# Appendix I

## Redlands Avenue West Industrial Project DPR20-00020
## Traffic Impact Analysis

Ganddini Group

March 8, 2022

# REDLANDS AVENUE WEST INDUSTRIAL PROJECT (DPR 20-000-20) TRAFFIC IMPACT ANALYSIS

City of Perris

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gandini

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

# REDLANDS AVENUE WEST INDUSTRIAL PROJECT (DPR 20-000-20) TRAFFIC IMPACT ANALYSIS

City of Perris

March 8, 2022

*prepared by*

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Project No. 19370

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# EXECUTIVE SUMMARY

The purpose of this study is to evaluate the potential for transportation impacts resulting from development of the proposed project both in the context of the City of Perris' discretionary authority for conformance with locally established operational standards and the California Environmental Quality Act (CEQA). 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 terms related to transportation engineering.

This study was prepared in consultation with City of Perris staff and in accordance with the procedures and methodologies for assessing transportation impacts established by the City of Perris. To assess the project's conformance with local operational standards, this study evaluates the project's effect on traffic operations and, if necessary, identifies recommended improvements or corrective measures to alleviate operational deficiencies substantially caused or worsened by the proposed project. For CEQA purposes, this study also evaluates the significance of project-related transportation impacts as measured by vehicle miles traveled (VMT) relative to thresholds established by the City of Perris as the lead agency and, if necessary, identifies any feasible mitigation measures to mitigate any significant impacts.

*Project Description*

The approximately 20.26-acre project site is located west of Redlands Avenue, approximately 1,000 feet south of Rider Street, and north of Placentia Avenue in the City of Perris, California.

The currently vacant site is proposed to be developed with a 330,447 square foot warehouse building with an additional 4,000 square foot mezzanine totaling 334,447 square feet of gross floor area. The project proposes three access driveways on Redlands Avenue. The north and south driveways will serve truck traffic only and the central driveway will serve passenger cars only. For purposes of this analysis, the proposed project is anticipated to be constructed and fully operational by year 2023.

*Existing Conditions*

The study intersections currently operate within acceptable Levels of Service during the peak hours for Existing conditions.

*Project Trip Generation*

The proposed project is forecast to generate approximately 605 daily vehicle trips, including 51 vehicle trips during the AM peak hour and 51 vehicle trips during the PM peak hour. The proposed project is forecast to generate approximately 857 daily PCE trips, including 59 PCE trips during the AM peak hour and 55 PCE trips during the PM peak hour.

*Levels of Service/Operational Analysis Findings (Non-CEQA)*

The study intersections are forecast to operate within acceptable Levels of Service (D or better) during the peak hours for Existing Plus Project conditions. Therefore, the proposed project is forecast to result in no substantial operational deficiencies at the study intersections for Existing Plus Project conditions and no off-site improvements or corrective measures are recommended.

The study intersections are projected to operate within acceptable Levels of Service (D or better) during the peak hours for Opening Year (2023) With Project conditions. Therefore, the proposed project is forecast to result in no substantial operational deficiencies at the study intersections for Opening Year (2023) With Project conditions and no off-site improvements or corrective measures are recommended.

*VMT Analysis Findings (CEQA)*

The proposed project is presumed to have a less than significant impact on VMT since it satisfies one or more of the VMT screening criteria established by the City of Perris (the project site is in a low VMT area). No additional VMT modeling or mitigation measures are required.

# 1. INTRODUCTION

This section introduces the proposed project and the general scope of the analysis.

## PROJECT DESCRIPTION

The approximately 20.26-acre project site is located west of Redlands Avenue, approximately 1,000 feet south of Rider Street, and north of Placentia Avenue in the City of Perris, California. Figure 1 shows the project location map.

The currently vacant site is proposed to be developed with a 330,447 square foot warehouse building with an additional 4,000 square foot mezzanine totaling 334,447 square feet of gross floor area. The project proposes three access driveways on Redlands Avenue. The north and south driveways will serve truck traffic only and the central driveway will serve passenger cars only. For purposes of this analysis, the proposed project is anticipated to be constructed and fully operational by year 2023. Figure 2 illustrates the project site plan.

## SCOPE OF ANALYSIS

The scope of this analysis was determined in consultation with City of Perris staff as documented in the City-approved scoping agreement provided in Appendix B.

### Study Area

Based on the study intersections identified in the approved scoping agreement (Appendix B), the study area consists of the following study intersections within City of Perris jurisdiction:

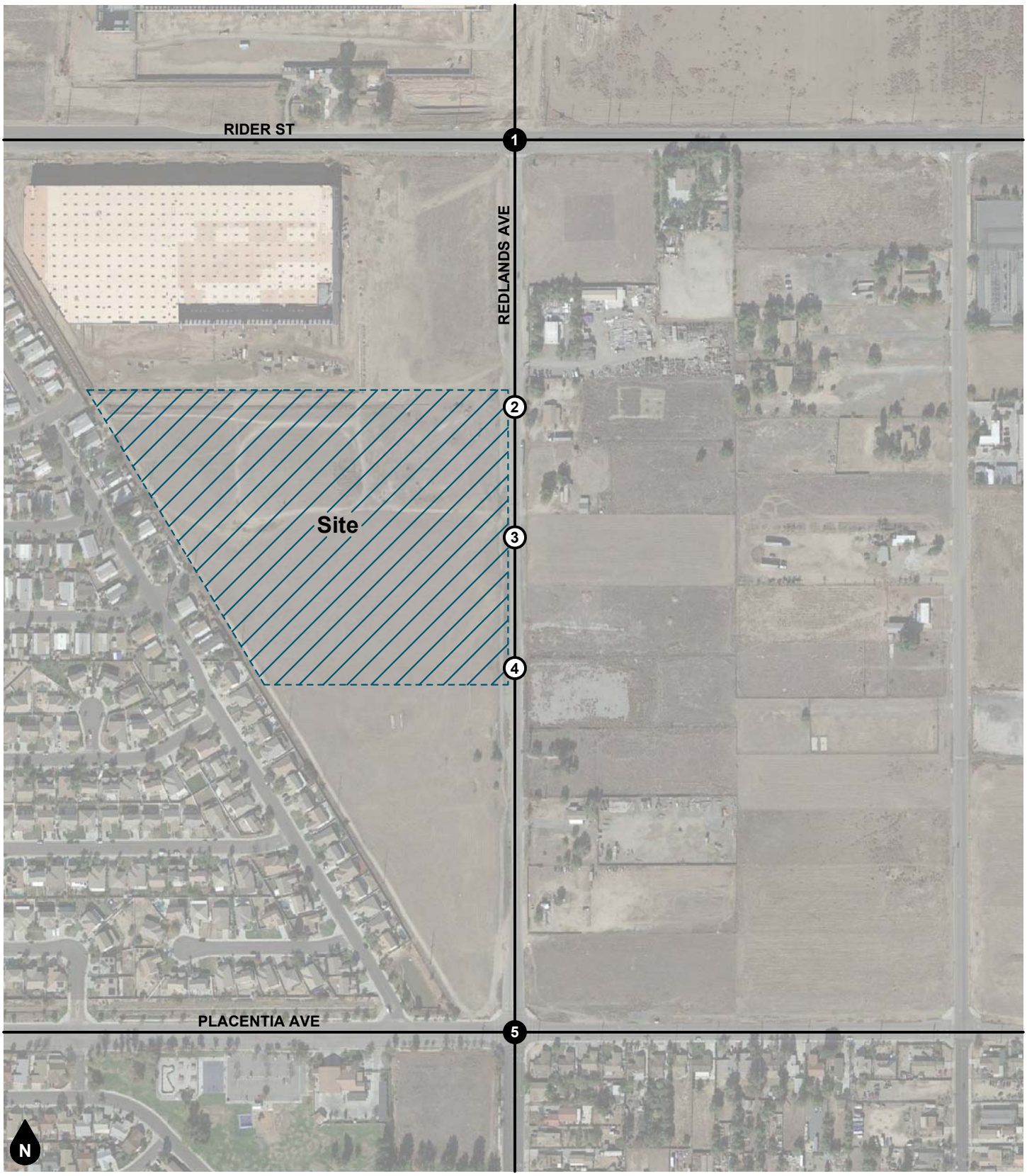
| Study Intersections[1] | Jurisdiction |
|---|---|
| 1. Redlands Avenue (NS) at Rider Street (EW) | City of Perris |
| 2. Redlands Avenue (NS) at Project North Driveway (EW) | City of Perris |
| 3. Redlands Avenue (NS) at Project Central Driveway (EW) | City of Perris |
| 4. Redlands Avenue (NS) at Project South Driveway (EW) | City of Perris |
| 5. Redlands Avenue (NS) at Placentia Avenue (EW) | City of Perris |

Notes:
1. (NS) = North-South roadway; (EW) = East-West roadway

### Analysis Scenarios

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

- Existing Conditions
- Existing Plus Project Conditions
- Opening Year (2023) Without Project Conditions
- Opening Year (2023) With Project Conditions




Legend

(#) Study Intersection

(#) Project Driveway

**Figure 1**
**Project Location Map**

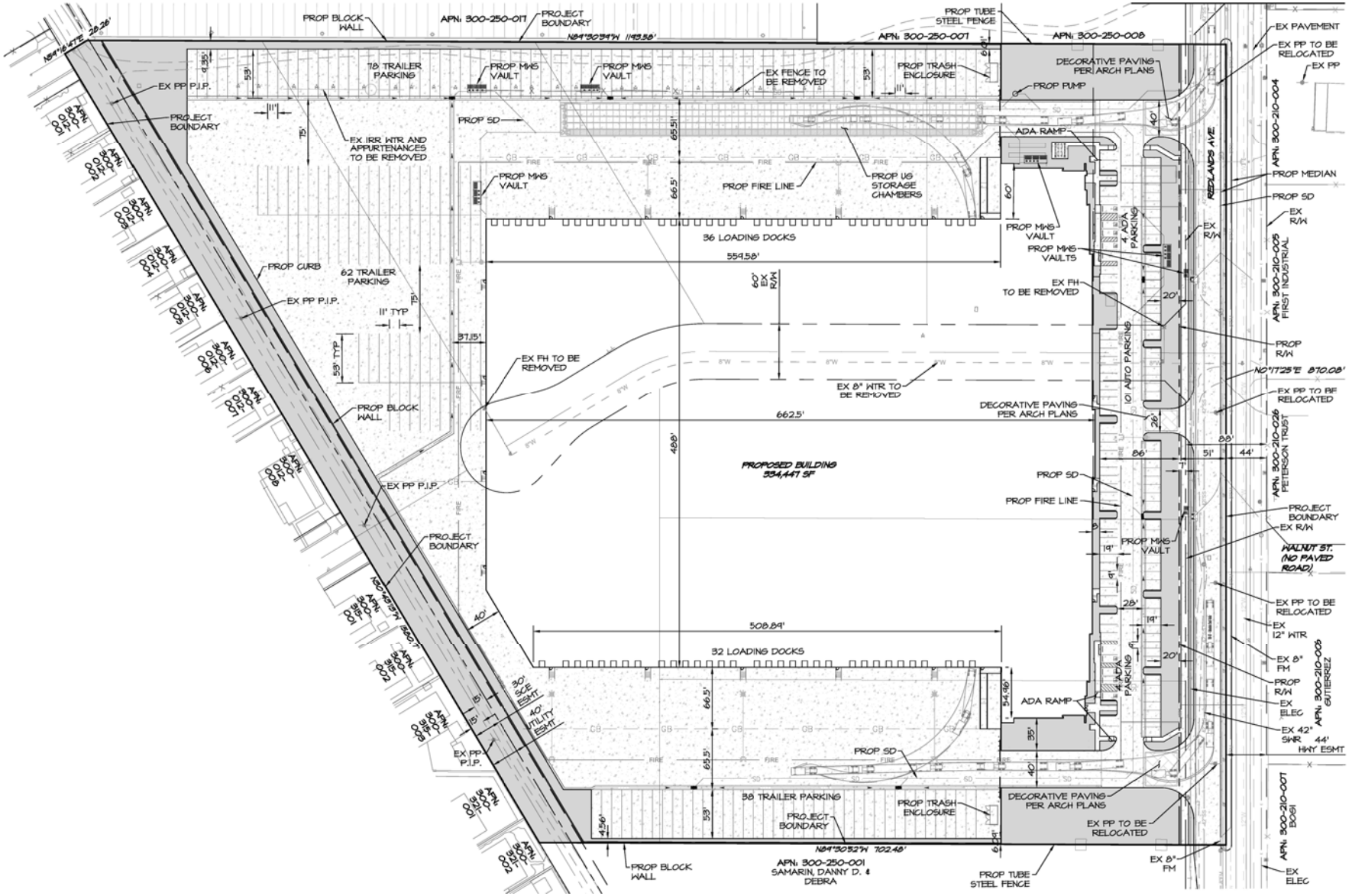



**Figure 2**
**Site Plan**

# 2. METHODOLOGY

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

## LEVEL OF SERVICE ANALYTICAL METHODOLOGY (NON-CEQA)

Level of Service analysis is performed for assessing conformance with General Plan and operational standards established by the applicable agencies. In accordance with current CEQA provisions, a project's effect on automobile delay (as measured by Level of Service) shall not constitute a significant environmental impact.

### Intersection Delay Methodology

The technique used to assess the performance of intersections 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 and Level of Service calculations were performed using the Vistro software.

### Performance Standards

The City of Perris has established Level of Service D as the minimum acceptable Level of Service along all City maintained roads (including intersections) and Level of Service D along I-215 and SR-74 (including intersections with local streets and roads). An exception to the local road standard is Level of Service E at intersections of any Arterials and Expressways with SR-74, the Ramona-Cajalco Expressway, or at I-215 freeway ramps. Level of Service E may be allowed within the boundaries of the Downtown Specific Plan Area to the extent that it would support transit-oriented development and walkable communities. Increased

congestion in this area will facilitate an increase in transit ridership and encourage development of a complementary mix of land uses within a comfortable walking distance from light rail stations.

**Substantial Operational Deficiency Criteria**

The following criteria are used to determine whether a project causes a substantial operational deficiency and should be required to provide improvements or corrective measures.

In the City of Perris, a project is considered to result in a substantial operational deficiency at a study intersection if one or more of the following conditions are satisfied:

- The addition of 50 or more peak hour project generated trips is forecast to cause an intersection to deteriorate from acceptable Level of Service (D or better) to unacceptable Level of Service (E or F); or,

- The addition of 50 or more peak hour project generated trips worsens the delay by 2 seconds or more at an intersection operating at an unacceptable Level of Service (E or F) in the baseline condition.

- A cumulative impact is considered significant when a study intersection is forecast to operate at an unacceptable Level of Service (E or F) with the addition of cumulative/background traffic and 50 or more peak hour project trips.

If a project is forecast to result in a substantial operational deficiency, recommended corrective measures are identified that would reduce the project's effect to a level that does not exceed the specified deficiency criteria. Corrective measures can be in many forms, including the construction of physical improvements (e.g., addition of travel lanes, traffic control modifications, etc.) or the implementation of transportation demand management measures.

### VEHICLE MILES TRAVELED ANALYTICAL METHODOLOGY (CEQA)

The metric used to evaluate the transportation impact of land use and transportation projects under CEQA is known as vehicle miles traveled (VMT). In general terms, VMT quantifies the amount and distance of automobile travel attributable to a project or region. Additional information and a detailed project assessment is provided in the Vehicle Miles Traveled section presented later in this report.

# 3. EXISTING CONDITIONS

This section describes the existing transportation setting in the project vicinity.

### EXISTING ROADWAY SYSTEM

Figure 3 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 site is provided by the Interstate 215 (I-215) Freeway located approximately 1.5 miles west of the project site. Key roadways providing local circulation include Redlands Avenue, Rider Street, and Placentia Avenue.

### GENERAL PLAN CONTEXT

Figure 4 shows the City of Perris 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 Perris standard roadway cross-sections are illustrated on Figure 5.

### TRUCK ROUTES

The City of Perris General Plan truck routes are illustrated on Figure 6. Existing truck routes in the project vicinity are shown on Figure 6. There are currently designated truck routes along Redlands Avenue adjacent to the project site. The truck routes have recently changed, and this figure represents the preliminary truck routes.

### TRANSIT SERVICE

Figure 7 shows Existing public transit facilities and routes in the project vicinity. As shown on Figure 7, the study area is currently served by the Riverside Transit Agency (RTA) bus service. RTA Route 41 runs along Rider Street.

### BICYCLE AND PEDESTRIAN FACILITIES

The City of Perris Active Transportation Plan bikeways are illustrated on Figure 8. There are currently no existing bicycle lanes along Redlands Avenue adjacent to the project site. It is noted that the City of Perris General Plan bike routes has not been updated to reflect the recent adoption of the Active Transportation Plan. The City of Perris General Plan shows a proposed Class II bicycle lane on Redlands Avenue along the project site frontage and the Active Transportation Plan, as shown on Figure 8, identifies a Class I shared-use path. The proposed site plan includes a Class I shared-use path on the street frontage and is dedicating an additional four feet of right-of-way beyond what is required by the General Plan.

Existing pedestrian facilities in the project vicinity are shown on Figure 9. Sidewalks are not currently provided on Redlands Avenue along the project site frontage.

### EXISTING ROADWAY VOLUMES

Figure 10 shows estimated existing average daily traffic volumes. The existing average daily traffic volumes were factored from peak hour intersection volumes using the following formula for each intersection leg:

PM Peak Hour (Approach Volume + Exit Volume) x 12 = Leg Volume.

Figure 11 and Figure 12 show the Existing AM and PM peak hour intersection turning movement volumes. Existing peak hour intersection volumes are based upon AM peak period and PM peak period intersection turning movement counts obtained in May 2021 during typical weekday conditions. The weekday AM peak period was counted between 7:00 AM and 9:00 AM and the weekday PM peak period was counted between 4:00 PM and 6:00 PM; these periods generally capture the peak times for commuter traffic when the roadway system is typically experiencing peak demand. The actual peak hour within each two-hour count period is determined based on the sum of the four consecutive 15-minute periods with the highest total volume. 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 total volume and may vary at other intersections. Intersection turning movement count worksheets are provided in Appendix C.

## EXISTING LEVELS OF SERVICE

The intersection Levels of Service for Existing conditions are shown in Table 1. Existing intersection Level of Service calculation worksheets are provided in Appendix D.

As shown in Table 1, the study intersections currently operate within acceptable Levels of Service (D or better) during the peak hours for Existing conditions.

**Table 1**
**Existing Intersection Levels of Service**

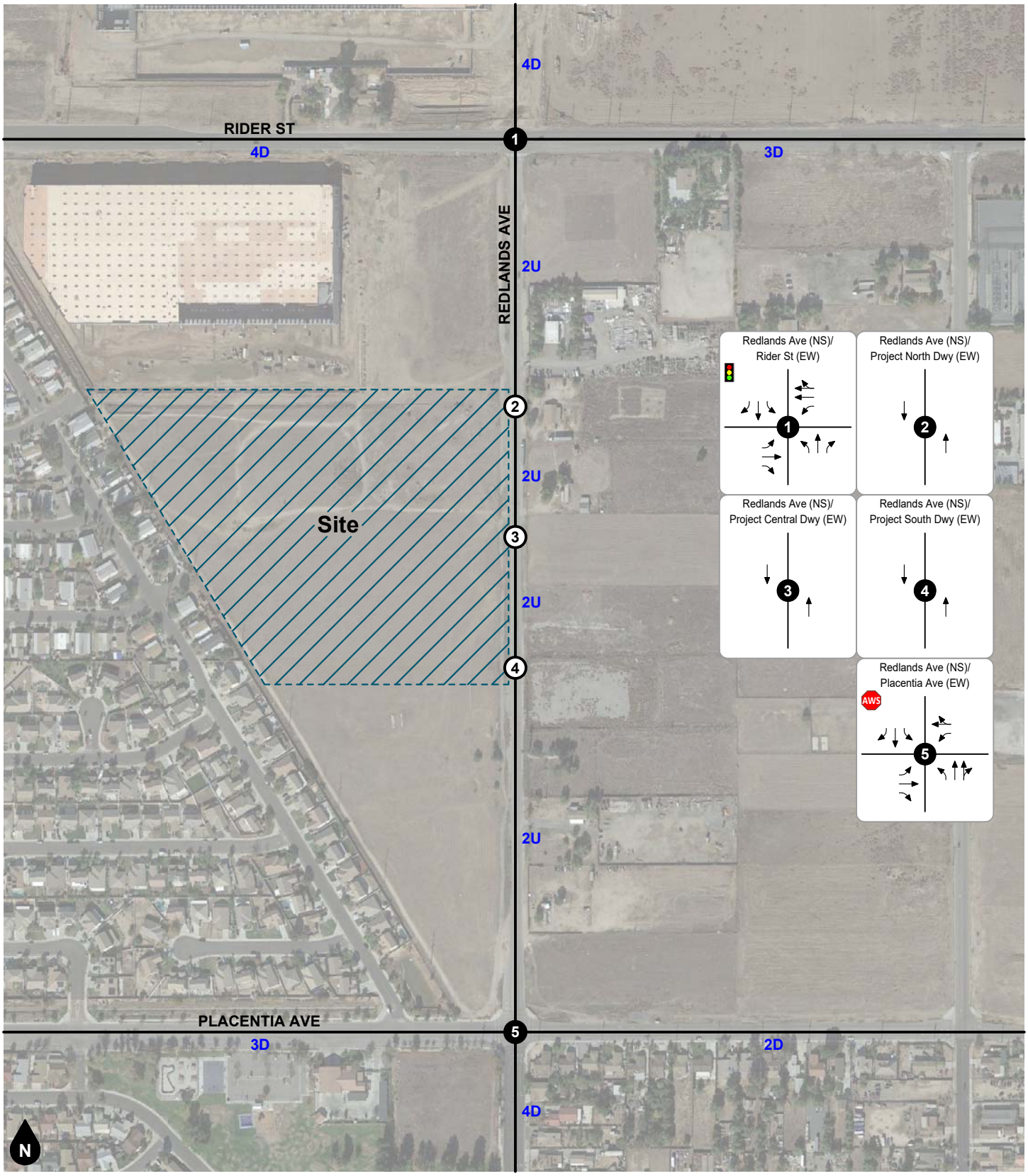
| Study Intersection | Traffic Control[1] | AM Peak Hour | | PM Peak Hour | |
|---|---|---|---|---|---|
| | | Delay[2] | LOS[3] | Delay[2] | LOS[3] |
| 1. Redlands Avenue at Rider Street | TS | 26.5 | C | 23.7 | C |
| 5. Redlands Avenue at Placentia Avenue | AWS | 8.2 | A | 9.0 | A |

Notes:

(1) TS = Traffic Signal; AWS = All Way Stop

(2) Delay is shown in seconds/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
- All Way Stop
- #D #-Lane Divided Roadway
- #U #-Lane Undivided Roadway
- Existing Lane

**Figure 3**
**Existing Lane Geometry and Intersection Traffic Controls**

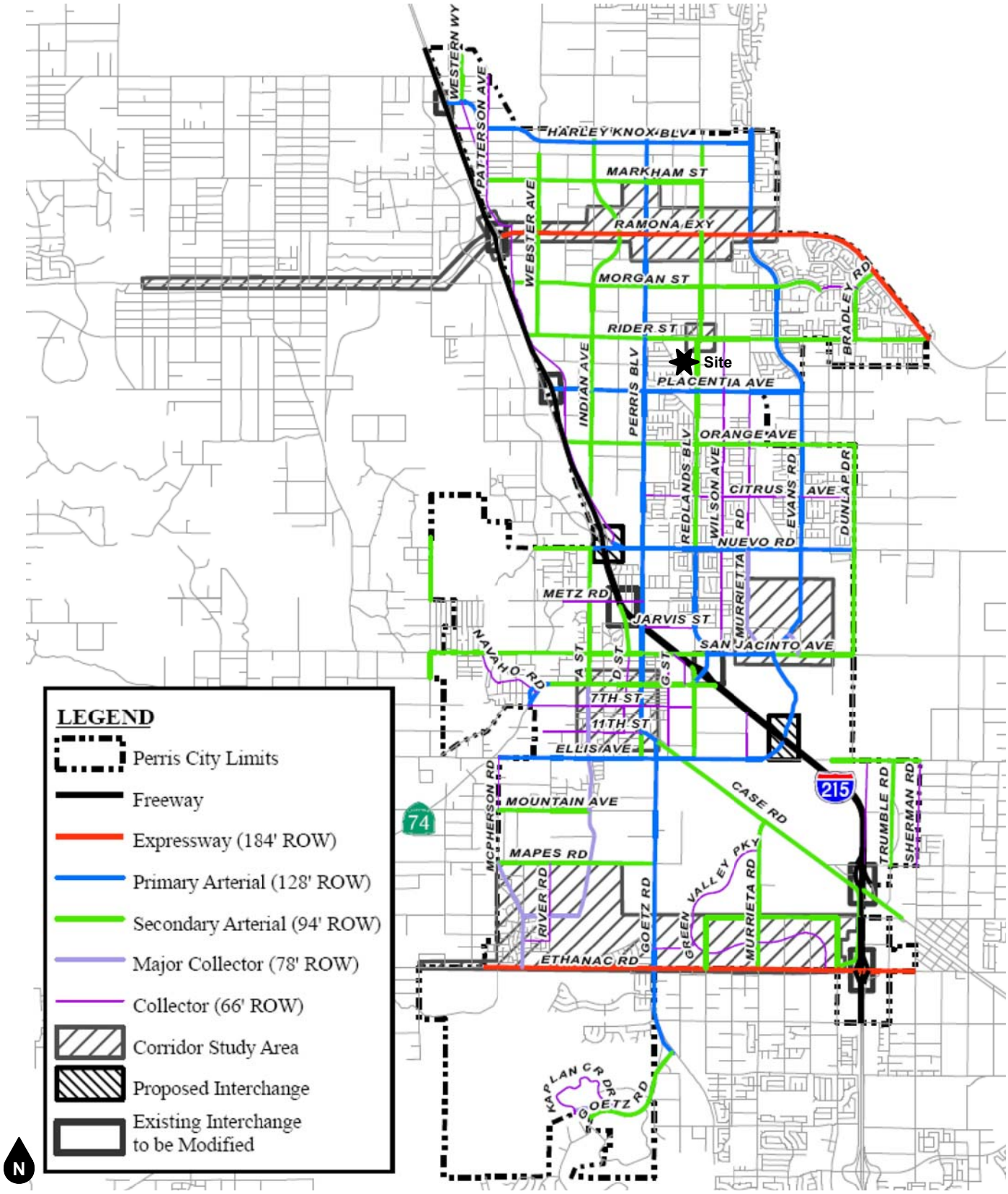
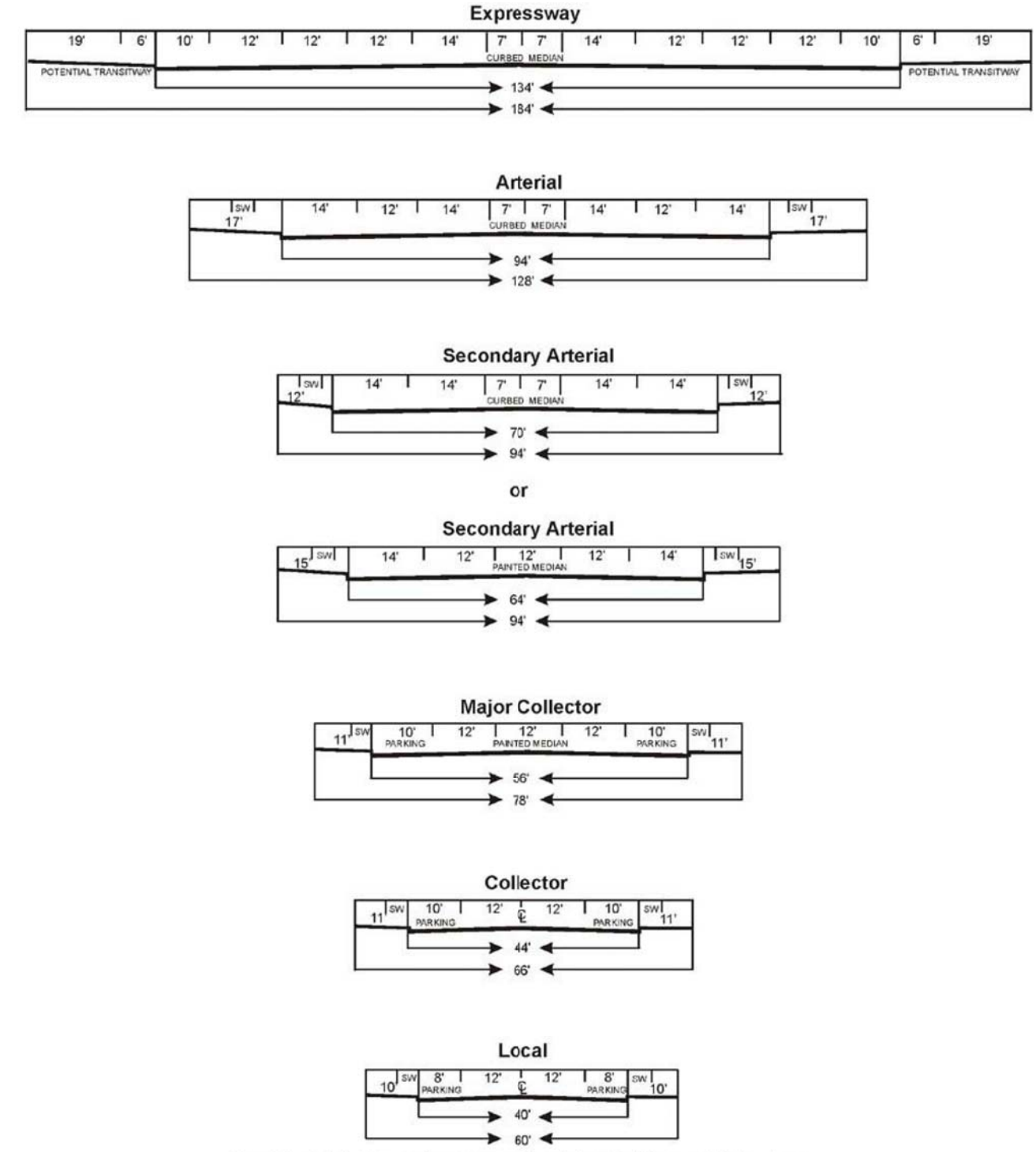



**Figure 4**
**City of Perris General Plan Circulation Element**

Source: City of Perris



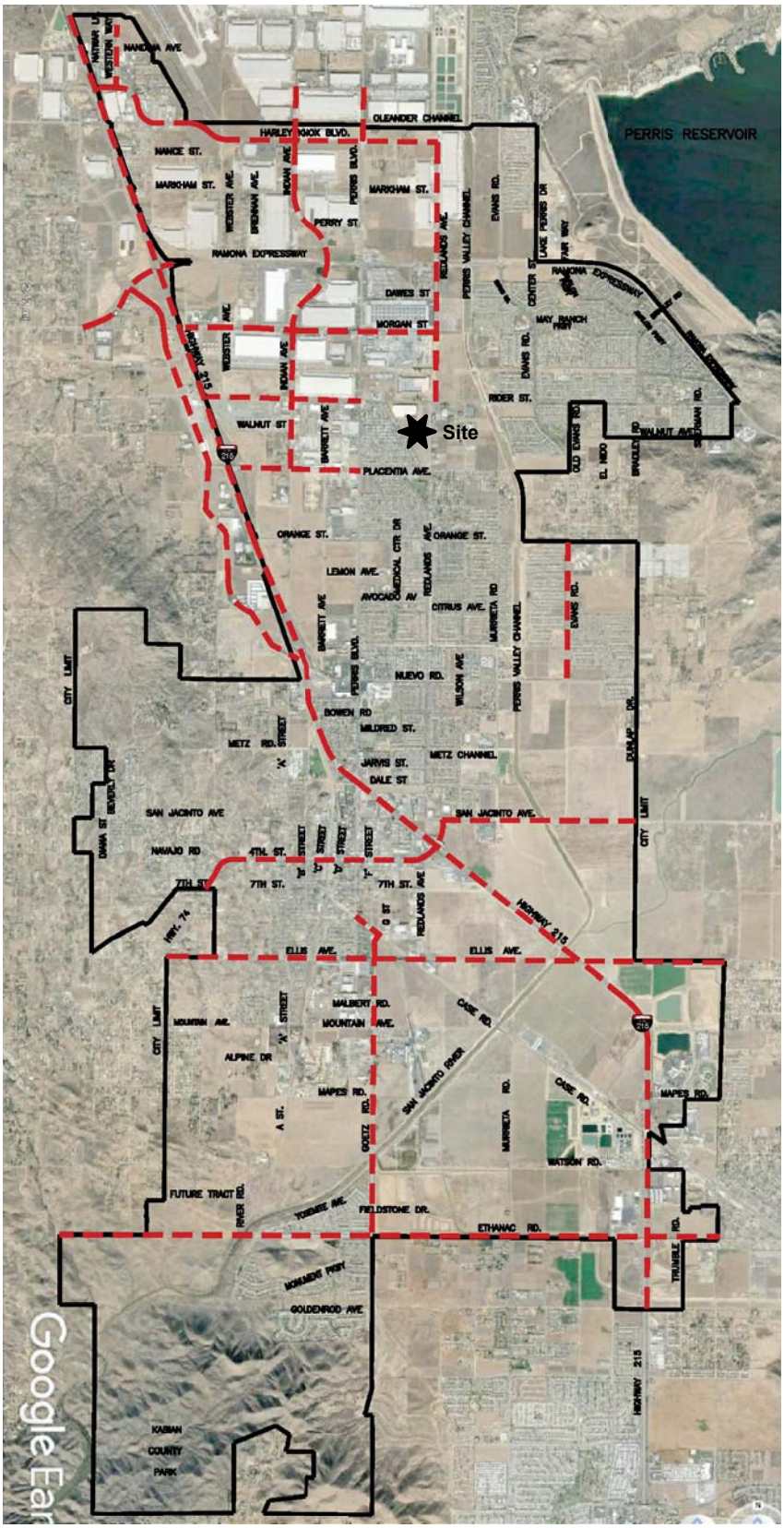

Specific details for each cross-section follow in Figures 4.1 A - 4.1 F

**Legend**

| | |
|---|---|
| SW | Sidewalk or Trail (at least 4 feet) |
| CURBED MEDIAN | Landscaped Center Median |
| PARKING | Parking or Bike Lane |
| PAINTED MEDIAN | Center Median and/or Continuous Left Turning Lane |

**Figure 5**
**City of Perris General Plan Roadway Cross-Sections**

Source: City of Perris




N

Legend

TRUCK ROUTES

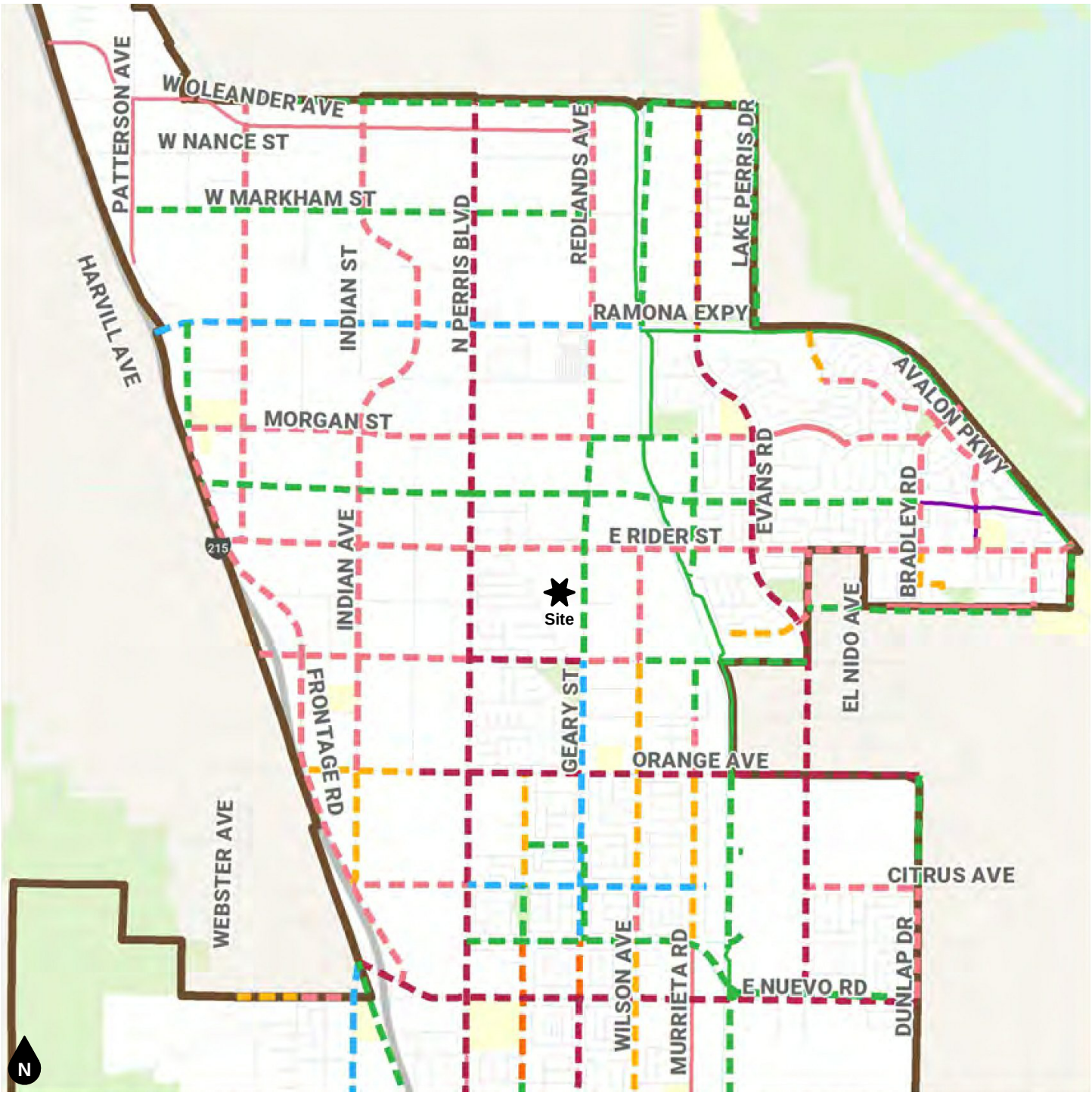
PERRIS CITY LIMITS

Source: City of Perris

**Figure 6**
**City of Perris General Plan Truck Routes**

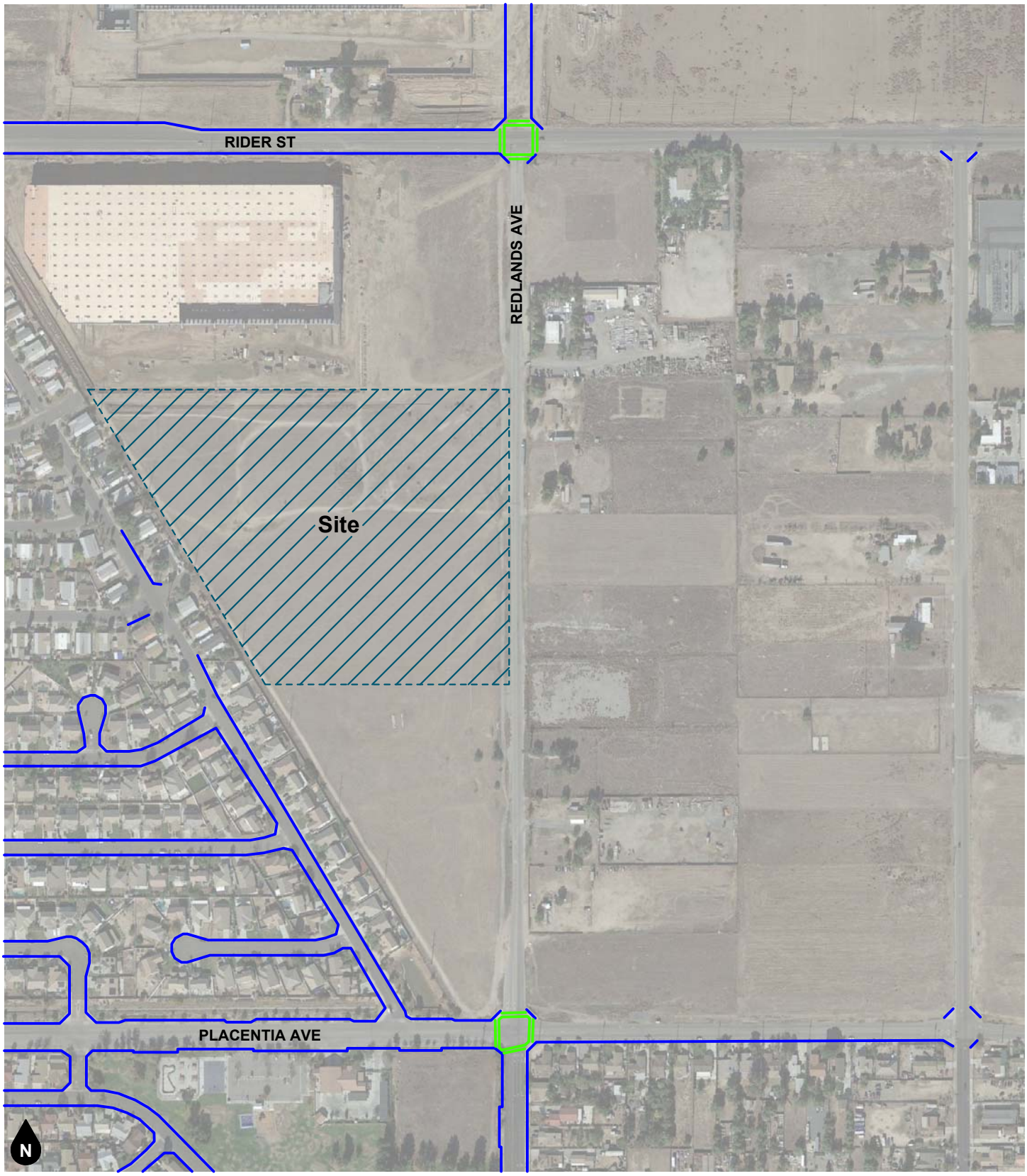

**Figure 7**
**Existing Transit Routes**

Source: Riverside Transit Agency



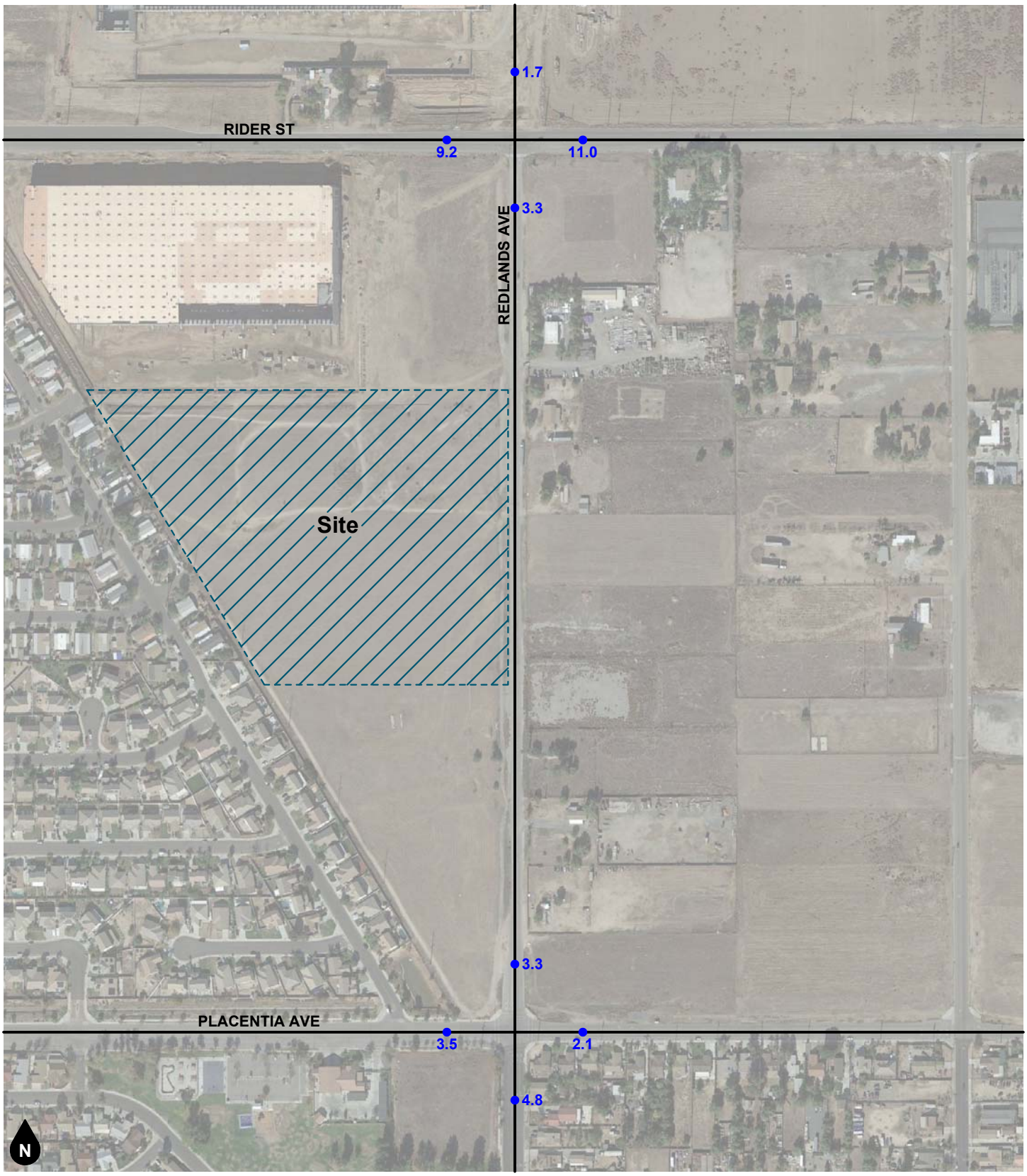

Source: City of Perris

**Figure 8**
**City of Perris Active Transportation Plan Bikeways**



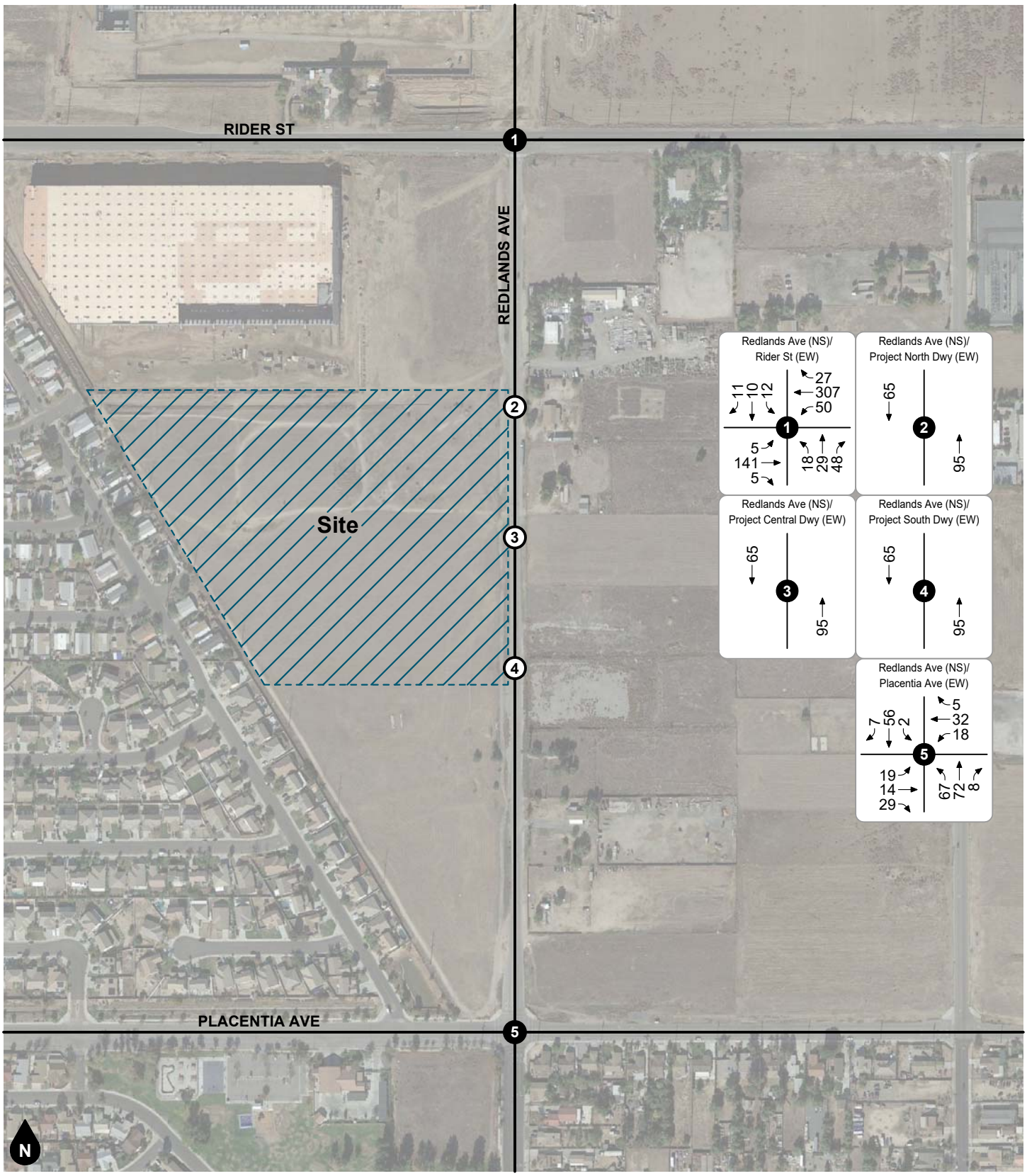

Legend
Sidewalk
Cross Walk

**Figure 9**
**Existing Pedestrian Facilities**




Legend
●## Vehicles Per Day (1,000's)

**Figure 10**
**Existing Average Daily Traffic Volumes**

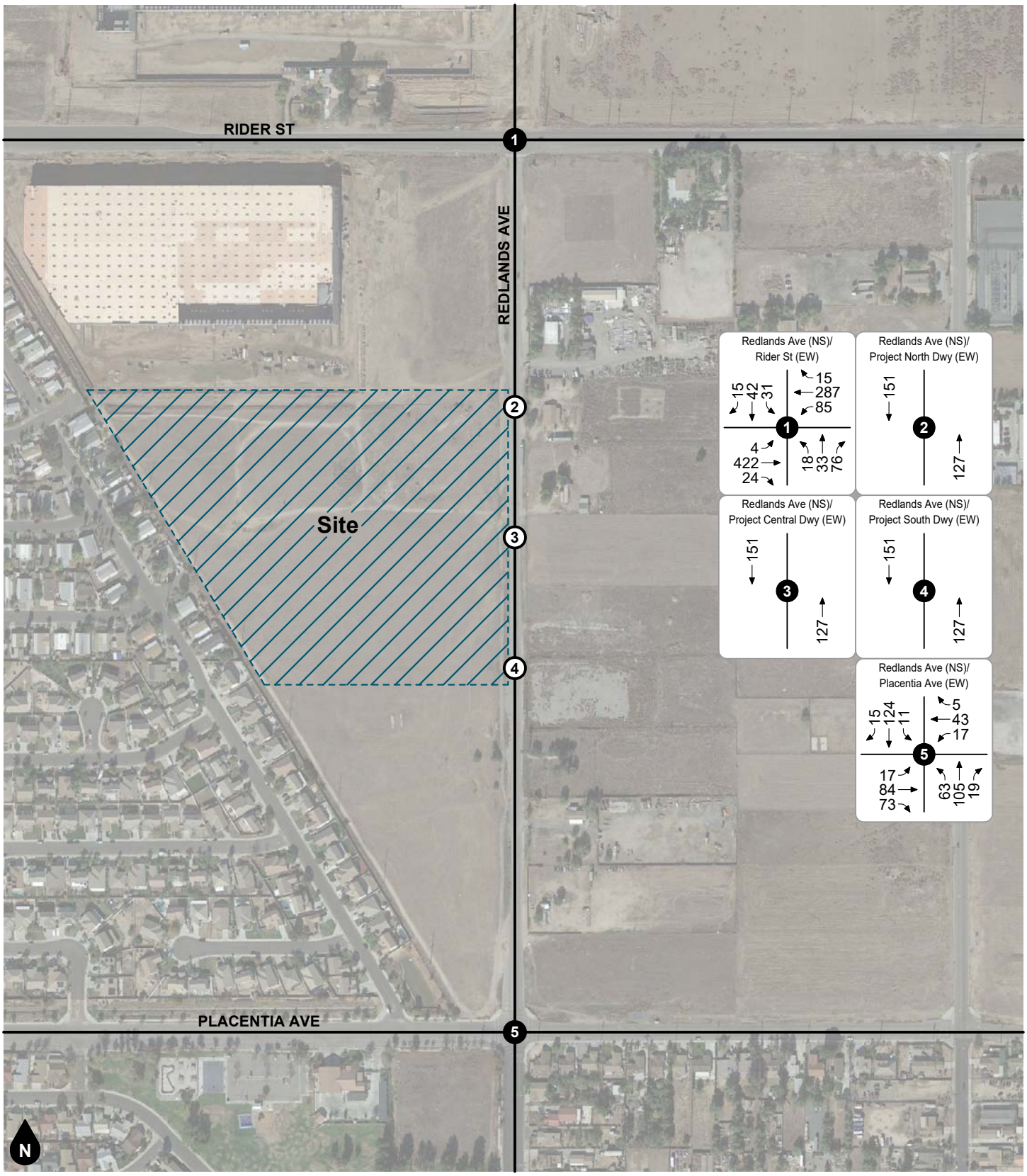



Legend

(#) Study Intersection

(#) Project Driveway

**Figure 11**
**Existing AM Peak Hour Intersection Turning Movement Volumes**




Legend

(#) Study Intersection

(#) Project Driveway

**Figure 12**
**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 2 shows the project trip generation forecast based on rates obtained from the Institute of Transportation Engineers (ITE) *Trip Generation Manual Supplement* (10th Edition, 2020). Based on review of the ITE land use description, trip generation rates for ITE Land Use Code 155 - High-Cube Warehouse Fulfillment Center Warehouse (Non-Sort) were determined to adequately represent the proposed use and were selected for calculation of the project trip generation forecast. The number of trips generated is determined by multiplying the trip generation rates and directional distributions by the land use quantity.

As shown in Table 2, the proposed project is forecast to generate approximately 605 daily vehicle trips, including 51 vehicle trips during the AM peak hour and 51 vehicle trips during the PM peak hour.

### Truck Trips

The project trip generation was also calculated in terms of Passenger Car Equivalent (PCE) trips. The percentage of truck trips was obtained from the ITE *Trip Generation Manual Supplement* (10th Edition, 2020). The truck mix by axle type was determined based on South Coast Air Quality Management District (SCAQMD) recommendations for high-cube warehousing facilities without cold-storage. Truck trips were converted to PCE trips based on the following factors: 1.5 for 2-axle trucks, 2.0 for 3-axle trucks, and 3.0 for trucks with four or more axles.

As also shown in Table 2, the proposed project is forecast to generate approximately 857 daily PCE trips, including 59 PCE trips during the AM peak hour and 55 PCE trips during the PM peak hour.

### Review of High-Cube Warehouse Rates

ITE provides the following land use description for Land Use Code 155 - High-Cube Warehouse Fulfillment Center Warehouse (Non-Sort):

> *A high-cube warehouse (HCW) is a building that typically has at least 200,000 gross square feet of floor area, has a ceiling height of 24 feet or more, and is used primarily for the storage and/or consolidation of manufactured goods (and to a lesser extent, raw materials) prior to their distribution to retail locations or other warehouses. A typical HCW has a high level of on-site automation and logistics management. The automation and logistics enable highly-efficient processing of goods through the HCW. High-cube fulfillment center warehouses include warehouses characterized by a significant storage function and direct distribution of ecommerce product to end users. These facilities typically handle smaller packages and quantities than other types of HCWs and often contain multiple mezzanine levels.*

The ITE database further categorizes high-cube fulfillment center warehousing into sort or non-sort facilities. A sorting facility is defined as a fulfillment center that ships out smaller items, requiring extensive manual sorting, whereas a non-sorting facility ships out large box items that are processed primarily through automation. The trip generation rates for sorting facilities are substantially greater than rates for non-sorting facilities; however, they are based on a limited sample size and may not necessarily represent typical operations. Other types of high-cube warehouses include high-cube parcel hub and cold-storage warehouses, neither of which are currently contemplated uses for the proposed project.

Based on review of the available ITE data, ITE Land Use Code 155 - High-Cube Warehouse Fulfillment Center Warehouse (Non-Sort) was determined to best represent a typical user for the type of building proposed, while still providing a more conservative daily trip estimate compared to a standard warehouse (ITE Land Use Code 150). To avoid grossly overestimating potential impacts and constructing unnecessary improvements, the project trip generation was calculated based on ITE Land Use Code 155 - High-Cube Warehouse Fulfillment Center Warehouse (Non-Sort). *Should a future potential tenant intend to occupy the building for use as a high-cube fulfillment center sorting facility, parcel hub, or cold-storage warehouse, preparation of a transportation demand management plan and/or further traffic analysis may be necessary to verify consistency with the trip estimates and findings of this study.*

### PROJECT TRIP DISTRIBUTION AND ASSIGNMENT

Figure 13 to Figure 14 show the forecast directional distribution patterns for the project generated passenger car and truck trips. The project trip distribution patterns are 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 15. Project AM and PM peak hour intersection turning movement volumes expected from the project are depicted on Figure 16 and Figure 17, respectively.

### SITE ACCESS

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

- Redlands Avenue (EW) at Project North Driveway (NS) [Study Intersection #2]
  - Truck access only
  - Construct one inbound lane and one outbound lane with eastbound stop-control
  - Northbound: two through lanes
  - Southbound: one through lane and one share through/right turn lane
  - Eastbound: one right turn only lane

- Redlands Avenue (EW) at Project Central Driveway (NS) [Study Intersection #3]
  - Passenger car access only
  - Construct one inbound lane and one outbound lane with eastbound stop-control
  - Northbound: two through lanes and one left turn lane
  - Southbound: one through lane and one share through/right turn lane
  - Eastbound: one right turn only lane

- Redlands Avenue (EW) at Project South Driveway (NS) [Study Intersection #4]
  - Truck access only
  - Construct one inbound lane and one outbound lane with eastbound stop-control
  - Northbound: two through lanes
  - Southbound: one through lane and one shared through/right turn lane
  - Eastbound: one shared left/right turn lane

A conceptual striping plan along Redlands Avenue including the Redlands Avenue East Industrial Project located across Redlands Avenue is shown on Figure 18. This figure shows the lane configurations and geometrics for the project driveways along Redlands Avenue.

## Table 2
## Project Trip Generation

| |
|---|
| Land Use: High-Cube Fulfillment Center Warehouse (Non-Sort) |
| Size: 334.447 TSF |

| TRIP GENERATION RATES PER TSF[1] | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | AM Peak Hour | | | PM Peak Hour | | | |
| Vehicle Type | Source[2] | In | Out | Rate | In | Out | Rate | Daily Rate |
| All Vehicles | TGMS 155 | 81% | 19% | 0.150 | 39% | 61% | 0.160 | 1.810 |
| Passenger Cars (91.0% AM, 93.0% PM, 73.0% Daily) | TGMS 155 | 0.111 | 0.026 | 0.137 | 0.058 | 0.091 | 0.149 | 1.321 |
| Trucks (9.0% AM, 7.0% PM, 27.0% Daily) | TGMS 155* | 0.011 | 0.003 | 0.014 | 0.004 | 0.007 | 0.011 | 0.489 |
| Truck Mix: | SCAQMD | | | | | | | |
| 2-Axle Trucks (16.7%) | | 0.002 | 0.000 | 0.002 | 0.001 | 0.001 | 0.002 | 0.082 |
| 3-Axle Trucks (20.7%) | | 0.002 | 0.001 | 0.003 | 0.001 | 0.001 | 0.002 | 0.101 |
| 4+ Axle Trucks (62.6%) | | 0.007 | 0.002 | 0.009 | 0.003 | 0.004 | 0.007 | 0.306 |

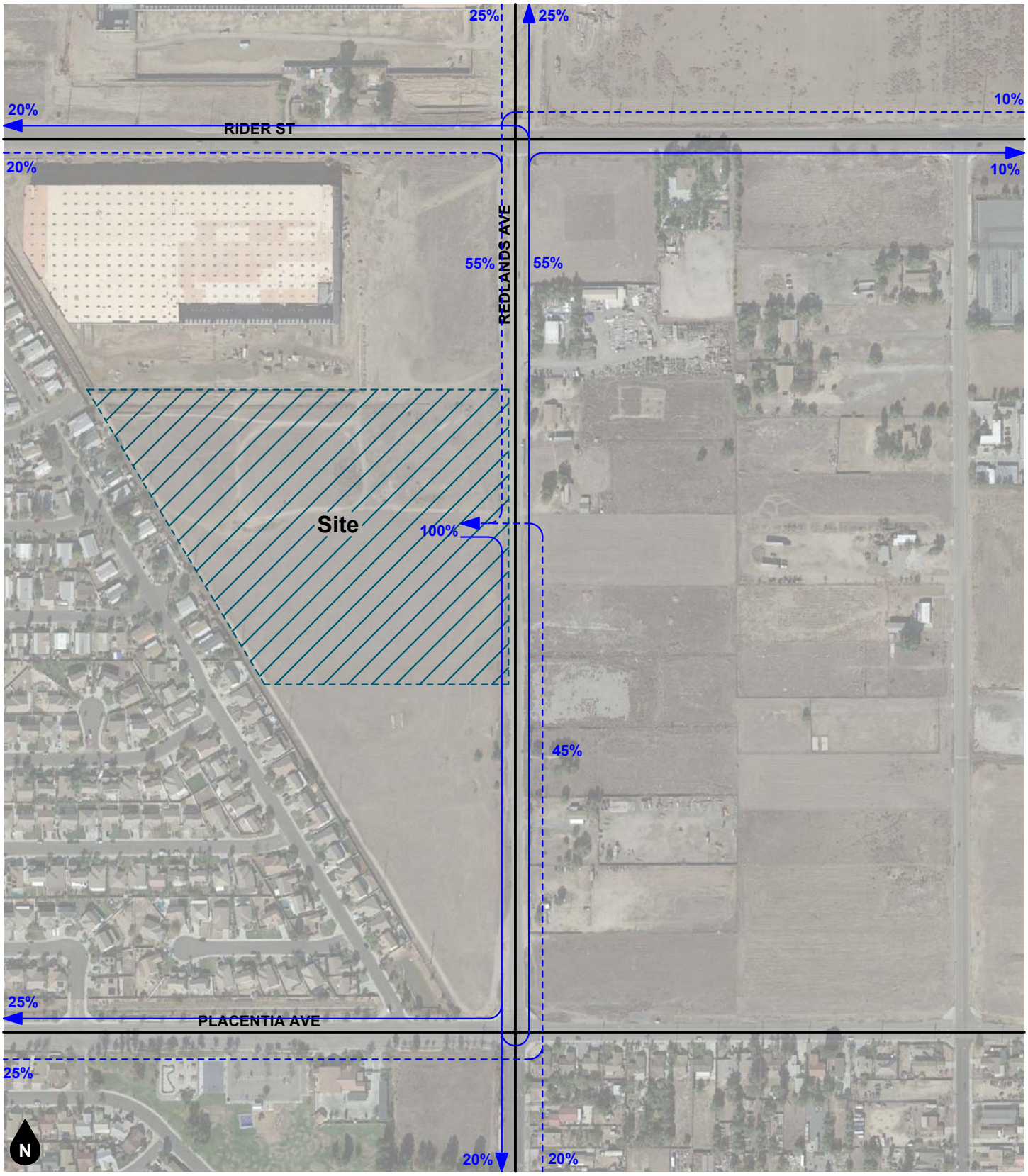
| VEHICLE TRIPS GENERATED | | | | | | | |
|---|---|---|---|---|---|---|---|
| | AM Peak Hour | | | PM Peak Hour | | | |
| Vehicle Type | In | Out | Total | In | Out | Total | Daily |
| Passenger Cars | 37 | 9 | 46 | 19 | 30 | 49 | 442 |
| Trucks | | | | | | | |
| 2-Axle Trucks | 1 | 0 | 1 | 0 | 0 | 0 | 27 |
| 3-Axle Trucks | 1 | 0 | 1 | 0 | 0 | 0 | 34 |
| 4+ Axle Trucks | 2 | 1 | 3 | 1 | 1 | 2 | 102 |
| Subtotal | 4 | 1 | 5 | 1 | 1 | 2 | 163 |
| **Total Vehicle Trips Generated** | **41** | **10** | **51** | **20** | **31** | **51** | **605** |

| PCE[3] TRIPS GENERATED | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | AM Peak Hour | | | PM Peak Hour | | | |
| Vehicle Type | PCE Factor[4] | In | Out | Total | In | Out | Total | Daily |
| Passenger Cars | 1.0 | 37 | 9 | 46 | 19 | 30 | 49 | 442 |
| Trucks | | | | | | | | |
| 2-Axle Trucks | 1.5 | 2 | 0 | 2 | 0 | 0 | 0 | 41 |
| 3-Axle Trucks | 2.0 | 2 | 0 | 2 | 0 | 0 | 0 | 68 |
| 4+ Axle Trucks | 3.0 | 6 | 3 | 9 | 3 | 3 | 6 | 306 |
| Subtotal | | 10 | 3 | 13 | 3 | 3 | 6 | 415 |
| **Total PCE Trips Generated** | | **47** | **12** | **59** | **22** | **33** | **55** | **857** |

Notes:
(1) TSF = Thousand Square Feet

(2) TGMS = Trip Generation Manual Supplement (Institute of Transportation Engineers (ITE), February 2020); ### = ITE Land Use Code.
* = Daily truck percent based on ITE 150 (Warehousing) since it is not available for ITE 155 (Non-Sort).

(3) PCE = Passenger Car Equivalent
(4) Source: San Bernardino County Congestion Management Program (2016), Appendix B.

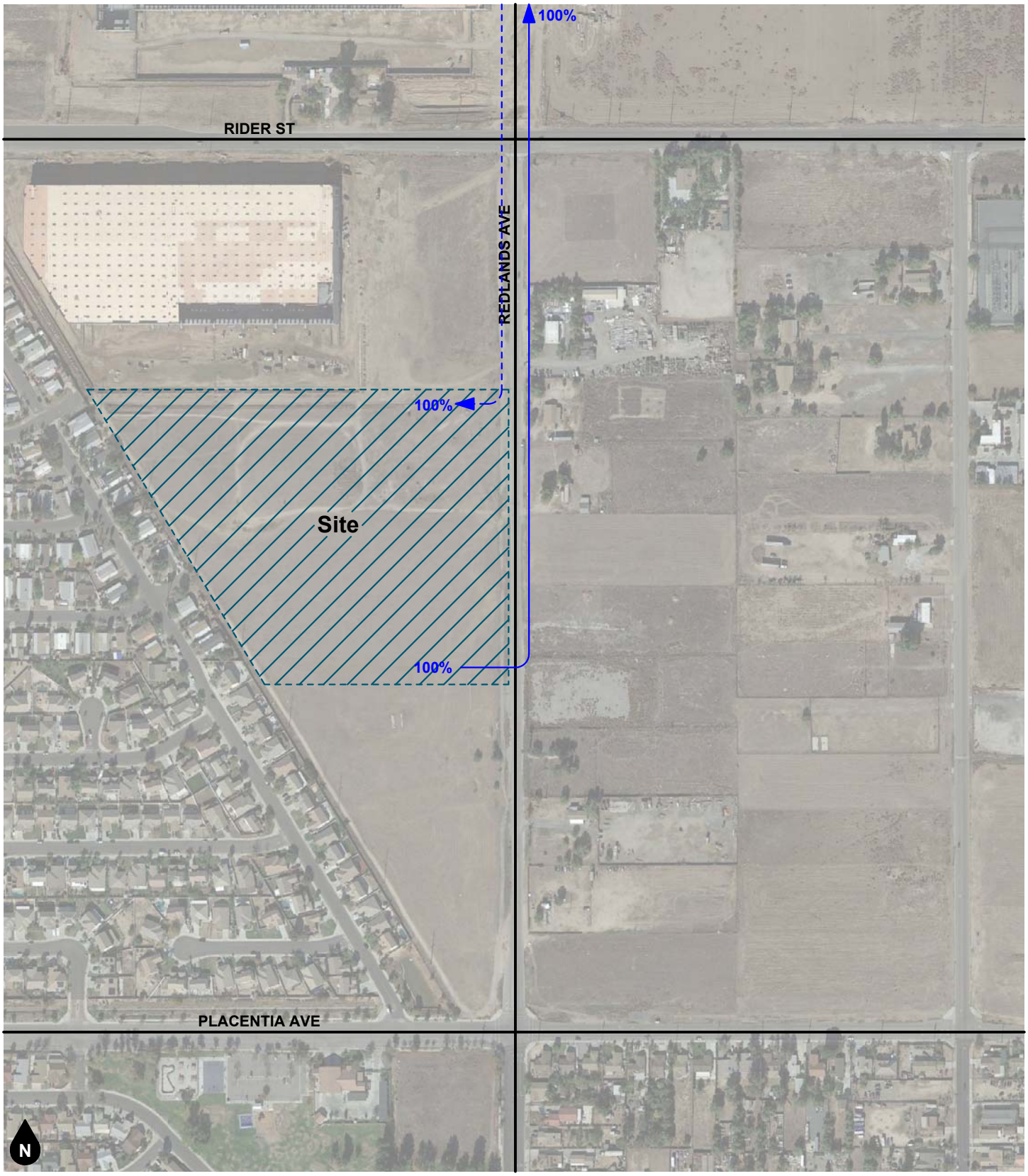



Legend

10% Percent From Project

10% Percent To Project

**Figure 13**
**Project Passenger Car Trip Distribution**

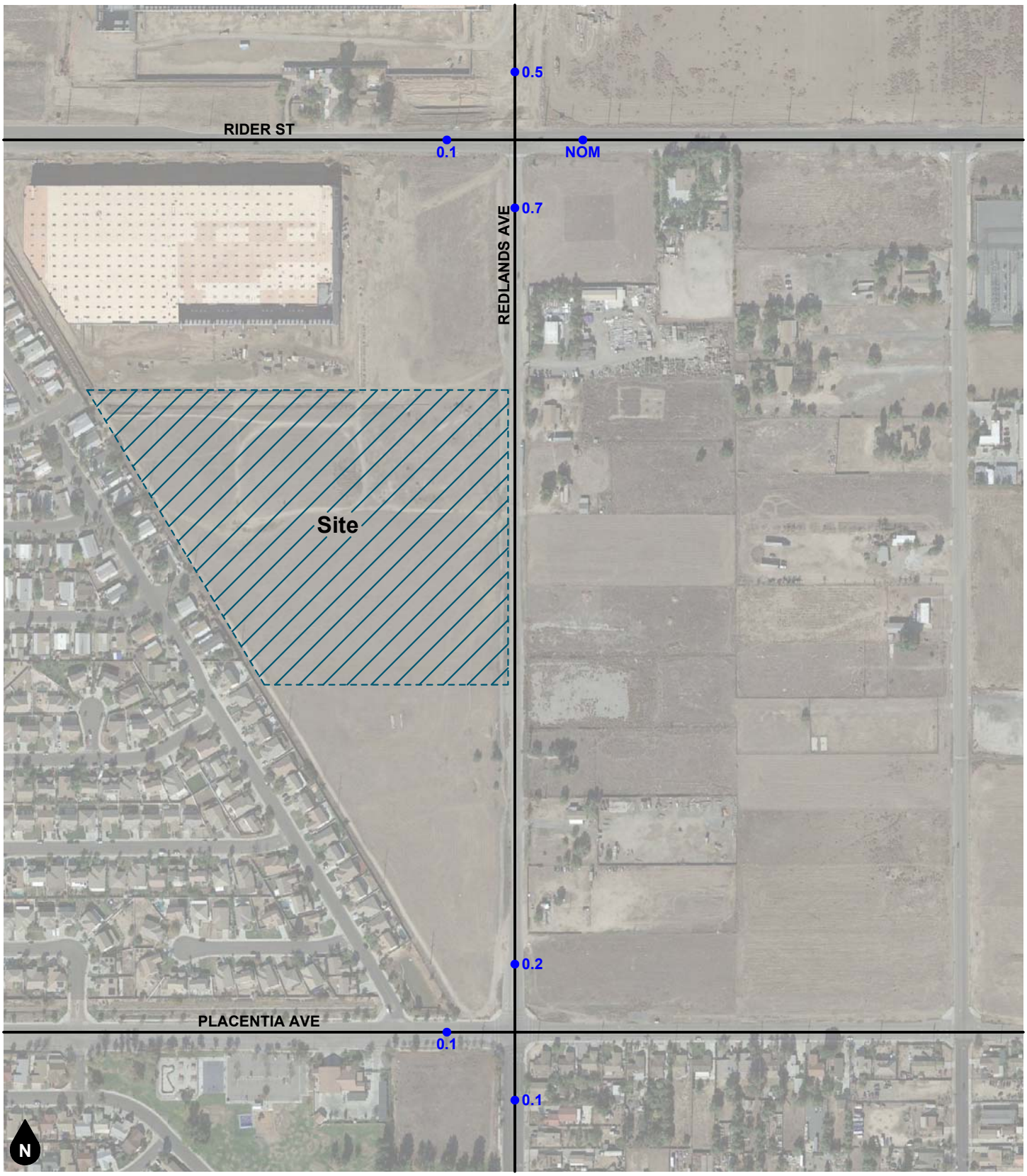



Legend

10% Percent From Project

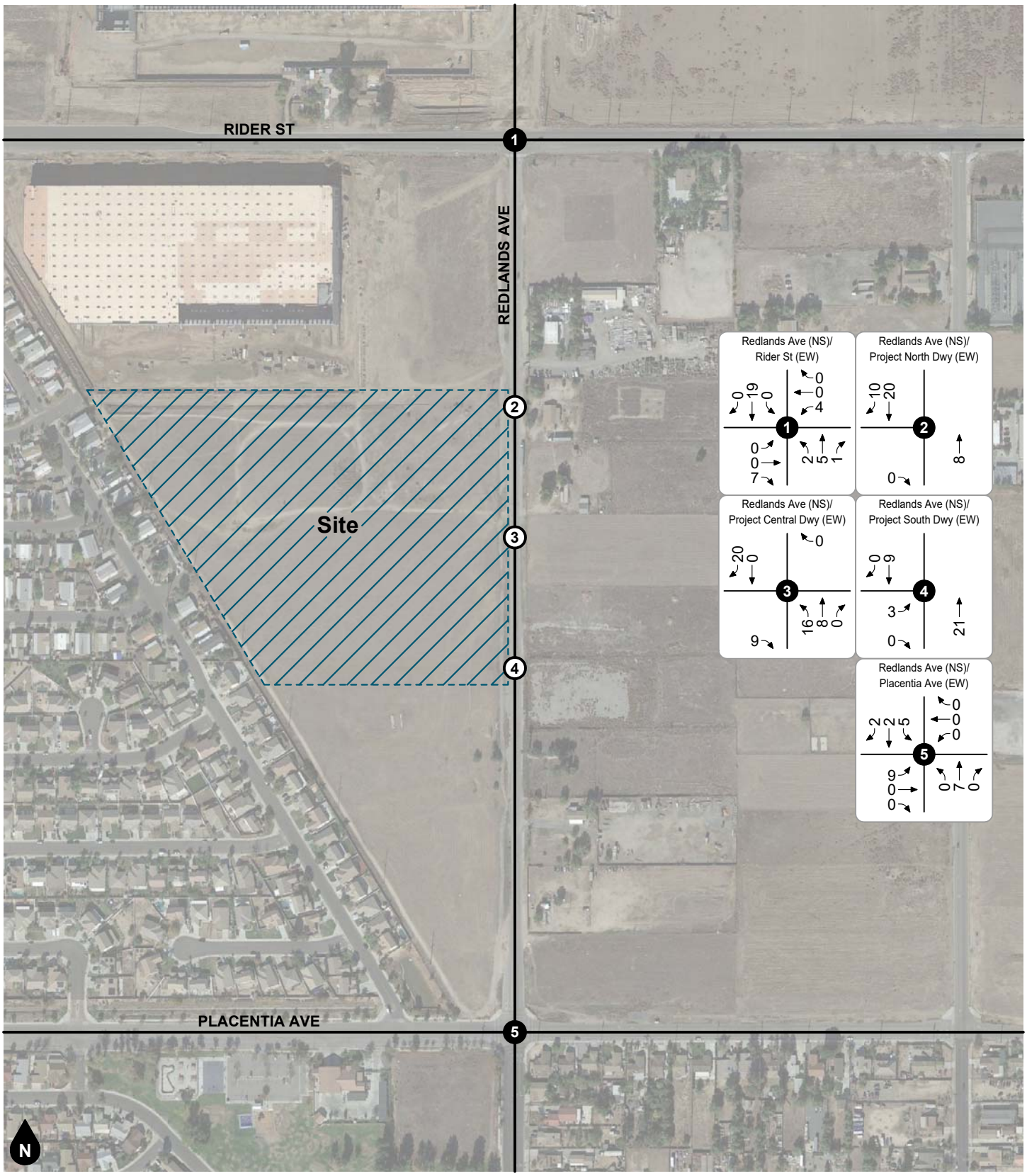
10% Percent To Project

**Figure 14**
**Project Truck Trip Distribution**




Legend
●## Vehicles Per Day (1,000's)
NOM Nominal Less Than 50 Vehicles Per Day

**Figure 15**
**Project Average Daily Traffic Volumes**

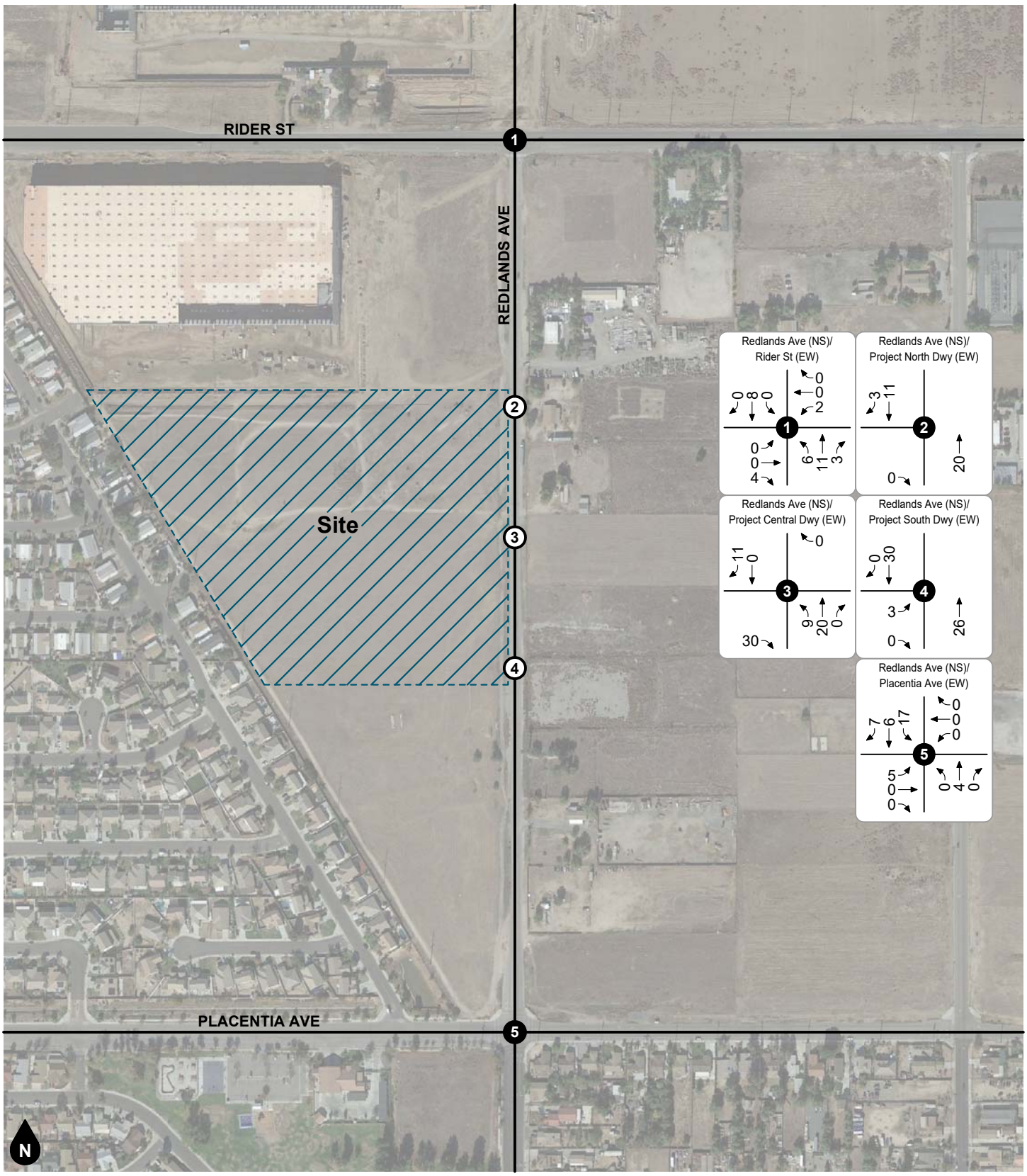



Legend

# Study Intersection

# Project Driveway

**Figure 16**
**Project AM Peak Hour Intersection Turning Movement Volumes**

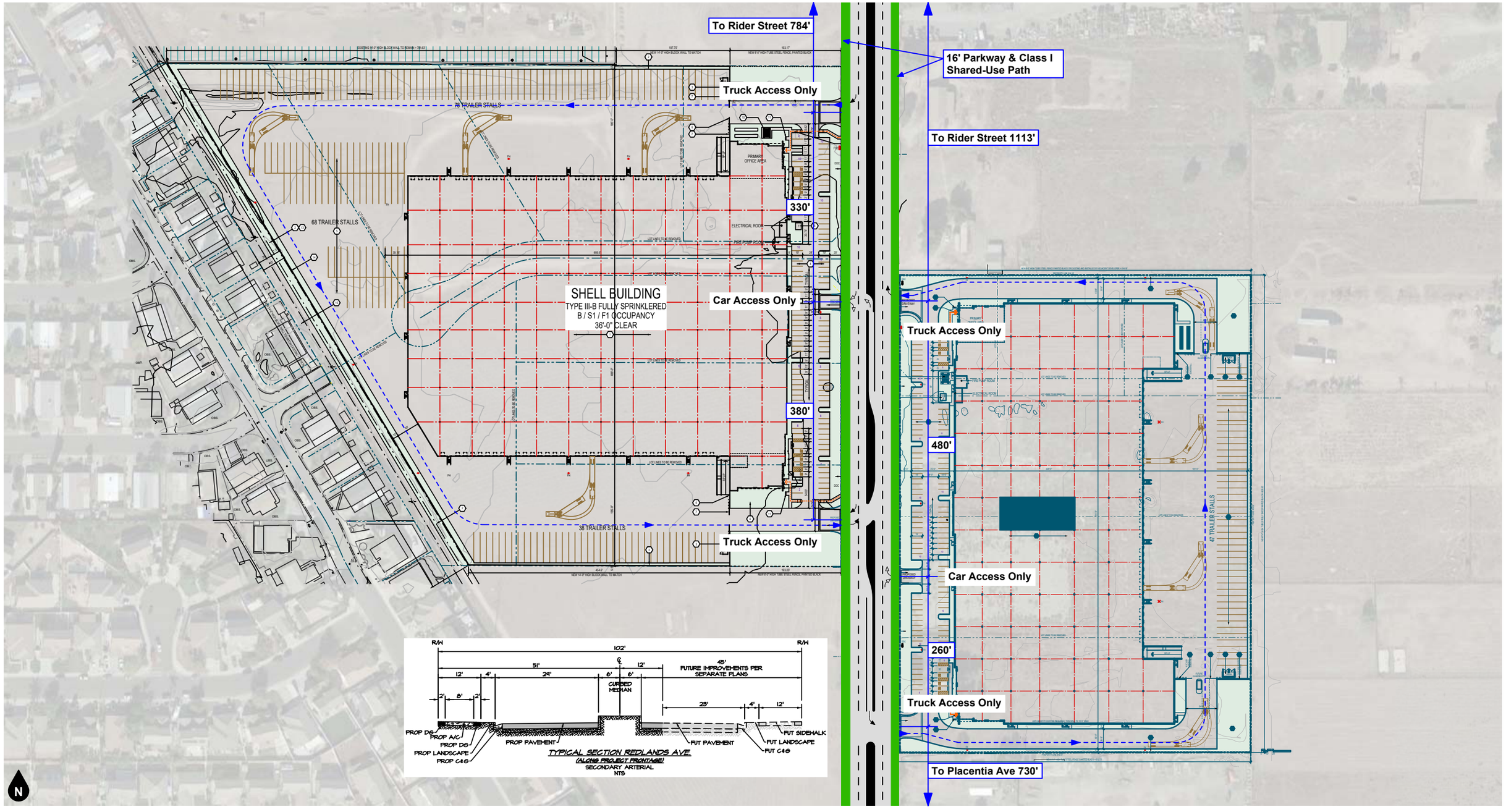



Legend

# Study Intersection

# Project Driveway

**Figure 17**
**Project PM Peak Hour Intersection Turning Movement Volumes**




Legend

- Passenger Car Only Movement
- Primary Truck Movement

**Figure 18**
**Redlands Avenue Conceptual Striping Plan**

# 5. FUTURE VOLUME FORECASTS

This section describes how future volume forecasts for each analysis scenario were developed. Forecast study area volumes are illustrated on figures contained in this section.

## CUMULATIVE TRIPS

### Ambient Growth Rate

To account for ambient growth on roadways, existing 2021 roadway volumes were increased by a growth rate of three percent (3%) per year over two years for Opening Year (2023) conditions. This equates to a total growth factor of approximately 1.06. The ambient growth rate was conservatively applied to all movements at the study intersections.

### Other Development

To account for trips generated by future development, trips generated by pending or approved other development projects in the City of Perris were added to the study area. Table 3 shows the other development trip generation and Figure 19 exhibits the other development location map.

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.

## ANALYSIS SCENARIO VOLUME FORECASTS

### Existing Plus Project

Existing Plus Project volume forecasts were developed by adding the project generated trips to Existing volumes. Existing Plus Project average daily traffic volumes are shown on Figure 23. Existing Plus Project AM and PM peak hour intersection turning movement volumes are shown on Figure 24 and Figure 25.

### Opening Year (2023) Without Project

Opening Year (2023) Without Project volume forecasts were developed by adding ambient growth and other development trips to Existing volumes. Opening Year (2023) Without Project average daily traffic volumes are shown on Figure 26. Opening Year (2023) Without Project AM and PM peak hour intersection turning movement volumes are shown Figure 27 and Figure 28.

### Opening Year (2023) With Project

Opening Year (2023) With Project volume forecasts were developed by adding project generated trips to the Opening Year (2023) Without Project forecast. Opening Year (2023) With Project daily traffic volumes are shown on Figure 29. Opening Year (2023) With Project AM and PM peak hour intersection turning movement volumes are shown on Figure 30 and Figure 31.

**Table 3 (1 of 2)**
**Other Development Trip Generation**

| Map ID | Project Name | Land Use | Quantity | Units[1] | Trips Generated[2] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | AM Peak Hour | | | PM Peak Hour | | | |
| | | | | | In | Out | Total | In | Out | Total | Daily |
| 1 | Redlands Avenue East | High-Cube Warehouse | 254.511 | TSF | | | | | | | |
| | | - Cars | | | 28 | 7 | 35 | 15 | 23 | 38 | 336 |
| | | - Trucks | | | 10 | 3 | 13 | 3 | 3 | 6 | 318 |
| 2 | IDI @ Ramona | High-Cube Warehouse | 426.000 | TSF | | | | | | | |
| | | - Cars | | | 21 | 6 | 27 | 10 | 26 | 36 | 501 |
| | | - Trucks | | | 13 | 3 | 16 | 3 | 13 | 16 | 244 |
| 3 | Cali Express Carwash | Car Wash | 5.600 | TSF | 17 | 17 | 34 | 39 | 39 | 78 | 861 |
| 4 | Expressway Industrial | High-Cube Warehouse | 347.000 | TSF | | | | | | | |
| | | - Cars | | | 17 | 5 | 22 | 8 | 21 | 29 | 408 |
| | | - Trucks | | | 13 | 3 | 16 | 3 | 10 | 13 | 199 |
| 5 | TR38071 | Single-Family Detached Residential | 197 | DU | 36 | 109 | 145 | 123 | 72 | 195 | 1,860 |
| 6 | Rados | High-Cube Warehouse | 1,200.000 | TSF | | | | | | | |
| | | - Cars | | | 59 | 18 | 77 | 29 | 72 | 101 | 1,411 |
| | | - Trucks | | | 41 | 10 | 51 | 16 | 31 | 47 | 680 |
| 7 | Walnut Indu | High-Cube Warehouse | 205.000 | TSF | | | | | | | |
| | | - Cars | | | 10 | 3 | 13 | 5 | 12 | 17 | 241 |
| | | - Trucks | | | 8 | 0 | 8 | 3 | 3 | 6 | 117 |
| 8 | Patriot Ind | High-Cube Warehouse | 286.000 | TSF | | | | | | | |
| | | - Cars | | | 14 | 4 | 18 | 7 | 17 | 24 | 336 |
| | | - Trucks | | | 10 | 3 | 13 | 3 | 10 | 13 | 163 |
| 9 | Burge Indus 1 | Light Industrial | 18.000 | TSF | | | | | | | |
| | | - Cars | | | 11 | 1 | 12 | 1 | 10 | 11 | 82 |
| | | - Trucks | | | 0 | 0 | 0 | 0 | 0 | 0 | 17 |
| 10 | Burge Indus 2 | Light Industrial | 19.000 | TSF | | | | | | | |
| | | - Cars | | | 11 | 2 | 13 | 2 | 10 | 12 | 87 |
| | | - Trucks | | | 0 | 0 | 0 | 0 | 0 | 0 | 17 |
| 11 | Pulliam Indus | Light Industrial | 16.000 | TSF | | | | | | | |
| | | - Cars | | | 10 | 1 | 11 | 1 | 9 | 10 | 73 |
| | | - Trucks | | | 0 | 0 | 0 | 0 | 0 | 0 | 14 |
| 12 | Rider 2 & 4 | High-Cube Warehouse | 1,371.000 | TSF | | | | | | | |
| | | - Cars | | | 67 | 21 | 88 | 33 | 82 | 115 | 1,612 |
| | | - Trucks | | | 46 | 13 | 59 | 16 | 41 | 57 | 779 |
| 13 | First Indus (Goodwin) | High-Cube Warehouse | 338.000 | TSF | | | | | | | |
| | | - Cars | | | 17 | 5 | 22 | 8 | 20 | 28 | 397 |
| | | - Trucks | | | 13 | 3 | 16 | 3 | 10 | 13 | 193 |
| 14 | Chartwell Ind | High-Cube Warehouse | 141.000 | TSF | | | | | | | |
| | | - Cars | | | 7 | 2 | 9 | 3 | 8 | 11 | 166 |
| | | - Trucks | | | 3 | 0 | 3 | 0 | 3 | 3 | 80 |

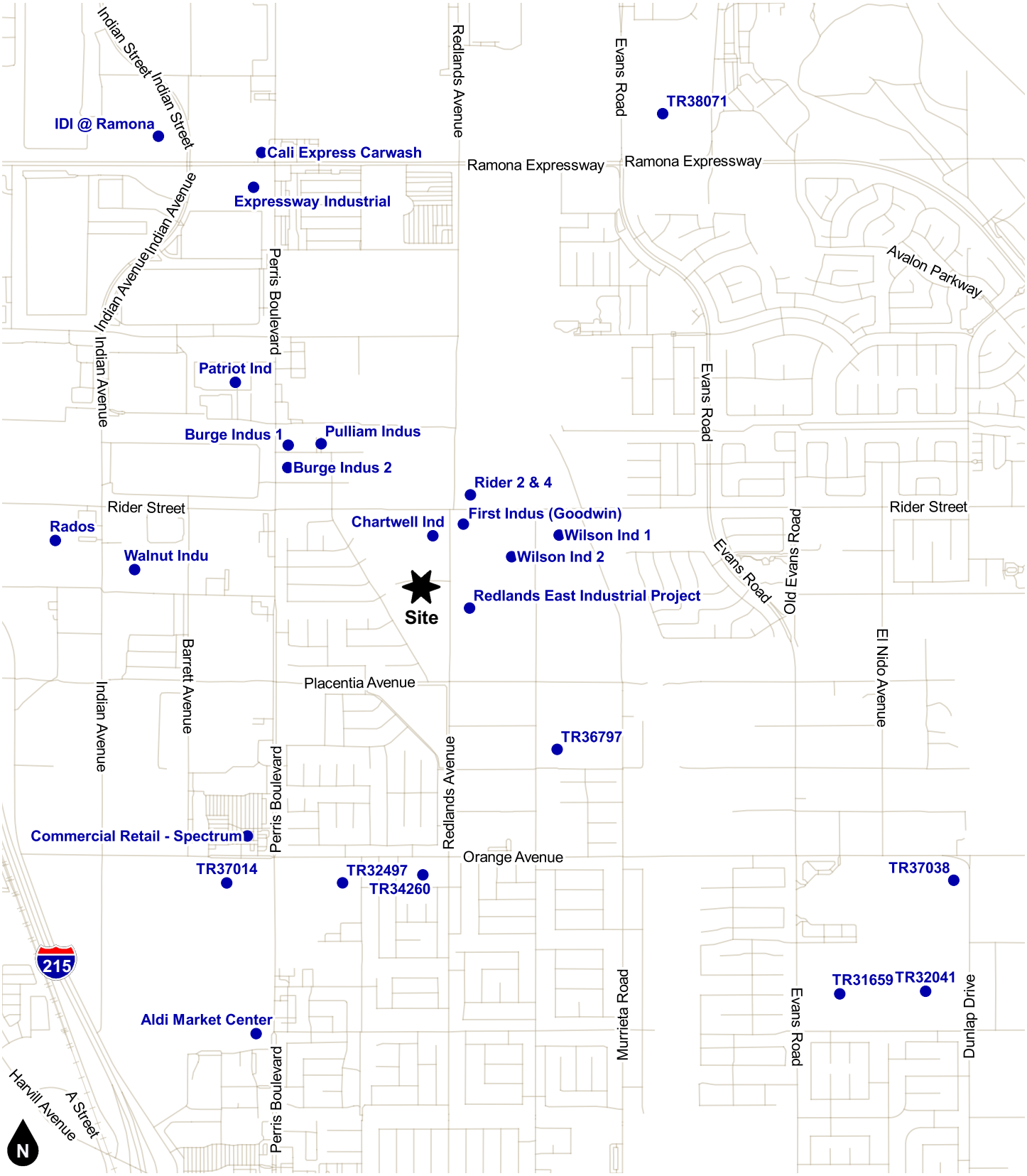
## Table 3 (2 of 2)
## Other Development Trip Generation

| Map ID | Project Name | Land Use | Quantity | Units[1] | Trips Generated[2] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | AM Peak Hour | | | PM Peak Hour | | | |
| | | | | | In | Out | Total | In | Out | Total | Daily |
| 15 | Wilson Ind 1 | High-Cube Warehouse | 303.000 | TSF | | | | | | | |
| | | - Cars | | | 15 | 5 | 20 | 7 | 18 | 25 | 356 |
| | | - Trucks | | | 10 | 3 | 13 | 3 | 10 | 13 | 171 |
| 16 | Wilson Ind 2 | High-Cube Warehouse | 248.000 | TSF | | | | | | | |
| | | - Cars | | | 12 | 4 | 16 | 6 | 15 | 21 | 292 |
| | | - Trucks | | | 8 | 0 | 8 | 3 | 6 | 9 | 141 |
| 17 | TR36797 | Multi-Family Residential | 76 | DU | 8 | 27 | 35 | 27 | 16 | 43 | 556 |
| 18 | Commercial Retail - Spectrum | Commercial Retail | 7.400 | TSF | 4 | 3 | 7 | 14 | 15 | 29 | 279 |
| 19 | TR37014 | Multi-Family Residential | 228 | DU | 24 | 81 | 105 | 80 | 47 | 127 | 1,669 |
| 20 | TR32497 | Multi-Family Residential | 131 | DU | 14 | 46 | 60 | 46 | 27 | 73 | 959 |
| 21 | TR34260 | Single-Family Detached Residential | 22 | DU | 4 | 12 | 16 | 14 | 8 | 22 | 208 |
| 22 | Aldi Market Center | Supermarket | 27.000 | TSF | 62 | 41 | 103 | 127 | 122 | 249 | 2,883 |
| 23 | TR37038 | Multi-Family Residential | 111 | DU | 12 | 39 | 51 | 39 | 23 | 62 | 813 |
| 24 | TR31659 | Single-Family Detached Residential | 161 | DU | 30 | 89 | 119 | 100 | 59 | 159 | 1,520 |
| 25 | TR32041 | Single-Family Detached Residential | 122 | DU | 23 | 68 | 91 | 76 | 45 | 121 | 1,152 |
| **Total** | | | | | **708** | **657** | **1,365** | **876** | **956** | **1,832** | **22,191** |

Notes:

(1) TSF = Thousand Square Feet; DU = Dwelling Units

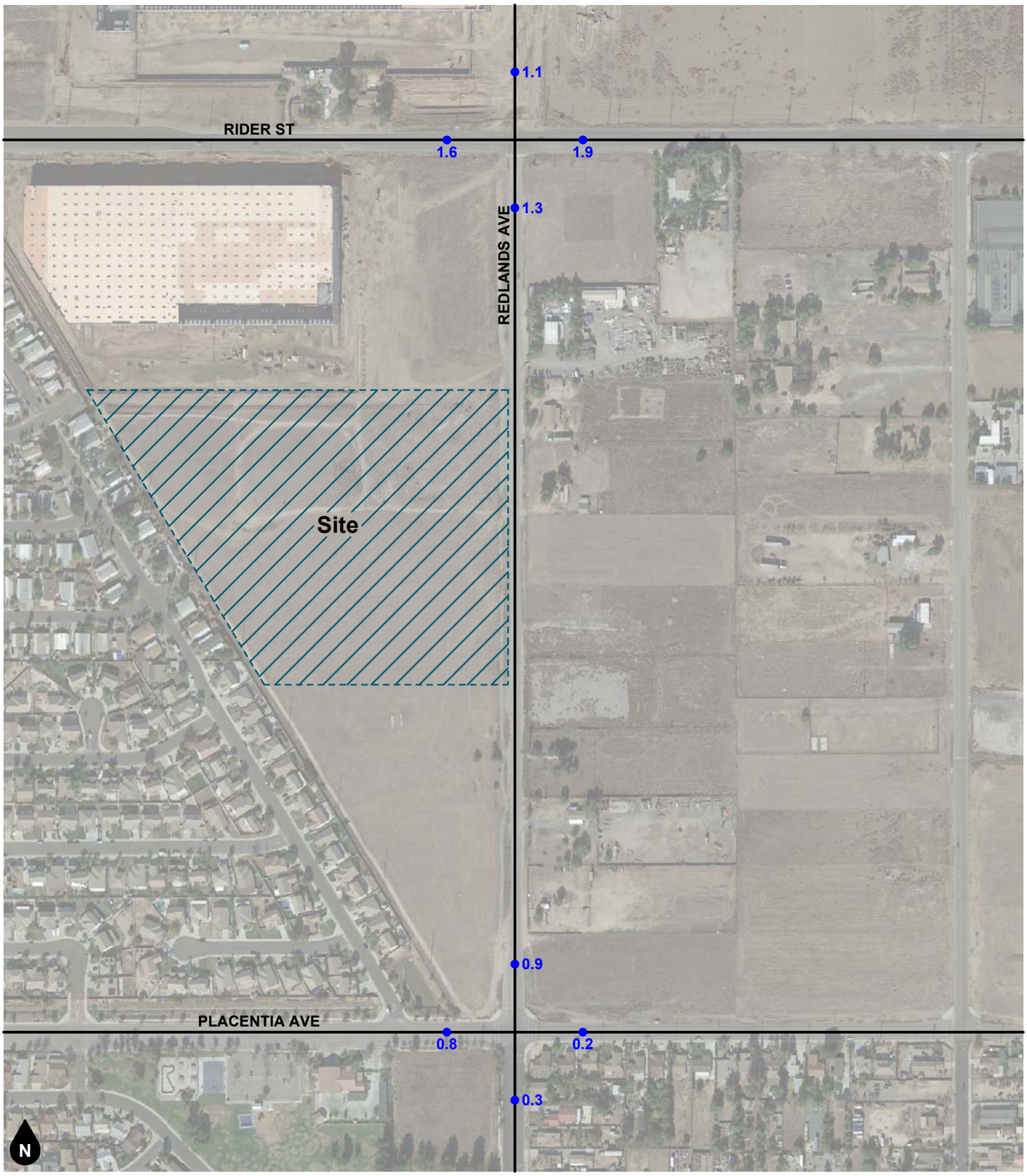
(2) ITE = Institute of Transportation Engineers (ITE) Trip Generation Manual (10th Edition, 2017); ### = ITE Land Use Code.
TGMS = ITE Trip Generation Manual Supplement (10th Edition, February 2020); ### = ITE Land Use Code.
SCAQMD = South Coast Air Quality Management District recommendations for non-cold storage high-cube warehouse.




Legend

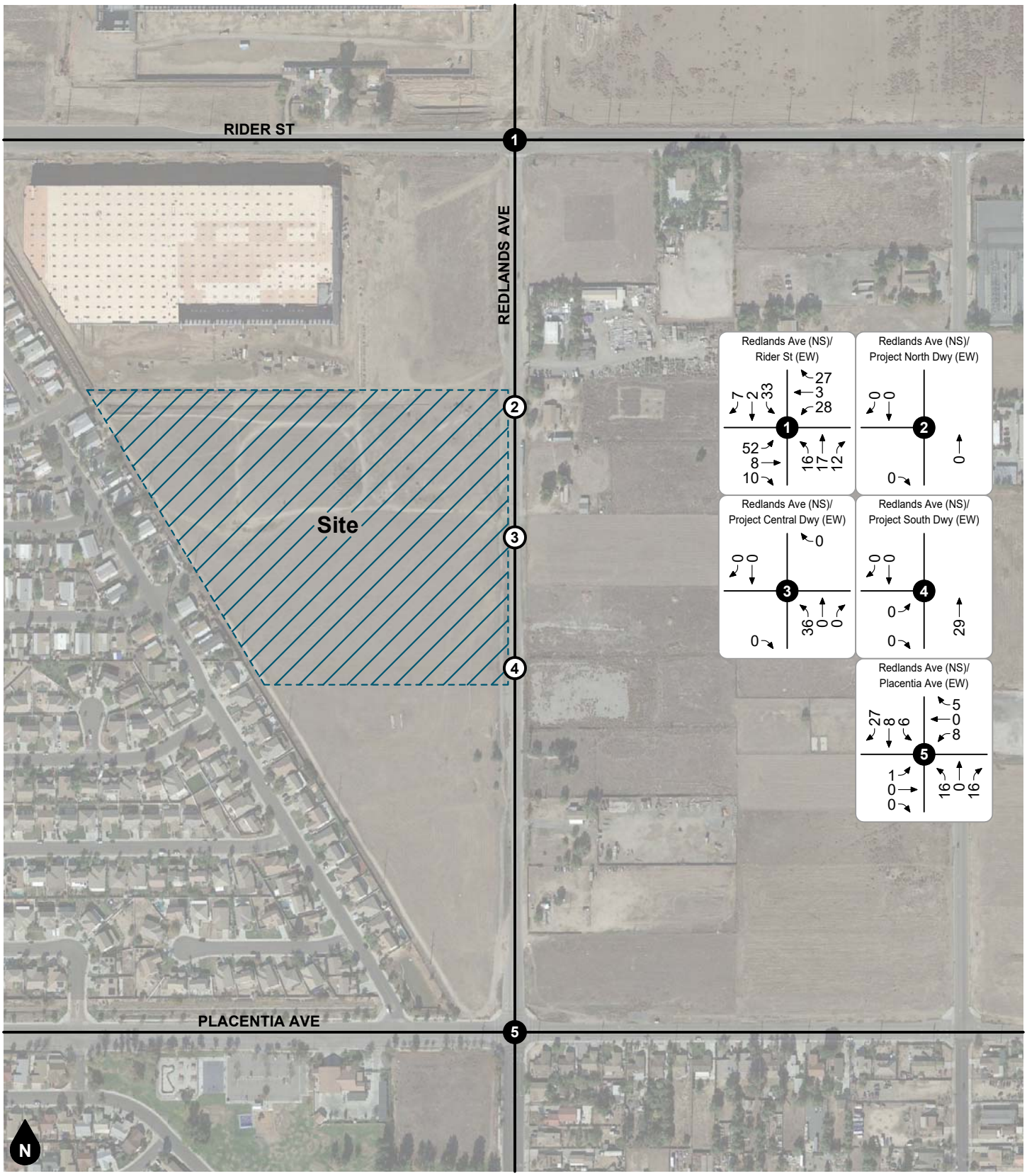
● Other Development

**Figure 19**
**Other Development Location Map**




Legend
●## Vehicles Per Day (1,000's)

**Figure 20**
**Other Development Average Daily Traffic Volumes**

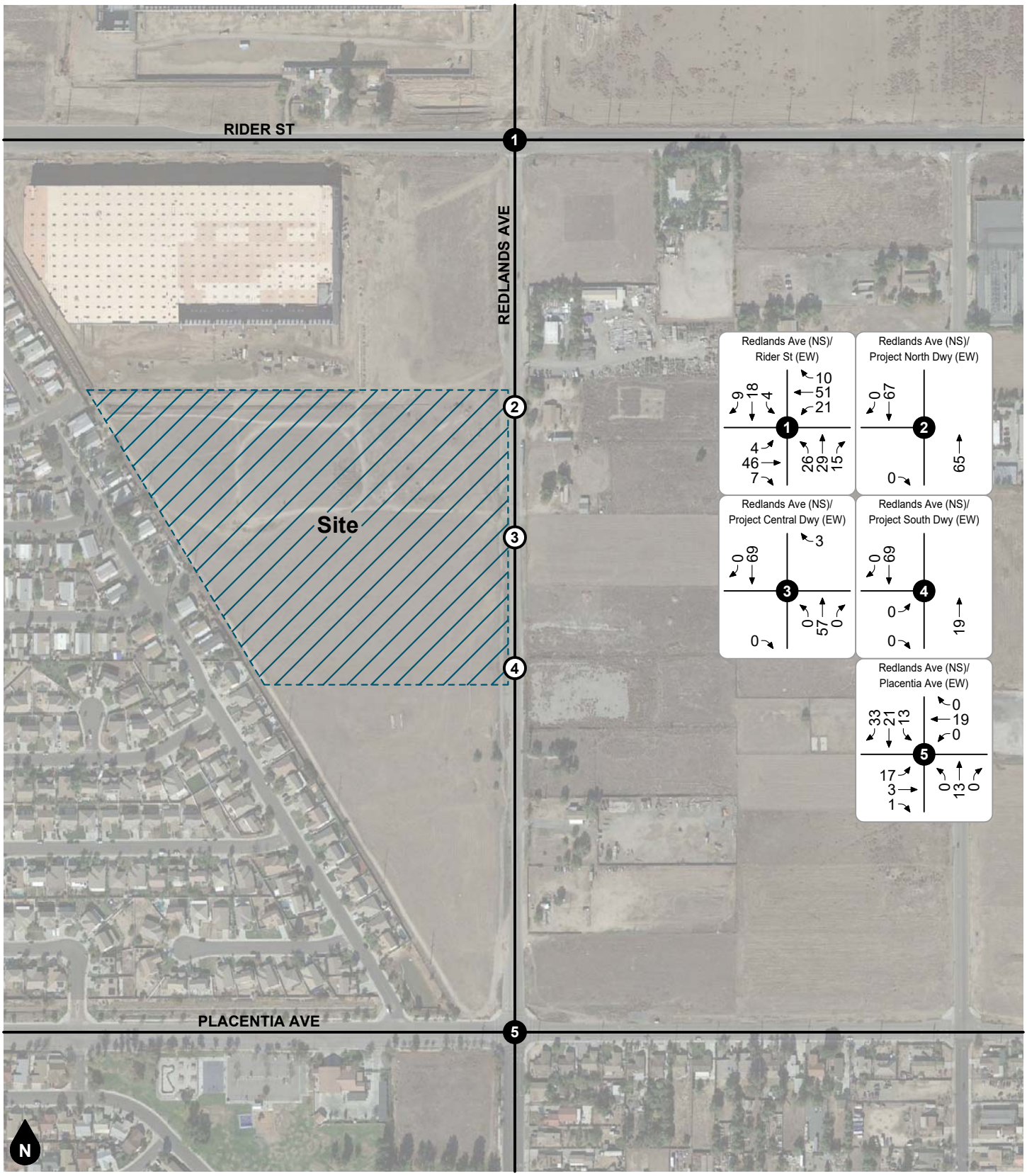



Legend

(#) Study Intersection

(#) Project Driveway

**Figure 21**
**Other Development**
**AM Peak Hour Intersection Turning Movement Volumes**

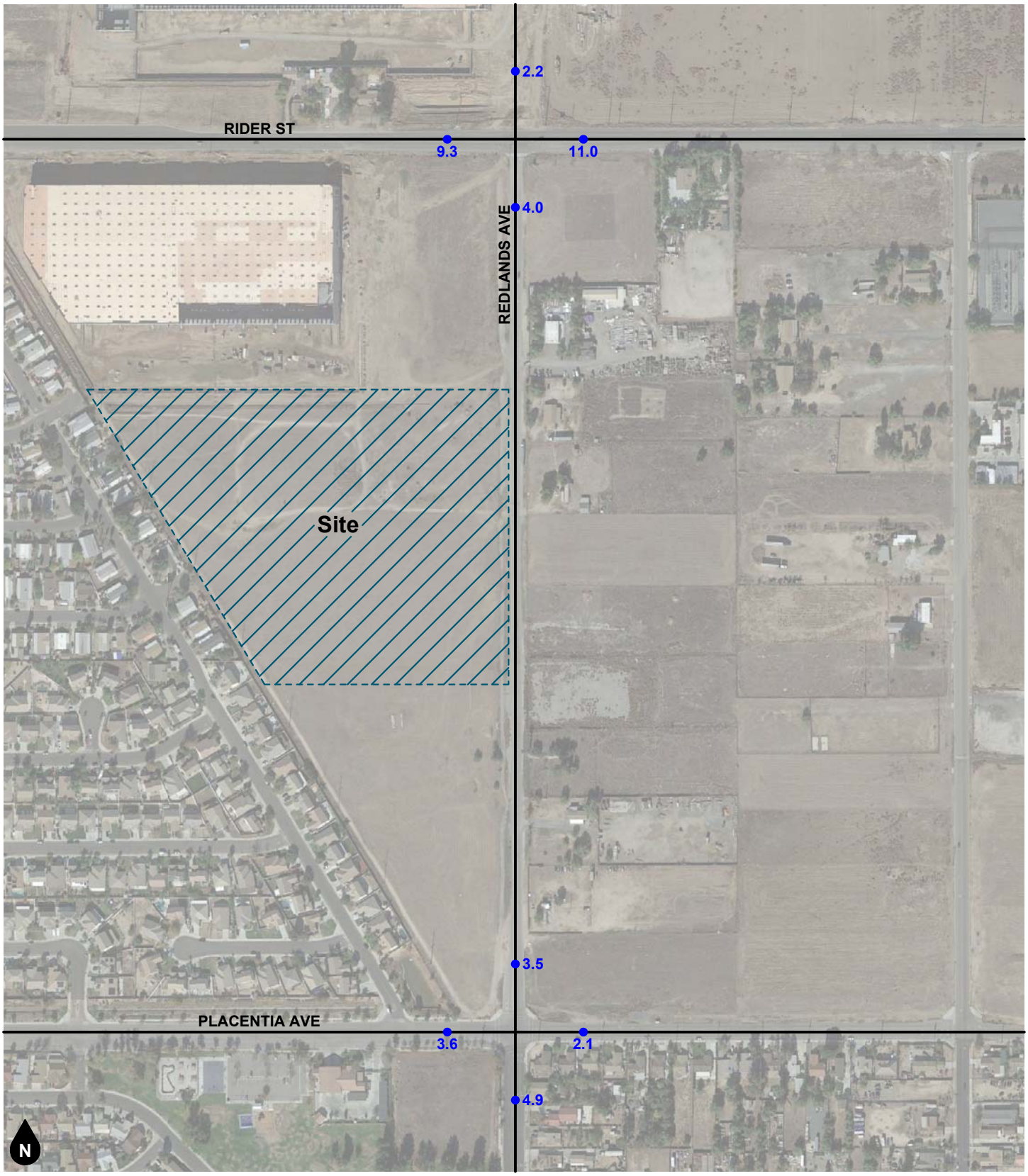



Legend

# Study Intersection

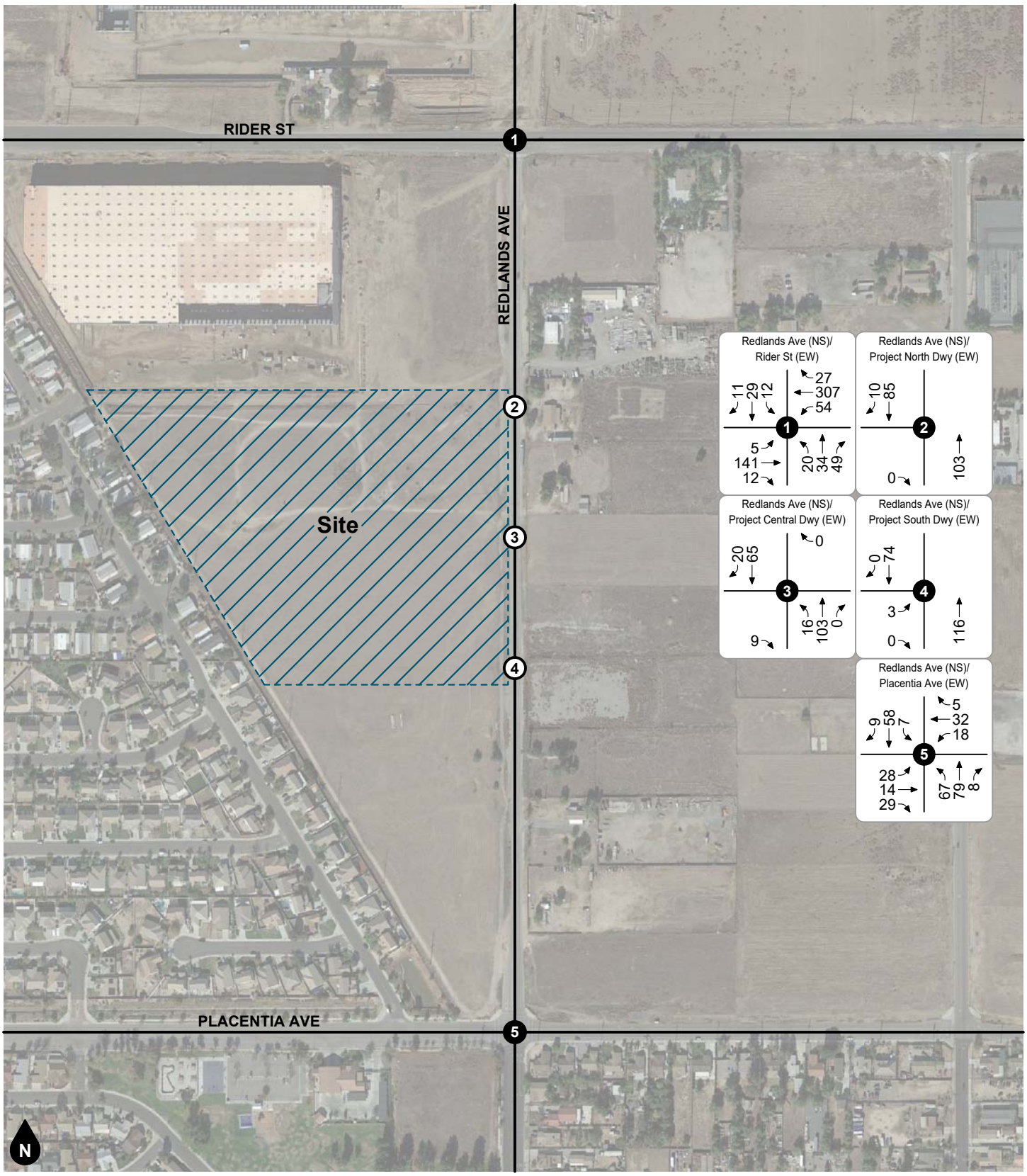
# Project Driveway

**Figure 22**
**Other Development**
**PM Peak Hour Intersection Turning Movement Volumes**




Legend
●## Vehicles Per Day (1,000's)

**Figure 23**
**Existing Plus Project Average Daily Traffic Volumes**

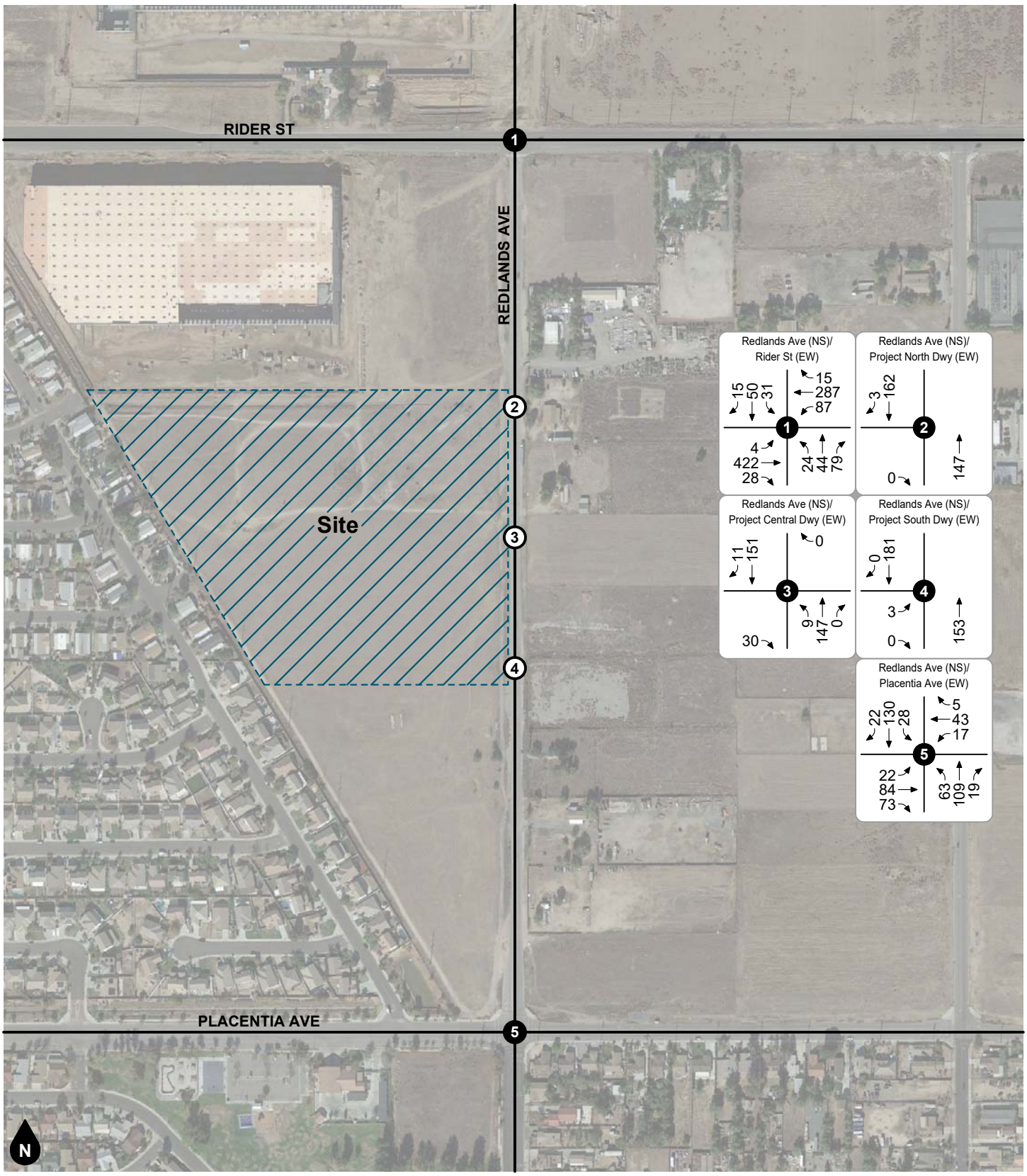



Legend

(#) Study Intersection

(#) Project Driveway

**Figure 24**
**Existing Plus Project**
**AM Peak Hour Intersection Turning Movement Volumes**

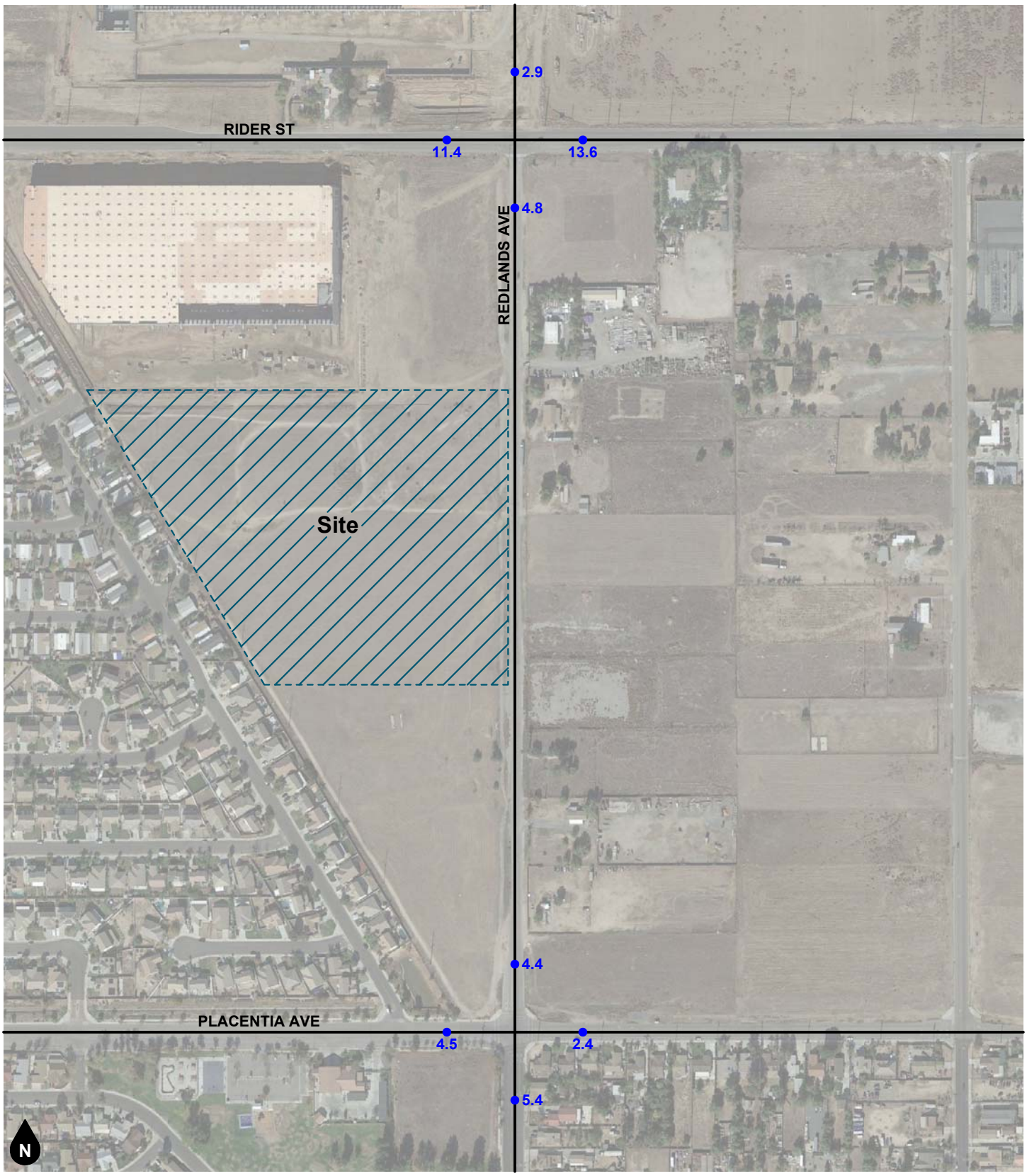



Legend

(#) Study Intersection

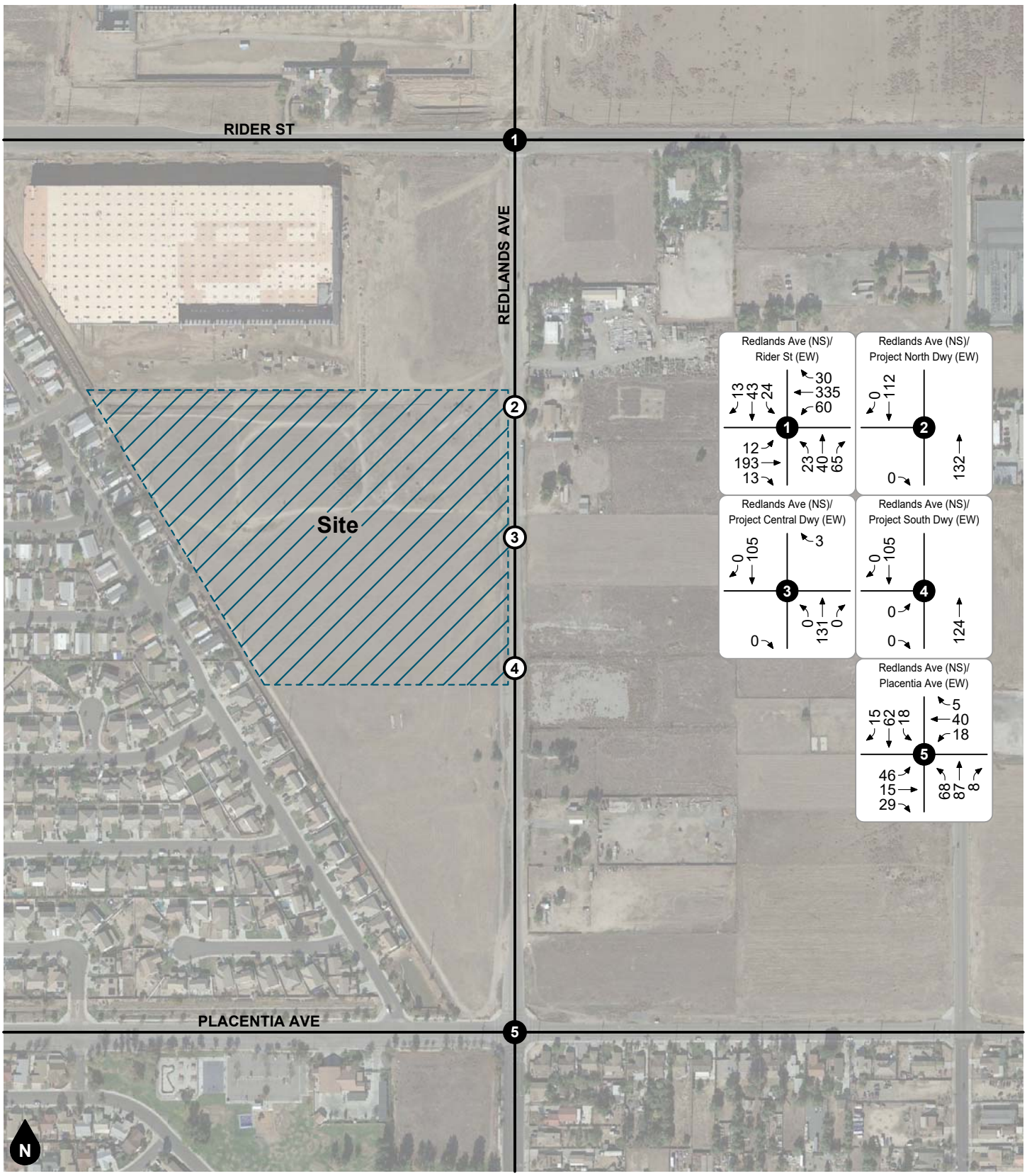
(#) Project Driveway

**Figure 25**
**Existing Plus Project**
**PM Peak Hour Intersection Turning Movement Volumes**




Legend
●## Vehicles Per Day (1,000's)

**Figure 26**
**Opening Year (2023) Without Project Average Daily Traffic Volumes**

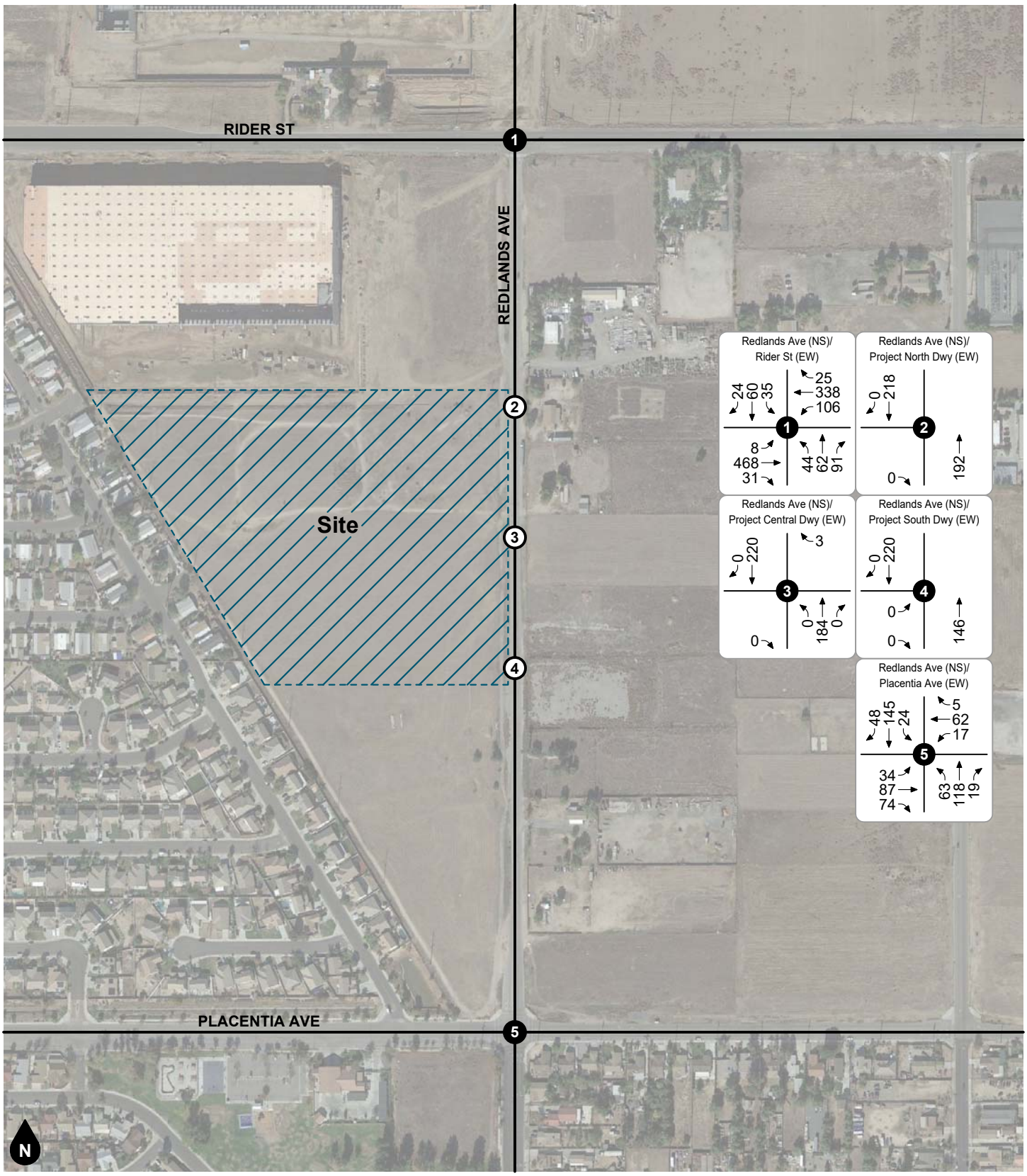



Legend

(#) Study Intersection

(#) Project Driveway

**Figure 27**
**Opening Year (2023) Without Project**
**AM Peak Hour Intersection Turning Movement Volumes**

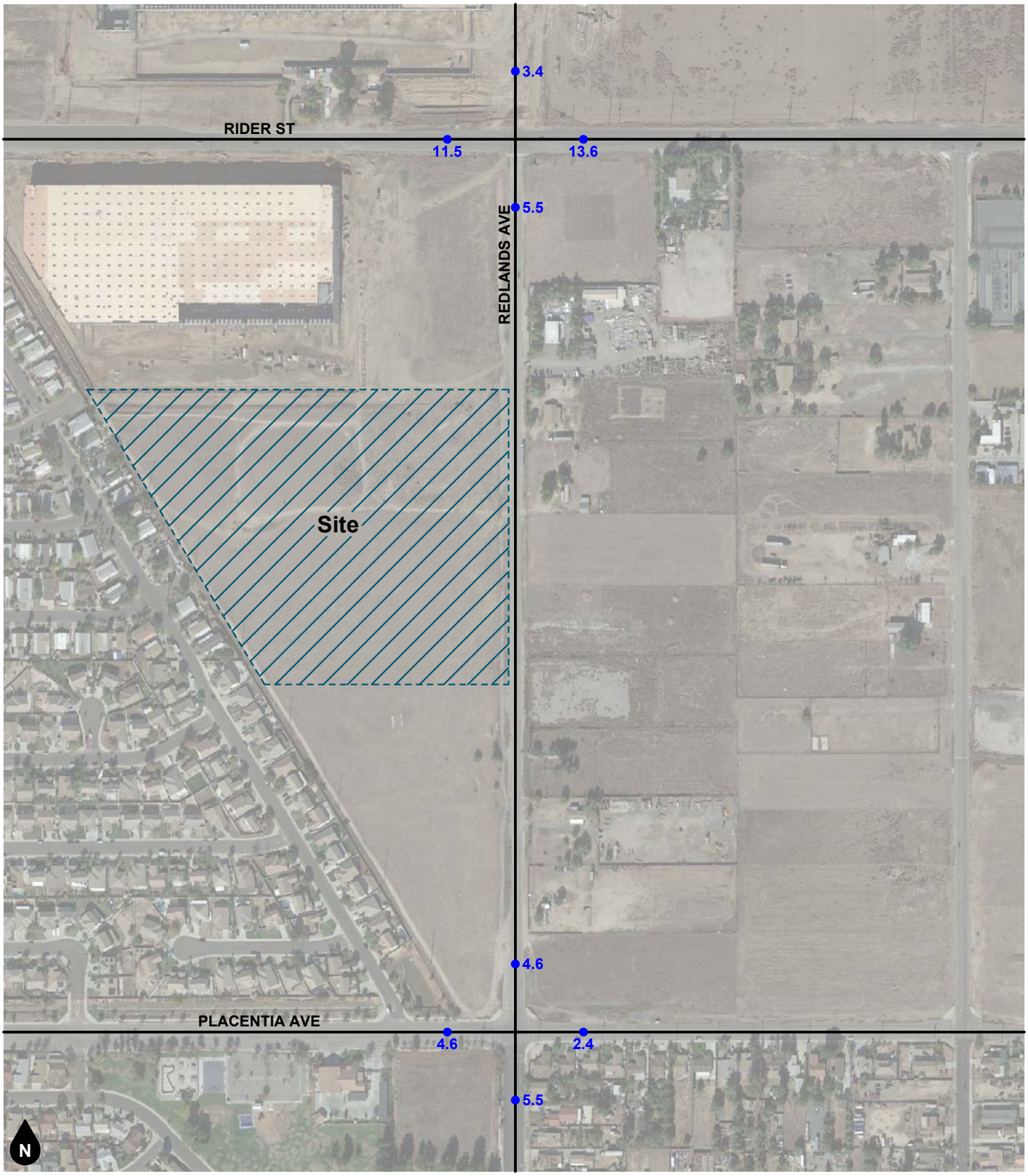



Legend

(#) Study Intersection

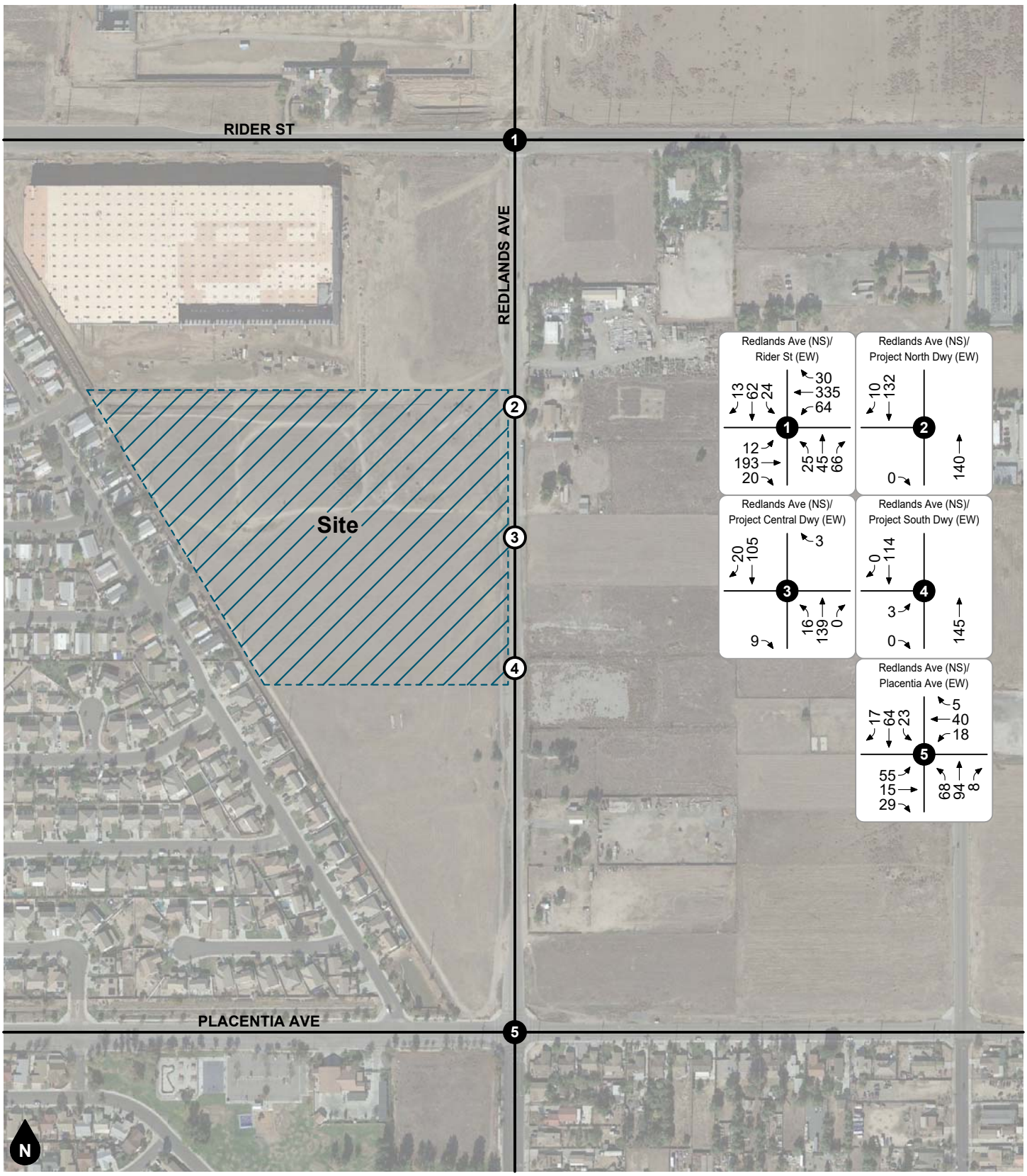
(#) Project Driveway

**Figure 28**
**Opening Year (2023) Without Project**
**PM Peak Hour Intersection Turning Movement Volumes**




Legend
●## Vehicles Per Day (1,000's)

**Figure 29**
**Opening Year (2023) With Project Average Daily Traffic Volumes**

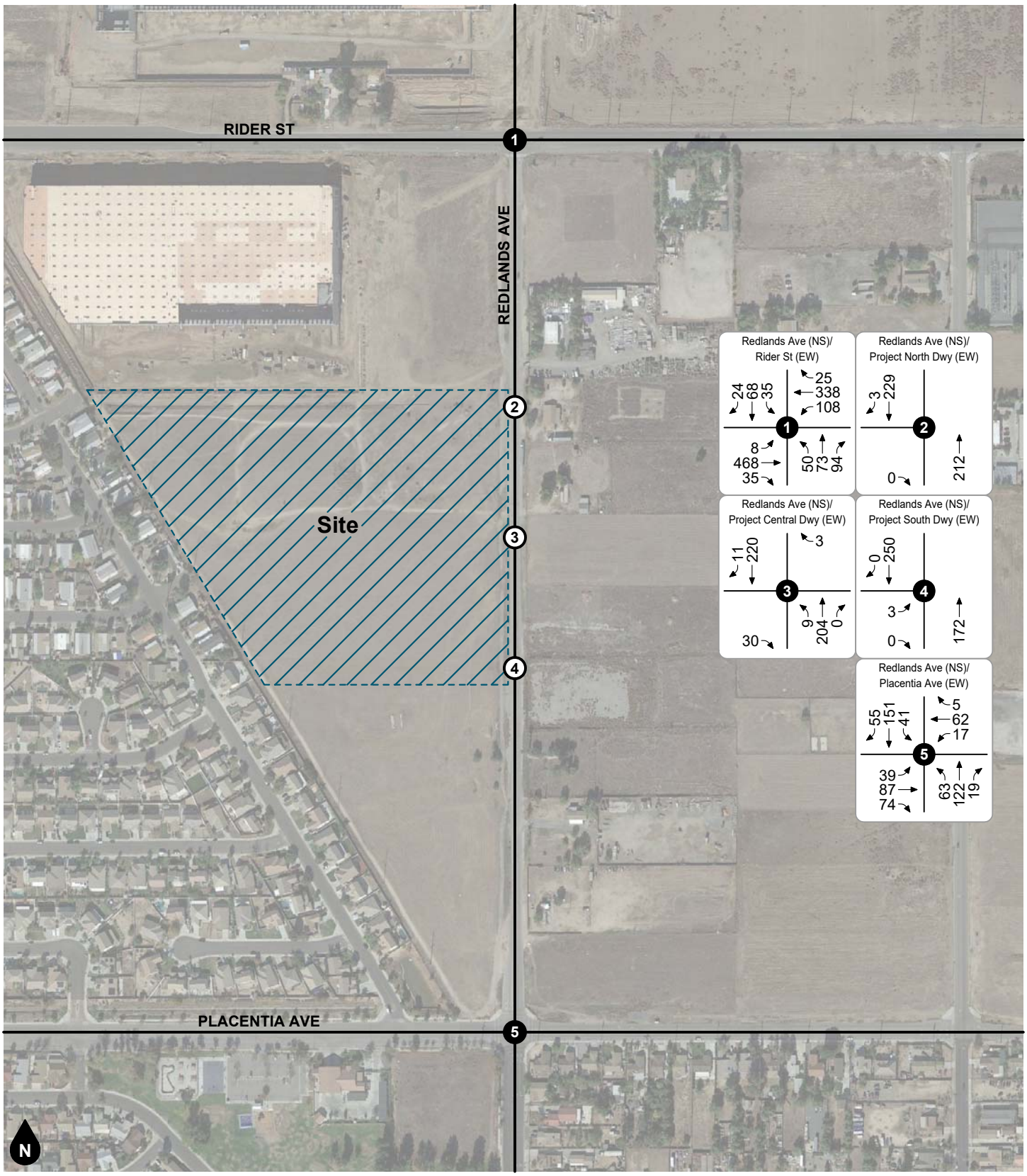



Legend

(#) Study Intersection

(#) Project Driveway

**Figure 30**
**Opening Year (2023) With Project**
**AM Peak Hour Intersection Turning Movement Volumes**




Legend

(#) Study Intersection

(#) Project Driveway

**Figure 31**
**Opening Year (2023) With Project**
**PM Peak Hour Intersection Turning Movement Volumes**

# 6. FUTURE OPERATIONAL ANALYSIS

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

### EXISTING PLUS PROJECT

The intersection Levels of Service for Existing Plus Project conditions are shown in Table 4. As shown in Table 4, the study intersections are forecast to operate within acceptable Levels of Service (D or better) during the peak hours for Existing Plus Project conditions. Therefore, the proposed project is forecast to result in no substantial operational deficiencies at the study intersections for Existing Plus Project conditions and no off-site improvements or corrective measures are recommended.

### OPENING YEAR (2023) WITHOUT PROJECT

The intersection Levels of Service for Opening Year (2023) Without Project conditions are shown in Table 5. As shown in Table 5, the study intersections are forecast to operate within acceptable Levels of Service (D or better) during the peak hours for Opening Year (2023) Without Project conditions.

### OPENING YEAR (2023) WITH PROJECT

The intersection Levels of Service for Opening Year (2023) With Project conditions are shown in Table 6. As shown in Table 6, the study intersections are projected to operate within acceptable Levels of Service (D or better) during the peak hours for Opening Year (2023) With Project conditions. Therefore, the proposed project is forecast to result in no substantial operational deficiencies at the study intersections for Opening Year (2023) With Project conditions and no off-site improvements or corrective measures are recommended.

**Table 4**
**Existing Plus Project Intersection Levels of Service**

| Study Intersection | Traffic Control[1] | AM Peak Hour | | PM Peak Hour | |
|---|---|---|---|---|---|
| | | Delay[2] | LOS[3] | Delay[2] | LOS[3] |
| 1. Redlands Avenue at Rider Street | TS | 25.6 | C | 23.5 | C |
| 2. Redlands Avenue at Project North Driveway | CSS | 8.6 | A | 8.7 | A |
| 3. Redlands Avenue at Project Central Driveway | CSS | 8.6 | A | 8.9 | A |
| 4. Redlands Avenue at Project South Driveway | CSS | 9.4 | A | 10.4 | B |
| 5. Redlands Avenue at Placentia Avenue | AWS | 8.3 | A | 9.0 | A |

Notes:

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

(2) Delay is shown in seconds/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 5**
**Opening Year (2023) Without Project Intersection Levels of Service**

| Study Intersection | Traffic Control[1] | AM Peak Hour | | PM Peak Hour | |
|---|---|---|---|---|---|
| | | Delay[2] | LOS[3] | Delay[2] | LOS[3] |
| 1. Redlands Avenue at Rider Street | TS | 24.8 | C | 23.5 | C |
| 5. Redlands Avenue at Placentia Avenue | AWS | 8.5 | A | 9.3 | A |

Notes:

(1) TS = Traffic Signal; AWS = All Way Stop

(2) Delay is shown in seconds/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 6**
**Opening Year (2023) With Project Intersection Levels of Service**

| Study Intersection | Traffic Control[1] | AM Peak Hour | | PM Peak Hour | |
|---|---|---|---|---|---|
| | | Delay[2] | LOS[3] | Delay[2] | LOS[3] |
| 1. Redlands Avenue at Rider Street | TS | 24.3 | C | 23.4 | C |
| 2. Redlands Avenue at Project North Driveway | CSS | 8.7 | A | 8.9 | A |
| 3. Redlands Avenue at Project Central Driveway | CSS | 8.7 | A | 9.1 | A |
| 4. Redlands Avenue at Project South Driveway | CSS | 9.8 | A | 11.1 | B |
| 5. Redlands Avenue at Placentia Avenue | AWS | 8.5 | A | 9.4 | A |

Notes:

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

(2) Delay is shown in seconds/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

# 7. SITE ACCESS AND CIRCULATION

This section includes a description of project improvements necessary to provide site access.

### PROJECT DESIGN FEATURES

As previously noted, a conceptual striping plan along Redlands Avenue including the Redlands Avenue East Industrial Project located across Redlands Avenue is shown on Figure 18. This analysis assumes the following improvements will be constructed by the project to provide project site access:

- Redlands Avenue (EW) at Project North Driveway (NS) [Study Intersection #2]
  - Truck access only
  - Construct one inbound lane and one outbound lane with eastbound stop-control
  - Northbound: two through lanes
  - Southbound: one through lane and one share through/right turn lane
  - Eastbound: one right turn only lane

- Redlands Avenue (EW) at Project Central Driveway (NS) [Study Intersection #3]
  - Passenger car access only
  - Construct one inbound lane and one outbound lane with eastbound stop-control
  - Northbound: two through lanes and one left turn lane
  - Southbound: one through lane and one share through/right turn lane
  - Eastbound: one right turn only lane

- Redlands Avenue (EW) at Project South Driveway (NS) [Study Intersection #4]
  - Truck access only
  - Construct one inbound lane and one outbound lane with eastbound stop-control
  - Northbound: two through lanes
  - Southbound: one through lane and one shared through/right turn lane
  - Eastbound: one shared left/right turn lane

This analysis also assumes the project shall comply with the following or similar conditions as part of the City of Perris standard development review process:

- A construction work site traffic control plan shall comply with State standards set forth in the California Manual of Uniform Traffic Control Devices and shall be submitted to the City for review and approval prior to the issuance of a grading permit or start of construction. The plan shall identify any roadway, sidewalk, bike route, or bus stop closures and detours as well as haul routes and hours of operation. All construction related trips shall be restricted to off-peak hours to the extent possible.

- All on-site and off-site roadway design, traffic signing and striping, and traffic control improvements relating to the proposed project shall be constructed in accordance with applicable State/Federal engineering standards to the satisfaction of the City of Perris.

- Site-adjacent roadways shall be constructed or repaired at their ultimate half-section width, including landscaping and parkway improvements in conjunction with development, or as otherwise required by the City of Perris.

- Adequate emergency vehicle access shall be provided to the satisfaction of the Riverside County Fire Authority.

- The final grading, landscaping, and street improvement plans shall demonstrate that sight distance requirements are met in accordance with applicable City of Perris/California Department of Transportation sight distance standards.

# 8. VEHICLES MILES TRAVELED (VMT)

## BACKGROUND

California Senate Bill 743 (SB 743) directs the State Office of Planning and Research (OPR) to amend the California Environmental Quality Act (CEQA) Guidelines for evaluating transportation impacts to provide alternatives to Level of Service that "promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." In December 2018, the California Natural Resources Agency certified and adopted the updated CEQA Guidelines package. The amended CEQA Guidelines, specifically Section 15064.3, recommend the use of Vehicle Miles Travelled (VMT) as the primary metric for the evaluation of transportation impacts associated with land use and transportation projects. In general terms, VMT quantifies the amount and distance of automobile travel attributable to a project or region. All agencies and projects State-wide are required to utilize the updated CEQA guidelines recommending use of VMT for evaluating transportation impacts as of July 1, 2020.

The updated CEQA Guidelines allow for lead agency discretion in establishing methodologies and thresholds provided there is substantial evidence to demonstrate that the established procedures promote the intended goals of the legislation. Where quantitative models or methods are unavailable, Section 15064.3 allows agencies to assess VMT qualitatively using factors such as availability of transit and proximity to other destinations. The Office of Planning and Research (OPR) *Technical Advisory on Evaluating Transportation Impacts in CEQA* (State of California, December 2018) ["OPR Technical Advisory"] provides technical considerations regarding methodologies and thresholds with a focus on office, residential, and retail developments as these projects tend to have the greatest influence on VMT.

## VMT ASSESSMENT AND SCREENING

The project VMT impact has been assessed in accordance with guidance from the *City of Perris Transportation Impact Analysis Guidelines for CEQA* (May 12, 2020) ["the City TIA Guidelines"]. The transportation guidelines provide a framework for "screening thresholds" for certain projects that are expected to cause a less than significant impact without conducting a detailed VMT study.

The project requirements for evaluation of transportation impacts under CEQA was assessed using the City of Perris VMT Scoping Form for Land Use Projects as appended to the City of Perris TIA Guidelines and included in Appendix B of this letter. As documented in the VMT Scoping Form, the proposed project satisfies the following VMT screening criteria:

| | | |
|---|---|---|
| B. | Is the project within half mile of qualifying transit? | No |
| C. | Is the project a local serving land use? | No |
| D. | Is the project in a low VMT area? | Yes |

Therefore, the proposed project is presumed to have a less than significant impact on VMT since it satisfies one or more of the VMT screening criteria established by the City of Perris (the project site is in a low VMT area). No additional VMT modeling or mitigation measures are required.

# 9. CONCLUSIONS

This section summarizes the findings and recommended improvements or mitigation measures (if any) identified in previous sections of this study.

### PROJECT TRIP GENERATION

The proposed project is forecast to generate approximately 605 daily vehicle trips, including 51 vehicle trips during the AM peak hour and 51 vehicle trips during the PM peak hour. The proposed project is forecast to generate approximately 857 daily PCE trips, including 59 PCE trips during the AM peak hour and 55 PCE trips during the PM peak hour.

### LEVELS OF SERVICE/OPERATIONAL ANALYSIS FINDINGS (NON-CEQA)

The study intersections are forecast to operate within acceptable Levels of Service (D or better) during the peak hours for Existing Plus Project conditions. Therefore, the proposed project is forecast to result in no substantial operational deficiencies at the study intersections for Existing Plus Project conditions and no off-site improvements or corrective measures are recommended.

The study intersections are projected to operate within acceptable Levels of Service (D or better) during the peak hours for Opening Year (2023) With Project conditions. Therefore, the proposed project is forecast to result in no substantial operational deficiencies at the study intersections for Opening Year (2023) With Project conditions and no off-site improvements or corrective measures are recommended.

### VMT ANALYSIS FINDINGS (CEQA)

The proposed project is presumed to have a less than significant impact on VMT since it satisfies one or more of the VMT screening criteria established by the City of Perris (the project site is in a low VMT area). No additional VMT modeling or mitigation measures are required.

# APPENDICES

Appendix A  Glossary
Appendix B  Scoping Agreement
Appendix C  Volume Count Worksheets
Appendix D  Level of Service Worksheets

# APPENDIX A

# GLOSSARY

## ACRONYMS

| | |
|---|---|
| **AC** | Acres |
| **ADT** | Average Daily Traffic |
| **Caltrans** | California Department of Transportation |
| **DU** | Dwelling Unit |
| **ICU** | Intersection Capacity Utilization |
| **GFA** | Gross Floor Area |
| **LOS** | Level of Service |
| **PCE** | Passenger Car Equivalent |
| **SP** | Service Population |
| **TSF** | Thousand Square Feet |
| **V/C** | Volume/Capacity |
| **VMT** | Vehicle Miles Traveled |

## TERMS

**ACTUATED SIGNAL CONTROL**: A type of traffic signal control in which display of each phase depends on whether the corresponding phase detector has registered a service call or the phase is on recall.

**ACTUATION**: Detection of a roadway user that is forwarded to the signal controller.

**AVERAGE DAILY TRAFFIC**: The average 24-hour volume for a stated period divided by the number of days in that period. For example, Annual Average Daily Traffic is the total volume during a year divided by 365 days.

**BANDWIDTH:** The number of seconds of green time available for through traffic in a signal progression.

**BOTTLENECK**: A point of constriction along a roadway that limits the amount of traffic that can proceed downstream from its location.

**CALL**: An indication within a signal controller that a particular phase is waiting for service, either through actuation from a roadway user or phase recall.

**CAPACITY**: The maximum number of vehicles that can be reasonably expected to pass through a roadway facility during a specified period.

**CHANNELIZATION:** The separation of conflicting traffic movements by use of pavement markings, raised curbs, or other suitable means to facilitate free flow movement.

**CLEARANCE INTERVAL**: Equal to the yellow plus all-red time, if any, when a traffic signal changes between phases (i.e., the amount of time between the end of a green light from one movement to the beginning of a green light for the next).

**COORDINATED SIGNAL CONTROL**: A type of traffic signal control in which non-coordinated phases associated with minor movements are constrained such that the coordinated phases are served at a specific time during the signal cycle, thus maintaining the efficient progression of traffic flow along the major roadway.

**CONTROL DELAY**: The portion of delay attributed to the intersection traffic control (such as a traffic signal or stop sign). It includes initial deceleration, queue move-up time, stopped delay, and final acceleration delay.

**CORDON**: An imaginary boundary line around or across a study area across which vehicles, persons, or other information can be collected for survey and analytical purposes.

**CORNER SIGHT DISTANCE**: The minimum sight distance required by the driver of a vehicle to cross or enter the lanes of the major roadway without requiring approaching traffic traveling at a given speed to radically alter their speed or trajectory.

**CYCLE**: A complete sequence of signal indications for all phases.

**CYCLE LENGTH**: The total time for a traffic signal to complete one full cycle.

**DAILY CAPACITY**: A theoretical value representing the daily traffic volume that will typically result in a peak hour volume equal to the capacity of the roadway.

**DELAY:** The total additional travel time experienced by a roadway user (driver, passenger, bicyclist, or pedestrian) beyond that required to travel at a desired speed.

**DENSITY**: The number of vehicles occupying in a unit length of the through traffic lanes of a roadway at any given instant. Usually expressed in vehicles per mile.

**DETECTOR:** A device used to count or determine the presence of a roadway user.

**DESIGN SPEED**: A speed used for purposes of designing horizontal and vertical alignments of a highway.

**DIRECTIONAL SPLIT**: The percent of two-way traffic traveling in a specified direction.

**DIVERSION:** The rerouting of traffic from a normal path of travel between two points, such as to avoid congestion or perform a secondary trip.

**FREE FLOW**: Traffic flow that is unaffected by a traffic control and/or or upstream or downstream conditions.

**GAP:** Time or distance between two vehicles measured from rear bumper of the front vehicle to front bumper of the second vehicle.

**GAP ACCEPTANCE:** The method by which a driver accepts an available gap in traffic to enter or cross the road.

**HEADWAY:** Time or distance between two successive vehicles measured from same point on both vehicles (i.e., front bumper to front bumper).

**LEVEL OF SERVICE**: A grading scale of quantitative performance measures representing the quality of service of a transportation facility or service from an average traveler's perspective.

**LOOP DETECTOR**: A vehicle detector consisting of a loop of wire embedded in the roadway, energized by alternating current and producing an output circuit closure when passed over by a vehicle.

**MULTI-MODAL**: More than one mode, such as automobile, transit, bicycle, and pedestrian.

**OFFSET**: The time interval between the beginning of a traffic signal cycle at one intersection and the beginning of signal cycle an adjacent intersection.

**PLATOON:** A set of vehicles traveling at similar speed and moving as a general group with clear separation between other vehicles ahead and behind.

**PASSENGER CAR EQUIVALENT**: A metric used to assess the impact of larger vehicles, such as trucks, recreational vehicles, and buses, by converting the traffic volume of larger vehicles to an equivalent number of passenger cars.

**PEDESTRIAN CLEARANCE INTERVAL**: Also known as the "Flashing Don't Walk" interval, it signals the end of pedestrian entry into the crosswalk following the "Walk" indication and provides time for pedestrians who have already entered the crosswalk to finishing crossing.

**PEAK HOUR**: The hour within a day in which the maximum volume occurs.

**PEAK HOUR FACTOR**: The peak hour volume divided by the four times the peak 15-minute flow rate. This

**PHASE**: In traffic signals, the green, yellow, and red clearance intervals assigned to a specified traffic movement.

**PRETIMED SIGNAL**: A traffic signal operation in which the cycle length, phasing sequence, and phasing times are predetermined and fixed, regardless of actual demand for any given traffic movement. Also known as a fixed time signal.

**PROGRESSION**: The coordinated movement of vehicles through signalized intersections along a corridor.

**QUEUE**: The number of vehicles waiting at a service area such as a traffic signal, stop sign, or access gate.

**QUEUE LENGTH**: The length of vehicle queue, typically expressed in feet, waiting at a service area such as a traffic signal, stop sign, or access gate.

**RECALL**: A signal phasing operation in which a specified phase places a call to the signal controller each time a conflicting phase is served, thus ensuring the specified phase will be serviced again.

**SEMI-ACTUATED CONTROL**: A type of traffic signal control in which only the minor movements are provided detection.

**SIGHT DISTANCE**: The continuous length of roadway visible to a driver or roadway user.

**STACKING DISTANCE**: The length of area available behind a service area, such as a traffic signal or gate, for vehicle queuing to occur.

**STOPPING SIGHT DISTANCE**: The minimum distance required by the driver of a vehicle traveling at a given speed to bring the vehicle to a stop after an object on the road becomes visible, including reaction and response time.

**TRIP OR TRIP END:** The one-directional movement of a person or vehicle. Every trip has an origin and a destination at its respective ends (i.e., trip ends). In terms of site trip generation, the same vehicle entering and exiting a site generates two trips: one inbound trip and one outbound trip.

**TRIP GENERATION RATE:** The rate at which a land use generates trips per the specified land use variable, such per dwelling unit or per thousand square feet.

**TRUCK:** A heavy motor vehicle generally used for transporting goods.

**VEHICLE MILES TRAVELED**: A measure of the amount and distance of automobile travel essentially calculated as the sum of each trip times the trip length.

# APPENDIX B

# SCOPING AGREEMENT

# MEMORANDUM OF UNDERSTANDING

**TO:** Candida Neal, Interim Development Services Director | CITY OF PERRIS

**FROM:** Bryan Crawford, Senior Transportation Planner | GANDDINI GROUP, INC.

**DATE:** ~~June 29, 2021~~ Revised 1/4/2022

**SUBJECT:** Redlands Avenue West Industrial Project (Case# DPR 20-000-20) Traffic Impact Analysis Scoping

## INTRODUCTION

The purpose of this traffic study scoping document is to outline the proposed traffic analysis parameters and assumptions for review/concurrence by City of Perris staff.

## PROJECT DESCRIPTION

Figure 1 shows the project location map. The project site is located west of Redlands Avenue, south of Rider Street, and north of Placentia Avenue in the City of Perris, as exhibited in Figure 2.

The site plan is show in Appendix A. The 20.26-acre project site is proposed to include a 330,447 square foot warehouse building with 4,000 square foot mezzanine. The proposed project is anticipated to be constructed and fully operational by year 2023.

The project site is proposed to provide three access driveways on Redlands Avenue. The north and south project driveways will primarily serve truck traffic and the center driveway will serve passenger cars.

## VMT SCOPING FORM

Appendix B shows the City of Perris VMT Scoping Form for Land Use Project based on the City of Perris TIA Guidelines, dated May 12, 2020. The project is presumed to have a less than significant impact on VMT because the project satisfies at least one (1) of the VMT screening criteria. As shown in Appendix B, the project satisfies VMT screening criteria D because the project is in a low VMT area. According to WRCOG VMT Screening Tool, the project TAZ 2012 daily home-based work VMT per worker is 9.95, which is less than the city average 2012 daily home-based work VMT per worker of 11.62.

## PROJECT TRIP GENERATION

Table 1 shows the project trip generation based upon rates obtained from the Institute of Transportation Engineers (ITE) Trip Generation Manual (10th Edition, 2017). ITE land use code 155 (High-Cube Fulfillment Center Non-Sort) has been used to estimate the site-specific trip generation estimates for up to 334,447 square feet of high-cube fulfillment center (non-sort) use.

The project vehicle trips are converted to Passenger Car Equivalent (PCE) trips based on truck rates (as a percentage of a total vehicle trips) from the ITE Trip Generation Manual Supplement (10th Edition, 2020) and truck axle mix data recommended by the South Coast Air Quality Management District (SCAQMD). Appendix C includes the source information. As shown in Table 1, the proposed project is forecast to generate approximately 857 daily PCE trips, including 59 PCE trips during the AM peak hour and 55 PCE trips during the PM peak hour.

## PROJECT TRIP DISTRIBUTION

Figure 3 and Figure 4 illustrate the forecast outbound and inbound directional distribution patterns of project-generated truck trips and passenger car trips.

## STUDY AREA

Based on the City of Perris TIA Guidelines for CEQA (May 12, 2020), a TIS (Traffic Impact Study) for LOS (Level of Service) evaluation is required for projects which exceed 500 daily trips or 50 peak hour trip for project approval purposes. Since the project is anticipated to generate more than 500 daily trips and more than 50 peak hour trips, a full TIA (Traffic Impact Analysis) is required.

Intersections identified for analysis typically include signalized intersections at which a project is forecast to contribute 50 or more trips during the AM or PM peak hours. The study area is proposed to consist of the following four (5) study intersections, even if the project may not contribute 50 or more trips during either the AM or PM peak hours but are the adjacent or primary intersections impacted by the proposed project.

Study Intersections (Figure 1)

1. Redlands Avenue (NS) at Rider Street (EW)
2. Redlands Avenue (NS) at Placentia Avenue (EW)
3. Project North Driveway (NS) at Redlands Avenue (EW)
4. Project Center Driveway (NS) at Redlands Avenue (EW)
5. Project South Driveway (NS) at Redlands Avenue (EW)

## TRAFFIC COUNTS

Intersection turning movement counts will be used at the study intersections during the AM peak period (7:00 AM – 9:00 AM) and PM peak period (4:00 PM – 6:00 PM) on a typical weekday (Tuesday, Wednesday, or Thursday).

## ANALYSIS SCENARIOS

The traffic study shall evaluate the following analysis scenarios for weekday AM and PM peak hour conditions:

- Existing [2021]
- Existing Plus Project [2021]
- Opening Year Without Project [2023]
- Opening Year With Project [2023]

## REDLANDS AVENUE CONCEPTUAL STRIPING PLAN

Figure 5 exhibits a conceptual striping plan for Redlands Avenue including project access. Driveway spacing is included on this figure. The City of Perris *Perris Valley Commerce Center Amendment No. 9 Specific Plan* (May 2018) states that appropriate driveway spacing for intersections along a Secondary Arterial (Raised Median),

such as Redlands Avenue, is 660 feet. The distance between Rider Street and the Project North Driveway is 784 feet, which exceeds the 660 feet requirement. The distance between the Project North Driveway and Project Central Driveway is 329.33 feet. The distance between the Project Central Driveway and the Project South Driveway is 378.71 feet. The distance between the Project North Driveway and Project South Driveway is 708.04 feet. Since the Project Central Driveway is less than 600 feet from the Project North Driveway and Project South Driveway, consultation between the City and project applicant in plan check shall determine feasibility of the inclusion of this project driveway.

## FORECASTING METHODOLOGY

Ambient Growth Rate

To account for area-wide ambient growth, the Opening Year 2023 will include a 3% annual growth for 2 years (total growth factor = 1.06) over the 2021 base volumes. The 3% annual growth rate is consistent to other traffic studies conducted in the area.

Other Cumulative Projects

A list of pending and approved cumulative development projects has been obtained from the City of Perris website (see Appendix D). This list will be narrowed down to include projects within a 1.5 mile radius of the project site. The Redlands Avenue East Industrial Project (Case# DPR 20-000-21) will be included as a cumulative project. This list obtained from City staff was last updated January 2021 and we are working with City staff on receiving a more current and updated list.

Trip forecasts for other development projects within the project study area will be determined based on the Institute of Transportation Engineers (ITE), Trip Generation Manual, 10th Edition, 2017 and will be added to existing roadway volumes for the applicable analysis scenarios.

## CONCLUSION

We appreciate the opportunity to provide this scoping document for your review. Should you have any questions or comments regarding the proposed scope, please contact Bryan Crawford at (714) 795-3100 x 104 or bryan@ganddini.com.

## Table 1
## Project Trip Generation

| |
|---|
| Land Use: High-Cube Fulfillment Center Warehouse (Non-Sort) |
| Size: 334.447 TSF |

| TRIP GENERATION RATES PER TSF[1] | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | AM Peak Hour | | | PM Peak Hour | | | |
| Vehicle Type | Source[2] | In | Out | Rate | In | Out | Rate | Daily Rate |
| All Vehicles | TGMS 155 | 81% | 19% | 0.150 | 39% | 61% | 0.160 | 1.810 |
| Passenger Cars (91.0% AM, 93.0% PM, 73.0% Daily) | TGMS 155 | 0.111 | 0.026 | 0.137 | 0.058 | 0.091 | 0.149 | 1.321 |
| Trucks (9.0% AM, 7.0% PM, 27.0% Daily) | TGMS 155* | 0.011 | 0.003 | 0.014 | 0.004 | 0.007 | 0.011 | 0.489 |
| Truck Mix: | SCAQMD | | | | | | | |
| 2-Axle Trucks (16.7%) | | 0.002 | 0.000 | 0.002 | 0.001 | 0.001 | 0.002 | 0.082 |
| 3-Axle Trucks (20.7%) | | 0.002 | 0.001 | 0.003 | 0.001 | 0.001 | 0.002 | 0.101 |
| 4+ Axle Trucks (62.6%) | | 0.007 | 0.002 | 0.009 | 0.003 | 0.004 | 0.007 | 0.306 |

| VEHICLE TRIPS GENERATED | | | | | | | |
|---|---|---|---|---|---|---|---|
| | AM Peak Hour | | | PM Peak Hour | | | |
| Vehicle Type | In | Out | Total | In | Out | Total | Daily |
| Passenger Cars | 37 | 9 | 46 | 19 | 30 | 49 | 442 |
| Trucks | | | | | | | |
| 2-Axle Trucks | 1 | 0 | 1 | 0 | 0 | 0 | 27 |
| 3-Axle Trucks | 1 | 0 | 1 | 0 | 0 | 0 | 34 |
| 4+ Axle Trucks | 2 | 1 | 3 | 1 | 1 | 2 | 102 |
| Subtotal | 4 | 1 | 5 | 1 | 1 | 2 | 163 |
| **Total Vehicle Trips Generated** | **41** | **10** | **51** | **20** | **31** | **51** | **605** |

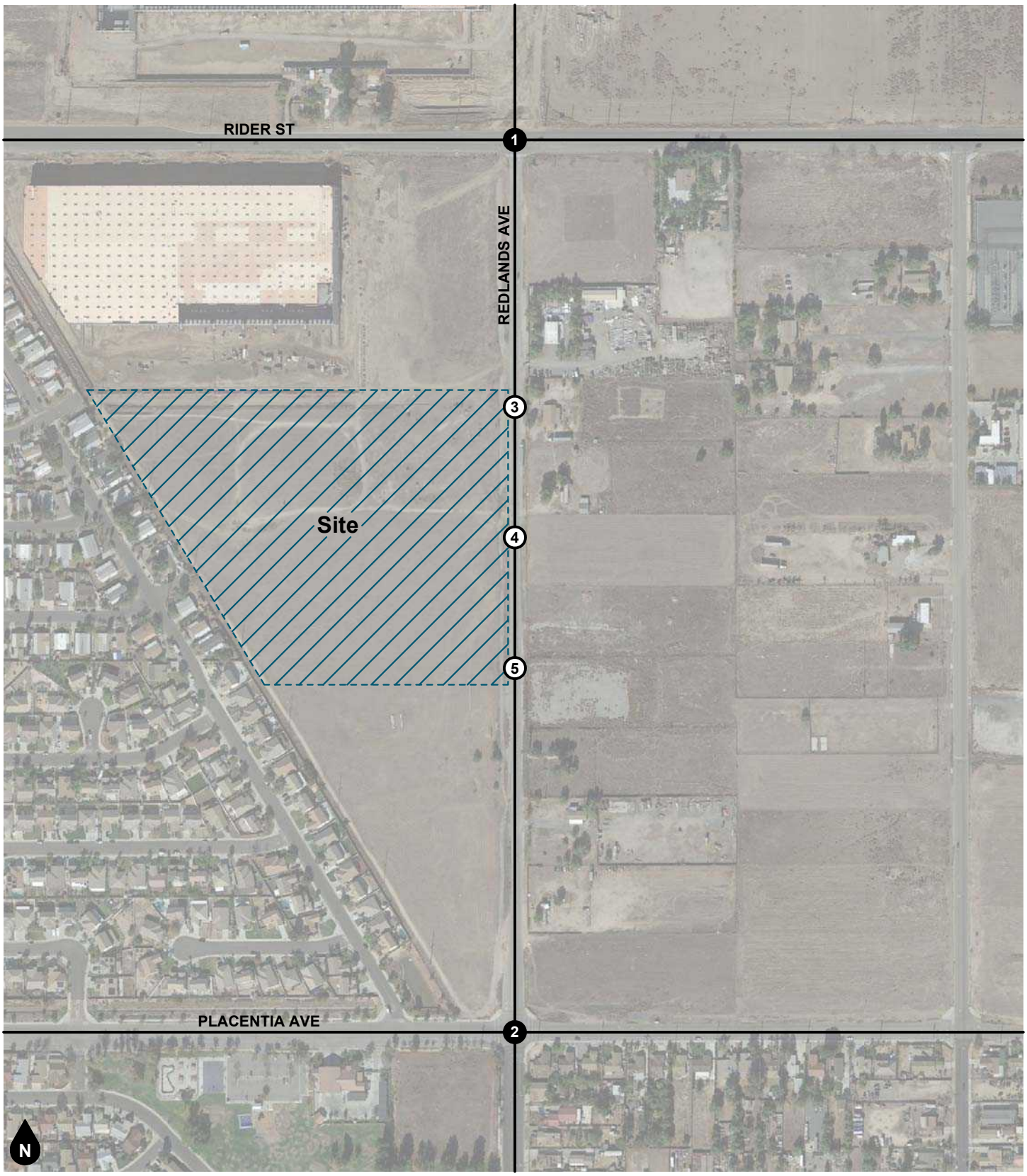
| PCE[3] TRIPS GENERATED | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | AM Peak Hour | | | PM Peak Hour | | | |
| Vehicle Type | PCE Factor[4] | In | Out | Total | In | Out | Total | Daily |
| Passenger Cars | 1.0 | 37 | 9 | 46 | 19 | 30 | 49 | 442 |
| Trucks | | | | | | | | |
| 2-Axle Trucks | 1.5 | 2 | 0 | 2 | 0 | 0 | 0 | 41 |
| 3-Axle Trucks | 2.0 | 2 | 0 | 2 | 0 | 0 | 0 | 68 |
| 4+ Axle Trucks | 3.0 | 6 | 3 | 9 | 3 | 3 | 6 | 306 |
| Subtotal | | 10 | 3 | 13 | 3 | 3 | 6 | 415 |
| **Total PCE Trips Generated** | | **47** | **12** | **59** | **22** | **33** | **55** | **857** |

Notes:
(1) TSF = Thousand Square Feet

(2) TGMS = Trip Generation Manual Supplement (Institute of Transportation Engineers (ITE), February 2020); ### = ITE Land Use Code.
* = Daily truck percent based on ITE 150 (Warehousing) since it is not available for ITE 155 (Non-Sort).
SCAQMD = South Coast Air Quality Management District recommendations for non-cold storage high-cube warehouse.

(3) PCE = Passenger Car Equivalent

(4) Source: San Bernardino County Congestion Management Program (2016), Appendix B.




Legend

(#) Study Intersection

(#) Project Driveway

**Figure 1**
**Project Location Map**

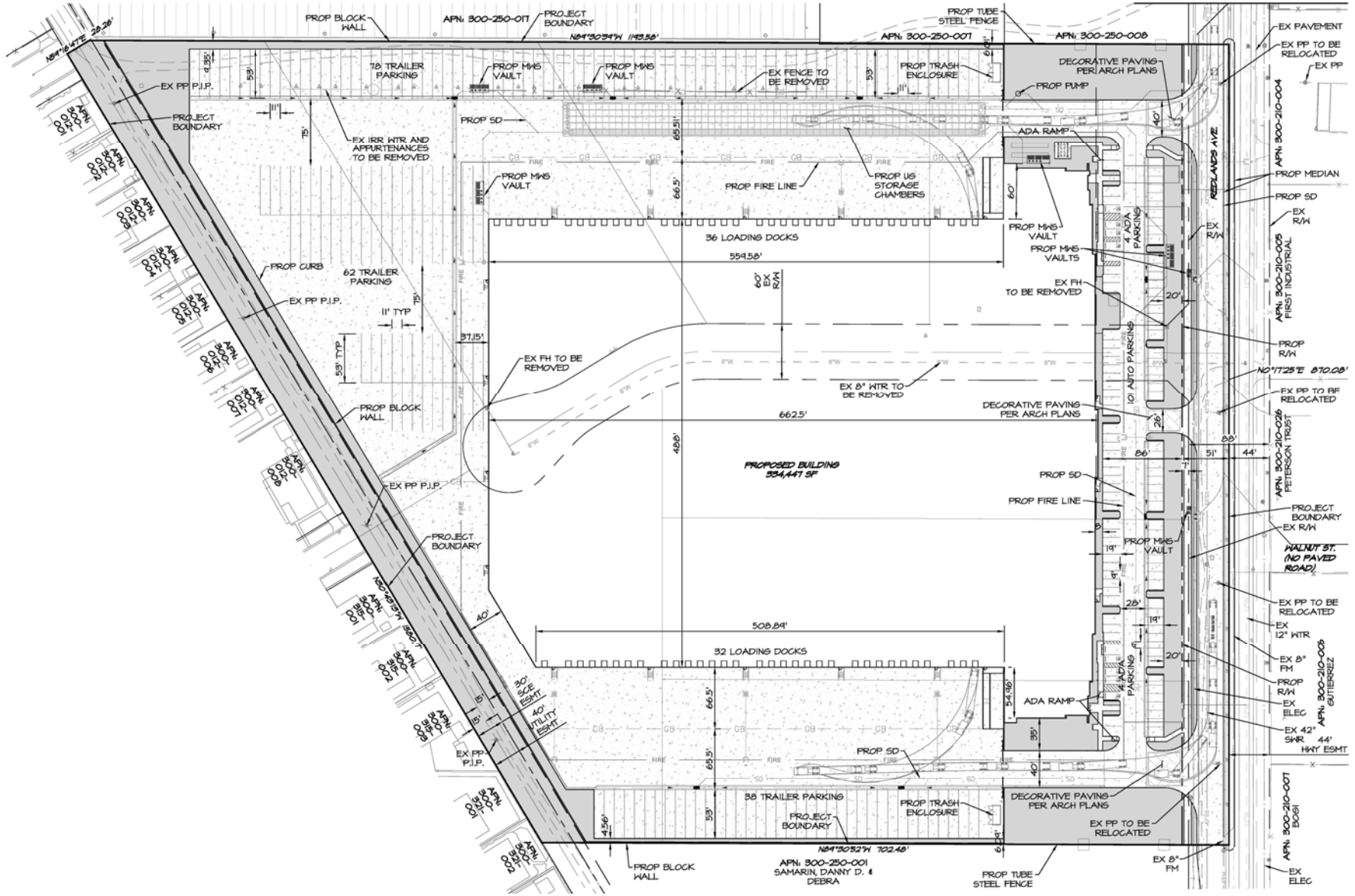
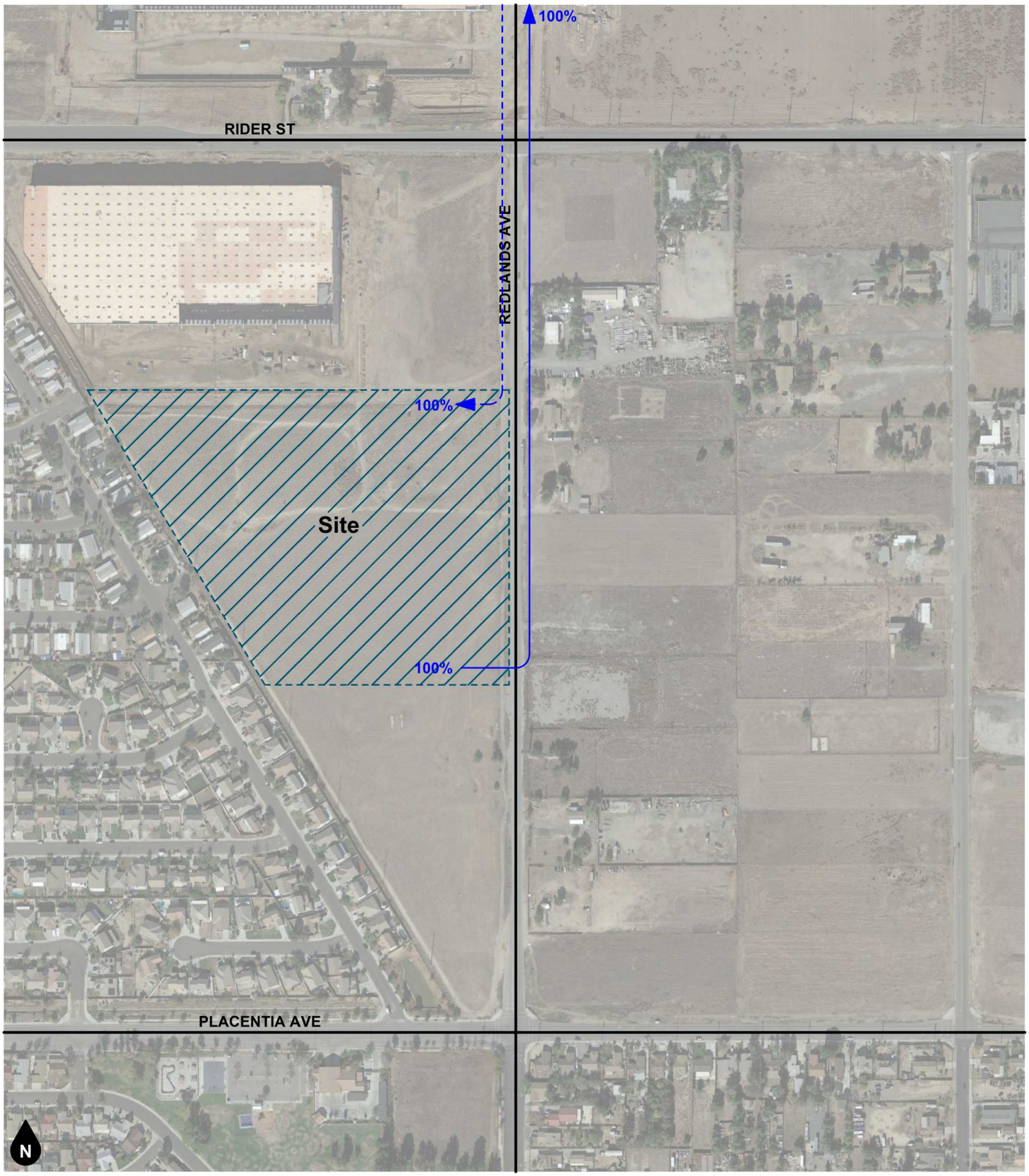



**Figure 2**
**Site Plan**

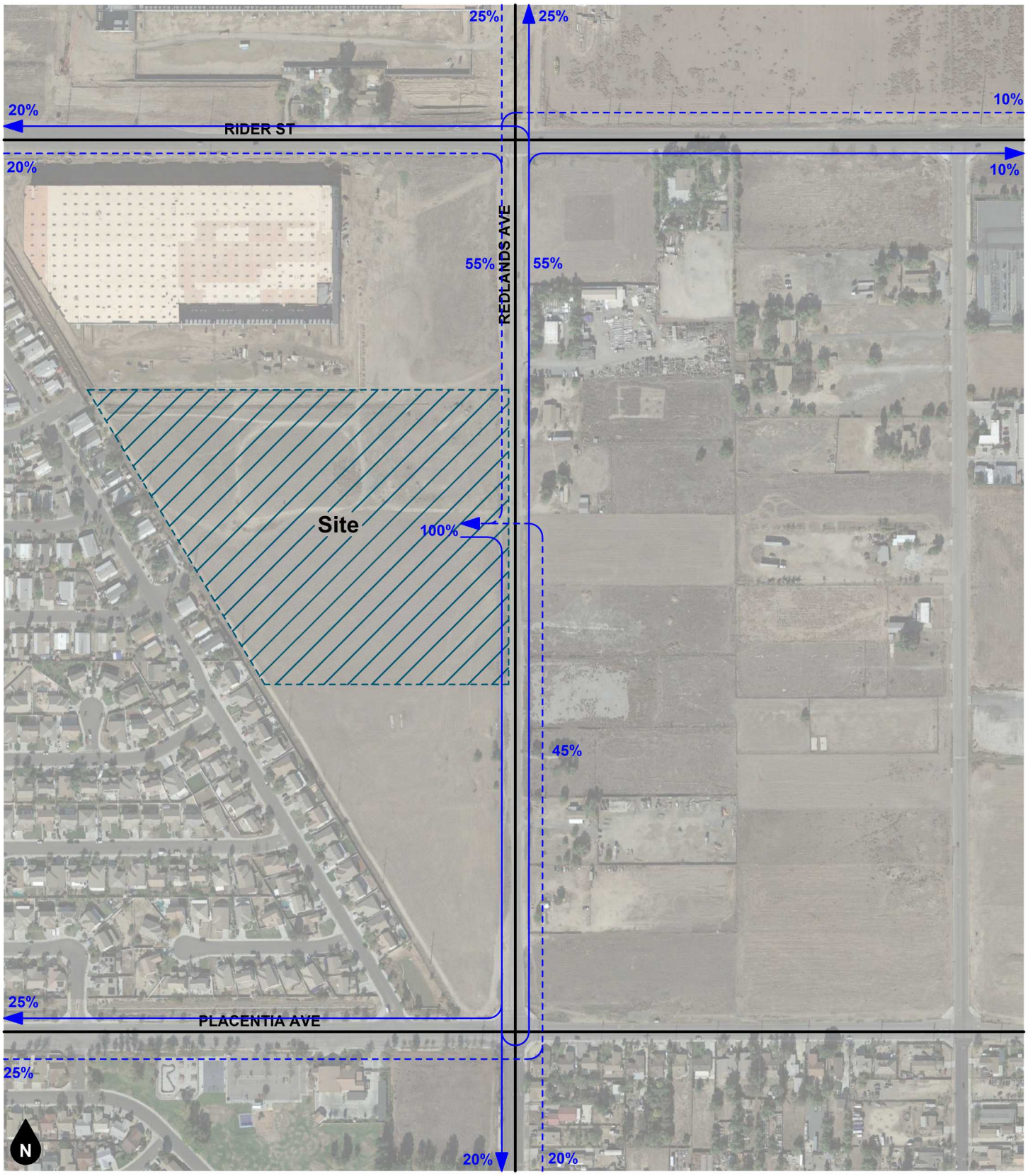



Legend

10% Percent From Project

10% Percent To Project

**Figure 3**
**Project Truck Trip Distribution**

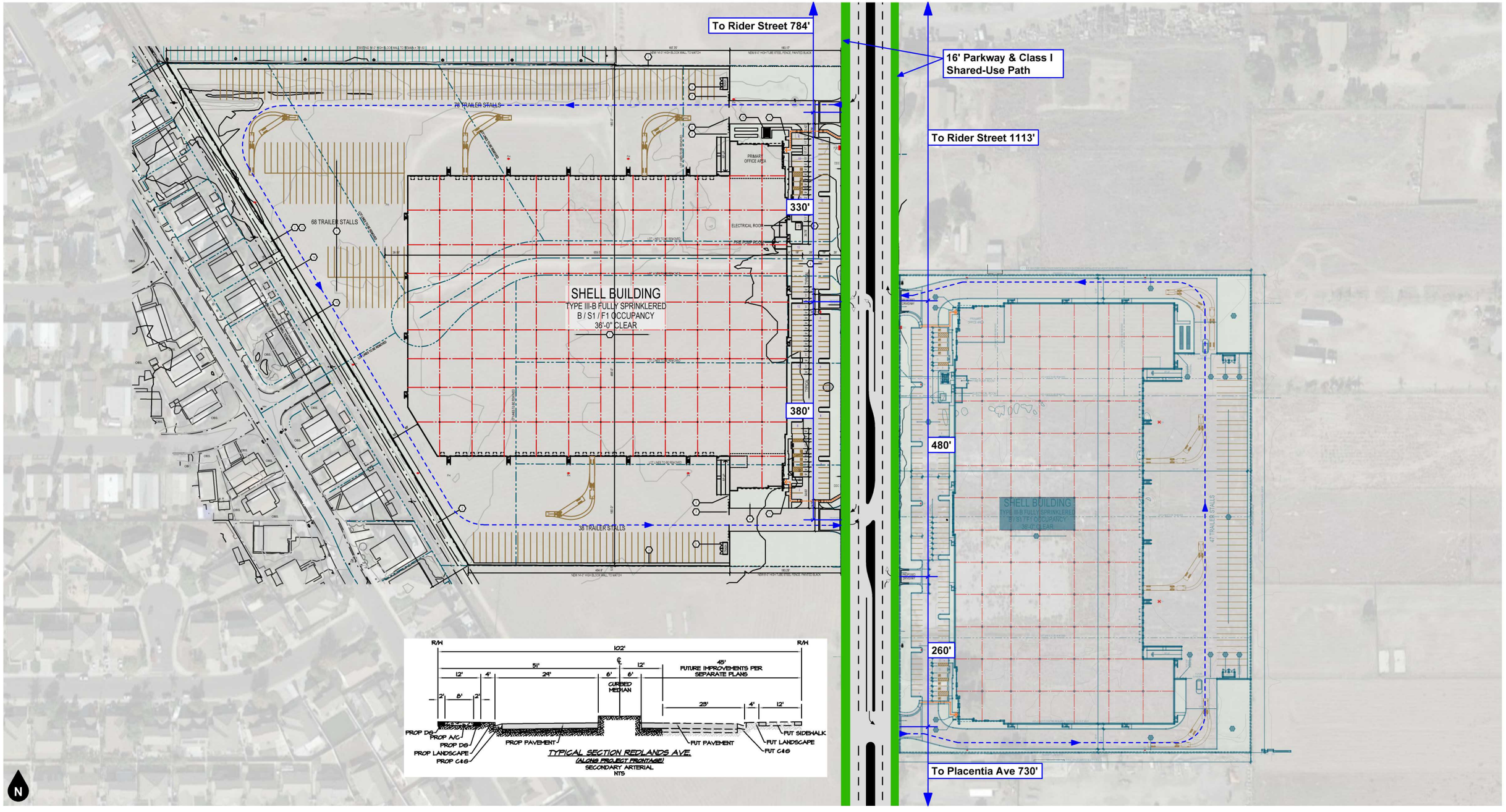



Legend

10% Percent From Project

10% Percent To Project

**Figure 4**
**Project Passenger Car Trip Distribution**




Legend

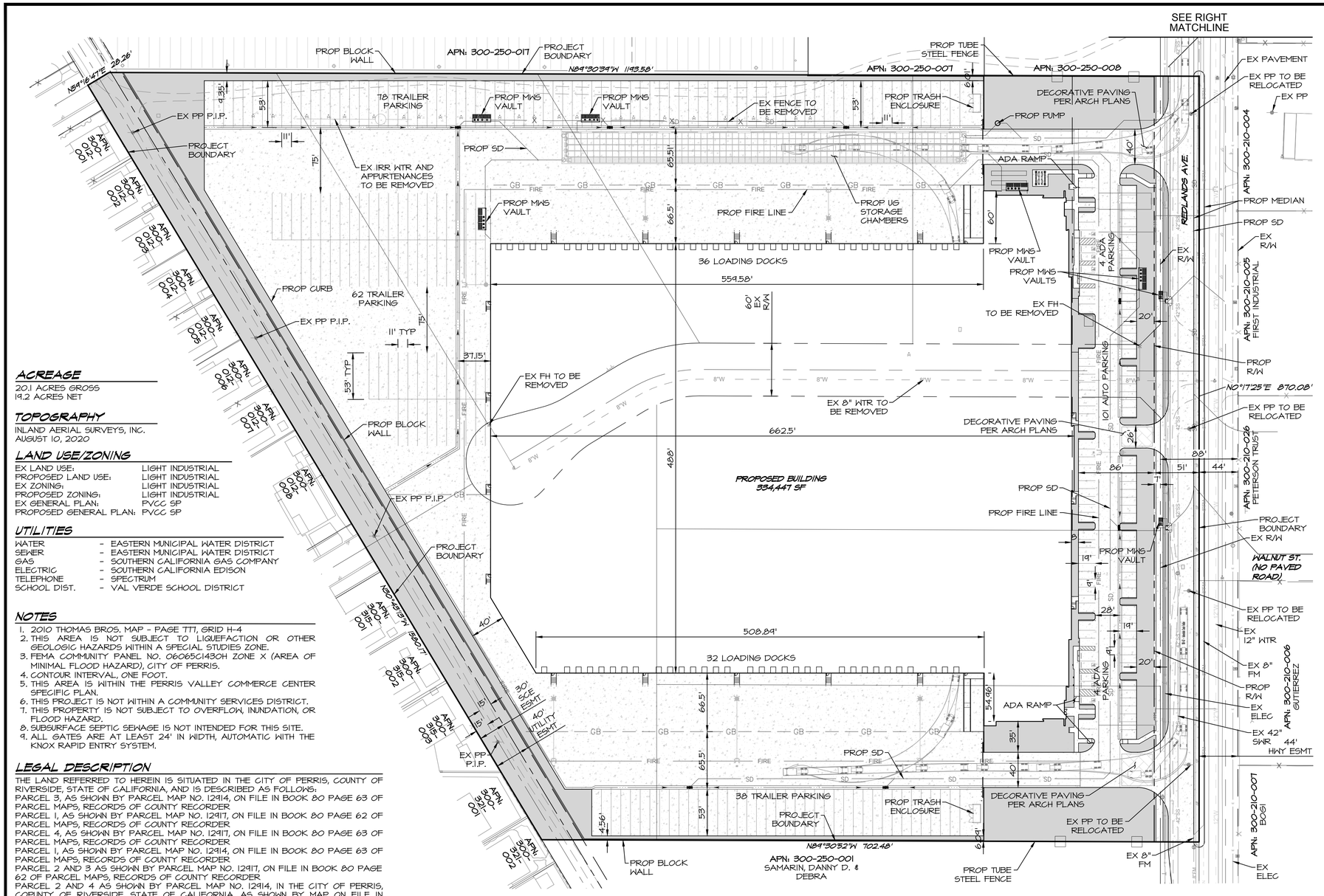
Passenger Car Only Movement

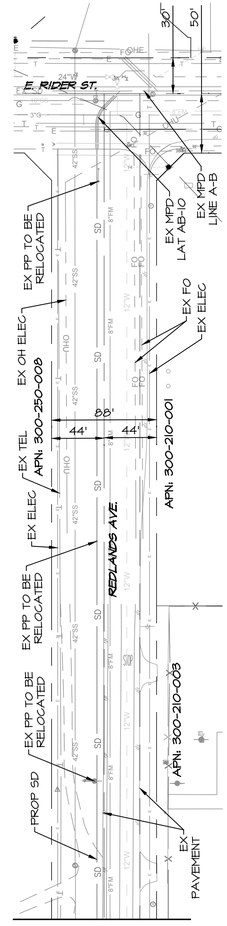
Primary Truck Movement

**Figure 18**
**Redlands Avenue Conceptual Striping Plan**

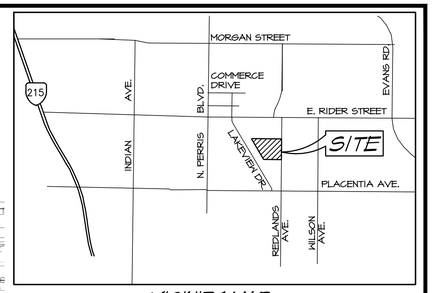
# Appendix A

## Site Plan




MATCHLINE SEE LEFT




## VICINITY MAP
N.T.S.

## ACREAGE
20.1 ACRES GROSS
19.2 ACRES NET

## TOPOGRAPHY
INLAND AERIAL SURVEYS, INC.
AUGUST 10, 2020

## LAND USE/ZONING

| | |
|---|---|
| EX LAND USE: | LIGHT INDUSTRIAL |
| PROPOSED LAND USE: | LIGHT INDUSTRIAL |
| EX ZONING: | LIGHT INDUSTRIAL |
| PROPOSED ZONING: | LIGHT INDUSTRIAL |
| EX GENERAL PLAN: | PVCC SP |
| PROPOSED GENERAL PLAN: | PVCC SP |

## UTILITIES

| | |
|---|---|
| WATER | - EASTERN MUNICIPAL WATER DISTRICT |
| SEWER | - EASTERN MUNICIPAL WATER DISTRICT |
| GAS | - SOUTHERN CALIFORNIA GAS COMPANY |
| ELECTRIC | - SOUTHERN CALIFORNIA EDISON |
| TELEPHONE | - SPECTRUM |
| SCHOOL DIST. | - VAL VERDE SCHOOL DISTRICT |

## NOTES
1. 2010 THOMAS BROS. MAP - PAGE 777, GRID H-4
2. THIS AREA IS NOT SUBJECT TO LIQUEFACTION OR OTHER GEOLOGIC HAZARDS WITHIN A SPECIAL STUDIES ZONE.
3. FEMA COMMUNITY PANEL NO. 06065C1430H ZONE X (AREA OF MINIMAL FLOOD HAZARD), CITY OF PERRIS.
4. CONTOUR INTERVAL, ONE FOOT.
5. THIS AREA IS WITHIN THE PERRIS VALLEY COMMERCE CENTER SPECIFIC PLAN.
6. THIS PROJECT IS NOT WITHIN A COMMUNITY SERVICES DISTRICT.
7. THIS PROPERTY IS NOT SUBJECT TO OVERFLOW, INUNDATION, OR FLOOD HAZARD.
8. SUBSURFACE SEPTIC SEWAGE IS NOT INTENDED FOR THIS SITE.
9. ALL GATES ARE AT LEAST 24' IN WIDTH, AUTOMATIC WITH THE KNOX RAPID ENTRY SYSTEM.

## LEGAL DESCRIPTION
THE LAND REFERRED TO HEREIN IS SITUATED IN THE CITY OF PERRIS, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:
PARCEL 3, AS SHOWN BY PARCEL MAP NO. 12414, ON FILE IN BOOK 80 PAGE 63 OF PARCEL MAPS, RECORDS OF COUNTY RECORDER
PARCEL 1, AS SHOWN BY PARCEL MAP NO. 12417, ON FILE IN BOOK 80 PAGE 62 OF PARCEL MAPS, RECORDS OF COUNTY RECORDER
PARCEL 4, AS SHOWN BY PARCEL MAP NO. 12417, ON FILE IN BOOK 80 PAGE 63 OF PARCEL MAPS, RECORDS OF COUNTY RECORDER
PARCEL 1, AS SHOWN BY PARCEL MAP NO. 12414, ON FILE IN BOOK 80 PAGE 63 OF PARCEL MAPS, RECORDS OF COUNTY RECORDER
PARCEL 2 AND 3 AS SHOWN BY PARCEL MAP NO. 12417, ON FILE IN BOOK 80 PAGE 62 OF PARCEL MAPS, RECORDS OF COUNTY RECORDER
PARCEL 2 AND 4 AS SHOWN BY PARCEL MAP NO. 12414, IN THE CITY OF PERRIS, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN BY MAP ON FILE IN BOOK 80 PAGE 63 OF PARCEL MAPS, RECORDS OF RIVERSIDE COUNTY

## APPLICANT
LAKE CREEK INDUSTRIAL LLC
1302 BRITTANY CROSS ROAD
SANTA ANA, CA 92705
CONTACT: MICHAEL JOHNSON
TEL: 786-200-9681

## OWNER
LAKE CREEK INDUSTRIAL LLC
1302 BRITTANY CROSS ROAD
SANTA ANA, CA 92705

## APN

| | |
|---|---|
| 300-250-009 | 300-250-013 |
| 300-250-010 | 300-250-014 |
| 300-250-011 | 300-250-015 |
| 300-250-012 | 300-250-016 |

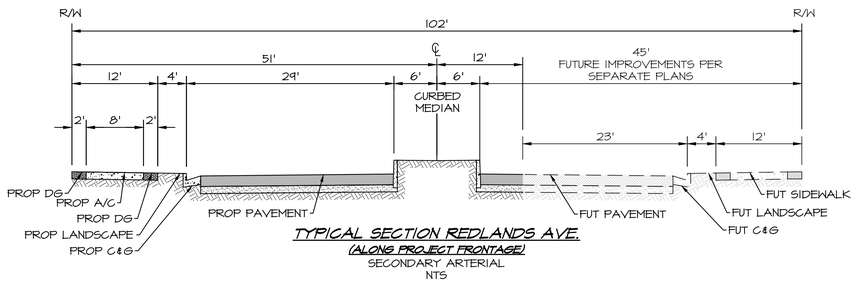
## EARTHWORK ESTIMATE

| | CUT | FILL |
|---|---|---|
| RAW CUT/FILL | 44,953 C.Y. | 44,953 C.Y. |

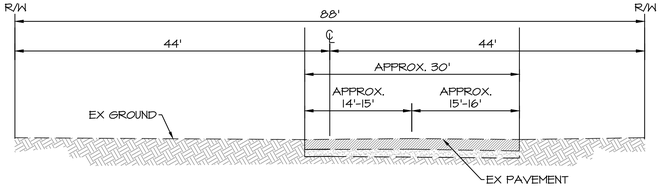
## PROJECT DATA

| | |
|---|---|
| SITE AREA | 877,309 SF |
| | 20.1 ACRES GROSS AREA |
| | 19.2 ACRES NET AREA |
| BUILDING AREA | |
| WAREHOUSE | 334,040 SF |
| LOT COVERAGE | 34.1% |
| PARKING REQUIRED | |
| 8,000 OFFICE PARKING (LESS THAN 10%) | 00 STALLS |
| 0-20K SF (1/1000 SF) | 20 STALLS |
| 20K-40K SF (1/2000 SF) | 10 STALLS |
| 40K+ SF (1/5000 SF) | 54 STALLS |
| TOTAL PARKING REQUIRED | 84 STALLS |
| PARKING PROVIDED | |
| ACCESSIBLE STALLS | 8 STALLS |
| STANDARD STALLS | 101 STALLS |
| FUTURE STALLS | 00 STALLS |
| TOTAL PROVIDED | 109 STALLS |
| LANDSCAPING | |
| AREA | 118,146 SF |
| AREA REQUIRED | 12.0% |
| AREA PROVIDED | 14.18% |
| GROSS IMPERVIOUS AREA | |
| AREA | 753,002 SF |

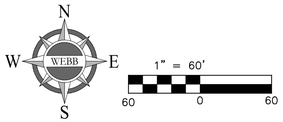
## LEGEND
- PROPOSED CONCRETE/ASPHALT
- PROPOSED LANDSCAPE
- PROPOSED 14' HIGH BLOCK WALL (PER ARCHITECT PLANS)
- PROPOSED 8' HIGH CHAIN LINK FENCE (PER ARCHITECT PLANS)
- PROPOSED MWS WATER QUALITY TREATMENT VAULT (SIZE VARIES)
- EX POWER POLE
- FIRE LINE
- EX STORM DRAIN
- PROP STORM DRAIN
- PROP FH




**TYPICAL SECTION REDLANDS AVE.**
(ALONG PROJECT FRONTAGE)
SECONDARY ARTERIAL
NTS




**EXISTING TYPICAL SECTION REDLANDS AVE.**
(OUTSIDE PROJECT FRONTAGE)
SECONDARY ARTERIAL
NTS




| REVISIONS | DATE | BY |
|---|---|---|
| | | |

SCALE: 1"=60'
DATE: 12/17/21
DESIGNED: AYS
CHECKED: JRG
PLN CK REF:
F.B.

ALBERT A. WEBB ASSOCIATES
ENGINEERING CONSULTANTS
3788 McCRAY STREET
RIVERSIDE CA. 92506
PH. (951) 686-1070
FAX (951) 788-1256

PLOT DATE: 17-Dec-21

CITY OF PERRIS
DEVELOPMENT PLAN REVIEW
DPR 20-00020

W.O. 20-0186
SHEET 1
OF 2 SHEETS
DWG. NO.

H:\2020\20-0186\DRAWINGS\ENTITLEMENT\DPR\20-186-C-DPR.DWG 12/17/2021 11:51:39 AM

# Appendix B

## VMT Scoping Form for Land Use Projects

City of Perris
www.cityofperris.org

# CITY OF PERRIS
# VMT SCOPING FORM FOR LAND USE PROJECTS

This Scoping Form acknowledges the City of Perris requirements for the evaluation of transportation impacts under CEQA. The analysis provided in this form should follow the City of Perris TIA Guidelines, dated May 12, 2020.

## I. Project Description

**Tract/Case No.** DPR 20-000-20

**Project Name:** Redlands Avenue West Industrial Project

**Project Location:** West Side of Redlands Avenue between Rider Street and Placentia Ave in the City of Perris

**Project Description:** A 330,447 SF warehouse building with 4,000 SF mezzanine

(Please attach a copy of the project Site Plan)

**Current GP Land Use:** PVCC SP - Light Industrial

**Proposed GP Land Use:** PVCC SP - Light Industrial

**Current Zoning:** PVCC SP - Light Industrial

**Proposed Zoning:** PVCC SP - Light Industrial

If a project requires a General Plan Amendment or Zone change, then additional information and analysis should be provided to ensure the project is consistent with RHNA and RTP/SCS Strategies.

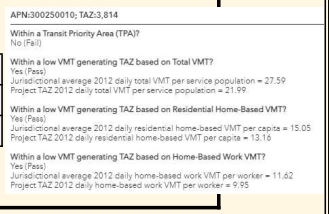
## II. VMT Screening Criteria

| | YES | | NO | | Attachments: |
|---|---|---|---|---|---|
| **A. Is the Project 100% affordable housing?** | YES | | NO | ✔ | |
| **B. Is the Project within 1/2 mile of qualifying transit?** | YES | | NO | ✔ | |
| **C. Is the Project a local serving land use?** | YES | | NO | ✔ | |
| **D. Is the Project in a low VMT area?** | YES | ✔ | NO | | |
| **E. Are the Project's Net Daily Trips less than 500 ADT?** | YES | | NO | ✔ | Table 1 |

**Low VMT Area Evaluation:**

| Citywide VMT Averages[1] | | |
|---|---|---|
| Citywide Home-Based VMT = | 15.05 | VMT/Capita |
| Citywide Employment-Based VMT = | 11.62 | VMT/Employee |

WRCOG VMT MAP




| Project TAZ | VMT Rate for Project TAZ[1] | | Type of Project | |
|---|---|---|---|---|
| 3,814 | | VMT/Capita | Residential: | |
| | 9.95 | VMT/Employee | Non-Residential: | ✔ |

[1] Base year (2012) projections from RIVTAM.

**Trip Generation Evaluation:**

**Source of Trip Generation:** ITE 10 Edition, 2017. High-Cube Fulfillment Center Warehouse Non-Sort (ITE 155)

**Project Trip Generation:** 605 ADT — Average Daily Trips (ADT)

| | YES | | NO | | |
|---|---|---|---|---|---|
| Internal Trip Credit: | YES | | NO | ✔ | % Trip Credit: |
| Pass-By Trip Credit: | YES | | NO | ✔ | % Trip Credit: |
| Affordable Housing Credit: | YES | | NO | ✔ | % Trip Credit: |
| Existing Land Use Trip Credit: | YES | | NO | ✔ | Trip Credit: |

**Net Project Daily Trips:** 857 PCE — Average Daily Trips (ADT) — Attachments: Table 1

**Does project trip generation warrant an LOS evaluation outside of CEQA?** YES ✔ NO

## III. VMT Screening Summary

**A. Is the Project presumed to have a less than significant impact on VMT?**

A Project is presumed to have a less than significant impact on VMT if the Project satisfies at least one (1) of the VMT screening criteria.

Yes. Criteria D.

**B. Is mitigation required?**

If the Project does not satisfy at least one (1) of the VMT screening criteria, then mitigation is required to reduce the Project's impact on VMT.

No.

**C. Is additional VMT modeling required to evaluate Project impacts?**

| YES | | NO | ✔ |
|---|---|---|---|

If the Project requires a zone change and/or General Plan Amendment AND generates 2,500 or more net daily trips, then additional VMT modeling using RIVTAM/RIVCOM is required. If the project generates less than 2,500 net daily trips, the Project TAZ VMT Rate can be used for mitigation purposes.

## IV. MITIGATION

**A. Citywide Average VMT Rate (Threshold of Significance) for Mitigation Purposes:**

**B. Unmitigated Project TAZ VMT Rate:**

**C. Percentage Reduction Required to Achieve the Citywide Average VMT:** %

**D. VMT Reduction Mitigation Measures:**

| **Source of VMT Reduction Estimates:** | |
|---|---|

| **Project Location Setting** | |
|---|---|

| | **VMT Reduction Mitigation Measure:** | **Estimated VMT Reduction (%)** |
|---|---|---|
| 1. | | 0.00% |
| 2. | | 0.00% |
| 3. | | 0.00% |
| 4. | | 0.00% |
| 5. | | 0.00% |
| 6. | | 0.00% |
| 7. | | 0.00% |
| 8. | | 0.00% |
| 9. | | 0.00% |
| 10. | | 0.00% |
| **Total VMT Reduction (%)** | | **0.00%** |

(Attach additional pages, if necessary, and a copy of all mitigation calculations.)

**E. Mitigated Project TAZ VMT Rate:**

**F. Is the project pressumed to have a less than significant impact with mitigation?**

If the mitigated Project VMT rate is below the Citywide Average Rate, then the Project is presumed to have a less than significant impact with mitigation. If the answer is no, then additional VMT modeling may be required and a potentially significant and unavoidable impact may occur. All mitigation measures identified in Section IV.D. are subject to become Conditions of Approval of the project. Development review and processing fees should be submitted with, or prior to the submittal of this Form. The Planning Department staff will not process the Form prior to fees being paid to the City.

| **Prepared By** | | **Developer/Applicant** | |
|---|---|---|---|
| **Company:** | Ganddini Group, Inc. | **Company:** | Lake Creek Industrial |
| **Contact:** | Bryan Crawford | **Contact:** | Dr. Michael Johnson |
| **Address:** | 550 Parkcenter Dr, Ste 202, Santa Ana CA 92705 | **Address:** | 1302 Brittany Cross Road, Santa Ana CA 92705 |
| **Phone:** | 714-795-3100*104 | **Phone:** | (786) 200-9681 |
| **Email:** | bryan@ganddini.com | **Email:** | mj@lakecreekindustrial.com |
| **Date:** | | **Date:** | |

| **Approved by:** | | | |
|---|---|---|---|
| | | | |
| **Perris Development Serivces Dept.** | **Date** | **Perris Public Works Dept.** | **Date** |

# Appendix C

## Trip Generation Information

# Land Use: 155
# High-Cube Fulfillment Center Warehouse

### Description

A high-cube warehouse (HCW) is a building that typically has at least 200,000 gross square feet of floor area, has a ceiling height of 24 feet or more, and is used primarily for the storage and/or consolidation of manufactured goods (and to a lesser extent, raw materials) prior to their distribution to retail locations or other warehouses. A typical HCW has a high level of on-site automation and logistics management. The automation and logistics enable highly-efficient processing of goods through the HCW. High-cube fulfillment center warehouses include warehouses characterized by a significant storage function and direct distribution of ecommerce product to end users. These facilities typically handle smaller packages and quantities than other types of HCWs and often contain multiple mezzanine levels. Warehousing (Land Use 150), high-cube transload and short-term storage warehouse (Land Use 154), high-cube parcel hub warehouse (Land Use 156), and high-cube cold storage warehouse (Land Use 157) are related land uses.

Each fulfillment center in the ITE database has been categorized as either a sort or non-sort facility. A sort facility is a fulfillment center that ships out smaller items, requiring extensive sorting, typically by manual means. A non-sort facility is a fulfillment center that ships large box items that are processed primarily with automation rather than through manual means. Separate sets of data plots are presented for the sort and non-sort fulfillment centers.

### Additional Data

The High-Cube Warehouse/Distribution Center-related land uses underwent specialized consideration through a commissioned study titled “High-Cube Warehouse Vehicle Trip Generation Analysis,” published in October 2016. The results of this study have been incorporated into the 10th Edition *Trip Generation Manual* and are posted on the ITE website at http://library.ite.org/pub/a3e6679a-e3a8-bf38-7f29-2961becdd498.

The sites were surveyed in the 2000s and the 2010s in California, New Jersey, and Texas.

### Source Numbers

752, 941, 1001, 1002, 1011

# High-Cube Fulfillment Center Warehouse - Non-Sort (155)

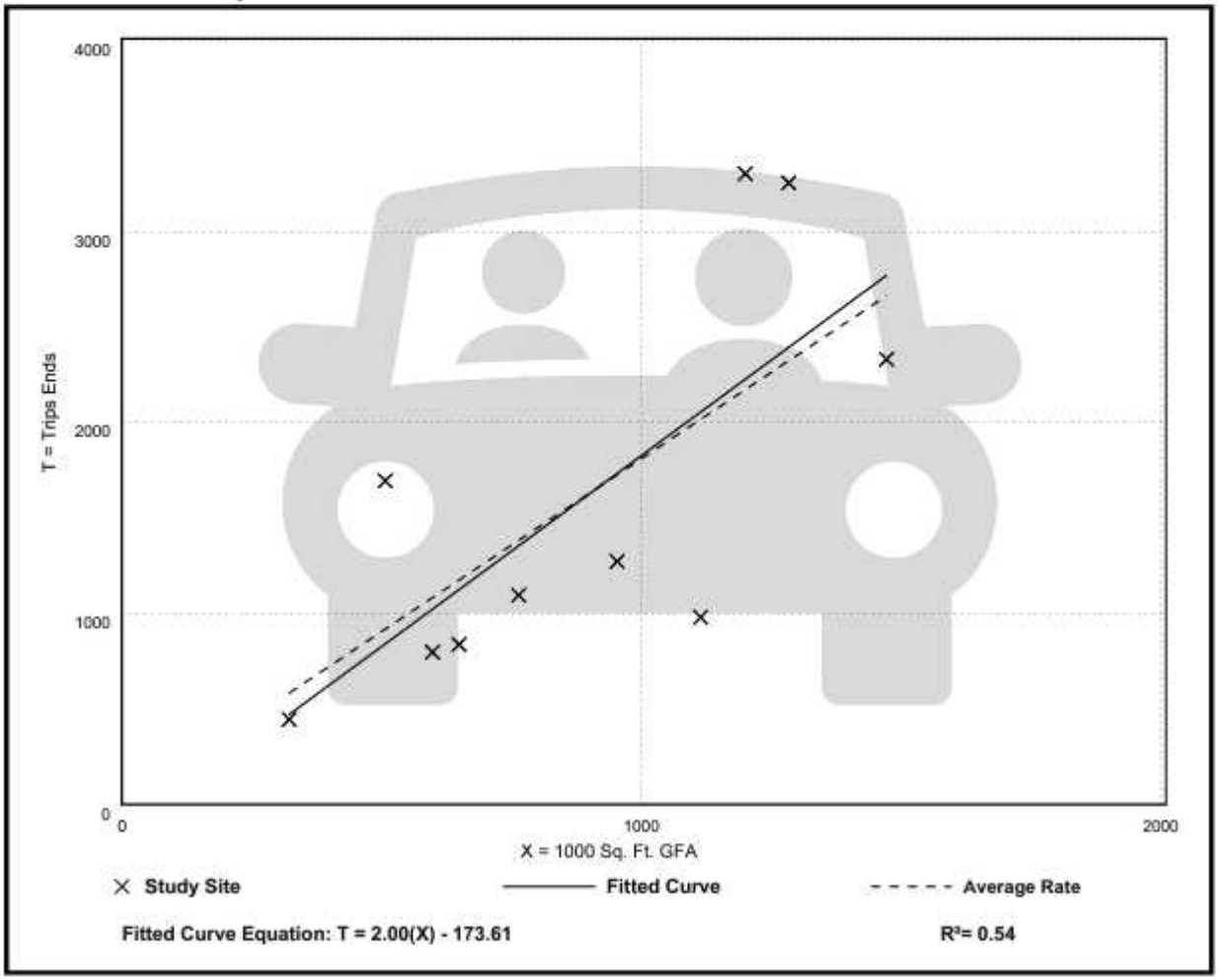
**Vehicle Trip Ends vs: 1000 Sq. Ft. GFA**
**On a: Weekday**

**Setting/Location: General Urban/Suburban**
Number of Studies: 10
Avg. 1000 Sq. Ft. GFA: 886
Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

| Average Rate | Range of Rates | Standard Deviation |
|---|---|---|
| 1.81 | 0.88 - 3.34 | 0.76 |

## Data Plot and Equation



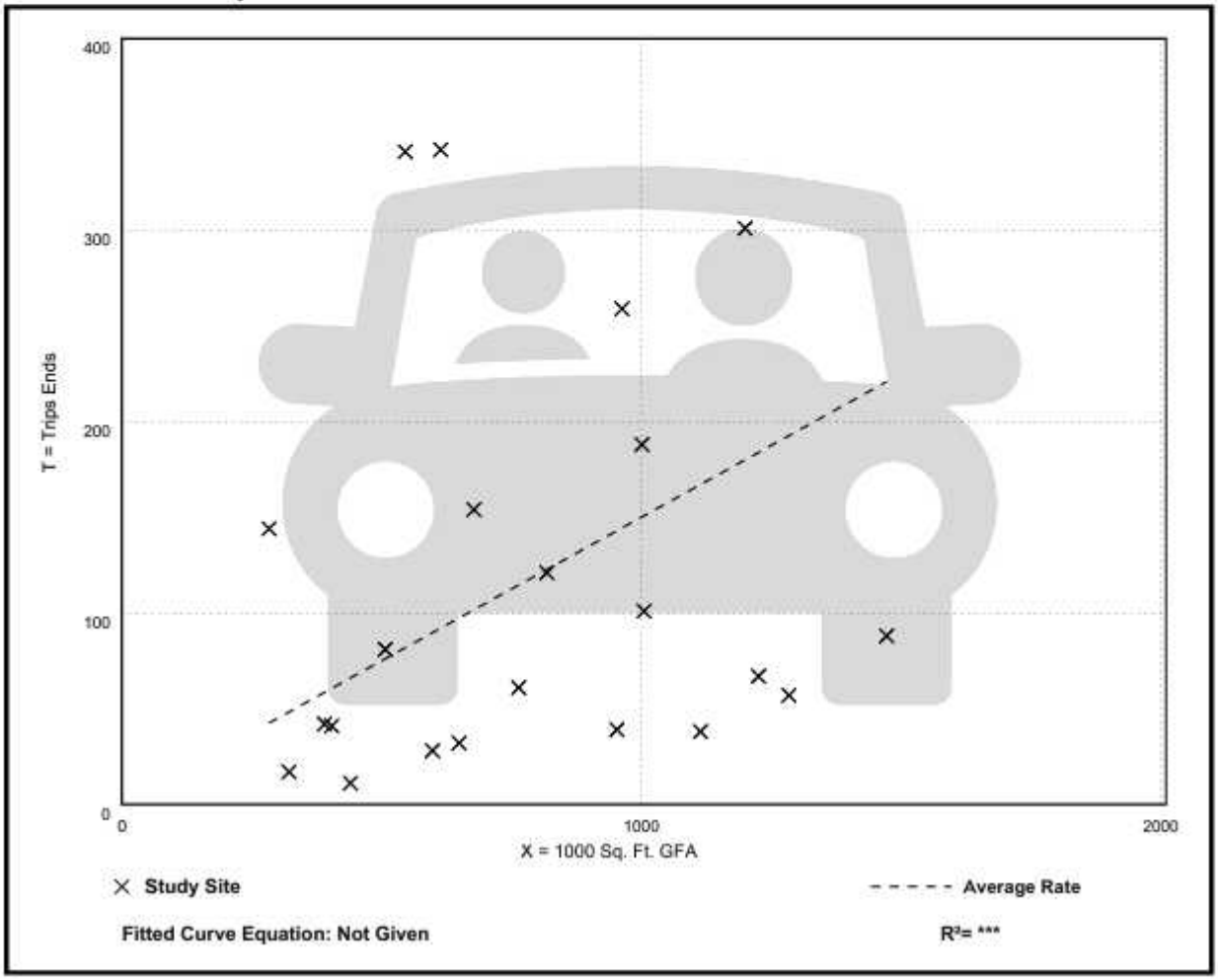
# High-Cube Fulfillment Center Warehouse - Non-Sort (155)

**Vehicle Trip Ends vs: 1000 Sq. Ft. GFA**
**On a: Weekday,**
**Peak Hour of Adjacent Street Traffic,**
**One Hour Between 7 and 9 a.m.**
**Setting/Location: General Urban/Suburban**
Number of Studies: 22
Avg. 1000 Sq. Ft. GFA: 783
Directional Distribution: 81% entering, 19% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

| Average Rate | Range of Rates | Standard Deviation |
|---|---|---|
| 0.15 | 0.03 - 0.62 | 0.15 |

## Data Plot and Equation



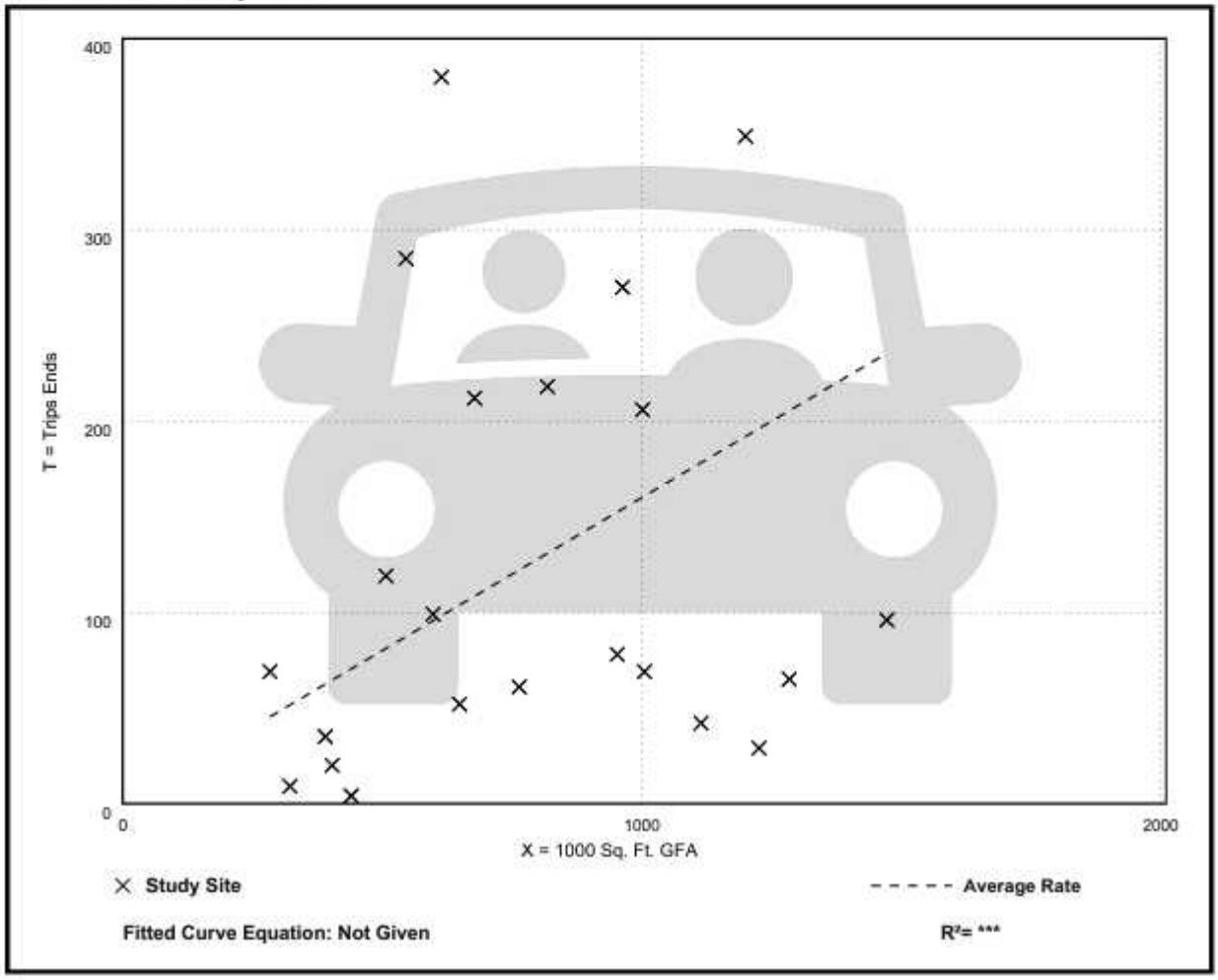
# High-Cube Fulfillment Center Warehouse - Non-Sort (155)

**Vehicle Trip Ends vs: 1000 Sq. Ft. GFA**
**On a: Weekday,**
**Peak Hour of Adjacent Street Traffic,**
**One Hour Between 4 and 6 p.m.**
**Setting/Location: General Urban/Suburban**
Number of Studies: 22
Avg. 1000 Sq. Ft. GFA: 783
Directional Distribution: 39% entering, 61% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

| Average Rate | Range of Rates | Standard Deviation |
|---|---|---|
| 0.16 | 0.01 - 0.62 | 0.15 |

## Data Plot and Equation



# C Appendix: Truck Trips as Percent of Total Vehicle Trips

| Land Use Code, Land Use Name, and Time Period | Truck Trips as Percentage of Total Vehicle Trips | | | | |
|---|---|---|---|---|---|
| | # Sites | Wtd Avg | Lowest | Highest | Std Dev |
| 110 General Light Industrial | | | | | |
| Weekday | 28 | 8% | 0% | 29% | 8% |
| Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. | 27 | 3% | 0% | 50% | 12% |
| Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. | 27 | 2% | 0% | 20% | 4% |
| Weekday, AM Peak Hour of Generator | 28 | 4% | 0% | 100% | 21% |
| Weekday, PM Peak Hour of Generator | 27 | 7% | 0% | 29% | 9% |
| 130 Industrial Park | | | | | |
| Weekday | 3 | 15% | 10% | 16% | 3% |
| Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. | 3 | 12% | 10% | 13% | 1% |
| Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. | 3 | 10% | 3% | 13% | 5% |
| Weekday, AM Peak Hour of Generator | 3 | 6% | 4% | 8% | 2% |
| Weekday, PM Peak Hour of Generator | 3 | 10% | 7% | 13% | 3% |
| 140 Manufacturing | | | | | |
| Weekday | 17 | 10% | 0% | 35% | 10% |
| Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. | 17 | 8% | 0% | 50% | 17% |
| Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. | 16 | 7% | 0% | 80% | 24% |
| Weekday, AM Peak Hour of Generator | 17 | 2% | 0% | 37% | 9% |
| Weekday, PM Peak Hour of Generator | 17 | 6% | 0% | 42% | 14% |

| Land Use Code, Land Use Name, and Time Period | Truck Trips as Percentage of Total Vehicle Trips | | | | |
|---|---|---|---|---|---|
| | # Sites | Wtd Avg | Lowest | Highest | Std Dev |
| 150 Warehousing | | | | | |
| Weekday | 12 | 27% | 0% | 65% | 21% |
| Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. | 21 | 13% | 0% | 71% | 22% |
| Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. | 23 | 15% | 0% | 87% | 20% |
| Weekday, AM Peak Hour of Generator | 24 | 22% | 0% | 100% | 26% |
| 151 Mini-Warehouse | | | | | |
| Weekday | 6 | 6% | 0% | 8% | 3% |
| Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. | 5 | 0% | 0% | 0% | 0% |
| Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. | 6 | 0% | 0% | 0% | 0% |
| Weekday, AM Peak Hour of Generator | 6 | 4% | 0% | 15% | 6% |
| Weekday, PM Peak Hour of Generator | 6 | 5% | 0% | 50% | 20% |
| 154 High-Cube Transload and Short-Term Storage Warehouse | | | | | |
| Weekday | 57 | 16% | 3% | 52% | 11% |
| Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. | 90 | 20% | 0% | 90% | 21% |
| Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. | 91 | 16% | 0% | 65% | 17% |
| Weekday, AM Peak Hour of Generator | 12 | 12% | 4% | 39% | 12% |
| Weekday, PM Peak Hour of Generator | 13 | 14% | 2% | 25% | 7% |
| 155 High-Cube Fulfillment Center Warehouse (Non-Sort) | | | | | |
| Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. | 11 | 9% | 1% | 49% | 18% |
| Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. | 11 | 7% | 2% | 100% | 31% |

| Land Use Code, Land Use Name, and Time Period | Truck Trips as Percentage of Total Vehicle Trips | | | | |
|---|---|---|---|---|---|
| | # Sites | Wtd Avg | Lowest | Highest | Std Dev |
| 155 High-Cube Fulfillment Center Warehouse (Sort) | | | | | |
| Weekday | 1 | 3% | — | — | N.A. |
| Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. | 2 | 2% | 1% | 2% | N.A. |
| Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. | 2 | 2% | 1% | 6% | N.A. |
| 156 High-Cube Parcel Hub Warehouse | | | | | |
| Weekday | 1 | 9% | — | — | N.A. |
| Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. | 1 | 5% | — | — | N.A. |
| Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. | 1 | 1% | — | — | N.A. |
| 157 High-Cube Cold Storage Warehouse | | | | | |
| Weekday | 4 | 35% | 32% | 39% | 3% |
| Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. | 5 | 27% | 18% | 46% | 13% |
| Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. | 5 | 23% | 0% | 45% | 16% |
| 170 Utility | | | | | |
| Weekday | 13 | 2% | 0% | 17% | 5% |
| Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. | 12 | 0% | 0% | 0% | 0% |
| Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. | 12 | 1% | 0% | 2% | 1% |
| Weekday, AM Peak Hour of Generator | 13 | 1% | 0% | 22% | 6% |
| Weekday, PM Peak Hour of Generator | 13 | 2% | 0% | 50% | 16% |

# Appendix D

## Other Cumulative Projects

**PROJECTS THAT HAVE STARTED CONSTRUCTION**

| TRACT | DEVELOPER | PROJECT | LOCATION | DU | TYPE | Approval Date | Status | Planner |
|---|---|---|---|---|---|---|---|---|
| 16-00014 | Talat Dib | DTSP Mixed Use | SW of "D" Street and 10th Street. | 15 | APT | 10/15/2017 | Vertical construction in process | BM |
| 31226 | Pacific Communities | Pacific Heritage 1 | SW Nuevo & McKimball | 82 | SFD | 10/15/2003 | Vertical construction in process | DS |
| 31650 | Sunwest Enterprises | | SW Van Wy & De Lines | 61 | SFD | 7/13/2004 | FTM approved 6-13-2006 - Architecture review MDPR 20-05143 | DS |
| 32406 | Sunwest Enterprises | | SE Bowen & Windflower | 15 | SFD | 1/5/2005 | FTM approved 11-28-2006 - Architecture review MDPR 20-05143 | AG/DS |
| 32497 | Pacific Communities | Pacific Ave | SW Orange & Medical | 131 | PUD | 10/31/2006 | Vertical construction in process | NP |
| 32769 | CBM Consulting & Dev, Inc. | Faith Circle | West side of "B" Street, south of 11th St | 20 | SFD | 4/20/2006 | Final Home Sales 2021 | RZ |
| 36988 | Richmond | GVSP | N of Ethanac Rd & W of Murrieta Rd | 169 | SFD | 8/29/2017 | Final Home Sales 2020 | KP |
| 36989 | KB Home | GVSP | N of Ethanac Rd & W of Murrieta Rd | 145 | SFD | 8/29/2017 | Final Home Sales 2020 | KP |
| | | | | **638** | **Total Units** | | | |

**PROJECTS IN PLAN CHECK**

| TRACT | DEVELOPER | PROJECT | LOCATION | DU | TYPE | Approval Date | Status | Planner |
|---|---|---|---|---|---|---|---|---|
| 31912 | TKC | | 7th & Clayton vacant land | 8 | SFD | | FTM approved 4/24/2007 Plan Check | RG |
| 37014 | JD Pierce | Barrett Apt | Btw Barrett & Perris Blvd | 202 | APT | 10/25/2016 | Plan check; grading anticipated 4th quarter 2019 - Major Mod 18-05211; DPR 15-0( | KP |
| | | | | **202** | **Total Units** | | | |

**FINAL MAP RECORDED OR DA WITH NO FURTHER NEED FOR EXTENSION**

| TRACT | DEVELOPER | PROJECT | LOCATION | DU | TYPE | Approval Date | Status | Planner |
|---|---|---|---|---|---|---|---|---|
| 31157 | Palin Enterprises | Parkwest SP | S of Nuevo Road & E. PVSD | 529 | SFD | 1/3/2018 | Dormant (DA extension until 1/27/2028) | KP |
| 31651 | Sunwest Enterprises | | SEC Nuevo & Wilson | 57 | SFD | 7/27/2004 | FTM approved 4/10/17. No Construction Started | DS |
| 31659 | Jason Keller/John Ford | | NEC Citrus & Evans | 161 | SFD | 7/27/2004 | FTM approved 2/28/2006 No Construction Started | |
| 32041 | Jason Keller/John Ford | | NWC Citrus & Dunlap | 122 | SFD | 4/24/2007 | FTM approved 5/24/2007 No Construction Started Right below School I( | NP |
| 32666 | WSI Mojave Inv/ Richland | Riverwood SP | Mapes & Ethanac | 663 | SFD | 12/14/2004 | Final Map recorded with option in increase to 750 lots; Ex)TTM 33042 | BE |
| 33338 | Rastogi Family LTD /John Ford | | NWC Nuevo & Evans | 75 | SFD | 4/11/2006 | FTM approved 4/24/2007 No Construction Started | NP |
| 33549 | Perris Investment Group | Village Walk | NE Perris & Commercial | 129 | SFD | 1/30/2007 | FTM approved 7/27/2011 No Construction Started | SC |
| | | | | **1736** | **Total Units** | | | |

**ENTITLED RESIDENTIAL DEVELOPMENTS**

| TRACT | DEVELOPER | PROJECT | LOCATION | DU | TYPE | Approval Date | Status | Planner |
|---|---|---|---|---|---|---|---|---|
| 33199 | MR-10, LLC | | NW of Metz and Webster Ave | 26 | SFD | 8/30/2005 | EOT18-05220 is proposing to Expire 08/30/2019 | RZ |
| 33900 | WSI Mojave Inv | Richland | SE Ethanac & McPherson | 198 | SFD | 4/29/2008 | Has received various 1 year extensions. Valid until 5/8/2020. EOT19-05029 | RZ |
| 33973 | County Lands PIP IV | | W McPherson & S Ethanac | 384 | SFD | 5/27/2008 | Has received various 1 year extensions. Valid until 5/27/2019. New EOT 19-05071 | RZ |
| 34260 | Tristone/David Jeffers | | Flame Avenue | 22 | SFD | 10/28/2014 | Has received various 1 year extensions. Valid until 10/28/2019. EOT18-05252 | KP |
| 35062 | Sterling Villa | Senior Housing | SE corner of Nuevo and Murrieta | 429 | APT | 2/13/2006 | Expires 2/4/2021 no further extension available through MMOD (aka DPR 06-0378) | KP |
| 36648 | John Abel | Stratford Ranch | W of Evans Road @ northern City Limits | 270 | SFD | 8/29/2017 | EOT 19-05151 for 1-year extension | NP |
| 36797 | Nova Homes | | NEC Wilson & Water | 76 | PUD | 10/28/2014 | Has received various 1 year extensions. Valid until 10/25/2019. EOT18-05254 | IL |
| 37038 | Kile Investment Trust | Citrus Court | SW Orange & Dunlap | 111 | PUD | 2/28/2017 | EOT 19-05325 | KP/RG |
| 37181 | Metz and A LLC | Villa Verona Apt | NE A & Metz | 360 | APT | 8/29/2017 | Dormant - DPR 16-00002 | NP |
| N/A | Lansing Properties | Senior Housing | NW of A & Ellis | 141 | APT | 3/26/2019 | Dormant - DPR 17-00005 | MB |
| | | | | **Total** | **2017** | **Total Units** | | |

**IN PROCESS RESIDENTIAL DEVELOPMENTS**

| TRACT | DEVELOPER | PROJECT | LOCATION | DU | TYPE | Approval Date | Status | Planner |
|---|---|---|---|---|---|---|---|---|
| 36647 | John Abel | Stratford Ranch | W of Evans Road and N of Ramona Exp | 90 | SFD | 9/29/2020 | Entitlement Phase | NP |
| 37441 | Julio Arias | Graham PUD | W of Graham St btw Metz & Weston | 33 | PUD | In process | Entitlement Phase | AG |
| 37223 | Raintree Investments GVSP | GVSP | Watson & Murrieta | 258 | SFD | In process | Entitlement Phase | NP |
| 37262 | Raintree Investments GVSP | GVSP | Ethanac & Goetz | 212 | SFD | In process | Entitlement Phase | NP |
| 37716 | Raintree Investments GVSP | GVSP | 730' E of the NW of Goetz & Ethanac | 108 | PUD | In process | Entitlement Phase | NP |
| 37722 | Raintree Investments GVSP | GVSP | NW Green Valley Pkwy & Murrieta Rd | 104 | SF | In process | Entitlement Phase | NP |
| 37803 | UCI Prop | | SWC Metz & A St | 145 | SFD | In process | Entitlement Phase (submitted 2019.8) | NP |
| 37817 | Raintree Investments GVSP | GVSP | NEC of GV Pky & Ethanac 1,500' N of Etha | 228 | PUD | In process | Entitlement Phase | NP |
| 37818 | Raintree Investments GVSP | GVSP | NWC of GV Pky and Ethanac | 376 | PUD/APT | In process | Entitlement Phase (140 PUD and 236 APT) | NP |
| | | | | **Total** | **1554** | **Total Units** | | |

Projects completed

| | Commercial | Sq. Ft. | Acreage | Location | Entitlement Status | Status | Case Number(s) | Planner |
|---|---|---|---|---|---|---|---|---|
| 1 | Perris Crossing | 387,993 | 27 | E of I-215 btw Watson and Ethanac Rd | Entitled 2006.4.11 | Partially completed (2009) | DPR 04-0621 | DS |
| 11 | DTSP Mixed Use | 10,834 | 1 | SW corner of Tenth and D | Entitled 2017.11.5 | Grading | DPR 16-00014 | BM |
| 12 | 7-Eleven | 3,000 | 1 | NE corner of Ethanac and Case | Entitled 2017.1.18 | Completed (November 2018) | CUP 16-05074 | NP |
| 13 | Autozone | 19,000 | 2 | NE corner of Perris Crossing Center | Entitled 2017.10.4 | Completed (December 2018) | ADPR 16-05074 | DS |
| 5 | Partial MTC | 10,000 | 2.4 | SE corner of Ethanac and Trumble | Entitled 2017.3.15 | Completed 2020 | CUP 16-05168 | KP |
| 9 | Weinerschnitzel | 2,000 | 1 | W side of Perris Blvd & S. of Placentia | Entitled 2017.11.15 | Completed (October 2019) | CUP 17-05083 | DS |
| 10 | Behavioral Health Clinic | 37,000 | 4 | NW San Jacinto & Redlands | Entitled 2017.7.19 | Completed (June 2019) | CUP 16-05189 | BM |
| | **Total** | **469,827** | | | | | | |

Projects that have started construction

| | Commercial | Sq. Ft. | Acreage | Location | Entitlement Status | Status | Case Number(s) | Planner |
|---|---|---|---|---|---|---|---|---|
| 6 | Perris Common | 35,000 | 5.5 | SW corner San Jacinto and Redlands | Entitled 2018.4.10 | Vertical construction | MAJ MOD 18-05004 | NP |
| 7 | Perris Plaza - Build-out | 173,000 | 42 | NE of Nuevo and Frontage | Entitled | Vertical construction | MIN MOD 17-05178 | NP |
| | **Total** | **208,000** | **48** | | | | | |

Project in Plan Check

| | Commercial | Sq. Ft. | Acreage | Location | Entitlement Status | Status | Case Number(s) | Planner |
|---|---|---|---|---|---|---|---|---|
| 3 | March Plaza | 47,253 | 8 | NW corner of Perris Blvd & Harley Knox | Entitled 2017.3.15 | Plan check | CUP 16-05165 | DS |
| | **Total** | **47,253** | **8** | | | | | |

In Process and Entitled Projects that are Dormant

| | Commercial | Sq. Ft. | Acreage | Location | Entitlement Status | Status | Case Number(s) | Planner |
|---|---|---|---|---|---|---|---|---|
| | Aldi Market Center | 27,000 | 4.6 | West of Perris Blvd and Citrus | Entitled 2020.3.4 | Grading | ADPR 19-05039; CUP 1 | NP |
| | Arco Expansion | 3,869 | 1.4 | 289 Old Nuevo Road & I-215 | Entitled 2015.2.18 | Prep for Plan Check | CUP 14-09-0001 | DS |
| 14 | Cali Express Carwash | 5,600 | 1 | NW corner of Ramona and Perris | Entitled 2018.10.18 | Prep for Plan Check | CUP 16-05258 | DS |
| 2 | Quick Quack Carwash | 3,600 | 1 | E of Case Rd north of Ethanac Rd | Entitled 2018.7.18 | Prep for Plan Check | CUP 18-05045 | DS |
| 4 | Motte Town Center (MTC) | 484,300 | 59 | SE corner of Ethanac and Trumble | Entitled 2008.5.13 | Dormant | DPR 06-0337 | DS |
| 8 | Perris Venue | 643,000 | 68 | SE corner of San Jacinto and Redlands | Entitled 2009.8.13 | Dormant | DPR 08-04-0015 | KP |
| | Gas Station & Carwash | 7,000 | 1.8 | 4th St and Navajo Rd | Submitted 2019.11.13 | In process | CUP 19-05295 | AG |
| | Commercial Retail - Spectrum | 7,400 | 2 | W of Perris Blvd north of Orange | Submitted 2019.11.18 | In process | CUP 19-05301 | AG |
| | Tommy's carwash | 8,500 | | E. side of Perris Blvd | Submitted 2020.12.23 | In process | CUP 20-05217 | RG |
| | Pharmacy | 15,000 | 1.3 | S. side of 4th St west of Park St | Submitted 2021.1.7 | In process | DPR 20-00022 | AG |
| | **Total** | **1,205,269** | | | | | | |

**PVCC SP - Projects Completed**

| Industrial Projects | Sq. Ft. | Acreage | Location | Entitlement Status | Status | Case Number(s) | Planner |
|---|---|---|---|---|---|---|---|
| BI (Bargemann Industrial) | 173,000 | 9 | Btw Harely Knox & Nance W of Webster | Entitled 2008.11.25 | Completed (April 2018) | DPR 07-09-0018 | KP |
| Circle Industrial | 600,000 | 31 | NW corner of Markham & Redlands | Entitled 2013.11.12 | Completed (March 2017) | DPR 13-02-00005 | NP |
| Circle Industrial III | 211,000 | 10 | NW corner of Nance & Redlands | Entitled 2018.10.17 | Complete (2020) | DPR 17-00006 | NP |
| Duke 2 (Forever 21) | 669,000 | 31 | SE corner of Indian & Markham | Entitled 2017.10.18 | Completed (April 2019) | DPR 16-00008 | NP |
| Duke @ Perris Blvd | 1,070,000 | 54 | E of Perris Blvd btw Markham & Perry | Entitled 2017.8.28 | Completed (August 2020) | DPR 17-00002 & CUP 1 | CP |
| First Perry | 240,000 | 11 | SW corner of Perry & Redlands | Entitled 2017.11.15 | Completed (December 2019) | DPR 16-00013 | NP |
| Gateway | 400,000 | 22 | SE corner of I-215 & Harley Knox | Entitled 2017.1.31 | Completed (December 2018) | DPR 16-00003 | KP |
| General Mills | 1,600,000 | 70 | Btw Markham and Ramona W of Indian | Entitled 2009.12.8 | Completed (November 2016) | DPR 07-07-0029 | KP |
| Home Depot (IDI) | 1,750,000 | 90 | Btw Nance & Markham W of Perris Blvd | Entitled | Completed (March 2014) | DPR 05-0113 | |
| Home Depot (SR) | 1,700,000 | 91 | E of Redlands north of Perry | Entitled 2012.11.27 | Completed (May 2017) | DPR 11-12-0004 | |
| Indian Palms | 39,000 | 2 | W of Indian bt Rider and Walnut | Entitled 2016.1.31 | Completed (2009) | DPR 05-0285 | |
| Integra | 864,000 | 43 | Btw Markham & Nance E of Webster | Entitled 2015.1.27 | Completed (December 2018) | DPR 14-02-0014 | DS |
| Lowes | 1,200,000 | 120 | Btw Ramona & Morgan W of Indian | Entitled | Completed (2001) | DPR 99-0167 | |
| Markham East | 460,000 | 22 | NW corner of Redlands & Perry | Entitled 2007.6.20 | Completed | DPR 05-0477 | |
| OLC 1 | 1,455,000 | 69 | NW corner of Webster & Ramona | Entitled 2016.1.12 | Completed (December 2018) | DPR 12-10-0005 | KP |
| OLC 2 (H&M) | 1,037,000 | 49 | NE corner of Patterson & Markham | Entitled 2016.1.12 | Completed (December 2019) | DPR 14-01-0015 | KP |
| Phelan Indus | 81,000 | 4 | N. Side of Markham btw Webster & Perris | Entitled 2017.10.10 | Complete (2020) | ADPR 16-05202 | NP |
| Ridge (Fallas & Hanes) | 1,900,000 | 90 | NW corner of Perris & Morgan | Entitled 2007.3.27 | Completed (2012) | DPR 05-0493 | |
| Rider 1 | 350,000 | 16 | SW corner of Rider & Redlands | Entitled 2007.6.20 | Completed (2020) | DPR 06-0365 | KP |
| Rider 3 | 640,000 | 30 | NW corner of Rider & Redlands | Entitled 2009.3.31 | Completed (2020) | DPR 06-0432 | KP |
| Ross (Oakmont 2) | 700,000 | 37 | SW corner of Perris & Markham | Entitled 2007.3.27 | Completed (2013) | DPR 05-0192 | |
| Ross | 1,600,000 | 83 | SW corner of Indian & Morgan | Entitled date ? | Completed (2002) | ? | |
| Wayfair (Duke 1) | 2,000,000 | 96 | NE corner of Indian & Rider | Entitled 2009.8.25 | Completed (October 2017) | DPR 06-0417 | DS |
| Western Brass | 494,000 | 24 | NE corner of Harley Knox and Indian | Entitled 2004.7.3 | Completed (2007) | DPR 03-0388 | KP |
| Whirlpool (IDS) | 1,700,000 | 80 | NE corner of Perris & Morgan | Entitled 2005.8.17 | Completed (2006) | DPR 04-0464 | |
| **Total** | **22,933,000** | 1,184 | | | | | |

**PVCC SP - Projects that have started construction**

| Industrial Projects | Sq. Ft. | Acreage | Location | Entitlement Status | Status | Case Number(s) | |
|---|---|---|---|---|---|---|---|
| AAA | 2,000 | 10 | SE Corner of Harley Knox & Webster | Entitled 2018.3.7 | Vertical Constructin | DPR 16-00012 | |
| Burge Indus 1 | 18,000 | 2.5 | E. of Perris Blvd. & N of Commerce Dr | Entitled 2019.8.7 | Vertical Constructin | DPR 18-00001 | CP |
| Burge Indus 2 | 19,000 | 3 | E. Perris Blvd. and S of Commerce Dr | Entitled 2019.8.7 | Vertical Constructin | DPR 18-00007 | CP |
| Duke @ Patterson | 811,000 | 37 | SE corner of Patterson & Markham | Entitled 2019.1.29 | Vertical Constructin | DPR 17-00001 | KP |
| MI (Markham Industrial) | 170,000 | 9 | NE corner of Indian & Markham | Entitled 2017.8.16 | Vertical Constructin | DPR 16-00015 | KP |
| Pulliam Indus | 16,000 | 0.5 | Lots 10 & 12 on Commerce Dr, E of Perris | Entitled 2018.6.20 | Vertical Constructin | DPR 17-00007 & 9 | CP |
| Western Ind | 250,000 | 25 | E. Side of Western Way & City limits | Entitled 2019.12.18 | Grading | DPR 19-00003 | NP |
| **Total** | **1,286,000** | **86.6** | | | | | |

**PVCC SP - Projects in Plan Check**

| Industrial Projects | Sq. Ft. | Acreage | Location | Entitlement Status | Status | Case Number(s) | |
|---|---|---|---|---|---|---|---|
| Canyon Steel (CS) | 25,000 | 4 | NWC of Patterson and California | Entitled 2019.2.20 | Plan Check | DPR 18-00006 | KP |
| Duke @ Perry | 144,000 | 7 | SE Corner of Perrty and Barrett | Entitled 2019.11.6 | Plan check | DPR 18-00011 | CP |
| IDI @ Ramona | 426,000 | 24 | NW corner of Ramona and Indian | Entitled 2019.11.20 | Plan check | DPR 18-00002 | CP |
| IDI - Site 3 | 2,300,000 | 217 | NE corner of Redlands and Ellis | Entitled 2010.7.13 | Plan Check | DPR 08-01-0007 | DS/CP |
| WT (Westcoast Textile) | 180,000 | 9 | SW corner of Indian & Nance | Entitled 2016.7.20 | Plan check | DPR 16-00001 | KP |
| Rados | 1,200,000 | 83 | SW corner of Rider & Indian | Entitled 2011.7.12 | Plan Check | MMOD 18-05204; DPR | NP |
| **Total** | **4,275,000** | **344** | | | | | |

**PVCC SP - In Process and Entitled Projects**

| Industrial Projects | Sq. Ft. | Acreage | Location | Entitlement Status | Status | Case Number(s) | |
|---|---|---|---|---|---|---|---|
| Integra - Expansion (IT-E) | 273,000 | 10 | NE corner of Markham and Webster | Entitled 2019.4.17 | In process | MMOD 17-05075 | DS |
| Marijuana Manufacturing (MM) | 1,000 | 0.5 | NW corner of Webster and Washington | Not entitled | In process | DPR 18-00008 | MD |
| Rider 2 & 4 | 1,373,000 | 73 | NE corner of Rider & Redlands | Not entitled | In process | DPR 19-00004 | MB |
| Walnut Indu | 205,000 | 11 | N. Side Walnut St, btw Indian & Barnett | Not entitled | In process | DPR 19-00014 | MD |
| Truck Terminal | 0 | 9.5 | N. side of Markham & E of Perris Blvd | Not entitled | In process | CUP 20-05100 | AG |
| Expressway Industrial | 347,000 | 16 | SW corner of Ramona and Perris | Not entitled | In process | DPR 19-00012 | AG |
| C5 Rental | 17,400 | 15.6 | 4783 Wade Avenue | Not entitled | In process | CUP 19-05128 | AG |
| First Indus (Goodwin) | 338,000 | 15 | SE Corner of Rider and Redlands | Not entitled | In process | DPR 19-00016 | AG |
| Patriot Ind | 286,000 | 15 | SW Perris and Morgan | Not entitled (9/29/20) | In process | DPR 20-00013 | CP |
| Wilson Ind | 303,000 | 16 | E. Side of Wilson S. of Rider St | Not entitled | In process | DPR 19-00007 | AG |
| Wilson Ind | 248,000 | | SW corner of Rider and Wilson | Not entitled (8/26/20) | In process | DPR 20-00011 | CP |
| Natwar Ind | 420,000 | 23 | W. Side of Natwar 300' N. of Nandina | Not entitled | In process | DPR 20-00004 | NP |
| Natwar Ind Truck Lot | 0 | 5 | E. Side of Natwar. 300' N. of Nandina | Not enttitled | In process | DPR 20-00009 | CP |
| Serrao Ind | 3,500 | 0.17 | N. Side of Nance Street 660' E. of Webster | Not entitled | In process | DPR 20-00010 | RG |
| Lakecreek East | 256,000 | 11 | E. Side of Redlands S. of Rider St | Not entitled (1/7/21) | In process | DPR 20-00021 | CP |
| Lakecreek West | 300,000 | 20 | W. Side of Reldands S. of Rider St | Not entitled (1/7/21) | In process | DPR 20-00020 | CP |
| **Total** | **4,370,900** | | | | | | |

1 **South Perris - In Process and Entitled Projects**

| 2 Industrial Projects | Sq. Ft. | Acreage | Location | Entitlement Status | Status | Case Number(s) | |
|---|---|---|---|---|---|---|---|
| 4 IDI - Site 1 | 784,000 | 36 | SW corner of Mountain & Goetz | Entitled 2010.7.13 | Dormant | DPR 07-0130 | DS |
| 5 IDI - Site 2 | 3,448,734 | 205 | SW of Mapes and Goetz | Entitled 2010.7.13 | Dormant | DPR 08-04-0006 | DS |
| 6 Marijuana Manufacturing | 50,000 | 2 | N. side of Malbert St & W. of Goetz Rd | Not entitled | In process | DPR 18-00005 | MB |
| 7 Marijuana Manufacturing | 12,000 | 1 | S. side of Illnois & E. I-215 Freeway | Not entitled | In process | DPR 18-00004 | |
| Marijuana Manufacturing/Cul | 30,000 | 6 | N. side of Mapes btw Goetz & Alpine | Not entitled | In process | DPR 18-00010 | |
| Perez Indus | 2,500 | 0.5 | E. side of G St N of Case Rd | Entitled 2018.12.19 | In process | DPR 16-00016 | |
| **Total** | **4,327,234** | | | | | | |

# APPENDIX C

# VOLUME COUNT WORKSHEETS

# INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

| DATE: | LOCATION: | Perris | PROJECT #: | SC |
|---|---|---|---|---|
| Wed, May 26, 21 | NORTH & SOUTH: | Redlands | LOCATION #: | 1 |
| | EAST & WEST: | Rider | CONTROL: | SIGNAL |

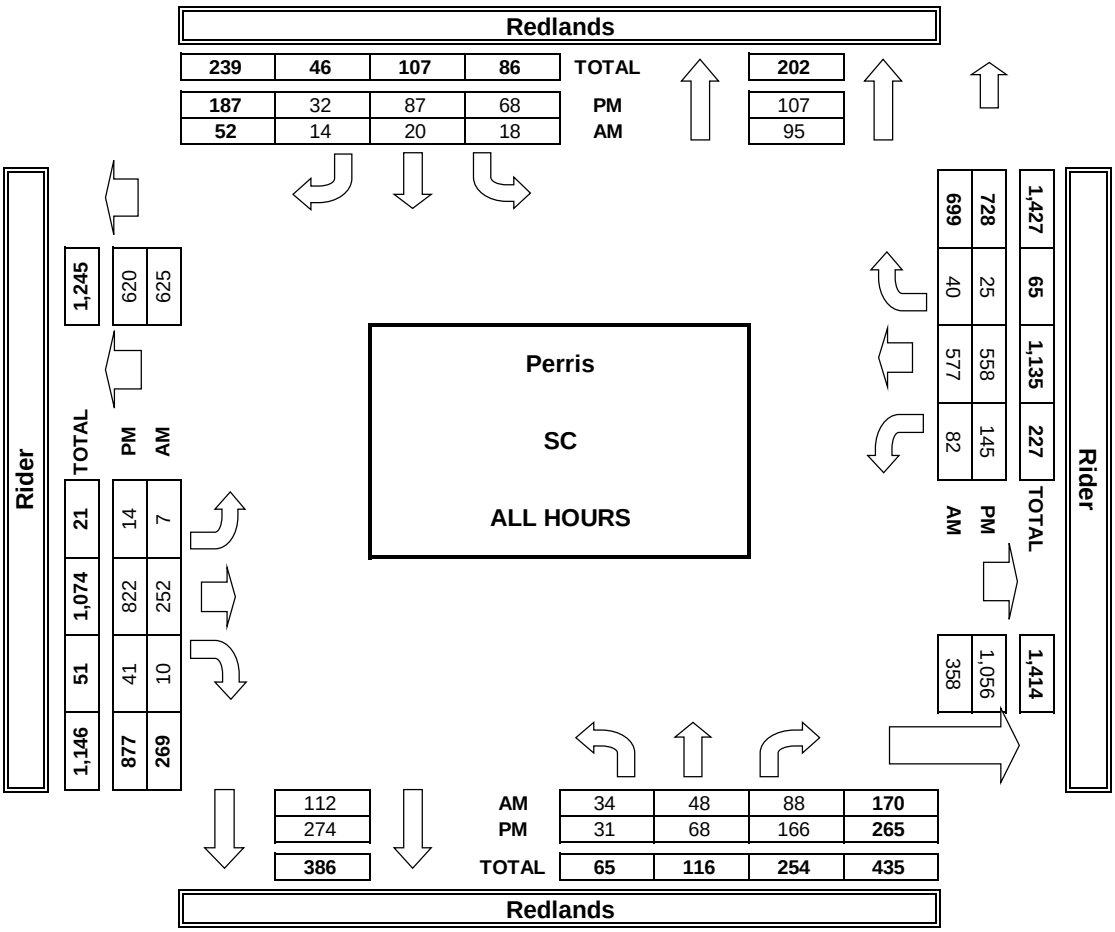
NOTES:

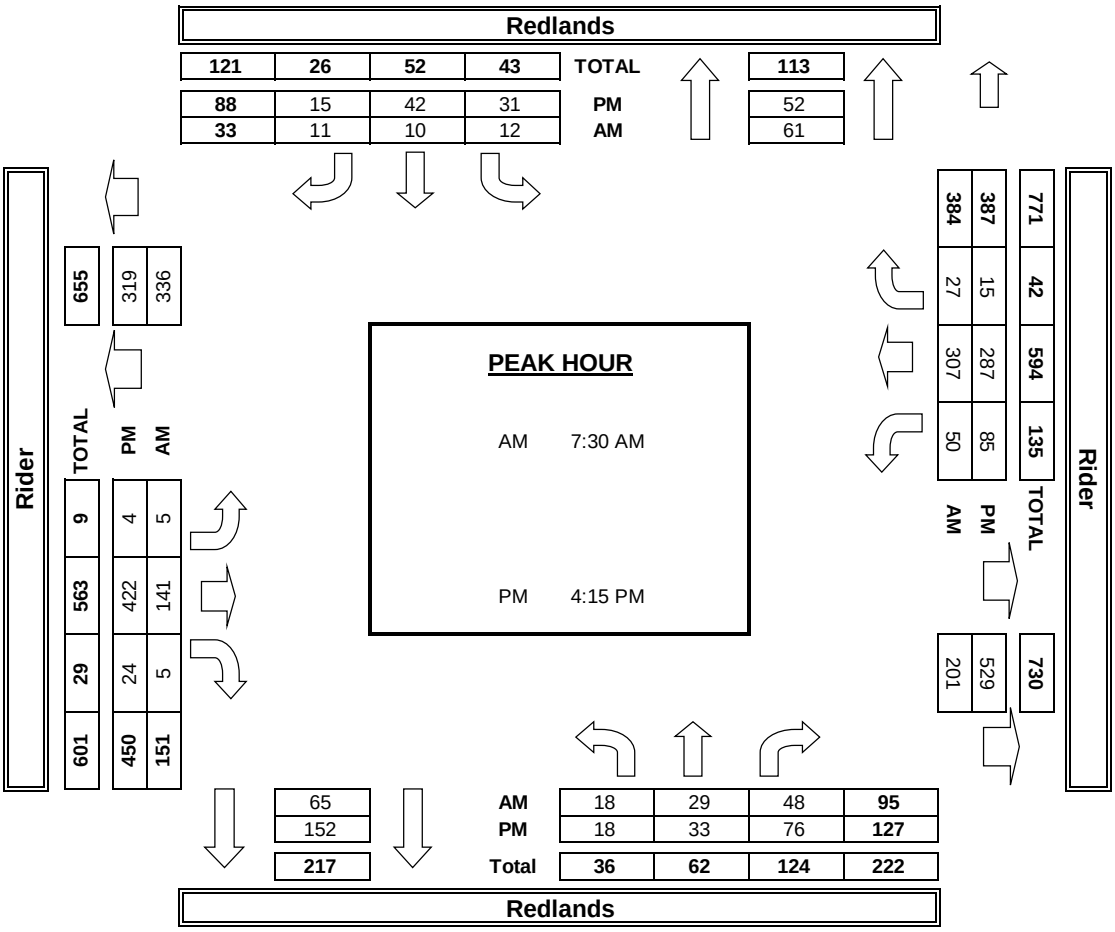
AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

| | | NORTHBOUND Redlands | | | SOUTHBOUND Redlands | | | EASTBOUND Rider | | | WESTBOUND Rider | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LANES: | NL 1 | NT 1 | NR 1 | SL 1 | ST 1 | SR 1 | EL 1 | ET 1 | ER 1 | WL 1 | WT 2 | WR 0 | TOTAL |
| AM | 7:00 AM | 5 | 4 | 8 | 1 | 0 | 1 | 0 | 18 | 1 | 3 | 69 | 3 | 113 |
| | 7:15 AM | 1 | 9 | 14 | 1 | 1 | 0 | 1 | 28 | 0 | 9 | 73 | 2 | 139 |
| | 7:30 AM | 3 | 8 | 19 | 3 | 0 | 1 | 0 | 41 | 0 | 14 | 81 | 8 | 178 |
| | 7:45 AM | 6 | 10 | 8 | 3 | 2 | 7 | 0 | 25 | 3 | 13 | 85 | 9 | 171 |
| | 8:00 AM | 6 | 4 | 8 | 4 | 4 | 1 | 2 | 40 | 1 | 14 | 67 | 8 | 159 |
| | 8:15 AM | 3 | 7 | 13 | 2 | 4 | 2 | 3 | 35 | 1 | 9 | 74 | 2 | 155 |
| | 8:30 AM | 7 | 3 | 5 | 3 | 6 | 2 | 1 | 34 | 1 | 8 | 60 | 5 | 135 |
| | 8:45 AM | 3 | 3 | 13 | 1 | 3 | 0 | 0 | 31 | 3 | 12 | 68 | 3 | 140 |
| | VOLUMES | 34 | 48 | 88 | 18 | 20 | 14 | 7 | 252 | 10 | 82 | 577 | 40 | 1,190 |
| | APPROACH % | 20% | 28% | 52% | 35% | 38% | 27% | 3% | 94% | 4% | 12% | 83% | 6% | |
| | APP/DEPART | 170 | / | 95 | 52 | / | 112 | 269 | / | 358 | 699 | / | 625 | 0 |
| | BEGIN PEAK HR | | 7:30 AM | | | | | | | | | | | |
| | VOLUMES | 18 | 29 | 48 | 12 | 10 | 11 | 5 | 141 | 5 | 50 | 307 | 27 | 663 |
| | APPROACH % | 19% | 31% | 51% | 36% | 30% | 33% | 3% | 93% | 3% | 13% | 80% | 7% | |
| | PEAK HR FACTOR | | 0.792 | | | 0.688 | | | 0.878 | | | 0.897 | | 0.931 |
| | APP/DEPART | 95 | / | 61 | 33 | / | 65 | 151 | / | 201 | 384 | / | 336 | 0 |
| PM | 4:00 PM | 5 | 10 | 18 | 13 | 9 | 2 | 3 | 89 | 7 | 15 | 61 | 4 | 236 |
| | 4:15 PM | 7 | 7 | 21 | 7 | 11 | 4 | 1 | 101 | 5 | 22 | 82 | 3 | 271 |
| | 4:30 PM | 4 | 6 | 17 | 8 | 9 | 1 | 0 | 93 | 6 | 24 | 70 | 3 | 241 |
| | 4:45 PM | 2 | 11 | 20 | 10 | 11 | 5 | 1 | 114 | 7 | 21 | 69 | 3 | 274 |
| | 5:00 PM | 5 | 9 | 18 | 6 | 11 | 5 | 2 | 114 | 6 | 18 | 66 | 6 | 266 |
| | 5:15 PM | 4 | 10 | 24 | 7 | 12 | 7 | 3 | 99 | 4 | 12 | 78 | 2 | 262 |
| | 5:30 PM | 2 | 10 | 27 | 5 | 10 | 4 | 4 | 102 | 3 | 14 | 64 | 0 | 245 |
| | 5:45 PM | 2 | 5 | 21 | 12 | 14 | 4 | 0 | 110 | 3 | 19 | 68 | 4 | 262 |
| | VOLUMES | 31 | 68 | 166 | 68 | 87 | 32 | 14 | 822 | 41 | 145 | 558 | 25 | 2,057 |
| | APPROACH % | 12% | 26% | 63% | 36% | 47% | 17% | 2% | 94% | 5% | 20% | 77% | 3% | |
| | APP/DEPART | 265 | / | 107 | 187 | / | 274 | 877 | / | 1,056 | 728 | / | 620 | 0 |
| | BEGIN PEAK HR | | 4:15 PM | | | | | | | | | | | |
| | VOLUMES | 18 | 33 | 76 | 31 | 42 | 15 | 4 | 422 | 24 | 85 | 287 | 15 | 1,052 |
| | APPROACH % | 14% | 26% | 60% | 35% | 48% | 17% | 1% | 94% | 5% | 22% | 74% | 4% | |
| | PEAK HR FACTOR | | 0.907 | | | 0.846 | | | 0.922 | | | 0.904 | | 0.960 |
| | APP/DEPART | 127 | / | 52 | 88 | / | 152 | 450 | / | 529 | 387 | / | 319 | 0 |

**AimTD LLC**

TURNING MOVEMENT COUNTS



# INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

| DATE: | LOCATION: | Perris | PROJECT #: | SC |
|---|---|---|---|---|
| Wed, May 26, 21 | NORTH & SOUTH: | Redlands | LOCATION #: | 2 |
| | EAST & WEST: | Placentia | CONTROL: | STOP ALL |

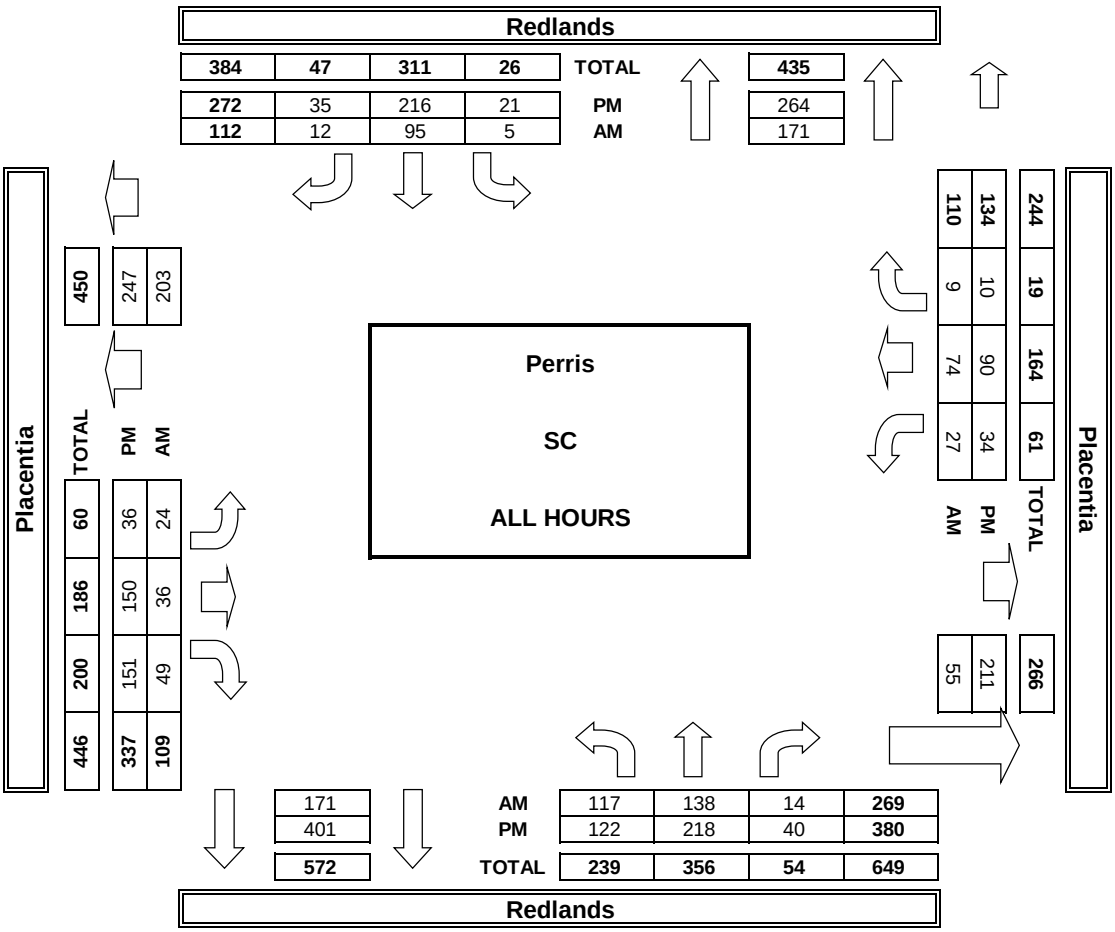
NOTES:

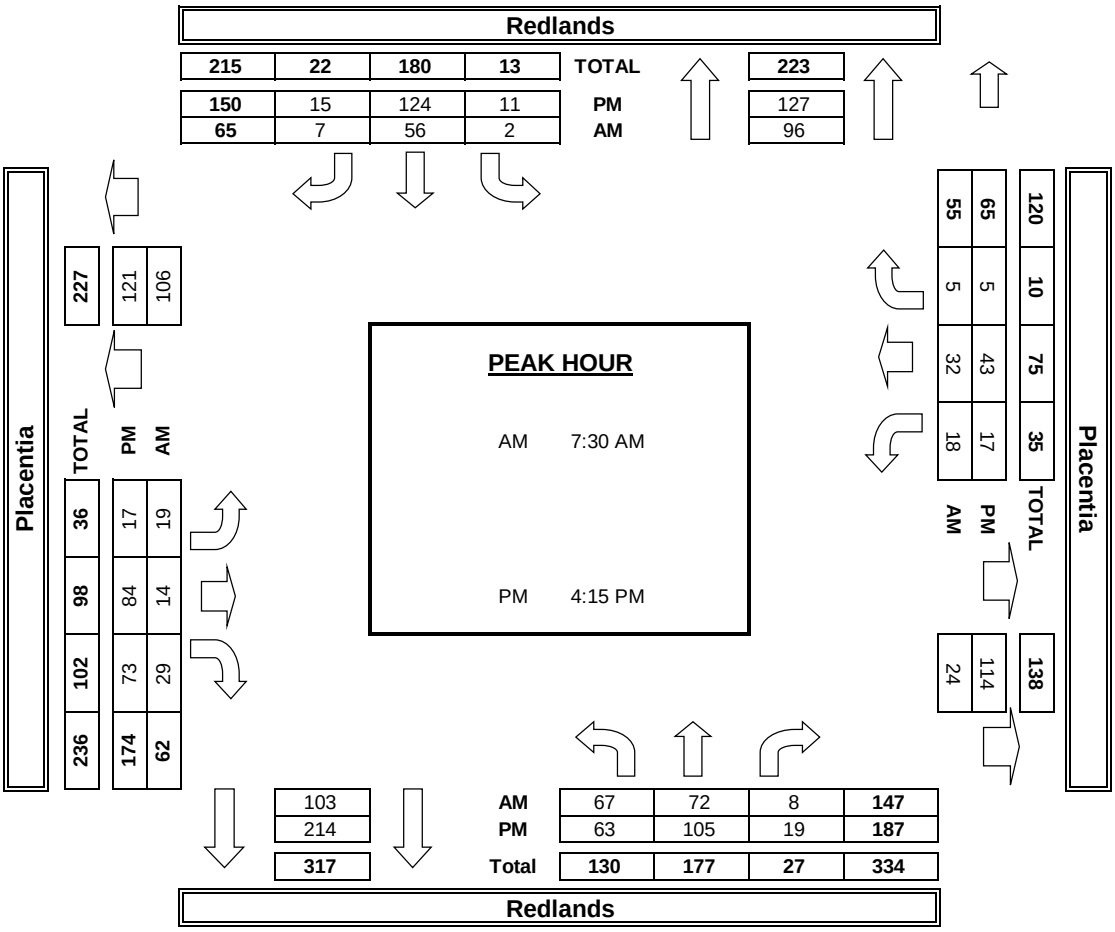
AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

| | | NORTHBOUND Redlands | | | SOUTHBOUND Redlands | | | EASTBOUND Placentia | | | WESTBOUND Placentia | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LANES: | NL 1 | NT 1.5 | NR 0.5 | SL 1 | ST 1 | SR 1 | EL 1 | ET 1 | ER 1 | WL 1 | WT 1 | WR 0 | TOTAL |
| AM | 7:00 AM | 18 | 17 | 0 | 0 | 5 | 0 | 1 | 2 | 3 | 1 | 13 | 0 | 60 |
| | 7:15 AM | 11 | 21 | 2 | 0 | 11 | 0 | 0 | 4 | 4 | 2 | 8 | 2 | 65 |
| | 7:30 AM | 20 | 23 | 1 | 0 | 13 | 2 | 8 | 1 | 8 | 4 | 7 | 0 | 87 |
| | 7:45 AM | 11 | 20 | 2 | 1 | 16 | 1 | 4 | 4 | 11 | 5 | 11 | 1 | 87 |
| | 8:00 AM | 15 | 13 | 4 | 0 | 15 | 2 | 3 | 7 | 6 | 4 | 7 | 2 | 78 |
| | 8:15 AM | 21 | 16 | 1 | 1 | 12 | 2 | 4 | 2 | 4 | 5 | 7 | 2 | 77 |
| | 8:30 AM | 11 | 13 | 4 | 0 | 10 | 3 | 0 | 9 | 3 | 3 | 13 | 1 | 70 |
| | 8:45 AM | 10 | 15 | 0 | 3 | 13 | 2 | 4 | 7 | 10 | 3 | 8 | 1 | 76 |
| | VOLUMES | 117 | 138 | 14 | 5 | 95 | 12 | 24 | 36 | 49 | 27 | 74 | 9 | 600 |
| | APPROACH % | 43% | 51% | 5% | 4% | 85% | 11% | 22% | 33% | 45% | 25% | 67% | 8% | |
| | APP/DEPART | 269 | / | 171 | 112 | / | 171 | 109 | / | 55 | 110 | / | 203 | 0 |
| | BEGIN PEAK HR | | 7:30 AM | | | | | | | | | | | |
| | VOLUMES | 67 | 72 | 8 | 2 | 56 | 7 | 19 | 14 | 29 | 18 | 32 | 5 | 329 |
| | APPROACH % | 46% | 49% | 5% | 3% | 86% | 11% | 31% | 23% | 47% | 33% | 58% | 9% | |
| | PEAK HR FACTOR | | 0.835 | | | 0.903 | | | 0.816 | | | 0.809 | | 0.945 |
| | APP/DEPART | 147 | / | 96 | 65 | / | 103 | 62 | / | 24 | 55 | / | 106 | 0 |
| PM | 4:00 PM | 14 | 25 | 6 | 2 | 22 | 7 | 4 | 14 | 19 | 3 | 10 | 0 | 126 |
| | 4:15 PM | 12 | 30 | 3 | 1 | 32 | 4 | 4 | 22 | 18 | 4 | 10 | 1 | 141 |
| | 4:30 PM | 15 | 20 | 6 | 5 | 30 | 4 | 7 | 21 | 21 | 2 | 6 | 0 | 137 |
| | 4:45 PM | 17 | 28 | 6 | 3 | 34 | 5 | 3 | 19 | 12 | 6 | 16 | 1 | 150 |
| | 5:00 PM | 19 | 27 | 4 | 2 | 28 | 2 | 3 | 22 | 22 | 5 | 11 | 3 | 148 |
| | 5:15 PM | 20 | 29 | 1 | 3 | 22 | 6 | 7 | 17 | 18 | 4 | 11 | 2 | 140 |
| | 5:30 PM | 13 | 35 | 8 | 2 | 22 | 1 | 6 | 16 | 18 | 6 | 8 | 1 | 136 |
| | 5:45 PM | 12 | 24 | 6 | 3 | 26 | 6 | 2 | 19 | 23 | 4 | 18 | 2 | 145 |
| | VOLUMES | 122 | 218 | 40 | 21 | 216 | 35 | 36 | 150 | 151 | 34 | 90 | 10 | 1,123 |
| | APPROACH % | 32% | 57% | 11% | 8% | 79% | 13% | 11% | 45% | 45% | 25% | 67% | 7% | |
| | APP/DEPART | 380 | / | 264 | 272 | / | 401 | 337 | / | 211 | 134 | / | 247 | 0 |
| | BEGIN PEAK HR | | 4:15 PM | | | | | | | | | | | |
| | VOLUMES | 63 | 105 | 19 | 11 | 124 | 15 | 17 | 84 | 73 | 17 | 43 | 5 | 576 |
| | APPROACH % | 34% | 56% | 10% | 7% | 83% | 10% | 10% | 48% | 42% | 26% | 66% | 8% | |
| | PEAK HR FACTOR | | 0.917 | | | 0.893 | | | 0.888 | | | 0.707 | | 0.960 |
| | APP/DEPART | 187 | / | 127 | 150 | / | 214 | 174 | / | 114 | 65 | / | 121 | 0 |

**AimTD LLC**

TURNING MOVEMENT COUNTS



# APPENDIX D

# LEVEL OF SERVICE WORKSHEETS

## Existing

Redlands Avenue West Industrial Project

Vistro File: C:\...\AME.vistro
Report File: C:\...\AME.pdf

Scenario 1 Existing AM Peak Hour
7/22/2021

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | Redlands Ave (NS) at Rider St (EW) | Signalized | HCM 6th Edition | EB Left | 0.186 | 26.5 | C |
| 5 | Redlands Ave (NS) at Placentia Ave (EW) | All-way stop | HCM 6th Edition | NB Left | 0.102 | 8.2 | A |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: Redlands Ave (NS) at Rider St (EW)**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 26.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 1 hour | Volume to Capacity (v/c): | 0.186 |

**Intersection Setup**

| Name | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | 45.00 | | | 45.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 18 | 29 | 48 | 12 | 10 | 11 | 5 | 141 | 5 | 50 | 307 | 27 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 18 | 29 | 48 | 12 | 10 | 11 | 5 | 141 | 5 | 50 | 307 | 27 |
| Peak Hour Factor | 0.9310 | 0.9310 | 0.9310 | 0.9310 | 0.9310 | 0.9310 | 0.9310 | 0.9310 | 0.9310 | 0.9310 | 0.9310 | 0.9310 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 5 | 8 | 13 | 3 | 3 | 3 | 1 | 38 | 1 | 13 | 82 | 7 |
| Total Analysis Volume [veh/h] | 19 | 31 | 52 | 13 | 11 | 12 | 5 | 151 | 5 | 54 | 330 | 29 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 65 |
| Coordination Type | Time of Day Pattern Isolated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 5 | 2 | 0 | 1 | 6 | 0 | 3 | 8 | 0 | 7 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 7 | 7 | 0 | 7 | 7 | 0 | 7 | 7 | 0 | 7 | 7 | 0 |
| Maximum Green [s] | 120 | 120 | 0 | 120 | 120 | 0 | 120 | 120 | 0 | 120 | 120 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 11 | 21 | 0 | 11 | 21 | 0 | 12 | 22 | 0 | 11 | 21 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 10 | 0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | R | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 2 | 37 | 37 | 1 | 36 | 36 | 1 | 7 | 7 | 4 | 10 | 10 |
| g / C, Green / Cycle | 0.03 | 0.57 | 0.57 | 0.02 | 0.56 | 0.56 | 0.01 | 0.10 | 0.10 | 0.06 | 0.16 | 0.16 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.02 | 0.03 | 0.01 | 0.01 | 0.01 | 0.00 | 0.08 | 0.00 | 0.03 | 0.09 | 0.09 |
| s, saturation flow rate [veh/h] | 1781 | 1870 | 1589 | 1781 | 1870 | 1589 | 1781 | 1870 | 1589 | 1781 | 1870 | 1818 |
| c, Capacity [veh/h] | 56 | 1057 | 898 | 40 | 1040 | 884 | 19 | 190 | 161 | 117 | 293 | 285 |
| d1, Uniform Delay [s] | 30.90 | 6.26 | 6.36 | 31.37 | 6.46 | 6.47 | 32.02 | 28.48 | 26.41 | 29.28 | 25.48 | 25.51 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 3.29 | 0.05 | 0.11 | 4.19 | 0.02 | 0.03 | 7.65 | 5.87 | 0.08 | 2.47 | 1.79 | 1.89 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.32 | 0.03 | 0.05 | 0.30 | 0.01 | 0.01 | 0.27 | 0.74 | 0.03 | 0.43 | 0.58 | 0.58 |
| d, Delay for Lane Group [s/veh] | 34.19 | 6.31 | 6.47 | 35.57 | 6.48 | 6.50 | 39.67 | 34.35 | 26.49 | 31.75 | 27.28 | 27.40 |
| Lane Group LOS | C | A | A | D | A | A | D | C | C | C | C | C |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 0.31 | 0.15 | 0.26 | 0.22 | 0.05 | 0.06 | 0.11 | 2.25 | 0.07 | 0.77 | 2.31 | 2.28 |
| 50th-Percentile Queue Length [ft/ln] | 7.83 | 3.83 | 6.55 | 5.56 | 1.35 | 1.51 | 2.79 | 56.15 | 1.68 | 19.17 | 57.83 | 57.00 |
| 95th-Percentile Queue Length [veh/ln] | 0.56 | 0.28 | 0.47 | 0.40 | 0.10 | 0.11 | 0.20 | 4.04 | 0.12 | 1.38 | 4.16 | 4.10 |
| 95th-Percentile Queue Length [ft/ln] | 14.10 | 6.89 | 11.79 | 10.02 | 2.43 | 2.72 | 5.01 | 101.06 | 3.02 | 34.51 | 104.09 | 102.60 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 34.19 | 6.31 | 6.47 | 35.57 | 6.48 | 6.50 | 39.67 | 34.35 | 26.49 | 31.75 | 27.33 | 27.40 |
| Movement LOS | C | A | A | D | A | A | D | C | C | C | C | C |
| d_A, Approach Delay [s/veh] | 11.67 | | | 17.06 | | | 34.27 | | | 27.91 | | |
| Approach LOS | B | | | B | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 26.49 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.186 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 22.43 | 22.43 | 22.43 | 22.43 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.159 | 2.140 | 2.424 | 2.327 |
| Crosswalk LOS | B | B | B | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 523 | 523 | 554 | 523 |
| d_b, Bicycle Delay [s] | 17.72 | 17.72 | 16.99 | 17.72 |
| l_b,int, Bicycle LOS Score for Intersection | 1.716 | 1.614 | 1.809 | 1.876 |
| Bicycle LOS | A | A | A | A |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

**Intersection Level Of Service Report**
**Intersection 5: Redlands Ave (NS) at Placentia Ave (EW)**

| | | | |
|---|---|---|---|
| Control Type: | All-way stop | Delay (sec / veh): | 8.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | A |
| Analysis Period: | 1 hour | Volume to Capacity (v/c): | 0.102 |

**Intersection Setup**

| Name | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | 25.00 | | | 25.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 67 | 72 | 8 | 2 | 56 | 7 | 19 | 14 | 29 | 18 | 32 | 5 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 67 | 72 | 8 | 2 | 56 | 7 | 19 | 14 | 29 | 18 | 32 | 5 |
| Peak Hour Factor | 0.9450 | 0.9450 | 0.9450 | 0.9450 | 0.9450 | 0.9450 | 0.9450 | 0.9450 | 0.9450 | 0.9450 | 0.9450 | 0.9450 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 18 | 19 | 2 | 1 | 15 | 2 | 5 | 4 | 8 | 5 | 8 | 1 |
| Total Analysis Volume [veh/h] | 71 | 76 | 8 | 2 | 59 | 7 | 20 | 15 | 31 | 19 | 34 | 5 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

**Lanes**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Capacity per Entry Lane [veh/h] | 655 | 721 | 742 | 638 | 700 | 810 | 632 | 692 | 799 | 630 | 702 |
| Degree of Utilization, x | 0.10 | 0.06 | 0.05 | 0.00 | 0.08 | 0.01 | 0.03 | 0.02 | 0.04 | 0.03 | 0.05 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 95th-Percentile Queue Length [veh] | 0.34 | 0.18 | 0.17 | 0.01 | 0.26 | 0.03 | 0.09 | 0.06 | 0.11 | 0.09 | 0.17 |
| 95th-Percentile Queue Length [ft] | 8.53 | 4.40 | 4.27 | 0.24 | 6.52 | 0.65 | 2.32 | 1.55 | 2.82 | 2.21 | 4.17 |
| Approach Delay [s/veh] | 8.32 | | | 8.17 | | | 7.88 | | | 8.27 | |
| Approach LOS | A | | | A | | | A | | | A | |
| Intersection Delay [s/veh] | 8.20 | | | | | | | | | | |
| Intersection LOS | A | | | | | | | | | | |

Redlands Avenue West Industrial Project

Vistro File: C:\...\PME.vistro
Report File: C:\...\PME.pdf

Scenario 1 Existing PM Peak Hour
7/22/2021

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | Redlands Ave (NS) at Rider St (EW) | Signalized | HCM 6th Edition | EB Left | 0.449 | 23.7 | C |
| 5 | Redlands Ave (NS) at Placentia Ave (EW) | All-way stop | HCM 6th Edition | SB Thru | 0.192 | 9.0 | A |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: Redlands Ave (NS) at Rider St (EW)**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 23.7 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 1 hour | Volume to Capacity (v/c): | 0.449 |

**Intersection Setup**

| Name | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | 45.00 | | | 45.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 18 | 33 | 76 | 31 | 42 | 15 | 4 | 422 | 24 | 85 | 287 | 15 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 18 | 33 | 76 | 31 | 42 | 15 | 4 | 422 | 24 | 85 | 287 | 15 |
| Peak Hour Factor | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 5 | 9 | 20 | 8 | 11 | 4 | 1 | 110 | 6 | 22 | 75 | 4 |
| Total Analysis Volume [veh/h] | 19 | 34 | 79 | 32 | 44 | 16 | 4 | 440 | 25 | 89 | 299 | 16 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 65 |
| Coordination Type | Time of Day Pattern Isolated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 5 | 2 | 0 | 1 | 6 | 0 | 3 | 8 | 0 | 7 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 7 | 7 | 0 | 7 | 7 | 0 | 7 | 7 | 0 | 7 | 7 | 0 |
| Maximum Green [s] | 120 | 120 | 0 | 120 | 120 | 0 | 120 | 120 | 0 | 120 | 120 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 11 | 21 | 0 | 11 | 21 | 0 | 12 | 22 | 0 | 11 | 21 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 10 | 0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | R | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 2 | 24 | 24 | 3 | 25 | 25 | 1 | 17 | 17 | 6 | 22 | 22 |
| g / C, Green / Cycle | 0.03 | 0.37 | 0.37 | 0.05 | 0.38 | 0.38 | 0.01 | 0.25 | 0.25 | 0.09 | 0.33 | 0.33 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.02 | 0.05 | 0.02 | 0.02 | 0.01 | 0.00 | 0.23 | 0.02 | 0.05 | 0.08 | 0.08 |
| s, saturation flow rate [veh/h] | 1781 | 1870 | 1589 | 1781 | 1870 | 1589 | 1781 | 1870 | 1589 | 1781 | 1870 | 1838 |
| c, Capacity [veh/h] | 56 | 690 | 587 | 85 | 721 | 613 | 15 | 471 | 400 | 153 | 615 | 605 |
| d1, Uniform Delay [s] | 30.90 | 13.21 | 13.63 | 30.08 | 12.59 | 12.43 | 32.12 | 23.57 | 18.53 | 28.61 | 15.97 | 15.98 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 3.29 | 0.13 | 0.46 | 2.60 | 0.15 | 0.07 | 8.91 | 6.89 | 0.06 | 3.16 | 0.21 | 0.21 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.32 | 0.05 | 0.13 | 0.36 | 0.06 | 0.02 | 0.26 | 0.90 | 0.06 | 0.56 | 0.25 | 0.25 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 34.19 | 13.34 | 14.09 | 32.69 | 12.75 | 12.50 | 41.03 | 30.46 | 18.60 | 31.77 | 16.18 | 16.19 |
| Lane Group LOS | C | B | B | C | B | B | D | C | B | C | B | B |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 0.31 | 0.30 | 0.74 | 0.51 | 0.38 | 0.13 | 0.10 | 6.31 | 0.25 | 1.29 | 1.45 | 1.43 |
| 50th-Percentile Queue Length [ft/ln] | 7.83 | 7.61 | 18.45 | 12.68 | 9.38 | 3.35 | 2.39 | 157.87 | 6.22 | 32.32 | 36.16 | 35.79 |
| 95th-Percentile Queue Length [veh/ln] | 0.56 | 0.55 | 1.33 | 0.91 | 0.68 | 0.24 | 0.17 | 10.44 | 0.45 | 2.33 | 2.60 | 2.58 |
| 95th-Percentile Queue Length [ft/ln] | 14.10 | 13.70 | 33.21 | 22.82 | 16.89 | 6.03 | 4.30 | 260.89 | 11.20 | 58.17 | 65.08 | 64.43 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 34.19 | 13.34 | 14.09 | 32.69 | 12.75 | 12.50 | 41.03 | 30.46 | 18.60 | 31.77 | 16.19 | 16.19 |
| Movement LOS | C | B | B | C | B | B | D | C | B | C | B | B |
| d_A, Approach Delay [s/veh] | 16.74 | | | 19.73 | | | 29.92 | | | 19.61 | | |
| Approach LOS | B | | | B | | | C | | | B | | |
| d_I, Intersection Delay [s/veh] | 23.69 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.449 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 22.43 | 22.43 | 22.43 | 22.43 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.192 | 2.153 | 2.507 | 2.448 |
| Crosswalk LOS | B | B | B | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 523 | 523 | 554 | 523 |
| d_b, Bicycle Delay [s] | 17.72 | 17.72 | 16.99 | 17.72 |
| l_b,int, Bicycle LOS Score for Intersection | 1.769 | 1.705 | 2.302 | 1.879 |
| Bicycle LOS | A | A | B | A |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

**Intersection Level Of Service Report**
**Intersection 5: Redlands Ave (NS) at Placentia Ave (EW)**

| | | | |
|---|---|---|---|
| Control Type: | All-way stop | Delay (sec / veh): | 9.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | A |
| Analysis Period: | 1 hour | Volume to Capacity (v/c): | 0.192 |

**Intersection Setup**

| Name | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | 25.00 | | | 25.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 63 | 105 | 19 | 11 | 124 | 15 | 17 | 84 | 73 | 17 | 43 | 5 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 63 | 105 | 19 | 11 | 124 | 15 | 17 | 84 | 73 | 17 | 43 | 5 |
| Peak Hour Factor | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 16 | 27 | 5 | 3 | 32 | 4 | 4 | 22 | 19 | 4 | 11 | 1 |
| Total Analysis Volume [veh/h] | 66 | 109 | 20 | 11 | 129 | 16 | 18 | 88 | 76 | 18 | 45 | 5 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

**Lanes**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Capacity per Entry Lane [veh/h] | 598 | 652 | 678 | 594 | 647 | 739 | 595 | 648 | 740 | 576 | 634 |
| Degree of Utilization, x | 0.11 | 0.10 | 0.09 | 0.02 | 0.19 | 0.02 | 0.03 | 0.13 | 0.10 | 0.03 | 0.08 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 95th-Percentile Queue Length [veh] | 0.35 | 0.31 | 0.30 | 0.06 | 0.71 | 0.06 | 0.09 | 0.45 | 0.33 | 0.09 | 0.25 |
| 95th-Percentile Queue Length [ft] | 8.82 | 7.87 | 7.54 | 1.42 | 17.75 | 1.55 | 2.21 | 11.16 | 8.20 | 2.28 | 6.14 |
| Approach Delay [s/veh] | 8.93 | | | 9.35 | | | 8.66 | | | 8.92 | |
| Approach LOS | A | | | A | | | A | | | A | |
| Intersection Delay [s/veh] | 8.95 | | | | | | | | | | |
| Intersection LOS | A | | | | | | | | | | |

## Existing Plus Project

Redlands Avenue West Industrial Project

Vistro File: Z:\...\AME.vistro
Report File: Z:\...\AMEP.pdf

Scenario 2 Existing Plus Project AM Peak Hour
1/4/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | Redlands Ave (NS) at Rider St (EW) | Signalized | HCM 6th Edition | EB Left | 0.190 | 25.6 | C |
| 2 | Redlands Ave (NS) at Project North Dwy (EW) | Two-way stop | HCM 6th Edition | EB Right | 0.000 | 8.6 | A |
| 3 | Redlands Ave (NS) at Project Central Dwy (EW) | Two-way stop | HCM 6th Edition | WB Right | 0.000 | 8.6 | A |
| 4 | Redlands Ave (NS) at Project South Dwy (EW) | Two-way stop | HCM 6th Edition | EB Left | 0.004 | 9.4 | A |
| 5 | Redlands Ave (NS) at Placentia Ave (EW) | All-way stop | HCM 6th Edition | NB Left | 0.103 | 8.3 | A |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: Redlands Ave (NS) at Rider St (EW)**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 25.6 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 1 hour | Volume to Capacity (v/c): | 0.190 |

**Intersection Setup**

| Name | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | | |  | | |  | | |  | | |
| Turning Movement | U-tu | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.0 | 100.0 | 100.0 | 100.0 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | | 35.00 | | | 45.00 | | | 45.00 | | |
| Grade [%] | 0.00 | | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 18 | 29 | 48 | 12 | 10 | 11 | 5 | 141 | 5 | 50 | 307 | 27 |
| Base Volume Adjustment Factor | 1.000 | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 2 | 5 | 1 | 0 | 19 | 0 | 0 | 0 | 7 | 4 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 20 | 34 | 49 | 12 | 29 | 11 | 5 | 141 | 12 | 54 | 307 | 27 |
| Peak Hour Factor | 1.000 | 0.931 | 0.931 | 0.931 | 0.9310 | 0.9310 | 0.9310 | 0.9310 | 0.9310 | 0.9310 | 0.9310 | 0.9310 | 0.9310 |
| Other Adjustment Factor | 1.000 | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 5 | 9 | 13 | 3 | 8 | 3 | 1 | 38 | 3 | 15 | 82 | 7 |
| Total Analysis Volume [veh/h] | 0 | 21 | 37 | 53 | 13 | 31 | 12 | 5 | 151 | 13 | 58 | 330 | 29 |
| Presence of On-Street Parking | No | | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 65 |
| Coordination Type | Time of Day Pattern Isolated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Permi | Prote | Permi | Permi | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 0 | 5 | 2 | 0 | 1 | 6 | 0 | 3 | 8 | 0 | 7 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | | |
| Lead / Lag | - | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 7 | 7 | 0 | 7 | 7 | 0 | 7 | 7 | 0 | 7 | 7 | 0 |
| Maximum Green [s] | 0 | 120 | 120 | 0 | 120 | 120 | 0 | 120 | 120 | 0 | 120 | 120 | 0 |
| Amber [s] | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 11 | 21 | 0 | 11 | 21 | 0 | 12 | 22 | 0 | 11 | 21 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 10 | 0 |
| Rest In Walk | | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | R | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 2 | 37 | 37 | 1 | 36 | 36 | 1 | 7 | 7 | 4 | 10 | 10 |
| g / C, Green / Cycle | 0.03 | 0.56 | 0.56 | 0.02 | 0.55 | 0.55 | 0.01 | 0.10 | 0.10 | 0.07 | 0.16 | 0.16 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.02 | 0.03 | 0.01 | 0.02 | 0.01 | 0.00 | 0.08 | 0.01 | 0.03 | 0.09 | 0.09 |
| s, saturation flow rate [veh/h] | 1781 | 1870 | 1589 | 1781 | 1870 | 1589 | 1781 | 1870 | 1589 | 1781 | 1870 | 1818 |
| c, Capacity [veh/h] | 61 | 1049 | 892 | 40 | 1027 | 873 | 19 | 191 | 163 | 122 | 301 | 292 |
| d1, Uniform Delay [s] | 30.76 | 6.40 | 6.48 | 31.37 | 6.73 | 6.67 | 32.02 | 28.41 | 26.47 | 29.16 | 25.24 | 25.27 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 3.11 | 0.06 | 0.12 | 4.19 | 0.05 | 0.03 | 7.65 | 5.61 | 0.19 | 2.50 | 1.65 | 1.74 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.33 | 0.03 | 0.05 | 0.30 | 0.03 | 0.01 | 0.27 | 0.74 | 0.07 | 0.44 | 0.56 | 0.57 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 33.87 | 6.45 | 6.60 | 35.57 | 6.78 | 6.70 | 39.67 | 34.02 | 26.66 | 31.66 | 26.89 | 27.00 |
| Lane Group LOS | C | A | A | D | A | A | D | C | C | C | C | C |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 0.34 | 0.18 | 0.27 | 0.22 | 0.16 | 0.06 | 0.11 | 2.23 | 0.16 | 0.83 | 2.29 | 2.26 |
| 50th-Percentile Queue Length [ft/ln] | 8.58 | 4.57 | 6.79 | 5.56 | 4.05 | 1.55 | 2.79 | 55.80 | 4.05 | 20.63 | 57.29 | 56.45 |
| 95th-Percentile Queue Length [veh/ln] | 0.62 | 0.33 | 0.49 | 0.40 | 0.29 | 0.11 | 0.20 | 4.02 | 0.29 | 1.49 | 4.12 | 4.06 |
| 95th-Percentile Queue Length [ft/ln] | 15.45 | 8.23 | 12.22 | 10.02 | 7.29 | 2.78 | 5.01 | 100.43 | 7.29 | 37.13 | 103.12 | 101.61 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 33.87 | 33.87 | 6.45 | 6.60 | 35.57 | 6.78 | 6.70 | 39.67 | 34.02 | 26.66 | 31.66 | 26.94 | 27.00 |
| Movement LOS | C | C | A | A | D | A | A | D | C | C | C | C | C |
| d_A, Approach Delay [s/veh] | 11.85 | | | | 13.41 | | | 33.64 | | | 27.60 | | |
| Approach LOS | B | | | | B | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 25.59 | | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | | |
| Intersection V/C | 0.190 | | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 22.43 | 22.43 | 22.43 | 22.43 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.169 | 2.147 | 2.427 | 2.329 |
| Crosswalk LOS | B | B | B | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 523 | 523 | 554 | 523 |
| d_b, Bicycle Delay [s] | 17.72 | 17.72 | 16.99 | 17.72 |
| l_b,int, Bicycle LOS Score for Intersection | 1.730 | 1.645 | 1.820 | 1.880 |
| Bicycle LOS | A | A | A | A |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

**Intersection Level Of Service Report**
**Intersection 2: Redlands Ave (NS) at Project North Dwy (EW)**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 8.6 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | A |
| Analysis Period: | 1 hour | Volume to Capacity (v/c): | 0.000 |

**Intersection Setup**

| Name | | | | | | |
|---|---|---|---|---|---|---|
| Approach | Northbound | | Southbound | | Eastbound | |
| Lane Configuration | | | | | | |
| Turning Movement | Left | Thru | Thru | Right | Left | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | 35.00 | | 30.00 | |
| Grade [%] | 0.00 | | 0.00 | | 0.00 | |
| Crosswalk | No | | No | | Yes | |

**Volumes**

| Name | | | | | | |
|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 95 | 65 | 0 | 0 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 8 | 20 | 10 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 103 | 85 | 10 | 0 | 0 |
| Peak Hour Factor | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 27 | 22 | 3 | 0 | 0 |
| Total Analysis Volume [veh/h] | 0 | 108 | 89 | 11 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | 0 | | 0 | |

**Intersection Settings**

| Priority Scheme | Free | Free | Stop |
|---|---|---|---|
| Flared Lane | | | |
| Storage Area [veh] | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | | | No |
| Number of Storage Spaces in Median | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 8.56 |
| Movement LOS | | A | A | A | | A |
| 95th-Percentile Queue Length [veh/ln] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft/ln] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh] | 0.00 | | 0.00 | | 8.56 | |
| Approach LOS | A | | A | | A | |
| d_I, Intersection Delay [s/veh] | 0.00 | | | | | |
| Intersection LOS | A | | | | | |

**Intersection Level Of Service Report**
**Intersection 3: Redlands Ave (NS) at Project Central Dwy (EW)**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 8.6 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | A |
| Analysis Period: | 1 hour | Volume to Capacity (v/c): | 0.000 |

**Intersection Setup**

| Name | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | No | | | Yes | | | Yes | | |

**Volumes**

| Name | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 95 | 0 | 0 | 65 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 16 | 8 | 0 | 0 | 0 | 20 | 0 | 0 | 9 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 16 | 103 | 0 | 0 | 65 | 20 | 0 | 0 | 9 | 0 | 0 | 0 |
| Peak Hour Factor | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 4 | 27 | 0 | 0 | 17 | 5 | 0 | 0 | 2 | 0 | 0 | 0 |
| Total Analysis Volume [veh/h] | 17 | 108 | 0 | 0 | 68 | 21 | 0 | 0 | 9 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| Priority Scheme | Free | Free | Stop | Stop |
|---|---|---|---|---|
| Flared Lane | | | | |
| Storage Area [veh] | 0 | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | | | No | No |
| Number of Storage Spaces in Median | 0 | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 7.41 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 8.57 | 0.00 | 0.00 | 8.58 |
| Movement LOS | A | A | A | | A | A | | | A | | | A |
| 95th-Percentile Queue Length [veh/ln] | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft/ln] | 0.80 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.67 | 0.00 | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh] | 1.00 | | | 0.00 | | | 8.57 | | | 8.58 | | |
| Approach LOS | A | | | A | | | A | | | A | | |
| d_I, Intersection Delay [s/veh] | 0.92 | | | | | | | | | | | |
| Intersection LOS | A | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 4: Redlands Ave (NS) at Project South Dwy (EW)**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 9.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | A |
| Analysis Period: | 1 hour | Volume to Capacity (v/c): | 0.004 |

**Intersection Setup**

| Name | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | No | | | Yes | | | Yes | | |

**Volumes**

| Name | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 95 | 0 | 0 | 65 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 21 | 0 | 0 | 9 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 116 | 0 | 0 | 74 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| Peak Hour Factor | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 31 | 0 | 0 | 19 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Total Analysis Volume [veh/h] | 0 | 122 | 0 | 0 | 78 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| Priority Scheme | Free | Free | Stop | Stop |
|---|---|---|---|---|
| Flared Lane | | | No | |
| Storage Area [veh] | 0 | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | | | No | |
| Number of Storage Spaces in Median | 0 | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 9.37 | 0.00 | 8.52 | 0.00 | 0.00 | 0.00 |
| Movement LOS | | A | A | | A | A | A | | A | | | |
| 95th-Percentile Queue Length [veh/ln] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft/ln] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.27 | 0.00 | 0.27 | 0.00 | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh] | 0.00 | | | 0.00 | | | 9.37 | | | 0.00 | | |
| Approach LOS | A | | | A | | | A | | | A | | |
| d_I, Intersection Delay [s/veh] | 0.15 | | | | | | | | | | | |
| Intersection LOS | A | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 5: Redlands Ave (NS) at Placentia Ave (EW)**

| | | | |
|---|---|---|---|
| Control Type: | All-way stop | Delay (sec / veh): | 8.3 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | A |
| Analysis Period: | 1 hour | Volume to Capacity (v/c): | 0.103 |

**Intersection Setup**

| Name | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | U-tu | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.0 | 100.0 | 100.0 | 100.0 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | | 25.00 | | | 25.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | | Yes | | | Yes | | |

**Volumes**

| Name | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 67 | 72 | 8 | 0 | 2 | 56 | 7 | 19 | 14 | 29 | 18 | 32 | 5 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 7 | 0 | 5 | 0 | 2 | 2 | 9 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 67 | 79 | 8 | 5 | 2 | 58 | 9 | 28 | 14 | 29 | 18 | 32 | 5 |
| Peak Hour Factor | 0.9450 | 0.9450 | 0.9450 | 1.000 | 0.945 | 0.945 | 0.945 | 0.9450 | 0.9450 | 0.9450 | 0.9450 | 0.9450 | 0.9450 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 18 | 21 | 2 | 1 | 1 | 15 | 2 | 7 | 4 | 8 | 5 | 8 | 1 |
| Total Analysis Volume [veh/h] | 71 | 84 | 8 | 5 | 2 | 61 | 10 | 30 | 15 | 31 | 19 | 34 | 5 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | | 0 | | | 0 | | |

**Intersection Settings**

**Lanes**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Capacity per Entry Lane [veh/h] | 649 | 714 | 733 | 633 | 694 | 803 | 628 | 688 | 793 | 624 | 695 |
| Degree of Utilization, x | 0.10 | 0.06 | 0.06 | 0.01 | 0.08 | 0.01 | 0.04 | 0.02 | 0.04 | 0.03 | 0.05 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 95th-Percentile Queue Length [veh] | 0.34 | 0.19 | 0.19 | 0.03 | 0.27 | 0.03 | 0.14 | 0.06 | 0.11 | 0.09 | 0.17 |
| 95th-Percentile Queue Length [ft] | 8.61 | 4.86 | 4.73 | 0.84 | 6.83 | 0.85 | 3.50 | 1.56 | 2.85 | 2.23 | 4.22 |
| Approach Delay [s/veh] | 8.38 | | | 8.23 | | | 8.04 | | | 8.33 | |
| Approach LOS | A | | | A | | | A | | | A | |
| Intersection Delay [s/veh] | 8.27 | | | | | | | | | | |
| Intersection LOS | A | | | | | | | | | | |

Redlands Avenue West Industrial Project

Vistro File: Z:\...\PME.vistro
Report File: Z:\...\PMEP.pdf

Scenario 2 Existing Plus Project PM Peak Hour
1/4/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | Redlands Ave (NS) at Rider St (EW) | Signalized | HCM 6th Edition | EB Left | 0.453 | 23.5 | C |
| 2 | Redlands Ave (NS) at Project North Dwy (EW) | Two-way stop | HCM 6th Edition | EB Right | 0.000 | 8.7 | A |
| 3 | Redlands Ave (NS) at Project Central Dwy (EW) | Two-way stop | HCM 6th Edition | EB Right | 0.031 | 8.9 | A |
| 4 | Redlands Ave (NS) at Project South Dwy (EW) | Two-way stop | HCM 6th Edition | EB Left | 0.004 | 10.4 | B |
| 5 | Redlands Ave (NS) at Placentia Ave (EW) | All-way stop | HCM 6th Edition | SB Thru | 0.202 | 9.0 | A |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: Redlands Ave (NS) at Rider St (EW)**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 23.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 1 hour | Volume to Capacity (v/c): | 0.453 |

**Intersection Setup**

| Name | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | | |  | | |  | | |  | | |
| Turning Movement | U-tu | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.0 | 100.0 | 100.0 | 100.0 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | | 35.00 | | | 45.00 | | | 45.00 | | |
| Grade [%] | 0.00 | | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 18 | 33 | 76 | 31 | 42 | 15 | 4 | 422 | 24 | 85 | 287 | 15 |
| Base Volume Adjustment Factor | 1.000 | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 6 | 11 | 3 | 0 | 8 | 0 | 0 | 0 | 4 | 2 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 24 | 44 | 79 | 31 | 50 | 15 | 4 | 422 | 28 | 87 | 287 | 15 |
| Peak Hour Factor | 1.000 | 0.960 | 0.960 | 0.960 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 |
| Other Adjustment Factor | 1.000 | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 6 | 11 | 21 | 8 | 13 | 4 | 1 | 110 | 7 | 23 | 75 | 4 |
| Total Analysis Volume [veh/h] | 0 | 25 | 46 | 82 | 32 | 52 | 16 | 4 | 440 | 29 | 91 | 299 | 16 |
| Presence of On-Street Parking | No | | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 65 |
| Coordination Type | Time of Day Pattern Isolated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Permi | Prote | Permi | Permi | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 0 | 5 | 2 | 0 | 1 | 6 | 0 | 3 | 8 | 0 | 7 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | | |
| Lead / Lag | - | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 7 | 7 | 0 | 7 | 7 | 0 | 7 | 7 | 0 | 7 | 7 | 0 |
| Maximum Green [s] | 0 | 120 | 120 | 0 | 120 | 120 | 0 | 120 | 120 | 0 | 120 | 120 | 0 |
| Amber [s] | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 11 | 21 | 0 | 11 | 21 | 0 | 12 | 22 | 0 | 11 | 21 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 10 | 0 |
| Rest In Walk | | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | R | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 3 | 24 | 24 | 3 | 24 | 24 | 1 | 17 | 17 | 6 | 22 | 22 |
| g / C, Green / Cycle | 0.04 | 0.37 | 0.37 | 0.05 | 0.38 | 0.38 | 0.01 | 0.25 | 0.25 | 0.09 | 0.33 | 0.33 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.02 | 0.05 | 0.02 | 0.03 | 0.01 | 0.00 | 0.23 | 0.02 | 0.05 | 0.08 | 0.08 |
| s, saturation flow rate [veh/h] | 1781 | 1870 | 1589 | 1781 | 1870 | 1589 | 1781 | 1870 | 1589 | 1781 | 1870 | 1838 |
| c, Capacity [veh/h] | 70 | 689 | 585 | 85 | 704 | 599 | 15 | 471 | 400 | 154 | 617 | 606 |
| d1, Uniform Delay [s] | 30.49 | 13.32 | 13.69 | 30.08 | 13.02 | 12.79 | 32.12 | 23.58 | 18.58 | 28.59 | 15.94 | 15.94 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 2.86 | 0.18 | 0.48 | 2.60 | 0.20 | 0.08 | 8.91 | 6.90 | 0.07 | 3.23 | 0.21 | 0.21 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.34 | 0.06 | 0.13 | 0.36 | 0.07 | 0.03 | 0.26 | 0.90 | 0.07 | 0.56 | 0.25 | 0.25 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 33.35 | 13.50 | 14.17 | 32.69 | 13.21 | 12.87 | 41.03 | 30.47 | 18.66 | 31.82 | 16.14 | 16.16 |
| Lane Group LOS | C | B | B | C | B | B | D | C | B | C | B | B |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 0.40 | 0.41 | 0.77 | 0.51 | 0.46 | 0.14 | 0.10 | 6.32 | 0.29 | 1.32 | 1.44 | 1.43 |
| 50th-Percentile Queue Length [ft/ln] | 10.08 | 10.23 | 19.26 | 12.68 | 11.46 | 3.42 | 2.39 | 157.90 | 7.28 | 33.11 | 36.10 | 35.73 |
| 95th-Percentile Queue Length [veh/ln] | 0.73 | 0.74 | 1.39 | 0.91 | 0.82 | 0.25 | 0.17 | 10.44 | 0.52 | 2.38 | 2.60 | 2.57 |
| 95th-Percentile Queue Length [ft/ln] | 18.14 | 18.42 | 34.66 | 22.82 | 20.62 | 6.15 | 4.30 | 260.93 | 13.11 | 59.60 | 64.97 | 64.31 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 33.35 | 33.35 | 13.50 | 14.17 | 32.69 | 13.21 | 12.87 | 41.03 | 30.47 | 18.66 | 31.82 | 16.15 | 16.16 |
| Movement LOS | C | C | B | B | C | B | B | D | C | B | C | B | B |
| d_A, Approach Delay [s/veh] | 17.10 | | | | 19.45 | | | 29.84 | | | 19.65 | | |
| Approach LOS | B | | | | B | | | C | | | B | | |
| d_I, Intersection Delay [s/veh] | 23.55 | | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | | |
| Intersection V/C | 0.453 | | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 22.43 | 22.43 | 22.43 | 22.43 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.202 | 2.158 | 2.510 | 2.450 |
| Crosswalk LOS | B | B | B | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 523 | 523 | 554 | 523 |
| d_b, Bicycle Delay [s] | 17.72 | 17.72 | 16.99 | 17.72 |
| l_b,int, Bicycle LOS Score for Intersection | 1.802 | 1.718 | 2.309 | 1.881 |
| Bicycle LOS | A | A | B | A |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

**Intersection Level Of Service Report**
**Intersection 2: Redlands Ave (NS) at Project North Dwy (EW)**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 8.7 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | A |
| Analysis Period: | 1 hour | Volume to Capacity (v/c): | 0.000 |

**Intersection Setup**

| Name | | | | | | |
|---|---|---|---|---|---|---|
| Approach | Northbound | | Southbound | | Eastbound | |
| Lane Configuration |  | |  | |  | |
| Turning Movement | Left | Thru | Thru | Right | Left | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | 35.00 | | 30.00 | |
| Grade [%] | 0.00 | | 0.00 | | 0.00 | |
| Crosswalk | No | | No | | Yes | |

**Volumes**

| Name | | | | | | |
|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 127 | 151 | 0 | 0 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 20 | 11 | 3 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 147 | 162 | 3 | 0 | 0 |
| Peak Hour Factor | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 39 | 43 | 1 | 0 | 0 |
| Total Analysis Volume [veh/h] | 0 | 155 | 171 | 3 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | 0 | | 0 | |

**Intersection Settings**

| Priority Scheme | Free | Free | Stop |
|---|---|---|---|
| Flared Lane | | | |
| Storage Area [veh] | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | | | No |
| Number of Storage Spaces in Median | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 8.75 |
| Movement LOS | | A | A | A | | A |
| 95th-Percentile Queue Length [veh/ln] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft/ln] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh] | 0.00 | | 0.00 | | 8.75 | |
| Approach LOS | A | | A | | A | |
| d_I, Intersection Delay [s/veh] | 0.00 | | | | | |
| Intersection LOS | A | | | | | |

**Intersection Level Of Service Report**
**Intersection 3: Redlands Ave (NS) at Project Central Dwy (EW)**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 8.9 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | A |
| Analysis Period: | 1 hour | Volume to Capacity (v/c): | 0.031 |

**Intersection Setup**

| Name | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | No | | | Yes | | | Yes | | |

**Volumes**

| Name | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 127 | 0 | 0 | 151 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 9 | 20 | 0 | 0 | 0 | 11 | 0 | 0 | 30 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 9 | 147 | 0 | 0 | 151 | 11 | 0 | 0 | 30 | 0 | 0 | 0 |
| Peak Hour Factor | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 2 | 39 | 0 | 0 | 40 | 3 | 0 | 0 | 8 | 0 | 0 | 0 |
| Total Analysis Volume [veh/h] | 9 | 155 | 0 | 0 | 159 | 12 | 0 | 0 | 32 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| Priority Scheme | Free | Free | Stop | Stop |
|---|---|---|---|---|
| Flared Lane | | | | |
| Storage Area [veh] | 0 | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | | | No | No |
| Number of Storage Spaces in Median | 0 | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 7.56 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 8.86 | 0.00 | 0.00 | 8.70 |
| Movement LOS | A | A | A | | A | A | | | A | | | A |
| 95th-Percentile Queue Length [veh/ln] | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft/ln] | 0.48 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.41 | 0.00 | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh] | 0.44 | | | 0.00 | | | 8.86 | | | 8.70 | | |
| Approach LOS | A | | | A | | | A | | | A | | |
| d_I, Intersection Delay [s/veh] | 0.96 | | | | | | | | | | | |
| Intersection LOS | A | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 4: Redlands Ave (NS) at Project South Dwy (EW)**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 10.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 1 hour | Volume to Capacity (v/c): | 0.004 |

**Intersection Setup**

| Name | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | No | | | Yes | | | Yes | | |

**Volumes**

| Name | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 127 | 0 | 0 | 151 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 26 | 0 | 0 | 30 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 153 | 0 | 0 | 181 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| Peak Hour Factor | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 40 | 0 | 0 | 48 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Total Analysis Volume [veh/h] | 0 | 161 | 0 | 0 | 191 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| Priority Scheme | Free | Free | Stop | Stop |
|---|---|---|---|---|
| Flared Lane | | | No | |
| Storage Area [veh] | 0 | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | | | No | |
| Number of Storage Spaces in Median | 0 | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.36 | 0.00 | 8.82 | 0.00 | 0.00 | 0.00 |
| Movement LOS | | A | A | | A | A | B | | A | | | |
| 95th-Percentile Queue Length [veh/ln] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft/ln] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.33 | 0.00 | 0.33 | 0.00 | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh] | 0.00 | | | 0.00 | | | 10.36 | | | 0.00 | | |
| Approach LOS | A | | | A | | | B | | | A | | |
| d_I, Intersection Delay [s/veh] | 0.09 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 5: Redlands Ave (NS) at Placentia Ave (EW)**

| | | | |
|---|---|---|---|
| Control Type: | All-way stop | Delay (sec / veh): | 9.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | A |
| Analysis Period: | 1 hour | Volume to Capacity (v/c): | 0.202 |

**Intersection Setup**

| Name | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | U-tu | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.0 | 100.0 | 100.0 | 100.0 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | | 25.00 | | | 25.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | | Yes | | | Yes | | |

**Volumes**

| Name | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 63 | 105 | 19 | 0 | 11 | 124 | 15 | 17 | 84 | 73 | 17 | 43 | 5 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 4 | 0 | 17 | 0 | 6 | 7 | 5 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 63 | 109 | 19 | 17 | 11 | 130 | 22 | 22 | 84 | 73 | 17 | 43 | 5 |
| Peak Hour Factor | 0.9600 | 0.9600 | 0.9600 | 1.000 | 0.960 | 0.960 | 0.960 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 16 | 28 | 5 | 4 | 3 | 34 | 6 | 6 | 22 | 19 | 4 | 11 | 1 |
| Total Analysis Volume [veh/h] | 66 | 114 | 20 | 17 | 11 | 135 | 23 | 23 | 88 | 76 | 18 | 45 | 5 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | | 0 | | | 0 | | |

**Intersection Settings**

**Lanes**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Capacity per Entry Lane [veh/h] | 591 | 644 | 668 | 591 | 643 | 735 | 588 | 640 | 729 | 571 | 627 |
| Degree of Utilization, x | 0.11 | 0.10 | 0.10 | 0.05 | 0.20 | 0.03 | 0.04 | 0.13 | 0.10 | 0.03 | 0.08 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 95th-Percentile Queue Length [veh] | 0.36 | 0.33 | 0.32 | 0.15 | 0.76 | 0.09 | 0.12 | 0.45 | 0.33 | 0.09 | 0.25 |
| 95th-Percentile Queue Length [ft] | 8.93 | 8.27 | 7.93 | 3.73 | 18.93 | 2.31 | 2.91 | 11.32 | 8.34 | 2.30 | 6.21 |
| Approach Delay [s/veh] | 9.02 | | | 9.38 | | | 8.76 | | | 8.99 | |
| Approach LOS | A | | | A | | | A | | | A | |
| Intersection Delay [s/veh] | 9.05 | | | | | | | | | | |
| Intersection LOS | A | | | | | | | | | | |

# Opening Year (2023) Without Project

Redlands Avenue West Industrial Project

Vistro File: Z:\...\AME.vistro

Scenario 3 Opening Year (2023) Without Project AM Peak Hour

Report File: Z:\...\AMOYWO.pdf

1/4/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | Redlands Ave (NS) at Rider St (EW) | Signalized | HCM 6th Edition | EB Left | 0.254 | 24.8 | C |
| 5 | Redlands Ave (NS) at Placentia Ave (EW) | All-way stop | HCM 6th Edition | NB Left | 0.107 | 8.5 | A |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: Redlands Ave (NS) at Rider St (EW)**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 24.8 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 1 hour | Volume to Capacity (v/c): | 0.254 |

**Intersection Setup**

| Name | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | | |  | | |  | | |  | | |
| Turning Movement | U-tu | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.0 | 100.0 | 100.0 | 100.0 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | | 35.00 | | | 45.00 | | | 45.00 | | |
| Grade [%] | 0.00 | | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 18 | 29 | 48 | 12 | 10 | 11 | 5 | 141 | 5 | 50 | 307 | 27 |
| Base Volume Adjustment Factor | 1.000 | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 3 | 2 | 11 | 17 | 12 | 33 | 2 | 7 | 52 | 8 | 10 | 28 | 3 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 3 | 20 | 40 | 65 | 24 | 43 | 13 | 12 | 193 | 13 | 60 | 335 | 30 |
| Peak Hour Factor | 1.000 | 0.931 | 0.931 | 0.931 | 0.9310 | 0.9310 | 0.9310 | 0.9310 | 0.9310 | 0.9310 | 0.9310 | 0.9310 | 0.9310 |
| Other Adjustment Factor | 1.000 | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 1 | 5 | 11 | 17 | 6 | 12 | 3 | 3 | 52 | 3 | 16 | 90 | 8 |
| Total Analysis Volume [veh/h] | 3 | 21 | 43 | 70 | 26 | 46 | 14 | 13 | 207 | 14 | 64 | 360 | 32 |
| Presence of On-Street Parking | No | | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 65 |
| Coordination Type | Time of Day Pattern Isolated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Permi | Prote | Permi | Permi | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 0 | 5 | 2 | 0 | 1 | 6 | 0 | 3 | 8 | 0 | 7 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | | |
| Lead / Lag | - | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 7 | 7 | 0 | 7 | 7 | 0 | 7 | 7 | 0 | 7 | 7 | 0 |
| Maximum Green [s] | 0 | 120 | 120 | 0 | 120 | 120 | 0 | 120 | 120 | 0 | 120 | 120 | 0 |
| Amber [s] | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 11 | 21 | 0 | 11 | 21 | 0 | 12 | 22 | 0 | 11 | 21 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 10 | 0 |
| Rest In Walk | | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | R | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 2 | 33 | 33 | 3 | 33 | 33 | 1 | 9 | 9 | 5 | 12 | 12 |
| g / C, Green / Cycle | 0.04 | 0.51 | 0.51 | 0.04 | 0.51 | 0.51 | 0.02 | 0.13 | 0.13 | 0.07 | 0.18 | 0.18 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.02 | 0.04 | 0.01 | 0.02 | 0.01 | 0.01 | 0.10 | 0.01 | 0.03 | 0.10 | 0.10 |
| s, saturation flow rate [veh/h] | 1781 | 1870 | 1589 | 1781 | 1870 | 1589 | 1781 | 1870 | 1589 | 1781 | 1870 | 1817 |
| c, Capacity [veh/h] | 68 | 951 | 808 | 70 | 953 | 810 | 40 | 250 | 213 | 130 | 345 | 335 |
| d1, Uniform Delay [s] | 30.56 | 8.05 | 8.21 | 30.49 | 8.02 | 7.90 | 31.37 | 27.28 | 24.67 | 29.00 | 24.07 | 24.09 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 2.91 | 0.08 | 0.19 | 2.86 | 0.09 | 0.04 | 4.19 | 5.19 | 0.12 | 2.57 | 1.30 | 1.36 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.34 | 0.04 | 0.08 | 0.34 | 0.05 | 0.02 | 0.30 | 0.77 | 0.06 | 0.46 | 0.53 | 0.54 |
| d, Delay for Lane Group [s/veh] | 33.47 | 8.13 | 8.41 | 33.35 | 8.11 | 7.94 | 35.57 | 32.47 | 24.79 | 31.57 | 25.36 | 25.45 |
| Lane Group LOS | C | A | A | C | A | A | D | C | C | C | C | C |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 0.39 | 0.26 | 0.43 | 0.40 | 0.28 | 0.08 | 0.22 | 2.97 | 0.17 | 0.91 | 2.41 | 2.37 |
| 50th-Percentile Queue Length [ft/ln] | 9.70 | 6.42 | 10.83 | 10.08 | 6.89 | 2.08 | 5.43 | 74.18 | 4.14 | 22.83 | 60.35 | 59.35 |
| 95th-Percentile Queue Length [veh/ln] | 0.70 | 0.46 | 0.78 | 0.73 | 0.50 | 0.15 | 0.39 | 5.34 | 0.30 | 1.64 | 4.35 | 4.27 |
| 95th-Percentile Queue Length [ft/ln] | 17.47 | 11.56 | 19.49 | 18.14 | 12.40 | 3.74 | 9.77 | 133.52 | 7.46 | 41.09 | 108.63 | 106.82 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 33.47 | 33.47 | 8.13 | 8.41 | 33.35 | 8.11 | 7.94 | 35.57 | 32.47 | 24.79 | 31.57 | 25.40 | 25.45 |
| Movement LOS | C | C | A | A | C | A | A | D | C | C | C | C | C |
| d_A, Approach Delay [s/veh] | 12.82 | | | | 15.65 | | | 32.18 | | | 26.28 | | |
| Approach LOS | B | | | | B | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 24.77 | | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | | |
| Intersection V/C | 0.254 | | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 22.43 | 22.43 | 22.43 | 22.43 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.183 | 2.159 | 2.453 | 2.372 |
| Crosswalk LOS | B | B | B | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 523 | 523 | 554 | 523 |
| d_b, Bicycle Delay [s] | 17.72 | 17.72 | 16.99 | 17.72 |
| l_b,int, Bicycle LOS Score for Intersection | 1.766 | 1.692 | 1.919 | 1.910 |
| Bicycle LOS | A | A | A | A |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

**Intersection Level Of Service Report**
**Intersection 5: Redlands Ave (NS) at Placentia Ave (EW)**

| | | | |
|---|---|---|---|
| Control Type: | All-way stop | Delay (sec / veh): | 8.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | A |
| Analysis Period: | 1 hour | Volume to Capacity (v/c): | 0.107 |

**Intersection Setup**

| Name | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | U-tu | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.0 | 100.0 | 100.0 | 100.0 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | | 25.00 | | | 25.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | | Yes | | | Yes | | |

**Volumes**

| Name | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 67 | 72 | 8 | 0 | 2 | 56 | 7 | 19 | 14 | 29 | 18 | 32 | 5 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 1 | 15 | 0 | 16 | 0 | 6 | 8 | 27 | 1 | 0 | 0 | 8 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 68 | 87 | 8 | 16 | 2 | 62 | 15 | 46 | 15 | 29 | 18 | 40 | 5 |
| Peak Hour Factor | 0.9450 | 0.9450 | 0.9450 | 1.000 | 0.945 | 0.945 | 0.945 | 0.9450 | 0.9450 | 0.9450 | 0.9450 | 0.9450 | 0.9450 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 18 | 23 | 2 | 4 | 1 | 16 | 4 | 12 | 4 | 8 | 5 | 11 | 1 |
| Total Analysis Volume [veh/h] | 72 | 92 | 8 | 16 | 2 | 66 | 16 | 49 | 16 | 31 | 19 | 42 | 5 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | | 0 | | | 0 | | |

**Intersection Settings**

**Lanes**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Capacity per Entry Lane [veh/h] | 635 | 696 | 713 | 622 | 680 | 783 | 619 | 676 | 778 | 613 | 679 |
| Degree of Utilization, x | 0.11 | 0.07 | 0.07 | 0.03 | 0.09 | 0.02 | 0.07 | 0.02 | 0.04 | 0.03 | 0.07 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 95th-Percentile Queue Length [veh] | 0.36 | 0.22 | 0.21 | 0.09 | 0.30 | 0.06 | 0.24 | 0.07 | 0.12 | 0.09 | 0.21 |
| 95th-Percentile Queue Length [ft] | 8.98 | 5.48 | 5.35 | 2.23 | 7.51 | 1.46 | 6.02 | 1.70 | 2.90 | 2.27 | 5.32 |
| Approach Delay [s/veh] | 8.54 | | | 8.37 | | | 8.37 | | | 8.49 | |
| Approach LOS | A | | | A | | | A | | | A | |
| Intersection Delay [s/veh] | 8.45 | | | | | | | | | | |
| Intersection LOS | A | | | | | | | | | | |

Redlands Avenue West Industrial Project

Vistro File: Z:\...\PME.vistro

Scenario 3 Opening Year (2023) Without Project PM Peak Hour

Report File: Z:\...\PMOYWO.pdf

1/4/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | Redlands Ave (NS) at Rider St (EW) | Signalized | HCM 6th Edition | EB Left | 0.513 | 23.5 | C |
| 5 | Redlands Ave (NS) at Placentia Ave (EW) | All-way stop | HCM 6th Edition | SB Thru | 0.231 | 9.3 | A |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: Redlands Ave (NS) at Rider St (EW)**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 23.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 1 hour | Volume to Capacity (v/c): | 0.513 |

**Intersection Setup**

| Name | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | | |  | | |  | | |  | | |
| Turning Movement | U-tu | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.0 | 100.0 | 100.0 | 100.0 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | | 35.00 | | | 45.00 | | | 45.00 | | |
| Grade [%] | 0.00 | | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 18 | 33 | 76 | 31 | 42 | 15 | 4 | 422 | 24 | 85 | 287 | 15 |
| Base Volume Adjustment Factor | 1.000 | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 16 | 10 | 29 | 15 | 4 | 18 | 9 | 4 | 46 | 7 | 21 | 51 | 10 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 16 | 28 | 62 | 91 | 35 | 60 | 24 | 8 | 468 | 31 | 106 | 338 | 25 |
| Peak Hour Factor | 1.000 | 0.960 | 0.960 | 0.960 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 |
| Other Adjustment Factor | 1.000 | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 4 | 7 | 16 | 24 | 9 | 16 | 6 | 2 | 122 | 8 | 28 | 88 | 7 |
| Total Analysis Volume [veh/h] | 16 | 29 | 65 | 95 | 36 | 63 | 25 | 8 | 488 | 32 | 110 | 352 | 26 |
| Presence of On-Street Parking | No | | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 65 |
| Coordination Type | Time of Day Pattern Isolated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Permi | Prote | Permi | Permi | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 0 | 5 | 2 | 0 | 1 | 6 | 0 | 3 | 8 | 0 | 7 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | | |
| Lead / Lag | - | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 7 | 7 | 0 | 7 | 7 | 0 | 7 | 7 | 0 | 7 | 7 | 0 |
| Maximum Green [s] | 0 | 120 | 120 | 0 | 120 | 120 | 0 | 120 | 120 | 0 | 120 | 120 | 0 |
| Amber [s] | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 11 | 21 | 0 | 11 | 21 | 0 | 12 | 22 | 0 | 11 | 21 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 10 | 0 |
| Rest In Walk | | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | R | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 4 | 22 | 22 | 3 | 21 | 21 | 1 | 18 | 18 | 6 | 23 | 23 |
| g / C, Green / Cycle | 0.06 | 0.34 | 0.34 | 0.05 | 0.33 | 0.33 | 0.01 | 0.28 | 0.28 | 0.09 | 0.35 | 0.35 |
| (v / s)_i Volume / Saturation Flow Rate | 0.02 | 0.03 | 0.06 | 0.02 | 0.03 | 0.02 | 0.00 | 0.25 | 0.02 | 0.06 | 0.10 | 0.10 |
| s, saturation flow rate [veh/h] | 1781 | 1870 | 1589 | 1781 | 1870 | 1589 | 1781 | 1870 | 1589 | 1781 | 1870 | 1825 |
| c, Capacity [veh/h] | 106 | 629 | 535 | 91 | 613 | 521 | 26 | 513 | 436 | 164 | 658 | 642 |
| d1, Uniform Delay [s] | 29.50 | 14.81 | 15.19 | 29.88 | 15.18 | 14.92 | 31.71 | 22.83 | 17.46 | 28.50 | 15.15 | 15.16 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 2.60 | 0.31 | 0.69 | 2.69 | 0.32 | 0.17 | 6.37 | 7.47 | 0.07 | 4.29 | 0.23 | 0.24 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.42 | 0.10 | 0.17 | 0.39 | 0.10 | 0.05 | 0.30 | 0.91 | 0.07 | 0.65 | 0.28 | 0.28 |
| d, Delay for Lane Group [s/veh] | 32.09 | 15.13 | 15.88 | 32.57 | 15.50 | 15.09 | 38.09 | 30.30 | 17.53 | 32.79 | 15.37 | 15.39 |
| Lane Group LOS | C | B | B | C | B | B | D | C | B | C | B | B |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 0.70 | 0.62 | 0.96 | 0.57 | 0.61 | 0.24 | 0.16 | 7.01 | 0.31 | 1.64 | 1.69 | 1.66 |
| 50th-Percentile Queue Length [ft/ln] | 17.57 | 15.61 | 24.00 | 14.22 | 15.37 | 6.11 | 4.03 | 175.25 | 7.73 | 41.06 | 42.28 | 41.59 |
| 95th-Percentile Queue Length [veh/ln] | 1.26 | 1.12 | 1.73 | 1.02 | 1.11 | 0.44 | 0.29 | 11.35 | 0.56 | 2.96 | 3.04 | 2.99 |
| 95th-Percentile Queue Length [ft/ln] | 31.62 | 28.10 | 43.21 | 25.60 | 27.66 | 11.00 | 7.25 | 283.80 | 13.92 | 73.90 | 76.11 | 74.87 |

**Movement, Approach, & Intersection Results**

| d_M, Delay for Movement [s/veh] | 32.09 | 32.09 | 15.13 | 15.88 | 32.57 | 15.50 | 15.09 | 38.09 | 30.30 | 17.53 | 32.79 | 15.38 | 15.39 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement LOS | C | C | B | B | C | B | B | D | C | B | C | B | B |
| d_A, Approach Delay [s/veh] | 19.27 | | | | 20.44 | | | 29.64 | | | 19.32 | | |
| Approach LOS | B | | | | C | | | C | | | B | | |
| d_I, Intersection Delay [s/veh] | 23.47 | | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | | |
| Intersection V/C | 0.513 | | | | | | | | | | | | |

**Other Modes**

| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
|---|---|---|---|---|
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 22.43 | 22.43 | 22.43 | 22.43 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.225 | 2.174 | 2.544 | 2.502 |
| Crosswalk LOS | B | B | B | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 523 | 523 | 554 | 523 |
| d_b, Bicycle Delay [s] | 17.72 | 17.72 | 16.99 | 17.72 |
| l_b,int, Bicycle LOS Score for Intersection | 1.858 | 1.756 | 2.396 | 1.947 |
| Bicycle LOS | A | A | B | A |

## Sequence

| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

**Intersection Level Of Service Report**
**Intersection 5: Redlands Ave (NS) at Placentia Ave (EW)**

| | | | |
|---|---|---|---|
| Control Type: | All-way stop | Delay (sec / veh): | 9.3 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | A |
| Analysis Period: | 1 hour | Volume to Capacity (v/c): | 0.231 |

**Intersection Setup**

| Name | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | U-tu | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.0 | 100.0 | 100.0 | 100.0 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | | 25.00 | | | 25.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | | Yes | | | Yes | | |

**Volumes**

| Name | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 63 | 105 | 19 | 0 | 11 | 124 | 15 | 17 | 84 | 73 | 17 | 43 | 5 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 13 | 0 | 13 | 0 | 21 | 33 | 17 | 3 | 1 | 0 | 19 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 63 | 118 | 19 | 13 | 11 | 145 | 48 | 34 | 87 | 74 | 17 | 62 | 5 |
| Peak Hour Factor | 0.9600 | 0.9600 | 0.9600 | 1.000 | 0.960 | 0.960 | 0.960 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 16 | 31 | 5 | 3 | 3 | 38 | 13 | 9 | 23 | 19 | 4 | 16 | 1 |
| Total Analysis Volume [veh/h] | 66 | 123 | 20 | 13 | 11 | 151 | 50 | 35 | 91 | 77 | 18 | 65 | 5 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | | 0 | | | 0 | | |

**Intersection Settings**

**Lanes**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Capacity per Entry Lane [veh/h] | 576 | 625 | 646 | 579 | 629 | 716 | 575 | 623 | 708 | 561 | 613 |
| Degree of Utilization, x | 0.11 | 0.11 | 0.11 | 0.04 | 0.23 | 0.07 | 0.06 | 0.14 | 0.10 | 0.03 | 0.11 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 95th-Percentile Queue Length [veh] | 0.37 | 0.37 | 0.36 | 0.13 | 0.90 | 0.22 | 0.19 | 0.49 | 0.35 | 0.09 | 0.37 |
| 95th-Percentile Queue Length [ft] | 9.21 | 9.22 | 8.88 | 3.24 | 22.38 | 5.39 | 4.71 | 12.15 | 8.75 | 2.34 | 9.19 |
| Approach Delay [s/veh] | 9.26 | | | 9.58 | | | 9.01 | | | 9.29 | |
| Approach LOS | A | | | A | | | A | | | A | |
| Intersection Delay [s/veh] | 9.30 | | | | | | | | | | |
| Intersection LOS | A | | | | | | | | | | |

## Opening Year (2023) With Project

Redlands Avenue West Industrial Project

Vistro File: Z:\...\AME.vistro
Report File: Z:\...\AMOYW.pdf

Scenario 4 Opening Year (2023) With Project AM Peak Hour
1/4/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | Redlands Ave (NS) at Rider St (EW) | Signalized | HCM 6th Edition | EB Left | 0.257 | 24.3 | C |
| 2 | Redlands Ave (NS) at Project North Dwy (EW) | Two-way stop | HCM 6th Edition | EB Right | 0.000 | 8.7 | A |
| 3 | Redlands Ave (NS) at Project Central Dwy (EW) | Two-way stop | HCM 6th Edition | WB Right | 0.003 | 8.7 | A |
| 4 | Redlands Ave (NS) at Project South Dwy (EW) | Two-way stop | HCM 6th Edition | EB Left | 0.004 | 9.8 | A |
| 5 | Redlands Ave (NS) at Placentia Ave (EW) | All-way stop | HCM 6th Edition | EB Left | 0.108 | 8.5 | A |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: Redlands Ave (NS) at Rider St (EW)**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 24.3 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 1 hour | Volume to Capacity (v/c): | 0.257 |

**Intersection Setup**

| Name | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | | |  | | |  | | |  | | |
| Turning Movement | U-tu | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.0 | 100.0 | 100.0 | 100.0 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | | 35.00 | | | 45.00 | | | 45.00 | | |
| Grade [%] | 0.00 | | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 18 | 29 | 48 | 12 | 10 | 11 | 5 | 141 | 5 | 50 | 307 | 27 |
| Base Volume Adjustment Factor | 1.000 | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 3 | 4 | 16 | 18 | 12 | 52 | 2 | 7 | 52 | 15 | 14 | 28 | 3 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 3 | 22 | 45 | 66 | 24 | 62 | 13 | 12 | 193 | 20 | 64 | 335 | 30 |
| Peak Hour Factor | 1.000 | 0.931 | 0.931 | 0.931 | 0.9310 | 0.9310 | 0.9310 | 0.9310 | 0.9310 | 0.9310 | 0.9310 | 0.9310 | 0.9310 |
| Other Adjustment Factor | 1.000 | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 1 | 6 | 12 | 18 | 6 | 17 | 3 | 3 | 52 | 5 | 17 | 90 | 8 |
| Total Analysis Volume [veh/h] | 3 | 24 | 48 | 71 | 26 | 67 | 14 | 13 | 207 | 21 | 69 | 360 | 32 |
| Presence of On-Street Parking | No | | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 65 |
| Coordination Type | Time of Day Pattern Isolated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Permi | Prote | Permi | Permi | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 0 | 5 | 2 | 0 | 1 | 6 | 0 | 3 | 8 | 0 | 7 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | | |
| Lead / Lag | - | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 7 | 7 | 0 | 7 | 7 | 0 | 7 | 7 | 0 | 7 | 7 | 0 |
| Maximum Green [s] | 0 | 120 | 120 | 0 | 120 | 120 | 0 | 120 | 120 | 0 | 120 | 120 | 0 |
| Amber [s] | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 11 | 21 | 0 | 11 | 21 | 0 | 12 | 22 | 0 | 11 | 21 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 10 | 0 |
| Rest In Walk | | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | R | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 3 | 33 | 33 | 3 | 33 | 33 | 1 | 9 | 9 | 5 | 12 | 12 |
| g / C, Green / Cycle | 0.04 | 0.51 | 0.51 | 0.04 | 0.51 | 0.51 | 0.02 | 0.13 | 0.13 | 0.07 | 0.19 | 0.19 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.02 | 0.04 | 0.01 | 0.03 | 0.01 | 0.01 | 0.10 | 0.01 | 0.04 | 0.10 | 0.10 |
| s, saturation flow rate [veh/h] | 1781 | 1870 | 1589 | 1781 | 1870 | 1589 | 1781 | 1870 | 1589 | 1781 | 1870 | 1817 |
| c, Capacity [veh/h] | 73 | 945 | 803 | 70 | 943 | 801 | 40 | 251 | 213 | 134 | 350 | 340 |
| d1, Uniform Delay [s] | 30.43 | 8.17 | 8.32 | 30.49 | 8.29 | 8.08 | 31.37 | 27.25 | 24.75 | 28.91 | 23.89 | 23.91 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 2.81 | 0.10 | 0.20 | 2.86 | 0.13 | 0.04 | 4.19 | 5.08 | 0.19 | 2.63 | 1.23 | 1.29 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.34 | 0.05 | 0.08 | 0.34 | 0.07 | 0.02 | 0.30 | 0.77 | 0.09 | 0.48 | 0.53 | 0.53 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 33.24 | 8.27 | 8.52 | 33.35 | 8.42 | 8.12 | 35.57 | 32.33 | 24.94 | 31.54 | 25.12 | 25.20 |
| Lane Group LOS | C | A | A | C | A | A | D | C | C | C | C | C |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 0.42 | 0.29 | 0.44 | 0.40 | 0.41 | 0.08 | 0.22 | 2.96 | 0.26 | 0.97 | 2.40 | 2.36 |
| 50th-Percentile Queue Length [ft/ln] | 10.45 | 7.31 | 11.10 | 10.08 | 10.22 | 2.11 | 5.43 | 73.98 | 6.41 | 24.31 | 59.97 | 58.96 |
| 95th-Percentile Queue Length [veh/ln] | 0.75 | 0.53 | 0.80 | 0.73 | 0.74 | 0.15 | 0.39 | 5.33 | 0.46 | 1.75 | 4.32 | 4.24 |
| 95th-Percentile Queue Length [ft/ln] | 18.81 | 13.16 | 19.99 | 18.14 | 18.39 | 3.81 | 9.77 | 133.17 | 11.53 | 43.75 | 107.95 | 106.12 |

**Movement, Approach, & Intersection Results**

| d_M, Delay for Movement [s/veh] | 33.24 | 33.24 | 8.27 | 8.52 | 33.35 | 8.42 | 8.12 | 35.57 | 32.33 | 24.94 | 31.54 | 25.16 | 25.20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement LOS | C | C | A | A | C | A | A | D | C | C | C | C | C |
| d_A, Approach Delay [s/veh] | 12.98 | | | | 14.43 | | | 31.85 | | | 26.11 | | |
| Approach LOS | B | | | | B | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 24.25 | | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | | |
| Intersection V/C | 0.257 | | | | | | | | | | | | |

**Other Modes**

| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
|---|---|---|---|---|
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 22.43 | 22.43 | 22.43 | 22.43 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.193 | 2.166 | 2.456 | 2.373 |
| Crosswalk LOS | B | B | B | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 523 | 523 | 554 | 523 |
| d_b, Bicycle Delay [s] | 17.72 | 17.72 | 16.99 | 17.72 |
| l_b,int, Bicycle LOS Score for Intersection | 1.779 | 1.723 | 1.931 | 1.914 |
| Bicycle LOS | A | A | A | A |

## Sequence

| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

**Intersection Level Of Service Report**
**Intersection 2: Redlands Ave (NS) at Project North Dwy (EW)**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 8.7 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | A |
| Analysis Period: | 1 hour | Volume to Capacity (v/c): | 0.000 |

**Intersection Setup**

| Name | | | | | | |
|---|---|---|---|---|---|---|
| Approach | Northbound | | Southbound | | Eastbound | |
| Lane Configuration |  | |  | |  | |
| Turning Movement | Left | Thru | Thru | Right | Left | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | 35.00 | | 30.00 | |
| Grade [%] | 0.00 | | 0.00 | | 0.00 | |
| Crosswalk | No | | No | | Yes | |

**Volumes**

| Name | | | | | | |
|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 95 | 65 | 0 | 0 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 45 | 67 | 10 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 140 | 132 | 10 | 0 | 0 |
| Peak Hour Factor | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 37 | 35 | 3 | 0 | 0 |
| Total Analysis Volume [veh/h] | 0 | 147 | 139 | 11 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | 0 | | 0 | |

**Intersection Settings**

| Priority Scheme | Free | Free | Stop |
|---|---|---|---|
| Flared Lane | | | |
| Storage Area [veh] | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | | | No |
| Number of Storage Spaces in Median | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 8.69 |
| Movement LOS | | A | A | A | | A |
| 95th-Percentile Queue Length [veh/ln] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft/ln] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh] | 0.00 | | 0.00 | | 8.69 | |
| Approach LOS | A | | A | | A | |
| d_I, Intersection Delay [s/veh] | 0.00 | | | | | |
| Intersection LOS | A | | | | | |

**Intersection Level Of Service Report**
**Intersection 3: Redlands Ave (NS) at Project Central Dwy (EW)**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 8.7 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | A |
| Analysis Period: | 1 hour | Volume to Capacity (v/c): | 0.003 |

**Intersection Setup**

| Name | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | No | | | Yes | | | Yes | | |

**Volumes**

| Name | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 95 | 0 | 0 | 65 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 16 | 44 | 0 | 0 | 40 | 20 | 0 | 0 | 9 | 0 | 0 | 3 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 16 | 139 | 0 | 0 | 105 | 20 | 0 | 0 | 9 | 0 | 0 | 3 |
| Peak Hour Factor | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 4 | 37 | 0 | 0 | 28 | 5 | 0 | 0 | 2 | 0 | 0 | 1 |
| Total Analysis Volume [veh/h] | 17 | 146 | 0 | 0 | 111 | 21 | 0 | 0 | 9 | 0 | 0 | 3 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| Priority Scheme | Free | Free | Stop | Stop |
|---|---|---|---|---|
| Flared Lane | | | | |
| Storage Area [veh] | 0 | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | | | No | No |
| Number of Storage Spaces in Median | 0 | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 7.49 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 8.67 | 0.00 | 0.00 | 8.69 |
| Movement LOS | A | A | A | | A | A | | | A | | | A |
| 95th-Percentile Queue Length [veh/ln] | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.01 |
| 95th-Percentile Queue Length [ft/ln] | 0.83 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.69 | 0.00 | 0.00 | 0.23 |
| d_A, Approach Delay [s/veh] | 0.77 | | | 0.00 | | | 8.67 | | | 8.69 | | |
| Approach LOS | A | | | A | | | A | | | A | | |
| d_I, Intersection Delay [s/veh] | 0.77 | | | | | | | | | | | |
| Intersection LOS | A | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 4: Redlands Ave (NS) at Project South Dwy (EW)**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 9.8 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | A |
| Analysis Period: | 1 hour | Volume to Capacity (v/c): | 0.004 |

**Intersection Setup**

| Name | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | No | | | Yes | | | Yes | | |

**Volumes**

| Name | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 95 | 0 | 0 | 65 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 50 | 29 | 0 | 49 | 0 | 3 | 0 | 0 | 0 | 0 | 7 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 145 | 29 | 0 | 114 | 0 | 3 | 0 | 0 | 0 | 0 | 7 |
| Peak Hour Factor | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 38 | 8 | 0 | 30 | 0 | 1 | 0 | 0 | 0 | 0 | 2 |
| Total Analysis Volume [veh/h] | 0 | 153 | 31 | 0 | 120 | 0 | 3 | 0 | 0 | 0 | 0 | 7 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| Priority Scheme | Free | Free | Stop | Stop |
|---|---|---|---|---|
| Flared Lane | | | No | |
| Storage Area [veh] | 0 | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | | | No | |
| Number of Storage Spaces in Median | 0 | 0 | 0 | 0 |

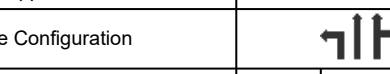
**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 9.77 | 0.00 | 8.63 | 0.00 | 0.00 | 0.00 |
| Movement LOS | | A | A | | A | A | A | | A | | | |
| 95th-Percentile Queue Length [veh/ln] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft/ln] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.30 | 0.00 | 0.30 | 0.00 | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh] | 0.00 | | | 0.00 | | | 9.77 | | | 0.00 | | |
| Approach LOS | A | | | A | | | A | | | A | | |
| d_I, Intersection Delay [s/veh] | 0.10 | | | | | | | | | | | |
| Intersection LOS | A | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 5: Redlands Ave (NS) at Placentia Ave (EW)**

| | | | |
|---|---|---|---|
| Control Type: | All-way stop | Delay (sec / veh): | 8.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | A |
| Analysis Period: | 1 hour | Volume to Capacity (v/c): | 0.108 |

**Intersection Setup**

| Name | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | U-tu | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.0 | 100.0 | 100.0 | 100.0 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | | 25.00 | | | 25.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | | Yes | | | Yes | | |

**Volumes**

| Name | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 67 | 72 | 8 | 0 | 2 | 56 | 7 | 19 | 14 | 29 | 18 | 32 | 5 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 1 | 22 | 0 | 21 | 0 | 8 | 10 | 36 | 1 | 0 | 0 | 8 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 68 | 94 | 8 | 21 | 2 | 64 | 17 | 55 | 15 | 29 | 18 | 40 | 5 |
| Peak Hour Factor | 0.9450 | 0.9450 | 0.9450 | 1.000 | 0.945 | 0.945 | 0.945 | 0.9450 | 0.9450 | 0.9450 | 0.9450 | 0.9450 | 0.9450 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 18 | 25 | 2 | 5 | 1 | 17 | 4 | 15 | 4 | 8 | 5 | 11 | 1 |
| Total Analysis Volume [veh/h] | 72 | 99 | 8 | 21 | 2 | 68 | 18 | 58 | 16 | 31 | 19 | 42 | 5 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | | 0 | | | 0 | | |

**Intersection Settings**

**Lanes**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Capacity per Entry Lane [veh/h] | 630 | 690 | 705 | 617 | 675 | 776 | 615 | 672 | 771 | 607 | 672 |
| Degree of Utilization, x | 0.11 | 0.07 | 0.07 | 0.04 | 0.09 | 0.02 | 0.09 | 0.02 | 0.04 | 0.03 | 0.07 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 95th-Percentile Queue Length [veh] | 0.36 | 0.24 | 0.23 | 0.12 | 0.31 | 0.07 | 0.29 | 0.07 | 0.12 | 0.09 | 0.22 |
| 95th-Percentile Queue Length [ft] | 9.07 | 5.98 | 5.85 | 2.90 | 7.85 | 1.68 | 7.36 | 1.71 | 2.93 | 2.29 | 5.38 |
| Approach Delay [s/veh] | 8.60 | | | 8.44 | | | 8.52 | | | 8.55 | |
| Approach LOS | A | | | A | | | A | | | A | |
| Intersection Delay [s/veh] | 8.54 | | | | | | | | | | |
| Intersection LOS | A | | | | | | | | | | |

Redlands Avenue West Industrial Project

Vistro File: Z:\...\PME.vistro
Report File: Z:\...\PMOYW.pdf

Scenario 4 Opening Year (2023) With Project PM Peak Hour
1/4/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | Redlands Ave (NS) at Rider St (EW) | Signalized | HCM 6th Edition | EB Left | 0.517 | 23.4 | C |
| 2 | Redlands Ave (NS) at Project North Dwy (EW) | Two-way stop | HCM 6th Edition | EB Right | 0.000 | 8.9 | A |
| 3 | Redlands Ave (NS) at Project Central Dwy (EW) | Two-way stop | HCM 6th Edition | EB Right | 0.033 | 9.1 | A |
| 4 | Redlands Ave (NS) at Project South Dwy (EW) | Two-way stop | HCM 6th Edition | EB Left | 0.005 | 11.1 | B |
| 5 | Redlands Ave (NS) at Placentia Ave (EW) | All-way stop | HCM 6th Edition | SB Thru | 0.241 | 9.4 | A |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: Redlands Ave (NS) at Rider St (EW)**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 23.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 1 hour | Volume to Capacity (v/c): | 0.517 |

**Intersection Setup**

| Name | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | | |  | | |  | | |  | | |
| Turning Movement | U-tu | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.0 | 100.0 | 100.0 | 100.0 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | | 35.00 | | | 45.00 | | | 45.00 | | |
| Grade [%] | 0.00 | | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 18 | 33 | 76 | 31 | 42 | 15 | 4 | 422 | 24 | 85 | 287 | 15 |
| Base Volume Adjustment Factor | 1.000 | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 16 | 16 | 40 | 18 | 4 | 26 | 9 | 4 | 46 | 11 | 23 | 51 | 10 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 16 | 34 | 73 | 94 | 35 | 68 | 24 | 8 | 468 | 35 | 108 | 338 | 25 |
| Peak Hour Factor | 1.000 | 0.960 | 0.960 | 0.960 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 |
| Other Adjustment Factor | 1.000 | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 4 | 9 | 19 | 24 | 9 | 18 | 6 | 2 | 122 | 9 | 28 | 88 | 7 |
| Total Analysis Volume [veh/h] | 16 | 35 | 76 | 98 | 36 | 71 | 25 | 8 | 488 | 36 | 113 | 352 | 26 |
| Presence of On-Street Parking | No | | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 65 |
| Coordination Type | Time of Day Pattern Isolated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Permi | Prote | Permi | Permi | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 0 | 5 | 2 | 0 | 1 | 6 | 0 | 3 | 8 | 0 | 7 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | | |
| Lead / Lag | - | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 7 | 7 | 0 | 7 | 7 | 0 | 7 | 7 | 0 | 7 | 7 | 0 |
| Maximum Green [s] | 0 | 120 | 120 | 0 | 120 | 120 | 0 | 120 | 120 | 0 | 120 | 120 | 0 |
| Amber [s] | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 11 | 21 | 0 | 11 | 21 | 0 | 12 | 22 | 0 | 11 | 21 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 10 | 0 |
| Rest In Walk | | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | R | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 4 | 22 | 22 | 3 | 21 | 21 | 1 | 18 | 18 | 6 | 23 | 23 |
| g / C, Green / Cycle | 0.06 | 0.34 | 0.34 | 0.05 | 0.32 | 0.32 | 0.01 | 0.28 | 0.28 | 0.09 | 0.35 | 0.35 |
| (v / s)_i Volume / Saturation Flow Rate | 0.03 | 0.04 | 0.06 | 0.02 | 0.04 | 0.02 | 0.00 | 0.25 | 0.02 | 0.06 | 0.10 | 0.10 |
| s, saturation flow rate [veh/h] | 1781 | 1870 | 1589 | 1781 | 1870 | 1589 | 1781 | 1870 | 1589 | 1781 | 1870 | 1825 |
| c, Capacity [veh/h] | 115 | 628 | 534 | 91 | 603 | 512 | 26 | 513 | 436 | 165 | 659 | 643 |
| d1, Uniform Delay [s] | 29.29 | 14.93 | 15.25 | 29.88 | 15.50 | 15.17 | 31.71 | 22.84 | 17.51 | 28.50 | 15.12 | 15.13 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 2.60 | 0.38 | 0.72 | 2.69 | 0.38 | 0.17 | 6.37 | 7.48 | 0.08 | 4.42 | 0.23 | 0.23 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.44 | 0.12 | 0.18 | 0.39 | 0.11 | 0.05 | 0.30 | 0.91 | 0.08 | 0.65 | 0.28 | 0.28 |
| d, Delay for Lane Group [s/veh] | 31.89 | 15.30 | 15.97 | 32.57 | 15.88 | 15.34 | 38.09 | 30.32 | 17.58 | 32.92 | 15.35 | 15.37 |
| Lane Group LOS | C | B | B | C | B | B | D | C | B | C | B | B |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 0.79 | 0.74 | 1.00 | 0.57 | 0.71 | 0.25 | 0.16 | 7.01 | 0.35 | 1.68 | 1.69 | 1.66 |
| 50th-Percentile Queue Length [ft/ln] | 19.81 | 18.54 | 24.89 | 14.22 | 17.71 | 6.18 | 4.03 | 175.30 | 8.76 | 41.93 | 42.23 | 41.54 |
| 95th-Percentile Queue Length [veh/ln] | 1.43 | 1.33 | 1.79 | 1.02 | 1.28 | 0.45 | 0.29 | 11.35 | 0.63 | 3.02 | 3.04 | 2.99 |
| 95th-Percentile Queue Length [ft/ln] | 35.66 | 33.37 | 44.80 | 25.60 | 31.89 | 11.13 | 7.25 | 283.87 | 15.76 | 75.48 | 76.02 | 74.78 |

**Movement, Approach, & Intersection Results**

| d_M, Delay for Movement [s/veh] | 31.89 | 31.89 | 15.30 | 15.97 | 32.57 | 15.88 | 15.34 | 38.09 | 30.32 | 17.58 | 32.92 | 15.36 | 15.37 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement LOS | C | C | B | B | C | B | B | D | C | B | C | B | B |
| d_A, Approach Delay [s/veh] | 19.41 | | | | 20.38 | | | 29.57 | | | 19.39 | | |
| Approach LOS | B | | | | C | | | C | | | B | | |
| d_I, Intersection Delay [s/veh] | 23.41 | | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | | |
| Intersection V/C | 0.517 | | | | | | | | | | | | |

**Other Modes**

| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
|---|---|---|---|---|
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 22.43 | 22.43 | 22.43 | 22.43 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.235 | 2.179 | 2.547 | 2.504 |
| Crosswalk LOS | B | B | B | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 523 | 523 | 554 | 523 |
| d_b, Bicycle Delay [s] | 17.72 | 17.72 | 16.99 | 17.72 |
| l_b,int, Bicycle LOS Score for Intersection | 1.891 | 1.769 | 2.403 | 1.948 |
| Bicycle LOS | A | A | B | A |

## Sequence

| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

**Intersection Level Of Service Report**
**Intersection 2: Redlands Ave (NS) at Project North Dwy (EW)**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 8.9 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | A |
| Analysis Period: | 1 hour | Volume to Capacity (v/c): | 0.000 |

**Intersection Setup**

| Name | | | | | | |
|---|---|---|---|---|---|---|
| Approach | Northbound | | Southbound | | Eastbound | |
| Lane Configuration |  | |  | |  | |
| Turning Movement | Left | Thru | Thru | Right | Left | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | 35.00 | | 30.00 | |
| Grade [%] | 0.00 | | 0.00 | | 0.00 | |
| Crosswalk | No | | No | | Yes | |

**Volumes**

| Name | | | | | | |
|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 127 | 151 | 0 | 0 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 85 | 78 | 3 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 212 | 229 | 3 | 0 | 0 |
| Peak Hour Factor | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 56 | 60 | 1 | 0 | 0 |
| Total Analysis Volume [veh/h] | 0 | 223 | 241 | 3 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | 0 | | 0 | |

**Intersection Settings**

| Priority Scheme | Free | Free | Stop |
|---|---|---|---|
| Flared Lane | | | |
| Storage Area [veh] | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | | | No |
| Number of Storage Spaces in Median | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 8.94 |
| Movement LOS | | A | A | A | | A |
| 95th-Percentile Queue Length [veh/ln] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft/ln] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh] | 0.00 | | 0.00 | | 8.94 | |
| Approach LOS | A | | A | | A | |
| d_I, Intersection Delay [s/veh] | 0.00 | | | | | |
| Intersection LOS | A | | | | | |

**Intersection Level Of Service Report**
**Intersection 3: Redlands Ave (NS) at Project Central Dwy (EW)**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 9.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | A |
| Analysis Period: | 1 hour | Volume to Capacity (v/c): | 0.033 |

**Intersection Setup**

| Name | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | No | | | Yes | | | Yes | | |

**Volumes**

| Name | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 127 | 0 | 0 | 151 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 9 | 77 | 0 | 0 | 69 | 11 | 0 | 0 | 30 | 0 | 0 | 3 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 9 | 204 | 0 | 0 | 220 | 11 | 0 | 0 | 30 | 0 | 0 | 3 |
| Peak Hour Factor | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 2 | 54 | 0 | 0 | 58 | 3 | 0 | 0 | 8 | 0 | 0 | 1 |
| Total Analysis Volume [veh/h] | 9 | 215 | 0 | 0 | 232 | 12 | 0 | 0 | 32 | 0 | 0 | 3 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| Priority Scheme | Free | Free | Stop | Stop |
|---|---|---|---|---|
| Flared Lane | | | | |
| Storage Area [veh] | 0 | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | | | No | No |
| Number of Storage Spaces in Median | 0 | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 7.72 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 9.07 | 0.00 | 0.00 | 8.87 |
| Movement LOS | A | A | A | | A | A | | | A | | | A |
| 95th-Percentile Queue Length [veh/ln] | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 | 0.01 |
| 95th-Percentile Queue Length [ft/ln] | 0.51 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.54 | 0.00 | 0.00 | 0.24 |
| d_A, Approach Delay [s/veh] | 0.33 | | | 0.00 | | | 9.07 | | | 8.87 | | |
| Approach LOS | A | | | A | | | A | | | A | | |
| d_I, Intersection Delay [s/veh] | 0.77 | | | | | | | | | | | |
| Intersection LOS | A | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 4: Redlands Ave (NS) at Project South Dwy (EW)**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 11.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 1 hour | Volume to Capacity (v/c): | 0.005 |

**Intersection Setup**

| Name | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | | 35.00 | | | 35.00 | | | 30.00 | | | 30.00 | |
| Grade [%] | | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | |
| Crosswalk | | No | | | No | | | Yes | | | Yes | |

**Volumes**

| Name | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 127 | 0 | 0 | 151 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 45 | 24 | 0 | 99 | 0 | 3 | 0 | 0 | 0 | 0 | 38 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 172 | 24 | 0 | 250 | 0 | 3 | 0 | 0 | 0 | 0 | 38 |
| Peak Hour Factor | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 45 | 6 | 0 | 66 | 0 | 1 | 0 | 0 | 0 | 0 | 10 |
| Total Analysis Volume [veh/h] | 0 | 181 | 25 | 0 | 263 | 0 | 3 | 0 | 0 | 0 | 0 | 40 |
| Pedestrian Volume [ped/h] | | 0 | | | 0 | | | 0 | | | 0 | |

**Intersection Settings**

| Priority Scheme | Free | Free | Stop | Stop |
|---|---|---|---|---|
| Flared Lane | | | No | |
| Storage Area [veh] | 0 | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | | | No | |
| Number of Storage Spaces in Median | 0 | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 11.10 | 0.00 | 9.02 | 0.00 | 0.00 | 0.00 |
| Movement LOS | | A | A | | A | A | B | | A | | | |
| 95th-Percentile Queue Length [veh/ln] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft/ln] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.38 | 0.00 | 0.38 | 0.00 | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh] | 0.00 | | | 0.00 | | | 11.10 | | | 0.00 | | |
| Approach LOS | A | | | A | | | B | | | A | | |
| d_I, Intersection Delay [s/veh] | 0.07 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 5: Redlands Ave (NS) at Placentia Ave (EW)**

| | | | |
|---|---|---|---|
| Control Type: | All-way stop | Delay (sec / veh): | 9.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | A |
| Analysis Period: | 1 hour | Volume to Capacity (v/c): | 0.241 |

**Intersection Setup**

| Name | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | U-tu | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.0 | 100.0 | 100.0 | 100.0 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | | 25.00 | | | 25.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | | Yes | | | Yes | | |

**Volumes**

| Name | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 63 | 105 | 19 | 0 | 11 | 124 | 15 | 17 | 84 | 73 | 17 | 43 | 5 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 17 | 0 | 30 | 0 | 27 | 40 | 22 | 3 | 1 | 0 | 19 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 63 | 122 | 19 | 30 | 11 | 151 | 55 | 39 | 87 | 74 | 17 | 62 | 5 |
| Peak Hour Factor | 0.9600 | 0.9600 | 0.9600 | 1.000 | 0.960 | 0.960 | 0.960 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 0.9600 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 16 | 32 | 5 | 8 | 3 | 39 | 14 | 10 | 23 | 19 | 4 | 16 | 1 |
| Total Analysis Volume [veh/h] | 66 | 127 | 20 | 30 | 11 | 157 | 57 | 41 | 91 | 77 | 18 | 65 | 5 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | | 0 | | | 0 | | |

**Intersection Settings**

**Lanes**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Capacity per Entry Lane [veh/h] | 569 | 618 | 638 | 577 | 626 | 712 | 569 | 617 | 698 | 557 | 608 |
| Degree of Utilization, x | 0.11 | 0.11 | 0.11 | 0.07 | 0.24 | 0.08 | 0.07 | 0.14 | 0.11 | 0.03 | 0.11 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 95th-Percentile Queue Length [veh] | 0.37 | 0.39 | 0.37 | 0.23 | 0.95 | 0.25 | 0.22 | 0.49 | 0.36 | 0.09 | 0.37 |
| 95th-Percentile Queue Length [ft] | 9.31 | 9.64 | 9.30 | 5.74 | 23.75 | 6.28 | 5.52 | 12.30 | 8.88 | 2.36 | 9.28 |
| Approach Delay [s/veh] | 9.36 | | | 9.67 | | | 9.12 | | | 9.36 | |
| Approach LOS | A | | | A | | | A | | | A | |
| Intersection Delay [s/veh] | 9.40 | | | | | | | | | | |
| Intersection LOS | A | | | | | | | | | | |

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