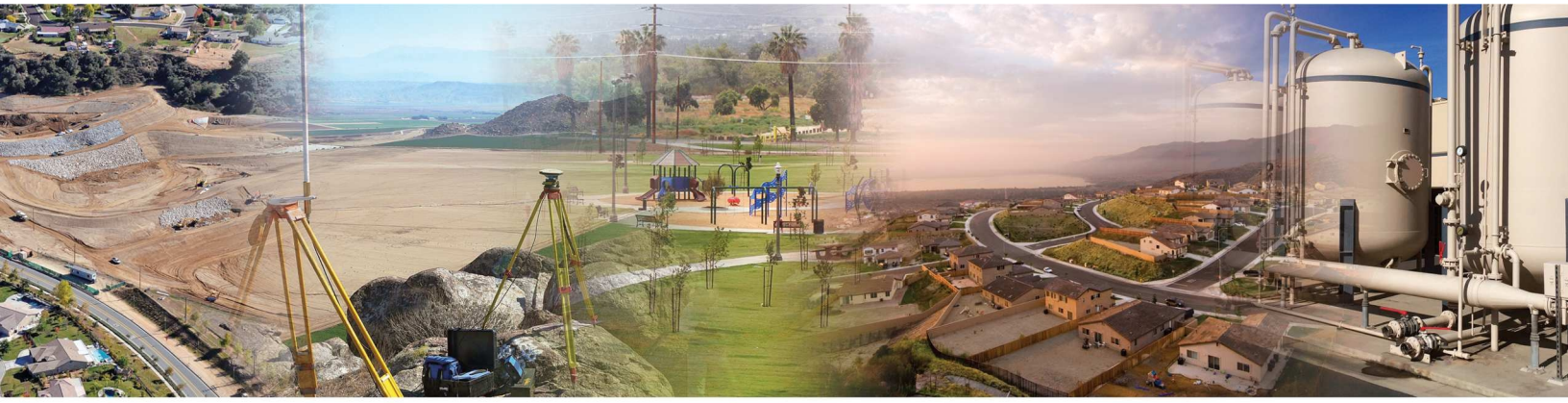
ALBERT A. WEBB ASSOCIATES



PATTERSON-NANCE WAREHOUSE PROJECT TRAFFIC IMPACT ANALYSIS (DPR 21-00005)

January 2022

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January 27, 2022

DJ Arellano
Duke Realty
764 W. Ramona Expy #C
Perris, CA 92571

RE: Traffic Impact Analysis report for proposed warehouse development on Patterson Avenue in the City of Perris (DPR 21-00005)

Dear Sir,

We are pleased to submit herewith our Traffic Impact Analysis (TIA) report for the proposed project, which we have prepared at your request.

If you have any questions regarding this report, please call the undersigned for clarification.

Sincerely,

ALBERT A. WEBB ASSOCIATES

Nicholas Lowe, PE
Senior Engineer

Kawai Mang, EIT
Assistant Engineer

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I. EXECUTIVE SUMMARY

Study Objectives

This study evaluates the potential effects on traffic circulation from a proposed industrial development between Patterson Avenue and Nevada Avenue, south of Harley Knox Boulevard in the City of Perris. The study objectives include:

- Document existing traffic conditions (2021) in the vicinity of the proposed development (study area);
- Determine the expected project traffic generation;
- Evaluate opening-day traffic scenarios for intersection levels of service (LOS), including ambient growth and cumulative projects;
- Determine if the LOS required by the City of Perris will be maintained within the study area, and
    - if not, determine the improvement measures needed to maintain the required LOS;
- Determine if peak-hour traffic signal warrants are met for any unsignalized study intersections.

Prior to the preparation of this study, the City of Perris was solicited for input on and approval of the study scope (**Appendix A**).

Project Description

Duke Realty is proposing to construct a new warehouse of approximately 769,668 square feet within a site of approximately 33 acres along Nance Street between Patterson Avenue and Nevada Avenue south of Harley Knox Boulevard in the City of Perris, within the Perris Valley Commerce Center (PVCC) Specific Plan. The site is currently vacant and zoned for commercial/industrial use. Project access is proposed via five driveways: four on Patterson Avenue and one on Nevada Avenue for emergency access only. Each driveway is specifically designated for trucks or passenger car use. The project is proposing to construct only Patterson Avenue to its ultimate half-width along the project frontage. The project is proposed to be developed in a single phase, completed and operational in the year 2024.

Project Trip Generation

Based on the proposed site plan and trip generation rates from the Institute of Transportation Engineers (ITE) and data from the South Coast Air Quality Management District (SCAQMD), and San Bernardino County Transportation Authority (SBCTA), the expected project traffic in passenger-car equivalent (PCE) rates is approximately 1,338 daily trips, with 88 trips in the AM peak hour and 92 trips in the PM peak hour. For details, see **Section 3**.

Analysis and Findings

Acceptable Level of Service Standards

The City's traffic operations standards are to maintain the following levels of service:

- LOS D along all City-maintained roads (including intersections) and LOS D along I-215 and SR-74 (including intersections with local streets and roads). An exception to the local road

standard is LOS E, at intersections of any Arterials and Expressways with SR-74, the Ramona-Cajalco Expressway, or at I-215 freeway ramps.

- LOS E may be allowed within the boundaries of the Downtown Specific Plan Area to the extent that it would support transit-oriented development and walkable communities. Increased congestion in this area will facilitate an increase in transit ridership and encourage development of a complementary mix of land uses within a comfortable walking distance from light rail stations.

Per the City of Perris General Plan, PVCC Specific Plan, and City LOS standards, the minimum acceptable LOS at the study intersections is **LOS D**.

Level of Service Findings

All study intersections are expected to operate above the minimum acceptable LOS standard in all study scenarios. For details, see **Sections 4-5** or **Appendix D.**

Traffic Signal Warrants

As a preliminary step in assessing the need for and feasibility of new traffic signal installations, this study found that no study intersection is expected to meet the peak-hour traffic volume signal warrant as outlined in the California Manual on Uniform Traffic Control Devices (MUTCD) in the future buildout condition. For details, see **Section 6** or **Appendix F**.

Proposed Improvements

Project Design Features

- Construct curb, sidewalk, and driveway improvements on Patterson Avenue and Nevada Avenue to their ultimate half-width adjacent to project site.
- Signing/striping to be implemented along with detailed construction plans for the project site.
- Sight distance at the project driveways will be reviewed with respect to City standards at the time of preparation of final grading, landscape, site development, and street improvement plans.

Nance Street Proposed Vacation

The project is proposing to vacate Nance Street between Patterson Avenue and Nevada Avenue. Nance Street is a two-lane undivided roadway, designated as a Local Road in the Perris Valley Commerce Center (PVCC) Specific Plan. The portion of Nance Street proposed to be vacated is currently undeveloped dirt road and the adjacent parcels are largely undeveloped as well; therefore, it does not carry much existing traffic. The intersection turning movement counts show no more than five vehicles in either direction during the two-hour count AM and PM count periods. Furthermore, Nance Street currently extends approximately 1.25 miles from Wade Avenue in the west to Indian Avenue in the east. This connection has alternative routes in Harley Knox Boulevard (an Arterial roadway) to the north and Markham Street (a Secondary Arterial) to the south, either of which is at most a quarter-mile away.

Based on Nance Street's classification as a local road, as well as its low existing traffic volumes, short link length, and nearby alternative routes, it is expected that its proposed vacation would not significantly impact traffic patterns or operations.

II. INTRODUCTION

Study Objectives

This study evaluates the potential effects on traffic circulation from a proposed industrial development between Patterson Avenue and Nevada Avenue, south of Harley Knox Boulevard in the City of Perris. The study objectives include:

- Document existing traffic conditions (2021) in the vicinity of the proposed development (study area);
- Determine the expected project traffic generation;
- Evaluate opening-day traffic scenarios for intersection levels of service (LOS), including ambient growth and cumulative projects;
- Determine if the LOS required by the City of Perris will be maintained within the study area, and
    - if not, determine the improvement measures needed to maintain the required LOS;
- Determine if peak-hour traffic signal warrants are met for any unsignalized study intersections.

Prior to the preparation of this study, the City of Perris was solicited for input on and approval of the study scope (**Appendix A**).

Project Location and Description

The proposed project site encompasses approximately 33 acres along Nance Street between Patterson Avenue and Nevada Avenue south of Harley Knox Boulevard in the City of Perris, within the Perris Valley Commerce Center (PVCC) Specific Plan. The site is currently vacant and zoned for commercial/industrial use.

The project proposes to construct one warehouse of approximately 769,668 square feet (**Figure 1**), along with associated parking and loading facilities as well as required improvements to the project frontage. Project access is proposed via five driveways: four on Patterson Avenue and one on Nevada Avenue. Each driveway is specifically designated for trucks or passenger car use, and the Nevada Avenue driveway is to be for emergency access only.

The project is proposed to be fully developed in a single phase, completed and operational in the year 2024.

The project is proposing to construct Patterson Avenue to its ultimate half-width along the project frontage, along with roadway signing and striping per the latest California Manual on Uniform Traffic Control Devices (MUTCD). It is also proposing to vacate Nance Street between Patterson Avenue and Nevada Avenue. This study accounts for redirecting any existing traffic on Nance Street in this segment.

Study Intersections

Based on a review of the existing roadway network and anticipated project traffic, the following study intersections were selected for analysis in conjunction with the City of Perris (**Figure 2**):

1. Patterson Ave @ Harley Knox Blvd
2. Patterson Ave @ California Ave / project dwy 2 (passenger cars only)
3. Patterson Ave @ Nance St / project dwy 3 (trucks only)
4. Patterson Ave @ Markham St

5. Nevada Ave @ Harley Knox Blvd
6. Nevada Ave @ Nance St / project dwy 5 (truck emergency/secondary access only)
7. Webster Ave @ Nance St
8. Webster Ave @ Markham St
9. Patterson Ave @ project dwy 1 (trucks only)
10. Patterson Ave @ project dwy 4 (passenger cars only)

Figure 1: Proposed Project Site Plan

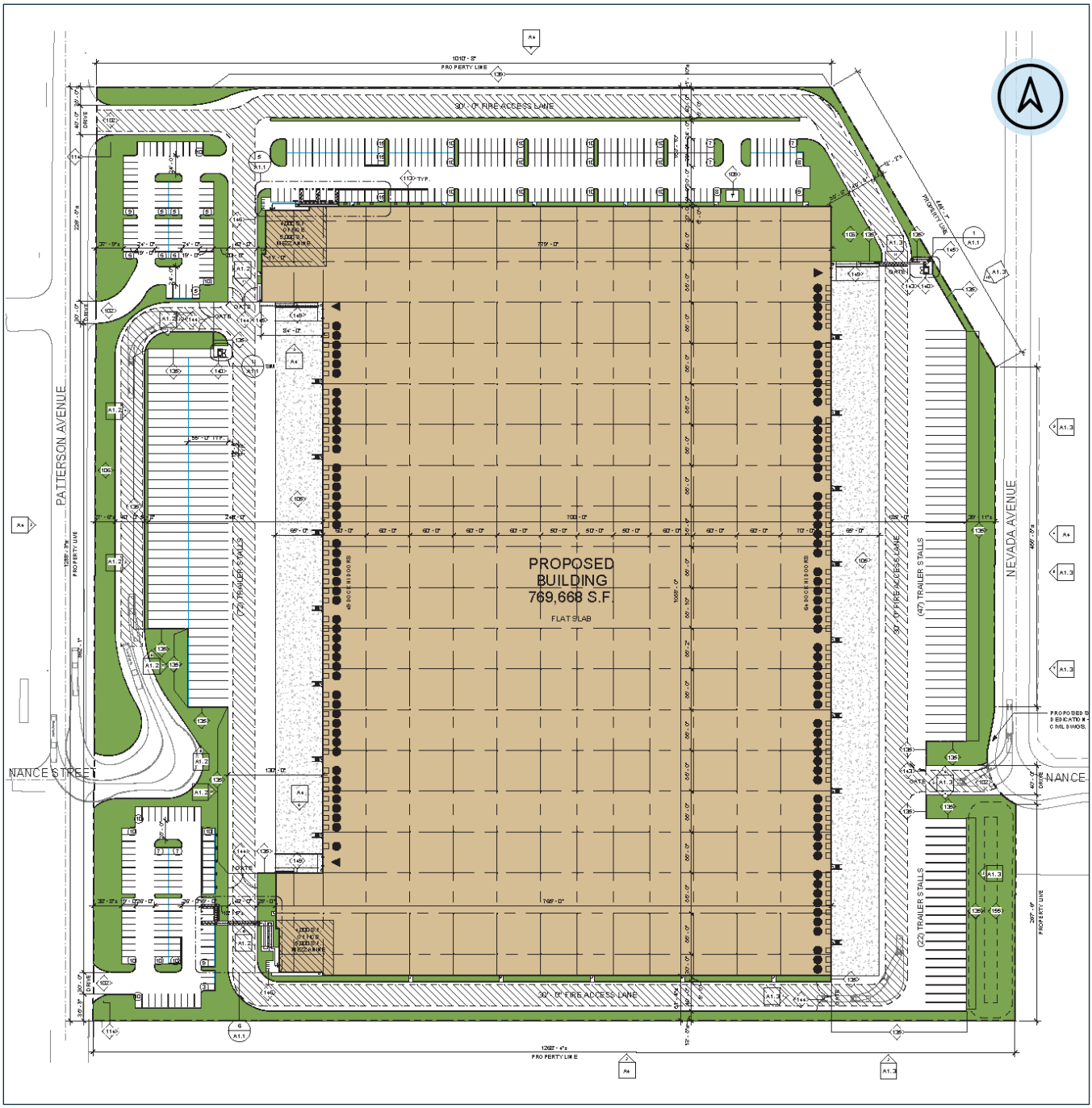
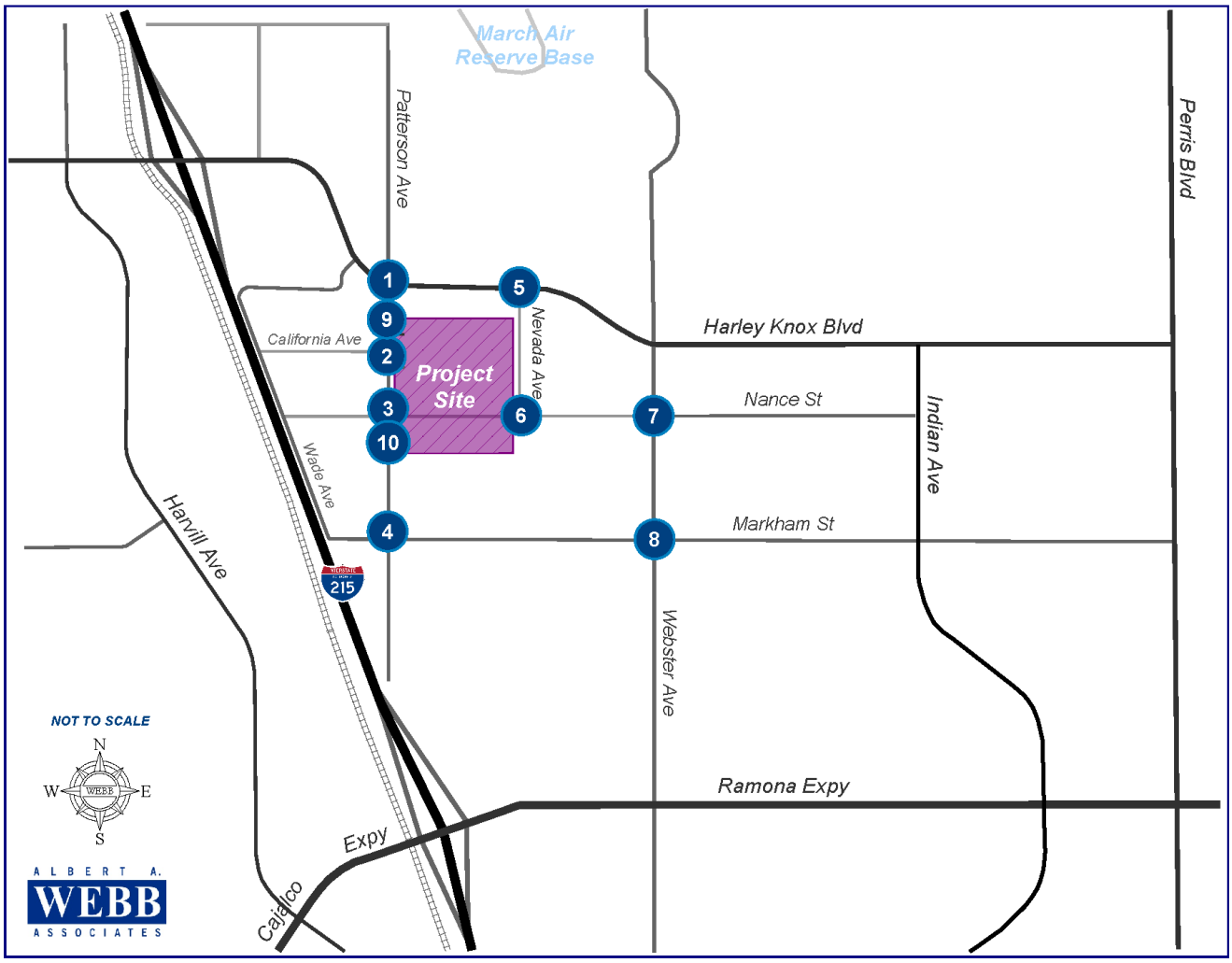


Figure 2: Study Intersections



Analysis Methodology

This study uses methodology from the most recent Transportation Research Board *Highway Capacity Manual* to analyze traffic operations via Level of Service (LOS) rankings. Accordingly, the *Highway Capacity Manual* 6th Edition (HCM6, 2016) was used to perform intersection LOS analysis for the following scenarios:

- Existing conditions (2021)
- Existing conditions plus project
- Opening Day conditions (existing traffic + ambient growth + cumulative projects, 2024)
- Opening Day conditions plus project (2024)

Per the HCM6, LOS rankings at intersections use a letter-grade scale ranging from LOS A (optimal conditions) to LOS F (congested or overcrowded conditions) based on average control delay in seconds per vehicle, or how long a vehicle typically waits before proceeding through the intersection. This delay is compared with free-flow conditions, and includes slowing before an intersection, waiting in queues, and stopping at the intersection. This study uses Vistro traffic modeling software to evaluate LOS at the study intersections.

For signalized and all-way stop-controlled intersections, LOS rankings are based on the average control delay of all vehicles passing through the intersection. For two-way or side-street stop-controlled intersections, LOS rankings are based on the highest average control delay of all controlled movements. **Table 1 and 2** show the LOS delay thresholds for signalized and unsignalized intersections, respectively.

Table 1: Level of Service at Signalized Intersections

Control Delay (sec/vehicle)	Level of Service	Description
0 - 10	A	Minimal delay and primarily free-flow operation. Most vehicles do not stop or only stop for a brief amount of time.
10 - 20	B	Short delay and reasonably unimpeded operation. Many vehicles do not stop or only stop for a short time. More vehicles stop than with LOS A.
20 - 35	C	Moderate delay and stable operation. Individual cycle failures may begin to appear. The number of vehicles stopping is significant.
35 - 55	D	Less stable operation; small increases in vehicles may cause substantial increases in delay. Many vehicles stop, individual cycle failures noticeable.
55 - 80	E	Significant delay and unstable operation. Most vehicles stop and individual cycle failures are frequent.
80 +	F	Considerable delay and extensive queuing. Almost all vehicles stop and most cycles fail to clear the queue.

Source: Transportation Research Board, Highway Capacity Manual 6 (2016)

Table 2: Level of Service at Unsignalized Intersections

Control Delay (sec/vehicle)	Level of Service	Description
0 - 10	A	Minimal delay. Usually no conflicting traffic.
10 - 15	B	Short delay. Occasionally some conflicting traffic.
15 - 25	C	Noticeable delay, but not inconveniencing. Usually some conflicting traffic.
25 - 35	D	Noticeable delay and irritating. A significant amount of conflicting traffic. Increased likelihood of risk taking.
35 - 50	E	Significant delay approaching tolerance level. Lots of conflicting traffic, with some gaps of suitable size. Risk taking behavior likely.
50 +	F	Considerable delay exceeding tolerance level. Lots of conflicting traffic, with not enough gaps of suitable size. High likelihood of risk taking.

Source: Transportation Research Board, Highway Capacity Manual 6 (2016)

Level of Service Standards

The City's traffic operations standards are to maintain the following levels of service:

- LOS D along all City-maintained roads (including intersections) and LOS D along I-215 and SR-74 (including intersections with local streets and roads). An exception to the local road standard is LOS E, at intersections of any Arterials and Expressways with SR-74, the Ramona-Cajalco Expressway, or at I-215 freeway ramps.
- LOS E may be allowed within the boundaries of the Downtown Specific Plan Area to the extent that it would support transit-oriented development and walkable communities. Increased congestion in this area will facilitate an increase in transit ridership and encourage development of a complementary mix of land uses within a comfortable walking distance from light rail stations.

Per the City of Perris General Plan, PVCC Specific Plan, and City LOS standards, the minimum acceptable LOS at the study intersections is **LOS D**.

LOS Deficiency and Improvement Criteria

To determine whether the addition of project-generated trips (or alternative-generated trips) results in a significant impact, and thus requires mitigation, the analysis evaluates significant impacts based on the following criteria:

- A project-related impact is considered direct and significant when a study intersection operates at an acceptable Level of Service for existing conditions (without the project) and the addition of 50 or more a.m. or p.m. peak hour project trips causes the intersection to operate at an unacceptable Level of Service for existing plus project conditions.
- A project-related impact is considered direct and significant when a study intersection operates at an unacceptable Level of Service for existing conditions (without the project) and the addition of 50 or more a.m. or p.m. peak hour project trips causes the intersection delay to increase by 2 seconds or more.
- A cumulative impact is considered significant when a study intersection is forecast to operate at an unacceptable Level of Service with the addition of cumulative/background traffic and 50 or more a.m. or p.m. peak hour project trips.

III. PROPOSED PROJECT TRAFFIC

This study uses a multi-step process to estimate project traffic. First, project trip generation estimates the arriving and departing traffic during a typical weekday and its peak hours by applying the vehicle trip generation rates to the project development. Next, trip distribution identifies the origins and destinations of project traffic based on existing and expected travel patterns. Finally, trip assignment allocates the distributed project traffic to specific roadways and intersections.

Project Trip Generation

Trip Generation Rates

Trip generation represents the traffic accessing a site, split by inbound and outbound vehicle trip ends. The Institute of Transportation Engineers (ITE) *Trip Generation Manual* 11th Edition (2021) uses studies across the nation to determine common trip generation characteristics by land use. Using the *Manual*, the anticipated project trip generation was determined using trip generation rates given by ITE Land Use Code #154 (High-Cube Transload and Short-Term Warehouse).

From specialized trip generation studies by ITE and the Southern California Air Quality Management District, average truck fleet mix percentages are applied to the trip generation rates to determine the number of 2-, 3-, and 4+-axle trucks expected to access the project. Truck trips are then weighted by passenger-car equivalent (PCE) factors developed by the San Bernardino County Transportation Authority (SBCTA). **Table 3** shows the trip generation rates used in this study, in both raw vehicle trips and PCE.

Trip Generation

The trip generation volumes are developed by multiplying the trip generation rates by the square footage of the proposed project. It is also common to determine the trip generation for existing land uses at the project site and deduct those trips to determine the net new trips generated. However, as the project site is currently vacant, no existing trip credits were deducted for this analysis. After determining the appropriate project trip generation, it is expected that the proposed project will generate approximately **1,338 daily PCE trip-ends, with 88 and 92 PCE trip-ends during the AM and PM peak hours, respectively** (**Table 4**).

Project Trip Distribution and Assignment

Modal Split

Based on the industrial nature of the project and its distance from existing public transit stops, no traffic reductions from transit use are considered in this study. For a conservative analysis, this study also uses no traffic reductions from active transportation modes such as bicycling and walking.

Trip Distribution

Trip distribution, or the directional orientation of traffic to and from the project, is based on the project's geographical location, nearby land uses, and proximity to the regional freeway system. The proposed project trip distribution for passenger vehicles and trucks are shown in **Figures 3 and 4**, respectively.

Table 3: Trip Generation Rates

Vehicle Type	PCE Factor[1]	Estimated Mix[2]	Units[3]	Daily	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
Trip Generation Rates (classification, non-PCE)[4]										
Passenger Cars[5]	-	-	KSF	1.18	0.052	0.008	**0.06**	0.023	0.067	**0.09**
2-axle Trucks	-	16.7%		0.037	0.0016	0.0017	**0.003**	0.0008	0.0009	**0.002**
3-axle Trucks	-	20.7%		0.046	0.0020	0.0021	**0.004**	0.0010	0.0011	**0.002**
4-axle Trucks	-	62.5%		0.138	0.0061	0.0064	**0.013**	0.0029	0.0033	**0.006**
Total		**100%**		**1.40**	**0.062**	**0.018**	**0.08**	**0.028**	**0.072**	**0.10**
Calculated Trip Generation Rates (PCE)										
Passenger Cars[5]	1	-	KSF	1.18	0.052	0.008	**0.06**	0.023	0.067	**0.09**
2-axle Trucks	1.5	16.7%		0.055	0.0025	0.0026	**0.005**	0.0012	0.0013	**0.003**
3-axle Trucks	2	20.7%		0.091	0.0041	0.0042	**0.008**	0.0019	0.0022	**0.004**
4-axle Trucks	3	62.5%		0.41	0.0184	0.0191	**0.038**	0.0088	0.0099	**0.019**
Total		**100%**		**1.74**	**0.077**	**0.034**	**0.11**	**0.035**	**0.080**	**0.12**

[1] PCE factors per San Bernardino County Transportation Authority

[2] Truck mix per High-Cube Warehouse Vehicle Trip Generation Analysis, ITE (2017); Warehouse Truck Trip Study, SCAQMD (2014)

[3] KSF = 1,000 square feet gross floor area

[4] ITE Trip Generation Manual 11th Ed, 2021- Land Use 154, High-Cube Transload and Short-Term Warehouse

[5] Passenger car rates per ITE vehicle trip generation rates less ITE truck trip generation rates.

Table 4: Project Trip Generation

Vehicle Type	PCE Factor[1]	Units[2]	Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Proposed Project Trip Generation (classification, non-PCE)									
Passenger Cars	-	770 KSF	908	40	6	**46**	18	51	**69**
2-axle Trucks	-		28	1	1	**2**	1	1	**2**
3-axle Trucks	-		35	2	2	**4**	1	1	**2**
4-axle Trucks	-		106	5	5	**10**	2	3	**5**
Total			**1,077**	**48**	**14**	**62**	**22**	**56**	**78**
Passenger Car Equivalent (PCE) Project Trip Generation									
Passenger Cars	1	770 KSF	908	40	6	**46**	18	51	**69**
2-axle Trucks	1.5		42	2	2	**4**	2	2	**4**
3-axle Trucks	2		70	4	4	**8**	2	2	**4**
4-axle Trucks	3		318	15	15	**30**	6	9	**15**
Total			**1,338**	**61**	**27**	**88**	**28**	**64**	**92**

[1] PCE factors per San Bernardino County Transportation Authority

[2] KSF = 1,000 square feet gross floor area

Figure 3: Project Traffic Distribution (Passenger Cars)

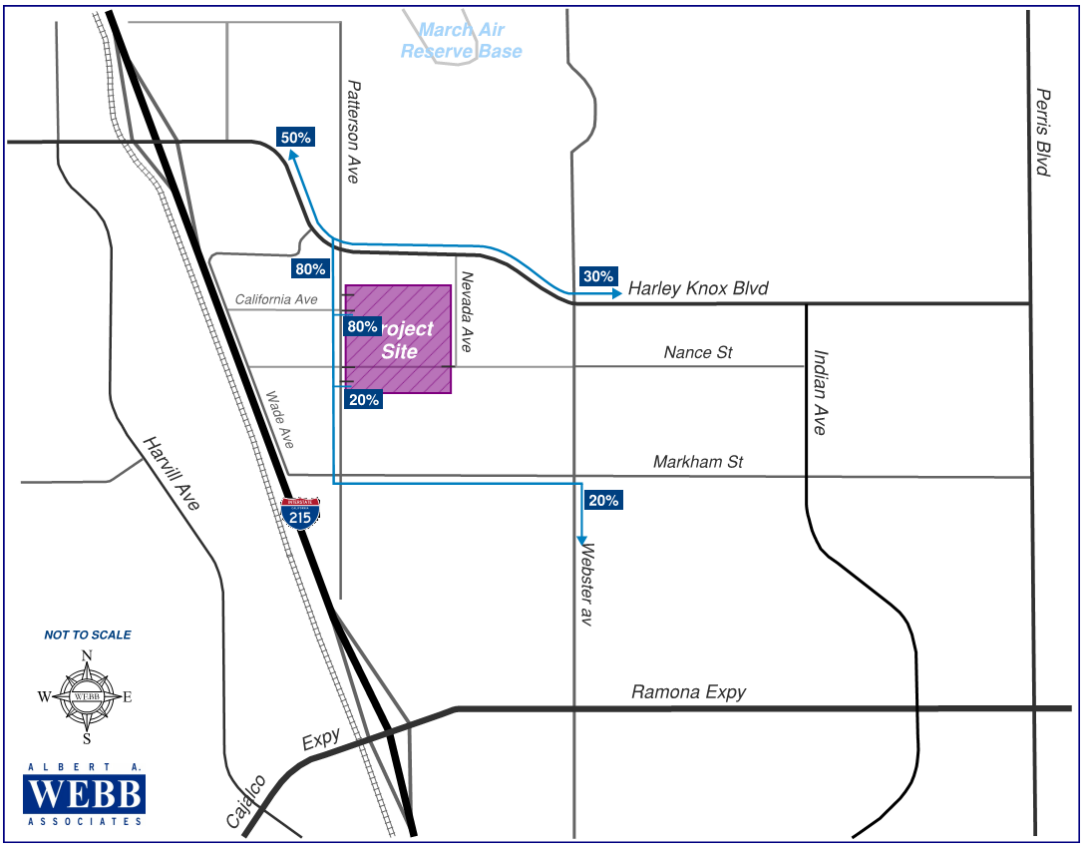
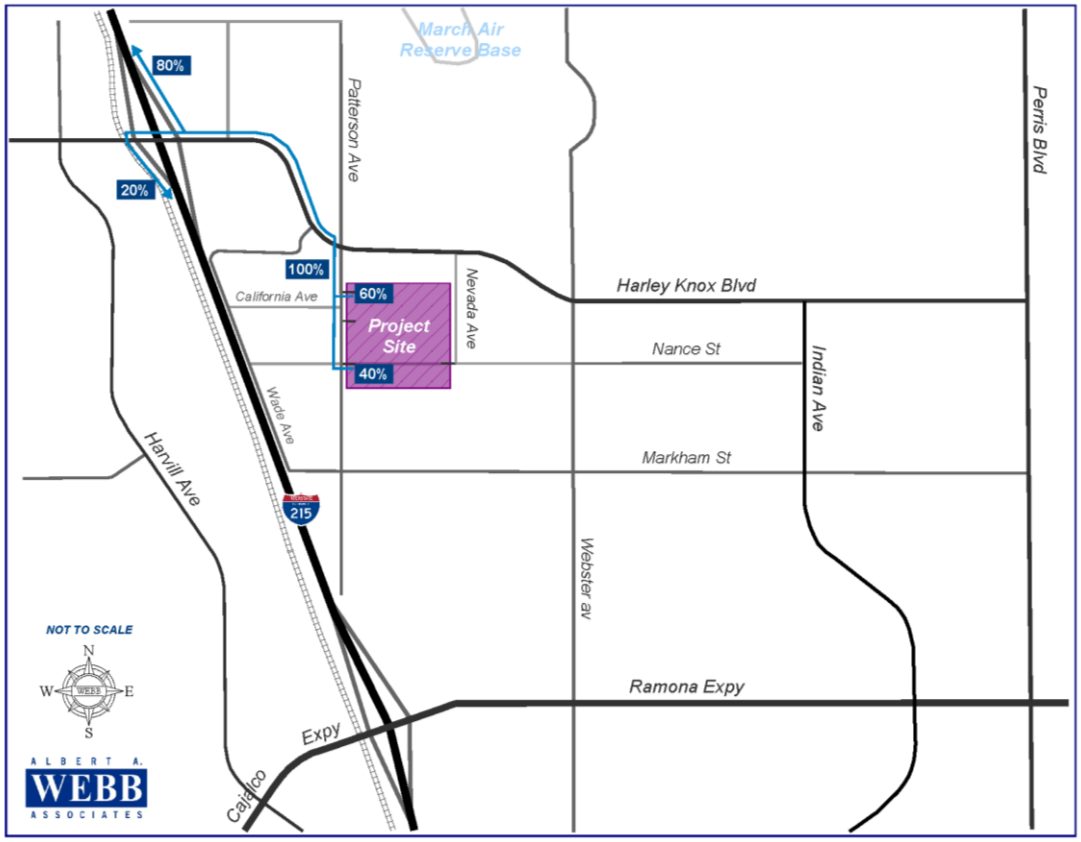


Figure 4: Project Traffic Distribution (Trucks)



Trip Assignment

The calculated project trips are then assigned to specific roadways and intersections according to the trip distribution model. **Figures 5 and 6** show the project trips in PCE at the study intersections for the AM and PM peak hours, respectively.

Figure 5: Project Traffic Volumes (PCE) – AM Peak Hour

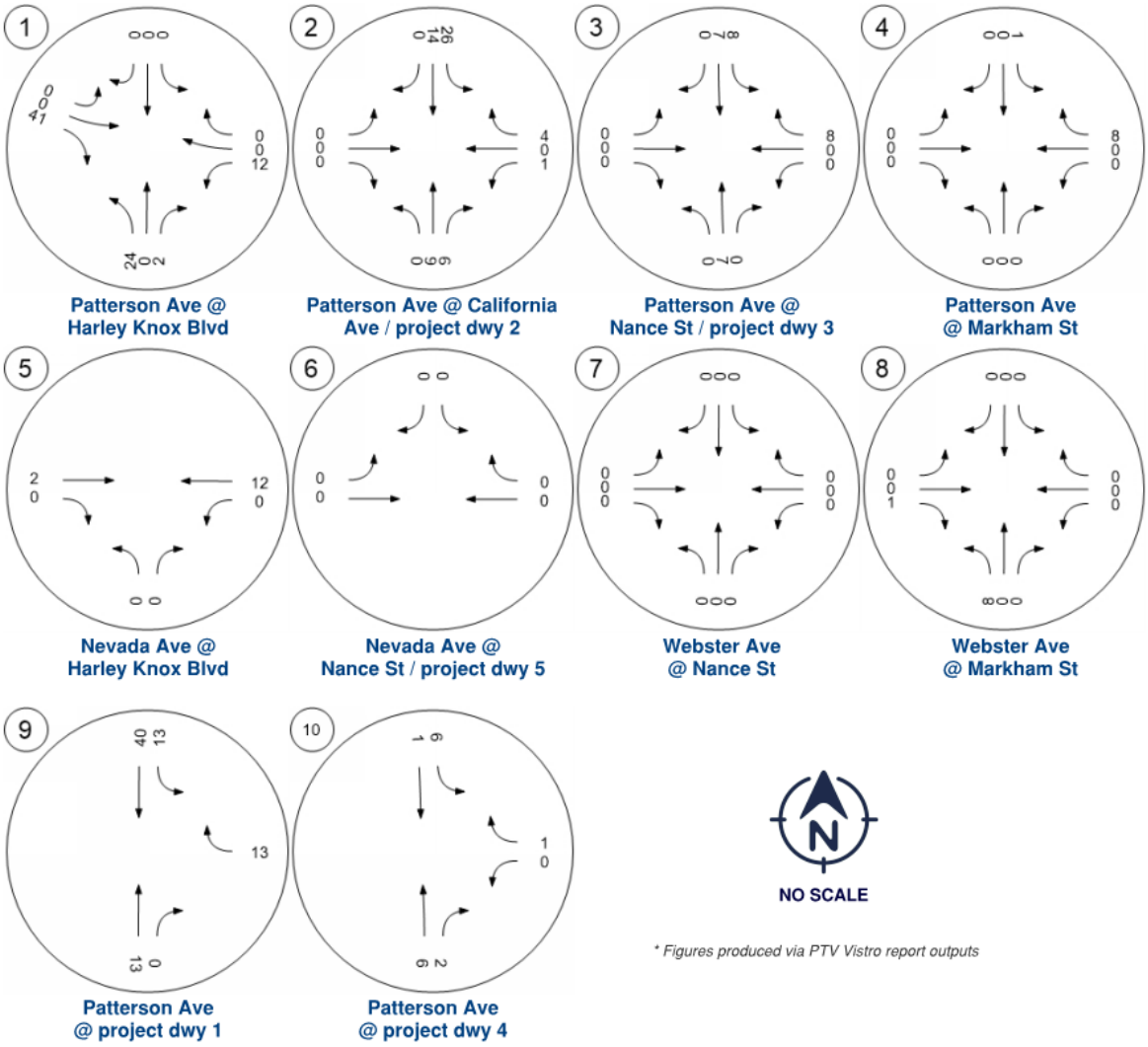
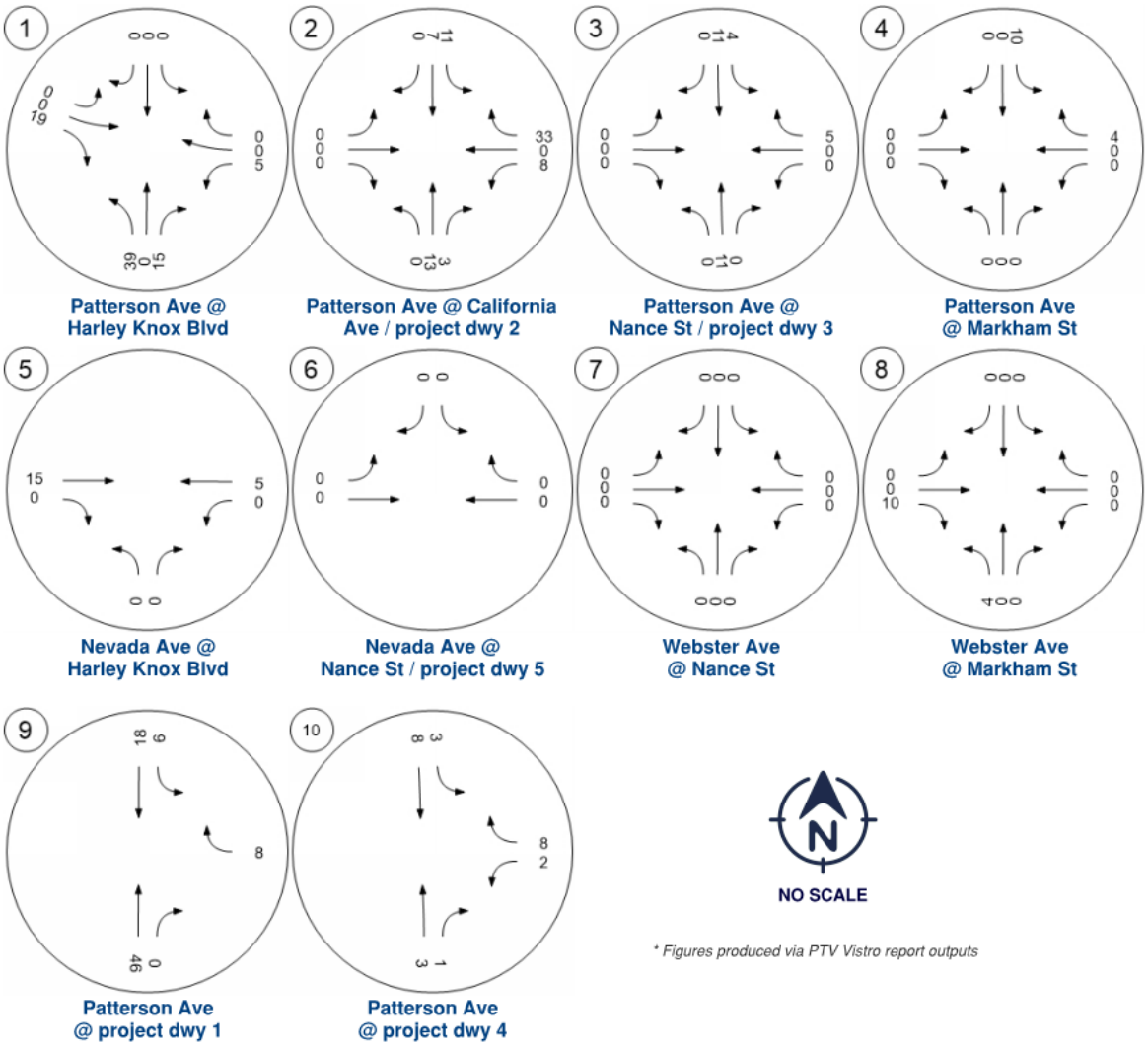


Figure 6: Project Traffic Volumes (PCE) – PM Peak Hour



IV. EXISTING CONDITIONS (2021)

The proposed project site is in the City of Perris, within the Perris Valley Commerce Center (PVCC) Specific Plan. The project site is comprised of approximately 33 acres along Nance Street between Patterson Avenue and Nevada Avenue, south of Harley Knox Boulevard.

Existing Roadway Network

Harley Knox Boulevard is a six-lane roadway classified as an Arterial in the PVCC Specific Plan. Within the study area, it has either a raised, landscaped median or a two-way left-turn median lane.

Patterson Avenue is a two-lane roadway with a two-way left-turn median lane from California Avenue to Markham Street. It is classified as a Collector in the PVCC Specific Plan, terminating north of Harley Knox Boulevard at Nandina Avenue and south of Markham Street.

Nevada Avenue is a two-lane undivided roadway classified as a Local Road per the PVCC Specific Plan. It terminates to the north at Harley Knox Boulevard and to the south at Nance Street.

Webster Avenue is a two-lane roadway classified as a Secondary Arterial per the PVCC Specific Plan. It is undivided north of Markham Street and has a two-way left-turn median lane south of it. Webster Avenue terminates to the north at Harley Knox Boulevard and provides connection southward to Ramona Expressway.

Nance Street is a two-lane undivided roadway classified as a Local Road per the PVCC Specific Plan. It terminates to the west at Wade Avenue and to the east at Indian Avenue. It is currently an undeveloped dirt road between Patterson Avenue and Webster Avenue.

Markham Street is classified as a Secondary Arterial per the PVCC Specific Plan. Throughout the study area, it varies from a two-lane undivided roadway to a four-lane roadway with a two-way left-turn median lane. It terminates to the west at Wade Avenue and to the east at Redlands Avenue.

Existing Intersection Geometrics and Traffic Control

Figure 7 identifies the existing intersection traffic controls, intersection geometrics, and the number of vehicle lanes for each study intersection.

Existing Traffic Volumes

Baseline traffic conditions for the existing condition (2021) are based on intersection turning movement counts conducted on Wednesday, November 10, 2021 for the AM and PM peak periods (**Figures 8 and 9**, respectively; details in **Appendix C**).

Figure 7: Existing Intersection Geometrics and Traffic Control

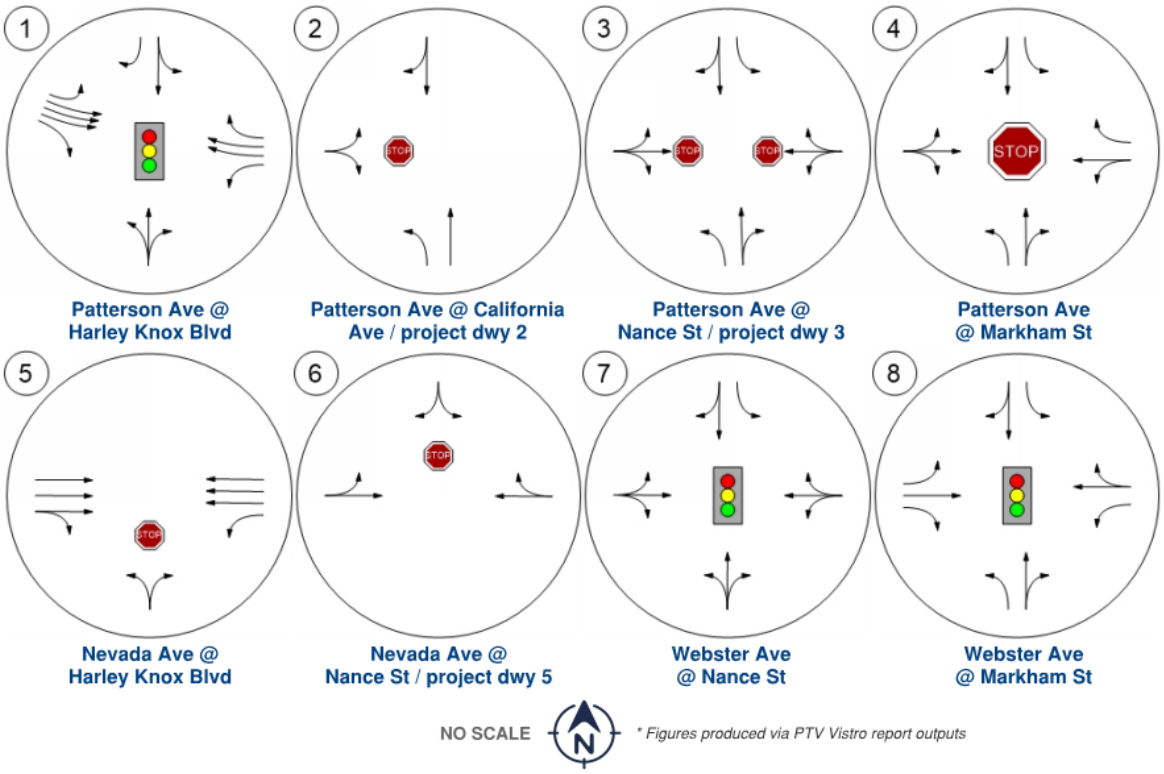


Figure 8: Existing Traffic Volumes – AM Peak Hour

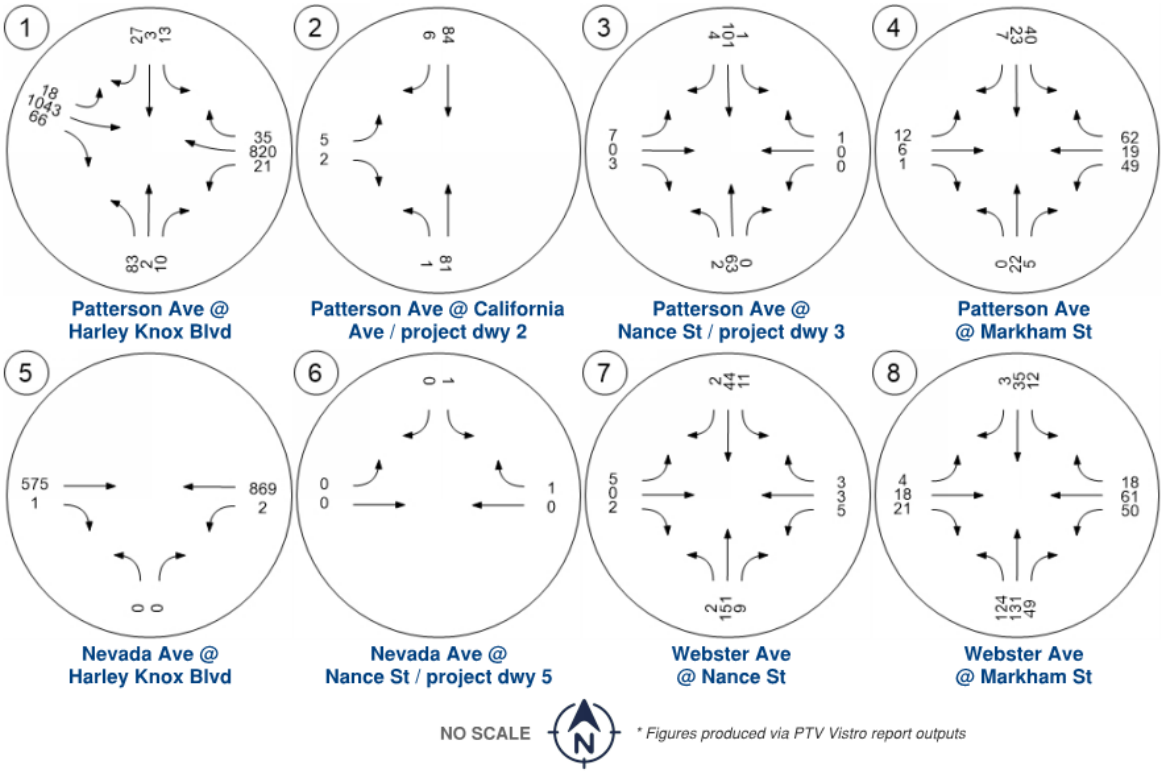
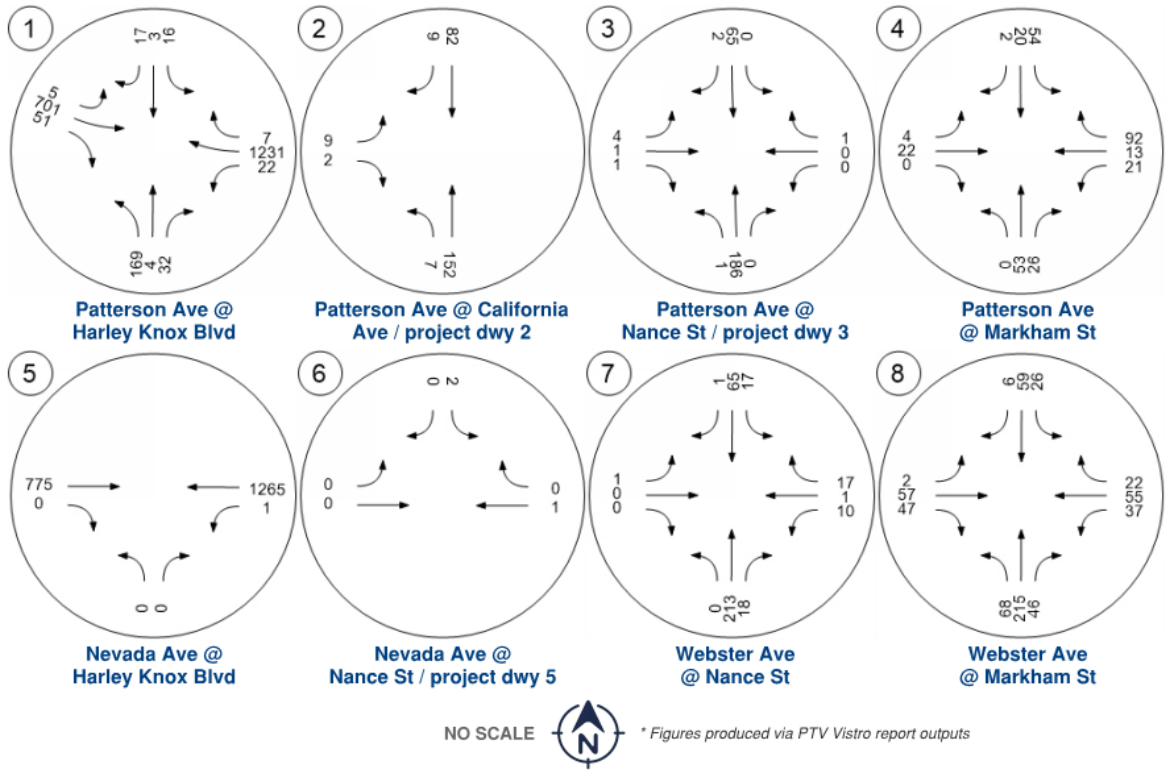


Figure 9: Existing Traffic Volumes – PM Peak Hour



Levels of Service – Existing Conditions (2021)

Based on the existing intersection geometrics and peak-hour traffic volumes, intersection LOS was analyzed for the AM and PM peak hours (**Table 5**, see **Appendix D** for details). Under existing conditions, all study intersections currently operate above the minimum acceptable LOS standard.

Table 5: Intersection LOS – Existing Conditions (2021)

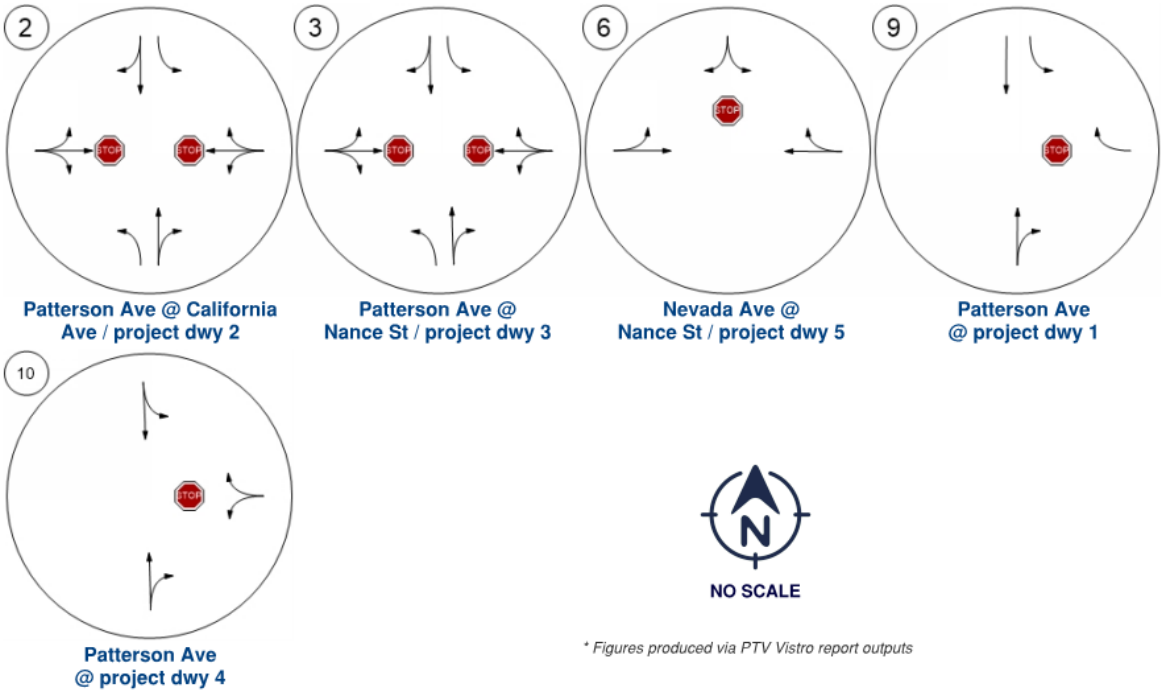
Intersection		Traffic Control[1]	AM Peak Hr		PM Peak Hr	
			Delay	LOS[2]	Delay	LOS[2]
1	Patterson Ave @ Harley Knox Blvd	Signal	6.9	**A**	9.9	**A**
2	Patterson Ave @ California Ave / project dwy 2	TWSC	9.7	**A**	11.5	**B**
3	Patterson Ave @ Nance St / project dwy 3	TWSC	9.8	**A**	11.2	**B**
4	Patterson Ave @ Markham St	AWSC	8	**A**	8.3	**A**
5	Nevada Ave @ Harley Knox Blvd	TWSC	10.8	**B**	12.8	**B**
6	Nevada Ave @ Nance St / project dwy 5	TWSC	8.5	**A**	8.5	**A**
7	Webster Ave @ Nance St	Signal	4.8	**A**	4.3	**A**
8	Webster Ave @ Markham St	Signal	8.2	**A**	8.5	**A**
9	Patterson Ave @ project dwy 1	TWSC	*DOES NOT EXIST*			
10	Patterson Ave @ project dwy 4	TWSC	*DOES NOT EXIST*			

[1] TWSC = two-way stop control; AWSC = all-way stop control
[2] Level of service (LOS) rankings based on average control delay (sec/veh) per Highway Control Manual.

Proposed Project Driveway Geometrics

Per the proposed project site plan, project access is proposed via five driveways controlled by side-street stop control: four on Patterson Avenue and one on Nevada Avenue (**Figure 10**).

Figure 10: Proposed Project Driveway Geometrics



Levels of Service – Existing Conditions plus Project

The expected project traffic is added to the existing traffic volumes to determine the AM and PM peak-hour traffic volumes for the "existing plus project" scenario (**Figures 11 and 12**, respectively).

Figure 11: Existing plus Project Traffic Volumes – AM Peak Hour

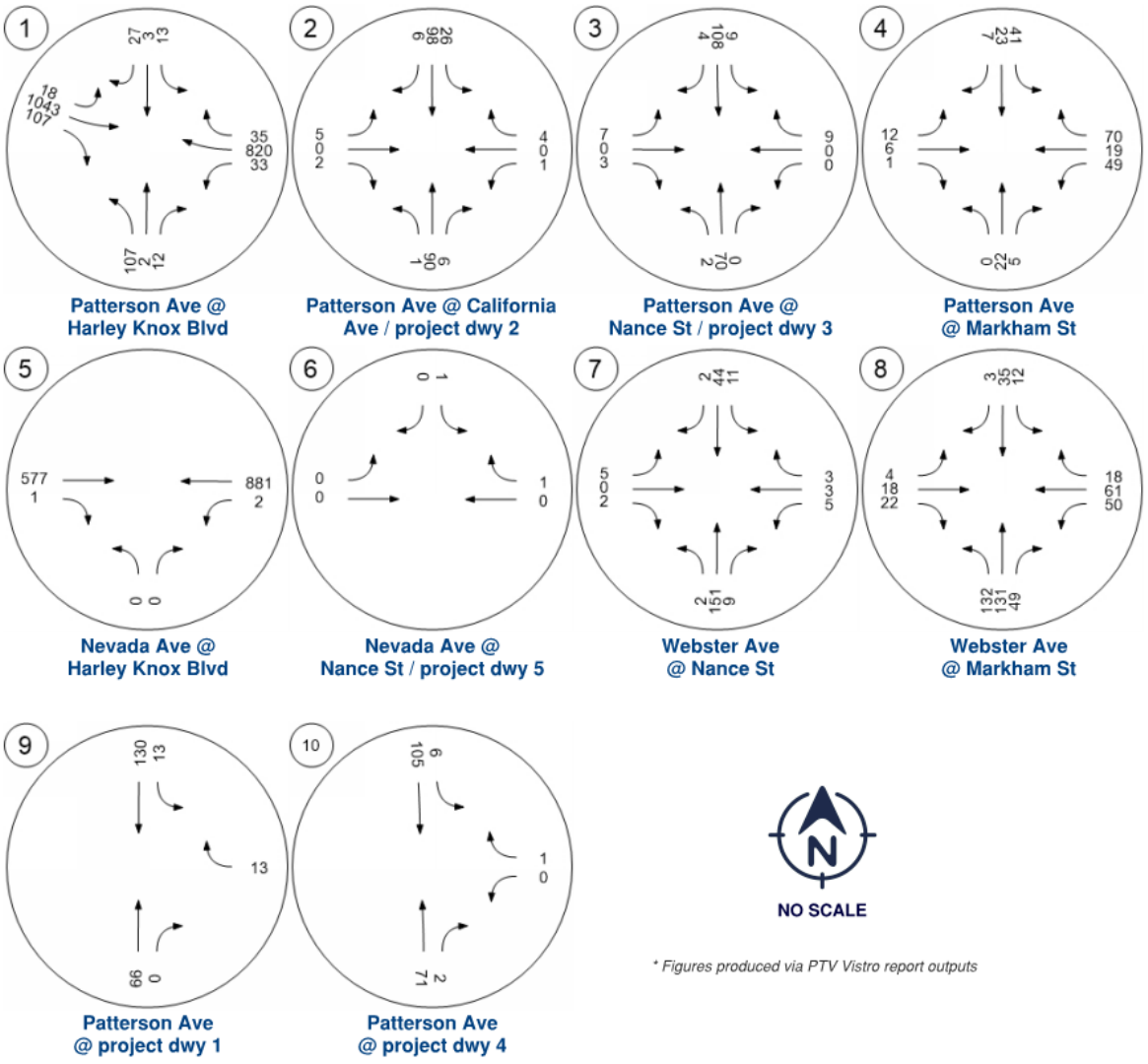
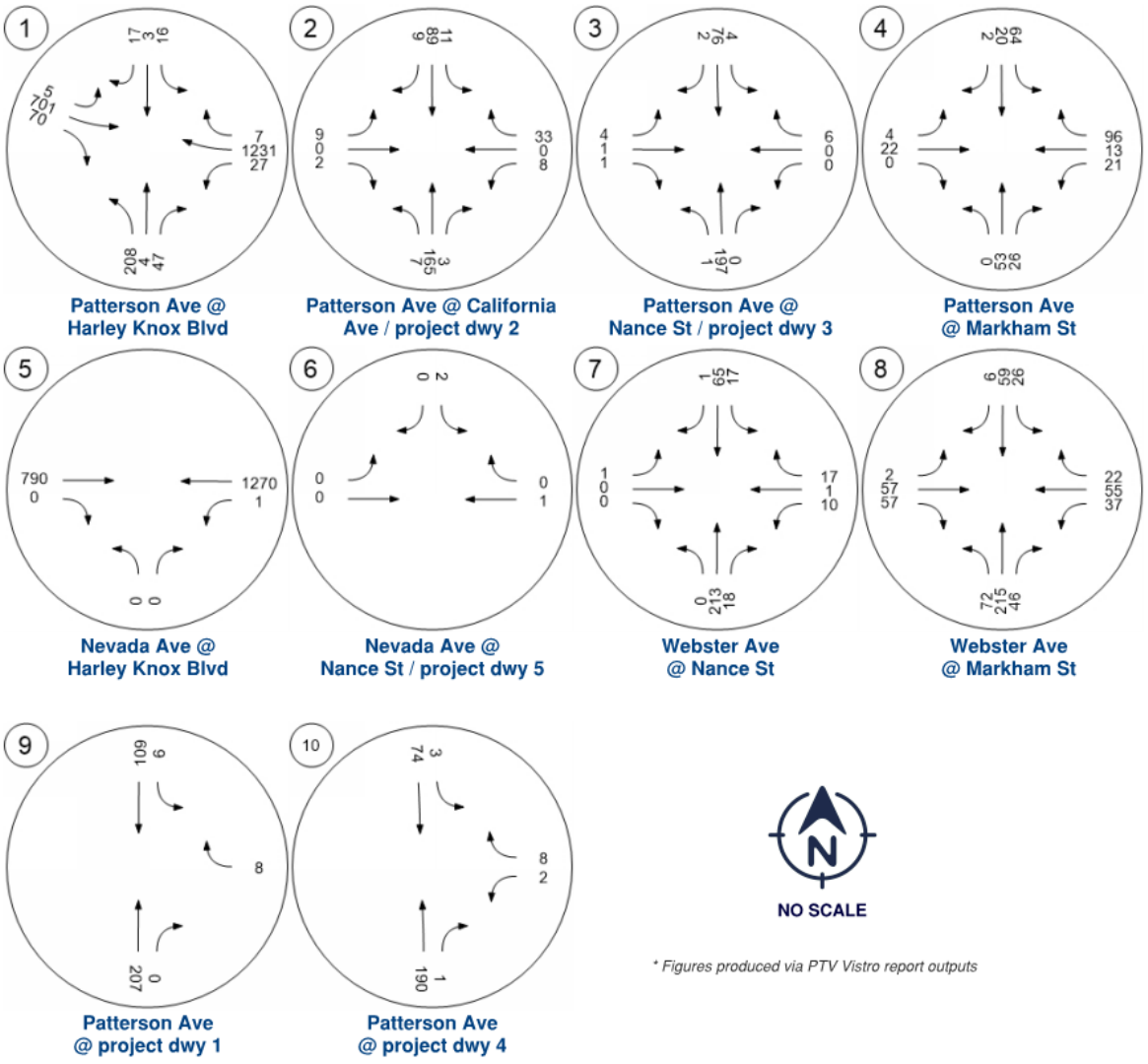


Figure 12: Existing plus Project Traffic Volumes – PM Peak Hour



** Figures produced via PTV Vistro report outputs*

Table 6 summarizes the LOS analysis results for the "existing plus project" scenario, with details in Appendix D. With the addition of proposed project traffic, all study intersections are expected to continue operating above the minimum acceptable LOS standard.

Table 6: Intersection LOS – Existing Conditions plus Project (2021)

	Intersection	Traffic Control[1]	AM Peak Hr		PM Peak Hr	
			Delay	LOS[2]	Delay	LOS[2]
1	Patterson Ave @ Harley Knox Blvd	Signal	7.6	**A**	11.7	**B**
2	Patterson Ave @ California Ave / project dwy 2	TWSC	10.5	**B**	13.0	**B**
3	Patterson Ave @ Nance St / project dwy 3	TWSC	10.1	**B**	11.6	**B**
4	Patterson Ave @ Markham St	AWSC	8	**A**	8.4	**A**
5	Nevada Ave @ Harley Knox Blvd	TWSC	10.8	**B**	13	**B**
6	Nevada Ave @ Nance St / project dwy 5	TWSC	8.5	**A**	8.5	**A**
7	Webster Ave @ Nance St	Signal	4.8	**A**	4.3	**A**
8	Webster Ave @ Markham St	Signal	8.2	**A**	8.6	**A**
9	Patterson Ave @ project dwy 1	TWSC	8.8	**A**	9.4	**A**
10	Patterson Ave @ project dwy 4	TWSC	8.6	**A**	10.1	**B**

[1] TWSC = two-way stop control; AWSC = all-way stop control
[2] Level of service (LOS) rankings based on average control delay (sec/veh) per Highway Control Manual.

V. PROJECT OPENING DAY CONDITIONS (2024)

Ambient Area Growth

An ambient traffic growth factor is used in future traffic models to account for regular growth in traffic volumes due to the developments within the region. Per the approved scoping agreement (Appendix A), this study uses a 3 percent annual ambient growth rate, for a total of 9 percent growth from 2021 to 2024.

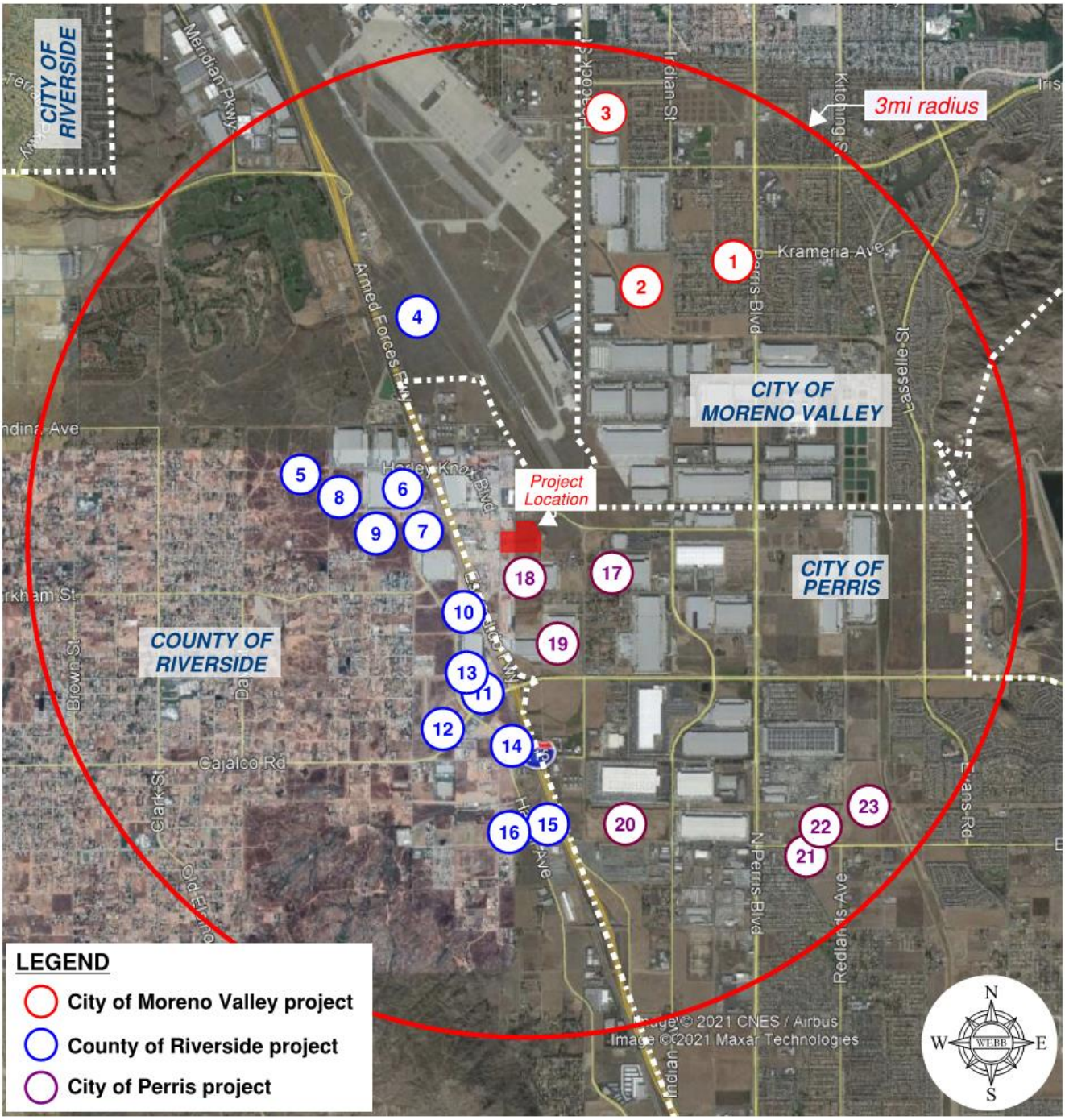
Cumulative Projects Analysis

Cumulative projects are developments within the surrounding area of the proposed project that are anticipated to be completed and contribute vehicle trips to the roadway network by the project's opening year. Compiled from information provided by the City of Perris, City of Moreno Valley, and County of Riverside (**Appendix E**), the cumulative projects used in this study are detailed in **Table 7** and shown in **Figure 13**.

Table 7: Cumulative Projects within the Study Area

Agency		Project	Location	Land Use	
City of Moreno Valley	1	TR37725	SW corner, Perris Blvd & Krameria Ave	210	*Single-Family Detached Housing*
	2	Moreno Valley Logistics Center	SW corner, Krameria Ave & Indian St	154	*High-Cube Transload and Short-Term Storage Warehouse*
				110	*General Light Industrial*
	3	Heacock Commerce Center (Rados)	SE corner, Heacock St & Gentian Ave	150	*Warehousing*
County of Riverside	4	VIP 215 Development	Van Buren Blvd & Western Way	110	*General Light Industrial*
	5	PAR 180032	South of Nandina Ave & East of Day St	110	*General Light Industrial*
	6	PPT 190031	SW corner, I-215 & Harley Knox Blvd	150	*Warehousing*
	7	CUP03227	SE corner, I-215 & Old Oleander Ave	140	*Manufacturing*
	8	PPT 180033	End of Harley Knox Blvd west of Harvill Ave	110	*General Light Industrial*
	9	PPT180029	SW side of Old Oleander Ave & Harvill Ave	150	*Warehousing*
	10	PPT180034	SE corner, Commerce Center Dr & Harvill Ave	110	*General Light Industrial*
	11	PP25699 Farmer Boys / Retail Shop CNR 4 BLDGS	SE corner, Messeria Ln & Harvill Ave	820	*Shopping Center*
	12	PAR180044 / PPT180028 Majestic Freeway Business Center	NW corner, Cajalco Expy & Harvill Ave	110	*General Light Industrial*
	13	PP16763	NE corner, Messenia Ln & Harvill Ave	150	*Warehousing*
	14	PPT190006 Industrial Warehouse	NE corner of Cajalco Rd & Harvill Ave	150	*Warehousing*
	15	PPT190039 / PAR180046	NE corner of Rider St & Harvill Ave	155	*High-Cube Fulfillment Center Warehouse*
	16	PAR190068 2 Industrial Bldgs	NW corner, Rider St & Harvill Ave	110	*General Light Industrial*
City of Perris	17	Integra Perris	NW side of Markham St & Webster Ave	150	*Warehousing*
	18	Optimus Building Corporation II	4150 Patterson Ave	150	*Warehousing*
	19	Optimus Building Corporation	NW of Webster Ave & Ramona Expy	150	*Warehousing*
	20	Rados Distribution	728 W Rider St	150	*Warehousing*
	21	Rider I	SE corner, Rider St & Lakeview Dr	150	*Warehousing*
	22	Rider 3	NW corner, Redlands Ave & Rider St	150	*Warehousing*
	23	Rider II & IV	NE corner, Redlands Ave & Rider St	150	*Warehousing*

Figure 13: Cumulative Projects Map



Levels of Service – Opening Day Conditions (2024)

Projected future traffic from ambient area growth and nearby cumulative projects is added to the existing traffic volumes to derive traffic conditions in the project opening year without project. The AM and PM peak-hour traffic volumes for the "opening day" scenario are shown on **Figures 14 and 15**, respectively.

Figure 14: Opening Day Traffic Volumes – AM Peak Hour

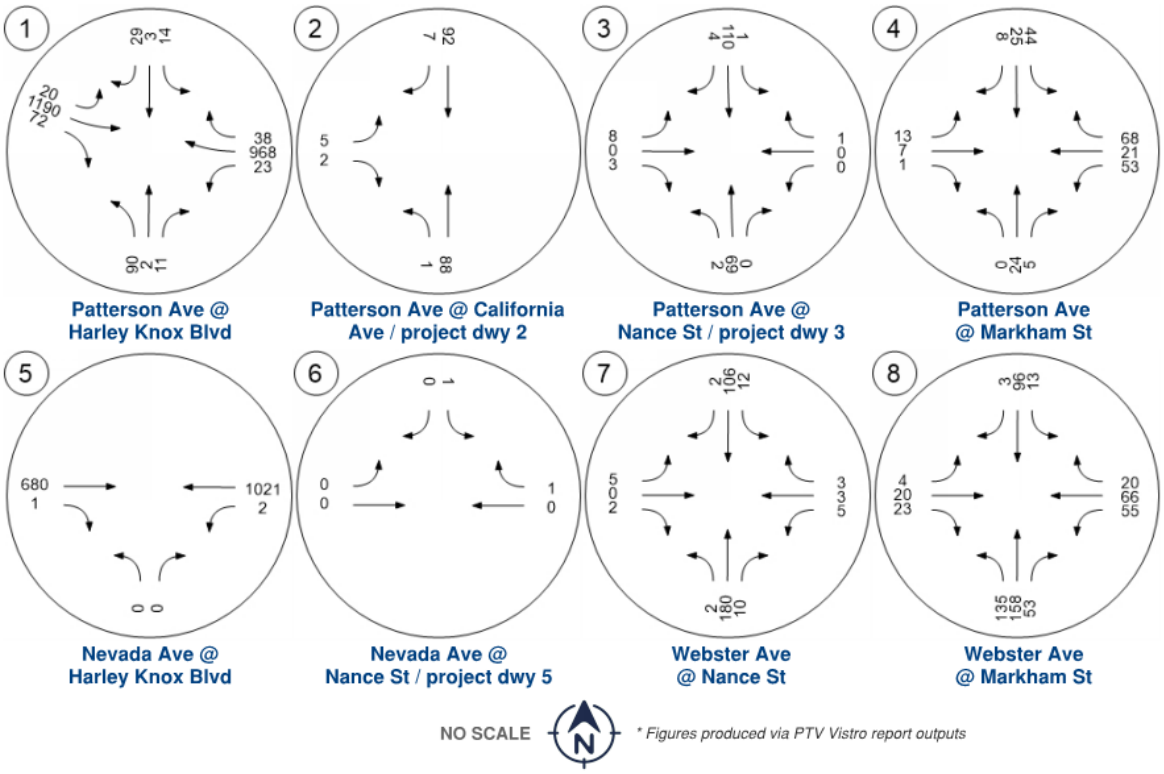


Figure 15: Opening Day Traffic Volumes – PM Peak Hour

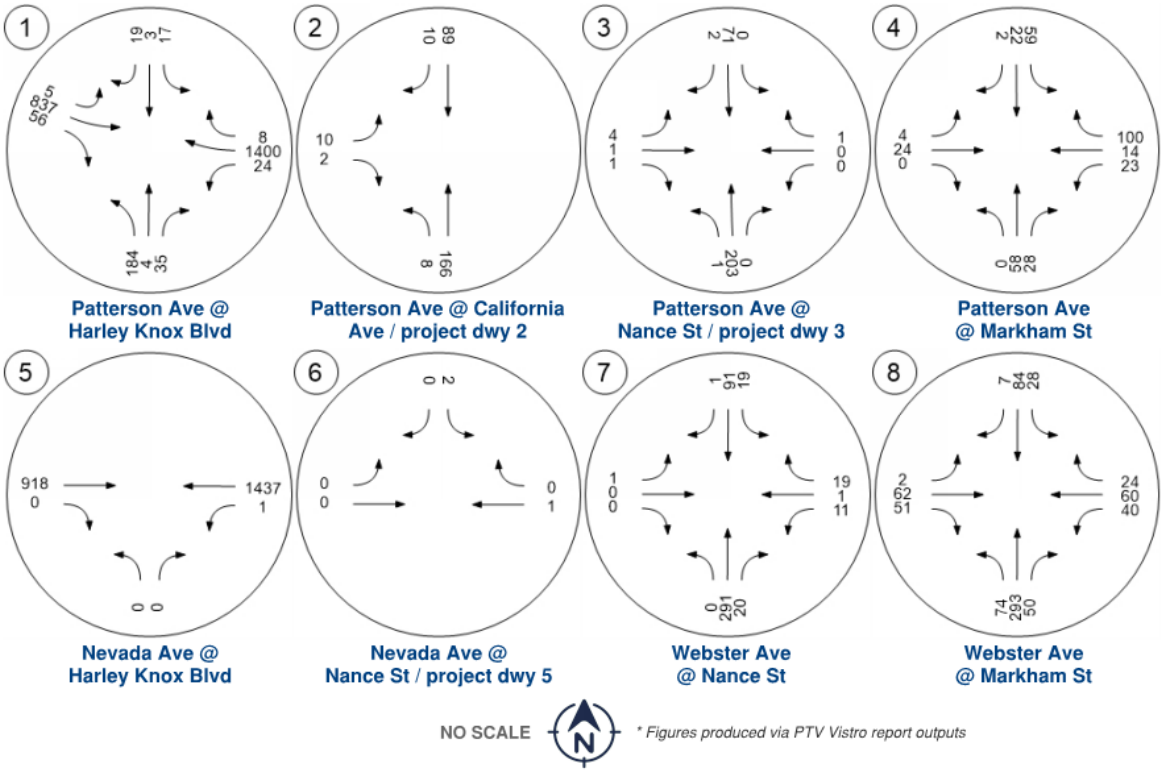


Table 8 summarizes the "opening day" LOS analysis, with detailed worksheets in **Appendix D**. With the addition of ambient traffic growth and nearby cumulative projects, all study intersections are expected to operate above the minimum acceptable LOS standard.

Table 8: Intersection LOS – Opening Day Conditions (2024)

	Intersection	Traffic Control[1]	AM Peak Hr		PM Peak Hr	
			Delay	LOS[2]	Delay	LOS[2]
1	Patterson Ave @ Harley Knox Blvd	Signal	7.2	**A**	11.2	**B**
2	Patterson Ave @ California Ave / project dwy 2	TWSC	9.8	**A**	11.8	**B**
3	Patterson Ave @ Nance St / project dwy 3	TWSC	9.9	**A**	11.5	**B**
4	Patterson Ave @ Markham St	AWSC	8.1	**A**	8.5	**A**
5	Nevada Ave @ Harley Knox Blvd	TWSC	11.5	**B**	14.3	**B**
6	Nevada Ave @ Nance St / project dwy 5	TWSC	8.5	**A**	8.5	**A**
7	Webster Ave @ Nance St	Signal	4.2	**A**	4.1	**A**
8	Webster Ave @ Markham St	Signal	8.2	**A**	8.9	**A**
9	Patterson Ave @ project dwy 1	TWSC	*DOES NOT EXIST*			
10	Patterson Ave @ project dwy 4	TWSC	*DOES NOT EXIST*			

[1] TWSC = two-way stop control; AWSC = all-way stop control
[2] Level of service (LOS) rankings based on average control delay (sec/veh) per Highway Control Manual.

Levels of Service – Opening Day plus Project

The expected project traffic is then added to the opening day traffic volumes (existing traffic + ambient growth + cumulative projects). The AM and PM peak-hour traffic volumes for the "opening day plus project" scenario are shown on **Figures 16 and 17**, respectively.

Figure 16: Opening Day plus Project Traffic Volumes – AM Peak Hour

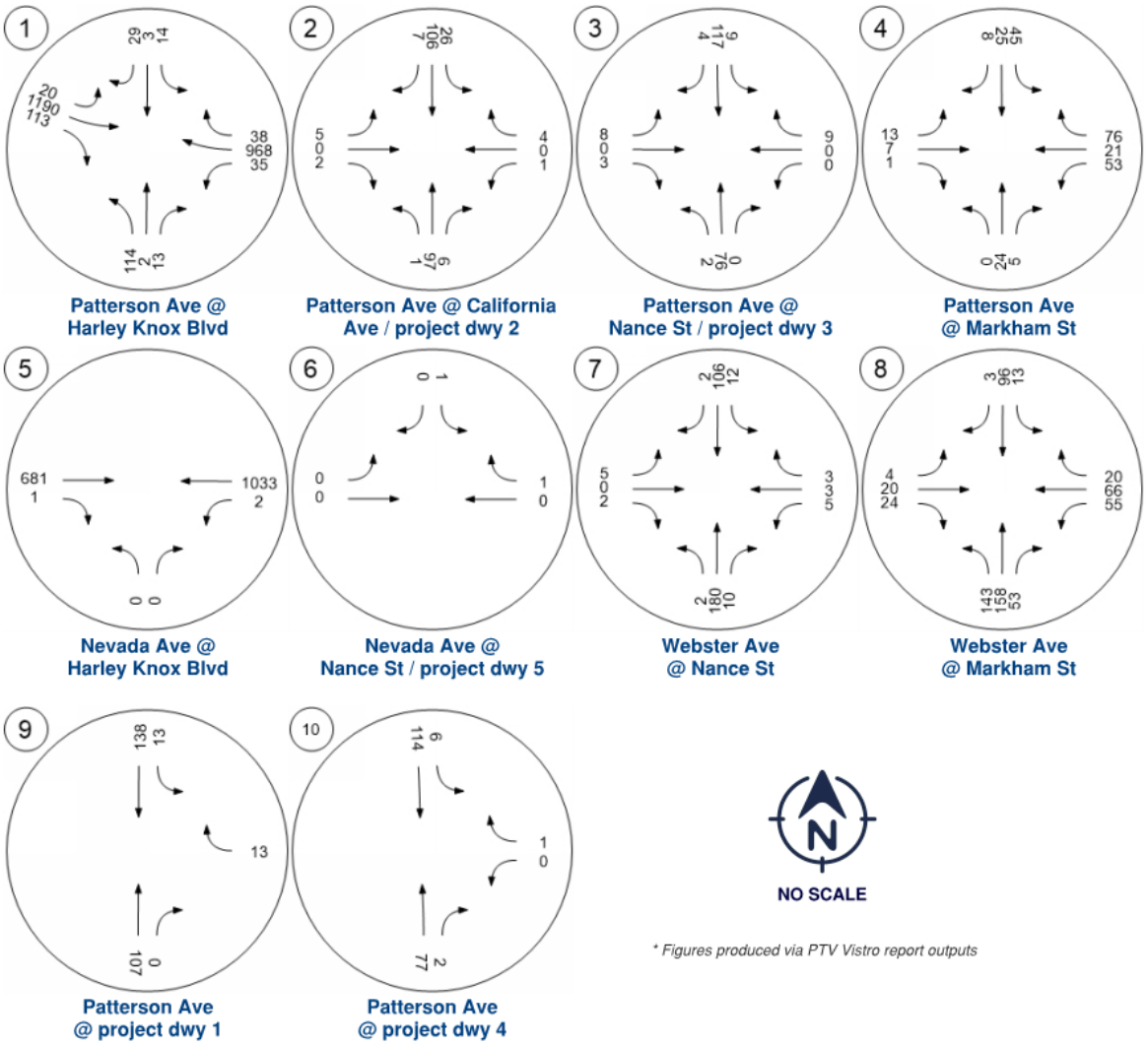


Figure 17: Opening Day plus Project Traffic Volumes – PM Peak Hour

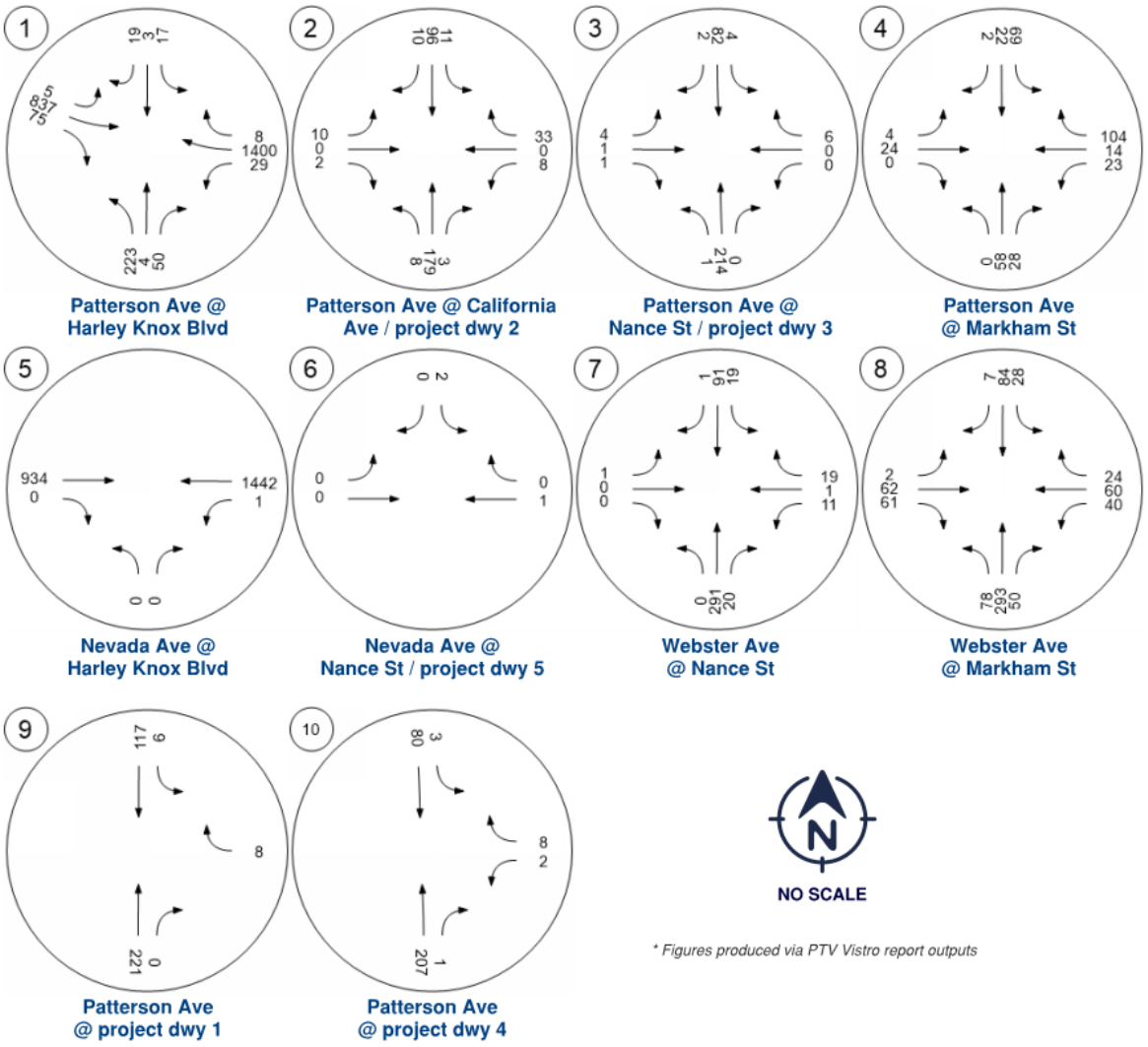


Table 9 summarizes the "opening day plus project" LOS analysis, with details in **Appendix D**. With the addition of ambient traffic growth, cumulative project traffic, and expected project traffic, all study intersections are expected to continue operating above the minimum acceptable LOS standard.

Table 9: Intersection LOS – Opening Day Conditions plus Project (2024)

	Intersection	Traffic Control[1]	AM Peak Hr		PM Peak Hr	
			Delay	LOS[2]	Delay	LOS[2]
1	Patterson Ave @ Harley Knox Blvd	Signal	8	**A**	13.4	**B**
2	Patterson Ave @ California Ave / project dwy 2	TWSC	10.6	**B**	13.6	**B**
3	Patterson Ave @ Nance St / project dwy 3	TWSC	10.3	**B**	11.8	**B**
4	Patterson Ave @ Markham St	AWSC	8.1	**A**	8.6	**A**
5	Nevada Ave @ Harley Knox Blvd	TWSC	11.5	**B**	14.5	**B**
6	Nevada Ave @ Nance St / project dwy 5	TWSC	8.5	**A**	8.5	**A**
7	Webster Ave @ Nance St	Signal	4.2	**A**	4.1	**A**
8	Webster Ave @ Markham St	Signal	8.2	**A**	9.0	**A**
9	Patterson Ave @ project dwy 1	TWSC	8.9	**A**	9.5	**A**
10	Patterson Ave @ project dwy 4	TWSC	8.7	**A**	10.3	**B**

[1] TWSC = two-way stop control; AWSC = all-way stop control
[2] Level of service (LOS) rankings based on average control delay (sec/veh) per Highway Control Manual.

VI. OTHER PROJECT CONSIDERATIONS

Project Design Features

The proposed project is located within an undeveloped site. The proposed project site plan includes the following improvements:

- Construct curb, sidewalk, and driveway improvements on Patterson Avenue and Nevada Avenue to their ultimate half-width adjacent to project site.
- Signing/striping to be implemented along with detailed construction plans for the project site.
- Sight distance at the project driveways will be reviewed with respect to City standards at the time of preparation of final grading, landscape, site development, and street improvement plans.

Nance Street Proposed Vacation

The project is proposing to vacate Nance Street between Patterson Avenue and Nevada Avenue. Nance Street is a two-lane undivided roadway, designated as a Local Road in the Perris Valley Commerce Center (PVCC) Specific Plan. The portion of Nance Street proposed to be vacated is currently undeveloped dirt road and the adjacent parcels are largely undeveloped as well; therefore, it does not carry much existing traffic. The intersection turning movement counts show no more than five vehicles in either direction during the two-hour count AM and PM count periods. Furthermore, Nance Street currently extends approximately 1.25 miles from Wade Avenue in the west to Indian Avenue in the east. This connection has alternative routes in Harley Knox Boulevard (an Arterial roadway) to the north and Markham Street (a Secondary Arterial) to the south, either of which is at most a quarter-mile away.

Based on Nance Street's classification as a local road, as well as its low existing traffic volumes, short link length, and nearby alternative routes, it is expected that its proposed vacation would not significantly impact traffic patterns or operations.

Traffic Signal Warrant Analysis

The California Manual on Uniform Control Devices (MUTCD) provides a set of nine warrant guidelines for the installation of a traffic signal. These traffic signal warrants include volume thresholds as well as other considerations such as proximity to railroad grade crossings or existing traffic signals. Per the MUTCD, the satisfaction of any single warrant shall not require the installation of a traffic signal. The peak-hour traffic signal warrant analysis should only be considered an indicator that an unsignalized intersection is likely to meet one or more of the other volume-based signal warrants. The MUTCD further advises that an engineering study should be conducted to determine that installing a traffic control signal will improve the overall safety and/or operation of the intersection and not seriously disrupt progressive traffic flow.

Accordingly, as a preliminary step in assessing the need for and feasibility of new traffic signals, this study analyzed whether the unsignalized study intersections meet the peak-hour traffic signal warrant as outlined in the MUTCD. Based on the traffic volume data, ambient area growth, nearby cumulative projects, and proposed project traffic, no study intersection is expected to meet the peak-hour signal warrant threshold in any study scenario (see **Appendix F** for details).

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