ARCO AM/PM SERVICE STATION TRAFFIC IMPACT ANALYSIS

City of Moreno Valley

June 22, 2019 (Revised August 12, 2019)

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Traffic Engineering ● Transportation Planning ● Parking ● Noise & Vibration
Air Quality ● Global Climate Change ● Health Risk Assessment

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June 22, 2019 (Revised August 12, 2019)

prepared by

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EXECUTIVE SUMMARY

The purpose of this Traffic Impact Analysis is to provide an assessment of traffic operations resulting from development of the proposed ARCO AM/PM Service Station project and to identify measures necessary to mitigate potentially significant traffic impacts. This report analyzes traffic impacts for the anticipated Opening Year (2024) with full development of the site when the project will be generating trips at its full potential occupancy, and for the General Plan Buildout (Year 2040).

Although this is a technical report, effort has been made to write the report clearly and concisely. To assist the reader with terms unique to transportation engineering, a glossary is provided in Appendix A.

PROJECT DESCRIPTION

The currently undeveloped 6.93-acre project site is located west of Redlands Boulevard between Spruce Avenue and Hemlock Avenue in the City of Moreno Valley. The proposed project involves the construction of a gasoline service station/convenience market with 16 fueling positions.

The project site is adjacent to the existing SR-60/Redlands Boulevard interchange which will be reconstructed with ramp reconfiguration after Opening Year and included in the General Plan Buildout. For purposes of this analysis, the project will have different interim and ultimate project access points for the eastern project driveway. The eastern access will be phased such that either the interim or the ultimate access will be open to accommodate the SR-60/Redlands Boulevard interchange configuration for existing or future conditions.

For the purposes of this study, the proposed project is anticipated to be constructed with full development in Opening Year (2024). The General Plan buildout (Year 2040) evaluates three alternative interchange layouts.

The project site is proposed to provide access at Hemlock Avenue, Spruce Avenue for Opening Year conditions, and Redlands Boulevard for ultimate conditions (i.e., post-interchange improvements). For Opening Year conditions, the project driveways at Hemlock Avenue and Spruce Avenue are proposed to provide full access ingress and egress to the site. For ultimate buildout conditions, full access will continue to be provided at Hemlock Avenue, the Spruce Avenue driveway will be closed, and a right turn in/out only access is proposed at Redlands Boulevard in conjunction with a raised median on Redlands Boulevard.

EXISTING OPERATIONS

The study intersections currently operate within acceptable Levels of Service (D or better) during the peak hours for Existing conditions (see Table 3).

PROJECT TRIPS

The proposed project is forecast to generate approximately 3,037 daily PCE trips, including 76 PCE trips during the AM peak hour and 99 PCE trips during the PM peak hour (see Table 4).

PROJECT DESIGN FEATURES

For Opening Year (2024) interim conditions prior to the SR-60 Freeway/Redland Boulevard interchange reconfiguration, the Spruce Avenue project driveway is proposed to provide full access ingress and egress to the site. The project driveway on Hemlock Avenue is proposed to provide full ingress and egress to the site.

- Hemlock Avenue Improvements
  - Construct the modified collector roadway from west property boundary to Redlands Boulevard.
  - Install stop control on eastbound Hemlock Avenue at Redlands Boulevard.
  - Construct the eastbound approach.

- The Hemlock Avenue / Redlands Boulevard intersection is designed to function as a right turn in /right turn out access driveway during the interim condition prior to the construction of the Redlands Interchange.

- Spruce Avenue Improvements
  - Realign and reconstruct segment of Spruce Avenue from the project site to Redlands Boulevard.
  - Construct west leg from Spruce Avenue bend to accommodate T-intersection.
  - Install stop control on northbound Spruce Avenue between Redlands Boulevard and project site.
  - Modify northbound approach from right turn to shared left-right turn.

- Project North Driveway (NS) at Hemlock Avenue (EW) - #6
  - Construct the northbound approach to consist of one shared left-right turn lane with stop-control.

- Spruce Avenue (NS) at Project South Driveway (EW) - #7
  - Construct the westbound approach to consist of one shared thru-right turn lane.
  - Reconfigure northbound approach to provide one shared left-right turn lane with stop-control.

For General Plan Buildout (Year 2040) after SR-60 Freeway/Redland Boulevard interchange reconfiguration (any alternative), the Redlands Boulevard project driveway is proposed to be restricted to right turns in/out only access. The project driveway on Hemlock Avenue is proposed to continue to provide full ingress and egress to the site.

- Redlands Boulevard (NS) at Project East Driveway (EW) - #8
  - Construct the westbound approach from project to Redlands Boulevard.
  - Install stop control for right turn out exit.

When the construction of the Redlands Boulevard Project East Driveway (#8) is completed, the Spruce Avenue Project South Driveway (#7) will be closed.

FORECAST OPERATIONS

Existing Plus Project: The study intersections are projected to operate within acceptable Levels of Service (D or better) during the peak hours for Existing Plus Project conditions (see Table 8); therefore, the proposed project is forecast to result in no significant traffic impacts for Existing Plus Project conditions.

Opening Year (2024) Without Project: The study intersections are forecast to operate within acceptable Levels of Service (D or better) during the peak hours for Opening Year (2024) Without Project conditions, except for the following study intersection that is projected to operate at unacceptable Level of Service without improvements (see Table 9):

- Redlands Boulevard at SR-60 Eastbound Ramps - #4 (PM peak hour)

The following improvements are required by other development within the study area to maintain acceptable Levels of Service at the study intersections:

- Redlands Boulevard at SR-60 Eastbound Ramps - #4
  - Widen eastbound approach (off-ramp) to provide one left turn lane and one right turn lane.

- Redlands Boulevard at Eucalyptus Avenue - #5[1]
  - Construct additional southbound approach lane to provide one left turn lane.

[1] Opening year cumulative improvements to be provided by other development in conjunction with other development improvements at or near the Redlands Boulevard and Eucalyptus intersection.

- Restripe eastbound right turn lane to a shared through-right turn lane and construct receiving through lane on the east leg.
- Reconstruct westbound approach to consist of one left turn lane, one through lane, and one right turn lane.

It should be noted that improvements to Redlands Boulevard at Eucalyptus Avenue are only needed because of other development traffic contributions.

Opening Year (2024) With Project: The study intersections are forecast to operate within acceptable Levels of Service (D or better) during the peak hours for Opening Year (2024) With Project conditions, except for the following study intersections that are projected to operate at unacceptable Levels of Service without improvements (see Table 9):

- Redlands Boulevard at SR-60 Eastbound Ramps - #4 (PM peak hour)

The same improvements are recommended to maintain acceptable Levels of Service at the study intersections for with Project as without project.

General Plan Buildout: The study intersections are forecast to operate within acceptable Levels of Service (D or better) for General Plan Buildout Without and With Project conditions for all three alternative interchange configurations, except for the following study intersection forecast to operate at unacceptable Level of Service without improvements:

- Redlands Boulevard at Hemlock Avenue - #2
- Redlands Boulevard at SR-60 Eastbound Ramps - #4 (PM peak hour - Alternative 1 and 2)

The following improvements are recommended to maintain acceptable Levels of Service at the study intersections for General Plan Buildout Without and With Project conditions:

- Redlands Boulevard at Hemlock Avenue - #2
  - Install traffic signal[2]
  - Construct a second northbound through lane and northbound left turn lane.
  - Construct a second southbound through lane.
  - Configure northbound approach lanes to provide one left turn lane, one through lane and one shared through-right turn lane.
  - Configure southbound approach lanes to provide one left turn lane, one through lane and one shared through-right turn lane.

- Redlands Boulevard at SR-60 Eastbound Ramps - #4 (Alternative 1 and 2)
  - Construct one northbound right turn lane.

MITIGATION MEASURES

Direct Impacts

The proposed project is forecast to result in no significant traffic impacts at the study intersections for Existing Plus Project conditions; therefore, no mitigation is required for direct project impacts.

[2] SR-60 / Redlands interchange improvement to provide alternative access for local traffic with the elimination of Spruce Avenue connection to Redlands Boulevard.

Cumulative Impacts

As mitigation for potential cumulative impacts, the proposed project shall contribute towards the identified improvements through an adopted traffic impact fee program, or through an equivalent fair share contribution for improvements not covered within such fee programs. Typically, applicable fees include the City of Moreno Valley Development Impact Fee, and the County of Riverside Transportation Uniform Mitigation Fee (TUMF) and Road and Bridge Benefit District (RBBD) programs.

The proposed project shall contribute its fair share, through the applicable development impact fee programs or equivalent fair share contribution, to the following improvements for Opening Year and General Plan Buildout conditions:

Opening Year (2024)

As shown in the traffic impact analysis reports opening year conditions for other cumulative developments in the study area, improvements to Redlands Boulevard intersections are shown as improvements by others.

- Redlands Boulevard at SR-60 Eastbound Ramps - #4[3]
  - Widen eastbound approach (off-ramp) to provide one left turn lane and one right turn lane.

- Redlands Boulevard at Eucalyptus Avenue - #5[4]
  - Construct additional southbound approach lane to provide one left turn lane.
  - Restripe eastbound right turn lane to a shared through-right turn lane and construct receiving through lane on the east leg.
  - Reconstruct westbound approach to consist of 1 left turn lane, 1 through lane and 1 right turn.

Figure 43 graphically illustrates the identified improvements for Opening Year (2024).

General Plan Buildout (Year 2040)

As shown in the traffic impact analysis reports general buildout conditions for other cumulative developments in the study area and the Redlands interchange project, improvements to Redlands Boulevard roadway and intersections are shown as improvements by others.

- Redlands Boulevard at Ironwood Avenue - #1
  - Construct a second northbound through lane.
  - Construct a second southbound through lane.
  - Construct additional eastbound approach lane to provide shared left turn-through lane and shared through-right turn lane and construct receiving through lane on the east leg.
  - Construct additional westbound approach lane to provide shared left turn-through lane and shared through-right turn lane and construct receiving through lane on the west leg.

[3] Opening year cumulative improvement which the project will contribute fair share funds in conjunction with other development projects to fund this improvement.

[4] The Highland Fairview Corporate Park at the northeast corner of Redlands Boulevard and Eucalyptus Avenue is proposed to be developed with commercial retail and industrial land uses. The Highland Fairview Corporate Park Draft EIR (2008) states; "The project proponent shall construct the fourth leg of the intersection located at Redlands Boulevard and Eucalyptus Avenue at the ultimate design required to provide adequate capacity for all phases of the project and buildout of the adjacent areas. The design tentatively consists of a separate westbound left turn lane, two westbound through lanes and a dedicated westbound right turn lane."
As the current information is that the development of the northeast corner of Redlands Boulevard and Eucalyptus Avenue is excepted to be constructed by Opening Year (2024), the minimum necessary lane improvements (westbound approach lanes, south-eastbound left turn lane and north-eastbound shared through-right lane) are shown for Opening Year (2024). These roadway improvements are required mitigation for the NWC development as shown in the 2008 EIR.

- Redlands Boulevard at Hemlock Avenue - #2
  - Install traffic signal[5]
  - Construct a second northbound through lane and northbound left turn lane.
  - Construct a second southbound through lane.
  - Configure northbound approach lanes to provide one left turn lane, one through lane and one shared through-right turn lane.
  - Configure southbound approach lanes to provide one left turn lane, one through lane and one shared through-right turn lane.

- Redlands Boulevard at SR-60 Westbound Ramps - #3
  - Construct a second northbound through lane.
  - Construct a second southbound through lane.
  - Construct additional southbound turn lane for on-ramp (Alternative 1-left, Alternatives 2 & 3 right)
  - Construct two additional westbound approach lanes for off-ramp.
  - Reconfigure westbound approach to consist of 1 left turn lane, 1 shared lane and 1 right turn lane.

- Redlands Boulevard at SR-60 Eastbound Ramps - #4
  - Construct a second northbound through lane.
  - Construct a second southbound through lane.
  - Construct two northbound right turn lanes for on-ramp.
  - Construct two southbound left turn lanes for on-ramp (Alternatives 1 & 2)
  - Construct additional eastbound approach lane for off-ramp.
  - Reconfigure eastbound approach to consist of 1 left turn lane, 1 shared lane and 1 right turn lane
  - Construct a second northbound right turn lane. (Alternatives 1 & 2)

- Redlands Boulevard at Eucalyptus Avenue - #5[6]
  - Construct a second northbound through lane.
  - Construct additional northbound approach lane to provide one right turn lane.
  - Construct a second southbound through lane.
  - Construct additional southbound approach lane to provide second left turn lane.
  - Construct a second eastbound through lane.
  - Construct additional eastbound approach lane to provide second left turn lane.
  - Construct additional eastbound approach lane to provide one right turn lane.
  - Construct additional westbound approach lane to provide second left turn lane.

Figure 44 graphically illustrates the identified improvements for General Plan Buildout (2040) Alternative 1, Alternative 2 and Alternative 3.

Site-adjacent improvements shall be constructed in conjunction with the project.

At some locations, payment of the City of Moreno Valley Development Impact Fee (DIF) would constitute mitigation of cumulative impacts. The City's Development Impact Fee program was adopted in Year 2005. The Development Impact Fee provides a funding mechanism for arterial streets, traffic signals, interchange improvements as well as emergency services. As noted in the Moreno Valley Municipal Code (Chapter 3.42),

[5] SR-60 / Redlands interchange improvement to provide alternative access for local traffic with the elimination of Spruce Avenue connection to Redlands Boulevard.

[6] The Highland Fairview Corporate Park at the northeast corner of Redlands Boulevard and Eucalyptus Avenue is proposed to be developed with commercial retail and industrial land uses. The Highland Fairview Corporate Park Draft EIR (2008) states; "The project proponent shall construct the fourth leg of the intersection located at Redlands Boulevard and Eucalyptus Avenue at the ultimate design required to provide adequate capacity for all phases of the project and buildout of the adjacent areas. The design tentatively consists of a separate westbound left turn lane, two westbound through lanes and a dedicated westbound right turn lane."

the Development Impact Fee costs included acquiring (right-of-way), designing, constructing and improving and maintaining of arterial streets from the current lane configuration to the ultimate lane configuration, new traffic signal as warranted, and interchange improvements. As required by City Code, all development projects are required to pay the Development Impact Fee as a condition of development.

Additionally, the City's General Plan Circulation Element and the Development Impact Fee program both include widening of Redlands Boulevard. The final designs have not been completed. The project will be constructing improvements at the Redlands Boulevard and Hemlock Avenue intersection as described in this report and is paying into the City's Development Impact Fee program.

GENERAL RECOMMENDATIONS

On-site improvements and improvements adjacent to the site will be required in conjunction with the proposed development to ensure adequate circulation within the project itself.

Circulation recommendations with the interim Spruce Avenue project access traffic conditions for Opening Year (2024) are summarized on Figure 45.

Figure 46 summarizes the circulation recommendations with the Redlands Boulevard project access traffic conditions for General Plan Buildout Alternatives.

All roadway design, traffic signing and striping, and traffic control improvements relating to the proposed project should be constructed in accordance with applicable engineering standards and to the satisfaction of the City of Moreno Valley Public Works Department.

On-site traffic signing and striping plans should be submitted for City of Moreno Valley approval in conjunction with detailed construction plans for the project.

Off-street parking should be provided to meet City of Moreno Valley Municipal Code requirements.

The final grading, landscaping, and street improvement plans should demonstrate that sight distance standards are met in accordance with applicable City of Moreno Valley/California Department of Transportation sight distance standards.

Note: Any proposed improvements within Caltrans right-of-way are subject to Caltrans review and approval for encroachment permits.

1. INTRODUCTION

This section describes the purpose of the Traffic Impact Analysis, project location, proposed development, and study area. Figure 1 shows the project location map, Figure 2 illustrates the project site plan for Opening Year (2024).

PURPOSE AND OBJECTIVES

The purpose of this Traffic Impact Analysis is to provide an assessment of traffic operations resulting from development of the proposed ARCO AM/PM Service Station project and to identify measures necessary to mitigate potentially significant traffic impacts. This report analyzes traffic impacts for the anticipated project Opening Year (2024) and for a Year 2040 forecast reflective of General Plan Buildout.

Although this is a technical report, effort has been made to write the report clearly and concisely. A glossary is provided in Appendix A to assist the reader with technical terms related to transportation engineering.

PROJECT DESCRIPTION

The currently undeveloped 6.93-acre project site is located west of Redlands Boulevard between Spruce Avenue and Hemlock Avenue in the City of Moreno Valley. The proposed project involves the construction of a gasoline service station/convenience market with 16 fueling positions.

PROJECT PHASING

The project site is adjacent to the existing SR-60/Redlands Boulevard interchange which will be reconstructed with ramp reconfiguration after Opening Year and included in the General Plan Buildout. For purposes of this analysis, the project will have different interim and ultimate project access points for the eastern project driveway. The eastern access will be phased such that either the interim or the ultimate access will be open to accommodate the SR-60/Redlands Boulevard interchange configuration for existing or future conditions.

For the purposes of this study, the proposed project is anticipated to be constructed with full development in Opening Year (2024). The General Plan buildout (Year 2040) evaluates three alternative interchange layouts.

PROJECT ACCESS

The project site is proposed to provide access at Hemlock Avenue, Spruce Avenue for Opening Year conditions, and Redlands Boulevard for ultimate conditions (i.e., post-interchange improvements). For Opening Year conditions, the project driveways at Hemlock Avenue and Spruce Avenue are proposed to provide full access ingress and egress to the site. For ultimate buildout conditions, full access will continue to be provided at Hemlock Avenue, the Spruce Avenue driveway will be closed, and a right turn in/out only access is proposed at Redlands Boulevard in conjunction with a raised median on Redlands Boulevard.

STUDY AREA

Based on the City-approved scoping agreement (see Appendix B), the study area consists of the following study intersections and roadway segments within the City of Moreno Valley and California Department of Transportation (Caltrans) jurisdiction:

Study Intersections	Jurisdiction
1. Redlands Boulevard (NS) at Ironwood Avenue (EW)	Moreno Valley
2. Redlands Boulevard (NS) at Hemlock Avenue (EW)	Moreno Valley
3. Redlands Boulevard (NS) at SR-60 Westbound Ramps (EW)	Moreno Valley/Caltrans
4. Redlands Boulevard (NS) at SR-60 Eastbound Ramps (EW)	Moreno Valley/Caltrans
5. Redlands Boulevard (NS) at Eucalyptus Avenue (EW)	Moreno Valley
6. Project West Access (NS) at Hemlock Avenue (EW)	Moreno Valley
7. Spruce Street (NS) at Project Access (EW) [Interim Condition-only]	Moreno Valley
8. Redlands Boulevard (NS) at Project Access (EW) [Future Condition-only]	Moreno Valley

Study Roadway Segments	Jurisdiction
1. Redlands Boulevard: Ironwood Avenue to Hemlock Avenue	Moreno Valley
2. Redlands Boulevard: Hemlock Avenue to SR-60 Westbound Ramps	Moreno Valley
3. Redlands Boulevard: SR-60 Eastbound Ramps to Eucalyptus Avenue	Moreno Valley

ANALYSIS SCENARIOS

The following scenarios are analyzed during typical weekday AM and PM peak hour conditions:

- Existing
- Existing Plus Project
- Opening Year (2024) Without Project
- Opening Year (2024) With Project
- General Plan Buildout (Year 2040) Without Project
- General Plan Buildout (Year 2040) With Project

General Plan Buildout Without and With Project scenarios evaluate the following alternatives for the SR-60/Redlands Boulevard interchange:

- Modified Spread Diamond Interchange Configuration
- Spread Diamond Interchange Configuration
- Modified Partial Cloverleaf Interchange Configuration

Legend

1 Study Intersection

7 Interim Study Intersection

8 Ultimate Study Intersection

--- Future Road

Figure 1
Project Location Map

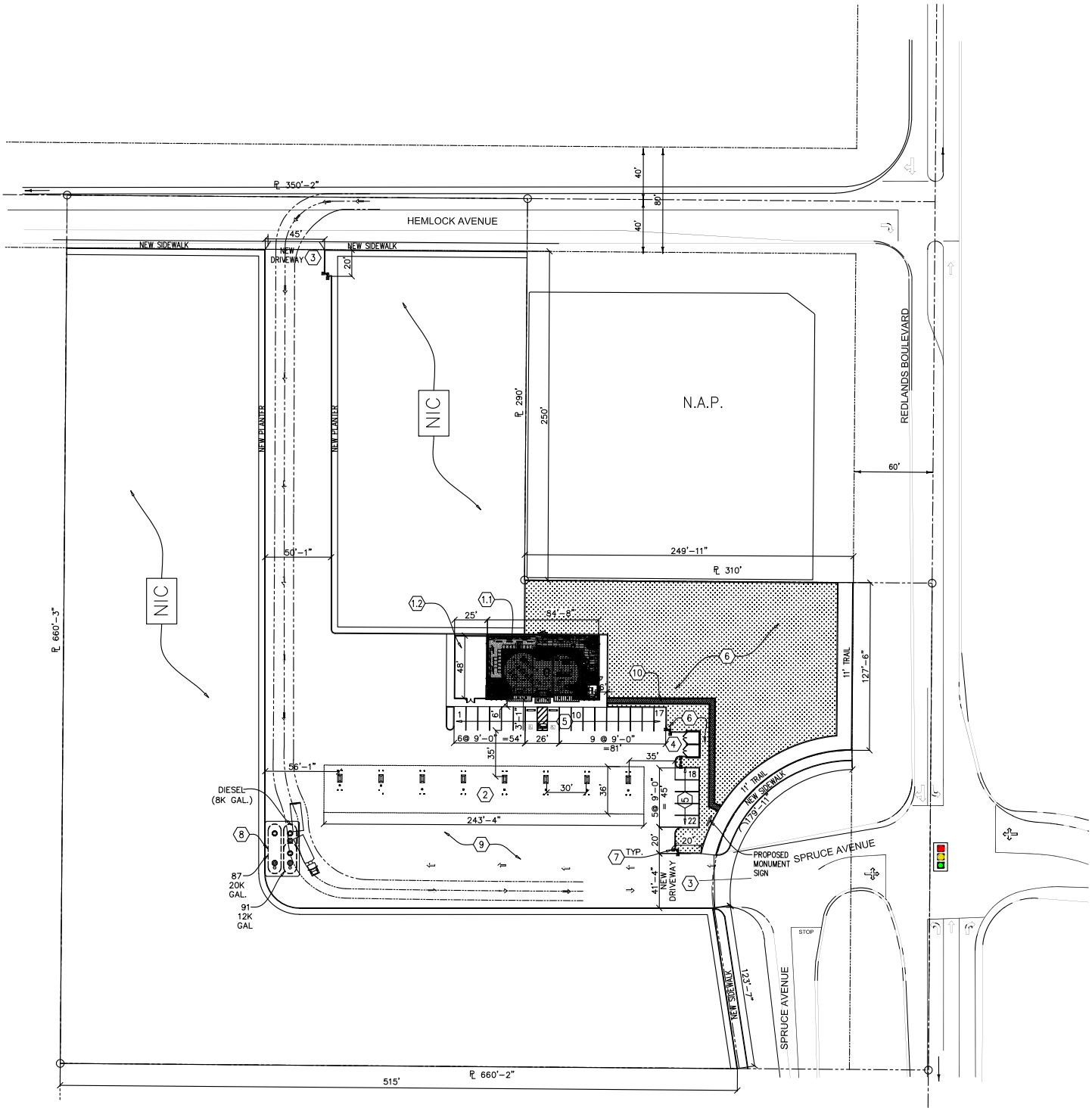
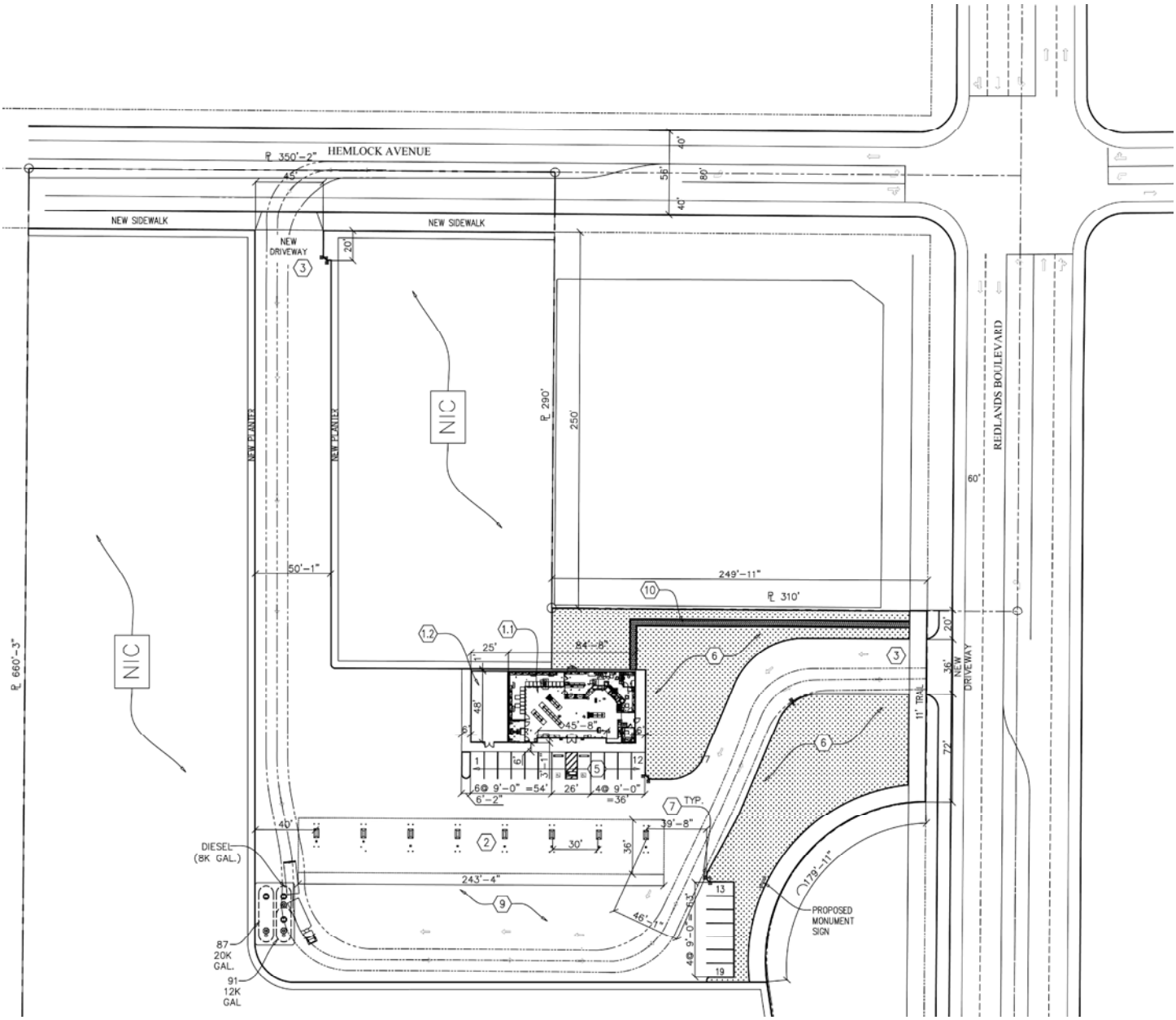


Figure 2
Site Plan - Interim



Note: Redlands Boulevard driveway to be relocated in conjunction with roadway improvements for SR-60/REDLANDS interchange.

Figure 3
Site Plan – Ultimate

2. METHODOLOGY

This section discusses the analysis methodologies used to assess transportation facility performance as adopted by the respective jurisdictional agencies.

ROADWAY CAPACITY METHODOLOGY

The technique used to assess the performance of roadway segments in the City of Moreno Valley is known as the volume to capacity analysis based on the procedures contained in the Highway Capacity Manual. The methodology compares the average daily traffic volume using the roadway segment to the capacity of the roadway segment to calculate the volume-to-capacity (V/C) ratio, which is then correlated to a performance measure known as Level of Service based on the following thresholds:

Level of Service	Volume / Capacity
A	0.000 - 0.600
B	0.601 - 0.700
C	0.701 - 0.800
D	0.801 - 0.900
E	0.901 - 1.000
F	> 1.0

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

Roadway classifications and capacity were determined based on the City of Moreno Valley General Circulation Element for roadway segments and the County of Riverside standards for freeway and Ramp facilities (see Table 1).

INTERSECTION DELAY METHODOLOGY

The technique used to assess the performance of intersections in the City of Moreno Valley is known as the intersection delay methodology based on the procedures contained in the Highway Capacity Manual (Transportation Research Board, 6th Edition). The methodology considers the traffic volume and distribution of movements, traffic composition, geometric characteristics, and signalization details to calculate the average control delay per vehicle and corresponding Level of Service. Control delay is defined as the portion of delay attributed to the intersection traffic control (such as a traffic signal or stop sign) and includes initial deceleration, queue move-up time, stopped delay, and final acceleration delay. The intersection control delay is then correlated to Level of Service based on the following thresholds:

Level of Service	Intersection Control Delay (Seconds / Vehicle)	
	Signalized Intersection	Unsignalized Intersection
A	≤ 10.0	≤ 10.0
B	> 10.0 to ≤ 20.0	> 10.0 to ≤ 15.0
C	> 20.0 to ≤ 35.0	> 15.0 to ≤ 25.0
D	> 35.0 to ≤ 55.0	> 25.0 to ≤ 35.0
E	> 55.0 to ≤ 80.0	> 35.0 to ≤ 50.0
F	> 80.0	> 50.0

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

Level of Service is used to qualitatively describe the performance of a roadway facility, ranging from Level of Service A (free-flow conditions) to Level of Service F (extreme congestion and system failure). At intersections with traffic signal or all way stop control, Level of Service is determined by the average control delay for the overall intersection. At intersections with cross street stop control (i.e., one- or two-way stop control), Level of Service is determined by the average control delay for the worst individual movement (or movements sharing a single lane).

Intersection delay analysis was performed using the Synchro (Version 10) software. The intersection Level of Service analysis has been performed in accordance with guidelines provided in the City of Moreno Valley General Plan Circulation Element, City of Moreno Valley Department Traffic Impact Analysis Preparation Guide, and Riverside County Transportation Department Traffic Impact Analysis Preparation Guide, including minimum phase times, lost time, and saturation flow rates.

PERFORMANCE STANDARDS

City of Moreno Valley

For roadway segments, the City of Moreno Valley has established, as a Citywide target, a Level of Service C on all City maintained roads and conventional State Highways, except that a Level of Service D could be allowed at areas of high employment concentration, north/south roads in the vicinity of the SR-60 Freeway or locations in already developed areas of the City with geometric constrains that prevent Level of Service C from being achieved.

The definition of an intersection deficiency has also been obtained from the City of Moreno Valley General Plan. The General Plan states that peak hour intersection operations of Level of Service D (or better) are generally acceptable, for site and non-site traffic at the Buildout of the study area. Therefore, any intersection operating at Level of Service E to F will be considered deficient.

California Department of Transportation

As stated in the Guide for the Preparation of Traffic Impact Studies (State of California, 2002), "California Department of Transportation endeavors to maintain a target LOS [Level of Service] at the transition between LOS "C" and LOS "D" on State highway facilities". The California Department of Transportation acknowledges this may not always be feasible and recommends consultation with the California Department of Transportation to determine the appropriate target Level of Service. For consistency with local requirements, this analysis defines Level of Service D as the minimum acceptable Level of Service for State Highway facilities.

SIGNIFICANCE IMPACT THRESHOLDS

City of Moreno Valley

The City of Moreno Valley General Plan and Circulation Element have been adopted in accordance with California Environmental Quality Act requirements, and any roadway improvements within the City of Moreno Valley that are consistent with these documents are not considered a significant impact, so long as the project contributes mitigation or fair share funding for improvements.

Based on the City-established performance standards, a project impact is defined as significant if the addition of project-generated trips is forecast to result in one or more of the following conditions:

- The addition of project-generated trips is forecast to cause or worsen unacceptable Level of Service (E or F) at a study roadway segment or signalized study intersection.

- The addition of project-generated trips is forecast to cause or worsen unacceptable Level of Service (E or F) at an unsignalized study intersection and the peak hour traffic volume warrant (Warrant 3) is satisfied in accordance with the California Manual on Uniform Traffic Control Devices.

To mitigate a significant project impact at facilities with unacceptable Level of Service (E or F) under pre-project conditions, the project shall provide or contribute to improvements that would, at a minimum, provide Level of Service that is equal to or better than pre-project conditions.

California Department of Transportation

Based on the Caltrans guidelines, project traffic impact is considered significant if the addition of project generated trips is forecast to cause the performance of a State Highway study intersection to change from acceptable operation (Level of Service D or better) to deficient operation (Level of Service E or F).

TRAFFIC VOLUME FORECASTS

Existing Conditions

Existing peak hour intersection turning movement volumes are based upon AM peak period and PM peak period intersection turning movement counts obtained during typical weekday conditions in May 2019. The AM peak period was counted between 7:00 AM and 9:00 AM and the PM peak period was counted between 4:00 PM and 6:00 PM. The actual peak hour within the peak period is the four consecutive 15-minute periods with the highest total volume when all movements are added together. Thus, the weekday PM peak hour at one intersection may be 4:45 PM to 5:45 PM if those four consecutive 15-minute periods have the highest combined volume. Intersection turning movement count worksheets are provided in Appendix C.

The Existing average daily traffic volumes have been obtained from the 2017 Traffic Volumes on California State Highways by the California Department of Transportation and factored from peak hour intersection turning movement volumes using the following formula for each intersection leg:

PM Peak Hour (Approach Volume + Exit Volume) x 9.1[1] = Leg Volume.

Opening Year (2024) Scenario

The Opening Year (2024) volume forecasts were developed by increasing existing traffic volumes by a growth rate of two percent (2%) per year over a five (5) year period and adding other development trips.

General Plan Buildout (Year 2040) Scenario

General Plan Buildout (Year 2040) forecasts have been obtained from the SR-60 Freeway/Theodore Interchange PA/ED Traffic Impact Analysis (see Figure 36). These future General Plan Buildout traffic volumes account for local area forecast growth at the study intersections for Year 2040. General Plan Buildout traffic volumes are included in Appendix D.

Quality control checks and forecast adjustments were performed as necessary to ensure that all future traffic volume forecasts reflect at least 10% growth over existing traffic volumes. The result of this forecasting procedure is a series of traffic volumes suitable for traffic operations analysis.

Additionally, the Spruce Avenue forecasted traffic volumes were diverted to the new Redlands Boulevard at Hemlock Avenue intersection with the future proposed closure of Spruce Avenue during the SR-60 Freeway/Redland Boulevard Interchange reconstruction. The General Plan Buildout peak hour turning

[1] Approximate average PM peak hour K factor for based on data 24 hour count data on Redlands Boulevard north and south of the SR-60 Freeway Ramps.

movement volumes for the new Redlands Boulevard at Hemlock Avenue intersection were determined for the quadrant of land east and west of Redlands Boulevard from the SR-60 Freeway to half-way between Hemlock and Ironwood Avenues. The quadrant with "future" Hemlock Avenue contains approximately 134.4 gross acres of which 72.1% are designated as low residential (1 DU/AC) and 27.9% are designated as office per the City of Moreno Valley Land Use Map. The gross acreage is reduced by a factor to be attributed to roads, open space and parking, such that the net development acreage is determined. To conservatively estimate the future traffic volumes, the ITE land use code of 750 (office park) was used instead of standard office (710) as office park incorporates commercial retail as well as commercial office uses. Finally, the resulting ADT value for Hemlock Avenue was compared to other roadways is in the study area as a quality control check.

The General Plan Buildout peak hour turning movement volumes were obtained from the SR-60 Freeway/Theodore Interchange PA/ED Traffic Impact Analysis. General Plan Buildout average daily traffic volumes are the more conservative of the factored peak hour intersection turning movement volumes, using a conservative daily peak hour factor (k) for this County or Ambient Growth with all other development for Year 2040.

The City of Moreno Valley and the California Department of Transportation propose to reconstruct the SR-60 Freeway/Redland Boulevard interchange. To accommodate the forecasted substantial traffic volume growth in the area, the proposed interchange improvements would alleviate peak hour congestion, improve traffic volume flow on the freeway and at the interchange, improve safety by upgrading the ramp geometry and provide standard vertical clearance for the freeway at the Redlands Boulevard overpass structure.

Alternative 1 – Modified Spread Diamond: This alternative would include three quadrants of a traditional spread diamond interchange configuration with the fourth ramp as a curved cloverleaf ramp from Redlands Boulevard to the westbound SR-60 Freeway.

Alternative 2 – Spread Diamond: This alternative would include four quadrants of a traditional spread diamond interchange configuration.

Alternative 3 – Modified Cloverleaf: This alternative would include four quadrants of a traditional spread diamond interchange configuration with two curved cloverleaf ramps from Redlands Boulevard to the SR-60 Freeway to eliminate left hand turn movements from Redlands Boulevard to the SR-60 Freeway on-ramps.

The three SR-60 Freeway/Redland Boulevard interchange reconfiguration alternative layout illustrations are included in Appendix E.

Table 1
Roadway Segment Daily Capacities

Roadway Classification	Number of Lanes[3]	Lane Width (feet)	Shoulder Width (feet)	Maximum Two-Way Traffic Volume (ADT)[1,2] by Level of Service		
				C	D	E[4]
Local	2U	11	7	NS	NS	NS
Collector	2U	14	8	NS	NS	NS
Industrial Collector	2D	12	10	10,000	11,250	12,500
Minor Arterial	4U	12	5-7	20,000	22,500	25,000
	4D	10-11	8	20,000	22,500	25,000
Arterial	4D	12-13	6-8	20,000	22,500	25,000
	4D	12-14	8	30,000	33,750	37,500
	6D	11-13	-	45,000	50,625	56,250
Major Arterial	6D	12-14	8	45,000	50,625	56,250
Expressway	6	NS	NS	79,000	87,000	95,000
Expressway	8	NS	NS	106,000	119,000	132,000
Freeway	4	NS	NS	80,000	91,000	100,000
Freeway	6	NS	NS	102,000	123,000	142,000
Freeway	8	NS	NS	136,000	164,000	176,000
Freeway	10	NS	NS	169,000	205,000	220,000
Ramp (One-Way)	1	NS	NS	16,000	18,000	20,000

Notes:

(1) Source: Link Volume Capacities/Level of Service for City of Moreno Valley General Plan Circulation Element for Local to Major Arterial Roadways and County of Riverside roadway daily service volume standards for Freeway and Ramp facilities.

(2) Average Daily Traffic

(3) Roadway directional lanes are either separated by a double yellow lane line (undivided - U), or separated with a painted or raised median (divided - D).

(4) These roadway capacities are theoretical estimates for planning purposes. The Level of Service E volumes are estimated maximum daily capacity for respective classifications.

(5) These roadway capacities thresholds represent the theoretical maximum two-way average daily traffic volumes that any given roadway is able to accommodate with in one day, given typical peak hour characteristics. Generally, roadway segment analysis is performed for planning purposes only and is affected by factors such as the number of intersections (spacing, configuration and control features), degree of access control, roadway grades, design geometrics (horizontal and vertical alignments), sight distance, vehicle mix (truck and bus traffic), and bicycle/pedestrian traffic. Roadway segments benefit from on-going traffic signal progression timing adjustments that maximize green time during peak traffic demands.

3. EXISTING CONDITIONS

Transportation elements as they exist today are presented in this section.

EXISTING ROADWAY SYSTEM

Figure 4 identifies the lane geometry and intersection traffic controls for Existing conditions based on a field survey of the study area. Regional access to the project area is provided by the SR-60 Freeway south of the project site. The key north-south roadway providing local circulation is Redlands Boulevard. The key east-west roadways providing local circulation are Ironwood Avenue, Hemlock Avenue, and Eucalyptus Avenue.

SR-60 Freeway is a four- to six-lane divided freeway classified as a State Highway on the County of Riverside General Plan Circulation Element. Freeway access is approximately one-half drivable miles from the proposed project. It currently carries approximately 64,000 to 69,000 vehicles per day in the study area.

Redlands Boulevard is a two-lane undivided to three-lane divided north and south roadway in the study area. This roadway has a posted speed of 50 miles per hour. Redlands Boulevard is identified for future improvements to elevate the capacity and classified as a Divided Arterial (4 lane divided) (86 feet designated roadway width) in the City of Moreno Valley General Plan Circulation Element. It is a designated truck route from Eucalyptus Avenue to the City of Moreno Valley north city limit. On-street parking is prohibited. On-street bicycle lanes are currently not provided, but are a proposed bike route is shown in the City of Moreno Valley General Plan. Sidewalks are currently not provided. It currently carries approximately 11,300 to 19,200 vehicles per day in the study area.

Ironwood Avenue is a two-lane undivided east-west roadway in the study area. This roadway has a posted speed of 55 miles per hour. Ironwood Avenue is identified for future improvements to elevate the capacity and classified as a Minor Arterial (four-lane divided) (64 feet designated roadway width) in the City of Moreno Valley General Plan Circulation Element. On-street parking is prohibited. On-street bicycle lanes are currently not provided, but are a proposed bike route is shown in the City of Moreno Valley General Plan. Sidewalks are currently not provided. It currently carries approximately 400 to 3,700 vehicles per day in the study area.

Hemlock Avenue is an unpaved east-west roadway currently in the study area. This roadway is proposed for future improvements to local-collector standards, but is not classified on the City of Moreno Valley General Plan Circulation Element.

Eucalyptus Avenue is an east-west roadway that is one-lane undivided east of Redlands Boulevard to three-lane divided west of Redlands Boulevard. This roadway has a posted speed of 45 miles per hour. Eucalyptus Avenue is identified for future improvements to elevate the capacity and is classified as an Arterial (four-lane divided) (76 feet designated roadway width) in the City of Moreno Valley General Plan Circulation Element. On-street parking is prohibited. On-street bicycle lanes are currently not provided, but a proposed bike route is shown in the City of Moreno Valley General Plan. Sidewalks are provided on both sides of the road east of Redlands Boulevard. It currently carries approximately 500 to 700 vehicles per day in the study area.

PEDESTRIAN FACILITIES

Existing pedestrian facilities in the project vicinity are shown on Figure 5. As shown on Figure 5, there are currently no pedestrian sidewalks along the roadways adjacent to the project site.

TRANSIT FACILITIES

Figure 6 shows the existing transit routes available in the project vicinity. As shown on Figure 6, the region is currently served by Riverside Transit Agency. Currently, the study area does not have a designated transit route. The closest transit route 31 serves Moreno Beach Drive and the SR-60 Freeway.

GENERAL PLAN CONTEXT

Figure 7 shows the City of Moreno Valley General Plan Circulation Element roadway classifications map. This figure shows the nature and extent of arterial and collector highways that are needed to adequately serve the ultimate development depicted by the Land Use Element of the General Plan. The City of Moreno Valley standard roadway cross-sections are illustrated on Figure 8.

BICYCLE ROUTES

There are currently no bicycle lanes provided in the project vicinity. On-street bicycle lanes (Class II) are proposed in the City of Moreno Valley General Plan for include Redlands Boulevard, Ironwood Avenue, and Eucalyptus Avenue. The City of Moreno Valley General Plan Bike Routes are depicted on Figure 9.

TRUCK ROUTES

Figure 10 shows the designated truck routes as identified in the City of Moreno Valley General Plan. Roadways in the study area identified as designated Truck Routes include Redlands Boulevard and the SR-60 Freeway.

EXISTING ROADWAY VOLUMES

Figure 11 shows the Existing average daily traffic volumes. The Existing average daily traffic volumes have been obtained from the 2017 Traffic Volumes on California State Highways by the California Department of Transportation and factored from peak hour intersection turning movement volumes using the following formula for each intersection leg:

PM Peak Hour (Approach Volume + Exit Volume) x 9.1[2] = Leg Volume.

Existing peak hour intersection volumes are based upon AM peak period and PM peak period intersection turning movement counts obtained in May 2019 during typical weekday conditions. The AM peak period was counted between 7:00 AM and 9:00 AM and the PM peak period was counted between 4:00 PM and 6:00 PM. The actual peak hour within the peak period is the four consecutive 15-minute periods with the highest total volume when all movements are added together. Thus, the weekday PM peak hour at one intersection may be 4:45 PM to 5:45 PM if those four consecutive 15-minute periods have the highest combined volume. Figure 12 and Figure 13 show the Existing AM and PM peak hour intersection turning movement volumes, respectively.

EXISTING ROADWAY DAILY CAPACITY

The roadway segment Levels of Service for Existing conditions have been calculated and are shown in Table 2. The study roadway segments currently operate within acceptable Levels of Service (D or better) for Existing conditions, except for the following:

- Redlands Boulevard – Ironwood Avenue to Hemlock Avenue
- Redlands Boulevard – Hemlock Avenue to SR-60 Westbound Ramps

EXISTING INTERSECTION LEVEL OF SERVICE

The study intersections currently operate within acceptable Levels of Service (D or better) during the peak hours for Existing conditions. The intersection Levels of Service for Existing conditions have been calculated and are shown in Table 3. Existing intersection Level of Service worksheets are provided in Appendix F.

[2] Approximate average PM peak hour K factor for based on data 24 hour count data on Redlands Boulevard north and south of the SR-60 Freeway Ramps.

Table 2
Existing Roadway Segment Daily Capacity Analysis

ID	Roadway	Segment From	Segment To	Roadway Capacity[1] Ultimate Classification	Ultimate Lanes	Ultimate Capacity[1]	Existing/Proposed Lanes	Existing/Proposed Capacity[2]	Existing Without Project ADT[3]	Existing Without Project V/C[3]	Existing Without Project LOS[3]
1.	Redlands Blvd	Ironwood Ave	Hemlock Ave	Divided Arterial	4D	37,500	2U	12,500	15,070	1.21	F
2.	Redlands Blvd	Hemlock Ave	SR-60 WB Ramps	Divided Arterial	4D	37,500	2D	12,500	14,470	1.16	F
3.	Redlands Blvd	SR-60 EB Ramps	Eucalyptus Ave	Divided Arterial	4D	37,500	3D	18,750	11,760	0.63	B
4.	Ironwood Ave	west of Redlands Blvd	Redlands Blvd	Minor Arterial	4U	25,000	2U	12,500	4,420	0.35	A
5.	Ironwood Ave	Redlands Blvd	east of Redlands Blvd	Minor Arterial	4U	25,000	2U	12,500	730	0.06	A
6.	Hemlock Ave	west of Redlands Blvd	Redlands Blvd	Unclassified - Local	2U	12,500	2U	12,500	-	-	-
7.	Eucalyptus Ave	west of Redlands Blvd	Redlands Blvd	Arterial	4D	37,500	3D	18,750	670	0.04	A
8.	Eucalyptus Ave	Redlands Blvd	east of Redlands Blvd	Arterial	4D	37,500	1U	6,250	330	0.05	A

Notes:

(1) Source: Link Volume Capacities/Level of Service for City of Moreno Valley General Plan Circulation Element (see Table 1).

(2) Roadway maximum capacity at Level of Service "E" for roadway classification. Capacity adjustment to reflect the number of existing number of travel lanes. When there are only 2 lanes on a classified roadway the capacity is adjusted to 12,500 regardless of future classification as the roadways currently lack design improvement features (lane width, shoulder width, bike lanes or medians) which would provide for increased capacity.

(3) ADT = Average Daily Traffic; V/C = Volume to Capacity; LOS = Level of Service

(4) Existing or Proposed roadway capacities are the Level of Service "E" volumes for the respective classifications. Capacity values for non-specified roadways are based on the capacity values for the specified roadway and are adjusted for number of lanes, lane control, shoulders. Values used for capacity are: 1-lane one way roadway capacity = 6,250 vehicles per day (half of the 2D-Collector), 3-lane undivided capacity = 18,750 vehicles per day (average of 2U-Collector and 4U-Secondary).

Table 3
Existing Intersection Level of Service

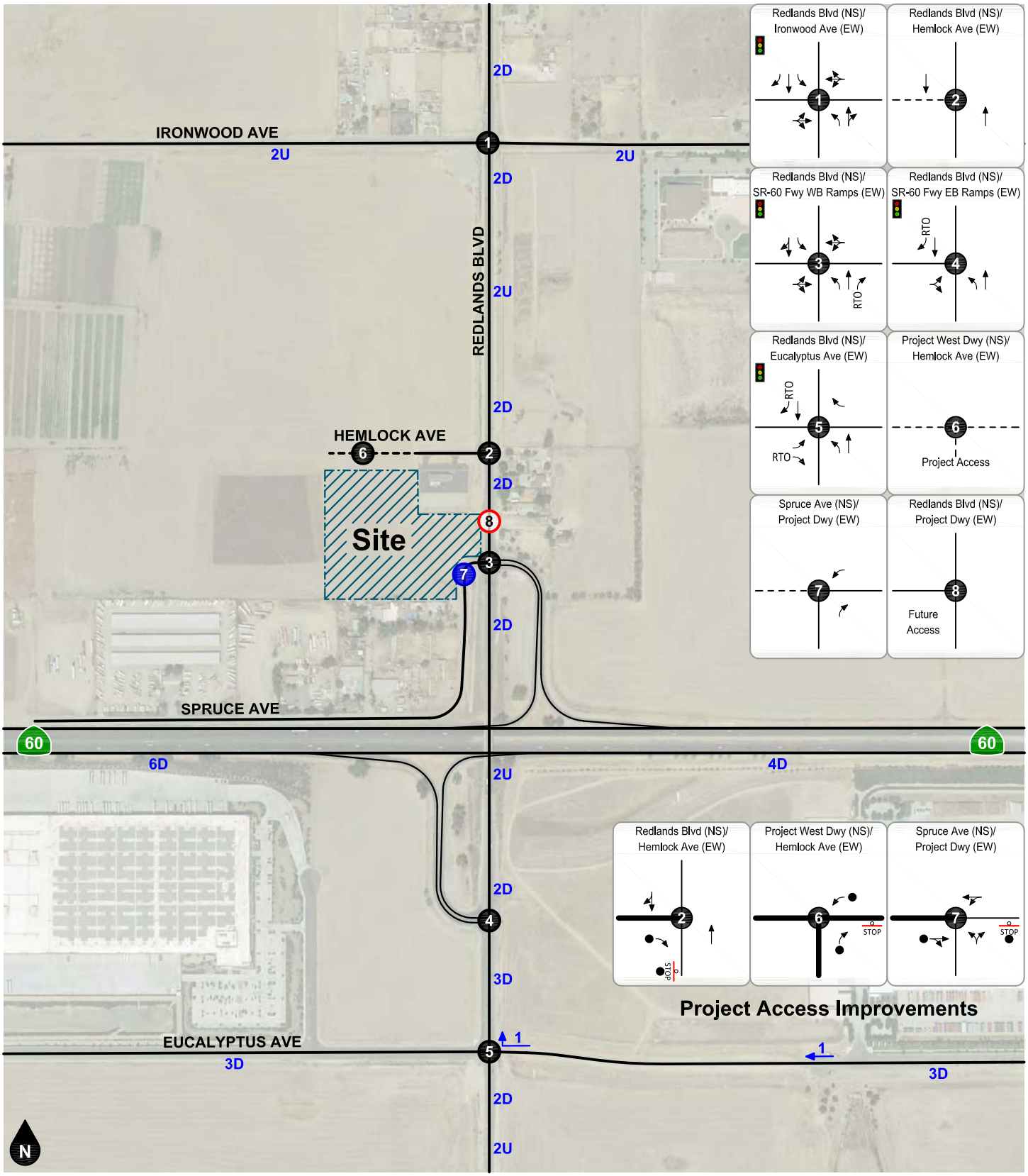
ID	Study Intersection	Traffic Control[1]	AM Peak Hour		PM Peak Hour	
			Delay[2]	LOS[3]	Delay[2]	LOS[3]
1.	Redlands Blvd at Ironwood Ave	TS	14.7	B	16.4	B
3.	Redlands Blvd at SR-60 WB Ramps	TS	42.4	D	20.2	C
4.	Redlands Blvd at SR-60 EB Ramps	TS	24.3	C	35.8	D
5.	Redlands Blvd at Eucalyptus Ave	TS	9.2	A	8.8	A

Notes:

(1) TS = Traffic Signal

(2) Delay is shown in seconds per vehicle. For intersections with traffic signal or all way stop control, overall average intersection delay and LOS are shown. For intersections with cross street stop control, LOS is based on average delay of the worst individual lane (or movements sharing a lane).

(3) LOS = Level of Service



Legend

- Traffic Signal
- STOP Stop Sign
- #D #-Lane Divided Roadway
- #U #-Lane Undivided Roadway
- Existing Lane
- RTO Right Turn Overlap
- Project Access Construction
- 1 One Way
- Project Improvement

Figure 4
Existing Lane Geometry and Intersection Traffic Controls

Legend
Sidewalk
Cross Walk

Figure 5
Existing Pedestrian Facilities

Figure 6
Local Transit Routes

Source: Riverside Transit Agency

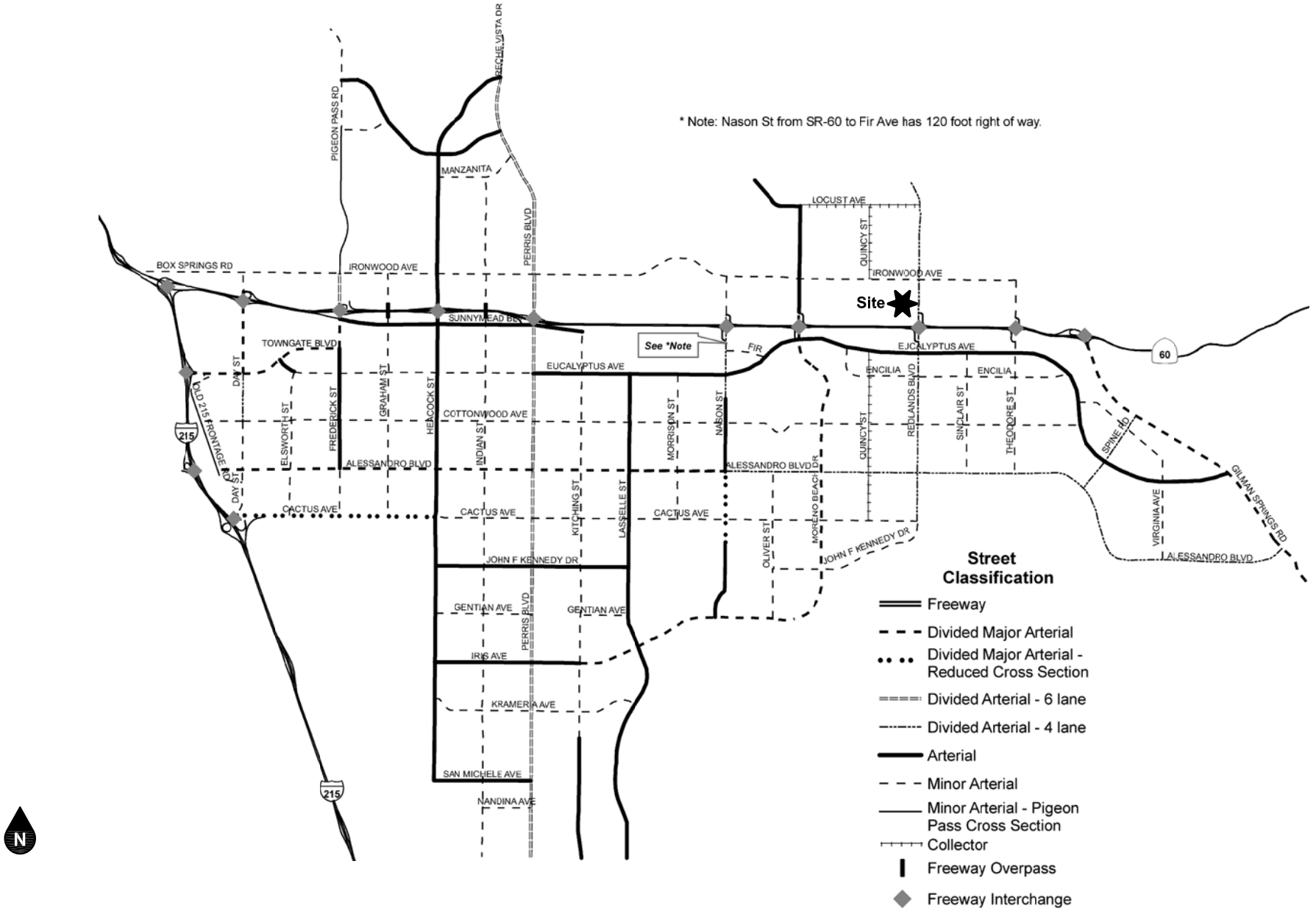


Figure 7
City of Moreno Valley General Plan Circulation Element

Source: City of Moreno Valley

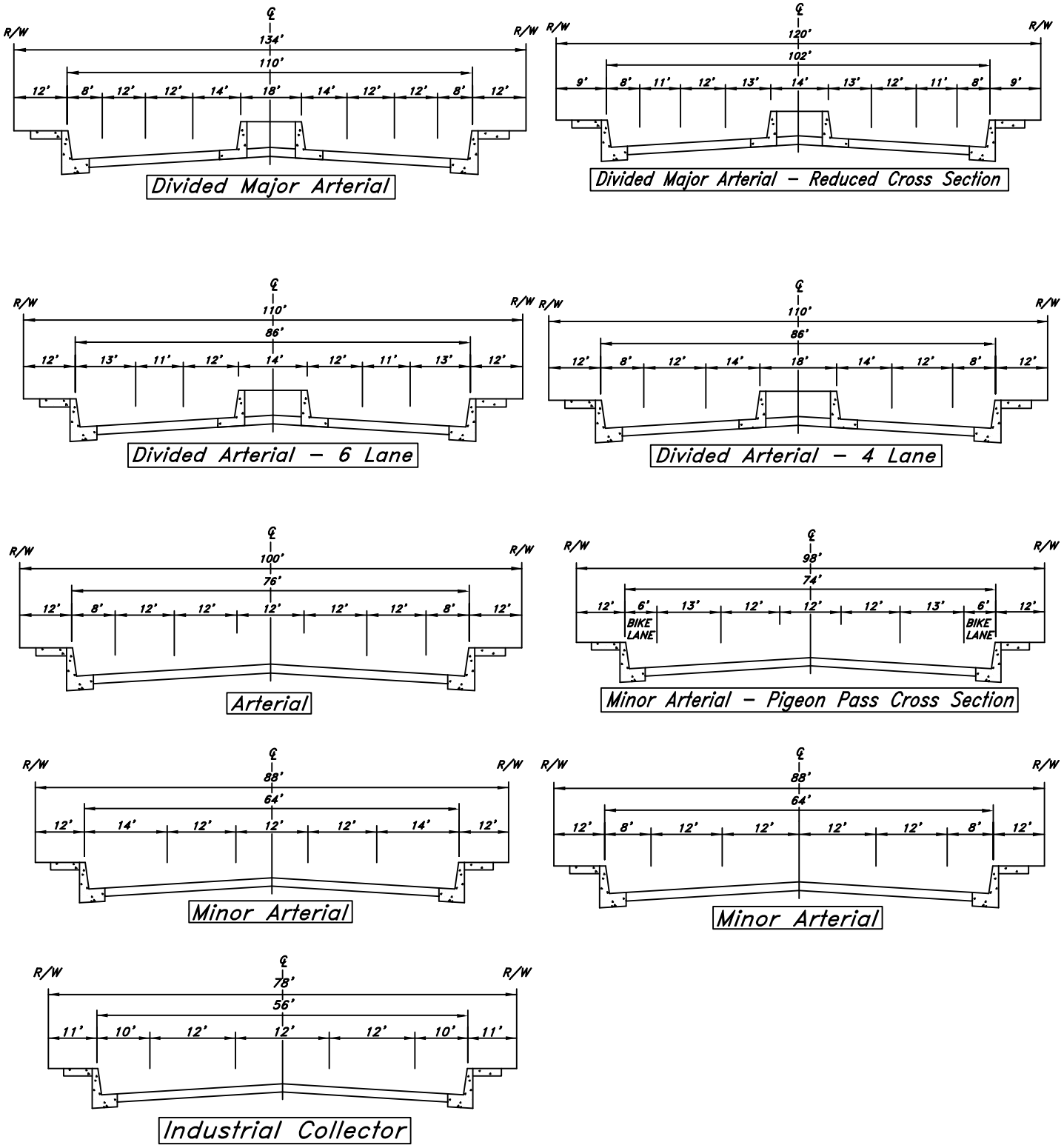


Figure 8
City of Moreno Valley General Plan Roadway Cross-Sections

Source: City of Moreno Valley

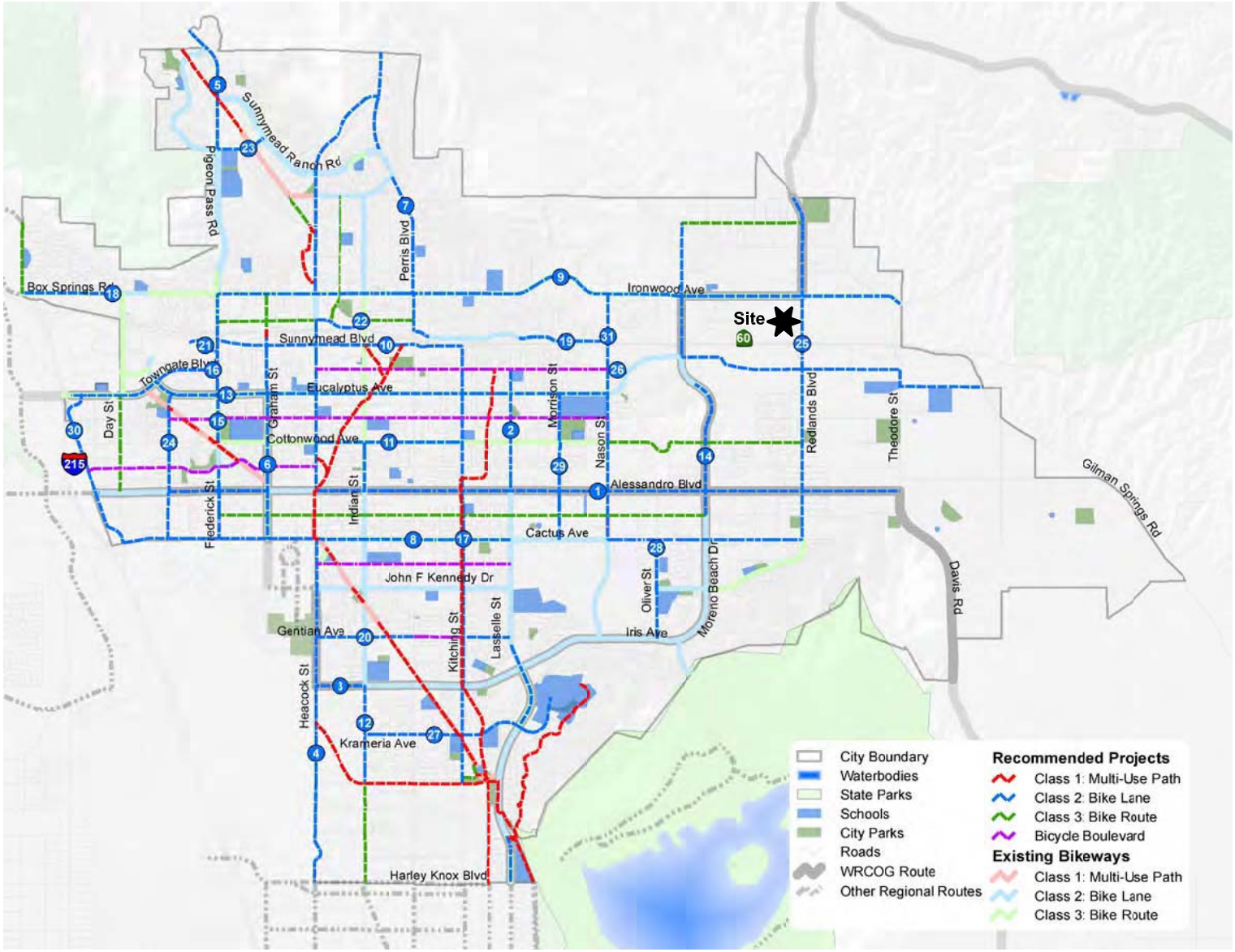


Figure 9
City of Moreno Valley General Plan Bike Routes

Source: City of Moreno Valley

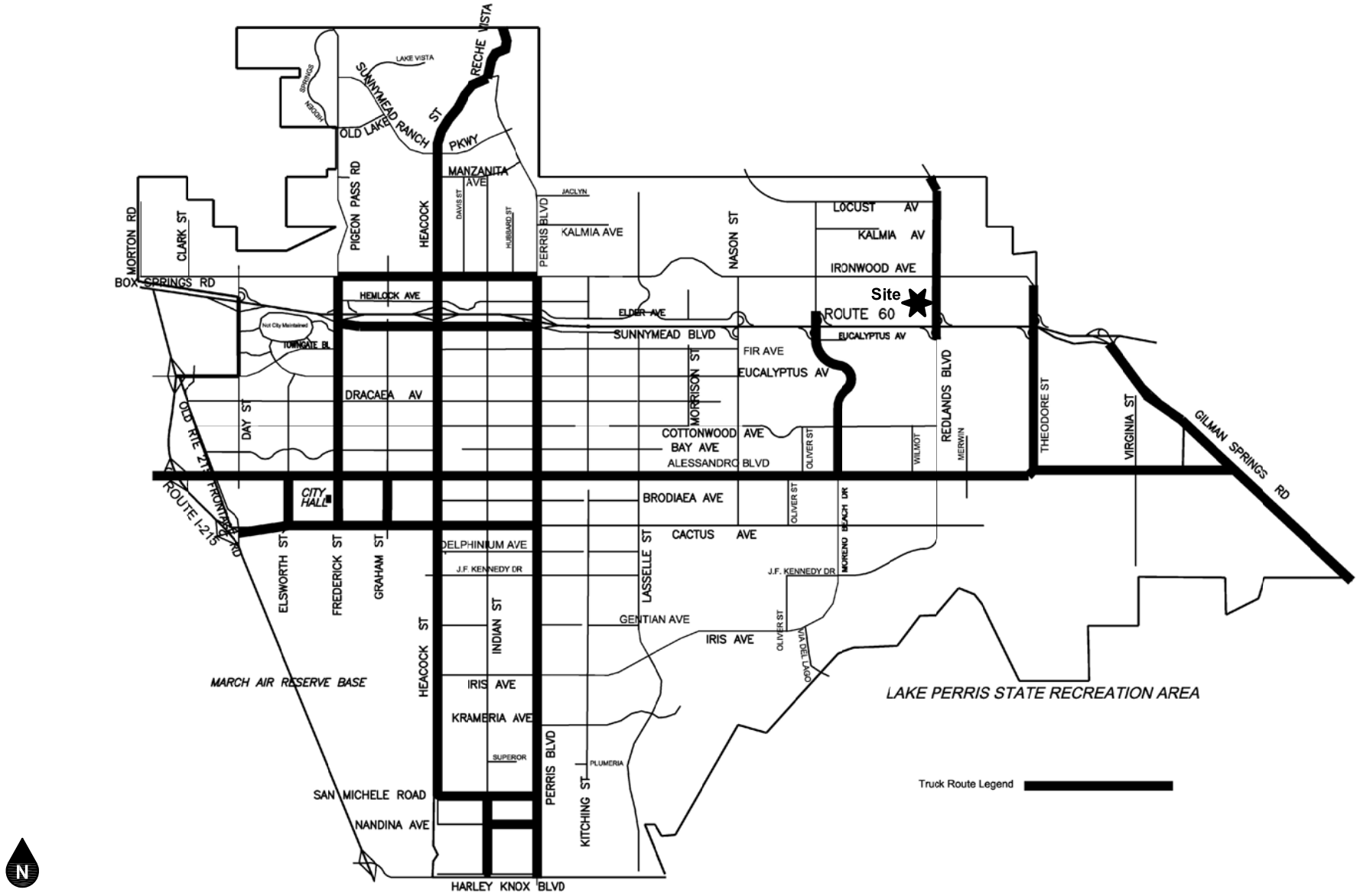
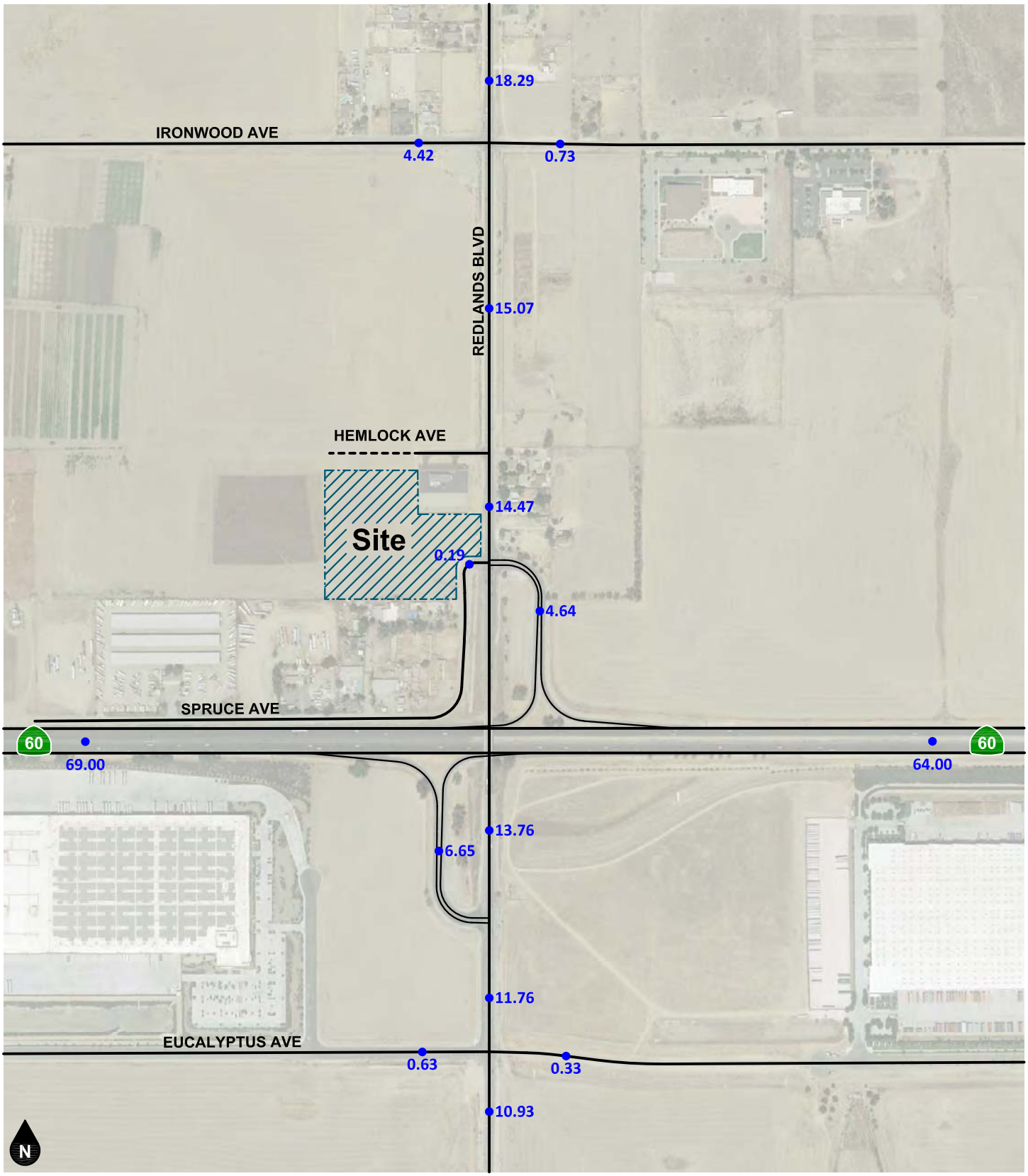


Figure 10
City of Moreno Valley Designated Truck Routes

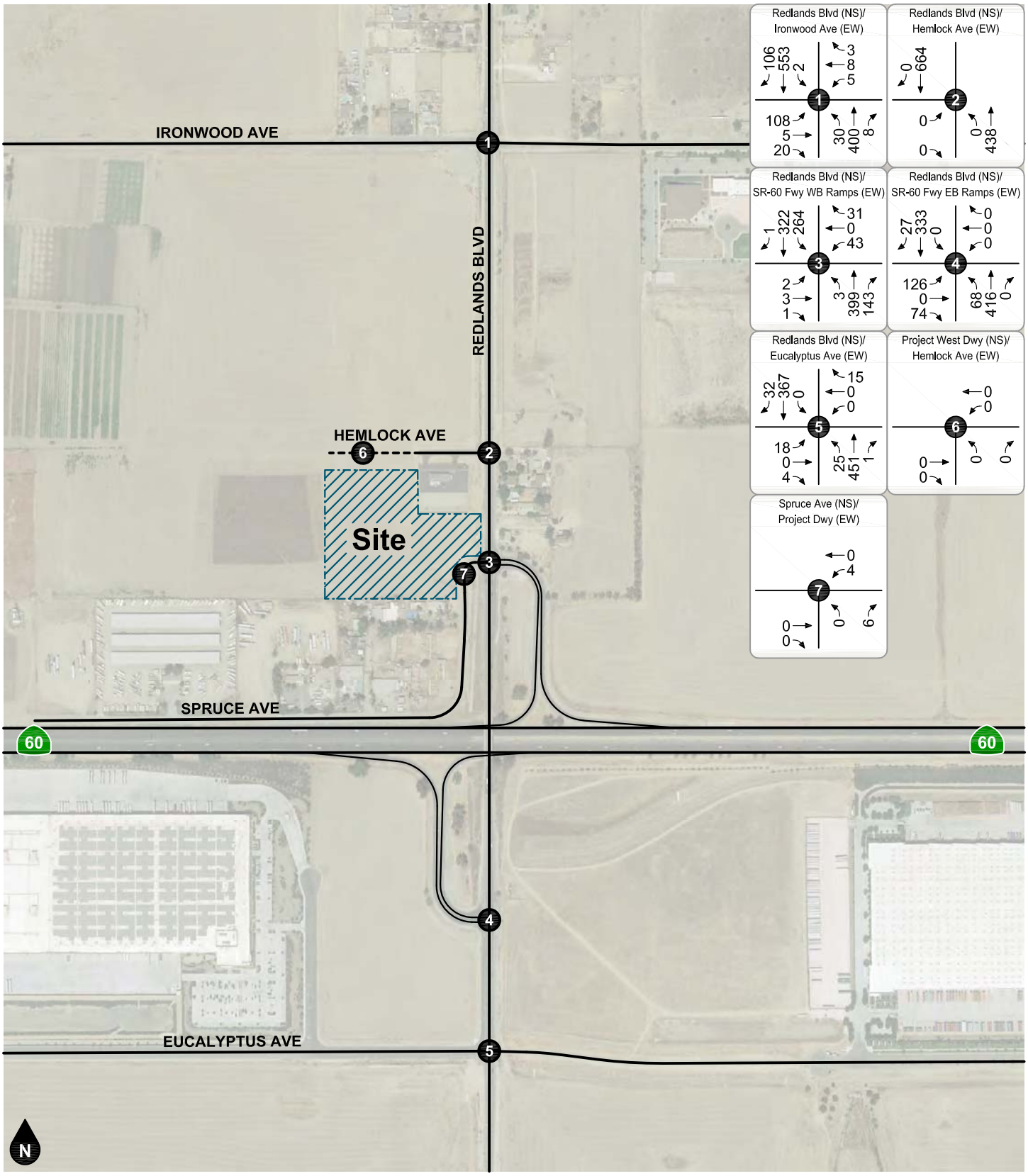
Source: City of Moreno Valley



Legend

●0.74 Vehicles Per Day (1,000's)

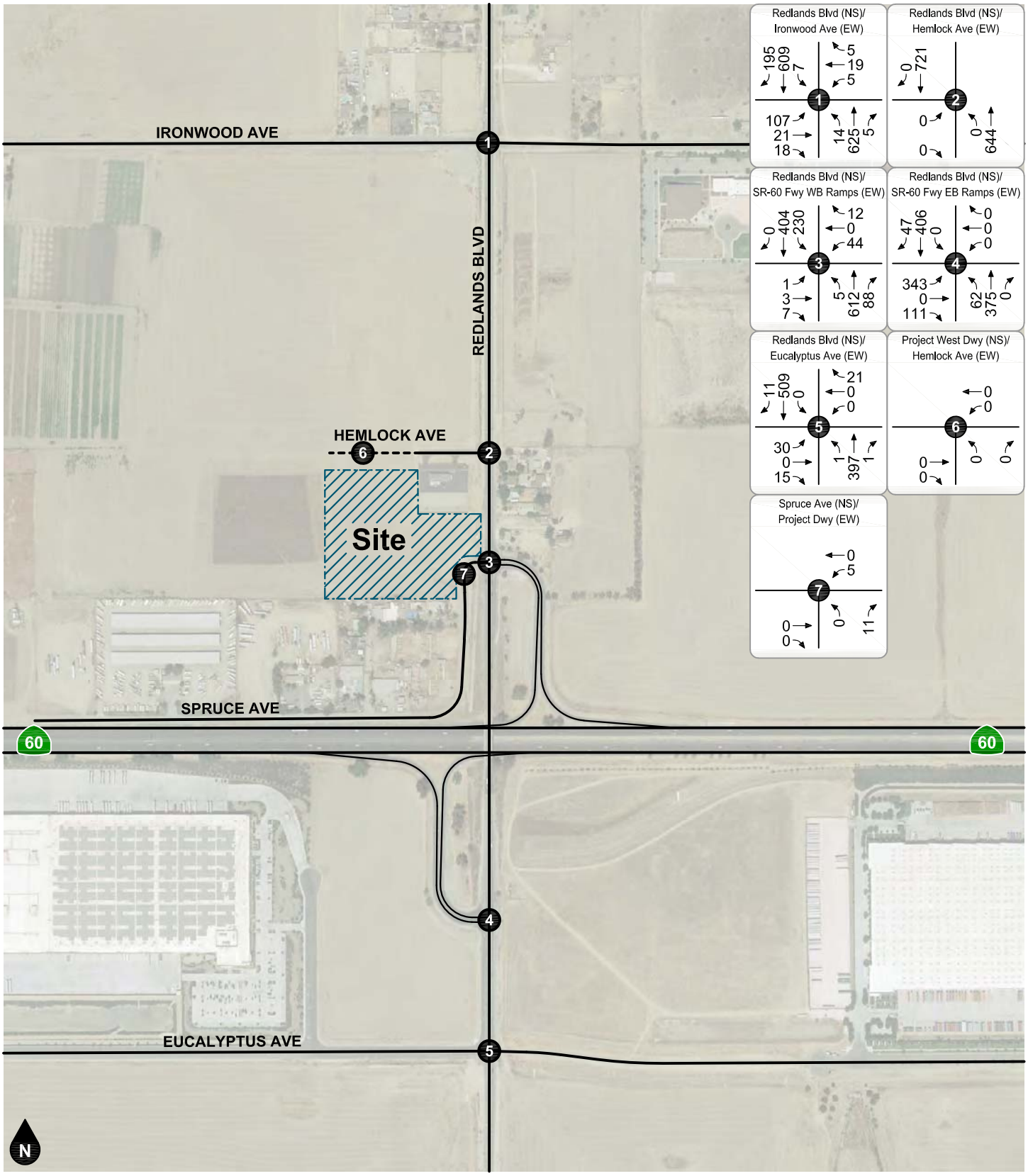
Figure 11
Existing Average Daily Traffic Volumes



Legend

1 Study Intersection

Figure 12
Existing AM Peak Hour Intersection Turning Movement Volumes



Legend

1 Study Intersection

Figure 13
Existing PM Peak Hour Intersection Turning Movement Volumes

4. PROJECT TRIP FORECASTS

This section describes how project trip generation, trip distribution, and trip assignment forecasts were developed. The forecast project volumes are illustrated on figures contained in this section.

PROJECT TRIP GENERATION

Table 4 shows the project trip generation forecast. Trip generation rates for AM peak hour, PM peak hour, and daily trips for the proposed land uses were obtained from the Institute of Transportation Engineers, Trip Generation Manual, 10th Edition, 2017. The number of trips forecast to be generated by each of the individual land uses are determined by multiplying the trip generation rates by the land use quantities.

The proposed project is forecast to generate approximately 3,037 daily PCE trips, including 76 PCE trips during the AM peak hour and 99 PCE trips during the PM peak hour (see Table 4).

Pass-By Trip Adjustment

The project trip generation shown in Table 4 includes applicable pass-by trip adjustments in accordance with procedures outlined in the Institute of Transportation Engineers Trip Generation Handbook (3rd Edition, 2017). Land uses such as shopping centers, restaurants, gasoline stations, and convenience stores will often locate next to busy roadways to attract motorists already on the street. For example, if a patron visits the gas station on the way home from work, one pass-by trip occurs as the vehicle enters the project site driveway and one pass-by trip occurs as the vehicle exits the project site driveway. Since the vehicle is already using the street system to travel home from work, no new trips would be added to the street system as a result of the new gas station, except at the project site driveway(s). Since the trip generation rates contained in the Trip Generation Manual represent vehicles entering and exiting the project site driveways, it is appropriate to adjust the initial trip generation forecast by the number of pass-by trips when calculating the net new trips that will be added to the surrounding street system by the proposed project. The pass-by trip reduction does not apply at the project site driveway(s).

PROJECT TRIP DISTRIBUTION AND ASSIGNMENT

Figure 14 through Figure 15 to show the forecast outbound and inbound directional distribution patterns for trips generated by the proposed project for Opening Year conditions. The project trip distribution patterns were developed in consultation with City of Moreno Valley staff based on review of existing volume data, surrounding land uses, designated truck routes, and the local and regional roadway facilities in the project vicinity.

Based on the identified project trip generation and distributions, project average daily traffic volumes have been calculated and shown on Figure 16. The AM and PM peak hour intersection turning movement volumes expected from the project are shown on Figure 17 and Figure 18, respectively.

Since the project site access configuration is different for ultimate conditions, project trip distribution and assignment for ultimate conditions are shown in the General Plan Buildout Volumes Forecast section later in this report.

PROJECT DESIGN FEATURES

This analysis assumes all improvements necessary for site access will be constructed in conjunction with the proposed project as Project Design Features. These are described later in the report under the Interim Site Access section and General Plan Buildout Site Access section.

Table 4
Project Trip Generation

Trip Generation Rates									
			AM Peak Hour			PM Peak Hour			Daily
Land Use	Source[1]	Unit[2]	% In	% Out	Rate	% In	% Out	Rate	Rate
Gas Station with Convenience Market	ITE 945	VFP	51%	49%	12.47	51%	49%	13.99	205.36

Trips Generated									
			AM Peak Hour			PM Peak Hour			
Land Use	Quantity[3]	Unit[2]	In	Out	Total	In	Out	Total	Daily
Proposed Land Uses									
Gas Station with Convenience Market	16	VFP	102	98	200	114	110	224	3,286
Trip Credits[4]									
Pass-By - Cars Gas Station w/ Convenience Market (AM:62%, PM:56%)			-63	-61	-124	-64	-61	-125	-249
TOTAL NET NEW TRIPS			**39**	**37**	**76**	**50**	**49**	**99**	**3,037**

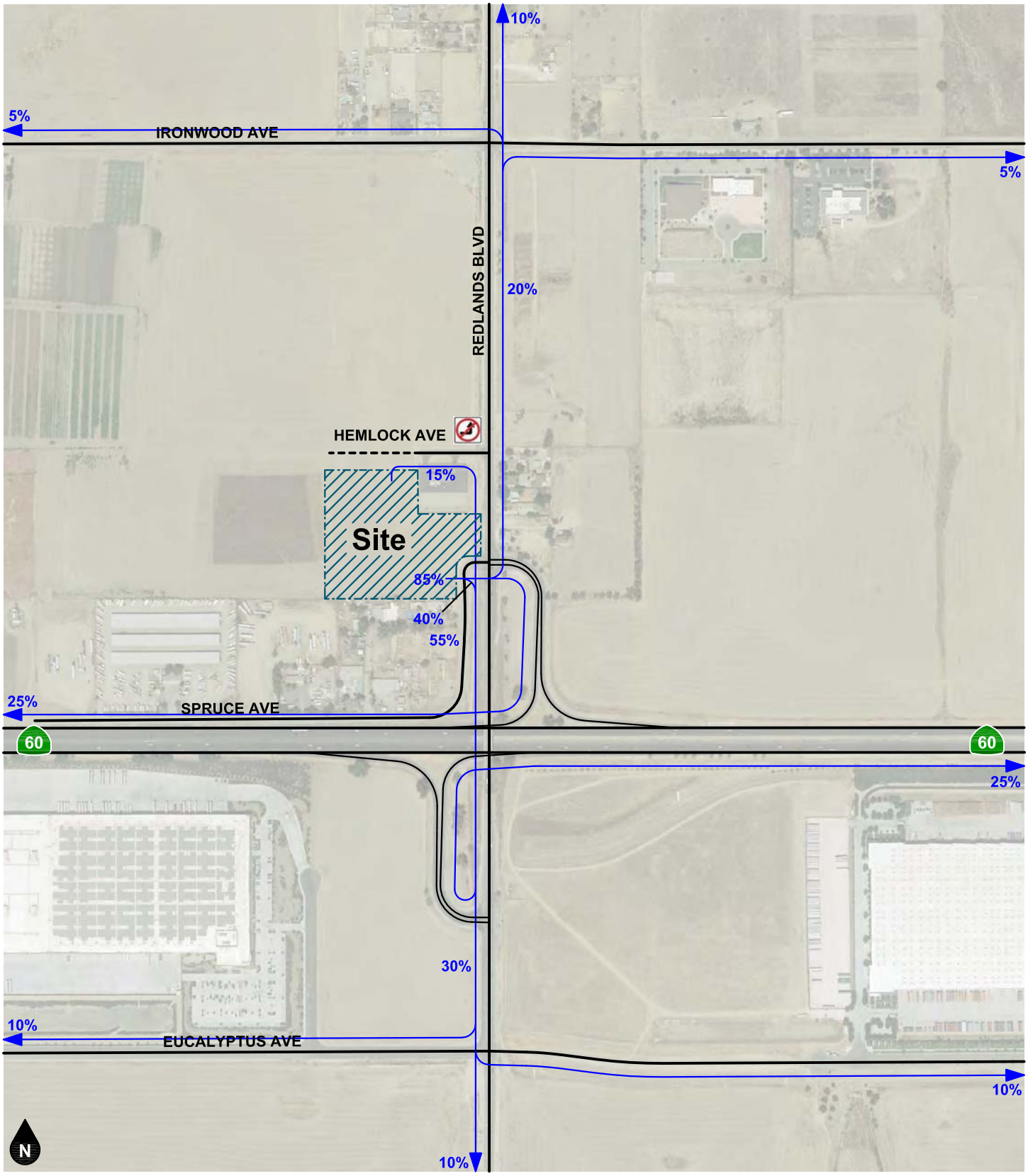
Notes:

(1) Source: Institute of Transportation Engineers (ITE) Trip Generation Manual (10th Edition, 2017); ### = Land Use Code.

(2) VFP = Vehicle Fueling Positions.

(3) Source: Drawing S-1 Site Plan for Project: Tesoro Refining & Marketing Co., received May 29, 2019.

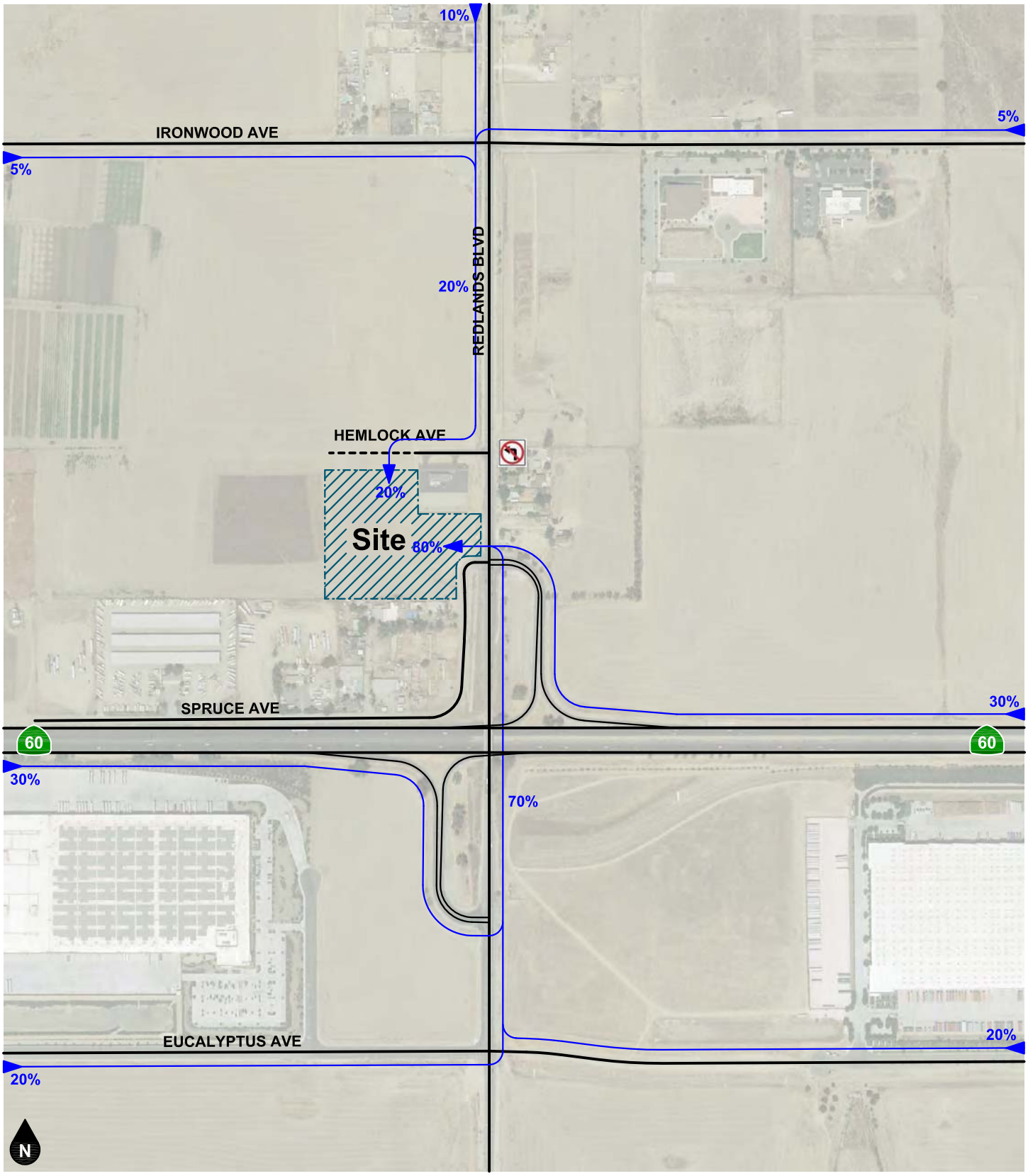
(4) Pass-by rates obtained from ITE Trip Generation Handbook (3rd Edition, 2017).



Legend

10% Percent From Project

Figure 14
Project Outbound Trip Distribution - Interim



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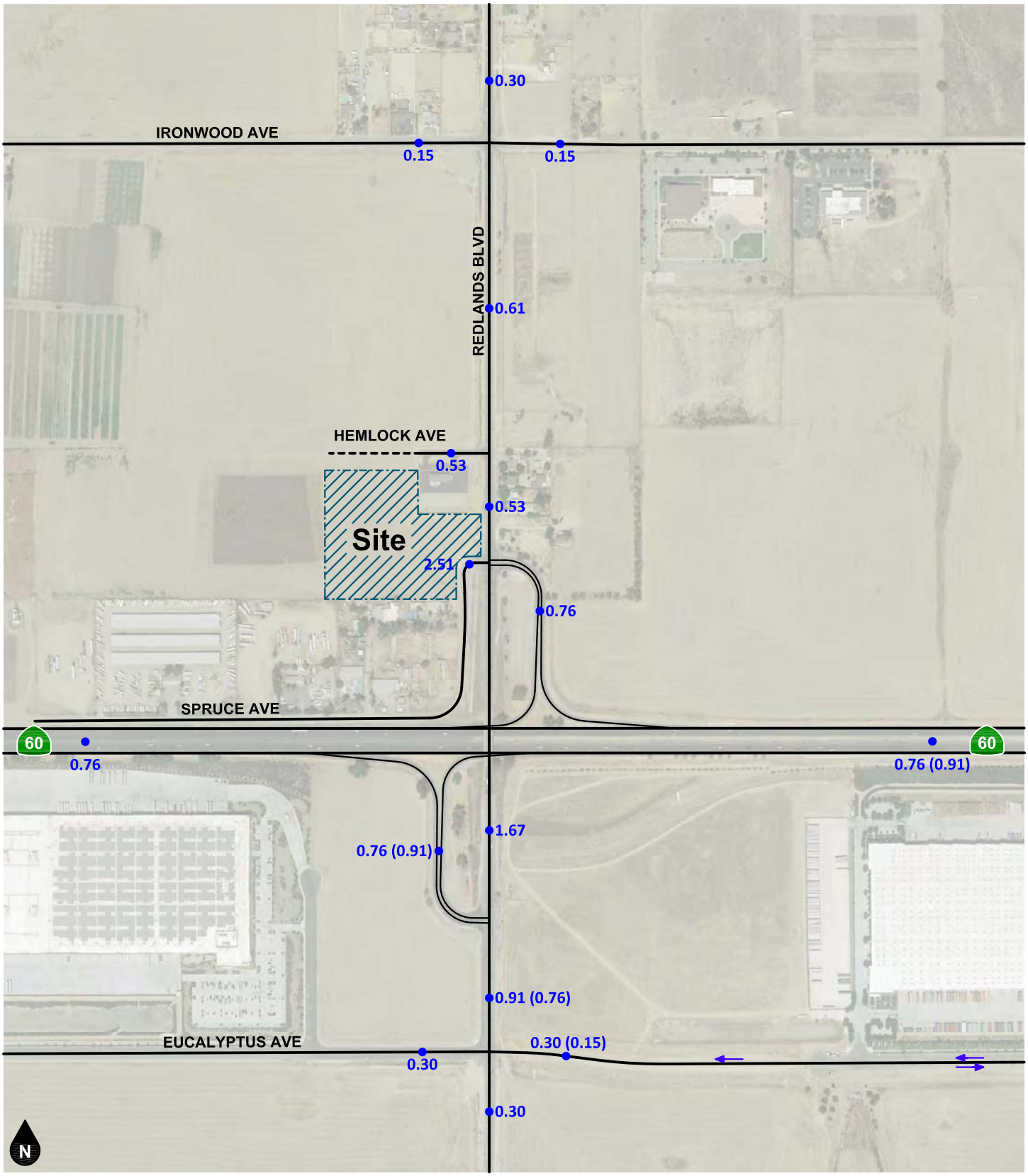
10% Percent To Project

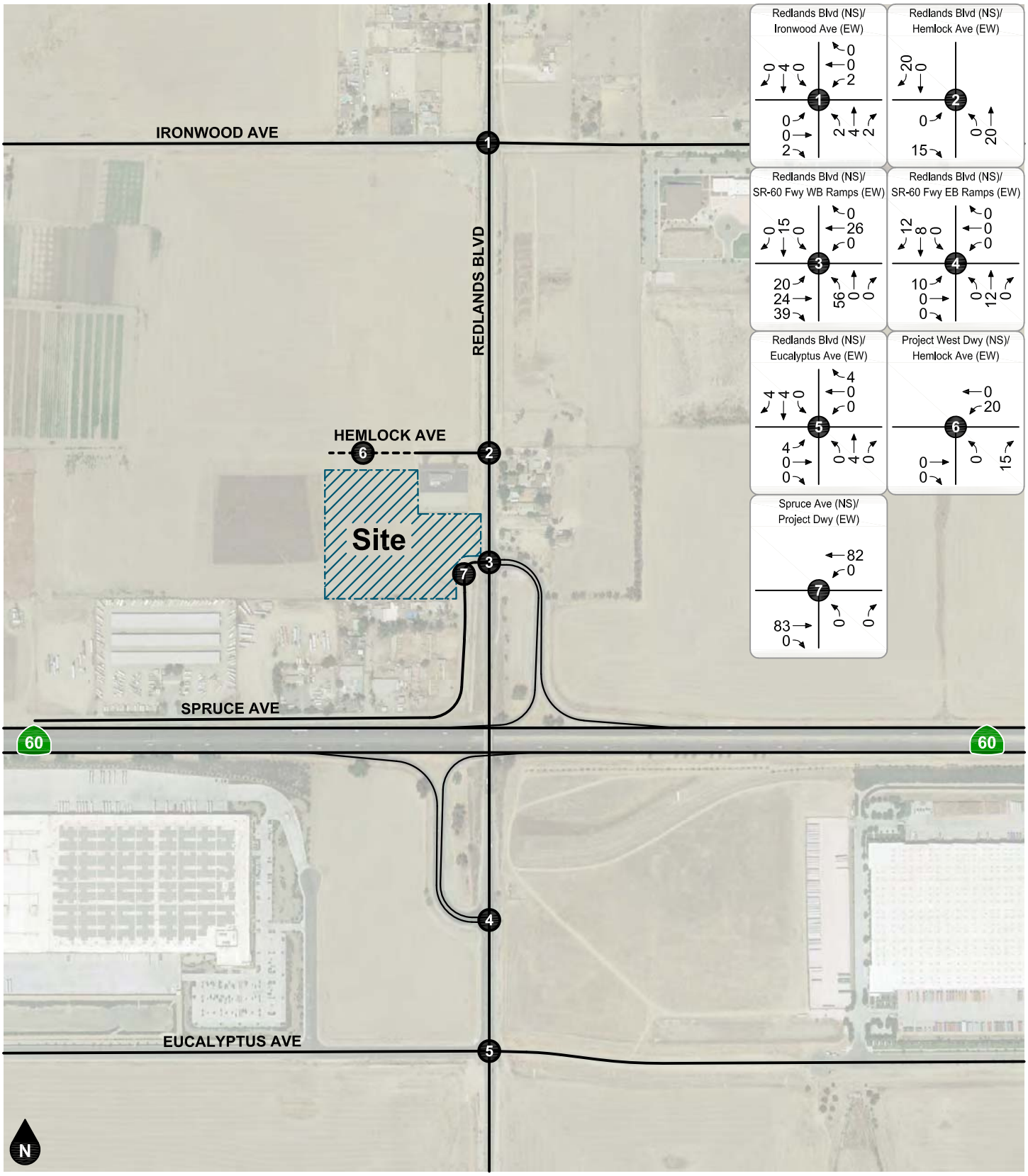
Figure 15
Project Inbound Trip Distribution - Interim



Legend

- 0.72 Opening Year 2022 (1,000's)
- (0.96) Existing plus Project (1,000's)
- 2 Way Traffic By Opening Year (2022)

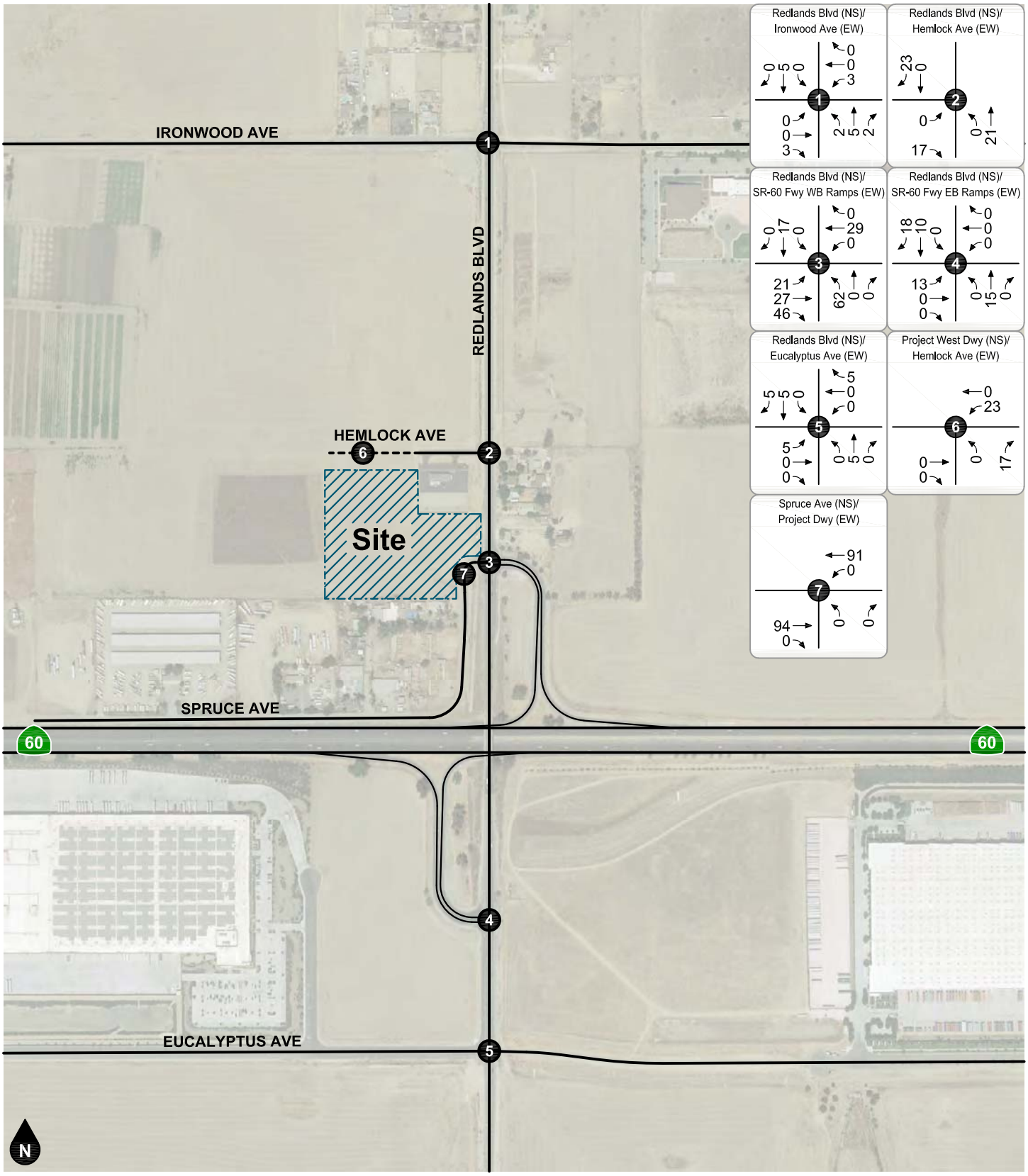
Figure 16
Project Average Daily Traffic Volumes – Interim



Legend

1 Study Intersection

Figure 17
Project
AM Peak Hour Intersection Turning Movement Volumes - Interim



Legend

1 Study Intersection

Figure 18
Project
PM Peak Hour Intersection Turning Movement Volumes - Interim

5. INTERIM YEAR VOLUME FORECASTS

This section describes how future volume forecasts for the Existing Plus Project and Opening Year (2024) scenarios were developed. Forecast study area volumes are illustrated on figures contained in this section.

AMBIENT GROWTH

To account for ambient growth on roadways, Opening Year (2024) volume forecasts were developed by increasing existing traffic volumes by a growth rate of two percent (2%) per year over a five (5) year period.

OTHER DEVELOPMENT

To account for trips generated by future development, trips generated by pending or approved other development projects in the City of Moreno Valley were added to the study intersections, as applicable. Table 5 shows the trip generation summary for other development projects, for Opening Year (2024). Figure 19 shows the other development location map.

The previously discussed ambient growth is assumed to account for any additional trips generated by other development projects located outside the project vicinity and not specifically listed in this report.

Figure 20 shows the forecast average daily traffic volumes for the other development. Figure 21 and Figure 22 show the forecast AM and PM peak hour intersection turning movement volumes for trips generated by other developments.

INTERIM YEAR VOLUME FORECASTS

Existing Plus Project

Existing Plus Project volumes were derived by adding the project generated trips to Existing volumes. Existing Plus Project AM and PM peak hour intersection turning movement volumes are shown on Figure 23 and Figure 24, respectively.

Opening Year (2024) Without Project

To develop Opening Year (2024) Without Project volumes, Existing volumes were combined with ambient growth and trips generated by other developments. Opening Year (2024) Without Project AM and PM peak hour intersection turning movement volumes are shown Figure 25 and Figure 26.

Opening Year (2024) With Project

To develop Opening Year (2024) With Project volumes, project trips were added to the Opening Year (2024) Without Project forecast. Opening Year (2024) With Project AM and PM peak hour intersection turning movement volumes are shown Figure 27 and Figure 28.

Table 5
Other Development Trip Generation

TAZ	Address/Name	Land Use	Source[1]	Quantity	Units[2]	AM Peak Hour			PM Peak Hour			Daily
						In	Out	Total	In	Out	Total	
1	TR31206	Single-Family Residential	ITE 210	23	DU	4	13	17	14	9	23	217
	TR32460	Single-Family Residential	ITE 210	58	DU	11	32	43	36	21	57	548
	TR33962	Single-Family Residential	ITE 210	31	DU	6	17	23	19	12	31	293
	TR32459	Single-Family Residential	ITE 210	11	DU	2	6	8	7	4	11	104
	TR30411	Single-Family Residential	ITE 210	24	DU	5	13	18	15	9	24	227
	Subtotal			147	DU	28	81	109	91	55	146	1,389
2	Westridge Commerce Center	High-Cube Warehouse	ITE 152	937.260	TSF	75	28	103	37	75	112	1,575
	Eucalyptus Industrial Park[5]	High-Cube Warehouse	ITE 152	1901.000	TSF	131	45	176	43	156	199	2,420
		Warehouse	ITE 150	367.000	TSF	64	69	133	98	59	157	1,989
	Subtotal-Cars				PCE	203	72	275	79	228	307	3,930
	Subtotal-Trucks				PCE	214	195	409	275	199	474	6,082
	Subtotal				PCE	417	267	684	354	427	781	10,012
3	Highland Fairview Corp Park Phase 2-3[6]	High-Cube Warehouse	ITE 152	600.000	TSF	48	18	66	24	48	72	1,008
		Commercial Retail	ITE 820	210.000	TSF	159	98	257	452	489	941	9,957
		Pass-by: 0%AM, 34%PM				0	0	0	-154	-166	-320	0
	Subtotal-Cars				PCE	205	115	320	321	369	690	10,925
	Subtotal-Trucks				PCE	30	11	41	15	30	45	624
	Subtotal				PCE	159	98	257	298	323	621	9,957
4	Moreno Valley Auto Mall [7]	New Auto Sales	ITE 840	100.000	TSF	137	50	187	97	146	243	2,784
5	TR32408	Single-Family Residential	ITE 210	80.000	DU	15	44	59	50	29	79	755
	TR31618	Single-Family Residential	ITE 210	56.000	DU	11	30	41	35	20	55	529
	Subtotal			136	DU	26	74	100	85	49	134	1,284
6	Moreno Beach Marketplace / Lowes	Home Improvement Store	ITE 862	175	TSF	156	119	275	200	208	408	5,380
		Pass-by: 0%AM, 42%PM				0	0	0	(84)	(87)	(171)	0
	Subtotal					156	119	275	116	121	237	5,380
7	TR36372	Single-Family Residential	ITE 210	25	DU	5	14	19	16	9	25	236
8	World Logistics - Phase 1[8]	High-Cube Warehouse	ITE 152	1660.000	TSF	1,695	753	2,448	835	1,837	2,672	37,104
		Warehouse	ITE 150	100	TSF	23	7	30	8	24	32	356
		Utility Servicing Station	ITE 170	31	TSF	22	2	25	11	13	23	248
		Convenience Mkt w/ Gas	ITE 853	12.000	FP	16	16	33	23	22	46	573
		Pass-by: 63%AM, 66%PM				(10)	(11)	(21)	(15)	(15)	(30)	0
	Subtotal-Cars				PCE	1,149	442	1,591	399	1,328	1,727	29,451
	Subtotal-Trucks				PCE	1,374	783	2,157	1,096	1,280	2,376	19,253
	Subtotal				PCE	2,523	1,225	3,748	1,495	2,608	4,103	48,704
9	TR36719	Single-Family Residential	ITE 210	34	DU	6	19	25	21	13	34	321
	TR35377	Single-Family Residential	ITE 210	9	DU	2	5	7	6	3	9	85
	Subtotal			43	DU	8	24	32	27	16	43	406
10	P06-158 (Gascomn)	Commercial Retail	ITE 820	116.360	TSF	130	80	210	292	316	608	6,664
		Pass-by: 0%AM, 34%PM				0	0	0	(99)	-108	-207	0
	Subtotal					130	80	210	193	208	401	6,664
Total						3,589	2,032	5,621	2,772	3,962	6,734	86,816

Notes:

(1) Source: City of Moreno Valley Website for Development Projects Map and Listing.

(2) Source: Institute of Transportation Engineers, Trip Generation Manual, 10th Edition, 2017, ### Land Use Code, unless otherwise noted.

(3) Source: Institute of Transportation Engineers, Trip Generation Handbook (3rd Edition,2017).

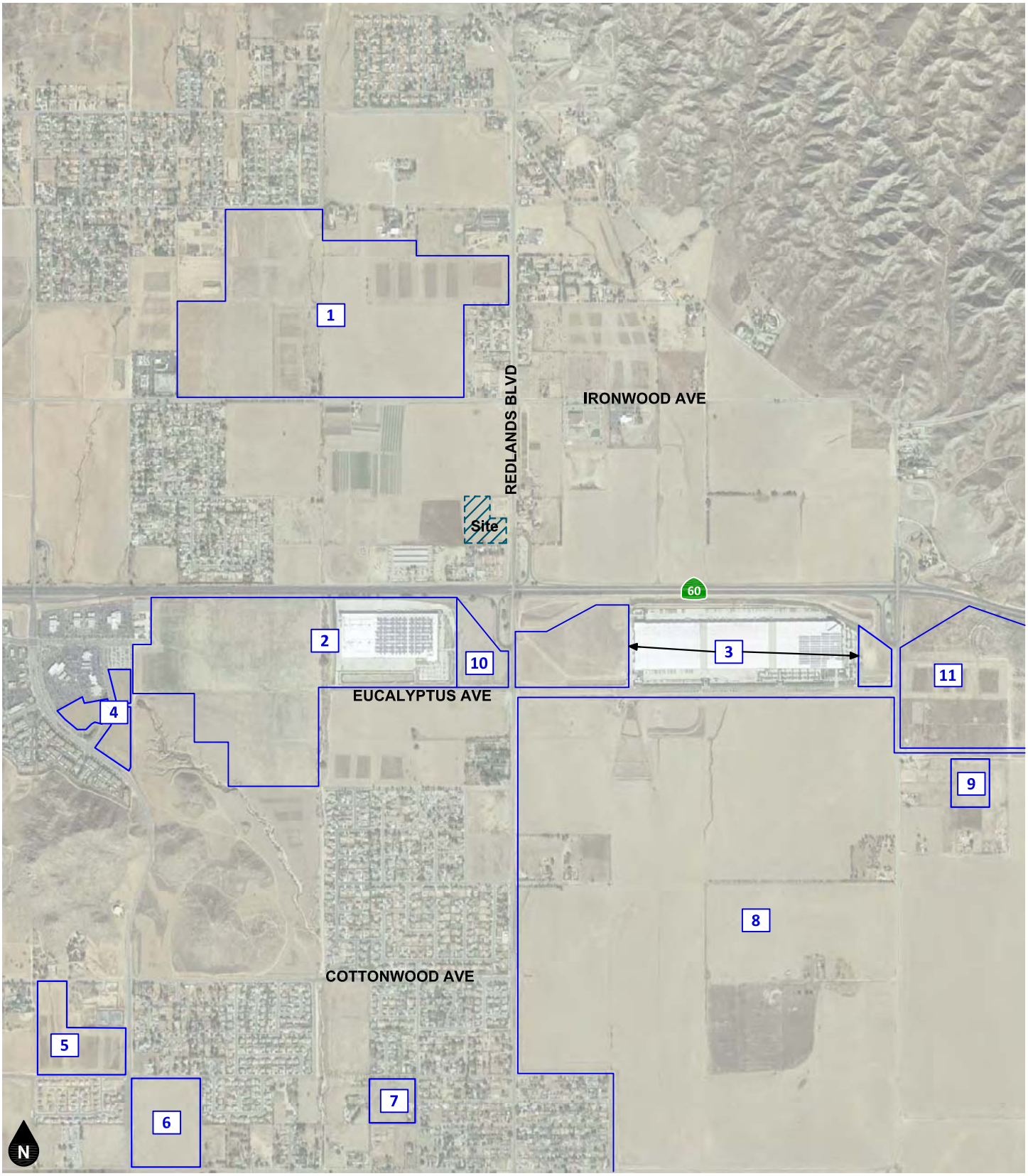
(4) DU = Dwelling Units; TSF = Thousand Square Feet; PCE = Passenger Car Equivalents ; FP = Fueling Positions; % = Pass-by Percentage.

(5) Source: Eucalyptus Industrial Park Traffic Study, prepared by LSA Associates, April 2012.

(6) Source: Highland Fairview Corporate Park Draft Environmental Impact Report , prepared by Michael Brandman Associates, August 2008.

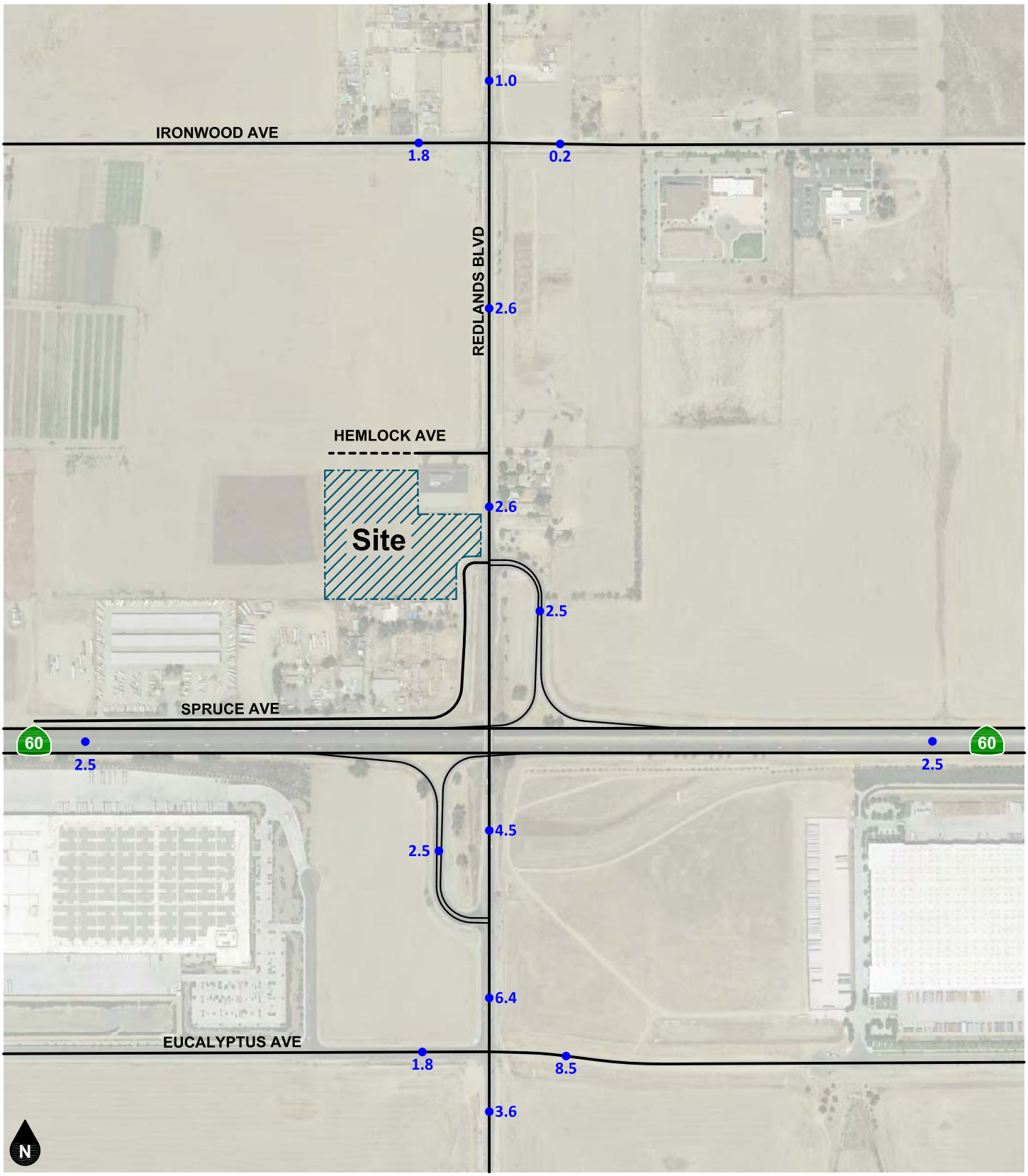
(7) Project currently is partically occupied. The remaining approved square footage estimated based on total land mass.

(8) Source: The World Logistics Center Traffic Impact Analysis Report, prepared by Parsons Brinkerhoff, Inc., January 2013.



Legend
[#] Traffic Analysis Zone

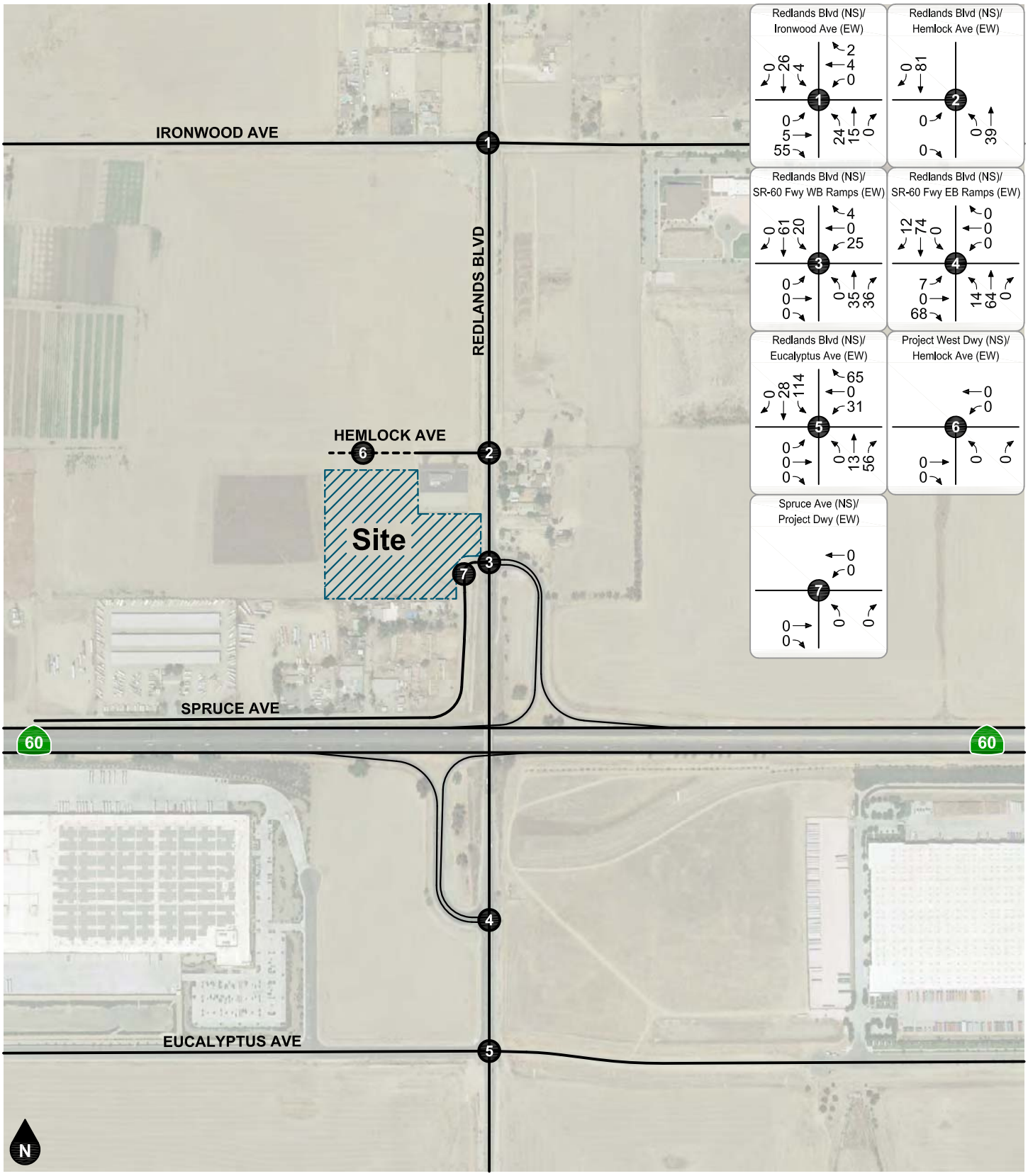
Figure 19
Other Development Location Map



Legend

●13.5 Vehicles Per Day (1,000's) Opening Year (2022)

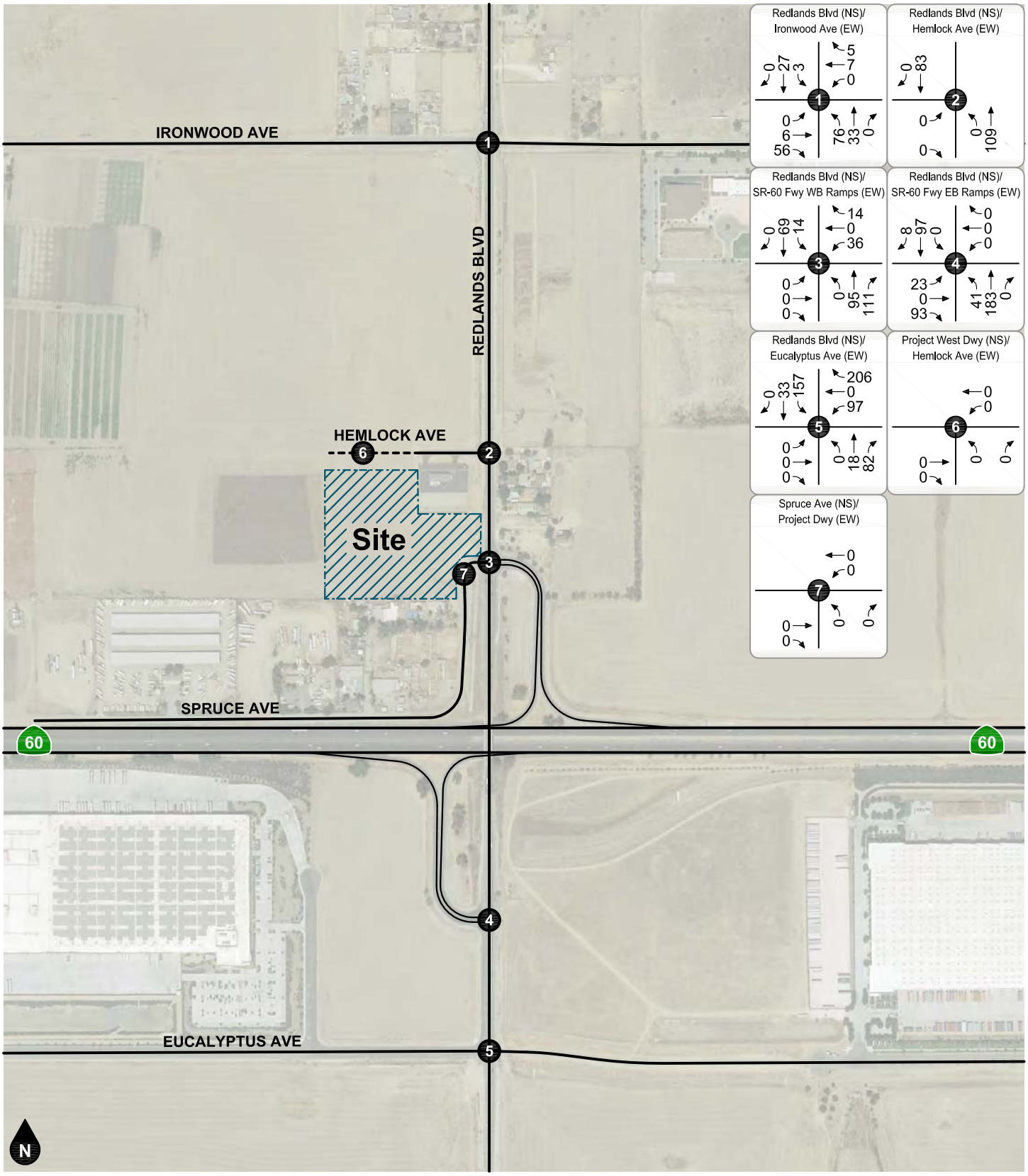
Figure 20
Other Development Average Daily Traffic Volumes



Legend

1 Study Intersection

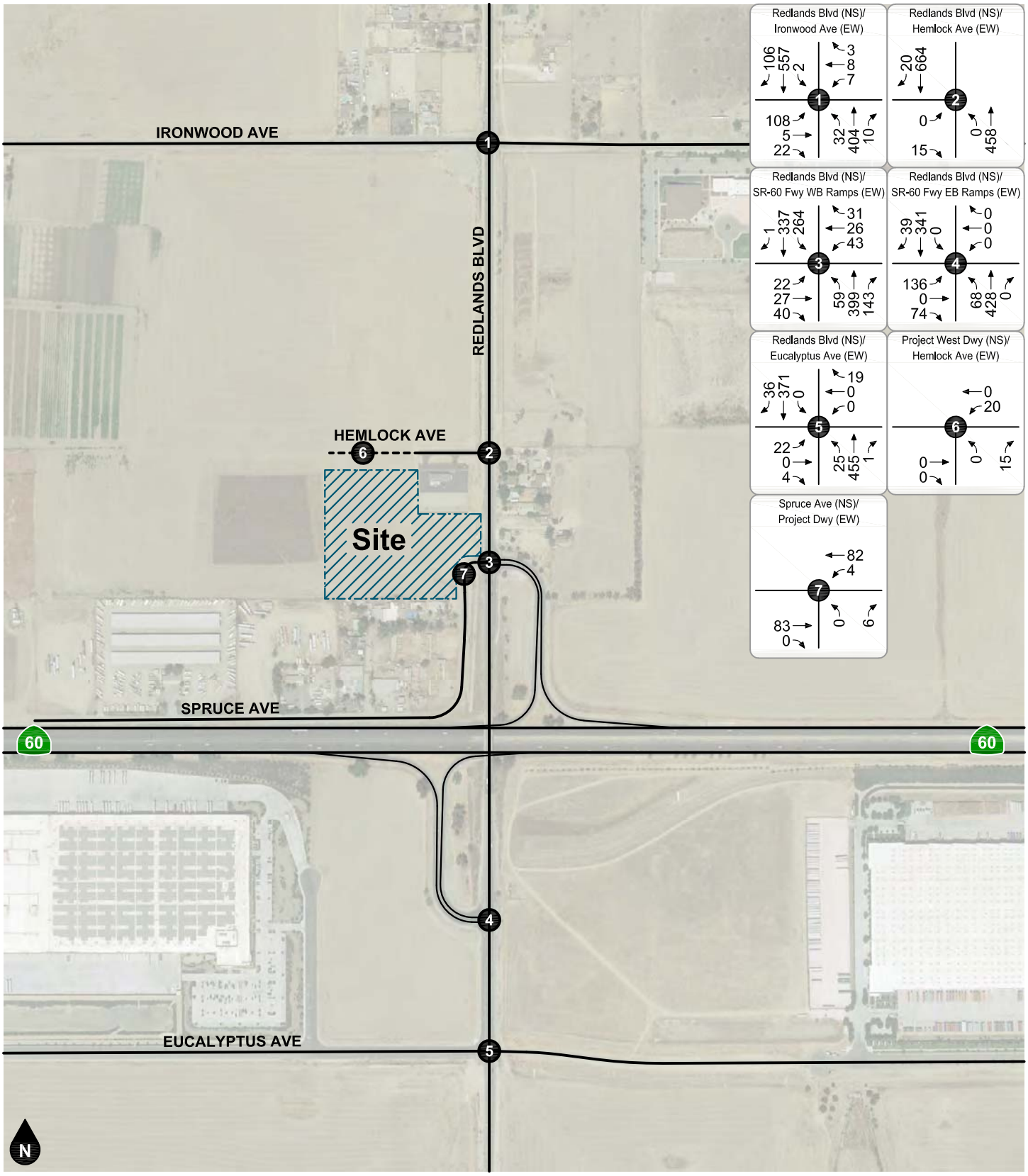
Figure 21
Other Development
AM Peak Hour Intersection Turning Movement Volumes



Legend

1 Study Intersection

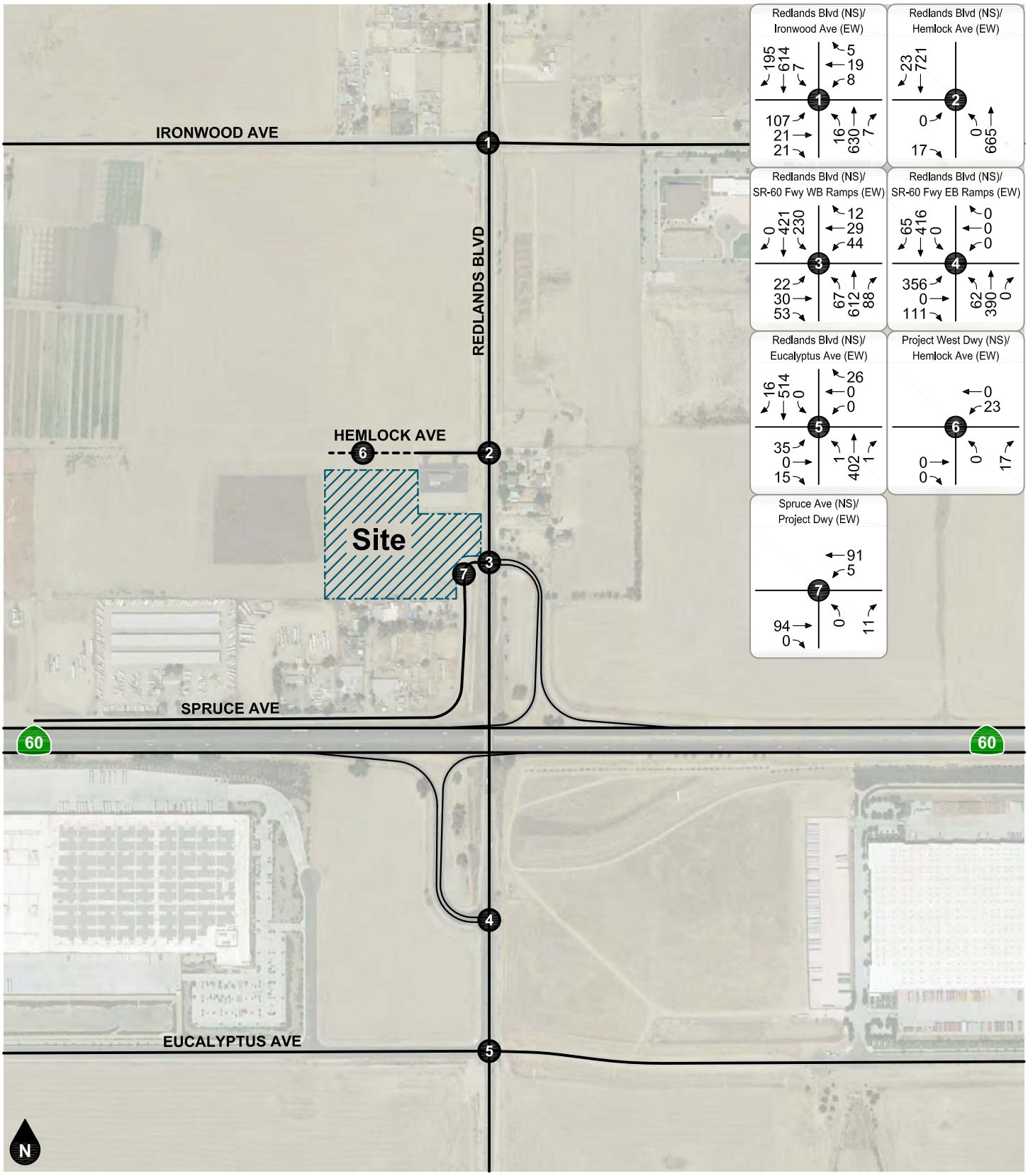
Figure 22
Other Development
PM Peak Hour Intersection Turning Movement Volumes



Legend

1 Study Intersection

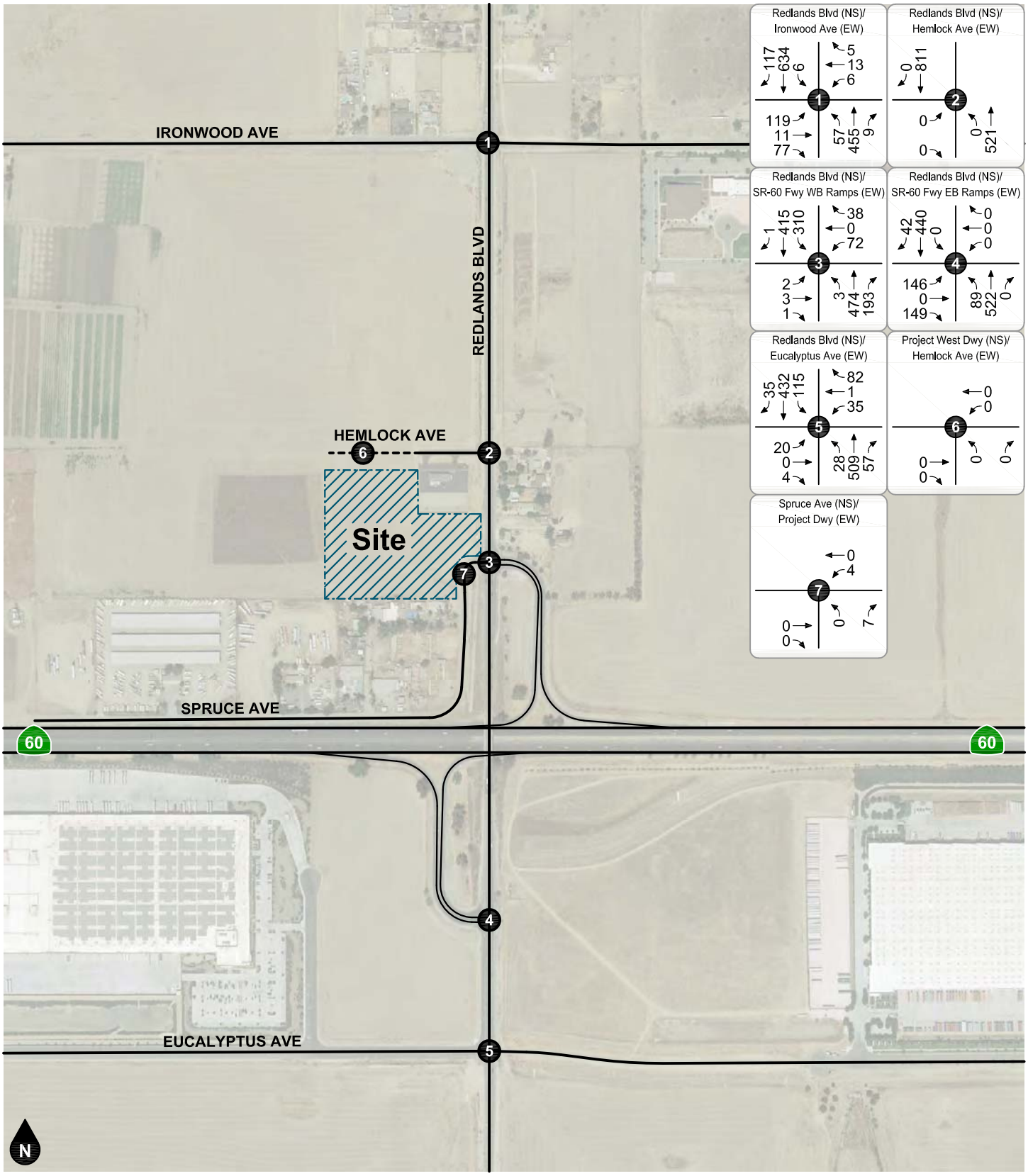
Figure 23
Existing Plus Project
AM Peak Hour Intersection Turning Movement Volumes



Legend

1 Study Intersection

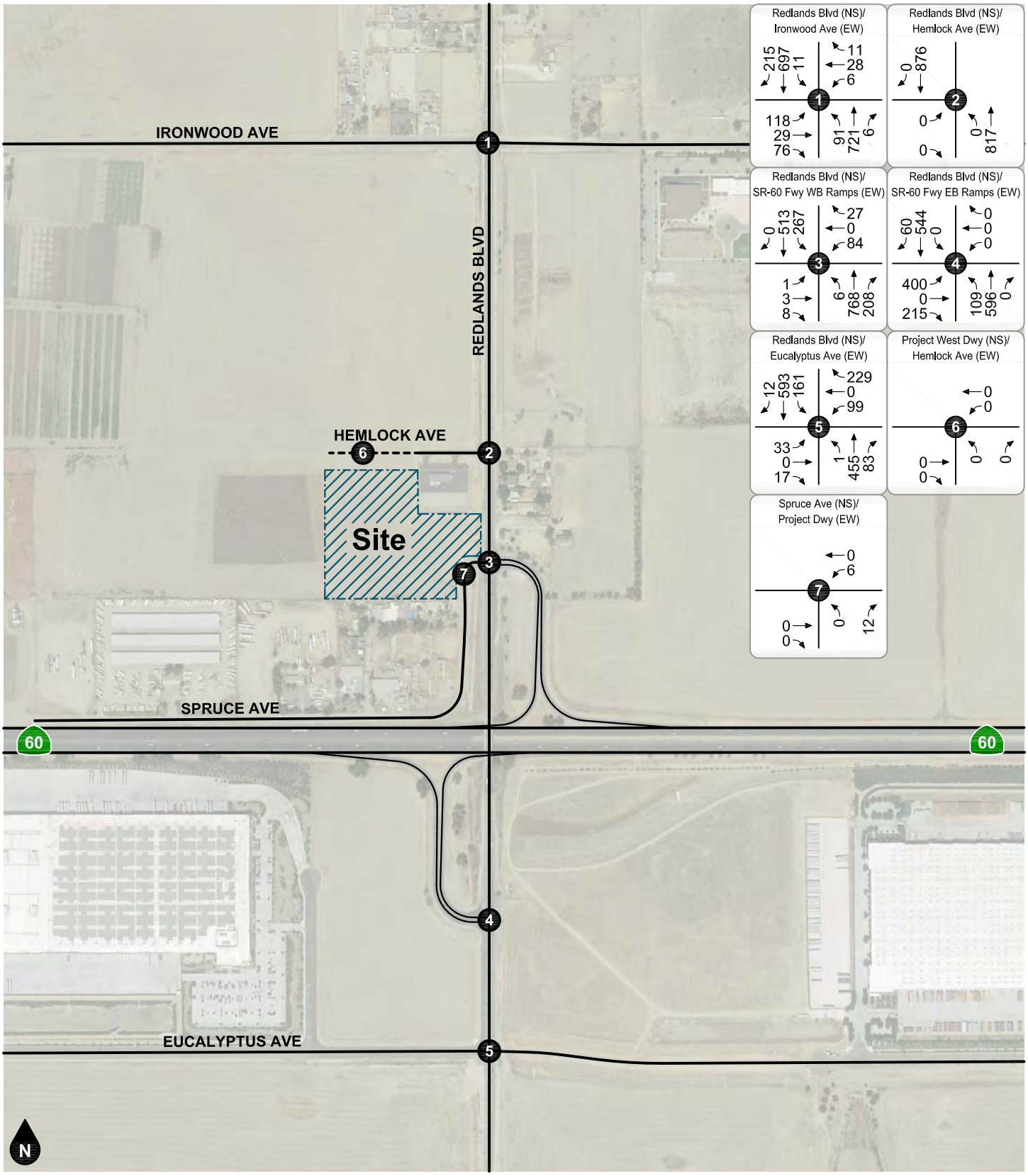
Figure 24
Existing Plus Project
PM Peak Hour Intersection Turning Movement Volumes



Legend

1 Study Intersection

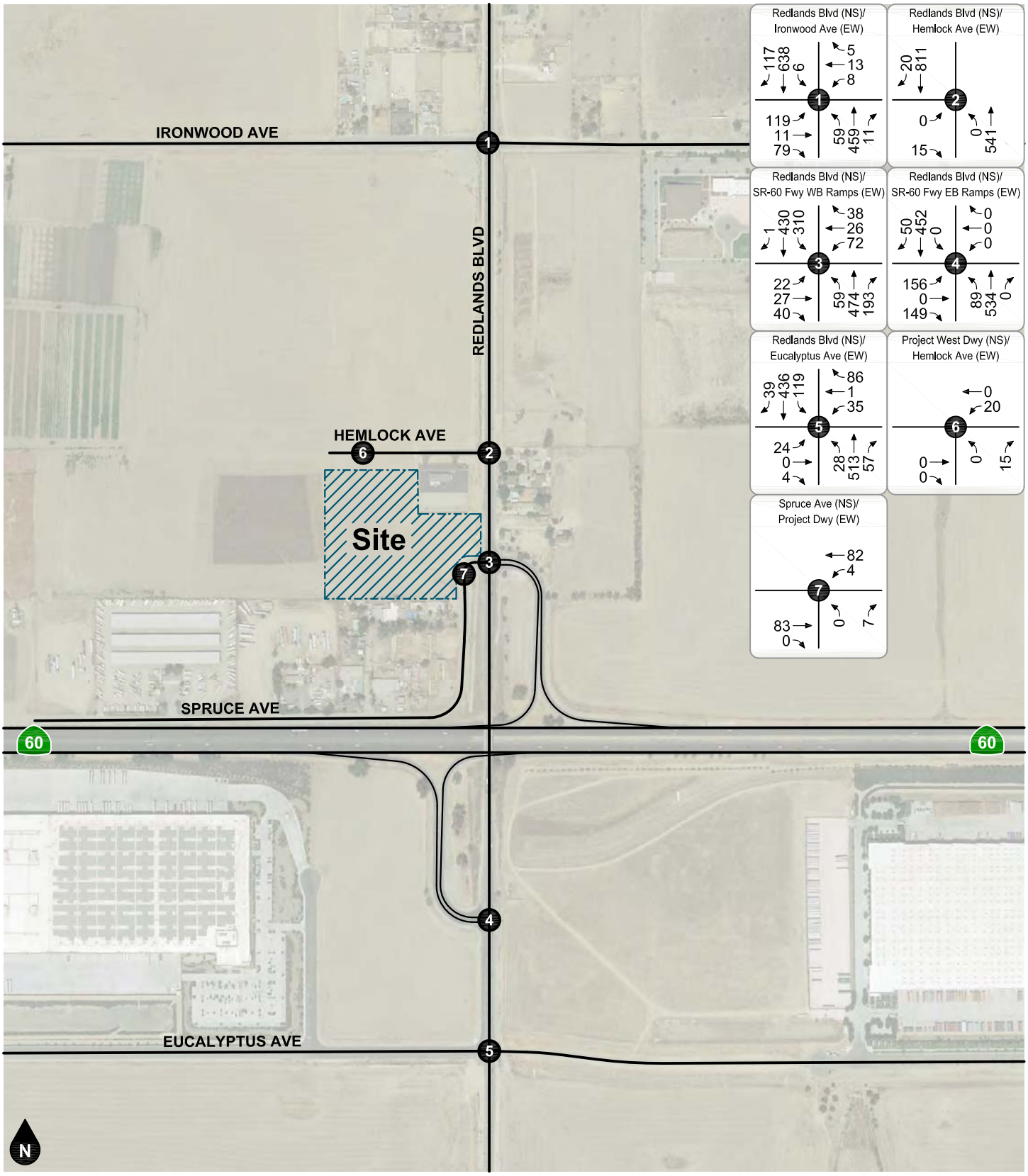
Figure 25
Opening Year (2024) Without Project
AM Peak Hour Intersection Turning Movement Volumes



Legend

1 Study Intersection

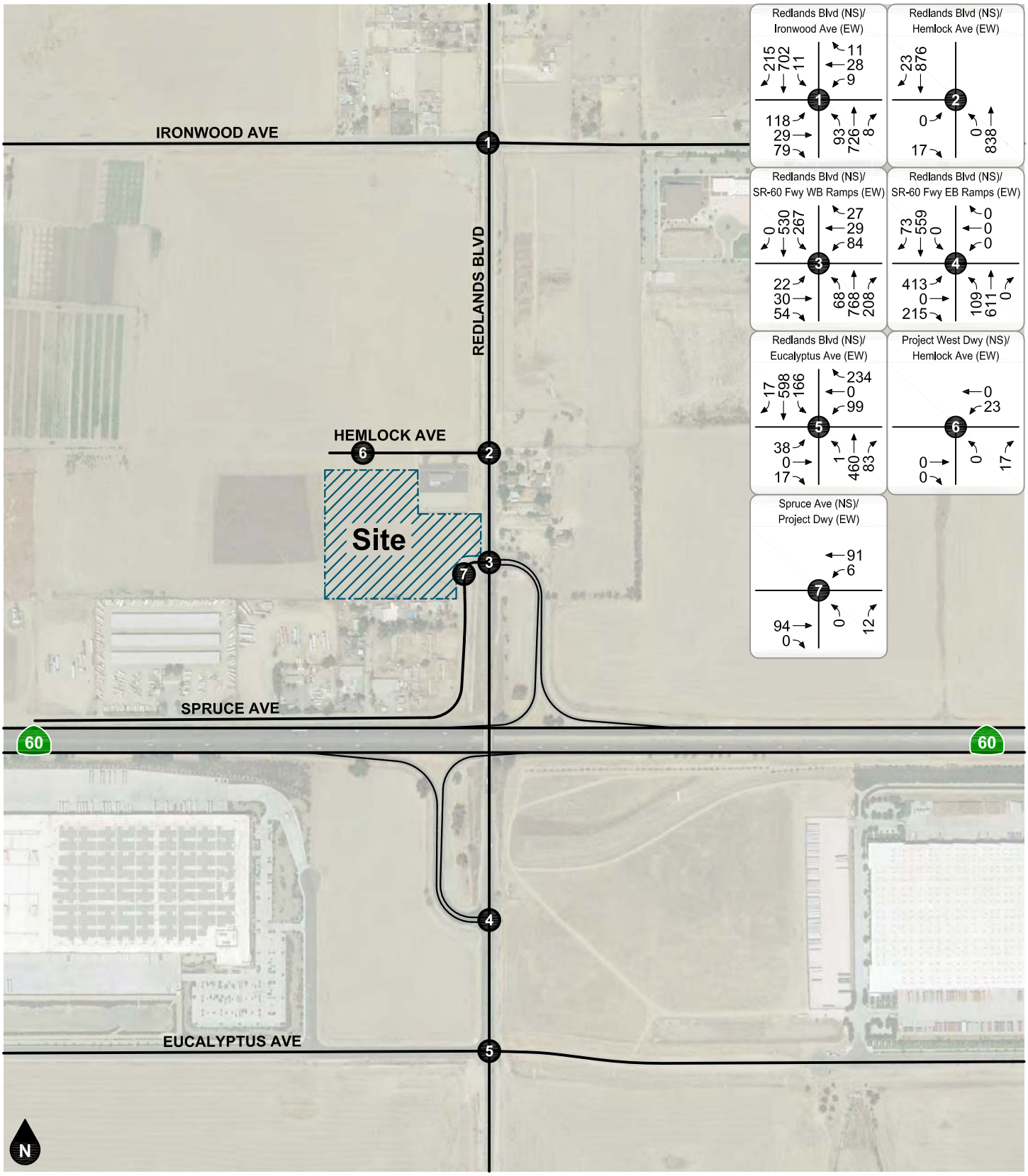
Figure 26
Opening Year (2024) Without Project
PM Peak Hour Intersection Turning Movement Volumes



Legend

1 Study Intersection

Figure 27
Opening Year (2024) With Project
AM Peak Hour Intersection Turning Movement Volumes



Legend

1 Study Intersection

Figure 28
Opening Year (2024) With Project PM Peak Hour Intersection Turning Movement Volumes

6. INTERIM OPERATIONAL ANALYSIS

Detailed intersection Level of Service calculation worksheets for each of the following analysis scenarios are provided in Appendix F.

INTERIM ROADWAY SYSTEM

Figure 4 identifies the lane geometry and intersection traffic controls for Existing conditions based on a field survey of the study area, as well as the Existing Plus Project improvements for project access. Figure 29 identifies the lane geometry and intersection traffic controls for Opening Year (2024) conditions, as well as the Opening Year (2024) with improvements.

Improvements are noted as either project improvements or other development improvements. See Appendix G for other development lane configuration recommendations and mitigation from the following reports: Eucalyptus Industrial Park Traffic Study, LSA Associates, Inc, dated April 24, 2012; Highland Fairview Corporate Park Environmental Impact Report, Michael Brandman Associates, dated August 4, 2008, and The World Logistics Center Traffic Impact Analysis Report, Parsons Brinckerhoff Inc., January 2013.

ROADWAY SEGMENT DAILY CAPACITY ANALYSIS

Existing Plus Project

The roadway segment Levels of Service for Existing Plus Project conditions have been calculated and are shown in Table 6. The study roadway segments are projected to operate within acceptable Levels of Service (D or better) for Existing Plus Project conditions, except for the following study roadway segments are projected to continue to operate at unacceptable Level of Service without improvements:

- Redlands Boulevard – Ironwood Avenue to Hemlock Avenue
- Redlands Boulevard – Hemlock Avenue to SR-60 Westbound Ramps

Opening Year (2024) Without Project

The roadway segment Levels of Service for Opening Year (2024) Without Project conditions have been calculated and are shown in Table 7. The study roadway segments are projected to operate within acceptable Levels of Service (D or better) for Opening Year (2024) Without Project conditions, except for the following study roadway segments are projected to continue to operate at unacceptable Level of Service without improvements:

- Redlands Boulevard – Ironwood Avenue to Hemlock Avenue
- Redlands Boulevard – Hemlock Avenue to SR-60 Westbound Ramps
- Redlands Boulevard – SR-60 Eastbound Ramps to Eucalyptus Avenue

Opening Year (2024) With Project

The roadway segment Levels of Service for Opening Year (2024) With Project conditions have been calculated and are shown in Table 7. The study roadway segments are projected to operate within acceptable Levels of Service (D or better) for Opening Year (2024) With Project conditions, except for the following study roadway segments are projected to continue to operate at unacceptable Level of Service without improvements:

- Redlands Boulevard – Ironwood Avenue to Hemlock Avenue
- Redlands Boulevard – Hemlock Avenue to SR-60 Westbound Ramps

- Redlands Boulevard – SR-60 Eastbound Ramps to Eucalyptus Avenue

INTERSECTION LEVEL OF SERVICE

Existing Plus Project

The intersection Levels of Service for Existing Plus Project conditions are shown in Table 8. The study intersections are projected to operate within acceptable Levels of Service (D or better) during the peak hours for Existing Plus Project conditions (see Table 8); therefore, the proposed project is forecast to result in no significant traffic impacts for Existing Plus Project conditions.

Opening Year (2024) Without Project

The delay and Levels of Service for Opening Year (2024) Without Project conditions are shown in Table 9. The study intersections are forecast to operate within acceptable Levels of Service (D or better) during the peak hours for Opening Year (2024) Without Project conditions, except for the following study intersection that is projected to operate at unacceptable Level of Service without improvements (see Table 9):

- Redlands Boulevard at SR-60 Eastbound Ramps - #4 (PM peak hour)

The following improvements are required by other development[3] within the study area to maintain acceptable Levels of Service at the study intersections:

- Redlands Boulevard at SR-60 Eastbound Ramps - #4
  - Widen eastbound approach (off-ramp) to provide one left turn lane and one right turn lane.

- Redlands Boulevard at Eucalyptus Avenue - #5[4]
  - Construct additional southbound approach lane to provide one left turn lane.
  - Restripe eastbound right turn lane to a shared through-right turn lane and construct receiving through lane on the east leg.
  - Reconstruct westbound approach to consist of one left turn lane, one through lane, and one right turn lane.

It should be noted that improvements to Redlands Boulevard at Eucalyptus Avenue are only needed because of other development traffic contributions.

Opening Year (2024) With Project

The delay and Levels of Service for Opening Year (2024) With Project conditions are shown in Table 9. The study intersections are forecast to operate within acceptable Levels of Service (D or better) during the peak

[3] Opening year cumulative improvements to be provided by other development in conjunction with other development improvements at or near the Redlands Boulevard and Eucalyptus intersection.

[4] The Highland Fairview Corporate Park at the northeast corner of Redlands Boulevard and Eucalyptus Avenue is proposed to be developed with commercial retail and industrial land uses. The Highland Fairview Corporate Park Draft EIR (2008) states; "The project proponent shall construct the fourth leg of the intersection located at Redlands Boulevard and Eucalyptus Avenue at the ultimate design required to provide adequate capacity for all phases of the project and buildout of the adjacent areas. The design tentatively consists of a separate westbound left turn lane, two westbound through lanes and a dedicated westbound right turn lane."
As the current information is that the development of the northeast corner of Redlands Boulevard and Eucalyptus Avenue is excepted to be constructed by Opening Year (2024), the minimum necessary lane improvements (westbound approach lanes, south-eastbound left turn lane and north-eastbound shared through-right lane) are shown for Opening Year (2024). These roadway improvements are required mitigation for the NWC development as shown in the 2008 EIR.

hours for Opening Year (2024) With Project conditions, except for the following study intersections that are projected to operate at unacceptable Levels of Service without improvements (see Table 9):

- Redlands Boulevard at SR-60 Eastbound Ramps - #4 (PM peak hour)

The same improvements are recommended to maintain acceptable Levels of Service at the study intersections for with Project as without project:

- Redlands Boulevard at SR-60 Eastbound Ramps - #4
  - Widen eastbound approach (off-ramp) to provide one left turn lane and one right turn lane.

- Redlands Boulevard at Eucalyptus Avenue - #5
  - Construct additional southbound approach lane to provide one left turn lane.
  - Restripe eastbound right turn lane to a shared through-right turn lane and construct receiving through lane on the east leg.
  - Reconstruct westbound approach to consist of one left turn lane, one through lane, and one right turn lane.

It should be noted that improvements to Redlands Boulevard at Eucalyptus Avenue are only needed because of other development traffic contributions.

The study intersections are projected to operate within acceptable Levels of Service (D or better) during the peak hours for Opening Year (2024) With Project conditions, with improvements (see Table 9).

Table 6
Existing Plus Project Roadway Segment Daily Capacity Analysis

ID	Roadway	Segment From	Segment To	Roadway Capacity[1] Ultimate Classification	Ultimate Lanes	Ultimate Capacity[1]	Existing/Proposed Lanes	Existing/Proposed Capacity[2]	Existing Without Project ADT[3]	Existing Without Project V/C[3]	Existing Without Project LOS[3]	Existing Plus Project ADT[3]	Existing Plus Project V/C[3]	Existing Plus Project LOS[3]
1.	Redlands Blvd	Ironwood Ave	Hemlock Ave	Divided Arterial	4D	37,500	2U	12,500	15,070	1.21	F	15,680	1.25	F
2.	Redlands Blvd	Hemlock Ave	SR-60 WB Ramps	Divided Arterial	4D	37,500	2D	12,500	14,470	1.16	F	15,010	1.20	F
3.	Redlands Blvd	SR-60 EB Ramps	Eucalyptus Ave	Divided Arterial	4D	37,500	3D	18,750	11,760	0.63	B	12,520	0.67	B
4.	Ironwood Ave	west of Redlands Blvd	Redlands Blvd	Minor Arterial	4U	25,000	2U	12,500	4,420	0.35	A	4,570	0.37	A
5.	Ironwood Ave	Redlands Blvd	east of Redlands Blvd	Minor Arterial	4U	25,000	2U	12,500	730	0.06	A	880	0.07	A
6.	Hemlock Ave	west of Redlands Blvd	Redlands Blvd	Unclassified - Local	2U	12,500	2U	12,500	-	-	-	530	0.04	A
7.	Eucalyptus Ave	west of Redlands Blvd	Redlands Blvd	Arterial	4D	37,500	3D	18,750	670	0.04	A	970	0.05	A
8.	Eucalyptus Ave	Redlands Blvd	east of Redlands Blvd	Arterial	4D	37,500	1U	6,250	330	0.05	A	630	0.10	A

Notes:

(1) Source: Link Volume Capacities/Level of Service for City of Moreno Valley General Plan Circulation Element (see Table 1).

(2) Roadway maximum capacity at Level of Service "E" for roadway classification. Capacity adjustment to reflect the number of existing number of travel lanes. When there are only 2 lanes on a classified roadway the capacity is adjusted to 12,500 regardless of future classification as the roadways currently lack design improvement features (lane width, shoulder width, bike lanes or medians) which would provide for increased capacity.

(3) ADT = Average Daily Traffic; V/C = Volume to Capacity; LOS = Level of Service

(4) Existing or Proposed roadway capacities are the Level of Service "E" volumes for the respective classifications. Capacity values for non-specified roadways are based on the capacity values for the specified roadway and are adjusted for number of lanes, lane control, shoulders. Values used for capacity are: 1-lane one way roadway capacity = 6,250 vehicles per day (half of the 2D-Collector), 3-lane undivided capacity = 18,750 vehicles per day (average of 2U-Collector and 4U-Secondary).

Table 7
Opening Year (2024) Roadway Segment Daily Capacity Analysis

ID	Roadway	Segment From	Segment To	Roadway Capacity[1] Ultimate Classification	Ultimate Lanes	Ultimate Capacity[1]	Existing/Proposed Lanes	Existing/Proposed Capacity[2]	Opening Year (2024) Without Project (EAC) ADT[3]	V/C[3]	LOS[3]	Opening Year (2024) With Project (EACP) ADT[3]	V/C[3]	LOS[3]
1.	Redlands Blvd	Ironwood Ave	Hemlock Ave	Divided Arterial	4D	37,500	2U	12,500	19,300	1.54	F	19,900	1.59	F
2.	Redlands Blvd	Hemlock Ave	SR-60 WB Ramps	Divided Arterial	4D	37,500	2D	12,500	18,600	1.49	F	19,100	1.53	F
3.	Redlands Blvd	SR-60 EB Ramps	Eucalyptus Ave	Divided Arterial	4D	37,500	3D	18,750	19,400	1.03	F	20,200	1.08	F
4.	Ironwood Ave	west of Redlands Blvd	Redlands Blvd	Minor Arterial	4U	25,000	2U	12,500	5,100	0.41	A	5,200	0.42	A
5.	Ironwood Ave	Redlands Blvd	east of Redlands Blvd	Minor Arterial	4U	25,000	2U	12,500	2,600	0.21	A	2,700	0.22	A
6.	Hemlock Ave	west of Redlands Blvd	Redlands Blvd	Unclassified - Local	2U	12,500	2U	12,500	0			500	0.04	A
7.	Eucalyptus Ave	west of Redlands Blvd	Redlands Blvd	Arterial	4D	37,500	3D	18,750	9,200	0.49	A	9,500	0.51	A
8.	Eucalyptus Ave	Redlands Blvd	east of Redlands Blvd	Arterial	4D	37,500	3D	18,750	2,200	0.12	A	2,500	0.13	A

Notes:

(1) Source: Link Volume Capacities/Level of Service for City of Moreno Valley General Plan Circulation Element (see Table 1).

(2) Roadway maximum capacity at Level of Service "E" for roadway classification. Capacity adjustment to reflect the number of existing number of travel lanes. When there are only 2 lanes on a classified roadway the capacity is adjusted to 12,500 regardless of future classification as the roadways currently lack design improvement features (lane width, shoulder width, bike lanes or medians) which would provide for increased capacity.

(3) ADT = Average Daily Traffic; V/C = Volume to Capacity; LOS = Level of Service

(4) Existing or Proposed roadway capacities are the Level of Service "E" volumes for the respective classifications. Capacity values for non-specified roadways are based on the capacity values for the specified roadway and are adjusted for number of lanes, lane control, shoulders. Values used for capacity are: 1-lane one way roadway capacity = 6,250 vehicles per day (half of the 2D-Collector), 3-lane undivided capacity = 18,750 vehicles per day (average of 2U-Collector and 4U-Secondary).

Table 8
Existing Plus Project Intersection Level of Service

ID	Study Intersection	Traffic Control[1]	Existing				Existing Plus Project			
			AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
			Delay[2]	LOS[3]	Delay	LOS	Delay	LOS	Delay	LOS
1.	Redlands Blvd at Ironwood Ave	TS	14.7	B	16.4	B	15.0	B	17.0	B
2.	Redlands Blvd at Hemlock Ave	CSS	-	-	-	-	13.8	B	14.7	B
3.	Redlands Blvd at SR-60 WB Ramps	TS	42.4	D	20.2	C	43.6	D	28.7	C
4.	Redlands Blvd at SR-60 EB Ramps	TS	24.3	C	35.8	D	24.1	C	35.9	D
5.	Redlands Blvd at Eucalyptus Ave	TS	9.2	A	8.8	A	8.6	A	9.4	A
6.	Project North Access at Hemlock Ave	CSS	-	-	-	-	8.4	A	8.4	A
7.	Spruce Ave at Project South Access	CSS	-	-	-	-	8.7	A	8.8	A

Notes:

(1) TS = Traffic Signal; CSS = Cross Street Stop

(2) Delay is shown in seconds per vehicle. For intersections with traffic signal or all way stop control, overall average intersection delay and LOS are shown. For intersections with cross street stop control, LOS is based on average delay of the worst individual lane (or movements sharing a lane).

(3) LOS = Level of Service

Table 9
Opening Year (2024) Intersection Level of Service

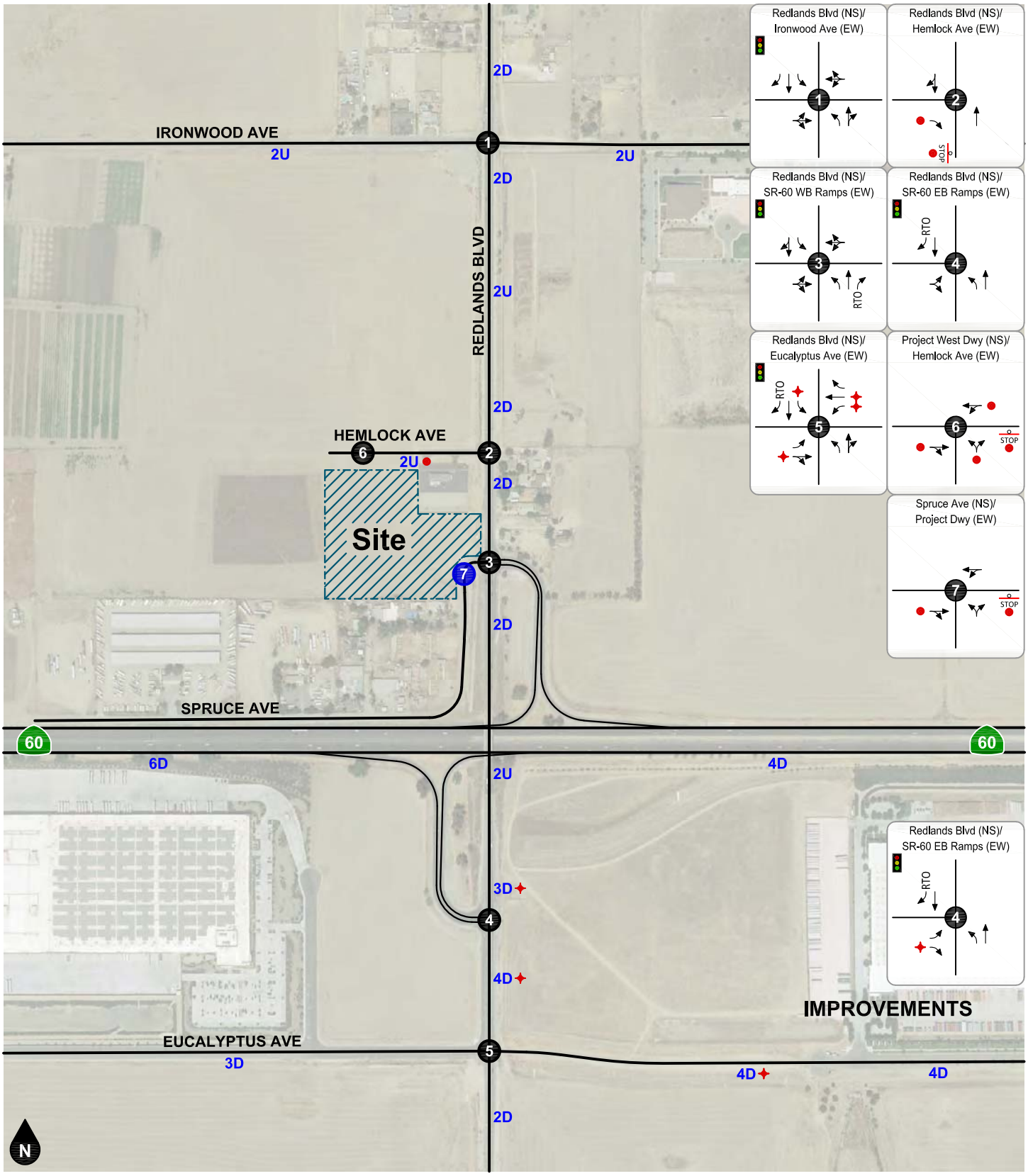
ID	Study Intersection	Traffic Control[1]	Opening Year (2024) Without Project				Opening Year (2024) With Project			
			AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
			Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delay[2]	LOS[3]
1.	Redlands Blvd at Ironwood Ave	TS	21.0	C	27.8	C	21.5	C	28.7	C
2.	Redlands Blvd at Hemlock Ave	CSS	-		-		16.0	C	17.3	C
3.	Redlands Blvd at SR-60 WB Ramps	TS	42.8	D	27.4	C	44.5	D	43.3	D
4.	Redlands Blvd at SR-60 EB Ramps	TS	27.0	C	56.6	E	27.3	C	58.0	E
	With Improvements	TS	23.9	C	32.8	C	24.0	C	34.6	C
5.	Redlands Blvd at Eucalyptus Ave	TS	22.2	C	36.4	D	22.9	C	37.5	D
6.	Project North Access at Hemlock Ave	CSS	-		-		8.4	A	8.4	A
7.	Spruce Ave at Project South Access	CSS	-		-		8.7	A	8.8	A

Notes:

(1) TS = Traffic Signal; CSS = Cross Street Stop

(2) Delay is shown in seconds per vehicle. For intersections with traffic signal or all way stop control, overall average intersection delay and LOS are shown. For intersections with cross street stop control, LOS is based on average delay of the worst individual lane (or movements sharing a lane).

(3) LOS = Level of Service



Legend

- Traffic Signal
- Stop Sign
- #D #-Lane Divided Roadway
- #U #-Lane Undivided Roadway
- Existing Lane
- RTO Right Turn Overlap
- Project Improvement
- Other Development Improvement

Figure 29
Opening Year (2024)
Lane Geometry and Intersection Controls

7. INTERIM SITE ACCESS

Two access driveways are proposed. Full access is proposed at Hemlock Avenue and Spruce Street. The west leg of the Redlands Boulevard and Spruce Avenue will be reconfigured to provide direct access to the site as it is the predominate traffic movement for the west leg with minor traffic flow to and from Spruce Avenue.

PROJECT DESIGN FEATURES

This analysis assumes the following improvements will be constructed by the project to provide project site access.

For Opening Year (2024) interim conditions prior to the SR-60 Freeway/Redland Boulevard interchange reconfiguration, the Spruce Avenue project driveway is proposed to provide full access ingress and egress to the site. The project driveway on Hemlock Avenue is proposed to provide full ingress and egress to the site.

- Hemlock Avenue Improvements
  - Construct the modified collector roadway from west property boundary to Redlands Boulevard.
  - Install stop control on eastbound Hemlock Avenue at Redlands Boulevard.
  - Construct the eastbound approach.
  - The Hemlock Avenue / Redlands Boulevard intersection is designed to function as a right turn in /right turn out access driveway during the interim condition prior to the construction of the Redlands Interchange.

- Spruce Avenue Improvements
  - Realign and reconstruct segment of Spruce Avenue from the project site to Redlands Boulevard.
  - Construct west leg from Spruce Avenue bend to accommodate T-intersection.
  - Install stop control on northbound Spruce Avenue between Redlands Boulevard and project site.
  - Modify northbound approach from right turn to shared left-right turn.

- Project North Driveway (NS) at Hemlock Avenue (EW) - #6
  - Construct the northbound approach to consist of one shared left-right turn lane with stop-control.

- Spruce Avenue (NS) at Project South Driveway (EW) - #7
  - Construct the westbound approach to consist of one shared thru-right turn lane
  - Reconfigure northbound approach to provide one shared left-right turn lane with stop-control.

SITE ACCESS QUEUEING

Table 10 summarizes the results of a queue analysis for left-turn, right-turn, or shared through-turn movements at the project driveways and site-adjacent study area intersections based on the forecast 95th-percentile queue lengths[5] shown in the delay calculation worksheets (see Appendix H). Additionally, the recommended storage length is provided for turn lanes that are forecast to exceed the existing storage.

For Opening Year (2024), it should be noted that project trips do not increase the queue length of any of the existing turning movements beyond the available queue length. Additionally, for the added eastbound right turn movement at intersection #4 and the southbound left turn movement at intersection #5, the queue length increases by only 5 feet (less than one car length). The project will provide fair-share contributions to these additional turning movements.

[5] For a more conservative analysis, the forecast 95th-percentile queue lengths shown in the delay calculation worksheets have been rounded up to nearest 5-foot increment.

Table 10
Summary of Queueing Analysis - Opening Year (2024)

ID Intersection	Approach	Lane	Storage Length (Feet)[1]	Peak Hour 95th-Percentile Queue Length (Feet) Opening Year (2024) Without Project AM	Without Project PM	With Project AM	With Project PM	Adequate Storage Provided
1. Redlands Blvd at Ironwood Ave	Northbound	Left	400	<25	105	70	105	YES
	Northbound	Thru/Right	1140	80	665	320	685	YES
	Southbound	Left	435	<25	<25	<25	<25	YES
	Southbound	Right	115	30	90	30	90	YES
	Eastbound	Left/Thru/Right	2130	175	205	180	215	YES
	Westbound	Left/Thru/Right	660	35	55	40	55	YES
2. Redlands Blvd at Hemlock Ave	Northbound	Thru	420	-	-	<25	<25	YES
	Southbound	Thru/Right	1300	-	-	<25	<25	YES
	Eastbound	**Right[2]**	375	-	-	<25	<25	YES
3. Redlands Blvd at SR-60 WB Ramps	Northbound	Left	100	<25	<25	70	45	YES
	Northbound	Right	320	35	<25	35	<25	YES
	Southbound	Left	330	315	260	315	260	YES
	Southbound	Thru/Right	420	310	275	330	325	YES
	Eastbound	Left/Thru/Right	635	<25	<25	90	105	YES
	Westbound	Left/Thru/Right	1288	40	30	170	190	YES
4. Redlands Blvd at SR-60 EB Ramps	Northbound	Left	350	85	115	85	115	YES
	Southbound	Right	120	<25	50	<25	<25	YES
	Eastbound	Left/Right	1420	190	600	200	620	YES
5. Redlands Blvd at Eucalyptus Ave	Northbound	Left	150	55	<25	55	<25	YES
	Northbound	Thru/Right	1300	410	520	425	530	YES
	Southbound[3]	**Left**	320	150	200	155	205	YES
	Southbound	Right	200	<25	<25	<25	<25	YES
	Eastbound	Left	275	45	65	50	70	YES
	Eastbound	Thru/Right	275	<25	<25	<25	<25	YES
	Westbound[3]	**Left**	150	65	140	65	140	YES
	Westbound	Right	1500	<25	<25	<25	<25	YES
6. Project North Access at Hemlock Ave	Northbound	Left/Right	60	-	-	<25	<25	YES
	Westbound	Left/Thru	375	-	-	<25	<25	YES
7. Spruce Ave at Project South Access	Northbound	Left/Right	600	-	-	<25	<25	YES
	Eastbound	Thru/Right	150	-	-	<25	<25	YES
	Westbound	Left/Thru	150	-	-	<25	<25	YES
4. Redlands Blvd at SR-60 EB Ramps With Improvements	Northbound	Left	350	85	115	85	115	YES
	Southbound	Right	120	<25	50	<25	35	YES
	Eastbound	Left	1345	120	305	125	320	YES
	Eastbound	**Right**	**75**	45	50	45	50	YES

Notes:
(1) Distance to the adjacent driveway (existing or proposed future development).
(2) Project improvement for Opening Year (2024).
(3) Other development improvement for Opening Year (2024).
(4) Improvements = **Bold**

8. GENERAL PLAN BUILDOUT VOLUME FORECASTS

Three build alternatives are being considered for study during the selection process[6] for the interchange at SR-60 Freeway and Redlands Boulevard. The build alternatives would reconstruct the on-off ramps of the SR-60 Freeway and replace the existing Redlands Boulevard overpass to accommodate standard vertical clearance and addition freeway through lanes.

This section describes how future volume forecasts for each General Plan Buildout (2040) traffic volumes for each of the SR-60 Freeway/Redland Boulevard interchange alternatives analysis scenario were developed. Forecast study area volumes are illustrated on figures contained in this section.

GENERAL PLAN BUILDOUT ROADWAY CONDITIONS

The currently adopted City of Moreno Valley plan in this area is the World Logistics Specific Plan. General Plan Buildout intersection configurations for this area were obtained from the City of Moreno staff and the SR-60 Freeway/Theodore Interchange PA/ED Traffic Impact Analysis prepared by Parsons Brinkerhoff, Inc. (January 28, 2015) for the World Logistics Specific Plan which is the adopted specific plan in the study area. These future General Plan Buildout intersection configurations account for local area forecast growth at the study intersections for Year 2040. General Plan Buildout intersection configurations from the SR-60 Freeway/Theodore Interchange study are included in Appendix D.

The SR-60 Freeway/Redlands Interchange PSR/PDS, dated June 20, 2016 also shows lane configurations for Redlands Boulevard ramp terminals. For the purposes of this study, the freeway ramp terminals lane configurations utilized were from SR-60 Freeway/Redlands Interchange PSR/PDS and the outlying intersections of Ironwood and Eucalyptus lane configurations were from SR-60 Freeway/Theodore Interchange PA/ED Traffic Impact Analysis.

Figure 30 identifies the General Plan Buildout (2040) conditions for study roadways. The future number of through lanes for General Plan Buildout roadways and the General Plan Buildout intersection controls are identified.

FUTURE SR-60 FREEWAY/REDLAND BOULEVARD INTERCHANGE CONFIGURATION ALTERNATIVES

The City of Moreno Valley and the California Department of Transportation propose to reconstruct the SR-60 Freeway/Redland Boulevard interchange. To accommodate the forecasted substantial traffic volume growth in the area, the proposed interchange improvements would alleviate peak hour congestion, improve traffic volume flow on the freeway and at the interchange, improve safety by upgrading the ramp geometry and provide standard vertical clearance for the freeway at the Redlands Boulevard overpass structure. The SR-60 Freeway/Redlands Interchange PSR/PDS, dated June 20, 2016 shows the anticipated lane configuration for the three (3) SR-60 Freeway/Redlands Interchange Alternatives and layout illustrations are included in Appendix E.

Alternative 1 – Modified Spread Diamond

This alternative would include three quadrants of a traditional spread diamond interchange configuration with the fourth ramp as a curved cloverleaf ramp from Redlands Boulevard to the westbound SR-60 Freeway.

Alternative 2 –Spread Diamond

This alternative would include four quadrants of a traditional spread diamond interchange configuration.

[6] Source: Project Study Report-Project Development Support (PSR-PDS) SR-60 at Redlands Boulevard Interchange by City of Moreno Valley and the California Department of Transportation, May 2016.

Alternative 3 – Modified Cloverleaf

This alternative would include four quadrants of a traditional spread diamond interchange configuration with two curved cloverleaf ramps from Redlands Boulevard to the SR-60 Freeway to eliminate left hand turn movements from Redlands Boulevard to the SR-60 Freeway on-ramps.

GENERAL PLAN BUILDOUT TRAFFIC VOLUMES

The General Plan Buildout traffic volumes for this area have been obtained from the SR-60 Freeway/Theodore Interchange PA/ED Traffic Impact Analysis. These future General Plan Buildout traffic volumes account for local area forecast growth at the study intersections for Year 2040. General Plan Buildout traffic volumes are included in Appendix D.

Quality control checks and forecast adjustments were performed as necessary to ensure that all future traffic volume forecasts reflect a minimum of 10% growth over existing traffic volumes. The result of this forecasting procedure is a series of traffic volumes suitable for traffic operations analysis.

Additionally, the Spruce Avenue forecasted traffic volumes were diverted to the new Redlands Boulevard at Hemlock Avenue intersection with the future proposed closure of Spruce Avenue during the SR-60 Freeway/Redland Boulevard Interchange reconstruction. The General Plan Buildout peak hour turning movement volumes for the new Redlands Boulevard at Hemlock Avenue intersection were determined for the quadrant of land east and west of Redlands Boulevard from the SR-60 Freeway to half-way between Hemlock and Ironwood Avenues. The quadrant with "future" Hemlock Avenue contains approximately 134.4 gross acres of which 72.1% are designated as low residential (1 DU/AC) and 27.9% are designated as office per the City of Moreno Valley Land Use Map. The gross acreage is reduced by a factor to be attributed to roads, open space and parking, such that the net development acreage is determined. To conservatively estimate the future traffic volumes, the ITE land use code of 750 (office park) was used instead of standard office (710) as office park incorporates commercial retail as well as commercial office uses. Finally, the resulting ADT value for Hemlock Avenue was compared to other roadways is in the study area as a quality control check.

The General Plan Buildout peak hour turning movement volumes were obtained from the SR-60 Freeway/Theodore Interchange PA/ED Traffic Impact Analysis. Left turn and right turn adjustments to account for the various ramp configurations have been applied to these volumes.

General Plan Buildout average daily traffic volumes are the more conservative of the factored peak hour intersection turning movement volumes, using a conservative daily peak hour factor (k) for this County or Ambient Growth with all other development for Year 2040.

FUTURE PROJECT ACCESS ADJUSTMENTS

With the closure of the interim full access project driveway at Spruce Avenue and the opening of the future right turn in/out only access project driveway at Redlands Boulevard, the project trip distributions, trip assignment and peak hour trip contributions have been modified to account for the right turns in/out only restriction at the Redlands Boulevard project access.

Figure 31 to Figure 32 show the forecast directional distributions of the project trips under ultimate conditions. Based on the ultimate conditions project trip distributions, project average daily traffic volumes have been calculated and shown on Figure 33. The AM and PM peak hour intersection turning movement volumes expected from the project under ultimate conditions are shown on Figure 34 and Figure 35.

GENERAL PLAN BUILDOUT VOLUME FORECASTS

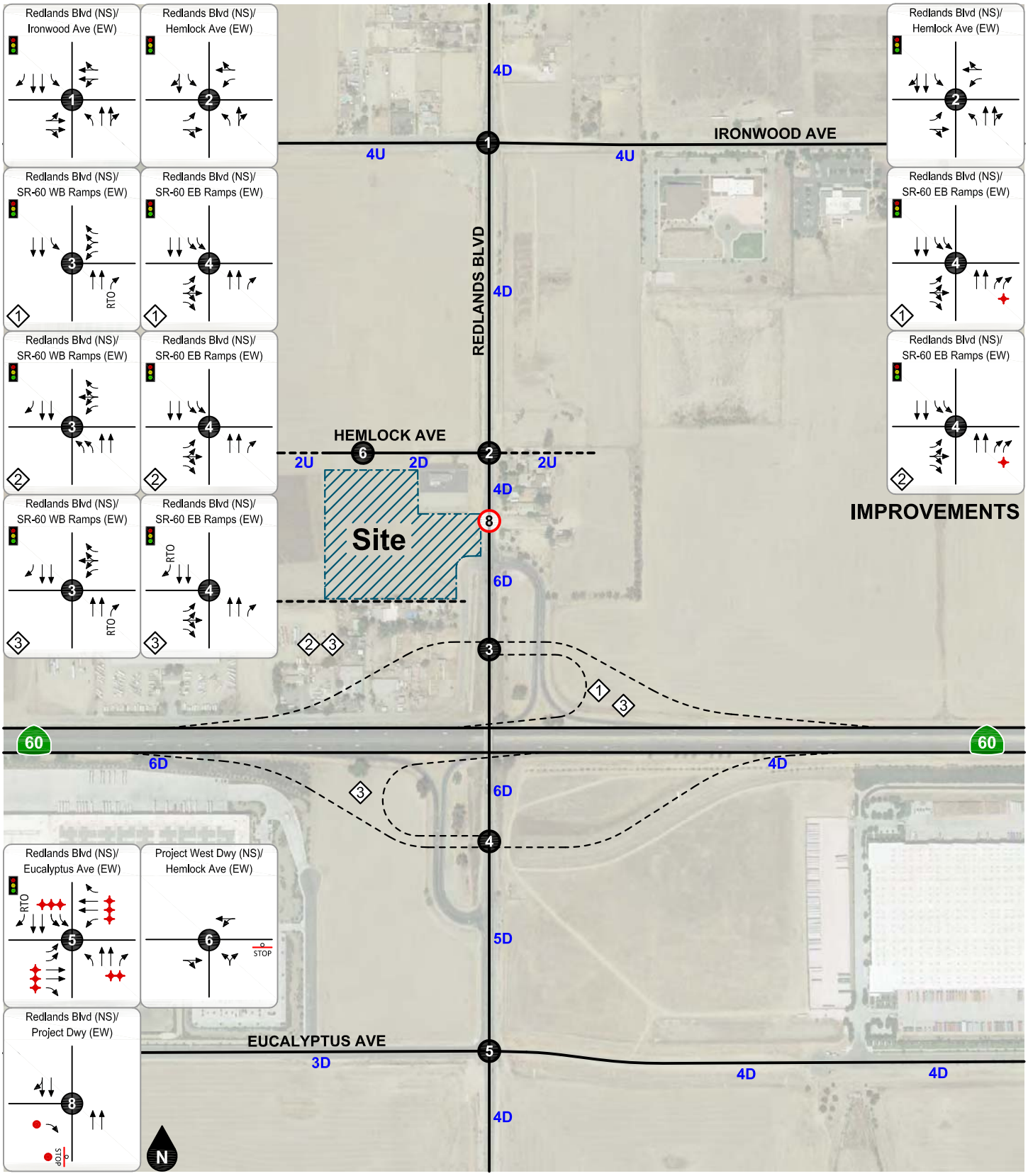
Figure 36 shows the General Plan Buildout traffic volumes from the SR-60 Freeway/Theodore Interchange PA/ED Traffic Impact Analysis were adjusted to ensure that all future traffic volume forecasts reflect at least ten percent (10%) growth over existing and other development traffic volumes.

General Plan Buildout Without Project

General Plan Buildout Without Project AM and PM peak hour intersection turning movement volumes are shown Figure 37 and Figure 38. The alternative future traffic volumes for study intersections #3 and #4 are shown for each of the three alternatives based on the interchange ramp geometry.

General Plan Buildout With Project

General Plan Buildout With Project AM and PM peak hour intersection turning movement volumes are shown on Figure 39 and Figure 40. The alternative future traffic volumes for study intersections #3 and #4 are shown for each of the three alternatives based on the interchange ramp geometry.



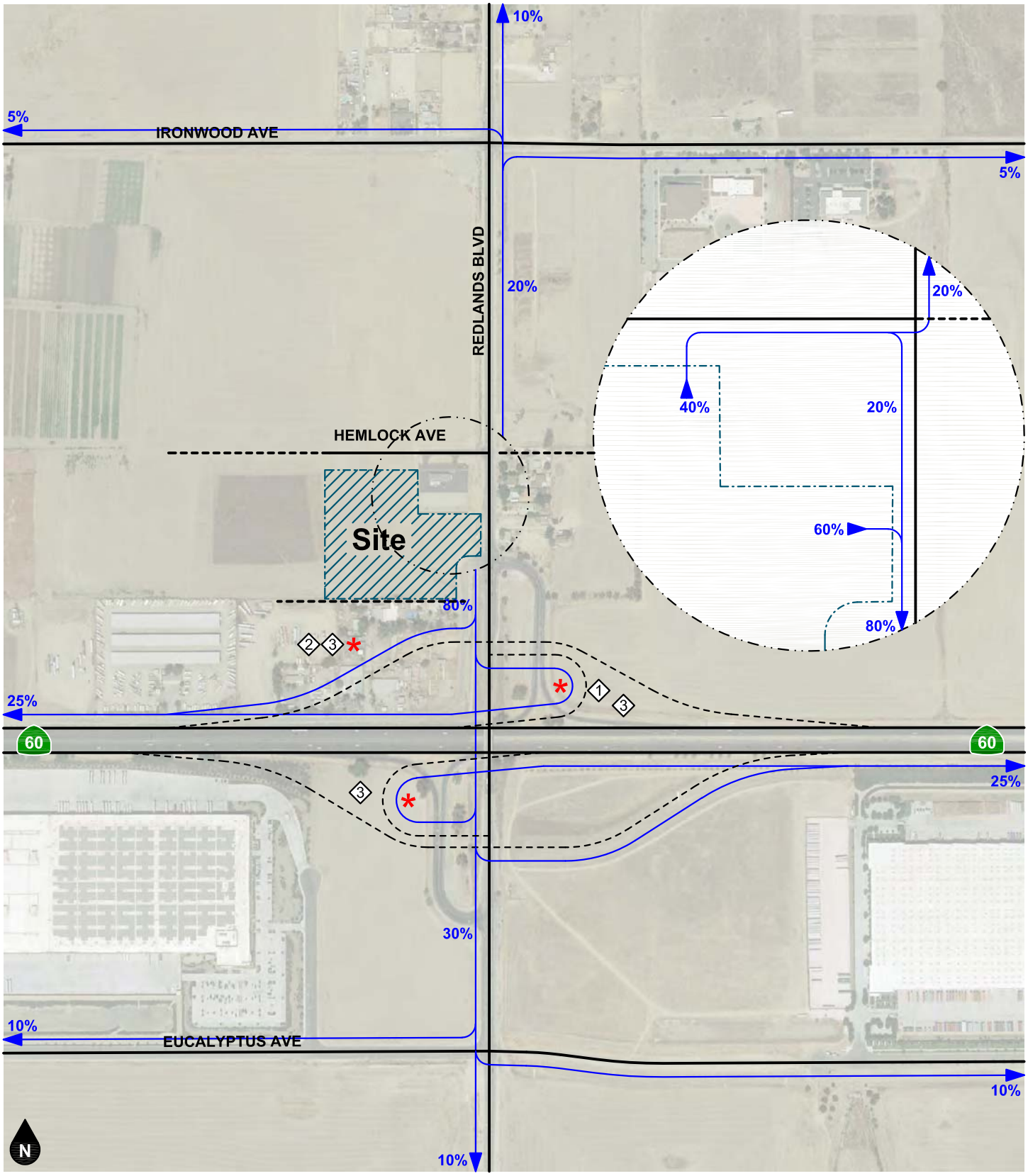
Legend

- Traffic Signal
- Stop Sign
- #D #-Lane Divided Roadway
- #U #-Lane Undivided Roadway
- Existing Lane
- ① Alternative 1 Modified Spread Diamond
- ② Alternative 2 Spread Diamond
- ③ Alternative 3 Modified Cloverleaf

RTO Right Turn Overlap

- Project Improvement
- Other Development Improvement

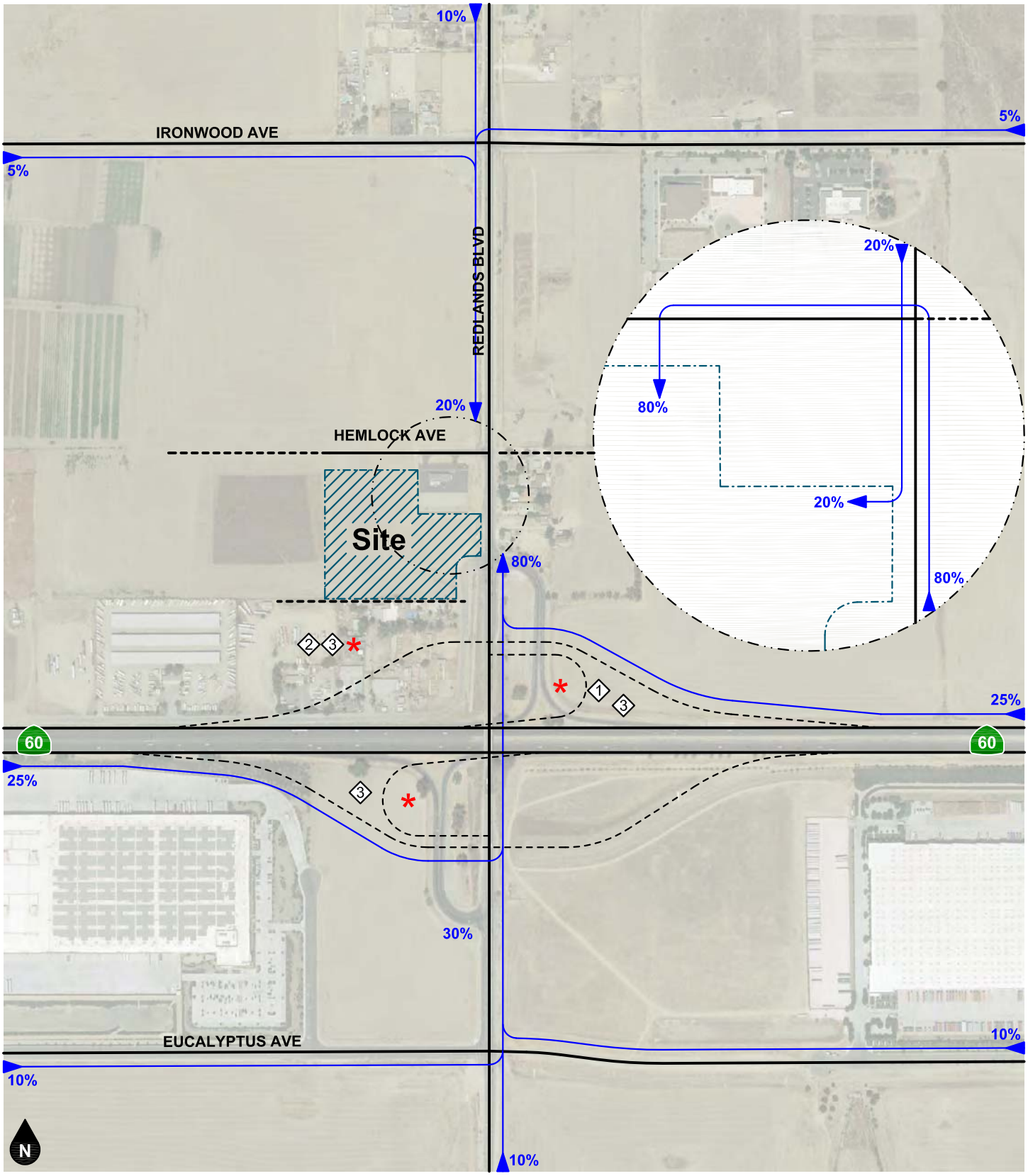
Figure 30
General Plan Buildout (Year 2040)
Lane Geometry and Intersection Controls



Legend

- 10% Percent From Project
- * Freeway Ramp Access Varies With Interchange Alternative
- Future Interchange Ramp Alternatives
- 1 Alternative 1 Modified Spread Diamond
- 2 Alternative 2 Spread Diamond
- 3 Alternative 3 Modified Cloverleaf

Figure 31
Project Outbound Trip Distribution - Ultimate



Legend

10% Percent To Project

* Freeway Ramp Access Varies With Interchange Alternative

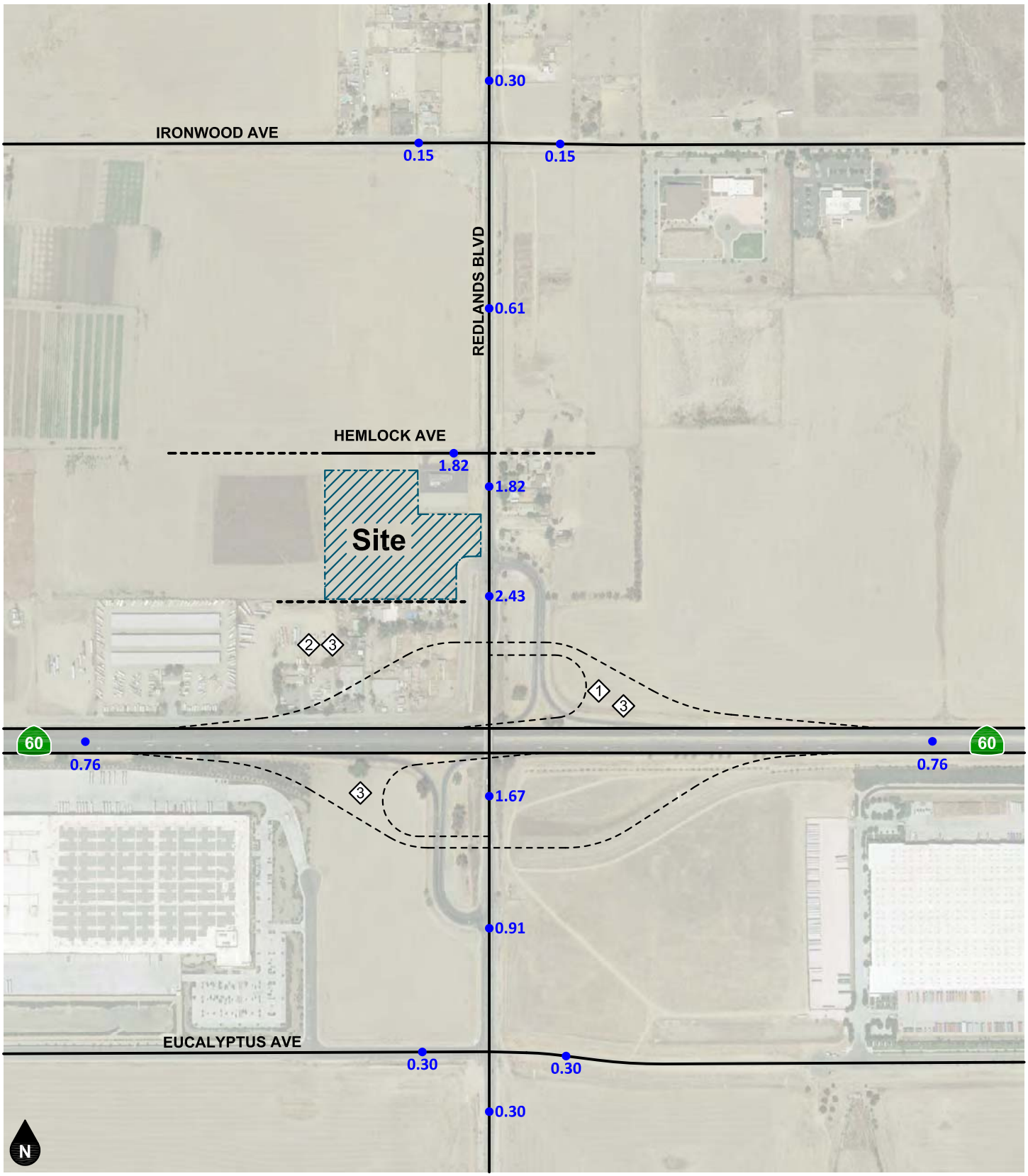
Future Interchange Ramp Alternatives

1 Alternative 1 Modified Spread Diamond

2 Alternative 2 Spread Diamond

3 Alternative 3 Modified Cloverleaf

Figure 32
Project Inbound Trip Distribution - Ultimate



Legend

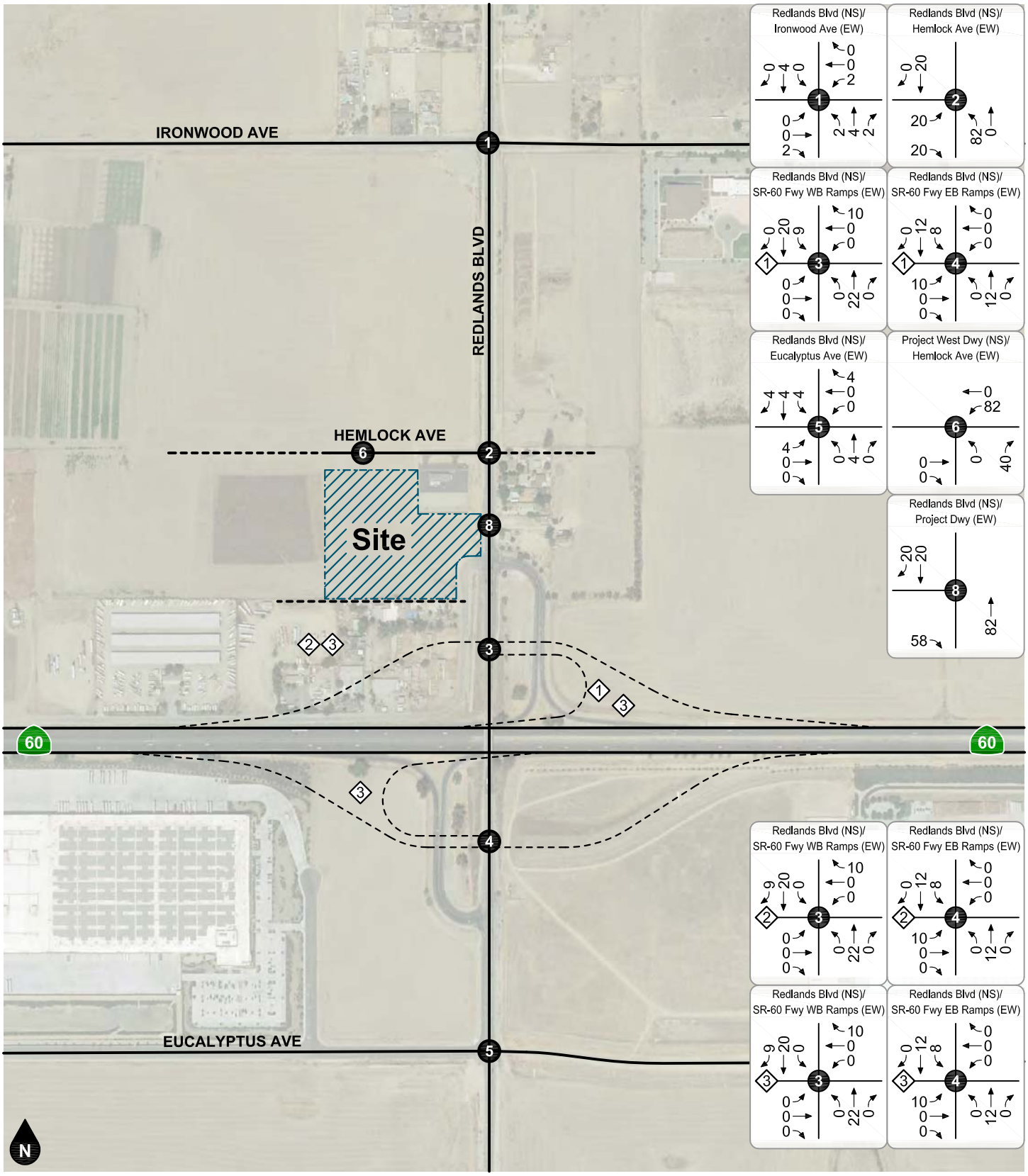
●11.2 Vehicles Per Day (1,000's)

① Alternative 1
Modified Spread Diamond

② Alternative 2
Spread Diamond

③ Alternative 3
Modified Cloverleaf

Figure 33
Project Average Daily Traffic Volumes
General Plan Buildout Alternatives



Legend

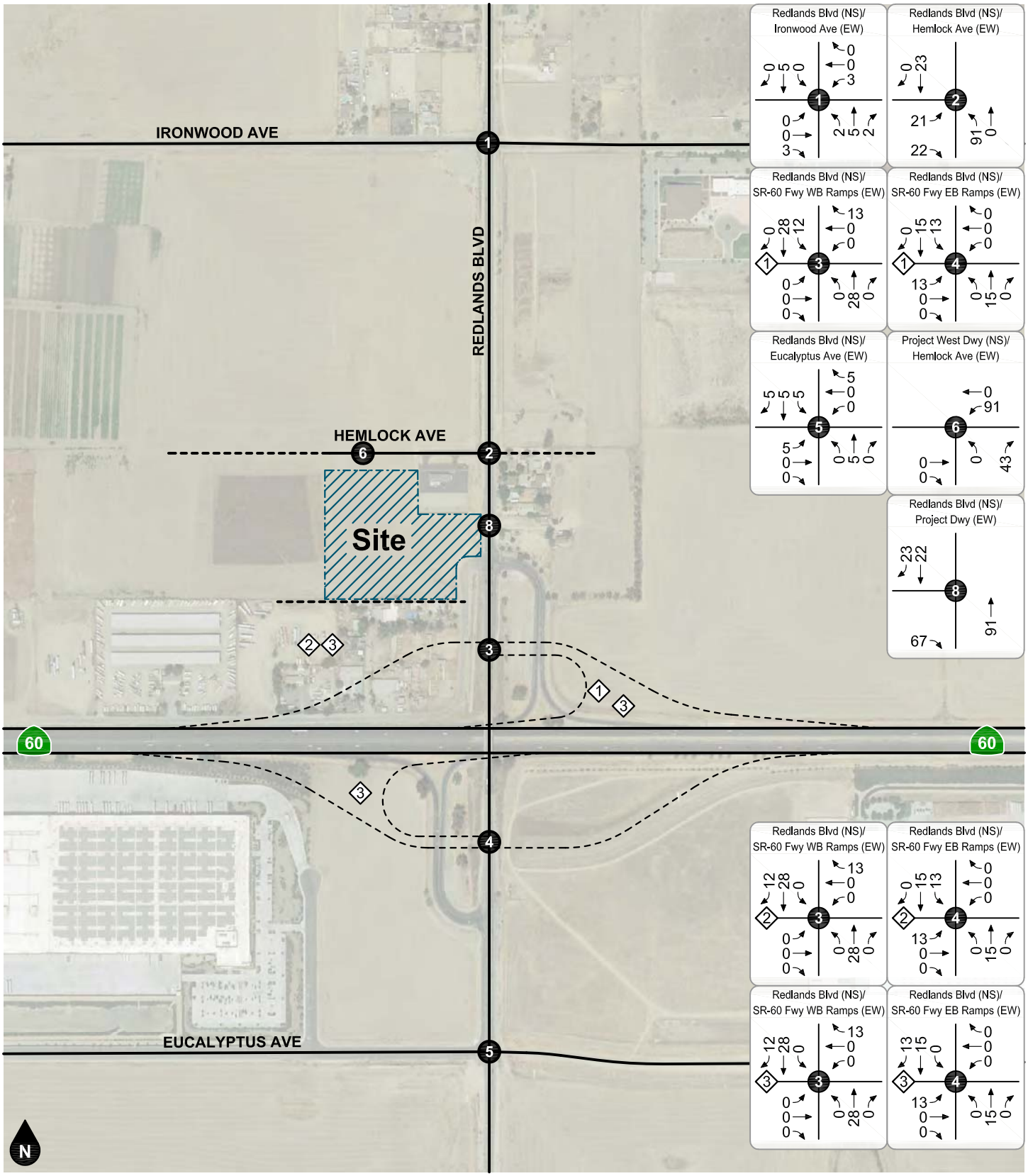
1 Study Intersection

1 Alternative 1
Modified Spread Diamond

2 Alternative 2
Spread Diamond

3 Alternative 3
Modified Cloverleaf

Figure 34
Project
AM Peak Hour Intersection Turning Movement Volumes
General Plan Buildout Alternatives



Legend

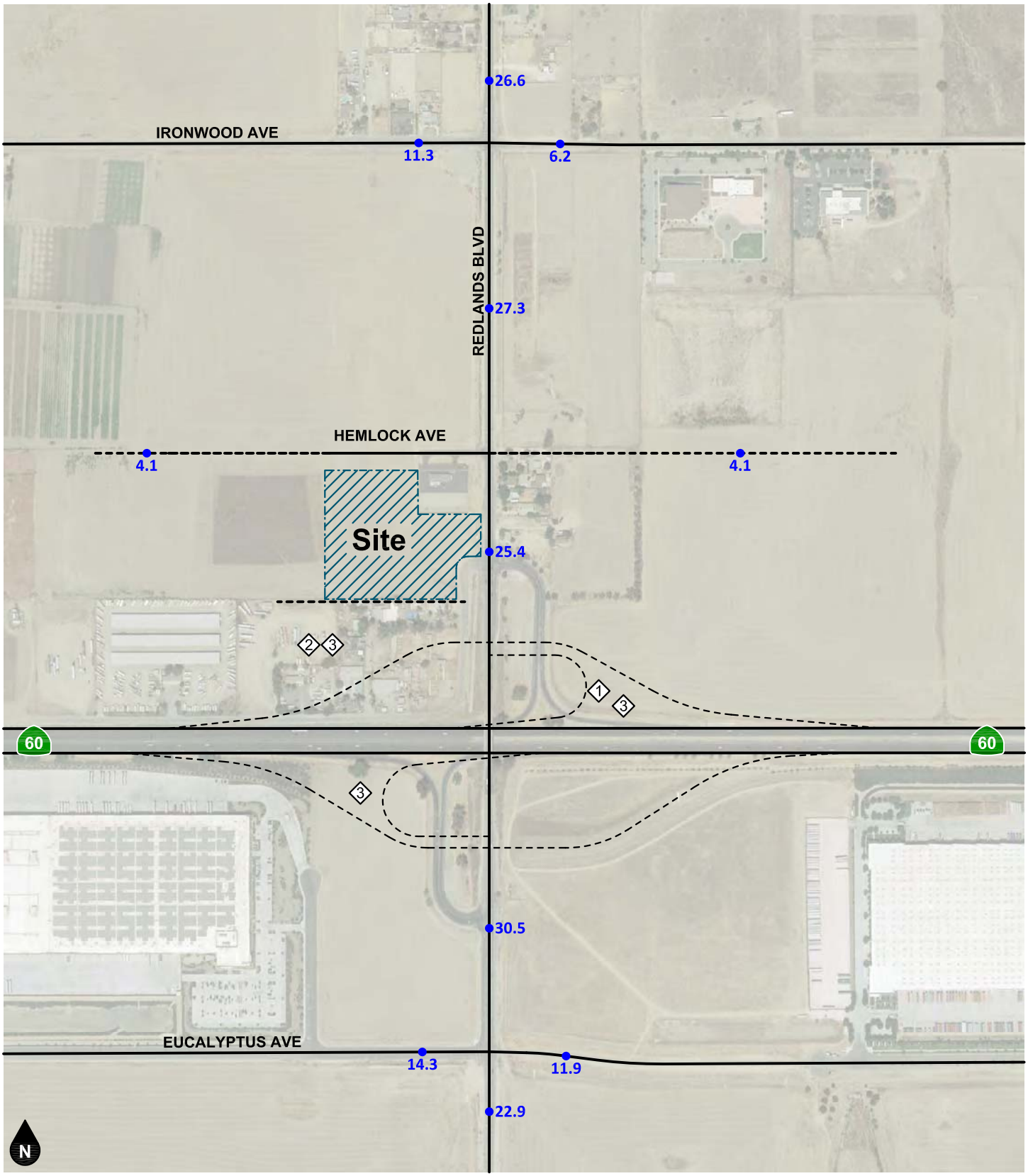
1 Study Intersection

1 Alternative 1
Modified Spread Diamond

2 Alternative 2
Spread Diamond

3 Alternative 3
Modified Cloverleaf

Figure 35
Project
PM Peak Hour Intersection Turning Movement Volumes
General Plan Buildout Alternatives



Legend

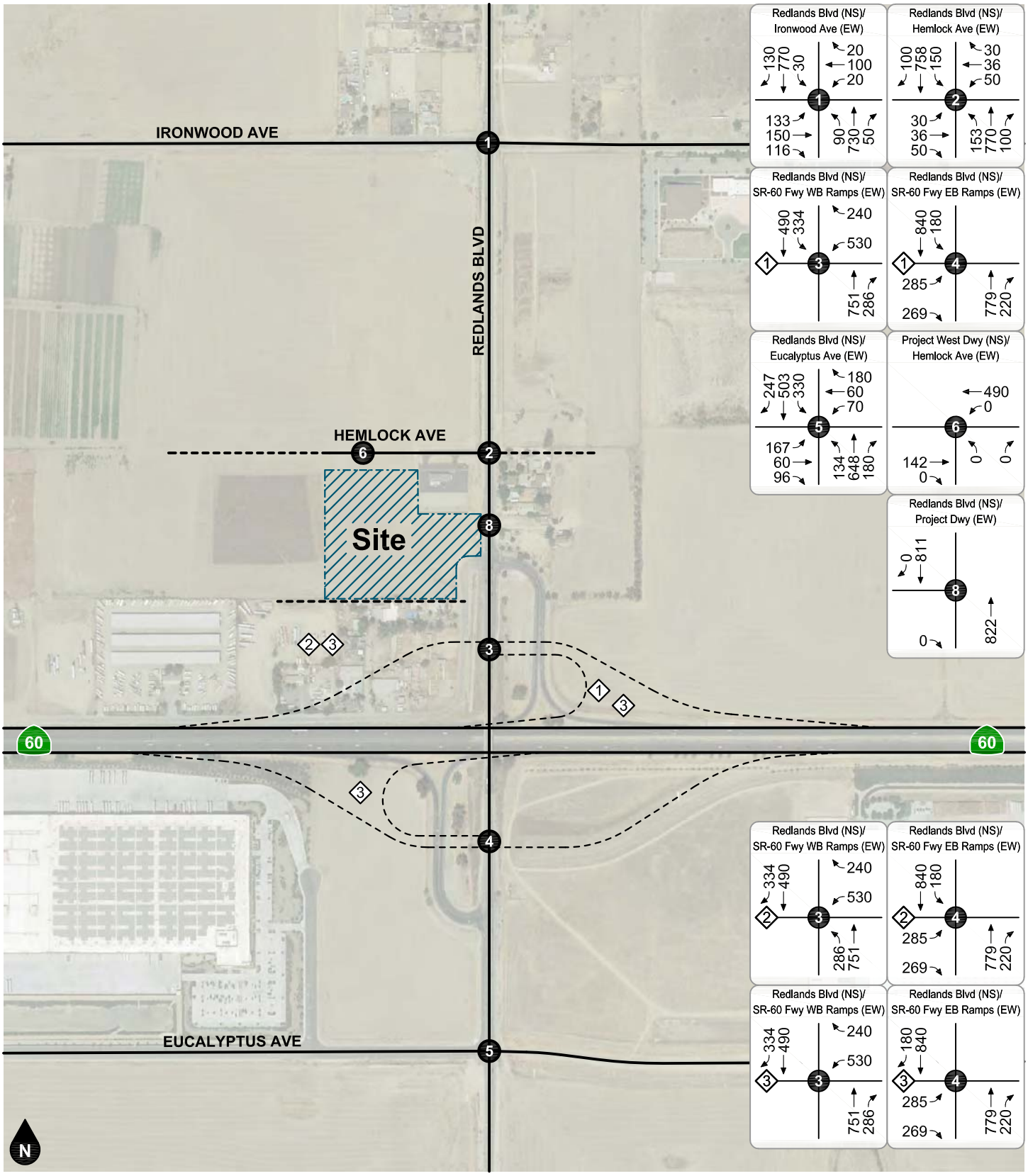
●11.2 Vehicles Per Day (1,000's)

① Alternative 1
Modified Spread Diamond

② Alternative 2
Spread Diamond

③ Alternative 3
Modified Cloverleaf

Figure 36
General Plan Buildout (Year 2040)
Average Daily Traffic Volumes



Legend

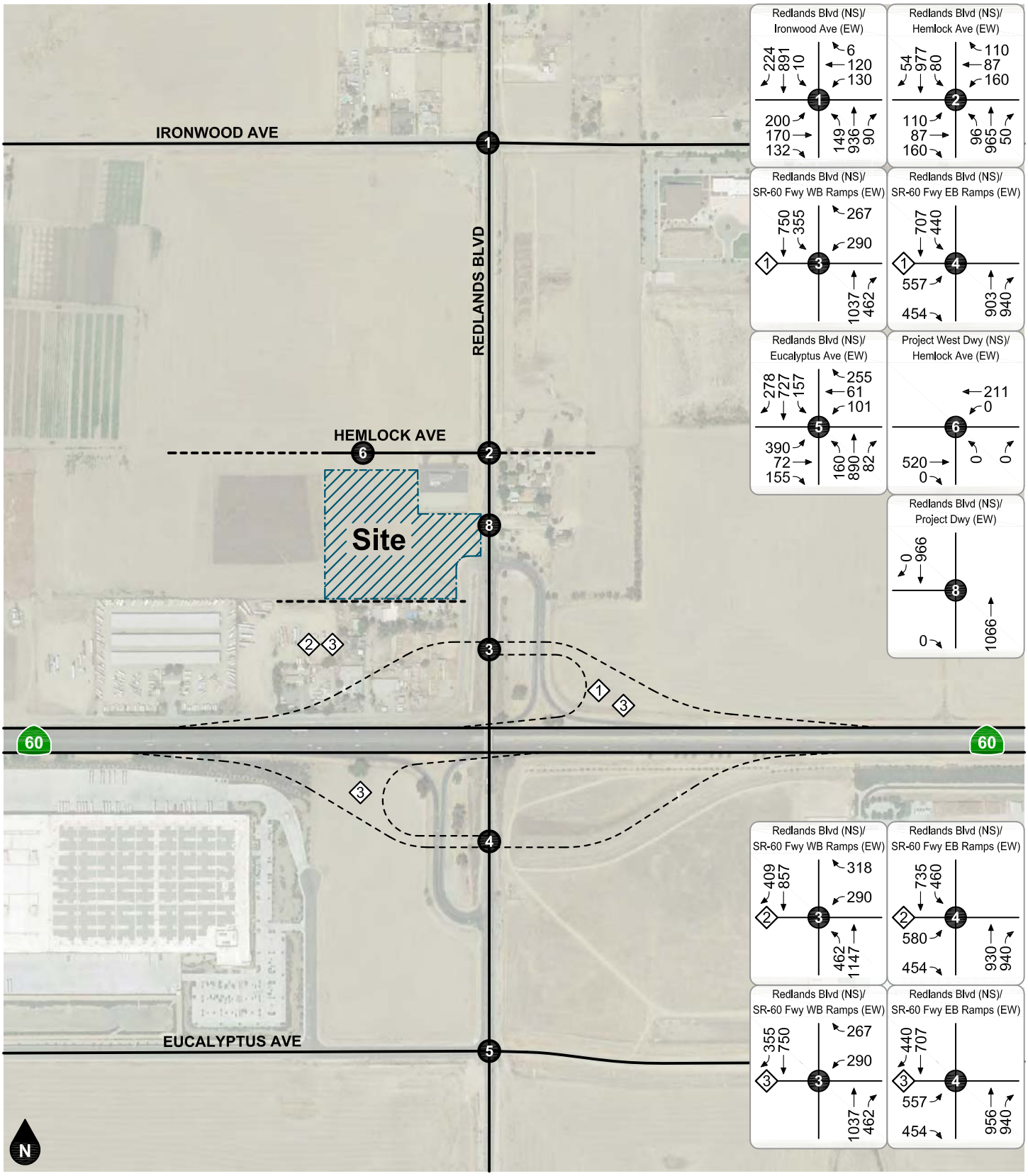
1 Study Intersection

1 Alternative 1
Modified Spread Diamond

2 Alternative 2
Spread Diamond

3 Alternative 3
Modified Cloverleaf

Figure 37
General Plan Buildout Without Project AM Peak Hour Intersection Turning Movement Volumes Alternatives



Legend

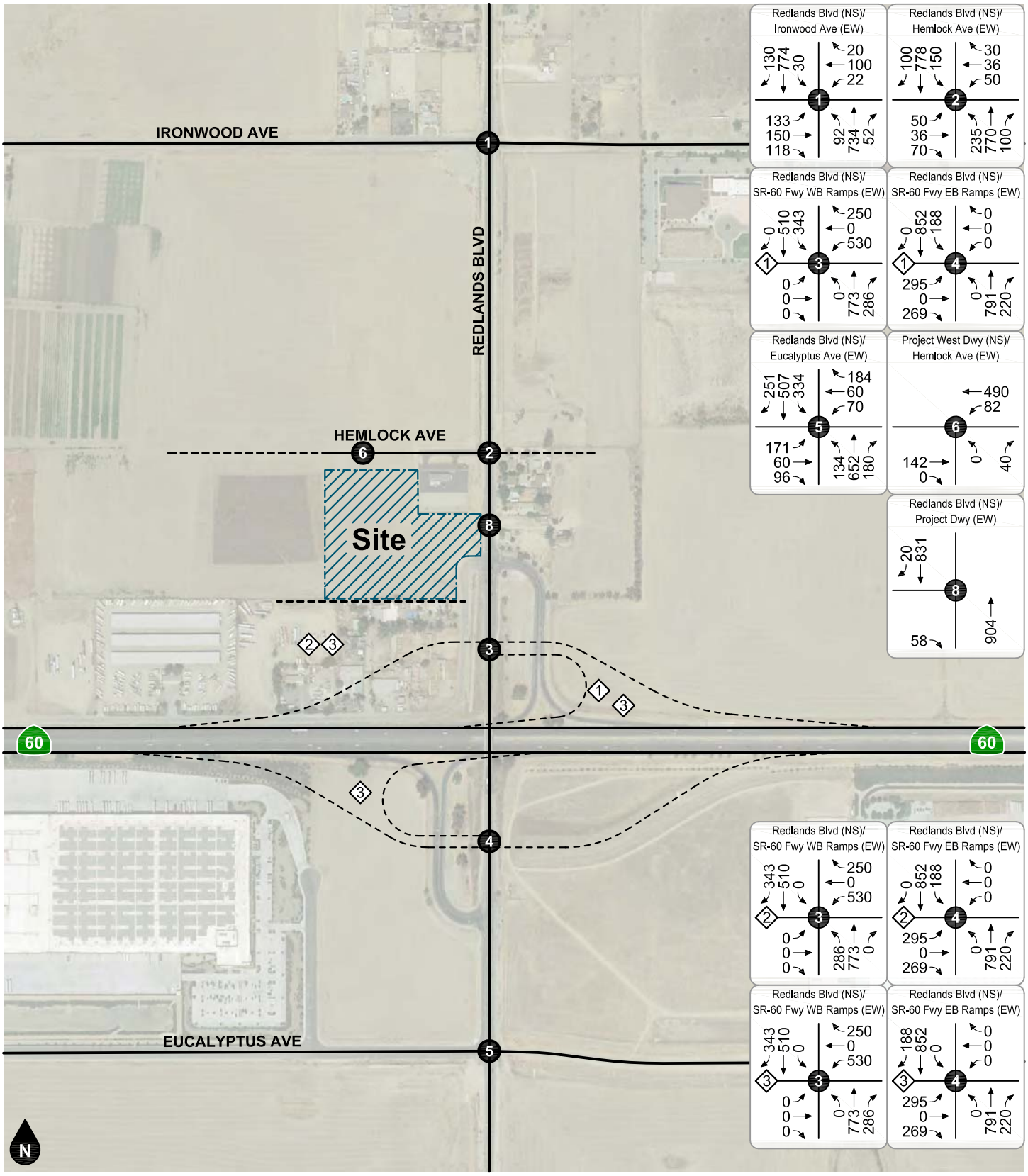
1 Study Intersection

1 Alternative 1 Modified Spread Diamond

2 Alternative 2 Spread Diamond

3 Alternative 3 Modified Cloverleaf

Figure 38
General Plan Buildout Without Project PM Peak Hour Intersection Turning Movement Volumes Alternatives



Legend

1 Study Intersection

1 Alternative 1
Modified Spread Diamond

2 Alternative 2
Spread Diamond

3 Alternative 3
Modified Cloverleaf

Figure 39
General Plan Buildout With Project AM Peak Hour Intersection Turning Movement Volumes Alternatives

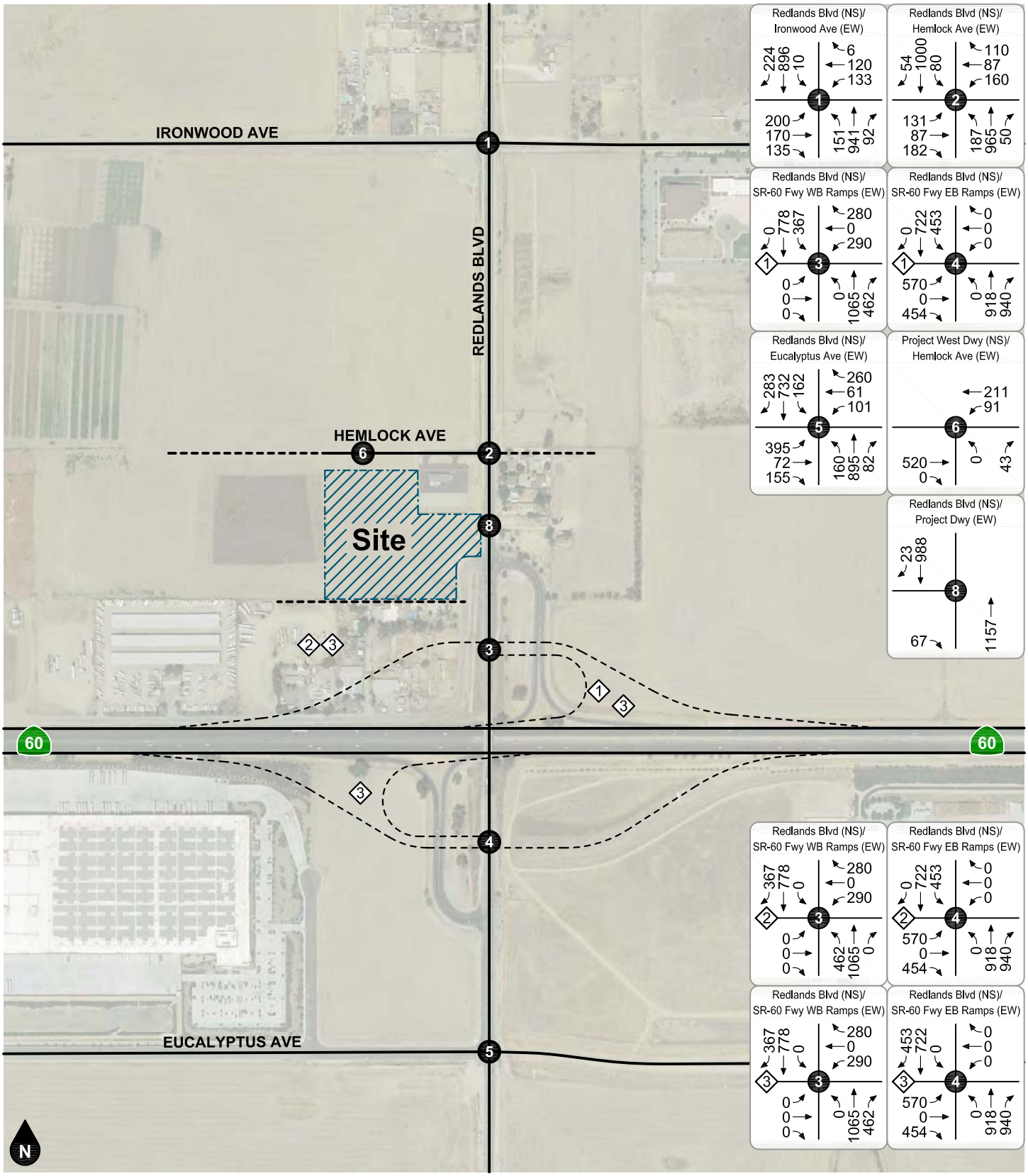


Figure 40
General Plan Buildout With Project PM Peak Hour Intersection Turning Movement Volumes Alternatives

9. GENERAL PLAN BUILDOUT OPERATIONAL ANALYSIS

Detailed intersection Level of Service calculation worksheets for each of the following analysis scenarios are provided in Appendix I.

ROADWAY SEGMENT DAILY CAPACITY ANALYSIS

General Plan Buildout Without Project

The roadway segment Levels of Service for General Plan Buildout Without Project conditions have been calculated and are shown in Table 11. The study roadway segments are forecast to operate within acceptable Levels of Service (D or better) for General Plan Buildout Without Project conditions

General Plan Buildout With Project

The roadway segment Levels of Service for General Plan Buildout With Project conditions have been calculated and are shown in Table 11. The study roadway segments are forecast to operate within acceptable Levels of Service (D or better) for General Plan Buildout With Project conditions

INTERSECTION LEVEL OF SERVICE

General Plan Buildout (Year 2040) Without Project conditions are shown for three (3) alternative interchange configurations.

General Plan Buildout Without Project – Alternative 1

The intersection Levels of Service for General Plan Buildout Without Project - Alternative 1 conditions have been calculated and are shown in Table 12. The study intersections are forecast to operate within acceptable Levels of Service (D or better) for General Plan Buildout without Project - Alternative 1 conditions, except for the following study intersection forecast to operate at unacceptable Level of Service without improvements:

- Redlands Boulevard at Hemlock Avenue - #2 (PM peak hour)
- Redlands Boulevard at SR-60 Eastbound Ramps - #4 (PM peak hour)

The following improvements are recommended to maintain acceptable Levels of Service at the study intersections for General Plan Buildout Without Project - Alternative 1 conditions:

- Redlands Boulevard at Hemlock Avenue - #2
  - Install traffic signal[7]
  - Construct a second northbound through lane and northbound left turn lane.
  - Construct a second southbound through lane.
  - Configure northbound approach lanes to provide one left turn lane, one through lane and one shared through-right turn lane.
  - Configure southbound approach lanes to provide one left turn lane, one through lane and one shared through-right turn lane.

- Redlands Boulevard at SR-60 Eastbound Ramps - #4
  - Construct one northbound right turn lane.

[7] SR-60 / Redlands interchange improvement to provide alternative access for local traffic with the elimination of Spruce Avenue connection to Redlands Boulevard.

The study intersections are projected to operate within acceptable Levels of Service (D or better) during the peak hours for General Plan Buildout Without Project - Alternative 1 conditions, improvements (see Table 12).

General Plan Buildout With Project – Alternative 1

The intersection Levels of Service for General Plan Buildout With Project - Alternative 1 conditions have been calculated and are shown in Table 12. The study intersections are forecast to operate within acceptable Levels of Service (D or better) for General Plan Buildout With Project - Alternative 1 conditions, except for the following study intersection forecast to operate at unacceptable Level of Service without improvements:

- Redlands Boulevard at Hemlock Avenue - #2 (PM peak hour)
- Redlands Boulevard at SR-60 Eastbound Ramps - #4 (PM peak hour)

The same improvements are recommended to maintain acceptable Levels of Service at the study intersections for General Plan Buildout with Project - Alternative 1 conditions as without project:

- Redlands Boulevard at Hemlock Avenue - #2
  - Install traffic signal
  - Construct a second northbound through lane and northbound left turn lane.
  - Construct a second southbound through lane.
  - Configure northbound approach lanes to provide one left turn lane, one through lane and one shared through-right turn lane.
  - Configure southbound approach lanes to provide one left turn lane, one through lane and one shared through-right turn lane.

- Redlands Boulevard at SR-60 Eastbound Ramps - #4
  - Construct one northbound right turn lane.

The study intersections are projected to operate within acceptable Levels of Service (D or better) during the peak hours for General Plan Buildout With Project – Alternative 1 conditions, with improvements (see Table 12).

General Plan Buildout Without Project – Alternative 2

The intersection Levels of Service for General Plan Buildout Without Project - Alternative 2 conditions have been calculated and are shown in Table 13. The study intersections are forecast to operate within acceptable Levels of Service (D or better) for General Plan Buildout Without Project - Alternative 2 conditions, except for the following study intersection forecast to operate at unacceptable Level of Service without improvements:

- Redlands Boulevard at Hemlock Avenue - #2 (PM peak hour)
- Redlands Boulevard at SR-60 Eastbound Ramps - #4 (PM peak hour)

The following improvements are recommended to maintain acceptable Levels of Service at the study intersections for General Plan Buildout Without Project - Alternative 2 conditions:

- Redlands Boulevard at Hemlock Avenue - #2
  - Install traffic signal[8]

[8] SR-60 / Redlands interchange improvement to provide alternative access for local traffic with the elimination of Spruce Avenue connection to Redlands Boulevard.

- Construct a second northbound through lane and northbound left turn lane.
- Construct a second southbound through lane.
- Configure northbound approach lanes to provide one left turn lane, one through lane and one shared through-right turn lane.
- Configure southbound approach lanes to provide one left turn lane, one through lane and one shared through-right turn lane.

- Redlands Boulevard at SR-60 Eastbound Ramps - #4
  - Construct one northbound right turn lane.

The study intersections are projected to operate within acceptable Levels of Service (D or better) during the peak hours for General Plan Buildout Without Project - Alternative 2 conditions, with improvements (see Table 13).

General Plan Buildout With Project – Alternative 2

The intersection Levels of Service for General Plan Buildout With Project - Alternative 2 conditions have been calculated and are shown in Table 13. The study intersections are forecast to operate within acceptable Levels of Service (D or better) for General Plan Buildout with Project - Alternative 2 conditions, except for the following study intersection forecast to operate at unacceptable Level of Service without improvements:

- Redlands Boulevard at Hemlock Avenue - #2 (PM peak hour)
- Redlands Boulevard at SR-60 Eastbound Ramps - #4 (PM peak hour)

The same improvements are recommended to maintain acceptable Levels of Service at the study intersections for General Plan Buildout With Project - Alternative 2 conditions as without project:

- Redlands Boulevard at Hemlock Avenue - #2
  - Install traffic signal
  - Construct a second northbound through lane and northbound left turn lane.
  - Construct a second southbound through lane.
  - Configure northbound approach lanes to provide one left turn lane, one through lane and one shared through-right turn lane.
  - Configure southbound approach lanes to provide one left turn lane, one through lane and one shared through-right turn lane.

- Redlands Boulevard at SR-60 Eastbound Ramps - #4
  - Construct one northbound right turn lane.

The study intersections are projected to operate within acceptable Levels of Service (D or better) during the peak hours for General Plan Buildout With Project - Alternative 2 conditions, with improvements (see Table 13).

General Plan Buildout Without Project – Alternative 3

The intersection Levels of Service for General Plan Buildout Without Project - Alternative 3 conditions have been calculated and are shown in Table 14 The study intersections are forecast to operate within acceptable Levels of Service (D or better) for General Plan Buildout Without Project - Alternative 3 conditions, except for the following study intersection forecast to operate at unacceptable Level of Service without improvements:

- Redlands Boulevard at Hemlock Avenue - #2 (PM peak hour)

The following improvements are recommended to maintain acceptable Levels of Service at the study intersections for General Plan Buildout Without Project - Alternative 3 conditions:

- Redlands Boulevard at Hemlock Avenue - #2
  - Install traffic signal[9]
  - Construct a second northbound through lane and northbound left turn lane.
  - Construct a second southbound through lane.
  - Configure northbound approach lanes to provide one left turn lane, one through lane and one shared through-right turn lane.
  - Configure southbound approach lanes to provide one left turn lane, one through lane and one shared through-right turn lane.

General Plan Buildout With Project – Alternative 3

The intersection Levels of Service for General Plan Buildout With Project - Alternative 3 conditions have been calculated and are shown in Table 14. The study intersections are forecast to operate within acceptable Levels of Service (D or better) for General Plan Buildout With Project - Alternative 3 conditions, except for the following study intersection forecast to operate at unacceptable Level of Service without improvements:

- Redlands Boulevard at Hemlock Avenue - #2 (PM peak hour)

The same improvements are recommended to maintain acceptable Levels of Service at the study intersections for General Plan Buildout With Project - Alternative 3 conditions as without project:

- Redlands Boulevard at Hemlock Avenue - #2
  - Install traffic signal
  - Construct a second northbound through lane and northbound left turn lane.
  - Construct a second southbound through lane.
  - Configure northbound approach lanes to provide one left turn lane, one through lane and one shared through-right turn lane.
  - Configure southbound approach lanes to provide one left turn lane, one through lane and one shared through-right turn lane.

[9] SR-60 / Redlands interchange improvement to provide alternative access for local traffic with the elimination of Spruce Avenue connection to Redlands Boulevard.

Table 11
General Plan Buildout (Year 2040) Roadway Segment Daily Capacity Analysis

ID	Roadway	Segment From	Segment To	Roadway Capacity[1] Ultimate Classification	Ultimate Lanes	Ultimate Capacity[1]	Proposed Lanes	Proposed Capacity[2]	General Plan Buildout Without Project ADT[3]	V/C[3]	LOS[3]	General Plan Buildout With Project ADT[3]	V/C[3]	LOS[3]
1.	Redlands Blvd	Ironwood Ave	Hemlock Ave	Divided Arterial	4D	37,500	4D	37,500	23,500	0.63	B	24,100	0.64	B
2.	Redlands Blvd	Hemlock Ave	SR-60 WB Ramps	Divided Arterial	4D	37,500	4D	37,500	20,600	0.55	A	22,400	0.60	A
3.	Redlands Blvd	SR-60 EB Ramps	Eucalyptus Ave	Divided Arterial	4D	37,500	4D	37,500	27,200	0.73	C	28,100	0.75	C
4.	Ironwood Ave	west of Redlands Blvd	Redlands Blvd	Minor Arterial	4U	25,000	4U	25,000	9,000	0.36	A	9,200	0.37	A
5.	Ironwood Ave	Redlands Blvd	east of Redlands Blvd	Minor Arterial	4U	25,000	4U	25,000	6,200	0.25	A	6,400	0.26	A
6.	Hemlock Ave	west of Redlands Blvd	Redlands Blvd	Unclassified - Local	2U	12,500	2U	12,500	4,100	0.33	A	5,900	0.47	A
7.	Eucalyptus Ave	west of Redlands Blvd	Redlands Blvd	Arterial	4D	37,500	4D	37,500	11,200	0.30	A	11,500	0.31	A
8.	Eucalyptus Ave	Redlands Blvd	east of Redlands Blvd	Arterial	4D	37,500	4D	37,500	9,200	0.25	A	9,500	0.25	A

Notes:

(1) Source: Link Volume Capacities/Level of Service for City of Moreno Valley General Plan Circulation Element (see Table 1).

(2) Roadway maximum capacity at Level of Service "E" for roadway classification. Capacity adjustment to reflect the number of existing number of travel lanes. When there are only 2 lanes on a classified roadway the capacity is adjusted to 12,500 regardless of future classification as the roadways currently lack design improvement features (lane width, shoulder width, bike lanes or medians) which would provide for increased capacity.

(3) ADT = Average Daily Traffic; V/C = Volume to Capacity; LOS = Level of Service.

(4) Existing or Proposed roadway capacities are the Level of Service "E" volumes for the respective classifications. Capacity values for non-specified roadways are based on the capacity values for the specified roadway and are adjusted for number of lanes, lane control, shoulders. Values used for capacity are: 1-lane one way roadway capacity = 6,250 vehicles per day (half of the 2D-Collector), 3-lane undivided capacity = 18,750 vehicles per day (average of 2U-Collector and 4U-Secondary).

Table 12
General Plan Buildout Intersection Level of Service - Alternative 1

ID	Study Intersection	Traffic Control[1]	Alternative 1 (Year 2040) Without Project				Alternative 1 (Year 2040) With Project			
			AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
			Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delay[2]	LOS[3]
1.	Redlands Blvd at Ironwood Ave	TS	24.1	C	28.2	C	24.2	C	28.4	C
2.	Redlands Blvd at Hemlock Ave	TS	23.3	C	68.9	E	31.0	C	87.8	F
	With Improvements	TS	16.9	B	24.6	C	17.8	B	29.2	C
3.	Redlands Blvd at SR-60 WB Ramp	TS	28.2	C	22.4	C	29.3	C	23.1	C
4.	Redlands Blvd at SR-60 EB Ramp	TS	14.4	B	83.4	F	14.5	B	84.2	F
	With Improvements	TS	14.3	B	28.1	C	14.4	B	28.6	C
5.	Redlands Blvd at Eucalyptus Ave	TS	32.1	C	41.6	D	32.3	C	42.2	D
6.	Project North Access at Hemlock Ave	CSS	-	-	-	-	9.1	A	10.8	B
8.	Redlands Blvd at Project East Access	CSS	-	-	-	-	12.4	B	13.8	B

Notes:

(1) TS = Traffic Signal; CSS = Cross Street Stop

(2) Delay is shown in seconds per vehicle. For intersections with traffic signal or all way stop control, overall average intersection delay and LOS are shown. For intersections with cross street stop control, LOS is based on average delay of the worst individual lane (or movements sharing a lane).

(3) LOS = Level of Service

Table 13
General Plan Buildout Intersection Level of Service - Alternative 2

ID	Study Intersection	Traffic Control[1]	Alternative 2 (Year 2040) Without Project				Alternative 2 (Year 2040) With Project			
			AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
			Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delay[2]	LOS[3]
1.	Redlands Blvd at Ironwood Ave	TS	24.1	C	28.2	C	24.2	C	28.4	C
2.	Redlands Blvd at Hemlock Ave	TS	23.3	C	68.9	E	31.0	C	87.8	F
	With Improvements	TS	16.9	B	24.6	C	17.8	B	29.2	C
3.	Redlands Blvd at SR-60 WB Ramp	TS	16.0	B	21.6	C	15.9	B	21.8	C
4.	Redlands Blvd at SR-60 EB Ramp	TS	14.4	B	83.0	F	14.5	B	83.7	F
	With Improvements	TS	14.3	B	27.6	C	14.4	B	28.1	C
5.	Redlands Blvd at Eucalyptus Ave	TS	32.1	C	41.6	D	32.3	C	42.2	D
6.	Project North Access at Hemlock Ave	CSS	-	-	-	-	9.1	A	10.8	B
8.	Redlands Blvd at Project East Access	CSS	-	-	-	-	12.4	B	13.8	B

Notes:

(1) TS = Traffic Signal; CSS = Cross Street Stop

(2) Delay is shown in seconds per vehicle. For intersections with traffic signal or all way stop control, overall average intersection delay and LOS are shown. For intersections with cross street stop control, LOS is based on average delay of the worst individual lane (or movements sharing a lane).

(3) LOS = Level of Service

Table 14
General Plan Buildout Intersection Level of Service - Alternative 3

ID	Study Intersection	Traffic Control[1]	Alternative 3 (Year 2040) Without Project				Alternative 3 (Year 2040) With Project			
			AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
			Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delay[2]	LOS[3]
1.	Redlands Blvd at Ironwood Ave	TS	24.1	C	28.2	C	24.2	C	28.4	C
2.	Redlands Blvd at Hemlock Ave	TS	23.3	C	68.9	E	31.0	C	87.8	F
	With Improvements	TS	16.9	B	24.6	C	17.8	B	29.2	C
3.	Redlands Blvd at SR-60 WB Ramp	TS	8.6	A	11.7	B	10.0	A	11.8	B
4.	Redlands Blvd at SR-60 EB Ramp	TS	7.3	A	23.2	C	8.3	A	20.6	C
5.	Redlands Blvd at Eucalyptus Ave	TS	32.1	C	41.6	D	32.3	C	42.2	D
6.	Project North Access at Hemlock Ave	CSS	-	-	-	-	9.1	A	10.8	B
8.	Redlands Blvd at Project East Access	CSS	-	-	-	-	12.4	B	13.8	B

Notes:

(1) TS = Traffic Signal; CSS = Cross Street Stop

(2) Delay is shown in seconds per vehicle. For intersections with traffic signal or all way stop control, overall average intersection delay and LOS are shown. For intersections with cross street stop control, LOS is based on average delay of the worst individual lane (or movements sharing a lane).

(3) LOS = Level of Service

10. GENERAL PLAN BUILDOUT SITE ACCESS

Two access driveways are proposed. Full access is proposed at Hemlock Avenue and right turn in/out only access is proposed at Redlands Boulevard.

PROJECT DESIGN FEATURES

This analysis assumes the following improvements will be constructed by the project to provide project site access:

- Redlands Boulevard (NS) at Project Driveway (EW) - #8
  - Construct the westbound approach from project to Redlands Boulevard.
  - Install stop control for right turn out exit.

For General Plan Buildout (Year 2040) after SR-60 Freeway/Redland Boulevard interchange reconfiguration (any alternative), the Redlands Boulevard project driveway is proposed to be restricted to right turns in/out only access. The project driveway on Hemlock Avenue is proposed to continue to provide full ingress and egress to the site.

When the construction of the Redlands Boulevard Project East Driveway (#8) is completed, the Spruce Avenue Project South Driveway (#7) will be closed.

SITE ACCESS QUEUEING

Table 15 summarizes the results of a queue analysis for left-turn, right-turn, or shared through-turn movements at the project driveways and site-adjacent study area intersections based on the forecast 95th-percentile queue lengths[10] shown in the delay calculation worksheets (see Appendix J). Additionally, the recommended storage length is provided for turn lanes that are forecast to exceed the existing storage.

For General Plan Buildout, it should be noted that project trips do not significantly increase (less than one car length) the queue length of the turning movements of the study area intersections, with the exception of intersection #2. The project will provide fair-share contributions for all lane improvements which have project trip distributions.

[10] For a more conservative analysis, the forecast 95th-percentile queue lengths shown in the delay calculation worksheets have been rounded up to nearest 5-foot increment.

Table 15
Summary of Queueing Analysis - General Plan Buildout Alternatives

ID	Intersection	Approach	Lane	Storage Length (Feet)[1]	Peak Hour 95th-Percentile Queue Length (Feet)												Adequate Storage Provided		
					Alternative 1				Alternative 2				Alternative 3				Alternative		
					No Project		With Project		No Project		With Project		No Project		With Project				
					AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	1	2	3
1.	Redlands Blvd at Ironwood Ave	NB	Left	400	110	220	110	225	-	-	-	-	-	-	-	-	YES	YES	YES
		NB	Thru/Right	1140	275	470	280	495	-	-	-	-	-	-	-	-	YES	YES	YES
		SB	Left	435	50	<25	50	<25	-	-	-	-	-	-	-	-	YES	YES	YES
		SB	Right[3]	130	50	130	50	130	-	-	-	-	-	-	-	-	YES	YES	YES
		EB	Left/Thru	2130	165	225	165	155	-	-	-	-	-	-	-	-	YES	YES	YES
		WB	Thru/Right	660	75	135	75	85	-	-	-	-	-	-	-	-	YES	YES	YES
2.	Redlands Blvd at Hemlock Ave	NB	Left	300	210	165	320	335	-	-	-	-	-	-	-	-	NO-335	YES	YES
		NB	Thru/Right	790	725	1190	725	1205	-	-	-	-	-	-	-	-	NO-1205	YES	YES
		SB	Thru/Right	1300	725	1220	935	1305	-	-	-	-	-	-	-	-	NO-1305	YES	YES
		EB	Left	150	55	155	80	190	-	-	-	-	-	-	-	-	NO-190	YES	YES
		EB	Right	375	85	230	80	245	-	-	-	-	-	-	-	-	YES	YES	YES
3.	Redlands Blvd at SR-60 WB Ramps	NB	Left	285	-	-	-	-	105	180	100	180	-	-	-	-	YES	YES	YES
		NB	Right	350	50	340	<25	125	-	-	-	-	<25	<25	<25	<25	YES	YES	YES
		SB	Left	330	235	230	125	245	-	-	-	-	-	-	-	-	YES	YES	YES
		SB	Thru/Right	790	50	70	50	75	135	215	140	230	45	90	55	35	YES	YES	YES
		WB	Left	250	215	140	215	135	210	120	210	120	140	140	140	200	YES	YES	YES
		WB	Right	150	60	60	60	60	65	115	75	120	80	40	90	110	YES	YES	YES
4.	Redlands Blvd at SR-60 EB Ramps	NB	Right	660	40	535	40	540	40	535	40	540	30	55	30	55	YES	YES	YES
		SB	Left	285	70	215	75	225	70	215	70	225	-	-	-	-	YES	YES	YES
		SB	Right	120	-	-	-	-	-	-	-	-	<25	<25	<25	<25	YES	YES	YES
		EB	Left	400	150	365	155	375	140	365	400	375	110	370	110	375	YES	YES	YES
		EB	Right	500	65	305	70	305	70	155	475	160	70	200	70	210	YES	YES	YES
5.	Redlands Blvd at Eucalyptus Ave	NB	**Left[3]**	250	155	200	155	200	-	-	-	-	-	-	-	-	YES	YES	YES
		NB	Right	320	40	<25	40	25	-	-	-	-	-	-	-	-	YES	YES	YES
		SB	Left	320	165	105	165	105	-	-	-	-	-	-	-	-	YES	YES	YES
		SB	Right	275	35	40	35	45	-	-	-	-	-	-	-	-	YES	YES	YES
		EB	Left	275	95	225	95	235	-	-	-	-	-	-	-	-	YES	YES	YES
		EB	Thru/Right	300	<25	55	40	55	-	-	-	-	-	-	-	-	YES	YES	YES
		WB	Left	250	95	140	95	140	-	-	-	-	-	-	-	-	YES	YES	YES
		WB	**Right[3]**	300	60	135	60	140	-	-	-	-	-	-	-	-	YES	YES	YES
6.	Project North Access at Hemlock Ave	NB	Left/Right	NA	-	-	<25	<25	-	-	-	-	-	-	-	-	YES	YES	YES
		WB	Left/Thru	NA	-	-	<25	<25	-	-	-	-	-	-	-	-	YES	YES	YES
8.	Redlands Blvd at Project East Access	SB	Thru/Right	NA	-	-	-	-	-	-	-	-	-	-	-	-	YES	YES	YES
		EB	Right	NA	-	-	<25	<25	-	-	-	-	-	-	-	-	YES	YES	YES
2.	Redlands Blvd at Hemlock Ave **With Improvements**	NB	Left	300	125	120	200	285	-	-	-	-	-	-	-	-	YES	YES	YES
		NB	Thru/Right	790	225	345	220	350	-	-	-	-	-	-	-	-	YES	YES	YES
		SB	Thru/Right	1300	225	355	265	385	-	-	-	-	-	-	-	-	YES	YES	YES
		EB	Left	150	40	115	60	145	-	-	-	-	-	-	-	-	YES	YES	YES
		EB	Right	375	60	180	70	205	-	-	-	-	-	-	-	-	YES	YES	YES
4.	Redlands Blvd at SR-60 EB Ramps **With Improvements**	NB	Right	660	<25	45	<25	45	<25	45	<25	45	-	-	-	-	YES	YES	YES
		SB	Left	285	70	215	75	225	70	215	70	225	-	-	-	-	YES	YES	YES
		SB	Right	120	-	-	-	-	-	-	-	-	-	-	-	-	YES	YES	YES
		EB	Left	400	150	305	155	315	140	305	145	315	-	-	-	-	YES	YES	YES
		EB	Right	250	65	175	70	185	70	175	75	175	-	-	-	-	YES	YES	YES

Notes:

(1) Distance to the adjacent driveway (existing or proposed future development).

(2) Improvements = **Bold**

(3) Other Devlolpement Improvement

11. STATE HIGHWAY ANALYSIS

This section discusses the prescribed methodology assess whether freeway mainline or ramp analyses are required.

CALIFORNIA DEPARTMENT OF TRANSPORTATION REGIONAL FREEWAY

The closest freeway to the proposed site is the SR-60 Freeway that is currently two (2) lanes in each direction and located approximately 600 feet south of the project site.

Based on the mainline average daily traffic volumes (64,000 to 69,000 vehicles per day) and the capacity of a 4 lane State Highway as specified in the County of Riverside Congestion Management Program, the freeway mainline currently operates at Levels of Service C or better.

Roadway Classification	Number of Lanes	Design Volume Level of Service C	Capacity Volume Level of Service E
Freeway	4D	80,000	100,000
Freeway	6D	102,000	132,000
Freeway	8D	136,000	176,000
Freeway	10D	169,000	220,000
Ramp (1-Way)	1	16,000	20,000

Source: County of Riverside roadway daily service volume standards.

TRIP CONTRIBUTION

The project trip distributions depict the project trip contribution during the peak hours to the roadway segment closest to the freeway are shown on Figure 41 and Figure 42, respectively for interim and ultimate roadway configurations.

For land developments in Riverside County, freeway mainline analysis is typically required when a project is forecast to contribute 100 peak hour trips or more to a freeway mainline in either direction. Freeway ramp terminal analysis is typically required when a project is forecast to contribute 50 peak hour trips or more to a freeway ramp terminal.

The project does not contribute greater than 100 two-way peak hour trips to the SR-60 Freeway. The project does contribute trips greater than the arterial link threshold volume of 50 two-way trips in the peak hours on freeway ramp terminals.

STATE HIGHWAY ANALYSIS METHODOLOGIES

Intersection Delay Methodology

As previously noted in the Methodology section, the technique used to assess the performance of intersections within the California Department of Transportation jurisdiction is known as the intersection delay methodology based on procedures contained in the Highway Capacity Manual (Transportation Research Board, 6th Edition).

Off-Ramp Queueing Methodology

For freeway off-ramps satisfying the trip contribution criteria, the 95th-percentile queue length has also been assessed based on procedures contained in the Highway Capacity Manual (Transportation Research Board,

6th Edition) and reported in the delay/Level of Service calculation worksheets (see Appendix H for Opening Year conditions and Appendix J for General Plan Buildout (Year 2040) conditions).

Thresholds of Significance

As previously noted, a project traffic impact is considered significant if the addition of project generated trips is forecast to cause the performance of a State Highway study intersection to change from acceptable operation (Level of Service D or better) to deficient operation (Level of Service E or F).

For freeway off-ramps, a project impact is considered significant if the addition of project generated trips is forecast to cause or worsen a condition where the queue length exceeds the storage capacity.

FREEWAY RAMP TERMINUS OPERATIONS

Intersection Levels of Service

As shown in the preceding operational analysis, the State highway study intersections are forecast to operate at Level of Service D or better during the peak hours traffic conditions, except for the following study intersection that is projected to operate at Level of Service (E or F), without improvements:

Opening Year (2024) Without Project Traffic Conditions (see Table 9):
- Redlands Boulevard at SR-60 Eastbound Ramps - #4 (PM peak hour) LOS E

Opening Year (2024) With Project Traffic Conditions (see Table 9):
- Redlands Boulevard at SR-60 Eastbound Ramps - #4 (PM peak hour) LOS E

General Plan Buildout (Year 2040) Without Project – Alternative 1 Traffic Conditions (Table 12):
- Redlands Boulevard at SR-60 Eastbound Ramps - #4 (PM peak hour) LOS F

General Plan Buildout (Year 2040) With Project – Alternative 1 Traffic Conditions (Table 12):
- Redlands Boulevard at SR-60 Eastbound Ramps - #4 (PM peak hour) LOS F

General Plan Buildout (Year 2040) Without Project – Alternative 2 Traffic Conditions (Table 13):
- Redlands Boulevard at SR-60 Eastbound Ramps - #4 (PM peak hour) LOS F

General Plan Buildout (Year 2040) With Project – Alternative 2 Traffic Conditions (Table 13):
- Redlands Boulevard at SR-60 Eastbound Ramps - #4 (PM peak hour) LOS F

Intersection Mitigation Measures

The improvements necessary to bring the freeway ramp intersection operations back to an acceptable Level of Service have been identified in the study as cumulative impacts to study area intersections #3 and #4. Therefore, as mitigation for the project share of the impact, the project shall contribute its share of the cost to construct the necessary improvements through payment of applicable development impact fees to study area intersections #3 and #4.

Opening Year Cumulative Improvements

- Redlands Boulevard at SR-60 Eastbound Ramps - #4
  - Widen eastbound approach to consist of one left turn lane and one right turn lane.

General Plan Buildout Cumulative Improvements

- Redlands Boulevard at SR-60 Westbound Ramps - #3
  - Construct a second northbound through lane.
  - Construct a second southbound through lane.
  - Construct additional southbound turn lane for on-ramp (Alternative 1-left, Alternatives 2 & 3 right)
  - Construct two additional westbound approach lanes for off-ramp.
  - Reconfigure westbound approach to consist of 1 left turn lane, 1 shared lane and 1 right turn lane

- Redlands Boulevard at SR-60 Eastbound Ramps - #4
  - Construct a second northbound through lane.
  - Construct a second southbound through lane.
  - Construct two northbound right turn lanes for on-ramp.
  - Construct two southbound left turn lanes for on-ramp (Alternatives 1 & 2)
  - Construct additional eastbound approach lane for off-ramp.
  - Reconfigure eastbound approach to consist of 1 left turn lane, 1 shared lane and 1 right turn lane
  - Construct a second northbound right turn lane. (Alternatives 1 & 2)

Off-Ramp Queueing

For Opening Year (2024), Table 16 summarizes the results of a queue analysis for left-turn, right-turn, or shared through/turn lanes for freeway off-ramp queueing based on the forecast 95th-percentile queue lengths shown in the delay calculation worksheets (see Appendix H). Additionally, the recommended storage length is provided for turn lanes that are forecast to exceed the existing storage.

Off-ramp queueing for the General Plan Buildout Alternatives is assumed to be a part of the interchange design process and therefore is assumed to be adequate.

Table 16
Freeway Off-Ramp Queueing Analysis

ID	Intersection	Approach	Lane	Queue Length / Distance (Feet)										Adequate Storage Provided	
				Designated Turning Lane Storage Length[1]	Distance From End of Designated Lane to Gore Point	Peak Hour 95th-Percentile Queue Length[2]		Queue Length Exceeding Turning Lane Storage		Sum of Queue Lengths Exceeding Turning Lane Storage		Off-Ramp Storage Length Remaining			
						AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
3.	Redlands Blvd at SR-60 WB Ramps	Westbound	Shared	**0**	1288	170	190	170	190	170	190	1118	1098	YES	YES
4.	Redlands Blvd at SR-60 EB Ramps	Eastbound	Left	75	1345	125	320	50	245	50	245	1295	1100	YES	YES
	With Improvements [4]	Eastbound	**Right**[3]	**75**		45	50	0	0						

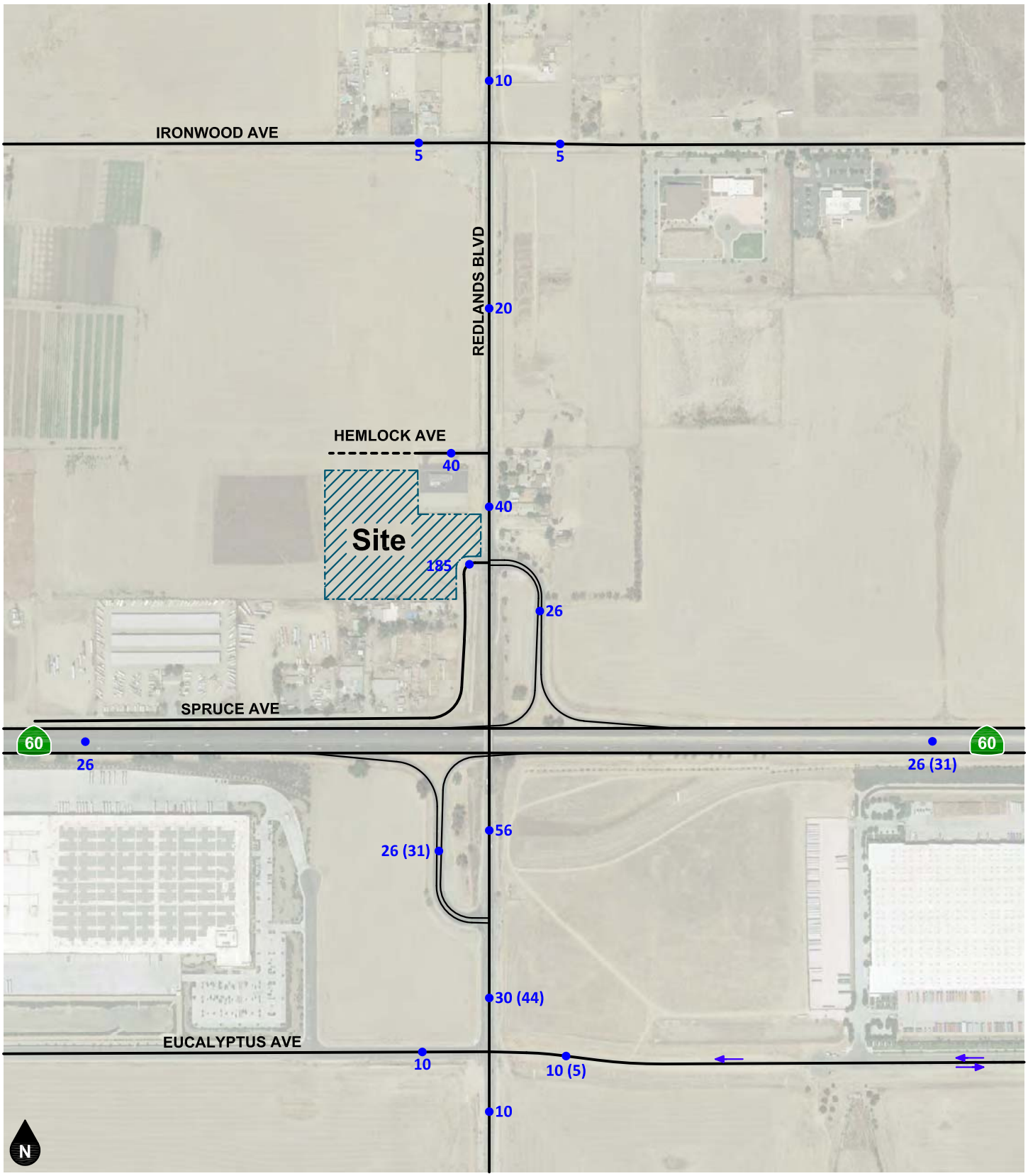
Notes:

(1) Ramp length = Length from stop bar to gore point. When a designated turning lane does not exist, the original ramp lane desiganted storage with improvments is equal to the new storage length of the adjacent lane.

(2) Peak Hour 95th-Percentile Queue Length shown for Opening Year (2024) With Project conditions.

(3) The eastbound right-turn lane shall be provided in conjunction with intersection/interchange improvements.

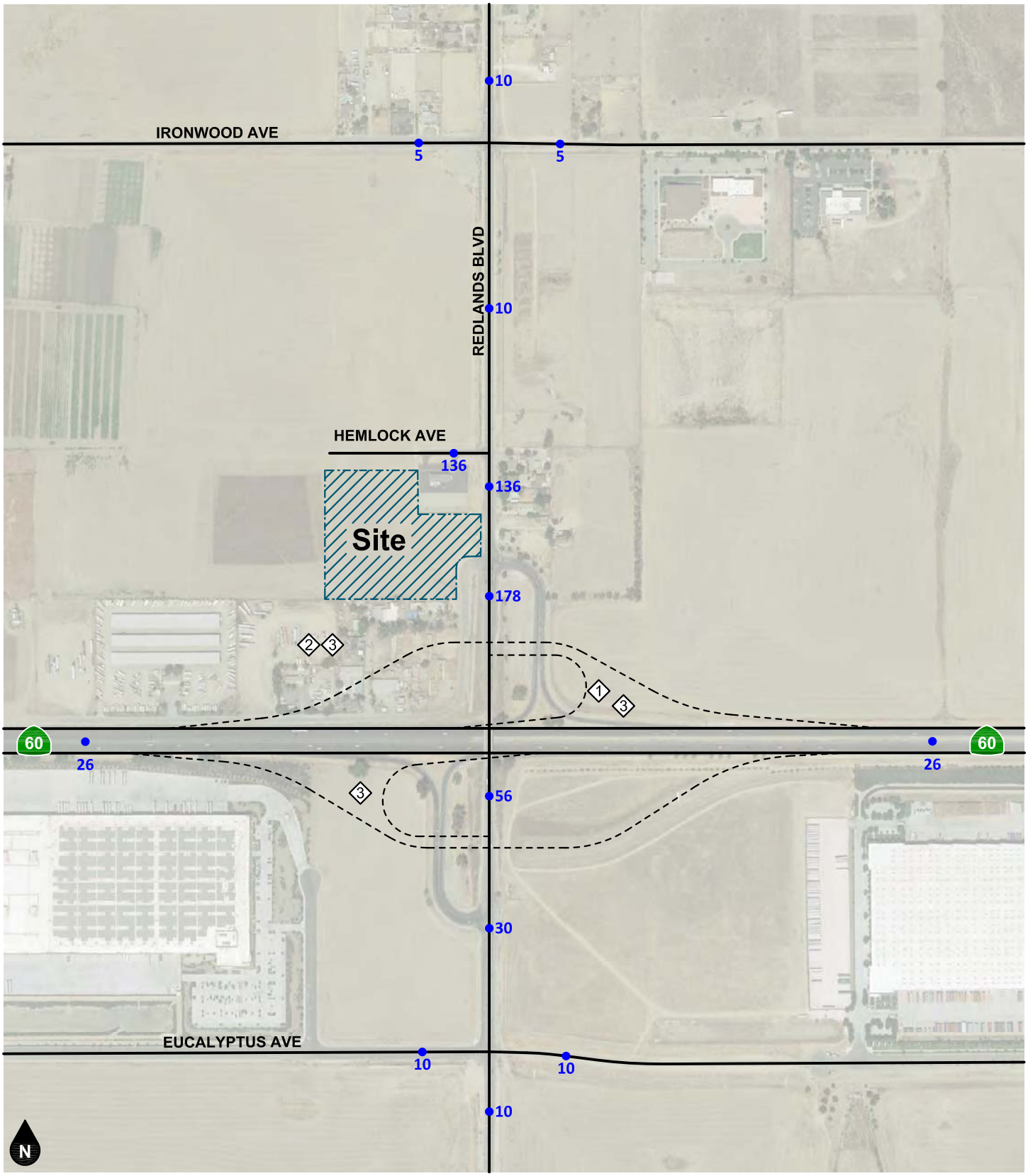
(4) Improvements = **Bold**



Legend

- ●28 Peak Hour Volume Opening Year (2022)
- ●(32) Peak Hour Volume Existing
- ⟷ 2 Way Traffic By Opening Year (2022)

Figure 41
Project Trip Contribution – Interim



Legend

●28 Evening Peak Hour Volumes

① Alternative 1 Modified Spread Diamond

② Alternative 2 Spread Diamond

③ Alternative 3 Modified Cloverleaf

Figure 42
Project Trip Contribution Volumes
General Plan Buildout Alternatives

12. SUMMARY OF IMPROVEMENTS

This section provides a summary of the transportation improvements identified in this analysis.

PROJECT DESIGN FEATURES

For Opening Year (2024) interim conditions prior to the SR-60 Freeway/Redland Boulevard interchange reconfiguration, the Spruce Avenue project driveway is proposed to provide full access ingress and egress to the site. The project driveway on Hemlock Avenue is proposed to provide full ingress and egress to the site.

- Hemlock Avenue Improvements
  - Construct the modified collector roadway from west property boundary to Redlands Boulevard.
  - Install stop control on eastbound Hemlock Avenue at Redlands Boulevard.
  - Construct the eastbound approach.
  - The Hemlock Avenue / Redlands Boulevard intersection is designed to function as a right turn in /right turn out access driveway during the interim condition prior to the construction of the Redlands Interchange.

- Spruce Avenue Improvements
  - Realign and reconstruct segment of Spruce Avenue from the project site to Redlands Boulevard.
  - Construct west leg from Spruce Avenue bend to accommodate T-intersection.
  - Install stop control on northbound Spruce Avenue between Redlands Boulevard and project site.
  - Modify northbound approach from right turn to shared left-right turn.

- Project North Driveway (NS) at Hemlock Avenue (EW) - #6
  - Construct the northbound approach to consist of one shared left-right turn lane with stop-control.

- Spruce Avenue (NS) at Project South Driveway (EW) - #7
  - Construct the westbound approach to consist of one shared thru-right turn lane.
  - Reconfigure northbound approach to provide one shared left-right turn lane with stop-control.

For General Plan Buildout (Year 2040) after SR-60 Freeway/Redland Boulevard interchange reconfiguration (any alternative), the Redlands Boulevard project driveway is proposed to be restricted to right turns in/out only access. The project driveway on Hemlock Avenue is proposed to continue to provide full ingress and egress to the site.

- Redlands Boulevard (NS) at Project East Driveway (EW) - #8
  - Construct the westbound approach from project to Redlands Boulevard.
  - Install stop control for right turn out exit.

When the construction of the Redlands Boulevard Project East Driveway (#8) is completed, the Spruce Avenue Project South Driveway (#7) will be closed.

MITIGATION MEASURES

Direct Impacts

The proposed project is forecast to result in no significant traffic impacts at the study intersections for Existing Plus Project conditions; therefore, no mitigation is required for direct project impacts.

Cumulative Impacts

As mitigation for potential cumulative impacts, the proposed project shall contribute towards the identified improvements through an adopted traffic impact fee program, or through an equivalent fair share contribution for improvements not covered within such fee programs. Applicable fees typically include the City of Moreno Valley Development Impact Fee, and the County of Riverside Transportation Uniform Mitigation Fee (TUMF) and Road and Bridge Benefit District (RBBD) programs.

The proposed project shall contribute its fair share, through the applicable development impact fee programs or equivalent fair share contribution, to the following improvements for Opening Year and General Plan Buildout conditions:

Opening Year (2024)

- Redlands Boulevard at SR-60 Eastbound Ramps - #4 [11]
  - Widen eastbound approach (off-ramp) to provide one left turn lane and one right turn lane.

- Redlands Boulevard at Eucalyptus Avenue - #5 [12]
  - Construct additional southbound approach lane to provide one left turn lane.
  - Restripe eastbound right turn lane to a shared through-right turn lane and construct receiving through lane on the east leg.
  - Reconstruct westbound approach to consist of one left turn lane, one through lane, and one right turn lane.

Figure 43 graphically illustrates the identified improvements for Opening Year (2024).

General Plan Buildout (Year 2040)[13]

- Redlands Boulevard at Ironwood Avenue - #1
  - Construct a second northbound through lane.
  - Construct a second southbound through lane.
  - Construct additional eastbound approach lane to provide shared left turn-through lane and shared through-right turn lane and construct receiving through lane on the east leg.
  - Construct additional westbound approach lane to provide shared left turn-through lane and shared through-right turn lane and construct receiving through lane on the west leg.

- Redlands Boulevard at Hemlock Avenue - #2[14]
  - Install traffic signal
  - Construct a second northbound through lane and northbound left turn lane.
  - Construct a second southbound through lane.
  - Configure northbound approach lanes to provide one left turn lane, one through lane and one shared through-right turn lane.
  - Configure southbound approach lanes to provide one left turn lane, one through lane and one shared through-right turn lane.

[11] Opening year cumulative improvement which the project will contribute fair share funds in conjunction with other development projects to fund this improvement.
[12] Opening year cumulative improvements to be provided by other development in conjunction with other development improvements at or near the Redlands Boulevard and Eucalyptus intersection.
[13] General plan buildout cumulative improvements are in conjunction with other development projects at or near the Redlands Boulevard study area. The general plan buildout lane improvements shown for this study are from previously developed traffic studies within the study area (see Appendix G).
[14] SR-60 / Redlands interchange improvement to provide alternative access for local traffic with the elimination of Spruce Avenue connection to Redlands Boulevard.

- Redlands Boulevard at SR-60 Westbound Ramps - #3
  - Construct a second northbound through lane.
  - Construct a second southbound through lane.
  - Construct additional southbound turn lane for on-ramp (Alternative 1-left, Alternatives 2 & 3 right)
  - Construct two additional westbound approach lanes for off-ramp.
  - Reconfigure westbound approach to consist of 1 left turn lane, 1 shared lane and 1 right turn lane.

- Redlands Boulevard at SR-60 Eastbound Ramps - #4
  - Construct a second northbound through lane.
  - Construct a second southbound through lane.
  - Construct two northbound right turn lanes for on-ramp.
  - Construct two southbound left turn lanes for on-ramp (Alternatives 1 & 2)
  - Construct additional eastbound approach lane for off-ramp.
  - Reconfigure eastbound approach to consist of 1 left turn lane, 1 shared lane and 1 right turn lane
  - Construct a second northbound right turn lane. (Alternatives 1 & 2)

- Redlands Boulevard at Eucalyptus Avenue - #5[15]
  - Construct a second northbound through lane.
  - Construct additional northbound approach lane to provide one right turn lane.
  - Construct a second southbound through lane.
  - Construct additional southbound approach lane to provide second left turn lane.
  - Construct a second eastbound through lane.
  - Construct additional eastbound approach lane to provide second left turn lane.
  - Construct additional eastbound approach lane to provide one right turn lane.
  - Construct additional westbound approach lane to provide second left turn lane.

Figure 44 graphically illustrates the identified improvements for General Plan Buildout (2040) Alternative 1, Alternative 2 and Alternative 3.

Site-adjacent improvements shall be constructed in conjunction with the project.

At some locations, payment of the City of Moreno Valley Development Impact Fee (DIF) would constitute mitigation of cumulative impacts. The City's Development Impact Fee program was adopted in Year 2005. The Development Impact Fee provides a funding mechanism for arterial streets, traffic signals, interchange improvements as well as emergency services. As noted in the Moreno Valley Municipal Code (Chapter 3.42), the Development Impact Fee costs included acquiring (right-of-way), designing, constructing and improving and maintaining of arterial streets from the current lane configuration to the ultimate lane configuration, new traffic signal as warranted, and interchange improvements. As required by City Code, all development projects are required to pay the Development Impact Fee as a condition of development.

Additionally, the City's General Plan Circulation Element and the Development Impact Fee program both include widening of Redlands Boulevard. The final designs have not been completed. The project will be constructing improvements at the Redlands Boulevard and Hemlock Avenue intersection as described in this report and is paying into the City's Development Impact Fee program.

[15] The Highland Fairview Corporate Park at the northeast corner of Redlands Boulevard and Eucalyptus Avenue is proposed to be developed with commercial retail and industrial land uses. The Highland Fairview Corporate Park Draft EIR (2008) states; "The project proponent shall construct the fourth leg of the intersection located at Redlands Boulevard and Eucalyptus Avenue at the ultimate design required to provide adequate capacity for all phases of the project and buildout of the adjacent areas. The design tentatively consists of a separate westbound left turn lane, two westbound through lanes and a dedicated westbound right turn lane."

STUDY AREA PLANNED IMPROVEMENTS

At some locations, payment of the City of Moreno Valley Development Impact Fee (DIF) would constitute mitigation of cumulative impacts. The City's Development Impact Fee program was adopted in Year 2005. The Development Impact Fee provides a funding mechanism for arterial streets, traffic signals, interchange improvements as well as emergency services. As noted in the Moreno Valley Municipal Code (Chapter 3.42), the Development Impact Fee costs included acquiring (right-of-way), designing, constructing and improving and maintaining of arterial streets from the current lane configuration to the ultimate lane configuration, new traffic signal as warranted, and interchange improvements. As required by City Code, all development projects are required to pay the Development Impact Fee as a condition of development.

Additionally, the City's General Plan Circulation Element and the Development Impact Fee program both include widening of Redlands Boulevard. The final designs have not been completed. The project will be constructing improvements at the Redlands Boulevard and Hemlock Avenue intersection as described in this report and is paying into the City's Development Impact Fee program.

Planned Arterial Improvements in the Study Area

Redlands Boulevard, which is currently two lanes undivided to three lanes divided, is identified for future improvements to elevate the capacity and is classified as a Divided Arterial (4 lane divided) roadway on the City of Moreno Valley General Plan Circulation Element.

Planned Interchange Improvements in the Study Area

The City of Moreno Valley and the California Department of Transportation propose to reconstruct the SR-60 Freeway/Redland Boulevard interchange. To accommodate the forecasted substantial traffic volume growth in the area, the proposed interchange improvements would alleviate peak hour traffic volume congestion, improve traffic volume flow on the freeway and at the interchange, improve safety by upgrading the ramp geometry, and provide standard vertical clearance for the SR-60 Freeway at the Redlands Boulevard overpass structure.

PROJECT TRIP CONTRIBUTION PERCENTAGES

For Opening Year (2024), the proportion of project peak hour traffic volume contributed to the improvement location relative to the total new peak hour traffic volume for Opening Year (2024) with Cumulative with Project conditions.

Table 17 presents a summary of project roadway segment trip contribution for study area roadway segments as a proportion of the anticipated Opening Year (2024) traffic volumes. The roadway segment calculations are based average daily traffic volumes.

The project proportional intersection trip contributions have been calculated in Table 18 for study area intersections as a proportion of the anticipated Opening Year (2024) traffic volumes. The intersection percentages are based on the higher of the morning or evening peak hour volumes. Improvements at the project driveways are project design features which shall be constructed by the project.

The project fair share is based on the proportion of project peak hour traffic volume contributed to the improvement location relative to the total new peak hour traffic volume for General Plan Buildout (Year 2040) with Project conditions.

Table 19 presents a summary of project roadway segment trip contribution for study area roadway segments as a proportion of the anticipated General Plan Buildout (Year 2040) traffic volumes. The roadway segment calculations are based average daily traffic volumes.

The project proportional intersection trip contributions have been calculated in Table 20 for study area intersections as a proportion of the anticipated General Plan Buildout (Year 2040) traffic volumes. The intersection percentages are based on the higher of the morning or evening peak hour volumes. Improvements at the project driveways are project design features which shall be constructed by the project.

These project fair share contribution estimates are provided for discussion purposes of any mitigation measure improvements not funded through the City of Moreno Valley Development Impact Fee (DIF) or other applicable fee programs. Costs estimates are sensitive to the quantity and location of work specified for a given installation. These values represent the relative magnitude of the cost and should be verified through the bidding process.

CONSTRUCTION TRAFFIC CONTROL MEASURES

A construction work site traffic control plan shall be submitted to the City for review and approval prior to the start of any construction work. The plans shall show the location of any roadway, sidewalk, bike route, bus stop or driveway closures, traffic detours, haul routes, hours of operation, protective devices, warning signs and access to abutting properties. Temporary traffic controls used around the construction area should adhere to the standards set forth in the California Manual of Uniform Traffic Control Devices (2014) and construction activities should adhere to applicable local ordinances.

Site development would require the use of haul trucks during site clearing and excavation and the use of a variety of other construction vehicles throughout the construction work at the site. Transportation of heavy construction equipment and or materials, which requires the use of oversized vehicles, will require the appropriate transportation permit.

Table 17
Project Roadway Segment Trip Contribution Percentages - Opening Year (2024)

ID	Roadway	Segment From	Segment To	Average Daily Traffic Volumes: Existing	Opening Year (2024) (EAGCP)	Cumulative Trips	Project Trips	Total New	Project Share
1.	Redlands Blvd	Ironwood Ave	Hemlock Ave	15,070	19,880	2,635	608	4,810	12.6%
2.	Redlands Blvd	Hemlock Ave	SR-60 WB Ramps	14,470	19,150	2,635	532	4,680	11.4%
3.	Redlands Blvd	SR-60 EB Ramps	Eucalyptus Ave	11,760	20,180	6,430	760	8,420	9.0%
4.	Ironwood Ave	west of Redlands Blvd	Redlands Blvd	4,420	5,210	180	152	790	19.2%
5.	Ironwood Ave	Redlands Blvd	east of Redlands Blvd	730	2,750	1,791	152	2,020	7.5%
6.	Hemlock Ave	west of Redlands Blvd	Redlands Blvd	0	530	0	530	530	100.0%
7.	Eucalyptus Ave	west of Redlands Blvd	Redlands Blvd	670	9,550	8,502	304	8,880	3.4%
8.	Eucalyptus Ave	Redlands Blvd	east of Redlands Blvd	330	2,460	1,790	304	2,130	14.3%

Table 18
Project Intersection Trip Contribution Percentages - Opening Year (2024)

I D Study Intersection	Estimated Construction Cost[1]	Peak Hour	Peak Hour Volume						Project % at Intersection[2]	Project Fair Share Cost
			Existing	Opening Year (2024) (EAGCP)	Cumulative Trips	Project Trips	New Trips	Project % of New Trips		
1. Redlands Blvd at Ironwood Ave	$0	AM	1,248	1,525	135	16	277	5.8%	5.8%	$0
		PM	1,630	2,029	213	20	399	5.0%		
2. Redlands Boulevard and Hemlock Avenue[3]	NA	AM	1,102	1,387	135	142	285	49.8%	49.8%	-
		PM	1,365	1,754	213	157	389	40.4%		
3. Redlands Blvd at SR-60 WB Ramps	$0	AM	1,212	1,692	200	61	480	12.7%	12.7%	$0
		PM	1,406	2,087	339	81	681	11.9%		
4. Redlands Blvd at SR-60 EB Ramps	$50,000	AM	1,044	1,403	248	42	359	11.7%	11.7%	$5,850
		PM	1,345	1,980	445	56	635	8.8%		
5. Redlands Boulevard and Eucalyptus Avenue[4]	$100,000	AM	919	1,342	307	24	423	5.7%	5.7%	$5,674
		PM	991	1,713	593	30	722	4.2%		
6. Project North Access at Hemlock Ave	N/A[5]	AM	0	35	0	35	35	100.0%	100.0%	-
		PM	0	40	0	40	40	100.0%		
7. Spruce Ave at Project South Access	N/A[5]	AM	10	176	0	165	166	99.4%	99.4%	-
		PM	16	203	0	185	187	98.9%		
Total										$11,523

Notes:

(1) Cost estimate based on values from the San Bernardino County Transportation Authority Preliminary Construction Cost Estimates For Congestion Management Program (2003). Costs estimates are sensitive to the quantity and location of work specified for a given installation. These values represent the relative magnitude of the cost and should be verified through the bidding process.

(2) Project share of new trips shown are the greater of the AM or PM percent contribution.

(3) Opening year improvements to Hemlock Avenue for project access will be funded and/or constructed by the applicant.

(4) Improvements to Redlands Boulevard / Eucalyptus intersection will be funded and/or constructed by others. The opening year improvements for southbound left turn and westbound right turn lanes are included in this estimate.

(5) Improvements to project access driveways will be funded and/or constructed by the applicant.

Table 19
Project Roadway Segment Trip Contribution Percentages - General Plan Buildout

ID	Roadway	Segment From	Segment To	Average Daily Traffic Volumes: Existing	General Plan Buildout (Year 2040)	Project Trips	Total New	Project Share
1.	Redlands Blvd	Ironwood Ave	Hemlock Ave	15,070	24,110	608	9,040	6.7%
2.	Redlands Blvd	Hemlock Ave	SR-60 WB Ramps	14,470	22,420	1,824	7,950	22.9%
3.	Redlands Blvd	SR-60 EB Ramps	Eucalyptus Ave	11,760	28,110	912	16,350	5.6%
4.	Ironwood Ave	west of Redlands Blvd	Redlands Blvd	4,420	9,150	152	4,730	3.2%
5.	Ironwood Ave	Redlands Blvd	east of Redlands Blvd	730	6,350	152	5,620	2.7%
6.	Hemlock Ave	west of Redlands Blvd	Redlands Blvd	0	5,910	1,824	5,910	30.9%
7.	Eucalyptus Ave	west of Redlands Blvd	Redlands Blvd	670	11,500	304	10,830	2.8%
8.	Eucalyptus Ave	Redlands Blvd	east of Redlands Blvd	330	9,500	304	9,170	3.3%

Table 20
Project Intersection Trip Contribution Percentages - General Plan Buildout

I D Study Intersection	Estimated Construction Cost[1]	Peak Hour	Peak Hour Volume					Project % at Intersection[2]	Project Fair Share Cost
			Existing	General Buildout (Year 2040) With Project	Project Trips	New Trips	Project % of New Trips		
1. Redlands Blvd at Ironwood Ave	$800,000	AM	1,248	2,335	16	1,087	1.5%	1.5%	$11,776
		PM	1,630	3,078	20	1,448	1.4%		
2. Redlands Boulevard and Hemlock Avenue[3]	$1,150,000	AM	1,102	2,405	142	1,303	10.9%	10.9%	$125,326
		PM	1,365	3,093	157	1,728	9.1%		
3. Redlands Blvd at SR-60 WB Ramps	$700,000	AM	1,212	2,692	61	1,480	4.1%	4.4%	$30,882
		PM	1,406	3,242	81	1,836	4.4%		
4. Redlands Blvd at SR-60 EB Ramps	$850,000	AM	1,044	2,615	42	1,571	2.7%	2.7%	$22,724
		PM	1,345	4,057	56	2,712	2.1%		
5. Redlands Boulevard and Eucalyptus Avenue[4]	$750,000	AM	919	2,599	24	1,680	1.4%	1.4%	$10,714
		PM	991	3,358	30	2,367	1.3%		
6. Project North Access at Hemlock Ave	N/A[5]	AM	0	527	122	527	23.1%	23.1%	-
		PM	0	728	134	728	18.4%		
8. Redlands Blvd at Project East Access	N/A[5]	AM	1,019	1,813	180	794	22.7%	22.7%	-
		PM	1,259	2,235	203	976	20.8%		
Total									$201,423

Notes:

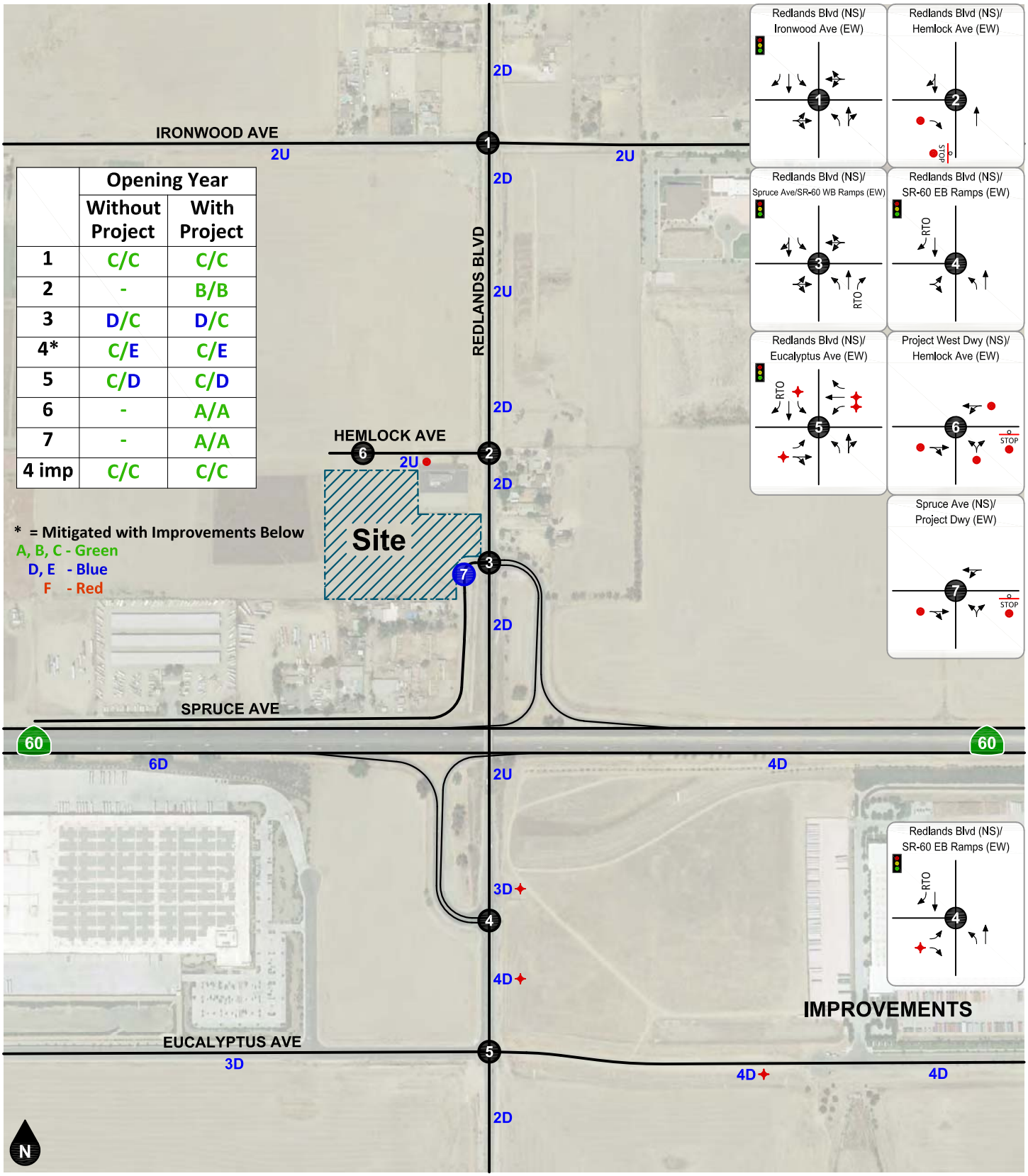
(1) Cost estimate based on values from the San Bernardino County Transportation Authority Preliminary Construction Cost Estimates For Congestion Management Program (2003). Costs estimates are sensitive to the quantity and location of work specified for a given installation. These values represent the relative magnitude of the cost and should be verified through the bidding process.

(2) Project share of new trips shown are the greater of the AM or PM percent contribution.

(3) Opening year improvements to Hemlock Avenue for project access will be funded and/or constructed by the applicant. The general plan buildout improvements for northbound lane and southbound lane, and traffic signal are included in this estimate. The westbound 2-lane approach is not included for fair-share and is attributed to other development.

(4) Improvements to Redlands Boulevard / Eucalyptus intersection will be funded and/or constructed by others. The general plan buildout improvements for northbound lanes, southbound lanes and turning movements to the north are included in this estimate.

(5) Improvements to project access driveways will be funded and/or constructed by the applicant.

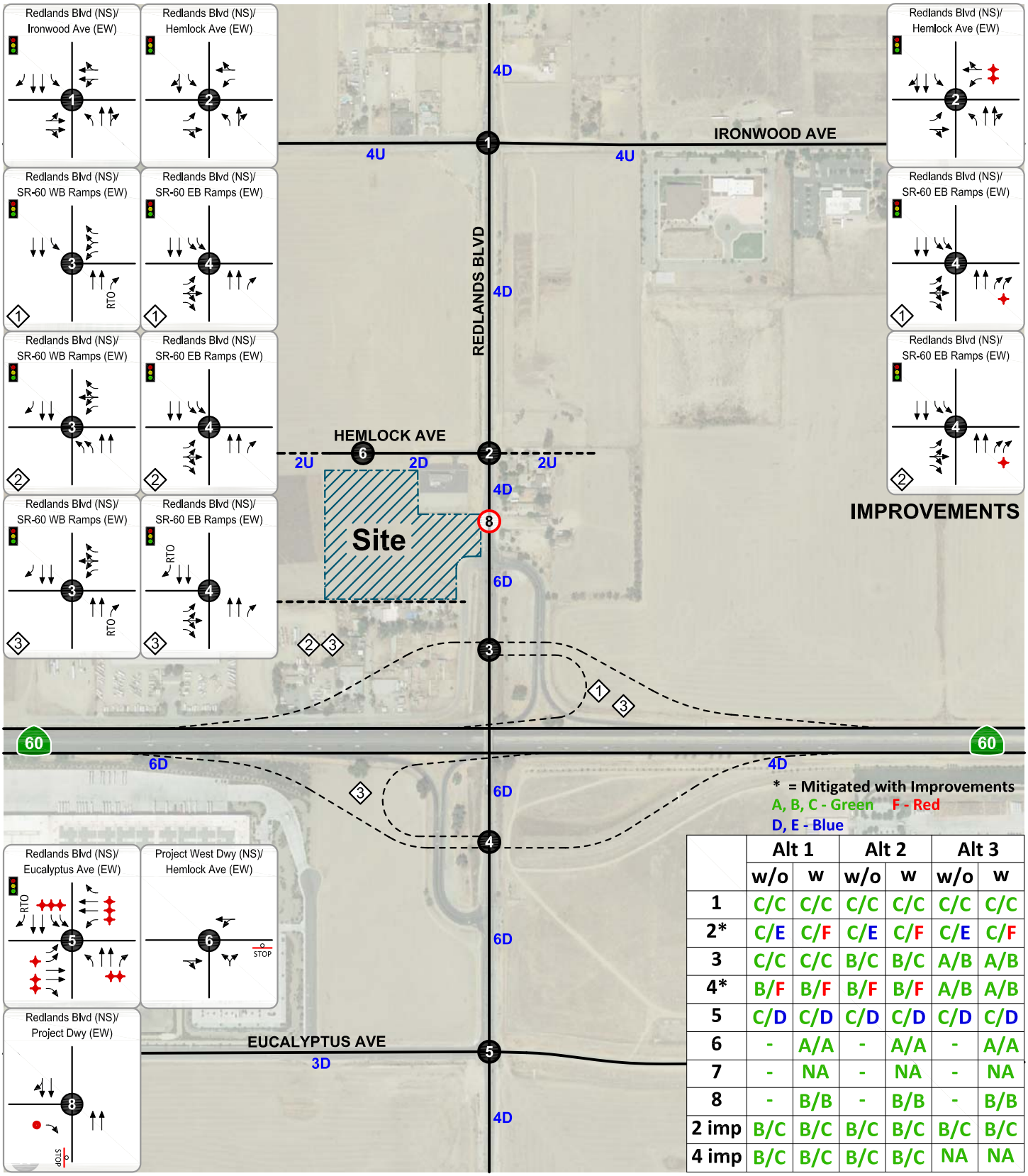


	Opening Year	
	Without Project	With Project
1	C/C	C/C
2	-	B/B
3	D/C	D/C
4*	C/E	C/E
5	C/D	C/D
6	-	A/A
7	-	A/A
4 imp	C/C	C/C

* = Mitigated with Improvements Below
A, B, C - Green
D, E - Blue
F - Red

Legend
- Traffic Signal
- Stop Sign
- #D #-Lane Divided Roadway
- #U #-Lane Undivided Roadway
- Existing Lane
- RTO Right Turn Overlap
- Project Improvement
- Other Development Improvement

Figure 43
Intersection Lanes, Traffic Control and Level of Service - Opening Year (2024)



* = Mitigated with Improvements
A, B, C - Green F - Red
D, E - Blue

	Alt 1		Alt 2		Alt 3	
	w/o	w	w/o	w	w/o	w
1	C/C	C/C	C/C	C/C	C/C	C/C
2*	C/E	C/F	C/E	C/F	C/E	C/F
3	C/C	C/C	B/C	B/C	A/B	A/B
4*	B/F	B/F	B/F	B/F	A/B	A/B
5	C/D	C/D	C/D	C/D	C/D	C/D
6	-	A/A	-	A/A	-	A/A
7	-	NA	-	NA	-	NA
8	-	B/B	-	B/B	-	B/B
2 imp	B/C	B/C	B/C	B/C	B/C	B/C
4 imp	B/C	B/C	B/C	B/C	NA	NA

Legend
- Traffic Signal
- Stop Sign
- #D #-Lane Divided Roadway
- #U #-Lane Undivided Roadway
- Existing Lane

- ① Alternative 1 Modified Spread Diamond
- ② Alternative 2 Spread Diamond
- ③ Alternative 3 Modified Cloverleaf

RTO Right Turn Overlap
- Project Improvement
- Other Development Improvement

Figure 44
Intersection Lanes, Traffic Control and Level of Service – General Plan Buildout Alternatives

13. CONCLUSIONS

The recommendations in this section address on-site improvements, off-site improvements and the phasing of all necessary study area transportation improvements. The improvements were determined through the operations analysis of Section 9 and mitigation measures of Section 12. Table 21 summarizes the operational analysis for analysis scenarios for Opening Year (2024). Table 22 summarizes the operational analysis for analysis scenarios for General Plan Buildout (2040) Alternative 1, Alternative 2 and Alternative 3.

FINDINGS OF SIGNIFICANCE

With implementation of the project design features, mitigation measures, and other planned improvements as summarized in the previous section, the proposed project is forecast to result in no unmitigated significant traffic impacts at the study intersections.

GENERAL RECOMMENDATIONS

On-site improvements and improvements adjacent to the site will be required in conjunction with the proposed development to ensure adequate circulation within the project itself.

Circulation recommendations with the interim Spruce Avenue project access traffic conditions for Opening Year (2024) are summarized on Figure 45.

Figure 46 summarizes the circulation recommendations with the Redlands Boulevard project access traffic conditions for General Plan Buildout Alternatives.

All roadway design, traffic signing and striping, and traffic control improvements relating to the proposed project should be constructed in accordance with applicable engineering standards and to the satisfaction of the City of Moreno Valley Public Works Department.

Off-street parking should be provided to meet City of Moreno Valley Municipal Code requirements.

The final grading, landscaping, and street improvement plans should demonstrate that sight distance standards are met in accordance with applicable City of Moreno Valley/California Department of Transportation sight distance standards.

Note: Any proposed improvements within Caltrans right-of-way are subject to Caltrans review and approval for encroachment permits.

Table 21
Summary of Intesection Level of Service - Interim

I D	Study Intersection	Existing				Existing Plus Project				Opening Year (2022) Without Project				Opening Year (2022) With Project			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]
1.	Redlands Blvd at Ironwood Ave	14.7	B	16.4	B	15.0	B	17.0	B	21.0	C	27.8	C	21.5	C	28.7	C
2.	Redlands Blvd at Hemlock Ave	-	-	-	-	13.8	B	14.7	B	-	-	-	-	16.0	C	17.3	C
3.	Redlands Blvd at SR-60 WB Ramps	42.4	D	20.2	C	43.6	D	28.7	C	42.8	D	27.4	C	44.5	D	43.3	D
4.	Redlands Blvd at SR-60 EB Ramps	24.3	C	35.8	D	24.1	C	35.9	D	27.0	C	56.6	E	27.3	C	58.0	E
	With Improvements	-		-		-		-		23.9	C	32.8	C	24.0	C	34.6	C
5.	Redlands Blvd at Eucalyptus Ave	9.2	A	8.8	A	8.6	A	9.4	A	22.2	C	36.4	D	22.9	C	37.5	D
6.	Project North Access at Hemlock Ave	-	-	-	-	8.4	A	8.4	A	-	-	-	-	8.4	A	8.4	A
7.	Spruce Ave at Project South Access	-	-	-	-	8.7	A	8.8	A	-	-	-	-	8.7	A	8.8	A

Notes:

(1) Delay is shown in seconds per vehicle. For intersections with traffic signal or all way stop control, overall average intersection delay and LOS are shown. For intersections with cross street stop control, LOS is based on average delay of the worst individual lane (or movements sharing a lane).

(2) LOS = Level of Service

Table 22
Summary of Intesection Level of Service - General Plan Builout Alternatives

	Alternative 1 Without Project				Alternative 1 With Project				Alternative 2 Without Project				Alternative 2 With Project				Alternative 3 Without Project				Alternative 3 With Project			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
I D Study Intersection	Delay[1]	LOS[2]	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. Redlands Blvd at Ironwood Ave	24.1	C	28.2	C	24.2	C	28.4	C	24.1	C	28.2	C	24.2	C	28.4	C	24.1	C	28.2	C	24.2	C	28.4	C
2. Redlands Blvd at Hemlock Ave	23.3	C	68.9	E	31.0	C	87.8	F	23.3	C	68.9	E	31.0	C	87.8	F	23.3	C	68.9	E	31.0	C	87.8	F
With Improvements	16.9	B	24.6	C	17.8	B	29.2	C	16.9	B	24.6	C	17.8	B	29.2	C	16.9	B	24.6	C	17.8	B	29.2	C
3. Redlands Blvd at SR-60 WB Ramp	28.2	C	22.4	C	29.3	C	23.1	C	16.0	B	21.6	C	15.9	B	21.8	C	8.6	A	11.7	B	10.0	A	11.8	B
4. Redlands Blvd at SR-60 EB Ramp	14.4	B	83.4	F	14.5	B	84.2	F	14.4	B	83.0	F	14.5	B	83.7	F	7.3	A	23.2	C	8.3	A	20.6	C
With Improvements	14.3	B	28.1	C	14.4	B	28.6	C	14.3	B	27.6	C	14.4	B	28.1	C	-		-		-		-	
5. Redlands Blvd at Eucalyptus Ave	32.1	C	41.6	D	32.3	C	42.2	D	32.1	C	41.6	D	32.3	C	42.2	D	32.1	C	41.6	D	32.3	C	42.2	D
6. Project North Access at Hemlock Ave	-	-	-	-	9.1	A	10.8	B	-	-	-	-	9.1	A	10.8	B	-	-	-	-	9.1	A	10.8	B
8. Redlands Blvd at Project East Access	-	-	-	-	12.4	B	13.8	B	-	-	-	-	12.4	B	13.8	B	-	-	-	-	12.4	B	13.8	B

Notes:

(1) Delay is shown in seconds per vehicle. For intersections with traffic signal or all way stop control, overall average intersection delay and LOS are shown. For intersections with cross street stop control, LOS is based on average delay of the worst individual lane (or movements sharing a lane).

(2) LOS = Level of Service

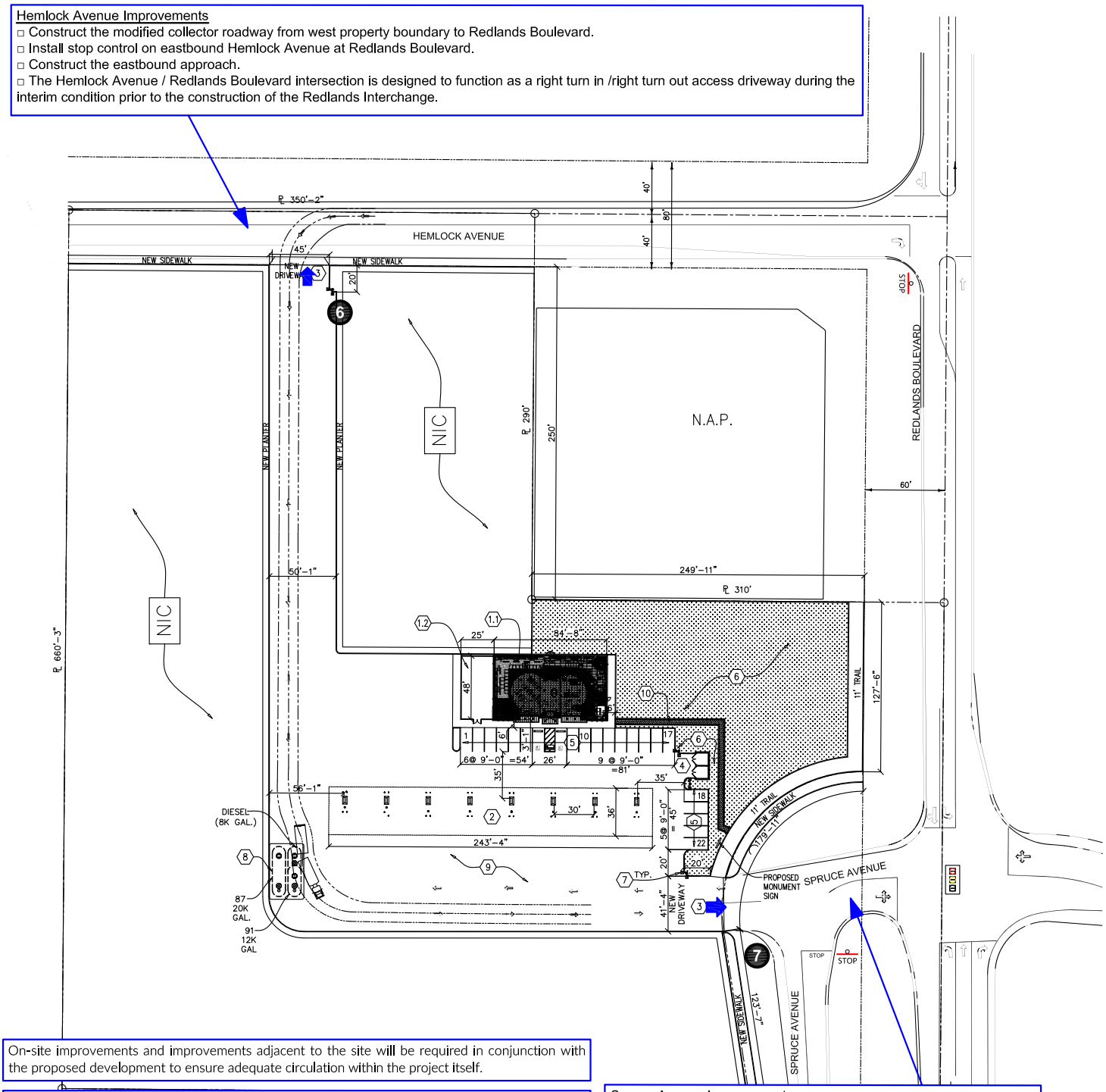
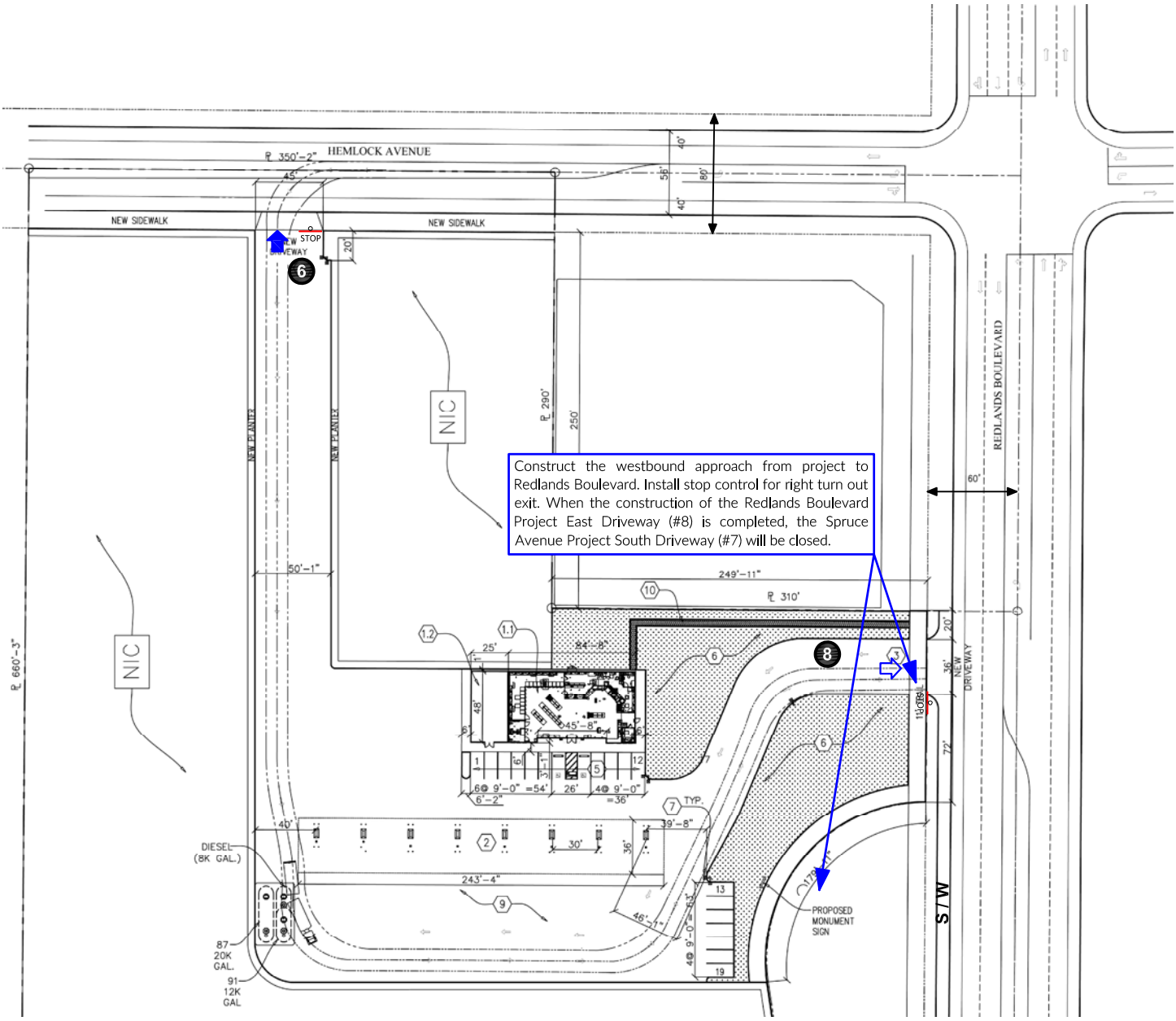


Figure 45
Circulation Recommendations - Interim



On-site improvements and improvements adjacent to the site will be required in conjunction with the proposed development to ensure adequate circulation within the project itself.

All roadway design, traffic signing and striping, and traffic control improvements relating to the proposed project should be constructed in accordance with applicable engineering standards and to the satisfaction of the City of Moreno Valley Public Works Department.

Off-street parking should be provided to meet City of Moreno Valley Municipal Code requirements.

The final grading, landscaping, and street improvement plans should demonstrate that sight distance standards are met in accordance with applicable City of Moreno Valley/California Department of Transportation sight distance standards.

General Plan Buildout Pavement and Lanes for Graphical presentation only. Roadway design to be determined by roadway engineer during the design phase of the interchange.

N

Legend

- STOP Stop Sign
- Full Access Driveway
- Right Turns In/Out Only Access Driveway
- # Project Access Driveway

Note: Any proposed improvements within Caltrans right-of-way are subject to Caltrans review and approval for encroachment permits.

Figure 46
Circulation Recommendations – Ultimate