffic study has been prepared to meet the traffic study requirements for the City of Perris and assesses the forecast traffic operations associated with the proposed project and its potential impact on the local street network. This report is being submitted to you for review and forwarding to the City of Perris.

Please contact us at (949) 878-3509 if you have any questions regarding this analysis.

Sincerely,

Thomas Wheat, PE, TE
President
Registered Civil Engineer *#69467*
Registered Traffic Engineer *#2565*

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1.0 EXECUTIVE SUMMARY

This Traffic Impact Analysis (TIA) analyzes the projected traffic operations associated with the proposed project, Acacia Pointe, TPM 38775, located south of East Nuevo Road along the Wilson Avenue northbound lane in the City of Perris. The purpose of this TIA is to evaluate potential circulation system deficiencies that may result from development of the proposed project, and, if applicable, to recommend improvements to achieve acceptable operations. This analysis was prepared in coordination with the City of Perris via a scoping agreement (See **Appendix A**) and is pursuant to applicable traffic impact analysis guidelines found in the *City of Perris General Plan Circulation Element* (*Perris Circulation Element*) last revised August 2022, the *City of Perris Transportation Impact Analysis Guidelines for CEQA* (*Perris Guidelines*) of May 2020, and *City of Perris LOS Standards and Traffic Criteria for Traffic Studies (Perris Standards)* from 2017.

The proposed project is for the construction of 141 single-family attached residential dwelling units. The anticipated year of completion is 2026.

Site access is planned via two driveways on Wilson Avenue. The northerly driveway will be gated with full access. The southerly driveway will be gated and exit only. The site is currently zoned as R-6,000, or medium density residential of four (4) to seven (7) dwelling units per acre. The site is proposed for MFR-14, or medium density residential of seven (7) to fourteen (14) dwelling units per acre. The project site is currently vacant.

A growth rate of three percent (3%) was used to account for 2026 traffic volumes. Upon completion, the project is projected to generate 1,015 daily trips with 68 AM and 80 PM peak hour trips.

The following five (5) intersections in the vicinity of the project site have been included in the level of service (LOS) analysis:

1. Wilson Avenue/East Nuevo Road;
2. Redlands Avenue – Jade Avenue/East Nuevo Road;
3. Murrieta Road/East Nuevo Road;
4. Wilson Avenue/Project Driveway #1;
5. Wilson Avenue/Project Driveway #2.

The study intersections are analyzed for the following study scenarios:

- Existing Traffic Conditions (Existing);
- Existing Plus Project Traffic Conditions (Existing + Project);
- Opening Year Traffic Conditions (Existing + Ambient + Cumulative);
- Opening Year Plus Project Traffic Conditions (Existing + Ambient + Cumulative + Project).

1.1 SUMMARY OF LEVEL OF SERVICE ANALYSIS RESULTS

Table ES-1 summarizes the results of the intersection level of service analysis based on both the *Perris Circulation Element* thresholds of significance for analyzing transportation deficiencies.

Table ES-1

Summary of Transportation Deficiencies at Study Intersections

Intersection			Existing Conditions	Opening Year (2026) with Project Conditions
1	Wilson Avenue	East Nuevo Road	No Deficiencies	No Deficiencies
2	Redlands Avenue – Jade Avenue	East Nuevo Road	No Deficiencies	No Deficiencies
3	Murrieta Road	East Nuevo Road	No Deficiencies	No Deficiencies
4	Wilson Avenue	Project Driveway #1	Not Applicable	No Deficiencies
5	Wilson Avenue	Project Driveway #2	Not Applicable	No Deficiencies

Existing Conditions

The study intersections are projected to operate at an acceptable LOS during the AM and PM peak hours for Existing Traffic Conditions.

Existing Plus Project Conditions (EP)

The study intersections are projected to operate at an acceptable LOS during the AM and PM peak hours for Existing Plus Project Traffic Conditions.

Opening Year Traffic Conditions (OY)

The study intersections are projected to operate at an acceptable LOS during the AM and PM peak hours for Opening Year Traffic Conditions.

Opening Year Plus Project Traffic Conditions (OYP)

The study intersections are projected to operate at an acceptable LOS during the AM and PM peak hours for Opening Year Plus Project Traffic Conditions.

1.2 ON-SITE ROADWAY AND SITE ACCESS IMPROVEMENTS

Wherever necessary, roadways adjacent to the proposed project site and site access points will be constructed in compliance with recommended roadway classifications and respective cross-sections in the *Perris Circulation Element*, or as directed as applicable by the City of Perris Engineer.

Sight distance at each project access point should be reviewed with respect to the County of Riverside Standard no. 821 Intersection Sight Standard and the City of Perris sight distance standards at the time of final grading, landscaping, and street improvement plans.

Signing/striping should be implemented in conjunction with detailed construction plans for the project site.

2.0 INTRODUCTION

This Traffic Impact Analysis (TIA) analyzes the projected traffic operations associated with the proposed project, Acacia Pointe, located south of East Nuevo Road along the northbound side of Wilson Avenue in the City of Perris. The purpose of this TIA is to evaluate potential circulation system deficiencies that may result from the development of the proposed project, and, if applicable, to recommend improvements to achieve acceptable operations. This analysis was prepared in coordination with the City of Perris via a scoping agreement (See **Appendix A**) and is pursuant to applicable traffic impact analysis guidelines found in the *City of Perris General Plan Circulation Element* (*Perris Circulation Element*) last revised August 2022, the *City of Perris Transportation Impact Analysis Guidelines for CEQA* (*Perris Guidelines*) of May 2020, and *City of Perris LOS Standards and Traffic Criteria for Traffic Studies (Perris Standards)* from 2017.

2.1 PROJECT DESCRIPTION

The proposed project is for the construction of 141 single-family attached residential dwelling units. The anticipated year of completion is 2026.

Site access is planned via two driveways on Wilson Avenue. The northerly driveway will be gated and full access. The southerly driveway will be gated with exit only. The site is currently zoned as R-6,000, or medium density residential of four (4) to seven (7) dwelling units per acre. The site is proposed for MFR-14, or medium density residential of seven (7) to fourteen (14) dwelling units per acre. The project site is currently vacant.

The project includes a proposal to restripe East Nuevo Road to provide a second through lane at the eastbound leg of its intersection with Wilson Avenue and continuing east toward Murrietta Road along the project site frontage.

A growth rate of three percent (3%) was used to account for 2026 traffic volumes. Upon completion, the project is projected to generate 1,015 daily trips with 68 AM and 80 PM peak hour trips.

Exhibit 1 shows the proposed project site location. **Exhibit 2** shows the proposed project site plan.

2.2 STUDY AREA

The following five (5) intersections in the vicinity of the project site have been included in the level of service (LOS) analysis:

1. Wilson Avenue/East Nuevo Road;
2. Redlands Avenue – Jade Avenue/East Nuevo Road;
3. Murrieta Road/East Nuevo Road;
4. Wilson Avenue/Project Driveway #1;
5. Wilson Avenue/Project Driveway #2.

The study intersections are analyzed for the following study scenarios:

- Existing Traffic Conditions (Existing);
- Existing Plus Project Traffic Conditions (Existing + Project);
- Opening Year Traffic Conditions (Existing + Ambient + Cumulative);
- Opening Year Plus Project Traffic Conditions (Existing + Ambient + Cumulative + Project).

Traffic operations are evaluated for the following time periods:

- Weekday AM Peak Hour occurring between 7:00 AM to 9:00 AM;
- Weekday PM Peak Hour occurring between 4:00 PM to 6:00 PM.

2.3 INTERSECTION ANALYSIS METHODOLOGY

Level of Service (LOS) is commonly used to describe the quality of flow on roadways and at intersections using a range from LOS A, very favorable progression, to LOS F, very poor progression. The LOS definitions for interruption of traffic flow differ depending on the type of traffic control (traffic signal, unsignalized intersection with side street stops, unsignalized intersection with all-way stops). The *Highway Capacity Manual* (*HCM*) *7th Edition* (Transportation Research Board, 2022) methodology expresses the LOS of an intersection in terms of delay time for the intersection approaches. The HCM methodology utilizes different procedures for different types of intersection control.

The *Perris Circulation Element* requires signalized intersection operations to be analyzed utilizing the HCM methodology. Intersection LOS for signalized intersections is based on the intersection's average control delay for all movements at the intersection during the peak hour. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.

Table 1 identifies each Level of Service category with the corresponding general characteristics of traffic flow plus accompanying delay ranges at signalized intersections.

Table 1

HCM – LOS & Delay Ranges – Signalized Intersections

Level of Service	Description	Delay (in seconds)
A	Very favorable progression; most vehicles arrive during green signal and do not stop. Short cycle lengths.	0 – 10.00
B	Good progression, short cycle lengths. More vehicles stop than for LOS A.	10.01 – 20.00
C	Fair progression; longer cycle lengths. Individual cycle failures may begin to appear. The number of vehicles stopping is significant, though many vehicles still pass through without stopping.	20.01 – 35.00
D	Progression less favorable, longer cycle length and high flow/capacity ratio. The proportion of vehicles that pass through without stopping diminishes. Individual cycle failures are obvious.	35.01 – 55.00
E	Severe congestion with some long-standing queues on critical approaches. Poor progression, long cycle lengths and high flow/capacity ratio. Individual cycle failures are frequent.	55.01 – 80.00
F	Very poor progression, long cycle lengths and many individual cycle failures. Arrival flow rates exceed capacity of intersection.	> 80.01

Source: Transportation Research Board, *Highway Capacity Manual*, HCM 7th Edition (Washington D.C., 2022).

Collected peak hour traffic volumes have been adjusted using a peak hour factor (PHF) to reflect peak 15-minute volumes. It is a common practice in LOS analysis to conservatively use a peak 15-minute flow rate applied to the entire hour to derive flow rates in vehicles per hour that are used in the LOS analysis. The PHF is the relationship between the peak 15-minute flow rate and the full hourly volume. PHF = [Hourly Volume]/ [4 * Peak 15-Minute Volume]. The use of a 15-minute PHF produces a more detailed and conservative analysis compared to analyzing vehicles per hour. Existing PHFs, obtained from the existing traffic counts have been used for all analysis scenarios in this study.

The *Perris Circulation Element* requires unsignalized intersection operations to be analyzed utilizing the HCM methodology. Operation for unsignalized intersections is based on the weighted average control delay expressed in seconds per vehicle.

At a two-way or side-street stop-controlled intersection, LOS is calculated for each stop-controlled minor street movement, for the left-turn movement(s) from the major street, and for the intersection as a whole. For approaches consisting of a single lane, the delay is calculated as the average of all movements in that lane. For all-way stop-controlled intersections, LOS is computed for the intersection as a whole.

Table 2 identifies each unsignalized intersection Level of Service category with their corresponding general characteristics of traffic flow, plus their accompanying delay ranges.

Table 2

HCM – LOS & Delay Ranges – Unsignalized Intersections

Level of Service	Description	Delay (in seconds)
A	Little or no delays.	0 – 10.00
B	Short traffic delays.	10.01 – 15.00
C	Average traffic delays.	15.01 – 25.00
D	Long traffic delays. Multiple vehicles in queue.	25.01 – 35.00
E	Very long delays. Demand approaching capacity of intersection	35.01 – 50.00
F	Very constrained flow with extreme delays and intersection capacity exceeded.	> 50.01

Source: Transportation Research Board, *Highway Capacity Manual*, HCM 7th Edition (Washington D.C., 2022).

This study utilizes *PTV Vistro 2022* software for all signalized and unsignalized intersections. Vistro is a macroscopic traffic software program that is based on the signalized intersection capacity analysis specified in Chapter 16 of the HCM. The level of service and capacity analysis performed within Vistro takes into consideration the optimization and coordination of signalized and unsignalized intersections within a network.

2.4 PERFORMANCE CRITERIA

The City of Perris provided the document, *City of Perris LOS Standards and Traffic Criteria for Traffic Studies,* which establishes the level of service "D" or better as the minimal LOS for all intersections along the designated street and highway system.

3.0 EXISTING CONDITIONS

3.1 EXISTING CIRCULATION NETWORK/STUDY AREA CONDITIONS

The proposed project site is located within the City of Perris. The characteristics of the roadway system within the study area of the proposed project site are described in **Table 3**.

Table 3
Roadway Characteristics Within Study Area

Roadway	Classification[1]	Jurisdiction	Direction	Existing Travel Lanes	Median Type[2]	Speed Limit (mph)	On-Street Parking
Wilson Avenue	Collector	Perris	North-South	2	NM	25	Yes
Redlands Avenue	Secondary Arterial	Perris	North-South	4	TWLTL	45	No
Jade Avenue	Collector	Perris	North-South	2	NM	25	Yes
Murrieta Road	Collector	Perris	North-South	2	TWLTL	25	Yes
East Nuevo Road	Secondary Arterial	Perris	East-West	4	TWLTL	40	Yes

1: Source: City of Perris General Plan Circulation Element (2022)
2: TWLTL = Two-Way Left-Turn Lane, NM = No Median.

Exhibit 3 shows existing intersection controls and roadway geometry of each study area intersection.

3.2 CITY OF PERRIS GENERAL PLAN CIRCULATION ELEMENT

The *Perris Circulation Element* provides a classification system for the roadways within the City of Perris. It includes illustrations of roadway cross-sections for each classification type. The *Perris Circulation Element* is attached in **Appendix A.**

3.3 EXISTING BICYCLE AND PEDESTRIAN FACILITIES

The *Perris Circulation Element* provides bikeway classifications. Currently, there are Class II bicycle lanes on both northbound and southbound legs of Murrieta Road. The *Perris Circulation Element* in **Appendix A** contains both a map and description of the City Bikeway System.

3.4 EXISTING PUBLIC TRANSIT SERVICES

The City of Perris is served by the Riverside Transit Authority (RTA), the transit operator for the Riverside County area, which operates bus routes throughout the County. There are no RTA bus routes with stops within one-half a mile from the proposed project.

3.5 EXISTING TRAFFIC VOLUMES

To determine the existing operation of the study intersections, AM and PM peak period traffic volumes were estimated based on new traffic counts collected on January 31, 2024. Detailed traffic count data is provided in **Appendix B**. Existing Traffic AM peak hour volumes at the study intersections are shown in **Exhibit 4** while **Exhibit 5** shows Existing Traffic PM peak hour volumes.

3.6 EXISTING TRAFFIC CONDITIONS INTERSECTION LEVEL OF SERVICE ANALYSIS

Existing intersection analysis of AM and PM peak hour conditions is shown in **Table 4**. Calculations are based on the existing geometrics at the study area intersections as shown in **Exhibit 3.** HCM 7 analysis sheets are provided in **Appendix C**.

Table 4
Intersection Analysis - Existing Traffic Conditions

Intersection			Control Type	Peak Hour	Existing Conditions	
					Delay	LOS
1	Wilson Avenue	East Nuevo Road	Signal	AM	12.32	B
				PM	14.14	B
2	Redlands Avenue – Jade Avenue	East Nuevo Road	Signal	AM	20.12	C
				PM	18.75	B
3	Murrieta Road	East Nuevo Road	Signal	AM	28.82	C
				PM	23.84	C

Note: OWSC = One-Way Stop-Control; Delay shown in seconds per vehicle.

As shown in **Table 4**, the existing study intersections are currently operating at an acceptable LOS during the AM and PM peak hours under Existing Traffic Conditions**.**

4.0 PROPOSED PROJECT

4.1 PROJECT DESCRIPTION

The proposed project is for the construction of 141 single-family attached residential dwelling units. The anticipated year of completion is 2026.

Site access is planned via two driveways on Wilson Avenue. The northerly driveway will be gated with full access. The southerly driveway will be gated and exit only. The site is currently zoned as R-6,000, or medium density residential of four (4) to seven (7) dwelling units per acre. The site is proposed for MFR-14, or medium density residential of seven (7) to fourteen (14) dwelling units per acre. The project site is currently vacant.

The project includes a proposal to restripe East Nuevo Road to provide a second through lane at the eastbound leg of its intersection with Wilson Avenue and continuing east toward Murrietta Road along the project site frontage. The new lane configurations and traffic controls are shown in Exhibit 6.

The proposed project is anticipated to be built and generating trips in 2026. A growth rate of three percent (3%) was used to account for 2026 traffic volumes. As previously shown, **Exhibit 2** displays the proposed project site plan.

4.2 PROJECT TRIP GENERATION

Trip generation represents the amount of traffic, both inbound and outbound, produced by a development. Determining trip generation for a proposed project is based on projecting the amount of traffic that the specific land uses being proposed will produce. Industry standard *Institute of Transportation Engineers (ITE) Trip Generation Manual (11th Edition, 2021)* trip generation rates were used to determine trip generation based on the proposed project land uses.

Table 5 summarizes the projected AM peak hour, PM peak hour and daily trip generation of the proposed project. The project is projected to generate 1,015 daily trips with 68 AM and 80 PM peak hour trips.

Table 5
Proposed Project Trip Generation

Proposed Land Use[1]	ITE Code	Qty	Unit[2]	Daily		AM Peak Hour					PM Peak Hour				
				Rate	Volume	Rate	In:Out Split	Volume			Rate	In:Out Split	Volume		
								In	Out	Total			In	Out	Total
Single-Family Attached Housing	215	141	DU	7.2	1,015	0.48	25:75	17	51	68	0.57	59:41	47	33	80

1: Trip generation rates from ITE Trip Generation (11th Edition, 2021).
2: DU = Dwelling Unit.

4.3 PROJECT TRIP DISTRIBUTION

Projecting trip distribution involves the process of identifying probable destinations and traffic routes that will be utilized by the proposed project's traffic. The potential interaction between the proposed land use and surrounding regional access routes are considered to identify the probable routes onto which project traffic would distribute. The projected trip distribution for the proposed project is based on anticipated travel patterns to and from the project site.

Exhibit 7 shows the projected distribution and turning movements of the proposed project generated trips both to and from the project. **Exhibit 8** and **Exhibit 9** show project's trip generation AM and PM peak hour volumes assigned as based on the trip distribution.

4.4 PROPOSED DRIVEWAY GATES

Site access is planned via two driveways on Wilson Avenue. The northerly driveway will be gated with full access. The southerly driveway will be gated and exit only. The gates at the northerly driveway are situated ahead of the gate controls to allow vehicles to pass-by, avoiding potential queues. Additionally, there is sufficient space between the gate controls and the gate itself to accommodate u-turns. Based on the proposed design, there does not appear to be any significant issues with vehicles queueing at the entrance gate. Additionally, as the southern driveway is exit only there are not any queueing issues that would impede traffic flow on Wilson Avenue.

4.4.1 Vehicle Turning Analysis

Exhibit 10 provides a turning template for passenger vehicles and delivery trucks not permitted to enter the proposed project via the entry gate at Driveway #1. The template was generated using three vehicles, two passenger and one delivery, of varying lengths. The template demonstrates that these vehicles will have sufficient space to make U-turns or 3-point turns in the event they are denied entrance at the gate.

4.4.2 Gate Stacking Analysis

An analysis of the Project Driveway #1 entry queue was performed using the Crommelin Methodology. This methodology is based on *Entrance-Exit Design and Control for Major Parking Facilities (Robert W. Crommelin, October 5, 1972)* and is used to determine the minimum storage length required to provide vehicles adequate access and control at gated entry points in order to ensure minimal impacts on the surrounding street network. The methodology is based on worst case peak hour volumes, the processing rate at the control point, and the number of travel lanes. The determination of the storage, or reservoir, length required to serve peak hour volumes is based on a *Poisson* distribution.

A traffic intensity factor is calculated by dividing the greater volume between AM and PM peak hour traffic by the service rate of the control point, which in this case is the Project Driveway #1 entry gate. The intensity factor is then plotted along the Poisson distribution selected confidence interval in the Crommelin Reservoir Needs Nomograph to determine the number of vehicles forecast to queue behind the control point. The forecast queue of vehicles from the Nomograph is then multiplied by 20 feet per passenger vehicle.

The physical gate at the Project Driveway #1 entry will open and close between each vehicle. The gate will be code/card operated. Based on this information, the Crommelin Methodology uses the service rate of 190 vehicles per hour.

The Project Driveway #1 traffic intensity factor was plotted in the Crommelin Reservoir Needs Nomograph to determine the maximum queue length the PM Peak Hour volume will need to operate with minimal impact to the surrounding street network. See **Appendix D** for the nomograph. **Table 6** shows that the maximum queue length needed for Project Driveway #1 is less than the planned length between the driveway beginning behind the pedestrian crosswalk and the call box center. Therefore, the planned Project Driveway #1 queue length at entry is expected to accommodate the anticipated vehicle queuing.

Table 6
Gate Stacking Analysis

Location	Entering Vehicle Volume		Service Rate (veh/hr)	Traffic Intensity Factor	Maximum Queue[1]		Provided Driveway Length (feet)
	AM	PM			Vehicles	Feet	
Project Driveway #1	18	48	190	0.25	<1	20	20

1: 20 feet per vehicle

4.5 SPEED SURVEY

To account for potential need of traffic calming features along Wilson Avenue, a speed survey was conducted. According to the California Department of Transportation (CALTRANS), the most widely accepted method of determining the posted speed limit is to set the speed limit at what is called the 85th percentile speed which is the speed at or below which 85 percent of the traffic is moving. It is identified as the prevailing speed, or the speed which most motorists feel comfortable, safe, and reasonable rate given the roadway condition.

Speeds were observed on Wilson Avenue between East Nuevo Road and Cherry Vista Drive for 24-hours on January 31, 2024. The 85th percentile speed for the roadway segment is shown in **Table 7**.

Table 7
Roadway Speed Survey

	Roadway Segment	85th Percentile Speed (MPH)
1	Wilson Avenue between East Nuevo Road & Cherry Vista Drive	40

5.0 EXISTING PLUS PROJECT TRAFFIC CONDITIONS (EP)

Existing Plus Project (Existing + Project) Traffic Conditions (EP) analysis is intended to identify the impacts of the project on current traffic conditions.

5.1 ROADWAY IMPROVEMENTS

The EP scenario assumes two changes to the Existing lane configurations and traffic controls. They are the addition of two (2) driveways for accessing the proposed project site, south of East Nuevo Road along the northbound lane of Wilson Avenue. The southerly driveway is exit only. The second change is the restriping of East Nuevo Road to provide a second through lane at the eastbound leg of its intersection with Wilson Avenue and continuing east toward Murrietta Road along the project site frontage. The new lane configuration and traffic controls are shown in
Exhibit 6.

5.2 EP TRAFFIC VOLUMES

To determine the EP operations of the study intersections, AM and PM peak period traffic volumes were estimated based on new traffic counts collected on January 31, 2024. These volumes were combined with the projected trip generation of the project from **Table 5**.

EP Traffic Volumes = Existing + Project

5.3 EP INTERSECTION LEVEL OF SERVICE ANALYSIS

EP Traffic AM and PM peak hour intersection analysis is shown in **Table 8**. EP Traffic AM and PM peak hour volumes at the study intersections are shown in **Exhibit 11** and **Exhibit 12**. HCM analysis sheets are provided in **Appendix C**.

Table 8
Intersection Analysis – Existing Plus Project (EP) Traffic Conditions

Intersection			Control Type	Peak Hour	Existing Conditions		EP Conditions	
					Delay[1]	LOS	Delay[1]	LOS
1	Wilson Avenue	East Nuevo Road	Signal	AM	12.32	B	12.29	B
				PM	14.14	B	12.10	B
2	Redlands Avenue – Jade Avenue	East Nuevo Road	Signal	AM	20.12	C	20.57	C
				PM	18.75	B	19.12	B
3	Murrieta Road	East Nuevo Road	Signal	AM	28.82	C	28.82	C
				PM	23.84	C	23.86	C
4	Wilson Avenue	Project Driveway #1	OWSC	AM	-	-	8.95	A
				PM	-	-	8.86	A
5	Wilson Avenue	Project Driveway #2	OWSC	AM	-	-	8.77	A
				PM	-	-	8.75	A

Note: OWSC = One-Way Stop-Control; Delay shown in seconds per vehicle.
1 = Per the Highway Capacity Manual 7th Edition, overall average delay and LOS are shown for intersections with one or two-way stop-control, the delay and LOS for the worst individual movement is shown.

As shown in **Table 8**, for Existing With Project traffic conditions, the two proposed project driveways are expected to operate an acceptable LOS during the AM and PM peak hours, and the three existing intersections are projected to continue operating at an acceptable LOS during the AM and PM peak hours.

6.0 OPENING YEAR TRAFFIC CONDITIONS (OY)

Opening Year Without Project (Existing + Ambient + Cumulative) Traffic Conditions (OY) analysis is intended to identify the traffic conditions in the near-term.

6.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for the OY scenario are consistent with those previously shown in **Exhibit 3**.

6.2 OY TRAFFIC VOLUMES

OY traffic condition volumes were estimated based on a yearly growth rate of 3% per year from base year, 2024, to the proposed project's estimated year of completion, 2026.

OY Traffic Volumes = (Existing (2024) Counts * 1.03^2)

6.3 OY TRAFFIC INTERSECTION LEVEL OF SERVICE ANALYSIS

OY intersection analysis is shown in Table 9**.** OY traffic AM and PM peak hour volumes at the study intersections are shown in **Exhibit 13** and **Exhibit 14**. HCM analysis sheets are provided in **Appendix C.**

Table 9
Intersection Analysis – Opening Year (OY) Traffic Conditions

Intersection			Control Type	Peak Hour	OY Conditions	
					Delay	LOS
1	Wilson Avenue	East Nuevo Road	Signal	AM	12.74	B
				PM	14.92	B
2	Redlands Avenue – Jade Avenue	East Nuevo Road	Signal	AM	20.95	C
				PM	19.86	B
3	Murrieta Road	East Nuevo Road	Signal	AM	30.45	C
				PM	24.97	C

Note: OWSC = One-Way Stop-Control; Delay shown in seconds per vehicle.

As shown in **Table 9**, the study intersections are projected to continue to operate at an acceptable LOS during the AM and PM peak hours for OY Traffic Conditions.

7.0 OPENING YEAR PLUS PROJECT TRAFFIC CONDITIONS (OYP)

Opening Year Plus Project (Existing + Ambient + Cumulative + Project) Traffic Conditions (OYP) analysis is intended to identify the project-related impacts on both the existing and planned near-term circulation system.

7.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for the OYP scenario are consistent with those previously shown in
Exhibit 6Exhibit 3.

7.2 CUMULATIVE PROJECTS

A list of cumulative projects in various stages of planning, entitlement, or construction was obtained for this analysis from the City of Perris. Of these, none were found to be located within a one-half mile radius from the proposed project and, therefore, are not considered to have a significant impact on the traffic conditions in the study area. Thus, trips generated by the cumulative projects were not included in this analysis.

7.3 OYP TRAFFIC VOLUMES

OYP traffic condition volumes were estimated based on a yearly growth rate of 3% per year from base year, 2024, to the proposed project's estimated year of completion, 2026.

OYP Traffic Volumes = (Existing (2024) Counts * 1.03^2) + Cumulative Projects + Project

7.4 OYP TRAFFIC INTERSECTION LEVEL OF SERVICE ANALYSIS

OYP traffic AM and PM peak hour intersection analysis is shown in **Table 10**. OYP traffic AM and PM peak hour volumes at the study intersections is shown in **Exhibit 15** Error! Reference source not found.and **Exhibit 16.** HCM analysis sheets are provided in **Appendix C**.

Table 10
Intersection Analysis – Opening Year Plus Project (OYP) Traffic Conditions

Intersection			Control Type	Peak Hour	OY Conditions		OYP Conditions		Change	Deficient
					Delay[1]	LOS	Delay[1]	LOS		
1	Wilson Avenue	East Nuevo Road	Signal	AM	12.74	B	12.63	B	-	-
				PM	14.92	B	12.32	B	-	-
2	Redlands Avenue – Jade Avenue	East Nuevo Road	Signal	AM	20.95	C	21.27	C	-	-
				PM	19.86	B	20.09	C	-	-
3	Murrieta Road	East Nuevo Road	Signal	AM	30.45	C	29.66	C	-	-
				PM	24.97	C	24.99	C	-	-
4	Wilson Avenue	Project Driveway #1 (northerly)	OWSC	AM	N/A	N/A	8.98	A	N/A	-
				PM	N/A	N/A	8.89	A	N/A	-
5	Wilson Avenue	Project Driveway #2 (southerly)	OWSC	AM	N/A	N/A	8.80	A	N/A	-
				PM	N/A	N/A	8.77	A	N/A	-

Note: OWSC = One-Way Stop-Control; N/A = Not Applicable; Delay shown in seconds per vehicle.
1 = Per the Highway Capacity Manual 7th Edition, overall average delay and LOS are shown for intersections with one-or-two-way stop-control, the delay and LOS for the worst individual movement is shown.

As shown in **Table 10**, the study intersections are projected to continue to operate at an acceptable LOS during the AM and PM peak hours for OYP Traffic Conditions.

7.5 OYP SIGNAL WARRANT ANALYSIS

To ensure signals are not warranted at the unsignalized study intersections a signal warrant analysis was conducted for Wilson Avenue and both proposed project driveways, currently unsignalized with no stops. The California Manual on Uniform Traffic Control Devices (CA MUTCD) contains Figure 4C-3, a tool which was utilized for this study to determine if a traffic signal is warranted. Based on OYP volumes, traffic signals are not warranted at either project driveway intersection with Wilson Avenue. Traffic signal warrant analysis worksheets are shown in **Appendix E**.

7.6 QUEUING ANALYSIS

To ensure sufficient vehicular circulation, a queue analysis was conducted at both proposed project driveways. The results for the 95th percentile queue lengths are shown in **Table 11**. For the northerly driveway, a minimal queue length of four vehicles was found. As the maximum 95th percentile queue length calculated was just over two feet, the northerly driveway length is not anticipated to create significant queueing issues along Wilson Avenue. For the southerly driveway, a queue length of one vehicle was found. Based on the 95th percentile queue length less than one foot, the southerly driveway is also not anticipated to create queuing issues at the intersection with Wilson Avenue.

Table 11
Opening Year With Project Queuing Analysis

Intersection		Movement	Storage Length (ft)	AM Peak Hour 95th Percentile Queue Length (ft)	PM Peak Hour 95th Percentile Queue Length (ft)
1	Wilson Avenue/Project Driveway #1 (northerly)	SBL	-	<20[1]	<20[1]
		SBT	-	<20[1]	<20[1]
		WBL	80	<20[1]	<20[1]
		WBR	80	<20[1]	<20[1]
2	Wilson Avenue/Project Driveway #2 (southerly)	WBL	20	<20[1]	<20[1]
		WBR	20	<20[1]	<20[1]

1: If the reported queue length is less than 20 feet, a queue length of one vehicle = 20 feet is assumed.

APPENDIX

Appendix A: Scoping Agreement and City Documents
Appendix B: Existing Traffic Counts and Model Volumes
Appendix C: HCM Analysis Sheets
Appendix D: Crommelin Reservoir Needs Nomograph
Appendix E: Traffic Signal Warrant Analysis Worksheets

APPENDIX A

SCOPING AGREEMENT AND CITY DOCUMENTS

APPENDIX B

EXISTING TRAFFIC COUNTS AND MODEL VOLUMES

APPENDIX C

HCM ANALYSIS WORKSHEETS

EXISTING TRAFFIC CONDITION

EXISTING PLUS PROJECT (EP) TRAFFIC CONDITIONS

OPENING YEAR (OY) TRAFFIC CONDITIONS

APPENDIX E

TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS