URBAN | CROSSROADS

ANTELOPE VALLEY COMMERCE CENTER

TRAFFIC ANALYSIS

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Reference Number	Agency	Date
14267-07 TA Report	City of Palmdale	November 10, 2023

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
AVTA	Antelope Valley Transit Authority
CA MUTCD	California Manual on Uniform Traffic Control Devices
Caltrans	California Department of Transportation
CMP	Congestion Management Program
DIF	Development Impact Fee
EC	Existing plus Cumulative
EPC	Existing plus Project plus Cumulative
HCM	Highway Capacity Manual
ITE	Institute of Transportation Engineers
LOS	Level of Service
NCHRP	National Cooperative Highway Research Program
PCE	Passenger Car Equivalent
PHF	Peak Hour Factor
Project	Antelope Valley Commerce Center
TA	Traffic Analysis
v/c	Volume to Capacity
vphgpl	Vehicles per Hour Green per Lane

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1 INTRODUCTION

This report presents the results of the Traffic Analysis (TA) for Antelope Valley Commerce Center (Project), which is located on the southeast corner of Avenue M/Columbia Way and Sierra Highway in the City of Palmdale, as shown on Exhibit 1-1. The purpose of this TA is to evaluate the potential circulation system deficiencies that may result from the development of the proposed Project, and where necessary, identify improvements to achieve acceptable operations consistent with General Plan level of service goals and policies. As the City of Palmdale does not have their own traffic study guidelines, this traffic study has been prepared in accordance with the County of Los Angeles' Transportation Impact Analysis Guidelines and consultation with City staff during the traffic study scoping process. (1) The City approved Project Traffic Study Scoping agreement is provided in Appendix 1.1 of this TA.

1.1 SUMMARY OF FINDINGS

The Project is to construct the following improvements as design features in conjunction with development of the site:

- Project to install a traffic signal at the intersections of 4th Street & Avenue M/Columbia Way (#7) and Challenger Way/10th Street East & Avenue M (#17).
- Project to construct Sierra Highway along the Project's frontage at its ultimate half-section width as a Regional Arterial (136-foot right-of-way) from the Project's southern boundary to Avenue M consistent with the City's standards.
- Project to construct Avenue M along the Project's frontage at its ultimate half-section width as a Regional Arterial (136-foot right-of-way) from Sierra Highway to 5th Street, and from 10th Street to the Project's eastern boundary consistent with the City's standards. Project to construct a raised median along Avenue M.
- Project to construct Street A at its ultimate full-section width as an Industrial Collector (76-foot right-of-way) from Avenue M to its southern terminus consistent with the City's standards.
- Project to construct Street A at its ultimate full-section width as an Industrial Collector (76-foot right-of-way) from Avenue M to its southern terminus consistent with the City's standards.

Additional details and intersection lane geometrics are provided in Section 1.6 *Recommendations* of this report.

1.2 PROJECT OVERVIEW

The Project is proposed to consist of the following uses for each phase (see Exhibit 1-2):

- Phase 1:
    - Building 1 is 136,670 square feet
    - Building 2 is 144,306 square feet
    - Building 3 is 132,695 square feet
    - Buildings 1 through 3 will assume 25% general light industrial and 75% general warehousing use

EXHIBIT 1-1: LOCATION MAP

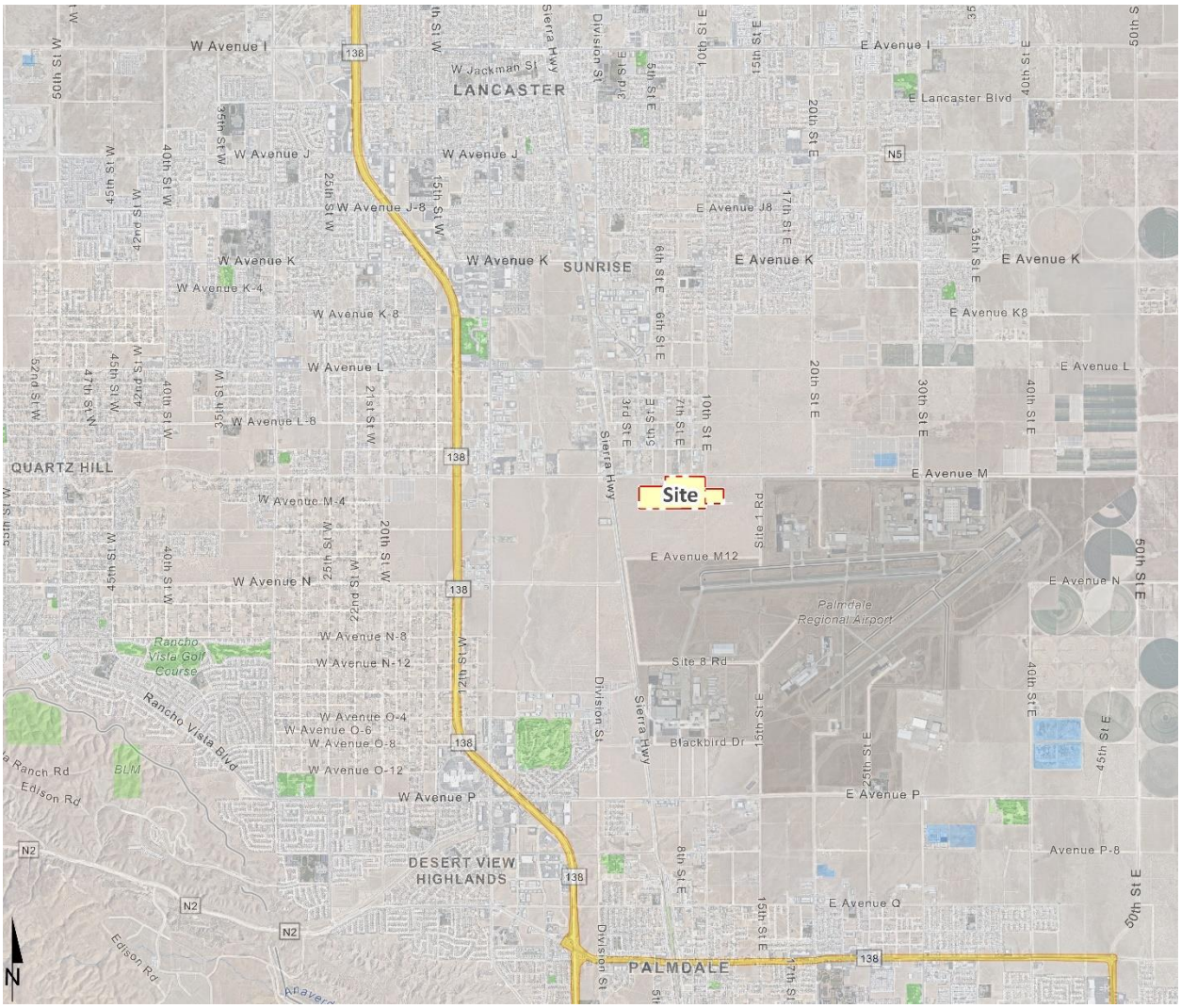
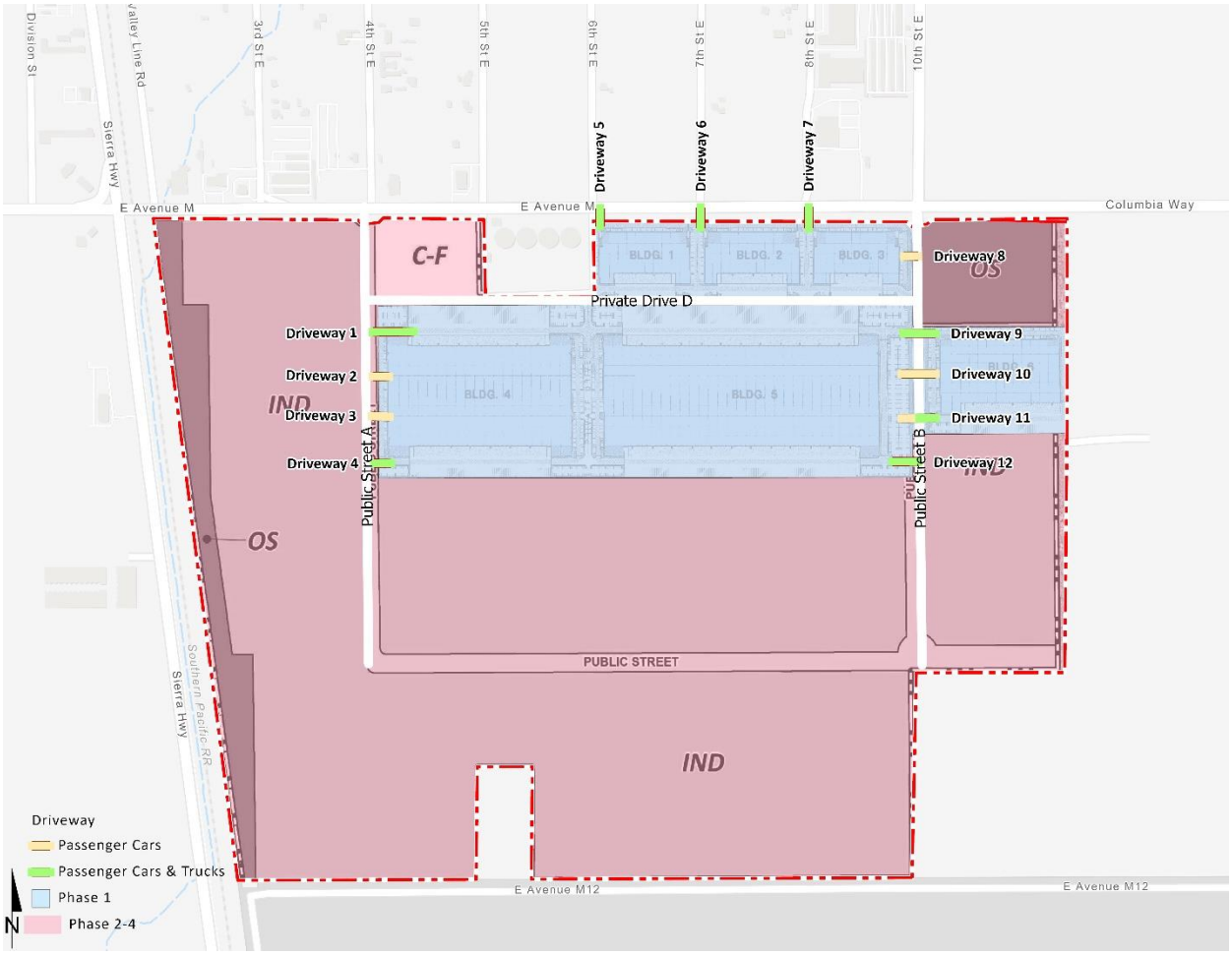


EXHIBIT 1-2: PRELIMINARY SITE PLAN



  - Building 4 is 680,469 square feet of high-cube fulfillment center (sort) warehouse use
  - Building 5 is 1,004,228 square feet with 25% high-cube cold storage warehouse use and high-cube fulfillment center (non-sort) warehouse use
  - Building 6 is 274,858 square feet with 25% manufacturing and 75% general warehousing use
- Phase 2:
  - 1,630,362 square feet of high-cube parcel hub warehousing use
  - 549,790 square feet with 25% manufacturing and 75% general warehousing use
- Phase 3:
  - 1,156,576 square feet with 25% high-cube cold storage warehouse use and 75% high-cube fulfillment (non-sort) warehousing use
  - 2,500 square feet of fast-food restaurant without drive-through window use, 2,500 square feet of fast-food restaurant with drive-through window use, 2,000 square feet of coffee shop with drive-through window use, and 53,984 square feet of commercial retail use (for a total of 60,984 square feet)
- Phase 4:
  - 2,555,556 square feet with 25% high-cube cold storage warehouse use and 75% high-cube fulfillment (non-sort) warehousing use

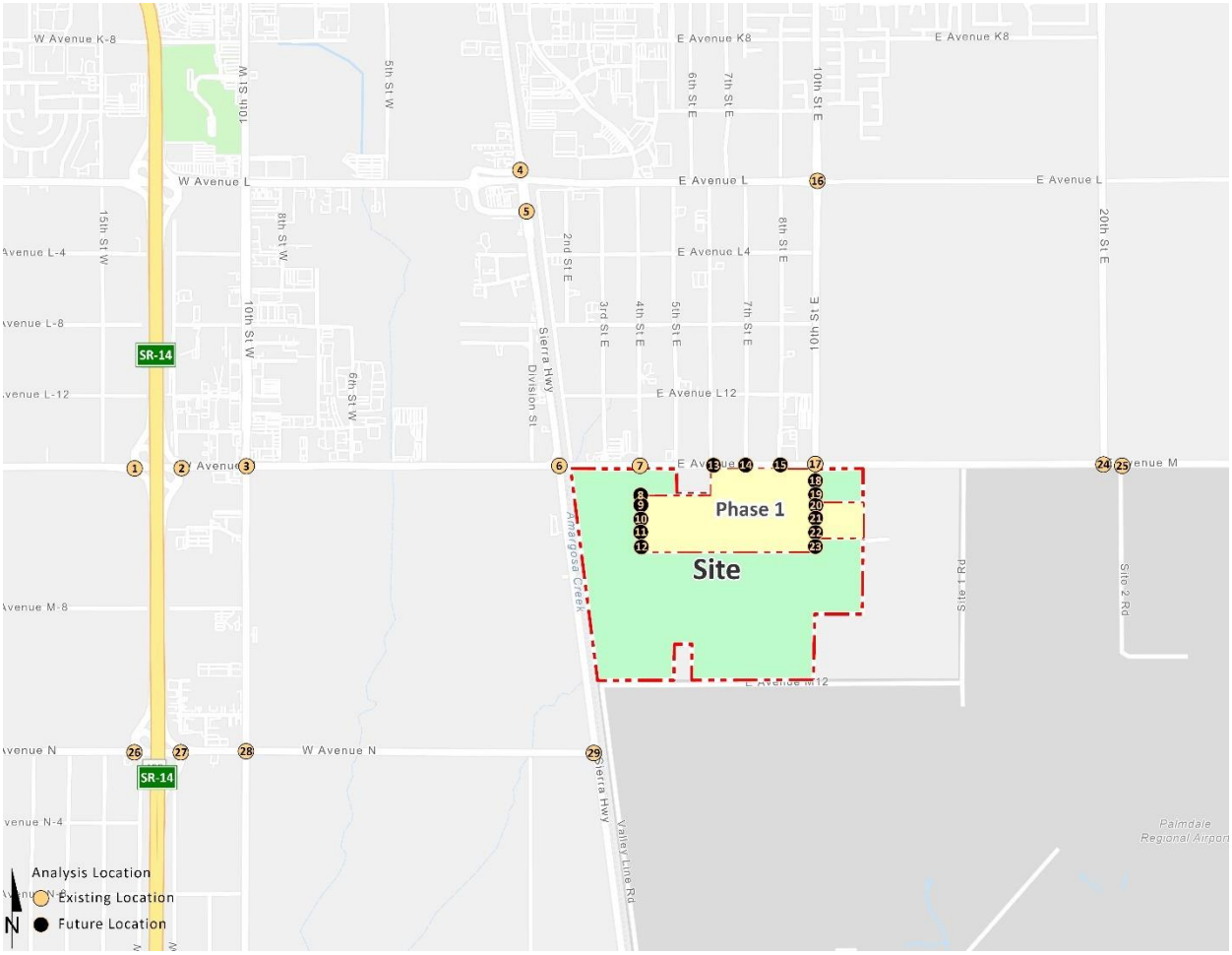
Exhibit 1-3 depicts the location of the proposed Project in relation to the existing roadway network and the study area intersections. The proposed Project is anticipated to have an opening year of 2025 for Phase 1 and 2032 for Project Buildout. Access is proposed along Avenue M and an easterly connection to the Palmdale Regional Airport. Regional access to the Project site is available from the SR-14 Freeway and Avenue M and Avenue N interchanges.

In order to develop the traffic characteristics of the proposed project, trip-generation statistics published in the Institute of Transportation Engineers (ITE) Trip Generation Manual (11th Edition, 2021) for the following ITE land uses (2):

- General Light Industrial (ITE Land Use Code 110)
- Manufacturing (ITE Land Use Code 140)
- Warehousing (ITE Land Use Code 150)
- High-Cube Fulfillment Center Warehouse (Non-Sort and Sort) (ITE Land Use Code 155)
- High-Cube Parcel Hub (ITE Land Use Code 156)
- High-Cube Cold Storage Warehouse (ITE Land Use Code 157)
- Shopping Center (40,000-150,000 square feet, no grocery store) (ITE Land Use Code 821)
- Fast-Food Restaurant Without Drive-Through Window (ITE Land Use Code 933)
- Fast-Food Restaurant With Drive-Through Window (ITE Land Use Code 934)
- Coffee/Donut Shop With Drive-Through Window (ITE Land Use Code 937)

The buildout of the proposed Project is anticipated to generate 26,214 two-way trip-ends per day in actual vehicles, with 2,958 actual AM peak hour trips and 3,124 actual PM peak hour trips. The assumptions and methods used to estimate the Project's trip generation characteristics are discussed in greater detail in Section 4.1 *Project Trip Generation* of this report.

EXHIBIT 1-3: STUDY AREA



1.3 ANALYSIS SCENARIOS

For the purposes of this traffic study, potential deficiencies to traffic and circulation have been assessed for each of the following conditions:

- Existing (2022) Conditions
- Existing plus Cumulative (EC) (2025) Conditions
- Existing plus Project plus Cumulative (EPC) (2025) Conditions – Phase 1
- EC (2032) Conditions
- EPC (2032) Conditions – Project Buildout

1.3.1 EXISTING (2022) CONDITIONS

Information for Existing (2022) conditions is disclosed to represent the baseline traffic conditions as they existed at the time this report was prepared.

1.3.2 EC & EPC (2025 & 2032) CONDITIONS

The EC and EPC (2025) traffic conditions analysis determines the potential near-term cumulative circulation system deficiencies. The roadway network is similar to Existing conditions except for new connections to be constructed by the Project for EPC conditions.

Conservatively, this TA adds traffic generated by other known or probable related projects under EC and EPC traffic conditions. Some of these related projects may not be implemented and operational within the 2025 and 2032 Opening Year time frame assumed for the Project. The resulting traffic growth utilized in this traffic study (traffic generated by related projects) would therefore tend to overstate rather than understate background cumulative traffic deficiencies under both 2025 and 2032 conditions. Pursuant to discussions with City staff, no ambient growth should be included if traffic associated with a list of cumulative development projects is included. As such, no ambient growth rate has been assumed for the future scenarios (2025 and 2032).

1.4 STUDY AREA

To ensure that this TA satisfies the City of Palmdale's traffic study requirements, Urban Crossroads, Inc. prepared a Project traffic study scoping package for review by City of Palmdale staff prior to the preparation of this report. This agreement provides an outline of the Project study area, trip generation, trip distribution, and analysis methodology. The agreement approved by the County is included in Appendix 1.1 of this TA. The 29 study area intersections shown on Exhibit 1-3 and listed in Table 1-1 were selected for evaluation in this TA based on consultation with City of Palmdale staff. At a minimum, the study area includes intersections where the Project is anticipated to contribute 50 or more peak hour trips per the County's traffic study guidelines. (1) The "50 peak hour trip" criteria represent a minimum number of trips at which a typical intersection would have the potential to be substantively affected by a given development proposal. The 50 peak hour trip criterion is a traffic engineering rule of thumb that is accepted and widely used within Los Angeles County for estimating a potential area of influence (i.e., study area).

TABLE 1-1: INTERSECTION ANALYSIS LOCATIONS

#	Intersection	Jurisdiction	CMP?
1	SR-14 SB Ramps & Avenue M	County, Lancaster, Caltrans	No
2	SR-14 NB Ramps & Avenue M	Palmdale, Lancaster, Caltrans	No
3	10th St. West & Avenue M	Palmdale, Lancaster	No
4	Sierra Hwy. & Avenue L West	Lancaster	No
5	Sierra Hwy. & Avenue L East	Lancaster	No
6	Sierra Hwy. & Avenue M	Palmdale, Lancaster	No
7	4th St. & Avenue M/Columbia Wy.	Palmdale, Lancaster	No
8	Street A & Private Drive D	Palmdale	No
9	Street A & Driveway 1	Palmdale	No
10	Street A & Driveway 2	Palmdale	No
11	Street A & Driveway 3	Palmdale	No
12	Street A & Driveway 4	Palmdale	No
13	6th St./Driveway 5 & Avenue M	Palmdale, Lancaster	No
14	7th St./Driveway 6 & Avenue M	Palmdale, Lancaster	No
15	8th St./Driveway 7 & Avenue M	Palmdale, Lancaster	No
16	Challenger Wy./10th St. East & Avenue L	Palmdale, Lancaster	No
17	Challenger Wy./10th St. East & Avenue M	Palmdale, Lancaster	No
18	Street B & Driveway 8	Palmdale	No
19	Street B & Driveway 9	Palmdale	No
20	Street B & Driveway 10	Palmdale	No
21	Street B & Driveway 11	Palmdale	No
22	Street B & Driveway 12	Palmdale	No
23	Street B & Driveway 13	Palmdale	No
24	20th St. & Avenue M	Palmdale	No
25	Site 2 Rd. & Avenue M	Palmdale	No
26	SR-14 SB Ramps & Avenue N	County, Caltrans	No
27	SR-14 NB Ramps & Avenue N	Palmdale, Caltrans	No
28	10th St. West & Avenue N	Palmdale	No
29	Sierra Hwy. & Avenue N	Palmdale	No

The intent of a Congestion Management Program (CMP) is to more directly link land use, transportation, and air quality, thereby prompting reasonable growth management programs that will effectively utilize new transportation funds, alleviate traffic congestion and related deficiencies, and improve air quality. The County of Los Angeles CMP was most recently updated in 2010. (3) There are no study area intersections identified as a Los Angeles County CMP intersection.

1.5 DEFICIENCIES

This section provides a summary of deficiencies by analysis scenario. Section 2 *Methodologies* provides information on the methodologies used in the analysis and Section 3 *Area Conditions*, Section 5 *EC & EPC (2025) Traffic Conditions* and Section 6 *EC & EPC (2032) Traffic Conditions* includes the detailed analysis. A summary of the Level of Service (LOS) results for all analysis scenarios is presented in Table 1-2.

1.5.1 EXISTING (2022) CONDITIONS

The following study area intersections are currently operating at an unacceptable LOS during the peak hours under Existing (2022) traffic conditions:

- SR-14 SB Ramps & Avenue M (#1) – LOS F AM peak hour only
- SR-14 NB Ramps & Avenue M (#2) – LOS F AM peak hour; LOS E PM peak hour
- 7th Street/Driveway 6 & Avenue M (#14) – LOS E AM and PM peak hours
- Challenger Way/10th Street East & Avenue M (#17) – LOS F PM peak hour only
- SR-14 SB Ramps & Avenue N (#26) – LOS E AM and PM peak hours
- SR-14 NB Ramps & Avenue N (#27) – LOS F PM peak hour only
- 10th Street West & Avenue N (#28) – LOS E PM peak hour only

1.5.2 EC & EPC (2025) CONDITIONS

The following study area intersections are anticipated to operate at an unacceptable LOS during the peak hours under EC (2025) Conditions:

- SR-14 SB Ramps & Avenue M (#1) – LOS F AM and PM peak hours
- SR-14 NB Ramps & Avenue M (#2) – LOS F AM and PM peak hours
- 10th Street West & Avenue M (#3) – LOS F AM and PM peak hours
- Sierra Highway & Avenue M (#6) – LOS E AM peak hour; LOS F PM peak hour
- 6th Street/Driveway 5 & Avenue M (#13) – LOS E PM peak hour only
- 7th Street/Driveway 6 & Avenue M (#14) – LOS E AM peak hour only
- Challenger Way/10th Street East & Avenue M (#17) – LOS E AM peak hour; LOS F PM peak hour
- SR-14 SB Ramps & Avenue N (#26) – LOS F AM and PM peak hours
- SR-14 NB Ramps & Avenue N (#27) – LOS E AM peak hour; LOS F PM peak hour
- 10th Street West & Avenue N (#28) – LOS F AM and PM peak hours

TABLE 1-2: SUMMARY OF LOS

#	Intersection	Existing AM	Existing PM	EC (2025) AM	EC (2025) PM	EPC (2025) AM	EPC (2025) PM	EAC (2032) AM	EAC (2032) PM	EAPC (2032) AM	EAPC (2032) PM
1	SR-14 SB Ramps & Avenue M	F	A - D	F	F	F	F	F	F	F	F
2	SR-14 NB Ramps & Avenue M	F	E	F	F	F	F	F	F	F	F
3	10th St. West & Avenue M	A - D	A - D	F	F	F	F	F	F	F	F
4	Sierra Hwy. & Avenue L West	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D
5	Sierra Hwy. & Avenue L East	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D
6	Sierra Hwy. & Avenue M	A - D	A - D	E	F	F	F	F	F	F	F
7	4th St. & Avenue M/Columbia Wy.	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D	F	F
8	Street A & Private Drive D	N/A	N/A	N/A	N/A	A - D	A - D	N/A	N/A	A - D	A - D
9	Street A & Driveway 1	N/A	N/A	N/A	N/A	A - D	A - D	N/A	N/A	A - D	A - D
10	Street A & Driveway 2	N/A	N/A	N/A	N/A	A - D	A - D	N/A	N/A	A - D	A - D
11	Street A & Driveway 3	N/A	N/A	N/A	N/A	A - D	A - D	N/A	N/A	A - D	A - D
12	Street A & Driveway 4	N/A	N/A	N/A	N/A	A - D	A - D	N/A	N/A	A - D	A - D
13	6th St./Driveway 5 & Avenue M	A - D	A - D	A - D	E	A - D	A - D	A - D	E	A - D	A - D
14	7th St./Driveway 6 & Avenue M	E	E	E	A - D	A - D	A - D	E	A - D	A - D	A - D
15	8th St./Driveway 7 & Avenue M	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D
16	Challenger Wy./10th St. East & Avenue L	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D
17	Challenger Wy./10th St. East & Avenue M	A - D	F	E	F	A - D	A - D	E	F	E	E
18	Street B & Driveway 8	N/A	N/A	N/A	N/A	A - D	A - D	N/A	N/A	A - D	A - D
19	Street B & Driveway 9	N/A	N/A	N/A	N/A	A - D	A - D	N/A	N/A	A - D	A - D
20	Street B & Driveway 10	N/A	N/A	N/A	N/A	A - D	A - D	N/A	N/A	A - D	A - D
21	Street B & Driveway 11	N/A	N/A	N/A	N/A	A - D	A - D	N/A	N/A	A - D	A - D
22	Street B & Driveway 12	N/A	N/A	N/A	N/A	A - D	A - D	N/A	N/A	A - D	A - D
23	Street B & Driveway 13	N/A	N/A	N/A	N/A	A - D	A - D	N/A	N/A	A - D	A - D
24	20th St. & Avenue M	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D
25	Site 2 Rd. & Avenue M	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D
26	SR-14 SB Ramps & Avenue N	E	E	F	F	F	F	F	F	F	F
27	SR-14 NB Ramps & Avenue N	A - D	F	E	F	F	F	F	F	E	F
28	10th St. West & Avenue N	A - D	E	F	F	F	F	F	F	F	F
29	Sierra Hwy. & Avenue N	A - D	A - D	A - D	A - D	A - D	A - D	E	A - D	F	F

= A - D = E = F

With the addition of Phase 1 Project traffic, there are no additional study area intersections anticipated to operate at an unacceptable LOS during the peak hours under EPC (2025) traffic conditions. It should be noted, the following study area intersections are anticipated to improve operations compared to EC (2025) traffic conditions with the implementation of the Project design features, as discussed in Section 1.6 *Recommendations*:

- 6th Street/Driveway 5 & Avenue M (#13)
- 7th Street/Driveway 6 & Avenue M (#14)
- Challenger Way/10th Street East & Avenue M (#17)

1.5.2 EC & EPC (2032) CONDITIONS

The following study area intersections are anticipated to operate at an unacceptable LOS during the peak hours:

- SR-14 SB Ramps & Avenue M (#1) – LOS F AM and PM peak hours
- SR-14 NB Ramps & Avenue M (#2) – LOS F AM and PM peak hours
- 10th Street West & Avenue M (#3) – LOS F AM and PM peak hours
- Sierra Highway & Avenue M (#6) – LOS F AM and PM peak hours
- 6th Street/Driveway 5 & Avenue M (#13) – LOS E PM peak hour only
- 7th Street/Driveway 6 & Avenue M (#14) – LOS E AM peak hour only
- Challenger Way/10th Street East & Avenue M (#17) – LOS E AM peak hour; LOS F PM peak hour
- SR-14 SB Ramps & Avenue N (#26) – LOS F AM and PM peak hours
- SR-14 NB Ramps & Avenue N (#27) – LOS F AM and PM peak hours
- 10th Street West & Avenue N (#28) – LOS F AM and PM peak hours
- Sierra Highway & Avenue N (#29) – LOS E AM peak hour only

With the addition of Project (Buildout) traffic, the following additional study area intersection is anticipated to operate at an unacceptable LOS during the peak hours under EPC (2032) traffic conditions:

- 4th Street & Avenue M/Columbia Way (#7) – LOS F AM and PM peak hours
- It should be noted, the deficiency at this location is likely attributable to the high through volumes along Avenue M as opposed to the traffic volumes associated with the proposed Project.

1.6 RECOMMENDATIONS

1.6.1 SITE ADJACENT AND SITE ACCESS RECOMMENDATIONS

The following recommendations are based on the minimum improvements needed to accommodate site access and maintain acceptable peak hour operations for the proposed Project. The site adjacent recommendations are shown on Exhibit 1-4 for Phase 1 and Exhibit 1-5 for Project (Buildout). The site adjacent queuing analysis worksheets are provided in Appendix 1.2.

Phase 1

Recommendation 1 – 4th Street & Avenue M/Columbia Way (#7) – The following improvements are necessary to accommodate site access:

- Project to install a traffic signal.
- Project to construct dual northbound left turn lanes with a minimum of 350-feet of storage and a shared through-right turn lane.
- Project to construct a southbound left turn lane with a minimum of 125-feet of storage.
- Project to construct a westbound left turn lane with a minimum of 100-feet of storage.

Recommendation 2 – 4th Street & Private Drive D (#8) – The following improvements are necessary to accommodate site access:

- Project to construct a northbound shared through-right turn lane.
- Project to construct a southbound shared left-through lane.
- Project to install a stop control on the westbound approach and construct a shared left-right turn lane.

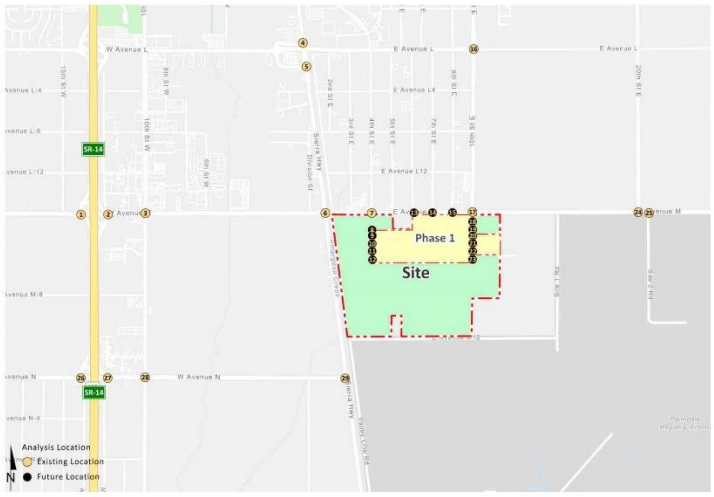
Recommendation 3 – Street A & Private Driveway 1 (#9) – The following improvements are necessary to accommodate site access:

- Project to construct a northbound shared through-right turn lane.
- Project to construct a southbound shared left-through lane.
- Project to install a stop control on the westbound approach and construct a shared left-right turn lane.

Recommendation 4 – Street A & Driveway 2 (#10) – The following improvements are necessary to accommodate site access:

- Project to construct a northbound shared through-right turn lane.
- Project to construct a southbound shared left-through lane.
- Project to install a stop control on the westbound approach and construct a shared left-right turn lane.

EXHIBIT 1-4: PROJECT (PHASE 1) SITE ACCESS RECOMMENDATIONS



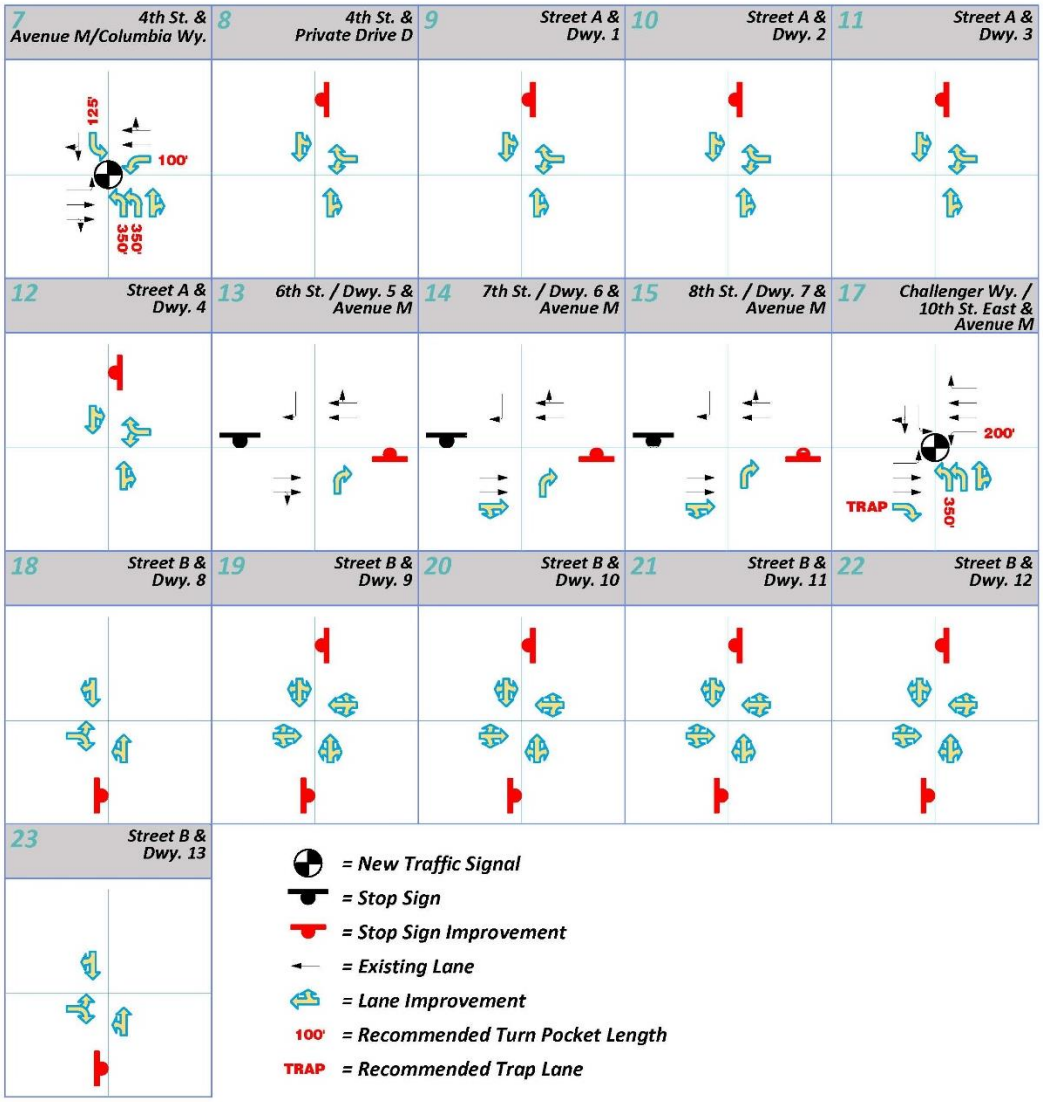
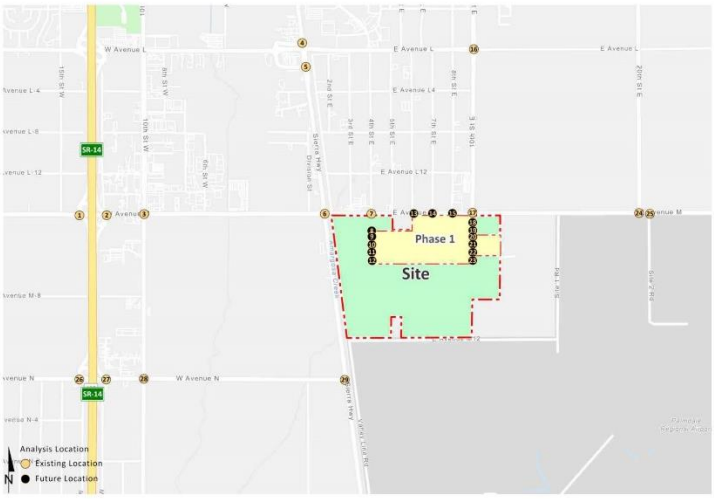
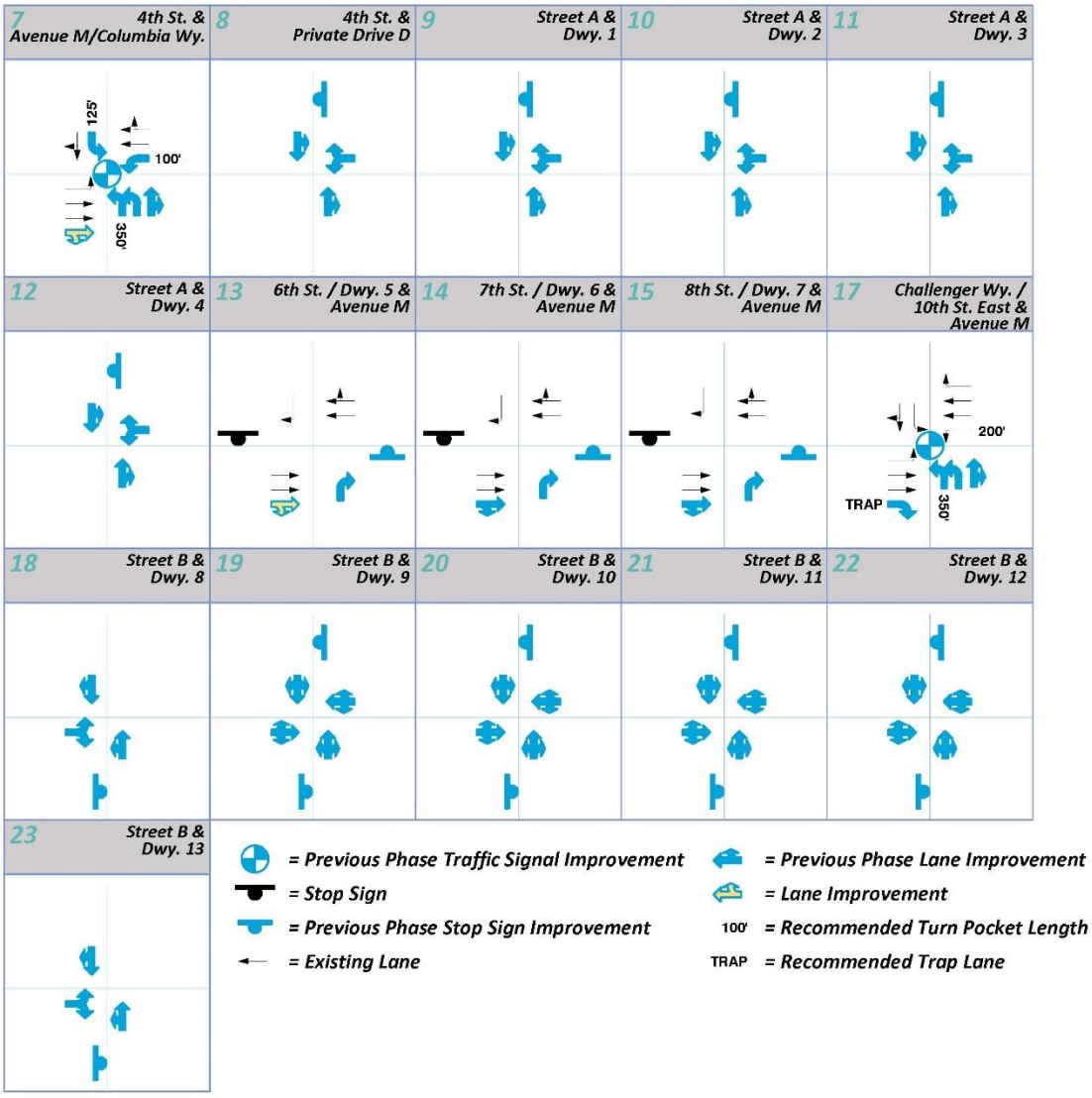


EXHIBIT 1-5: PROJECT (BUILDOUT) SITE ACCESS RECOMMENDATIONS





Recommendation 5 – Street A & Driveway 3 (#11) – The following improvements are necessary to accommodate site access:

- Project to construct a northbound shared through-right turn lane.
- Project to construct a southbound shared left-through lane.
- Project to install a stop control on the westbound approach and construct a shared left-right turn lane.

Recommendation 6 – Street A & Driveway 4 (#12) – The following improvements are necessary to accommodate site access:

- Project to construct a northbound shared through-right turn lane.
- Project to construct a southbound shared left-through lane.
- Project to install a stop control on the westbound approach and construct a shared left-right turn lane.

Recommendation 7 – 6th Street/Driveway 5 & Avenue M (#13) – The following improvement is necessary to accommodate site access:

- Project to install a stop control on the northbound approach and construct a northbound right turn lane (Project Driveway).

Recommendation 8 – 7th Street/Driveway 6 & Avenue M (#14) – The following improvement is necessary to accommodate site access:

- Project to install a stop control on the northbound approach and construct a northbound right turn lane (Project Driveway).

Recommendation 9 – 8th Street/Driveway 7 & Avenue M (#15) – The following improvement is necessary to accommodate site access:

- Project to install a stop control on the northbound approach and construct a northbound right turn lane (Project Driveway).

Recommendation 10 – Challenger Way/10th Street East & Avenue M (#17) – The following improvements are necessary to accommodate site access:

- Project to install a traffic signal.
- Project to construct dual northbound left turn lanes with a minimum of 350-feet of storage and a shared through-right turn lane.
- Project to construct an eastbound right turn trap lane. It should be noted, the right turn lane should be restriped to a through lane at some time in the future when Avenue M is widened to the east with additional receiving lanes.

Recommendation 11 – Street B & Driveway 8 (#18) – The following improvements are necessary to accommodate site access:

- Project to construct a northbound shared left-through lane.
- Project to construct a southbound shared through-right turn lane.
- Project to install a stop control on the eastbound approach and a shared left-right turn lane.

Recommendation 12 – Street B & Driveway 9 (#19) – The following improvements are necessary to accommodate site access:

- Project to construct a northbound shared left-through-right turn lane.
- Project to construct a southbound shared left-through-right turn lane.
- Project to install a stop control on the eastbound approach and a shared left-through-right turn lane.
- Project to install a stop control on the westbound approach and a shared left-through-right turn lane.

Recommendation 13 – Street B & Driveway 10 (#20) – The following improvements are necessary to accommodate site access:

- Project to construct a northbound shared left-through-right turn lane.
- Project to construct a southbound shared left-through-right turn lane.
- Project to install a stop control on the eastbound approach and a shared left-through-right turn lane.
- Project to install a stop control on the westbound approach and a shared left-through-right turn lane.

Recommendation 14 – Street B & Driveway 11 (#21) – The following improvements are necessary to accommodate site access:

- Project to construct a northbound shared left-through-right turn lane.
- Project to construct a southbound shared left-through-right turn lane.
- Project to install a stop control on the eastbound approach and a shared left-through-right turn lane.
- Project to install a stop control on the westbound approach and a shared left-through-right turn lane.

Recommendation 15 – Street B & Driveway 12 (#22) – The following improvements are necessary to accommodate site access:

- Project to construct a northbound shared left-through-right turn lane.
- Project to construct a southbound shared left-through-right turn lane.
- Project to install a stop control on the eastbound approach and a shared left-through-right turn lane.
- Project to install a stop control on the westbound approach and a shared left-through-right turn lane.

Recommendation 16 – Street B & Driveway 13 (#23) – The following improvements are necessary to accommodate site access:

- Project to construct a northbound shared left-through lane.
- Project to construct a southbound shared through-right turn lane.
- Project to install a stop control on the eastbound approach and a shared left-right turn lane.

Recommendation 17 – Avenue M is an east-west oriented roadway located on the Project's northern boundary. Project to construct Avenue M at its ultimate half-section width as a Regional Arterial (136-foot right-of-way) along the Project's frontage from 6th Street to 10th Street consistent with the City's standards. Project to construct a raised median along Avenue M. It should be noted, the 4th eastbound through lane will remain unstriped until such a time in the future when there is an additional receiving lane along Avenue M, east of 10th Street.

Recommendation 18 – Street A is a north-south oriented roadway that bisects the Project site. Project to construct Street A at its ultimate full-section width as an Industrial Collector (76-foot right-of-way) from Avenue M to its southern terminus consistent with the City's standards.

Recommendation 19 – Street B is a north-south oriented roadway that bisects the Project site. Project to construct Street B at its ultimate full-section width as an Industrial Collector (76-foot right-of-way) from Avenue M to its southern terminus consistent with the City's standards.

On-site traffic signing and striping should be implemented agreeable with the provisions of the California Manual on Uniform Traffic Control Devices (CA MUTCD) and in conjunction with detailed construction plans for the Project site.

Sight distance at each project access point should be reviewed with respect to standard California Department of Transportation (Caltrans) and City of Palmdale sight distance standards at the time of preparation of final grading, landscape, and street improvement plans.

Project (Buildout)

Recommendation 20 – 4th Street & Avenue M/Columbia Way (#7) – The following improvement is necessary to accommodate site access:

- Project to construct an eastbound shared through-right turn lane.

Recommendation 21 – 6th Street/Driveway 5 & Avenue M (#13) – The following improvement is necessary to accommodate site access:

- Project to construct an eastbound shared through-right turn lane.

Recommendation 22 – Avenue M is an east-west oriented roadway located on the Project's northern boundary. Project to construct Avenue M at its ultimate half-section width as a Regional Arterial (136-foot right-of-way) along the Project's frontage from Sierra Highway to 5th Street, and from 10th Street to the Project's eastern boundary consistent with the City's standards. Project to construct a raised median along Avenue M. It should be noted, the 4th eastbound through lane will remain unstriped until such a time in the future when there is an additional receiving lane along Avenue M, east of the Project's eastern boundary.

Recommendation 23 – Sierra Highway is a north-south oriented roadway located on the Project's western boundary. Project to construct Sierra Highway at its ultimate half-section width as a Regional Arterial (136-foot right-of-way) along the Project's frontage from the Project's southern boundary to Avenue M consistent with the City's standards.

On-site traffic signing and striping should be implemented agreeable with the provisions of the California Manual on Uniform Traffic Control Devices (CA MUTCD) and in conjunction with detailed construction plans for the Project site.

Sight distance at each project access point should be reviewed with respect to standard California Department of Transportation (Caltrans) and City of Palmdale sight distance standards at the time of preparation of final grading, landscape, and street improvement plans.

1.6.2 OFF-SITE RECOMMENDATIONS

A summary of the off-site intersection improvements is provided in Table 1-3. As shown in Table 1-3, the Project will construct the improvements identified, as discussed in Section 1.6.1 *Site Adjacent and Site Access Recommendations*.

1.7 TRUCK ACCESS

Due to the typical wide turning radius of large trucks, a truck turning template has been overlaid on the site plan at each applicable Project driveway anticipated to be utilized by heavy trucks in order to determine appropriate curb radii and to verify that trucks will have sufficient space to execute turning maneuvers (see Exhibit 1-6). A WB-67 truck (53-foot trailer) has been utilized for the purposes of this analysis. As shown on Exhibit 1-6, the following curb radius changes are necessary in order to accommodate the ingress and egress of heavy trucks:

- Driveway 5 at Avenue M should be modified to provide a 20-foot curb radius on the southwest corner.
- Driveway 9 at Street B should be modified to provide a 30-foot curb radius on the northeast corner.

Driveways 1 and 4 along Street A, Driveways 6 and 7 along Avenue M, and Driveways 11, and 12 along Street B are anticipated to accommodate the wide turning radius of heavy trucks as currently designed.

TABLE 1-3: SUMMARY OF IMPROVEMENTS BY ANALYSIS SCENARIO

#	Intersection Location	Jurisdiction	EPC (2025)	EPC (2032)	Improvements in DIF[1,2]
1	SR-14 SB Ramps & Avenue M	County, Lancaster, Caltrans	Install a Traffic Signal	Same	No
			Add 2nd EB through lane	Same	Yes
			Add 2nd WB through lane	Same	Yes
			Add 2nd SB left turn lane	Same	Yes
				Add 3rd EB through lane	Yes
				Add 3rd WB through lane	Yes
2	SR-14 NB Ramps & Avenue M	Palmdale, Lancaster, Caltrans	Install a Traffic Signal	Same	No
			Add 2nd EB through lane	Same	Yes
			Add 2nd WB through lane	Same	Yes
				Add 3rd EB through lane	Yes
				Add 3rd WB through lane	Yes
3	10th St. West & Avenue M	Palmdale, Lancaster	Restripe the EB defacto right turn lane to provide a 3rd through lane	Same	Yes
			Restripe the WB right turn lane to provide a 3rd through lane	Same	Yes
			Add 2nd NB left turn lane	Same	Yes
			Add 2nd SB left turn lane	Same	Yes
			Add 2nd EB left turn lane	Same	Yes
			Add 2nd WB left turn lane	Same	Yes
				Add 3rd NB through lane	Yes
				Add 3rd SB through lane	Yes
6	Sierra Hwy. & Avenue M	Palmdale, Lancaster	Add 2nd EB left turn lane	Same	Yes
			Restripe the EB right turn lane to provide a 3rd through lane	Same	Yes
			Add 2nd WB left turn lane	Same	Yes
			Restripe the WB right turn lane to provide a 3rd through lane	Same	Yes
			Modify the traffic signal to implement overlap phasing for the NB right turn lane	Same	Yes
				Add 2nd NB left turn lane	Yes
				Add 3rd NB through lane	Yes
				Add 2nd SB left turn lane	Yes
				Add 3rd SB through lane	Yes
				Add 4th EB through lane	Yes
				Add 4th WB through lane	Yes

#	Intersection Location	Jurisdiction	EAC (2025)	EAC (2030)	Improvements in DIF[1,2]
7	4th St. & Avenue M/Columbia Wy.	Palmdale, Lancaster	None	Install a Traffic Signal	Yes
				Add NB left turn lane	Yes
				Add 2nd NB left turn lane	Yes
				Add NB shared through-right turn lane	Yes
				Add SB left turn lane	Yes
				Add WB left turn lane	Yes
				Add 3rd EB through lane	Yes
				Add 3rd WB through lane	Yes
				Add 4th EB through lane	Yes
				Add 4th WB through lane	Yes
				Add EB right turn lane	Yes
				Modify the traffic signal to implement overlap phasing for the EB right turn lane	Yes
17	Challenger Wy./10th St. East & Avenue M	Palmdale, Lancaster	None	Install a Traffic Signal	Yes
				Add NB left turn lane	Yes
				Add 2nd NB left turn lane	Yes
				Add NB shared through-right turn lane	Yes
				Add WB left turn lane	Yes
				Add 3rd EB through lane	Yes
				Add 3rd WB through lane	Yes
				Add 4th EB through lane	Yes
				Add 4th WB through lane	Yes
26	SR-14 SB Ramps & Avenue N	County, Caltrans	Install a Traffic Signal	Same	No
				Add 2nd EB through lane	Yes
				Add 2nd WB through lane	Yes
27	SR-14 NB Ramps & Avenue N	Palmdale, Caltrans	Install a Traffic Signal	Same	No
				Add 2nd EB through lane	Yes
				Add 2nd WB through lane	Yes
28	10th St. & Avenue N	Palmdale	Add 2nd EB through lane	Same	Yes
			Add 2nd WB through lane	Same	Yes
				Add 2nd EB left turn lane	Yes
29	Sierra Hwy. & Avenue N	Palmdale	None	Add 3rd EB through lane	Yes
				Add 3rd WB through lane	Yes
				Add 2nd EB left turn lane	Yes

[1] Improvements included in regional/City DIF programs have been identified as such.

[2] Program improvements constructed by project may be eligible for fee credit. In lieu fee payment is at the discretion of the City.

EXHIBIT 1-6: TRUCK ACCESS (PAGE 1 OF 3)

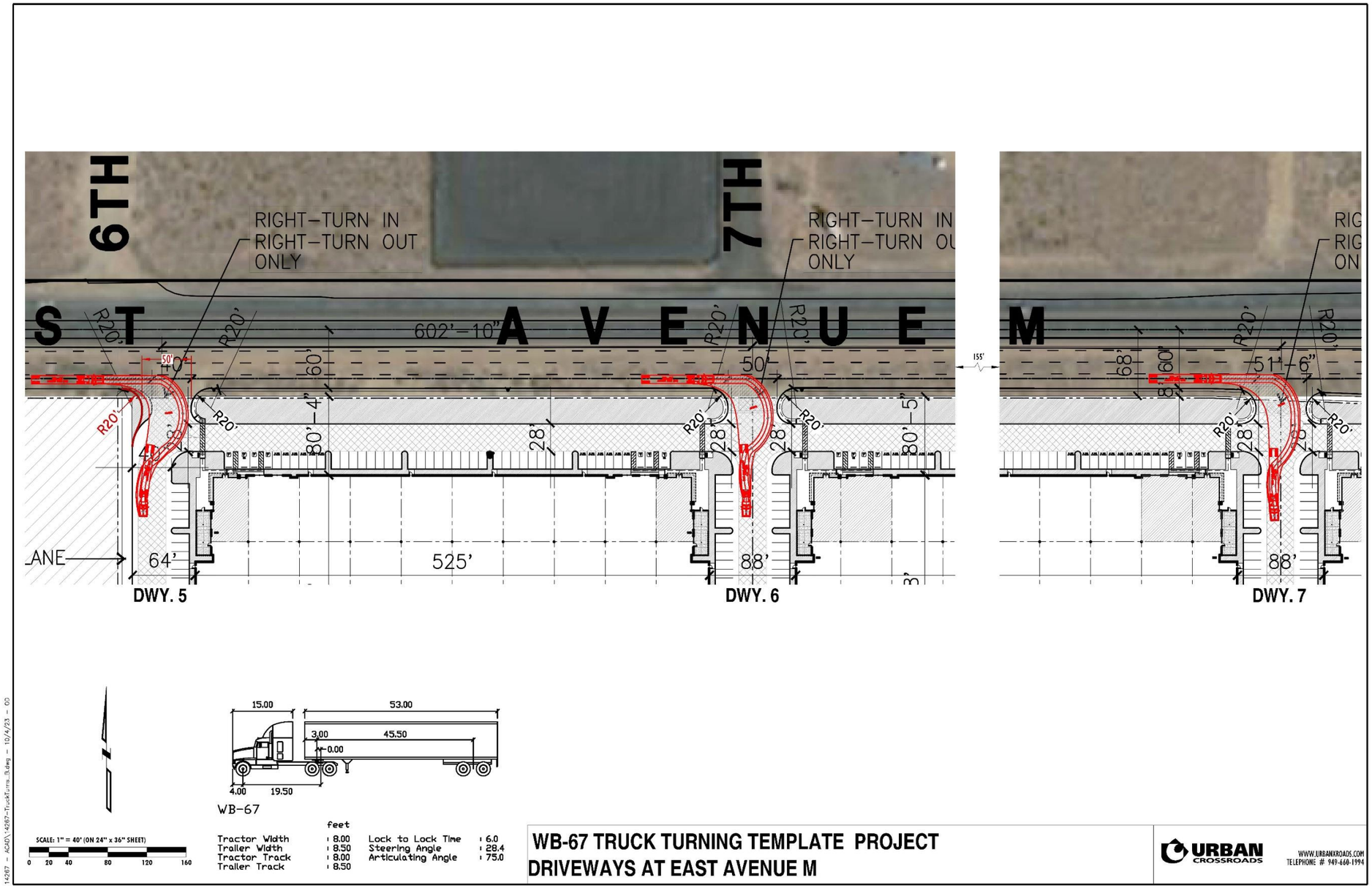


EXHIBIT 1-6: TRUCK ACCESS (PAGE 2 OF 3)

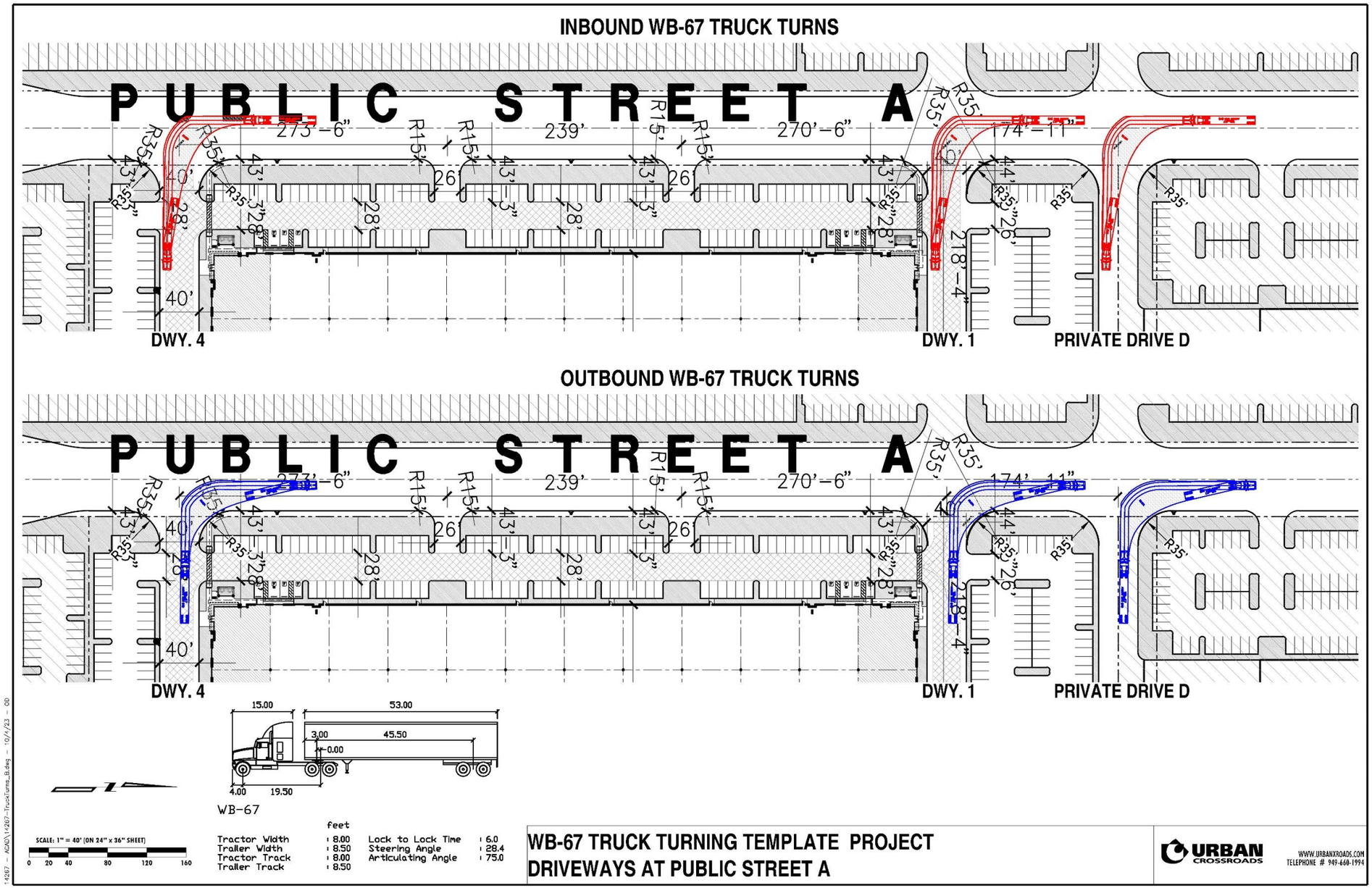
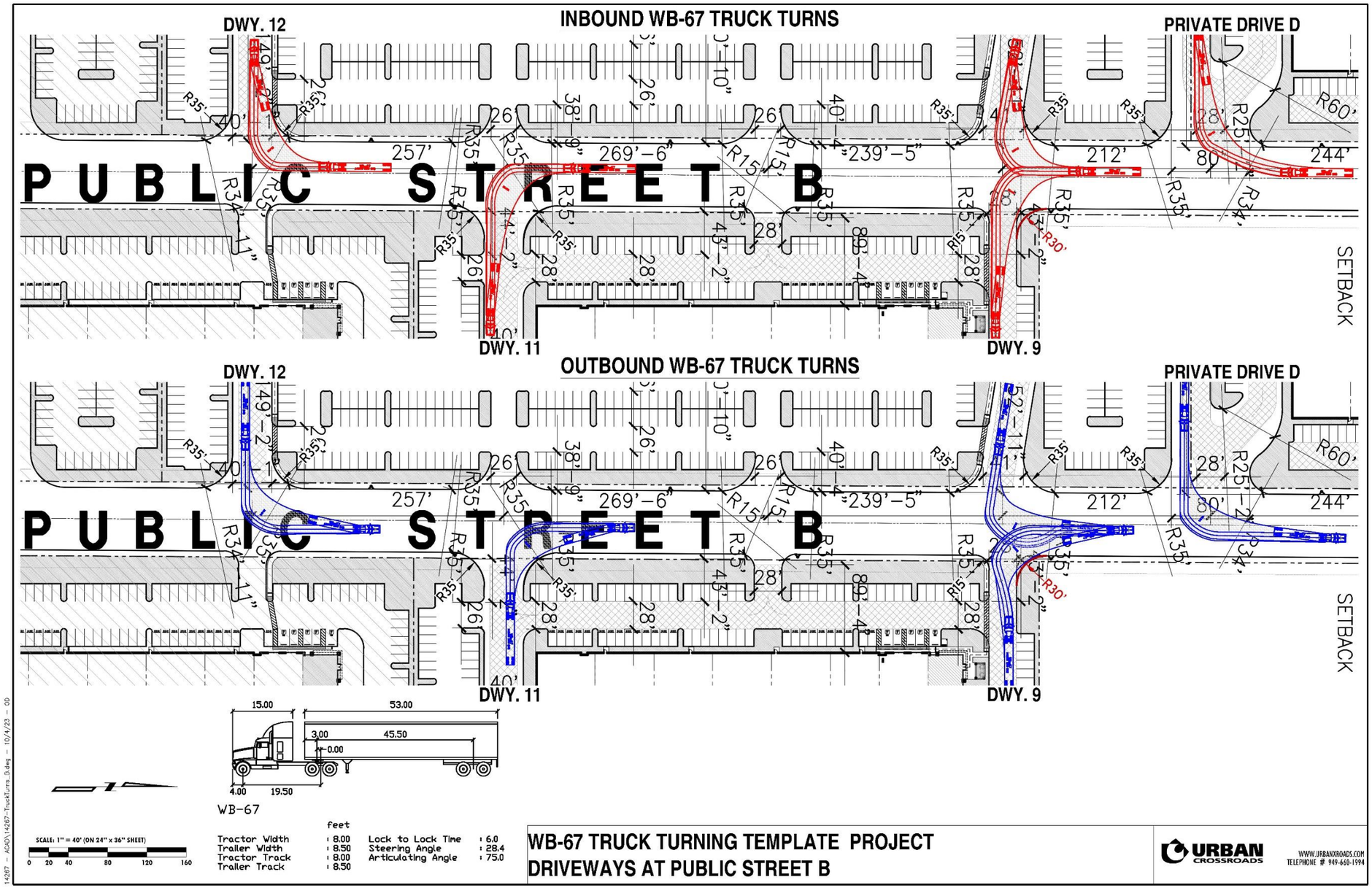


EXHIBIT 1-6: TRUCK ACCESS (PAGE 3 OF 3)



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2 METHODOLOGIES

This section of the report presents the methodologies used to perform the traffic analyses summarized in this report. The methodologies described are consistent with the County of Los Angeles' Traffic Study Guidelines.

2.1 LEVEL OF SERVICE

Traffic operations of roadway facilities are described using the term "Level of Service" (LOS). LOS is a qualitative description of traffic flow based on several factors, such as speed, travel time, delay, and freedom to maneuver. Six levels are typically defined ranging from LOS A, representing completely free-flow conditions, to LOS F, representing breakdown in flow resulting in stop-and-go conditions. LOS E represents operations at or near capacity, an unstable level where vehicles are operating with the minimum spacing for maintaining uniform flow.

2.2 INTERSECTION CAPACITY ANALYSIS

The definitions of LOS for interrupted traffic flow (flow restrained by the existence of traffic signals and other traffic control devices) differ slightly depending on the type of traffic control. The LOS is typically dependent on the quality of traffic flow at the intersections along a roadway. The 6th Edition Highway Capacity Manual (HCM) methodology expresses the LOS at an intersection in terms of delay time for the various intersection approaches. (4) The HCM uses different procedures depending on the type of intersection control.

2.2.1 SIGNALIZED INTERSECTIONS

The City of Palmdale, City of Lancaster, and County of Los Angeles require signalized intersection operations analysis based on the methodology described in the HCM. (4) Intersection LOS operations are based on an intersection's average control delay. Control delays include initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. For signalized intersections LOS is related to the average control delay per vehicle and is correlated to a LOS designation as described in Table 2-1.

TABLE 2-1: SIGNALIZED INTERSECTION LOS THRESHOLDS

Description	Average Control Delay (Seconds), V/C ≤ 1.0	Level of Service, V/C ≤ 1.0[1]
Operations with very low delay occurring with favorable progression and/or short cycle length.	0 to 10.00	A
Operations with low delay occurring with good progression and/or short cycle lengths.	10.01 to 20.00	B
Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.01 to 35.00	C
Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	35.01 to 55.00	D
Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.01 to 80.00	E
Operation with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths.	80.01 and up	F

Source: HCM, 6th Edition

[1] If V/C is greater than 1.0 then LOS is F per HCM.

Consistent with the Los Angeles County CMP, a saturation flow rate of 1600 vehicles per hour green per lane (vphgpl) has been utilized for all intersections for all scenarios.

The traffic modeling and signal timing optimization software package Synchro (Version 11) has been utilized to analyze signalized intersections. Synchro is a macroscopic traffic software program that is based on the signalized intersection capacity analysis as specified in the HCM. Macroscopic level models represent traffic in terms of aggregate measures for each movement at the study intersections. Equations are used to determine measures of effectiveness such as delay and queue length. The level of service and capacity analysis performed by Synchro takes into consideration optimization and coordination of signalized intersections within a network.

The peak hour traffic volumes have been adjusted using a peak hour factor (PHF) to reflect peak 15-minute volumes. Customary practice for LOS analysis is to use a peak 15-minute rate of flow. However, flow rates are typically expressed in vehicles per hour. The PHF is the relationship between the peak 15-minute flow rate and the full hourly volume (e.g., PHF = [Hourly Volume] / [4 x Peak 15-minute Flow Rate]). The use of a 15-minute PHF produces a more detailed analysis as compared to analyzing vehicles per hour. Existing PHFs have been used for all analysis scenarios. Per the HCM, PHF values over 0.95 often are indicative of high traffic volumes with capacity constraints on peak

hour flows while lower PHF values are indicative of greater variability of flow during the peak hour. (4)

2.2.2 UNSIGNALIZED INTERSECTIONS

The City of Palmdale, City of Lancaster, and County of Los Angeles require the operations of unsignalized intersections be evaluated using the methodology described in the HCM. (4) The LOS rating is based on the weighted average control delay expressed in seconds per vehicle (see Table 2-2). At two-way or side-street stop-controlled intersections, LOS is calculated for each controlled movement and for the left turn movement from the major street, as well as for the intersection as a whole. For approaches composed of a single lane, the delay is computed as the average of all movements in that lane. Delay for the intersection is reported for the worst individual movement at a two-way stop-controlled intersection. For all-way stop controlled intersections, LOS is computed for the intersection as a whole (average delay).

TABLE 2-2: UNSIGNALIZED INTERSECTION LOS THRESHOLDS

Description	Average Control Delay (Seconds), V/C ≤ 1.0	Level of Service, V/C ≤ 1.0[1]
Little or no delays.	0 to 10.00	A
Short traffic delays.	10.01 to 15.00	B
Average traffic delays.	15.01 to 25.00	C
Long traffic delays.	25.01 to 35.00	D
Very long traffic delays.	35.01 to 50.00	E
Extreme traffic delays with intersection capacity exceeded.	> 50.00	F

Source: HCM, 6th Edition

[1] If V/C is greater than 1.0 then LOS is F per HCM.

2.3 TRAFFIC SIGNAL WARRANT ANALYSIS METHODOLOGY

The term "signal warrants" refers to the list of established criteria used by Caltrans and other public agencies to quantitatively justify or determine the potential need for installation of a traffic signal at an otherwise unsignalized intersection. This TA uses the signal warrant criteria presented in the latest edition of the Caltrans California Manual on Uniform Traffic Control Devices (CA MUTCD). (5)

The signal warrant criteria for Existing study area intersections are based upon several factors, including volume of vehicular and pedestrian traffic, frequency of accidents, and location of school areas. The CA MUTCD indicates that the installation of a traffic signal should be considered if one or more of the signal warrants are met. (5) Specifically, this TA utilizes the Peak Hour Volume-based Warrant 3 as the appropriate representative traffic signal warrant analysis for existing traffic conditions and for all future analysis scenarios for existing unsignalized intersections. Warrant 3 is appropriate to use for this TA because it provides specialized warrant criteria for intersections with rural characteristics. For the purposes of this study, the speed limit was the basis for determining whether Urban or Rural warrants were used for a given intersection. Urban warrants have been used

as posted speed limits on the major roadways with unsignalized intersections are 40 miles per hour or below and rural warrants have been used where speeds exceed 40 miles per hour.

Future intersections that do not currently exist have been assessed regarding the potential need for new traffic signals based on future average daily traffic (ADT) volumes, using the Caltrans planning level ADT-based signal warrant analysis worksheets. Similarly, the speed limit has been used as the basis for determining the use of Urban and Rural warrants. Traffic signal warrant analyses were performed for the following study area intersection shown in Table 2-3:

TABLE 2-3: TRAFFIC SIGNAL WARRANT ANALYSIS LOCATIONS

#	Intersection
1	SR-14 SB Ramps & Avenue M
2	SR-14 NB Ramps & Avenue M
7	4th St. & Avenue M/Columbia Wy.
8	Street A & Private Drive D
9	Street A & Driveway 1
10	Street A & Driveway 2
11	Street A & Driveway 3
12	Street A & Driveway 4
13	6th St./Driveway 5 & Avenue M
14	7th St./Driveway 6 & Avenue M
15	8th St./Driveway 7 & Avenue M
16	Challenger Wy./10th St. East & Avenue L
17	Challenger Wy./10th St. East & Avenue M
18	Street B & Driveway 8
19	Street B & Driveway 9
20	Street B & Driveway 10
21	Street B & Driveway 11
22	Street B & Driveway 12
23	Street B & Driveway 13
26	SR-14 SB Ramps & Avenue N
27	SR-14 NB Ramps & Avenue N

Although unsignalized, the future Project driveways along Avenue M (Driveways 5, 6, and 7) are proposed to be restricted access (right-in/right-out only) since the Project will construct a median along Avenue M. As such, traffic signal warrants have not been evaluated for these locations for "With Project" conditions only. "Without Project" conditions will evaluate the traffic signal warrants since the access would not be restricted (consistent with Existing conditions).

The Existing conditions traffic signal warrant analysis is presented in the subsequent section, Section 3 *Area Conditions* of this report. The traffic signal warrant analyses for future conditions are presented in Section 5 *EC & EPC (2025) Conditions* and Section 6 *EC & EPC (2032) Conditions* of this report. It is important to note that a signal warrant defines the minimum condition under which the installation of a traffic signal might be warranted. Meeting this threshold condition does not require that a traffic control signal be installed at a particular location, but rather, that other traffic factors and conditions be evaluated in order to determine whether the signal is truly justified. It should also be noted that signal warrants do not necessarily correlate with LOS. An intersection may satisfy a signal warrant condition and operate at or above acceptable LOS or operate below acceptable LOS and not meet a signal warrant.

2.4 OFF-RAMP QUEUING ANALYSIS

Consistent with Caltrans requirements, the 95th percentile queuing of vehicles has been assessed at the off-ramps to determine potential queuing deficiencies at the freeway ramp intersections at the SR-14 Freeway at the Avenue M and Avenue N interchanges. Specifically, the off-ramp queuing analysis is utilized to identify any potential queuing and "spill back" onto the SR-14 Freeway mainline from the off-ramps.

The traffic progression analysis tool and HCM intersection analysis program, Synchro, has been used to assess the potential deficiencies/needs of the intersections with traffic added from the proposed Project. Storage (turn-pocket) length recommendations at the ramps have been based upon the 95th percentile queue resulting from the Synchro progression analysis. The footnote from the Synchro output sheets indicates if the 95th percentile cycle exceeds capacity. Traffic is simulated for two complete cycles of the 95th percentile traffic in Synchro in order to account for the effects of spillover between cycles. In practice, the 95th percentile queue shown will rarely be exceeded and the queues shown with the footnote are acceptable for the design of storage bays. The 95th percentile queue is derived from the average queue plus 1.65 standard deviations. The 95th percentile queue is not necessarily ever observed, it is simply based on statistical calculations.

2.5 MINIMUM ACCEPTABLE LEVELS OF SERVICE (LOS)

Minimum Acceptable LOS and associated definitions of intersection deficiencies have been obtained from each of the applicable surrounding jurisdictions.

2.5.1 CITY OF PALMDALE AND COUNTY OF LOS ANGELES

Consistent with the County of Los Angeles, the City of Palmdale utilizes LOS D as the minimum acceptable LOS. (1)

2.5.2 CITY OF LANCASTER

Per the City of Lancaster's traffic study guidelines, LOS D is considered the minimum acceptable LOS for intersections within the City. (6)

2.5.3 CALTRANS

Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on State Highway System facilities, however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. (7) If an existing State highway facility is operating at less than this target LOS, the existing LOS should be maintained. In general, the region-wide goal for an acceptable LOS on all freeways and intersections is LOS D. Consistent with the City of Palmdale, City of Lancaster, and County of Los Angeles, LOS threshold of LOS D will be used as the target LOS.

2.6 DEFICIENCY CRITERIA

This section outlines the methodology used in this analysis related to identifying circulation system deficiencies. The following deficiency criteria have been utilized for the City of Palmdale, County of Los Angeles, and Caltrans. To determine whether the addition of project-related traffic at a study intersection would result in a deficiency, the following will be utilized:

- A deficiency occurs at study area intersections if the pre-Project condition is at or better than LOS D (i.e., acceptable LOS), and the addition of project trips causes the peak hour LOS of the study area intersection to operate at unacceptable LOS (i.e., LOS E or F). For intersections currently operating at unacceptable LOS (LOS E or F), a deficiency will occur if the Project contributes peak hour trips to pre-Project traffic conditions.

The following deficiency criteria has been utilized for the City of Lancaster to determine whether the addition of project-related traffic at a study intersection would result in a deficiency:

- For signalized intersections operating at an acceptable LOS under pre-Project conditions, and the addition of Project trips causes the peak hour LOS at the study area intersection to operate at an unacceptable LOS, a deficiency is deemed to occur. If the signalized intersection is operating at an unacceptable LOS under pre-Project conditions, a deficiency is deemed to occur if the Project-related increase in delay is equal to or greater than 5.0 seconds.
- For unsignalized intersections operating at an acceptable LOS under pre-Project conditions, and the addition of Project trips causes the peak hour LOS at the study area intersection to operate at an unacceptable LOS, a deficiency is deemed to occur. If the unsignalized intersection is operating at an unacceptable LOS under pre-Project conditions, a deficiency is deemed to occur if the Project-related increase in delay is equal to or greater than 3.0 seconds for all-way stop controlled intersections and cross-street stop-controlled intersections.

Where improvements are necessary based on the above criteria, the Project shall identify improvements to mitigate the LOS to pre-Project delay or better.

3 AREA CONDITIONS

This section provides a summary of the existing circulation network, the City of Palmdale General Plan Circulation Network, and a review of existing peak hour intersection operations, traffic signal warrant, and off-ramp queuing analyses.

3.1 EXISTING CIRCULATION NETWORK

Pursuant to the agreement with City of Palmdale staff (Appendix 1.1), the study area includes a total of 29 existing and future intersections as shown previously on Exhibit 1-2. Exhibit 3-1 illustrates the study area intersections located near the proposed Project and identifies the number of through traffic lanes for existing roadways and intersection traffic controls.

3.2 CITY OF PALMDALE GENERAL PLAN CIRCULATION ELEMENT

As noted previously, the Project site is located within the City of Palmdale. The roadway classifications and planned (ultimate) roadway cross-sections of the major roadways within the study area, as identified in the City of Palmdale General Plan Circulation Element, are described subsequently. Exhibit 3-2 shows the City of Palmdale General Plan Circulation Element and Exhibit 3-3 illustrates the City of Palmdale General Plan roadway cross-sections.

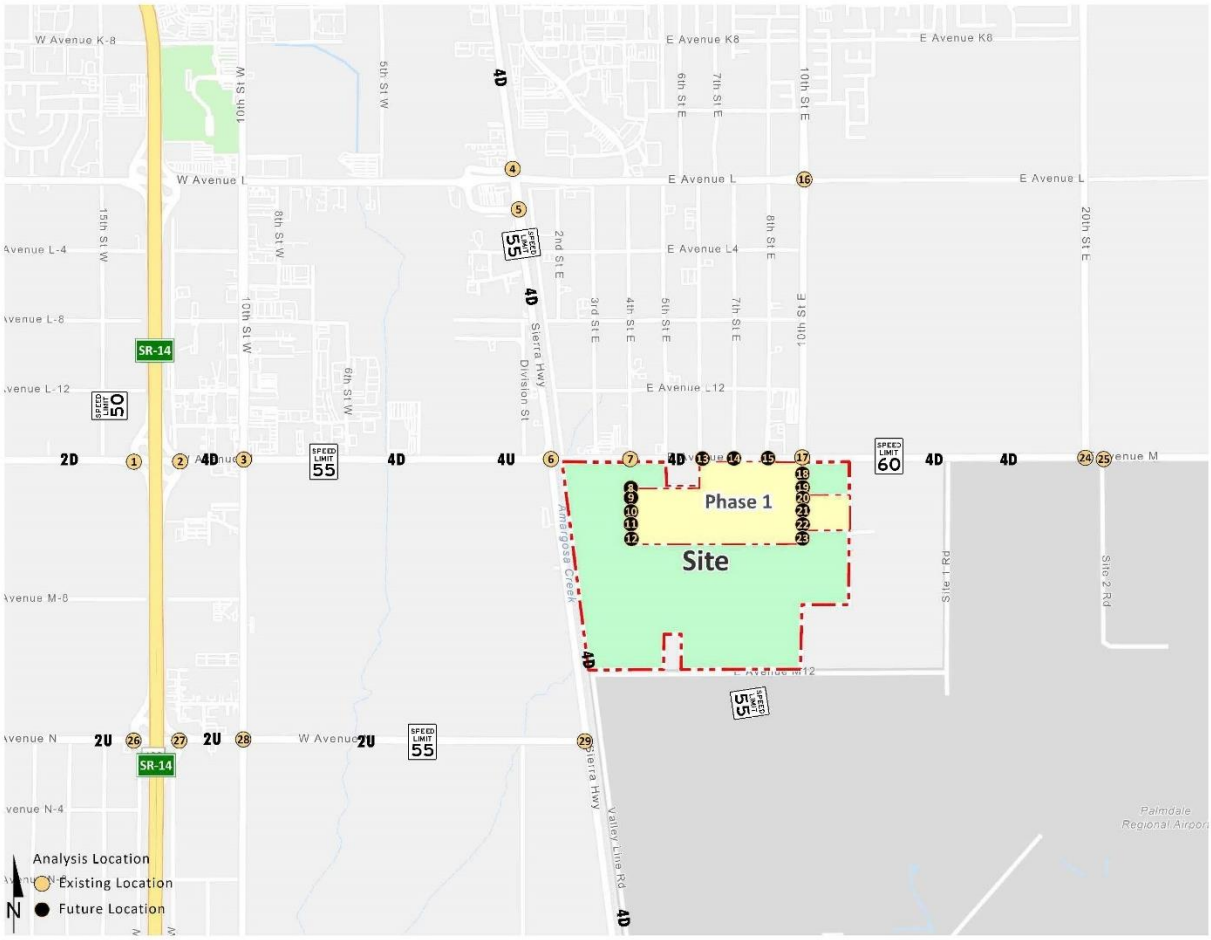
Regional Arterials can accommodate six-to-eight travel lines. These facilities primarily serve through traffic to which access from abutting property shall be kept at a minimum. The following roadways are classified as a Regional Arterial within the study area:

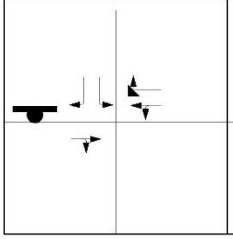
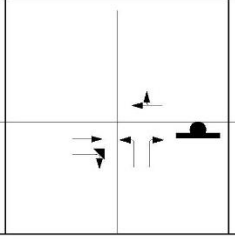
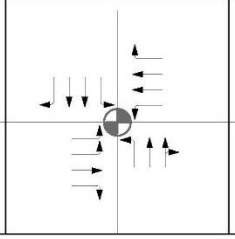
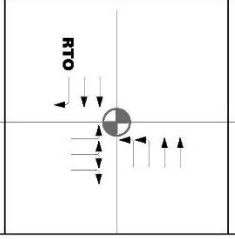
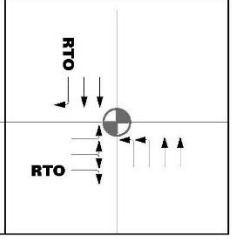
- Avenue M
- Sierra Highway, south of Avenue M
- 10th Street, south of Avenue M

Major Arterials can accommodate four-to-six travel lanes. These facilities serve property zoned for major industrial and commercial uses, or to serve through traffic. The following roadways are classified as a Major Arterial within the study area:

- Avenue N
- Challenger Way
- Division Street

EXHIBIT 3-1: EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS (PAGE 1 OF 2)



1 SR-14 SB Ramps & Avenue M	2 SR-14 NB Ramps & Avenue M	3 10th St. West & Avenue M	4 Sierra Hwy. & Avenue L West	5 Sierra Hwy. & Avenue L East
				

4 = Number of Lanes
D = Divided
U = Undivided
= Speed Limit (MPH)

= Traffic Signal
RA = Roundabout
= Stop Sign
RTO = Right Turn Overlap
= Free Right Turn

EXHIBIT 3-1: EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS (PAGE 2 OF 2)

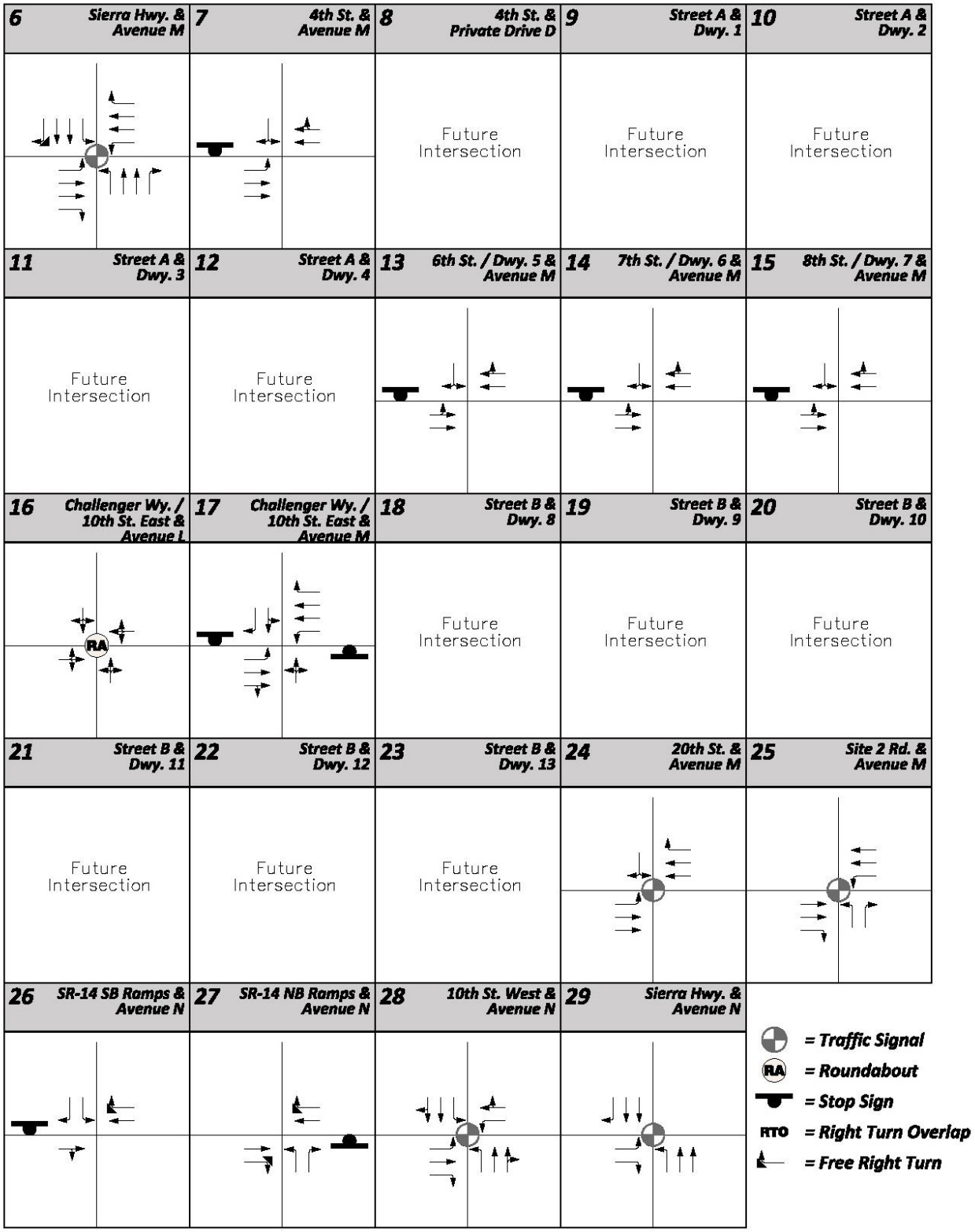


EXHIBIT 3-2: CITY OF PALMDALE GENERAL PLAN CIRCULATION ELEMENT

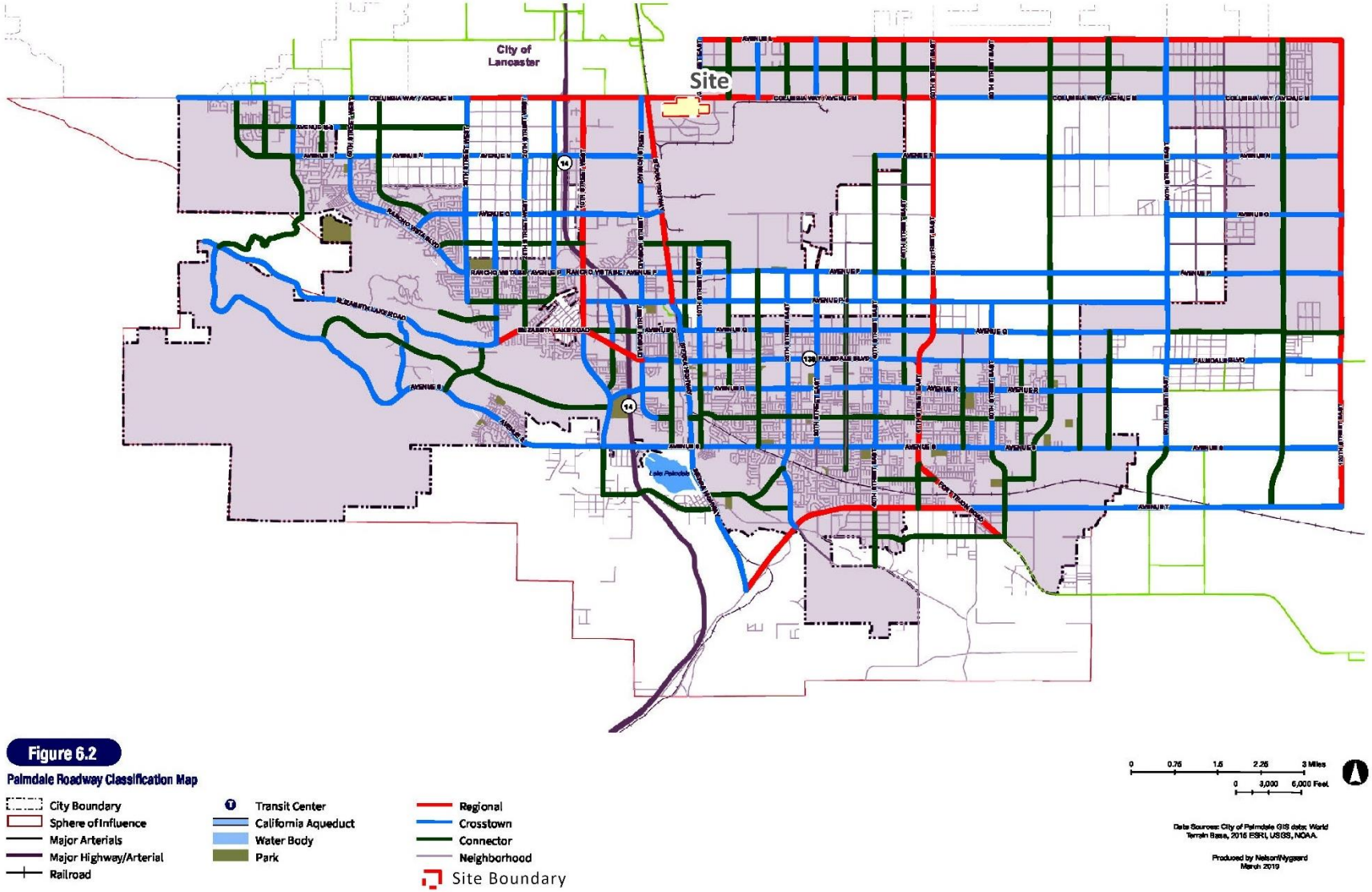


EXHIBIT 3-3: CITY OF PALMDALE GENERAL PLAN ROADWAY CROSS-SECTIONS (PAGE 1 OF 2)

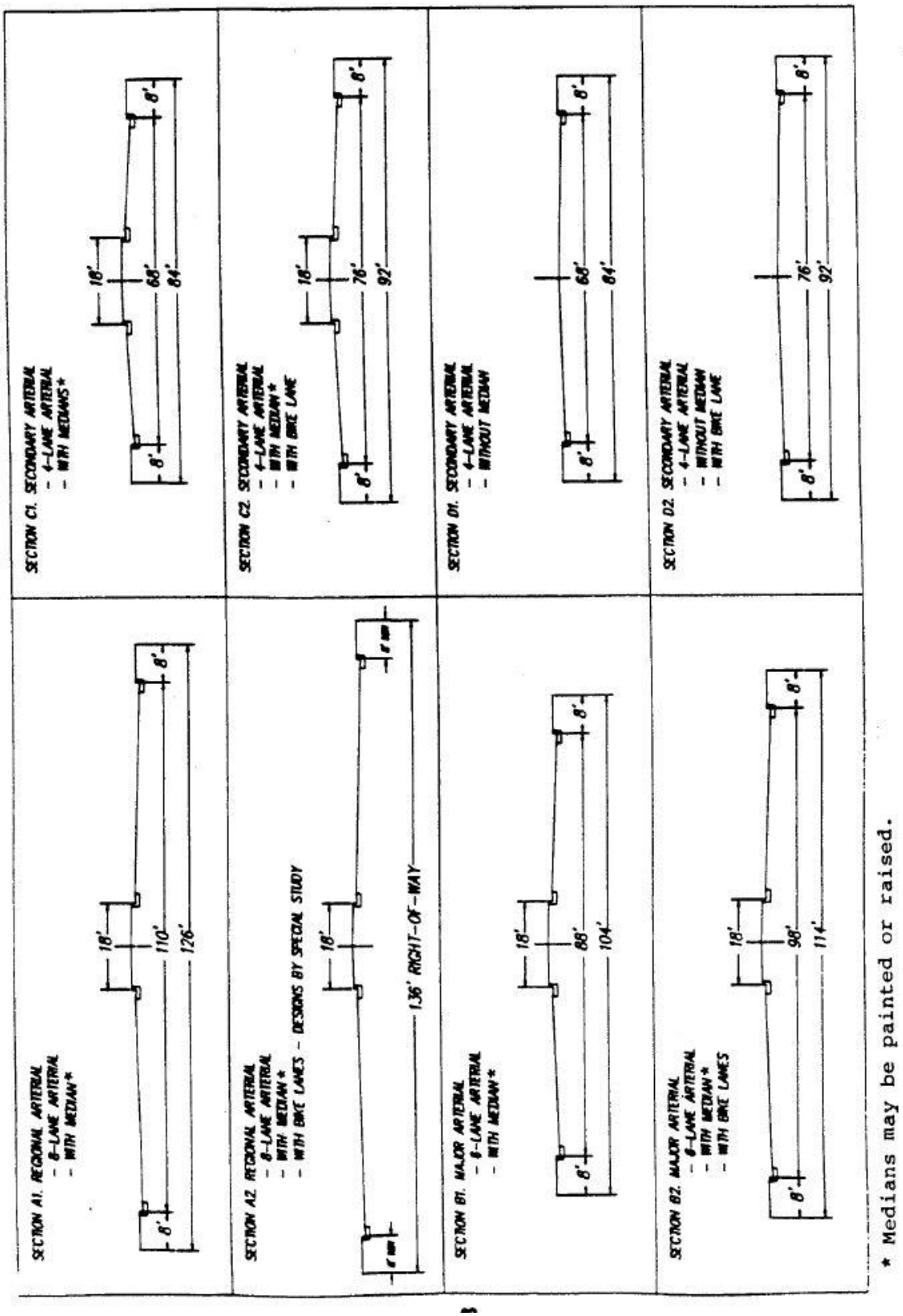
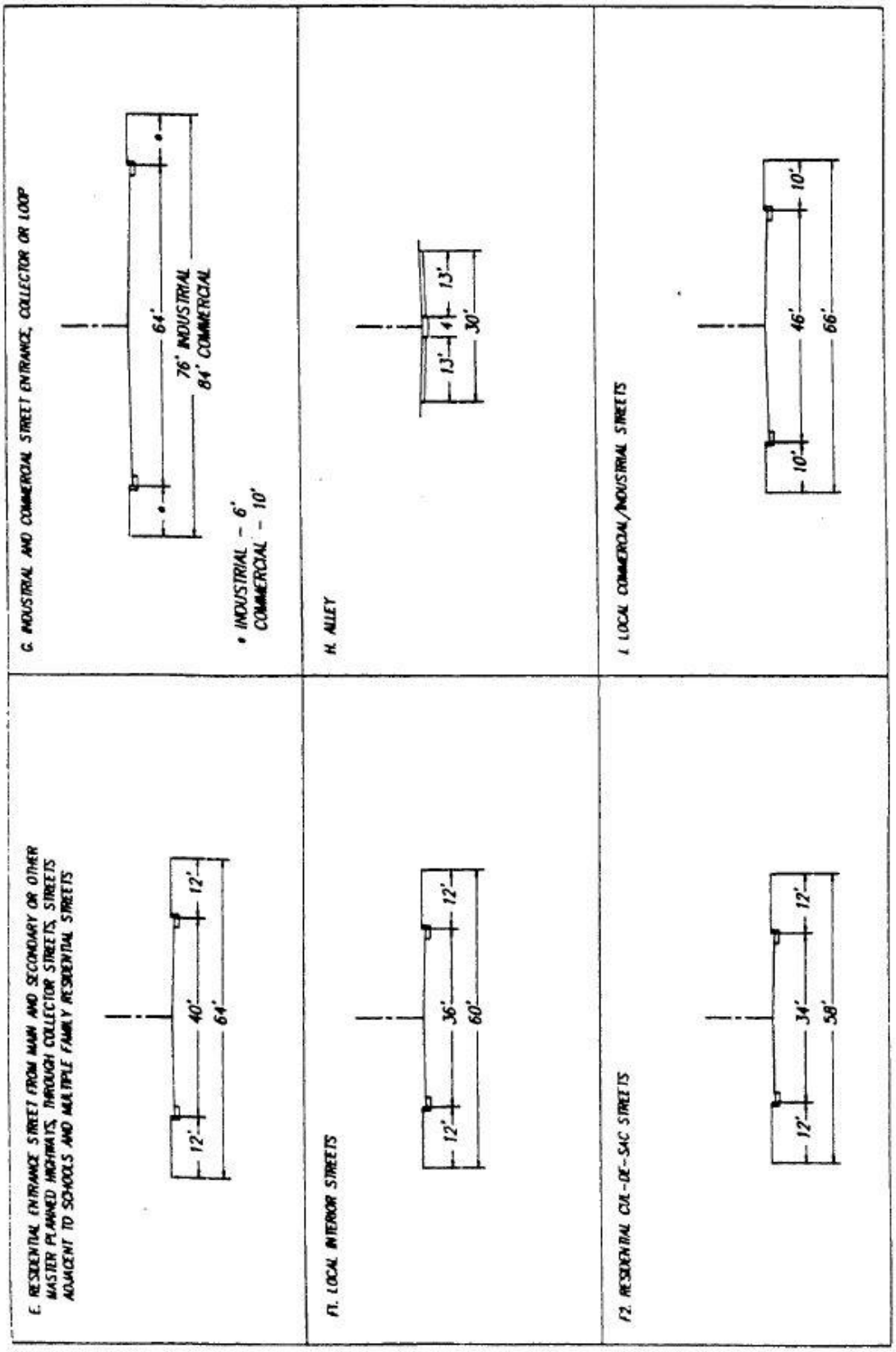


EXHIBIT 3-3: CITY OF PALMDALE GENERAL PLAN ROADWAY CROSS-SECTIONS (PAGE 2 OF 2)



3.3 CITY OF LANCASTER GENERAL PLAN CIRCULATION ELEMENT

The City of Lancaster does not provide a circulation map within their General Plan.

3.4 BICYCLE & PEDESTRIAN FACILITIES

In an effort to promote alternative modes of transportation, the City of Palmdale also includes a bikeway system. The City of Palmdale General Plan bikeway network, shown on Exhibit 3-4, shows the proposed bikeways within the City. There are existing bike routes along Sierra Highway in the vicinity of the Project site.

Existing pedestrian facilities within the study area are shown on Exhibit 3-5. As shown on Exhibit 3-5, there are limited pedestrian facilities in the vicinity of the Project site. Field observations and traffic counts conducted in May 2022 indicate light pedestrian and bicycle activity within the study area.

3.5 TRANSIT SERVICE

The study area within the City of Palmdale is currently served by Antelope Valley Transit Authority (AVTA), a public transit agency serving various jurisdictions within Los Angeles County. Based on a review of the existing transit routes within the vicinity of the proposed Project, AVTA Routes 4, 5, 785, and 786 run along Avenue M and Sierra Highway within the vicinity of the Project site and could potentially serve the Project site. Transit service is reviewed and updated by AVTA periodically to address ridership, budget, and community demand needs. Changes in land use can affect these periodic adjustments which may lead to either enhanced or reduced service where appropriate. As such, it is recommended that the applicant work in conjunction with AVTA to potentially provide bus service to the site. Existing transit routes in the vicinity of the study area are illustrated on Exhibit 3-6. The City of Palmdale transit routes are shown on Exhibit 3-7.

3.6 TRUCK ROUTES

The City of Palmdale designated truck routes are shown on Exhibit 3-8. As shown on Exhibit 3-8, Avenue M and Sierra Highway are identified as truck routes within the City of Palmdale. These truck routes have been utilized to route truck traffic from both the proposed Project and nearby cumulative development projects within the area.

3.7 EXISTING (2022) TRAFFIC COUNTS

The intersection LOS analysis is based on the traffic volumes observed during the peak hour conditions using traffic count data collected in May 2022. The following peak hours were selected for analysis:

- Weekday AM Peak Hour (peak hour between 7:00 AM and 9:00 AM)
- Weekday PM Peak Hour (peak hour between 4:00 PM and 6:00 PM)

EXHIBIT 3-4: CITY OF PALMDALE GENERAL PLAN BICYCLE FACILITIES

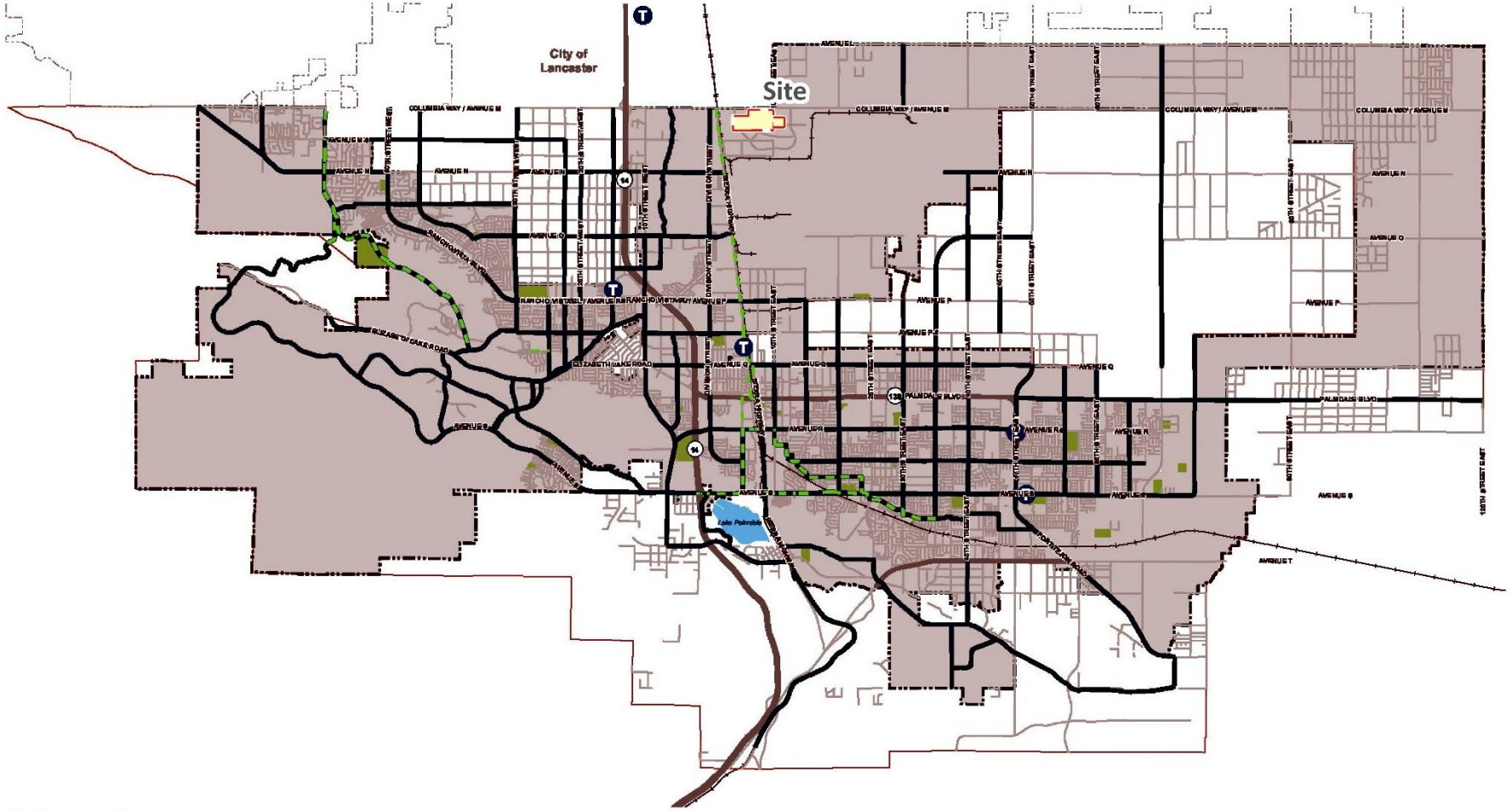


EXHIBIT 3-5: EXISTING PEDESTRIAN FACILITIES

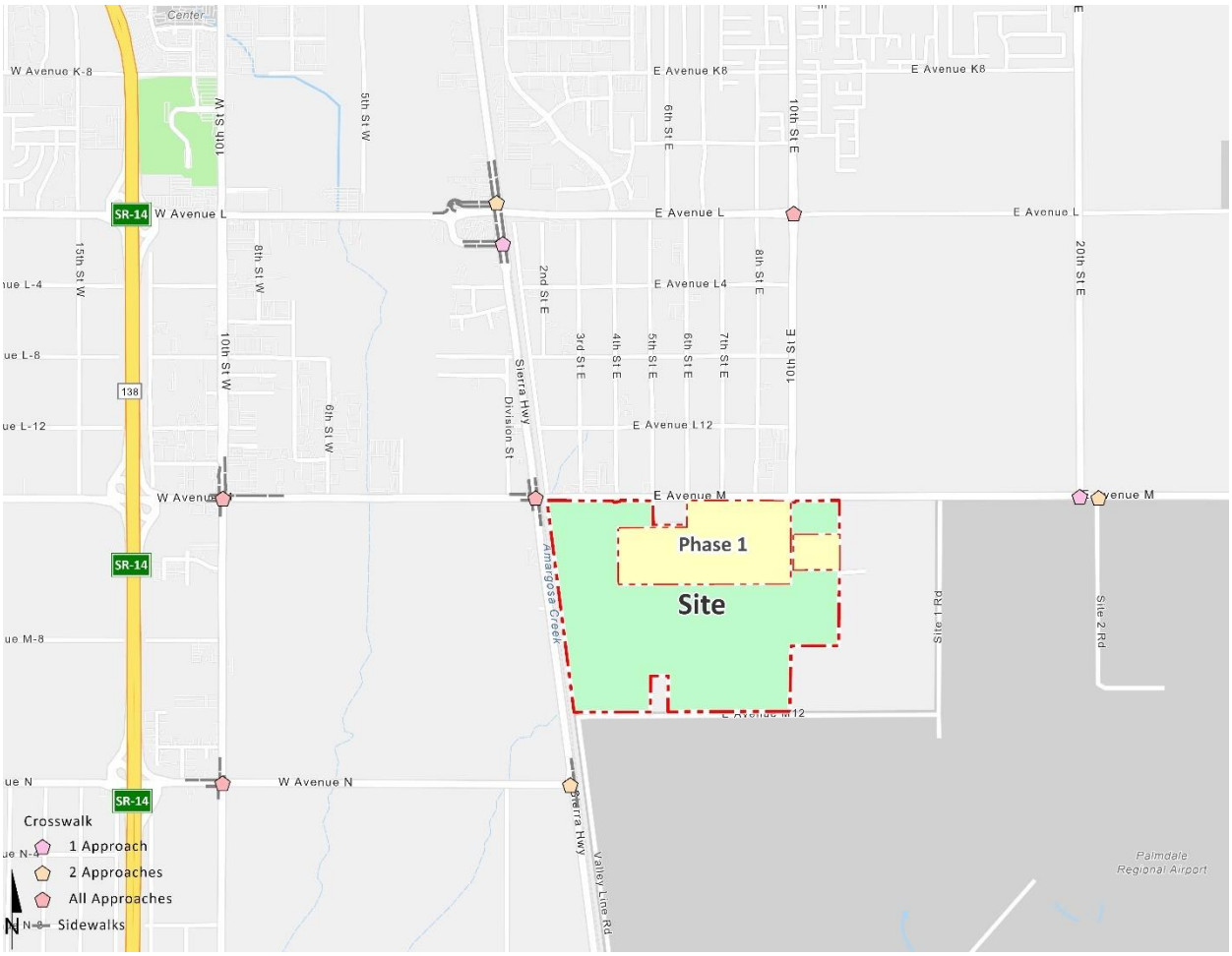


EXHIBIT 3-6: EXISTING TRANSIT ROUTES

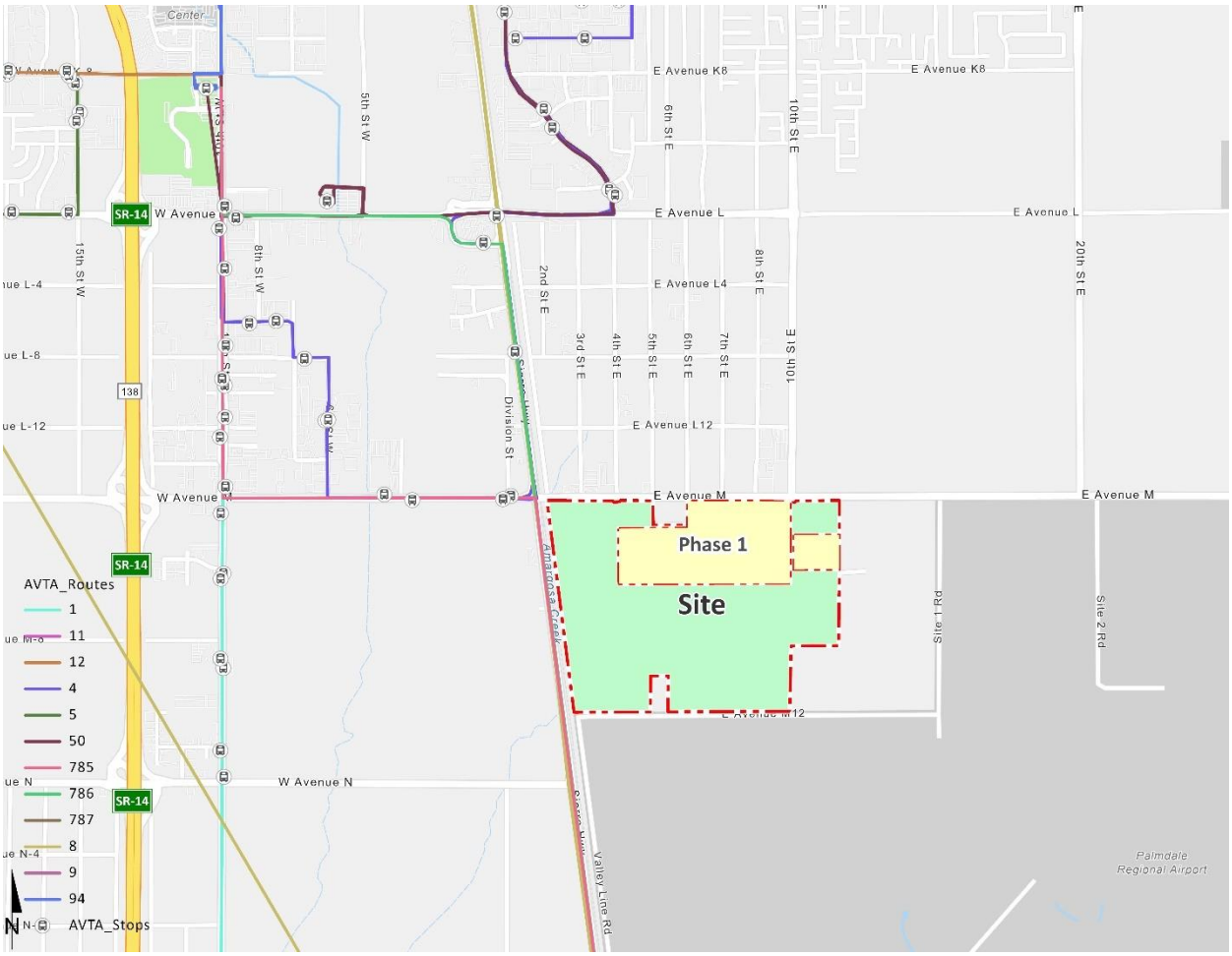


EXHIBIT 3-7: CITY OF PALMDALE TRANSIT ROUTES

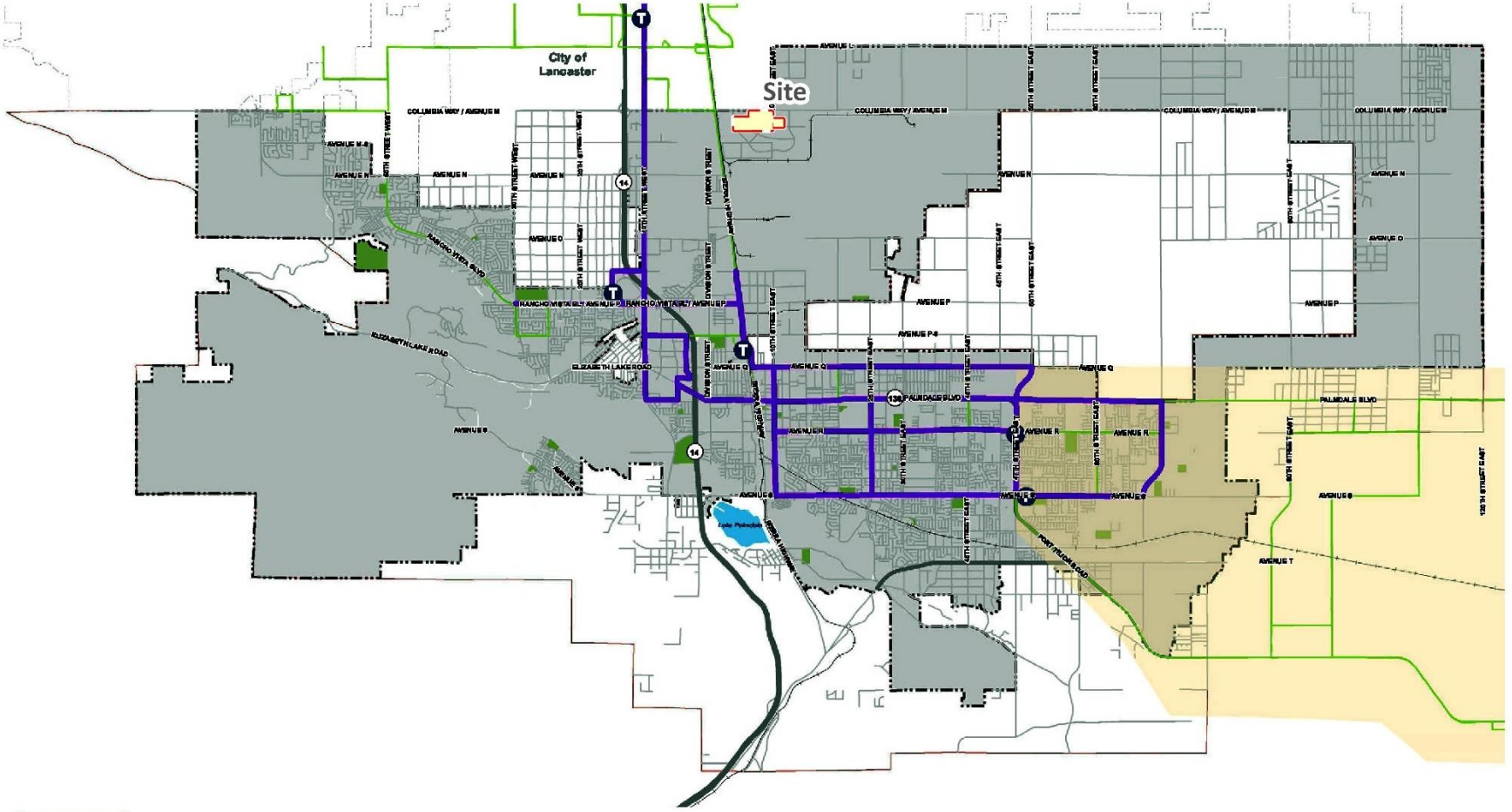
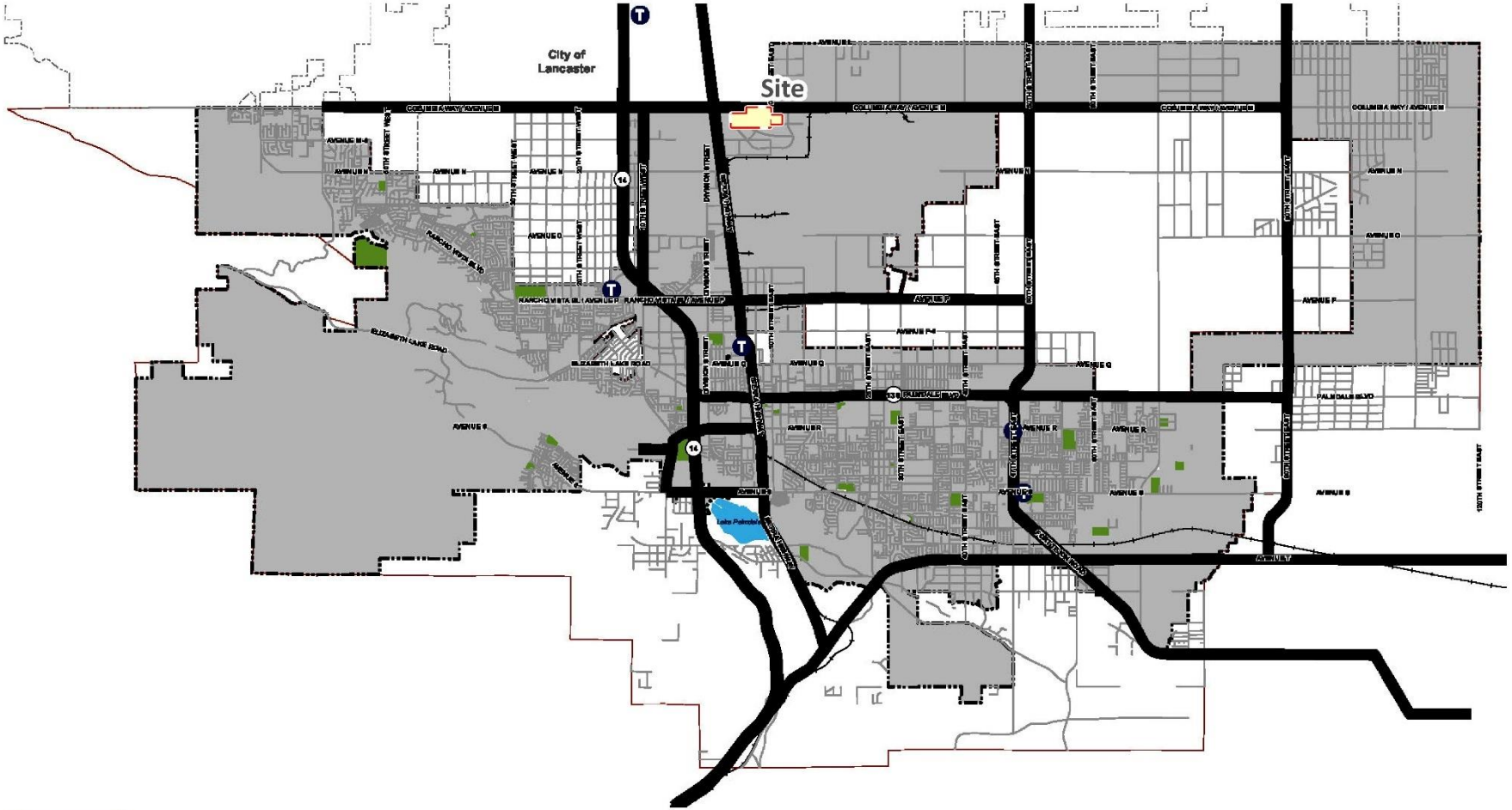


EXHIBIT 3-8: CITY OF PALMDALE TRUCK ROUTES



The 2022 weekday AM and weekday PM peak hour count data is representative of typical weekday peak hour traffic conditions in the study area. There were no observations made in the field that would indicate atypical traffic conditions on the count dates, such as construction activity or detour routes and near-by schools were in session and operating on normal schedules. As such, no additional adjustments were made to the traffic counts to establish the baseline condition. The raw manual peak hour turning movement traffic count data sheets are included in Appendix 3.1.

Existing weekday ADT volumes are shown on Exhibit 3-9. Where actual 24-hour tube count data was not available, Existing ADT volumes were based upon factored intersection peak hour counts collected by Urban Crossroads, Inc. using the following formula for each intersection leg:

Weekday PM Peak Hour (Approach Volume + Exit Volume) x 15.08 = Leg Volume

A comparison of the PM peak hour and daily traffic volumes of various roadway segments within the study area indicated that the peak-to-daily relationship is approximately 6.63 percent. As such, the above equation utilizing a factor of 15.08 estimates the ADT volumes on the study area roadway segments assuming a peak-to-daily relationship of approximately 6.63 percent (i.e., 1/0.0663 = 15.08) and was assumed to sufficiently estimate ADT volumes for planning-level analyses. Existing weekday and weekend peak hour intersection volumes, in actual vehicles, are also shown on Exhibit 3-9.

To represent the effect large trucks, buses, and recreational vehicles have on traffic flow, all trucks were converted into passenger car equivalent (PCE). By their size alone, these vehicles occupy the same space as two or more passenger cars. In addition, the time it takes for them to accelerate and slow-down is also much longer than for passenger cars and varies depending on the type of vehicle and number of axles. For this analysis, the following PCE factors have been used to estimate each turning movement: 1.5 for 2-axle trucks, 2.0 for 3-axle trucks, and 3.0 for 4+-axle trucks. These factors are consistent with the values recommended for use in the County's Guidelines.

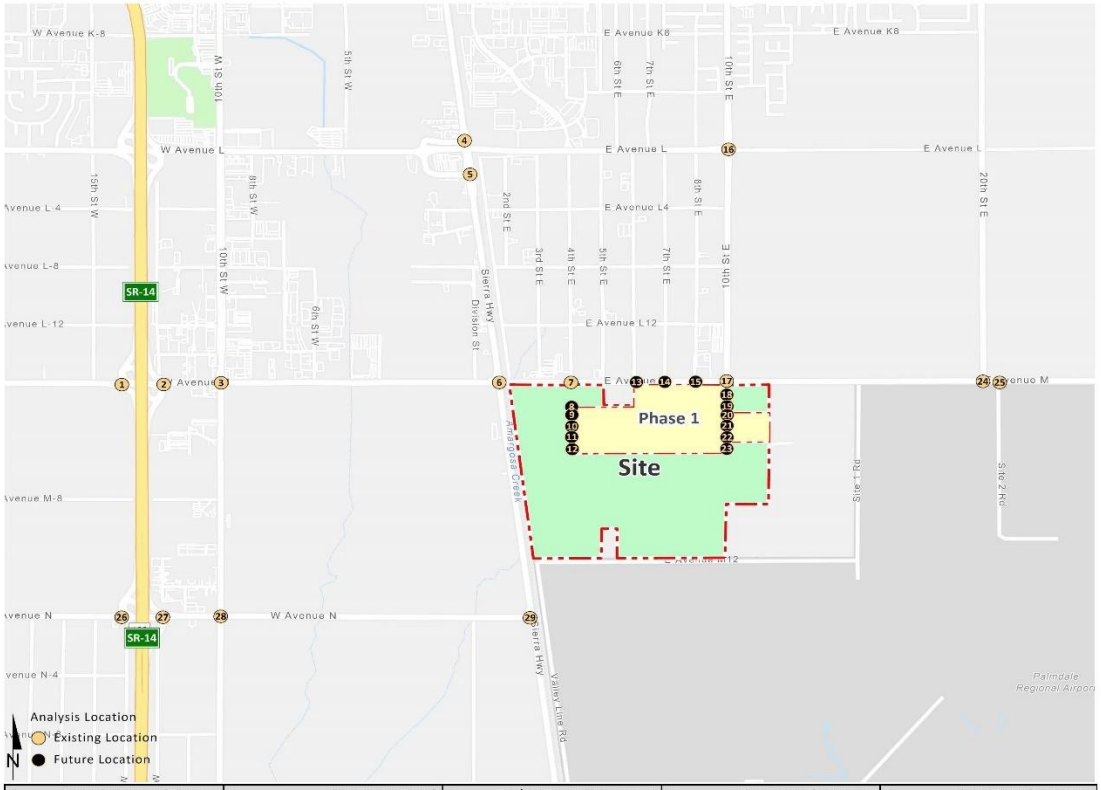
3.8 INTERSECTION OPERATIONS ANALYSIS

Existing peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2.2 *Intersection Capacity Analysis* of this report. The intersection operations analysis results are summarized in Table 3-1, which indicates that the following study area intersections are currently operating at an unacceptable LOS during the peak hours under Existing (2022) traffic conditions:

- SR-14 SB Ramps & Avenue M (#1) – LOS F AM peak hour only
- SR-14 NB Ramps & Avenue M (#2) – LOS F AM peak hour; LOS E PM peak hour
- 7th Street/Driveway 6 & Avenue M (#14) – LOS E AM and PM peak hours
- Challenger Way/10th Street East & Avenue M (#17) – LOS F PM peak hour only
- SR-14 SB Ramps & Avenue N (#26) – LOS E AM and PM peak hours
- SR-14 NB Ramps & Avenue N (#27) – LOS F PM peak hour only
- 10th Street West & Avenue N (#28) – LOS E PM peak hour only

The intersection operations analysis worksheets are included in Appendix 3.2 of this TA.

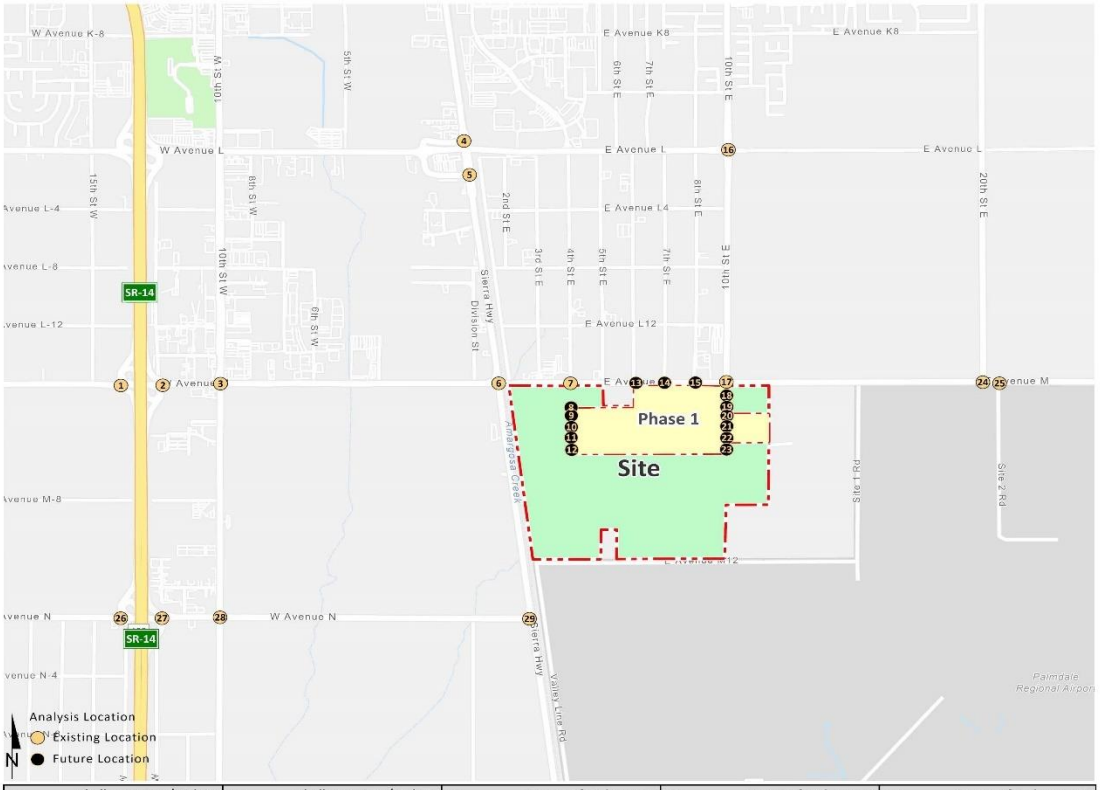
EXHIBIT 3-9: EXISTING (2022) TRAFFIC VOLUMES (ACTUAL VEHICLES) (PAGE 1 OF 2)



1 SR-14 SB Ramps & Avenue M	2 SR-14 NB Ramps & Avenue M	3 10th St. West & Avenue M	4 Sierra Hwy. & Avenue L West	5 Sierra Hwy. & Avenue L East
9,750 / 23,350 93(115) ↲ 161(124) ↳ ← 234(407) ← 391(695) 640(321) → 215(104) ↴ 18,650 / 1,550	5,300 / 31,250 ← 149(352) ← 555(1005) 696(421) → 105(24) ↴ 70(97) ↱ 273(293) 23,350 / 6,250	25,000 / 28,500 74(285) ↲ 270(544) ← 95(94) ↳ ↰ 120(145) ← 545(950) ↰ 84(167) 192(155) ↳ 600(439) → 92(54) ↴ 60(95) ↰ 310(435) ↑ 90(94) ↱ 29,850 / 20,950	23,850 / 26,550 61(92) ↲ 522(722) ↓ 14(16) ↳ 105(164) ↴ 72(123) ↑ 683(752) 5,950 / 26,550	26,550 / 28,150 14(17) ↲ 613(869) ↓ 51(72) ↳ 60(155) ↴ 24(39) ↰ 704(803) ↑ 4,250 / 28,150
6 Sierra Hwy. & Avenue M	**7 4th St. & Avenue M/Columbia Wy.**	**8 Street A & Private Drive D**	**9 Street A & Driveway 1**	**10 Street A & Driveway 2**
24,000 / 29,550 92(98) ↲ 456(654) ↓ 71(118) ↳ ← 119(83) ← 611(666) ← 277(319) 68(100) ↳ 423(465) → 60(93) ↴ 135(158) ↰ 512(540) ↑ 464(310) ↱ 23,850 / 31,300	4,700 / 30,700 86(135) ↲ 10(27) ↳ ← 64(37) ← 939(1027) 217(111) ↳ 783(946) → 33,450			
11 Street A & Driveway 3	**12 Street A & Driveway 4**	**13 6th St./Driveway 5 & Avenue M**	**14 7th St./Driveway 6 & Avenue M**	**15 8th St./Driveway 7 & Avenue M**
		Nominal / 30,900 2(1) ↲ 1(1) ↳ ← 1(0) ← 1022(1073) 800(975) → 30,900	Nominal / 30,900 1(1) ↲ 2(2) ← ← 1(0) ← 1022(1072) 1(1) ↳ 800(975) → 30,900	30,900 ← 1023(1072) 802(977) → 26,250

##(##) AM(PM) Peak Hour Intersection Volumes
Average Daily Trips

EXHIBIT 3-9: EXISTING (2022) TRAFFIC VOLUMES (ACTUAL VEHICLES) (PAGE 2 OF 2)



16 Challenger Wy./10th St. East & Avenue L	17 Challenger Wy./10th St. East & Avenue M	18 Street B & Driveway 8	19 Street B & Driveway 9	20 Street B & Driveway 10
17,250 / 10,850 327(247) 249(197) 4(15) 28(25) 329(185) 17(4) 208(364) 204(419) 32(32) 38(31) 191(296) 21(70) 19,250 / 9,500	7,650 / 26,250 198(170) 19(53) 113(48) 825(901) 171(237) 631(740) 0(1) 30,900	0(1)	0(1)	0(1)

21 Street B & Driveway 11	22 Street B & Driveway 12	23 Street B & Driveway 13	24 20th St. & Avenue M	25 Site 2 Rd. & Avenue M
0(1)	0(1)	0(1)	6,200 / 24,200 195(108) 60(65) 28(54) 724(941) 63(184) 614(543) 26,800	24,200 / 23,600 739(948) 4(1) 630(606) 44(2) 13(47) 13(47) 6(9) 24,200 / 900

26 SR-14 SB Ramps & Avenue N	27 SR-14 NB Ramps & Avenue N	28 10th St. West & Avenue N	29 Sierra Hwy. & Avenue N
7,550 / 18,750 89(298) 165(131) 35(72) 248(678) 645(362) 249(141) 22,300 / 2,150	6,250 / 19,350 123(415) 136(481) 456(322) 354(170) 146(269) 124(65) 18,750 / 7,600	21,650 / 8,450 52(114) 333(635) 14(40) 34(15) 128(323) 8(31) 146(103) 182(135) 124(128) 106(298) 312(529) 4(16) 16,600 / 24,700	36,850 35(102) 783(1143) 94(83) 106(109) 135(266) 1029(1117) 8,450 / 39,750

##(##) AM(PM) Peak Hour Intersection Volumes
Average Daily Trips

TABLE 3-1: INTERSECTION ANALYSIS FOR EXISTING (2022) CONDITIONS

#	Intersection	Traffic Control[2]	Delay[1] (secs.) AM	Delay[1] (secs.) PM	Level of Service AM	Level of Service PM
1	SR-14 SB Ramps & Avenue M	CSS	**62.4**	33.2	**F**	D
2	SR-14 NB Ramps & Avenue M	CSS	**56.6**	**38.0**	**F**	**E**
3	10th St. West & Avenue M	TS	31.7	44.3	C	D
4	Sierra Hwy. & Avenue L West	TS	9.8	11.2	A	B
5	Sierra Hwy. & Avenue L East	TS	9.6	11.0	A	B
6	Sierra Hwy. & Avenue M	TS	38.2	54.6	D	D
7	4th St. & Avenue M/Columbia Wy.	CSS	23.5	28.6	C	D
8	Street A & Private Drive D		Future Intersection			
9	Street A & Driveway 1		Future Intersection			
10	Street A & Driveway 2		Future Intersection			
11	Street A & Driveway 3		Future Intersection			
12	Street A & Driveway 4		Future Intersection			
13	6th St./Driveway 5 & Avenue M	CSS	28.9	32.3	D	D
14	7th St./Driveway 6 & Avenue M	CSS	**40.1**	**39.1**	**E**	**E**
15	8th St./Driveway 7 & Avenue M	CSS	0.0	0.0	A	A
16	Challenger Wy./10th St. East & Avenue L	RA	10.9	15.4	B	C
17	Challenger Wy./10th St. East & Avenue M	CSS	17.7	**69.4**	C	**F**
18	Street B & Driveway 8		Future Intersection			
19	Street B & Driveway 9		Future Intersection			
20	Street B & Driveway 10		Future Intersection			
21	Street B & Driveway 11		Future Intersection			
22	Street B & Driveway 12		Future Intersection			
23	Street B & Driveway 13		Future Intersection			
24	20th St. & Avenue M	TS	12.4	16.2	B	B
25	Site 2 Rd. & Avenue M	TS	5.4	6.6	A	A
26	SR-14 SB Ramps & Avenue N	CSS	**36.2**	**39.6**	**E**	**E**
27	SR-14 NB Ramps & Avenue N	CSS	16.9	**58.3**	C	**F**
28	10th St. West & Avenue N	TS	22.8	**56.3**	C	**E**
29	Sierra Hwy. & Avenue N	TS	14.0	17.9	B	B

* **BOLD** = Level of Service (LOS) does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

1 Per the Highway Capacity Manual (6th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. HCM delay reported in seconds.

2 TS = Traffic Signal; CSS = Cross-street Stop; RA = Roundabout

3.9 TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants for Existing traffic conditions are based on existing peak hour intersection turning volumes. The following unsignalized study area intersections currently meet a traffic signal warrant under Existing (2022) traffic conditions:

- SR-14 SB Ramps & Avenue M (#1)
- SR-14 NB Ramps & Avenue M (#2)
- 4th Street & Avenue M/Columbia Way (#7)
- Challenger Way/10th Street East & Avenue L (#16)
- Challenger Way/10th Street East & Avenue M (#17)
- SR-14 SB Ramps & Avenue N (#26)
- SR-14 NB Ramps & Avenue N (#27)

Existing conditions traffic signal warrant analysis worksheets are provided in Appendix 3.3.

3.10 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the study area off-ramps at the SR-14 Freeway at the Avenue M and Avenue N interchanges to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially "spill back" onto the SR-14 Freeway mainline. Queuing analysis findings are presented in Table 3-2. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline. As shown in Table 3-2, there are no movements that are currently experiencing queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows. Worksheets for Existing (2022) traffic conditions off-ramp queuing analysis are provided in Appendix 3.4.

TABLE 3-2: PEAK HOUR OFF-RAMP QUEUING SUMMARY FOR EXISTING (2022) CONDITIONS

Intersection	Movement	Available Stacking Distance (Feet)	95th Percentile Queue (Feet)		Acceptable? [1]	
			AM Peak Hour	PM Peak Hour	AM	PM
SR-14 SB Ramps & Avenue M (#1)	SBL	1,335	190	98	Yes	Yes
	SBR	330	15	35	Yes	Yes
SR-14 NB Ramps & Avenue M (#2)	NBL	1,375	80	123	Yes	Yes
	NBR	340	215	80	Yes	Yes
SR-14 SB Ramps & Avenue N (#26)	SBL	1,395	133	100	Yes	Yes
	SBR	335	13	160	Yes	Yes
SR-14 NB Ramps & Avenue N (#27)	NBL	1,380	48	228	Yes	Yes
	NBR	290	28	8	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

3.11 DEFICIENCIES AND IMPROVEMENTS

Improvements needed to achieve acceptable LOS have been identified at intersections or off-ramps that are currently operating at a deficient LOS under Existing (2022) traffic conditions.

3.11.1 IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

Improvement strategies have been recommended at intersections that are currently operating at a deficient LOS under Existing (2022) traffic conditions in an effort to achieve an acceptable LOS (i.e., LOS D or better). The effectiveness of the recommended improvement strategies to address Existing (2022) traffic deficiencies are presented in Table 3-2. Worksheets for Existing (2022), with improvements, intersection operations are provided in Appendix 3-5.

TABLE 3-3: INTERSECTION ANALYSIS FOR EXISTING (2022) CONDITIONS WITH IMPROVEMENTS

		Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service	
	Traffic	Northbound			Southbound			Eastbound			Westbound						
	Control[3]	L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
1 SR-14 SB Ramps & Avenue M																	
Without Improvements:	CSS	0	0	0	1	0	1	0	1	1>>	0	1	1>>	**62.4**	33.2	**F**	D
With Improvements:	**TS**	0	0	0	1	0	1	0	1	1>>	0	1	1>>	12.4	12.6	B	B
2 SR-14 NB Ramps & Avenue M																	
Without Improvements:	CSS	1	0	1	0	0	0	0	1	1>>	0	1	1>>	**56.6**	**38.0**	**F**	**E**
With Improvements:	**TS**	1	0	1	0	0	0	0	1	1>>	0	1	1>>	22.2	22.9	C	C
14 7th St./Driveway 6 & Avenue M																	
Without Improvements:	CSS	0	0	0	0	1	0	**1**	2	0	0	2	0	**40.1**	**39.1**	**E**	**E**
With Improvements:	CSS	0	0	0	0	1	0	**1**	2	0	0	2	0	21.6	20.7	C	C
17 Challenger Wy./10th St. East & Avenue M																	
Without Improvements:	CSS	1	1	0	1	0	1	1	2	0	1	2	1	17.7	**69.4**	C	**F**
With Improvements:	**TS**	1	1	0	1	0	1	1	2	0	1	2	1	16.6	18.0	B	B
26 SR-14 SB Ramps & Avenue N																	
Without Improvements:	CSS	0	0	0	1	0	1	0	1	1>>	0	1	1>>	36.2	**39.6**	E	**E**
With Improvements:	**TS**	0	0	0	1	0	1	0	1	1>>	0	1	1>>	12.8	17.7	B	B
27 SR-14 NB Ramps & Avenue N																	
Without Improvements:	CSS	1	0	1	0	0	0	0	1	1>>	0	1	1>>	16.9	**58.3**	C	**F**
With Improvements:	**TS**	1	0	1	0	0	0	0	1	1>>	0	1	1>>	11.6	12.4	B	B
28 10th St. & Avenue N																	
Without Improvements:	TS	1	2	0	1	2	0	1	1	1	1	1	0	22.8	**56.3**	C	**E**
With Improvements:	TS	1	2	0	1	2	0	1	**2**	1	1	**2**	0	21.3	35.7	C	D

* **BOLD** = Level of Service (LOS) does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; **1** = Improvement; >> = Free-Right Turn

[2] Per the Highway Capacity Manual (6th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] CSS = Cross-street Stop; TS = Traffic Signal; **TS** = Improvement

3.11.2 IMPROVEMENTS TO ADDRESS DEFICIENCIES ON OFF-RAMP QUEUES

As shown previously in Table 3-2, there are no movements that are currently experiencing queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for Existing (2022) traffic conditions. As such, no improvements have been identified.

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4 PROJECTED FUTURE TRAFFIC

This section presents the traffic volumes estimated to be generated by the Project, as well as the Project's trip assignment onto the study area roadway network. A preliminary site plan for the proposed Project is shown previously on Exhibit 1-2. The Project is proposed to consist of the following uses for each phase:

- Phase 1:
  - Building 1 is 136,670 square feet
  - Building 2 is 144,306 square feet
  - Building 3 is 132,695 square feet
  - Buildings 1 through 3 will assume 25% general light industrial and 75% general warehousing use
  - Building 4 is 680,469 square feet of high-cube fulfillment center (sort) warehouse use
  - Building 5 is 1,004,228 square feet with 25% high-cube cold storage warehouse use and high-cube fulfillment center (non-sort) warehouse use
  - Building 6 is 274,858 square feet with 25% manufacturing and 75% general warehousing use
- Phase 2:
  - 1,630,362 square feet of high-cube parcel hub warehousing use
  - 549,790 square feet with 25% manufacturing and 75% general warehousing use
- Phase 3:
  - 1,156,576 square feet with 25% high-cube cold storage warehouse use and 75% high-cube fulfillment (non-sort) warehousing use
  - 2,500 square feet of fast-food restaurant without drive-through window use, 2,500 square feet of fast-food restaurant with drive-through window use, 2,000 square feet of coffee shop with drive-through window use, and 53,984 square feet of commercial retail use (for a total of 60,984 square feet)
- Phase 4:
  - 2,555,556 square feet with 25% high-cube cold storage warehouse use and 75% high-cube fulfillment (non-sort) warehousing use

A summary of the land uses by phase is provided in Table 4-1. The proposed Project is anticipated to have an opening year of 2025 for Phase 1 and 2032 for Project Buildout. Access is proposed along Avenue M and an easterly connection to the Palmdale Regional Airport. Regional access to the Project site is available from the SR-14 Freeway and Avenue M and Avenue N interchanges.

4.1 PROJECT TRIP GENERATION

Trip generation represents the amount of traffic which is both attracted to and produced by a development. Determining traffic generation for a specific project is therefore based upon forecasting the amount of traffic that is expected to be both attracted to and produced by the specific land uses being proposed for a given development.

TABLE 4-1: PROPOSED PROJECT LAND USE SUMMARY

Land Use	Quantity	Units[1]
Phase 1		
General Light Industrial	103.418	TSF
Manufacturing	68.715	TSF
Warehousing	516.396	TSF
High-Cube Fulfillment (Non-Sort)	753.171	TSF
High-Cube Fulfillment (Sort)	680.469	TSF
High-Cube Cold Storage	251.057	TSF
Project Buildout (Phase 2-4)		
Manufacturing	137.448	TSF
Warehousing	412.342	TSF
High-Cube Parcel Hub	1,630.362	TSF
High-Cube Fulfillment (Non-Sort)	867.432	TSF
High-Cube Cold Storage	289.144	TSF
High-Cube Cold Storage	638.889	TSF
High-Cube Fulfillment (Non-Sort)	1,916.667	TSF
Fast-Food Restaurant Without Drive-Thru	2.500	TSF
Fast-Food Restaurant With Drive-Thru	2.500	TSF
Coffee Shop With Drive-Thru	2.000	TSF
Commercial Retail	53.984	TSF
Total Industrial	**8,265.510**	**TSF**
Total Retail	**60.984**	**TSF**

[1] TSF = Thousand Square Feet

In order to develop the traffic characteristics of the proposed Project, trip-generation statistics published in the ITE Trip Generation Manual (11th Edition, 2021) was used to estimate the trip generation. For purposes of this analysis, the following land use codes and vehicle mixes have been utilized:

- ITE land use code 110 (General Light Industrial) has been used to derive site specific trip generation estimates. A light industrial facility is a free-standing facility devoted to a single use that has an emphasis on activities other than manufacturing. Typically, there is minimum office space. The vehicle mix has been obtained from the ITE's Trip Generation Manual. The truck percentages were further broken down by axle type per the following SCAQMD recommended truck mix: 2-Axle = 16.7%; 3-Axle = 20.7%; 4+-Axle = 62.6%.
- ITE land use code 140 (Manufacturing) has been used to derive site specific trip generation estimates. A manufacturing facility is an area where the primary activity is the conversion of raw materials or parts into finished products. Size and type of activity may vary substantially from one facility to another. In addition to the actual production of goods, manufacturing facilities generally also have office, warehouse, research, and associated functions. The vehicle mix has been obtained from the ITE's Trip Generation Manual. The truck percentages were further broken down by axle type per the following SCAQMD recommended truck mix: 2-Axle = 16.7%; 3-Axle = 20.7%; 4+-Axle = 62.6%.
- ITE land use code 150 (Warehousing) has been used to derive site specific trip generation estimates. A warehouse is primarily devoted to the storage of materials but may also include office and maintenance areas. The vehicle mix has been obtained from the ITE's Trip Generation Manual. The truck percentages were further broken down by axle type per the following SCAQMD recommended truck mix: 2-Axle = 16.7%; 3-Axle = 20.7%; 4+-Axle = 62.6%.
- High-Cube Fulfillment Center Warehouse (ITE Land Use Code 155) has been used to derive site specific trip generation estimates. The ITE Trip Generation Manual has trip generation rates for high-cube fulfillment center use for both non-sort and sort facilities (ITE land use code 155). As defined by ITE, *a high-cube warehouse 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 high-cube warehouse has a high level of on-site automation and logistics management. The automation and logistics enable highly-efficient processing of goods through the high-cube warehouse.* The ITE Trip Generation Manual has two subcategories for the High-Cube Fulfillment Center use: sort and non-sort. ITE describes a sort facility as a *fulfillment center that ships out smaller items, requiring extensive sorting, typically by manual means*. In comparison, *a non-sort facility is a fulfillment center that ships large box items that are processed primarily with automation rather than through manual means*. Some limited assembly and repackaging may occur within the facility. Given this description, both sort and non-sort facility has been assumed for the purposes of calculating trip generation for the Project. The vehicle mix (passenger cars versus trucks) has been obtained from the ITE's Trip Generation Manual. The truck percentages were further broken down by axle type per the following SCAQMD recommended truck mix: 2-Axle = 16.7%; 3-Axle = 20.7%; 4+-Axle = 62.6%.
- ITE land use code 156 (High-Cube Parcel Hub Warehouse) has been used to derive site specific trip generation estimates High-cube parcel hub warehouses typically serve a regional and local freight-forwarder facility for time sensitive shipments via airfreight and ground carriers. The High-Cube Parcel Hub Warehouse vehicle mix (passenger cars versus trucks) has been obtained from the ITE's Trip Generation Manual. The truck percentages were further broken down by axle type per the following SCAQMD recommended truck mix: 2-Axle = 16.7%; 3-Axle = 20.7%; 4+-Axle = 62.6%.

- ITE land use code 157 (High-Cube Cold Storage Warehouse) has been used to derive site specific trip generation estimates. High-cube cold storage warehouses include warehouses characterized by 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. High-cube cold storage warehouses are facilities typified by temperature-controlled environments for frozen food or other perishable products. The High-Cube Cold Storage Warehouse vehicle mix (passenger cars versus trucks) has been obtained from the ITE's Trip Generation Manual. The truck percentages were further broken down by axle type per the following SCAQMD recommended truck mix: 2-Axle = 34.7%; 3-Axle = 11.0%; 4+-Axle = 54.3%.
- Shopping Center (40,000-150,000 square feet, no grocery store) (ITE Land Use Code 821)
- Fast-Food Restaurant Without Drive-Through Window (ITE Land Use Code 933)
- Fast-Food Restaurant With Drive-Through Window (ITE Land Use Code 934)
- Coffee/Donut Shop With Drive-Through Window (ITE Land Use Code 937)

Refinements to the raw trip generation estimates have been made to provide a more detailed breakdown of trips between passenger cars and trucks. Trip generation for heavy trucks was further broken down by truck type (or axle type). The total truck percentage is comprised of 3 different truck types: 2-axle, 3-axle, and 4+-axle trucks. PCE factors were applied to the trip generation rates for heavy trucks (large 2-axles, 3-axles, 4+-axles). PCEs allow the typical "real-world" mix of vehicle types to be represented as a single, standardized unit, such as the passenger car, to be used for the purposes of capacity and level of service analyses. The PCE factors are consistent with the recommended PCE factors in County's Guidelines.

As the Project is proposed to include shopping center and restaurant uses, pass-by percentages have been obtained from the ITE Trip Generation Manual (3rd Edition, 2021). (8) Pass-by trips account for trips that are currently on the existing roadway network that would stop by uses within the proposed Project on their way to their ultimate destination. Pass-by trip reductions will be accounted for off-site intersections but will be added back to applicable commercial serving driveways to ensure access analysis accounts for all trips. Patrons of the uses may also visit other uses on-site, including the restaurants, and retail uses, without leaving the site. The ITE Trip Generation Handbook has been utilized to determine the internal capture for the applicable mix of uses.

Internal capture is a percentage reduction that can be applied to the trip generation estimates for individual land uses to account for trips internal to the site. In other words, trips may be made between individual retail uses on-site and can be made either by walking or using internal roadways without using external streets. As the trip generation for the site was conservatively estimated based on individual land uses (commercial and restaurant uses) as opposed to the average ITE Shopping Center rate, an internal capture reduction was applied to recognize the interactions that would occur between the various complementary land uses. In addition, the Project includes uses that would likely interact with the restaurant and shopping center uses. The internal capture is based on the National Cooperative Highway Research Program's (NCHRP Report 684) internal capture trip capture estimation tool. The NCHRP internal capture estimation tool is based on the methodology outlined in the ITE Trip Generation Handbook. These internal capture worksheets are attached to this scoping agreement.

The proposed Project trip generation rates and trip generation summary, in actual vehicles, are provided in Tables 4-2 and 4-3, respectively. As shown in Table 4-3, the buildout of the proposed Project is anticipated to generate 26,214 two-way trip-ends per day in actual vehicles, with 2,958 actual AM peak hour trips and 3,124 actual PM peak hour trips. The trip generation rates and trip generation summary for the Project, in PCE, is shown in Tables 4-4 and 4-5, respectively. For the purposes of the peak hour intersection operations analyses, the PCE trip generation has been utilized. The detailed trip generation tables, in both actual vehicles and PCE, are provided in Appendix 4.1.

4.2 PROJECT TRIP DISTRIBUTION

The Project trip distribution and assignment process represents the directional orientation of traffic to and from the Project site. The trip distribution pattern is heavily influenced by the geographical location of the site, the location of surrounding uses, and the proximity to the regional freeway system. In addition, truck routes for neighboring agencies have been taken into consideration in the development of the trip distribution patterns for heavy trucks. Exhibit 4-1 shows the Project truck trip distribution, Exhibit 4-2 shows the Project passenger car trip distribution, while Exhibit 4-3 shows the Project retail trip distribution.

4.3 MODAL SPLIT

The potential for Project trips to be reduced by the use of public transit, walking or bicycling have not been included as part of the Project's estimated trip generation. Essentially, the Project's traffic projections are "conservative" in that these alternative travel modes would reduce the forecasted traffic volumes.

4.4 PROJECT TRIP ASSIGNMENT

The assignment of traffic from the Project area to the adjoining roadway system is based upon the Project trip generation, trip distribution, and the arterial highway and local street system improvements that would be in place by the time of initial occupancy of the Project. Based on the identified Project traffic generation and trip distribution patterns, Project (Phase 1) and Project (Buildout) weekday ADT and weekday peak hour intersection turning movement volumes, in actual vehicles, are shown on Exhibits 4-4 and 4-5, respectively.

TABLE 4-2: PROJECT TRIP GENERATION RATES (ACTUAL VEHICLES)

Land Use[1]	ITE Code	Units[2]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
General Light Industrial[3]	110	TSF	0.651	0.089	0.740	0.091	0.559	0.650	4.870
Passenger Cars			0.645	0.085	0.730	0.086	0.554	0.640	4.620
2-Axle Trucks			0.001	0.001	0.002	0.001	0.001	0.002	0.042
3-Axle Trucks			0.001	0.001	0.002	0.001	0.001	0.002	0.052
4+-Axle Trucks			0.004	0.002	0.006	0.003	0.003	0.006	0.157
Manufacturing[3]	140	TSF	0.517	0.163	0.680	0.229	0.511	0.740	4.750
Passenger Cars			0.500	0.150	0.650	0.217	0.493	0.710	4.300
2-Axle Trucks			0.003	0.002	0.005	0.002	0.003	0.005	0.075
3-Axle Trucks			0.003	0.003	0.006	0.003	0.004	0.006	0.093
4+-Axle Trucks			0.011	0.008	0.019	0.008	0.011	0.019	0.282
Warehousing[3]	150	TSF	0.131	0.039	0.170	0.050	0.130	0.180	1.710
Passenger Cars			0.120	0.030	0.150	0.034	0.116	0.150	1.110
2-Axle Trucks			0.002	0.001	0.003	0.003	0.002	0.005	0.100
3-Axle Trucks			0.002	0.002	0.004	0.003	0.003	0.006	0.124
4+-Axle Trucks			0.007	0.006	0.013	0.010	0.009	0.019	0.376
High-Cube Fulfillment Center (Non-Sort)[3]	155	TSF	0.122	0.028	0.150	0.062	0.098	0.160	1.810
Passenger Cars			0.112	0.018	0.130	0.057	0.093	0.150	1.580
2-Axle Trucks			0.002	0.001	0.003	0.001	0.001	0.002	0.038
3-Axle Trucks			0.002	0.002	0.004	0.001	0.001	0.002	0.048
4+-Axle Trucks			0.006	0.007	0.013	0.003	0.003	0.006	0.144
High-Cube Fulfillment Center (Sort)[3]	155	TSF	0.705	0.165	0.870	0.468	0.732	1.200	6.440
Passenger Cars			0.695	0.155	0.850	0.458	0.722	1.180	6.250
2-Axle Trucks			0.002	0.001	0.003	0.002	0.001	0.003	0.032
3-Axle Trucks			0.002	0.002	0.004	0.002	0.002	0.004	0.039
4+-Axle Trucks			0.006	0.007	0.013	0.006	0.007	0.013	0.119
High-Cube Parcel Hub[3]	156	TSF	0.350	0.350	0.700	0.435	0.205	0.640	4.630
Passenger Cars			0.305	0.305	0.610	0.394	0.186	0.580	4.050
2-Axle Trucks			0.008	0.007	0.015	0.007	0.003	0.010	0.097
3-Axle Trucks			0.009	0.010	0.019	0.008	0.004	0.012	0.120
4+-Axle Trucks			0.028	0.028	0.056	0.026	0.012	0.038	0.363
High-Cube Cold Storage Warehouse[3]	157	TSF	0.085	0.025	0.110	0.034	0.086	0.120	2.120
Passenger Cars			0.076	0.004	0.080	0.019	0.071	0.090	1.370
2-Axle Trucks			0.003	0.007	0.010	0.005	0.005	0.010	0.260
3-Axle Trucks			0.001	0.002	0.003	0.002	0.001	0.003	0.083
4+-Axle Trucks			0.005	0.011	0.016	0.008	0.008	0.016	0.407
Shopping Center (40,000-150,000 SF, no groc	821	TSF	1.07	0.66	1.73	2.54	2.65	5.19	67.52
Fast-Food Restaurant without Drive-Thru	933	TSF	25.04	18.14	43.18	16.61	16.60	33.21	450.49
Fast-Food Restaurant with Drive-Thru	934	TSF	22.75	21.86	44.61	17.18	15.85	33.03	467.48
Coffee/Donut Shop with Drive-Thru	937	TSF	43.80	42.08	85.88	19.50	19.50	38.99	533.57

[1] Trip Generation and Vehicle Mix Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, 11th Edition (2021).

[2] DU = dwelling units; TSF = thousand square feet; AC = acres

[3] Truck Mix: South Coast Air Quality Management District's (SCAQMD) recommended truck mix, by axle type.

Normalized % - Without Cold Storage: 16.7% 2-Axle trucks, 20.7% 3-Axle trucks, 62.6% 4-Axle trucks.

Normalized % - With Cold Storage: 34.7% 2-Axle trucks, 11.0% 3-Axle trucks, 54.3% 4-Axle trucks.

TABLE 4-3: PROJECT TRIP GENERATION RATES (ACTUAL VEHICLES)

Land Use	Quantity	Units[1]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Phase 1 (2025):									
General Light Industrial	103.418	TSF							
Passenger Cars:			67	9	76	9	57	66	478
Total Truck Trips (Actual Vehicles):			0	0	0	0	0	0	26
Warehousing	516.396	TSF							
Passenger Cars:			62	15	77	18	60	78	574
Total Truck Trips (Actual Vehicles):			5	4	9	9	8	17	316
High-Cube Fulfillment (Sort)	680.469	TSF							
Passenger Cars:			473	105	578	312	491	803	4,254
Total Truck Trips (Actual Vehicles):			6	6	12	6	6	12	132
High-Cube Cold Storage	251.057	TSF							
Passenger Cars:			19	1	20	5	18	23	344
Total Truck Trips (Actual Vehicles):			2	6	8	4	3	7	190
High-Cube Fulfillment (Non-Sort)	753.171	TSF							
Passenger Cars:			84	14	98	43	70	113	1,190
Total Truck Trips (Actual Vehicles):			9	8	17	4	4	8	174
Manufacturing	68.715	TSF							
Passenger Cars:			34	10	44	15	34	49	296
Total Truck Trips (Actual Vehicles):			1	1	2	1	1	2	32
Industrial Component Passenger Cars			739	154	893	402	730	1,132	7,136
Industrial Component Trucks			23	25	48	24	22	46	870
Phase 1 (2025) Total Trips (Actual Vehicles)[2]			**762**	**179**	**941**	**426**	**752**	**1,178**	**8,006**

Land Use	Quantity	Units[1]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Phases 2 through 4 (2030):									
High-Cube Parcel Hub	1,630.362	TSF							
Passenger Cars:			497	497	994	642	303	945	6,604
Total Truck Trips (Actual Vehicles):			74	73	147	66	31	97	946
Manufacturing	137.448	TSF							
Passenger Cars:			69	21	90	30	68	98	592
Total Truck Trips (Actual Vehicles):			2	1	3	1	3	4	64
Warehousing	412.342	TSF							
Passenger Cars:			49	12	61	14	48	62	458
Total Truck Trips (Actual Vehicles):			5	4	9	6	6	12	250
High-Cube Cold Storage	928.033	TSF							
Passenger Cars:			71	4	75	17	66	83	1,272
Total Truck Trips (Actual Vehicles):			8	19	27	13	13	26	698
High-Cube Fulfillment (Non-Sort)	2,784.099	TSF							
Passenger Cars:			312	51	363	158	259	417	4,400
Total Truck Trips (Actual Vehicles):			29	28	57	15	14	29	644
Commercial Retail	53.984	TSF	58	35	93	137	143	280	3,646
Internal Capture:			-5	-5	-10	-47	-34	-81	-1,056
Pass-by Reduction (40% PM/Daily):			0	0	0	-44	-44	-88	-1,036
Fast-Food Restaurant without Drive-Thru	2.500	TSF	63	45	108	42	42	84	1,126
Internal Capture:			-2	-2	-4	-12	-16	-28	-360
Pass-by Reduction (50% AM; 55% PM/Daily):			-31	-31	-62	-14	-14	-28	-422
Fast-Food Restaurant with Drive-Thru	2.500	TSF	57	55	112	43	40	83	1,170
Internal Capture:			-2	-2	-4	-11	-16	-27	-350
Pass-by Reduction (50% AM; 55% PM/Daily):			-28	-28	-56	-13	-13	-26	-452
Coffee/Donut Shop with Drive-Thru	2.000	TSF	88	84	172	39	39	78	1,068
Internal Capture:			-1	-1	-2	-11	-15	-26	-346
Pass-by Reduction (90% AM; 98% PM/Daily):			-78	-78	-156	-24	-24	-48	-708
Commercial Component Total:			119	72	191	85	88	173	2,280
Industrial Component Passenger Cars			998	585	1,583	861	744	1,605	13,326
Industrial Component Trucks			118	125	243	101	67	168	2,602
Phases 2 through 4 Total Trips (Actual Vehicles)[2]			**1,235**	**782**	**2,017**	**1,047**	**899**	**1,946**	**18,208**
Commercial Component Passenger Cars			119	72	191	85	88	173	2,280
Industrial Component Passenger Cars			1,737	739	2,476	1,263	1,474	2,737	20,462
Industrial Component Trucks			141	150	291	125	89	214	3,472
Project Buildout Total Trips (Actual Vehicles)[2]			**1,997**	**961**	**2,958**	**1,473**	**1,651**	**3,124**	**26,214**

[1] TSF = thousand square feet

[2] Total Trips = Passenger Cars + Trucks

TABLE 4-4: PROJECT TRIP GENERATION RATES (PCE)

Land Use[1]	ITE Code	Units[2]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
General Light Industrial[3]	110	TSF	0.651	0.089	0.740	0.091	0.559	0.650	4.870
Passenger Cars			0.645	0.085	0.730	0.086	0.554	0.640	4.620
2-Axle Trucks (PCE = 1.5)			0.002	0.001	0.003	0.002	0.001	0.003	0.063
3-Axle Trucks (PCE = 2.0)			0.002	0.002	0.004	0.002	0.002	0.004	0.104
4+-Axle Trucks (PCE = 3.0)			0.012	0.007	0.019	0.009	0.010	0.019	0.470
Manufacturing[3]	140	TSF	0.517	0.163	0.680	0.229	0.511	0.740	4.750
Passenger Cars			0.500	0.150	0.650	0.217	0.493	0.710	4.300
2-Axle Trucks (PCE = 1.5)			0.005	0.003	0.008	0.003	0.004	0.008	0.113
3-Axle Trucks (PCE = 2.0)			0.006	0.006	0.012	0.005	0.007	0.012	0.186
4+-Axle Trucks (PCE = 3.0)			0.033	0.023	0.056	0.023	0.033	0.056	0.845
Warehousing[3]	150	TSF	0.131	0.039	0.170	0.050	0.130	0.180	1.710
Passenger Cars			0.120	0.030	0.150	0.034	0.116	0.150	1.110
2-Axle Trucks (PCE = 1.5)			0.003	0.002	0.005	0.005	0.003	0.008	0.150
3-Axle Trucks (PCE = 2.0)			0.004	0.004	0.008	0.006	0.006	0.012	0.248
4+-Axle Trucks (PCE = 3.0)			0.021	0.017	0.038	0.030	0.026	0.056	1.127
High-Cube Fulfillment Center (Non-Sort)[3]	155	TSF	0.122	0.028	0.150	0.062	0.098	0.160	1.810
Passenger Cars			0.112	0.018	0.130	0.057	0.093	0.150	1.580
2-Axle Trucks (PCE = 1.5)			0.003	0.002	0.005	0.002	0.001	0.003	0.058
3-Axle Trucks (PCE = 2.0)			0.004	0.004	0.008	0.002	0.002	0.004	0.095
4+-Axle Trucks (PCE = 3.0)			0.018	0.020	0.038	0.009	0.010	0.019	0.432
High-Cube Fulfillment Center (Sort)[3]	155	TSF	0.705	0.165	0.870	0.468	0.732	1.200	6.440
Passenger Cars			0.695	0.155	0.850	0.458	0.722	1.180	6.250
2-Axle Trucks (PCE = 1.5)			0.003	0.002	0.005	0.003	0.002	0.005	0.048
3-Axle Trucks (PCE = 2.0)			0.004	0.004	0.008	0.004	0.004	0.008	0.079
4+-Axle Trucks (PCE = 3.0)			0.018	0.020	0.038	0.018	0.020	0.038	0.357
High-Cube Parcel Hub[3]	156	TSF	0.350	0.350	0.700	0.435	0.205	0.640	4.630
Passenger Cars			0.305	0.305	0.610	0.394	0.186	0.580	4.050
2-Axle Trucks (PCE = 1.5)			0.012	0.011	0.023	0.011	0.005	0.015	0.145
3-Axle Trucks (PCE = 2.0)			0.018	0.019	0.037	0.016	0.009	0.025	0.240
4+-Axle Trucks (PCE = 3.0)			0.084	0.085	0.169	0.078	0.035	0.113	1.089
High-Cube Cold Storage Warehouse[3]	157	TSF	0.085	0.025	0.110	0.034	0.086	0.120	2.120
Passenger Cars			0.076	0.004	0.080	0.019	0.071	0.090	1.370
2-Axle Trucks (PCE = 1.5)			0.005	0.011	0.016	0.008	0.008	0.016	0.390
3-Axle Trucks (PCE = 2.0)			0.002	0.005	0.007	0.004	0.003	0.007	0.165
4+-Axle Trucks (PCE = 3.0)			0.015	0.034	0.049	0.024	0.025	0.049	1.222
Shopping Center (40,000-150,000 SF, no grocery)	821	TSF	1.07	0.66	1.73	2.54	2.65	5.19	67.52
Fast-Food Restaurant without Drive-Thru	933	TSF	25.04	18.14	43.18	16.61	16.60	33.21	450.49
Fast-Food Restaurant with Drive-Thru	934	TSF	22.75	21.86	44.61	17.18	15.85	33.03	467.48
Coffee/Donut Shop with Drive-Thru	937	TSF	43.80	42.08	85.88	19.50	19.50	38.99	533.57

[1] Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, 11th Edition (2021).

[2] DU = dwelling units; TSF = thousand square feet; AC = acres

[3] Truck Mix: South Coast Air Quality Management District's (SCAQMD) recommended truck mix, by axle type.
Normalized % - Without Cold Storage: 16.7% 2-Axle trucks, 20.7% 3-Axle trucks, 62.6% 4-Axle trucks.
Normalized % - With Cold Storage: 34.7% 2-Axle trucks, 11.0% 3-Axle trucks, 54.3% 4-Axle trucks.

TABLE 4-5: PROJECT TRIP GENERATION SUMMARY (PCE)

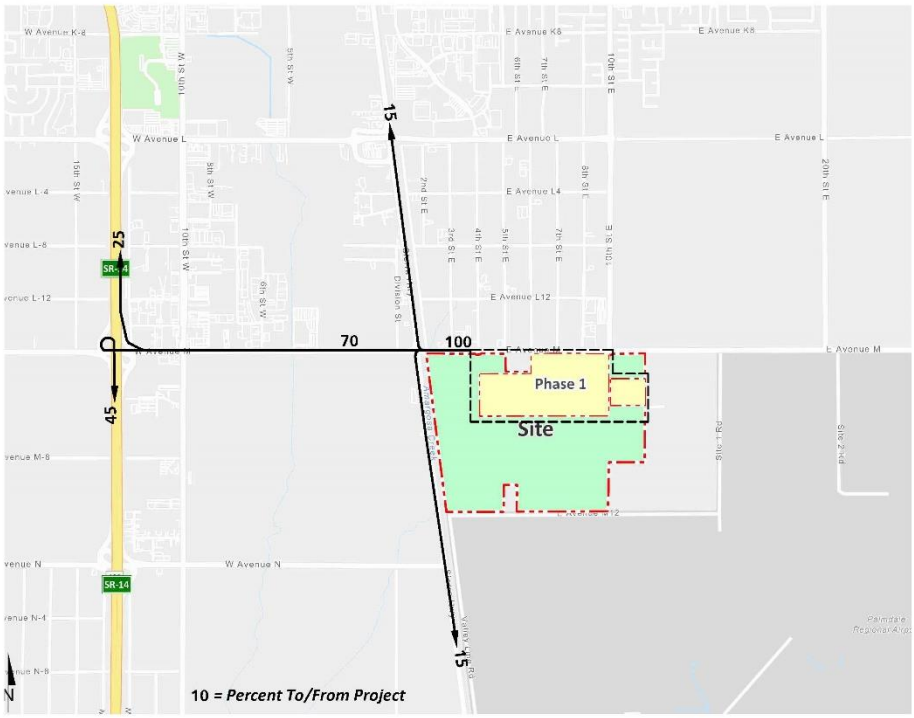
			AM Peak Hour			PM Peak Hour			
Land Use	Quantity	Units[1]	In	Out	Total	In	Out	Total	Daily
Phase 1 (2025):									
General Light Industrial	103.418	TSF							
Passenger Cars:			67	9	76	9	57	66	478
Total Truck Trips (PCE):			1	1	2	1	1	2	68
Warehousing	516.396	TSF							
Passenger Cars:			62	15	77	18	60	78	574
Total Truck Trips (PCE):			15	11	26	20	18	38	792
High-Cube Fulfillment (Sort)	680.469	TSF							
Passenger Cars:			473	105	578	312	491	803	4,254
Total Truck Trips (PCE):			17	17	34	17	17	34	330
High-Cube Cold Storage	251.057	TSF							
Passenger Cars:			19	1	20	5	18	23	344
Total Truck Trips (PCE):			6	13	19	9	9	18	448
High-Cube Fulfillment (Non-Sort)	753.171	TSF							
Passenger Cars:			84	14	98	43	70	113	1,190
Total Truck Trips (PCE):			19	20	39	10	10	20	442
Manufacturing	68.715	TSF							
Passenger Cars:			34	10	44	15	34	49	296
Total Truck Trips (PCE):			2	2	4	2	3	5	80
Industrial Component Passenger Cars			739	154	893	402	730	1,132	7,136
Industrial Component Trucks			60	64	124	59	58	117	2,160
Phase 1 (2025) Total Trips (PCE)[2]			**799**	**218**	**1,017**	**461**	**788**	**1,249**	**9,296**

Land Use	Quantity	Units[1]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Phases 2 through 4 (2030):									
High-Cube Parcel Hub	1,630.362	TSF							
Passenger Cars:			497	497	995	642	303	946	6,604
Total Truck Trips (PCE):			186	187	373	170	78	248	2,406
Manufacturing	137.448	TSF							
Passenger Cars:			69	21	90	30	68	98	592
Total Truck Trips (PCE):			7	4	11	4	7	11	158
Warehousing	412.342	TSF							
Passenger Cars:			49	12	61	14	48	62	458
Total Truck Trips (PCE):			12	10	22	16	15	31	630
High-Cube Cold Storage	928.033	TSF							
Passenger Cars:			71	4	75	17	66	83	1,272
Total Truck Trips (PCE):			20	46	66	33	33	66	1,654
High-Cube Fulfillment (Non-Sort)	2,784.099	TSF							
Passenger Cars:			312	51	363	158	259	417	4,400
Total Truck Trips (PCE):			71	72	143	35	36	71	1,632
Commercial Retail	53.984	TSF	58	35	93	137	143	280	3,646
Internal Capture:			-5	-5	-10	-47	-34	-81	-1,056
Pass-by Reduction (40% PM/Daily):			0	0	0	-44	-44	-88	-1,036
Fast-Food Restaurant without Drive-Thru	2.500	TSF	63	45	108	42	42	84	1,126
Internal Capture:			-2	-2	-4	-12	-16	-28	-360
Pass-by Reduction (50% AM; 55% PM/Daily):			-31	-31	-62	-14	-14	-28	-422
Fast-Food Restaurant with Drive-Thru	2.500	TSF	57	55	112	43	40	83	1,170
Internal Capture:			-2	-2	-4	-11	-16	-27	-350
Pass-by Reduction (50% AM; 55% PM/Daily):			-28	-28	-56	-13	-13	-26	-452
Coffee/Donut Shop with Drive-Thru	2.000	TSF	88	84	172	39	39	78	1,068
Internal Capture:			-1	-1	-2	-11	-15	-26	-346
Pass-by Reduction (90% AM; 98% PM/Daily):			-78	-78	-156	-24	-24	-48	-708
Commercial Component Total:			119	72	191	85	88	173	2,280
Industrial Component Passenger Cars			998	585	1,584	861	744	1,606	13,326
Industrial Component Trucks			296	319	615	258	169	427	6,480
Phases 2 through 4 Total Trips (PCE)[2]			**1,413**	**976**	**2,390**	**1,204**	**1,001**	**2,206**	**22,086**
Commercial Component Passenger Cars			119	72	191	85	88	173	2,280
Industrial Component Passenger Cars			1,737	739	2,477	1,263	1,474	2,738	20,462
Industrial Component Trucks			356	383	739	317	227	544	8,640
Project Buildout Total Trips (PCE)[2]			**2,212**	**1,194**	**3,407**	**1,665**	**1,789**	**3,455**	**31,382**

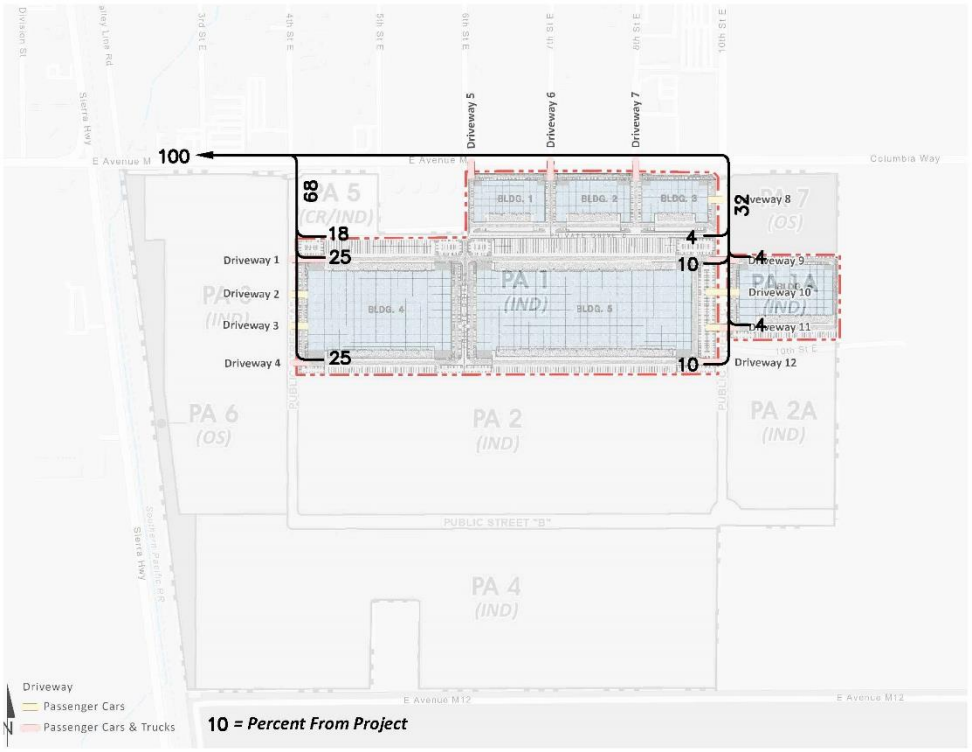
[1] TSF = thousand square feet

[2] Total Trips = Passenger Cars + Trucks

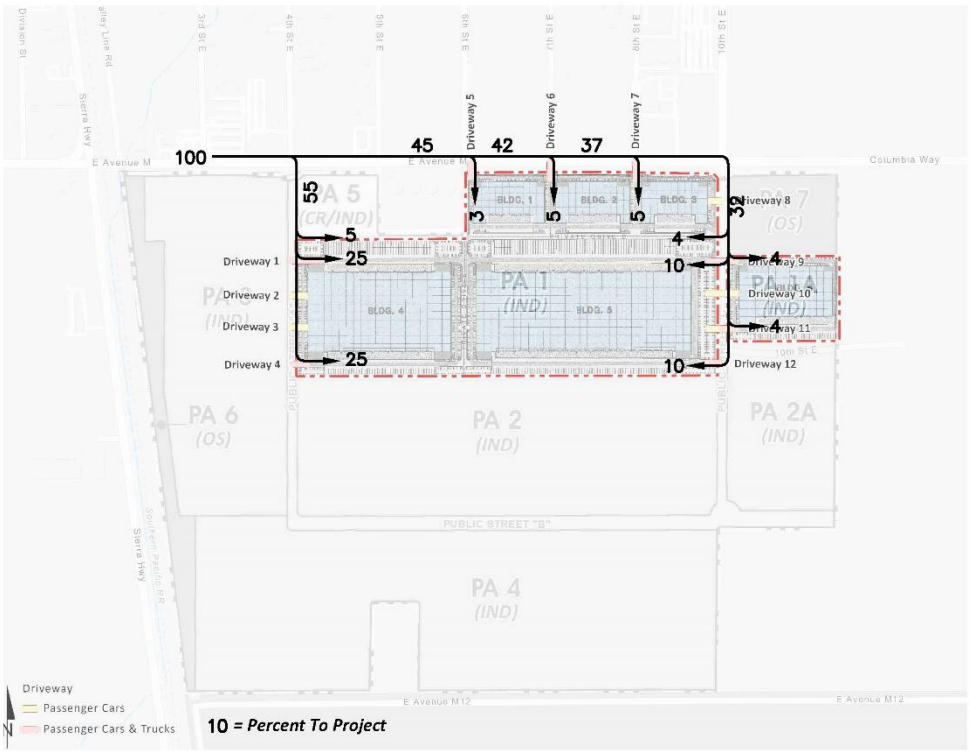
EXHIBIT 4-1: PROJECT (TRUCK) TRIP DISTRIBUTION



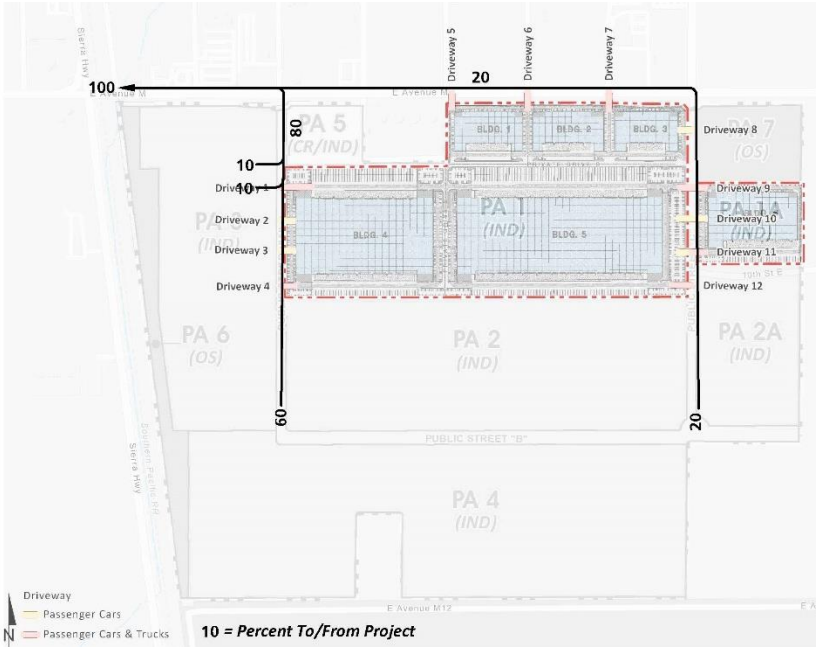
Phase 1 (Outbound):



Phase 1 (Inbound):



Phase 2:



Phase 3:

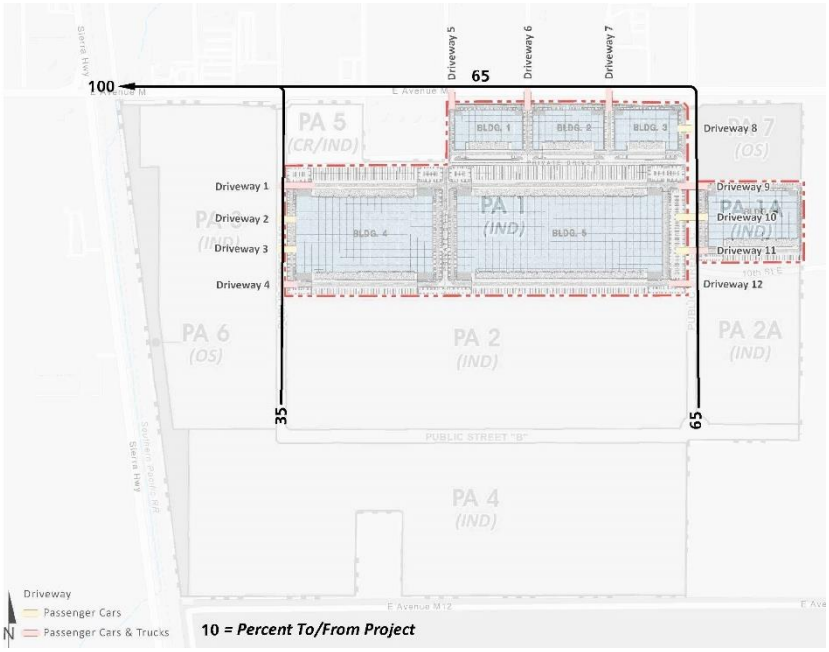
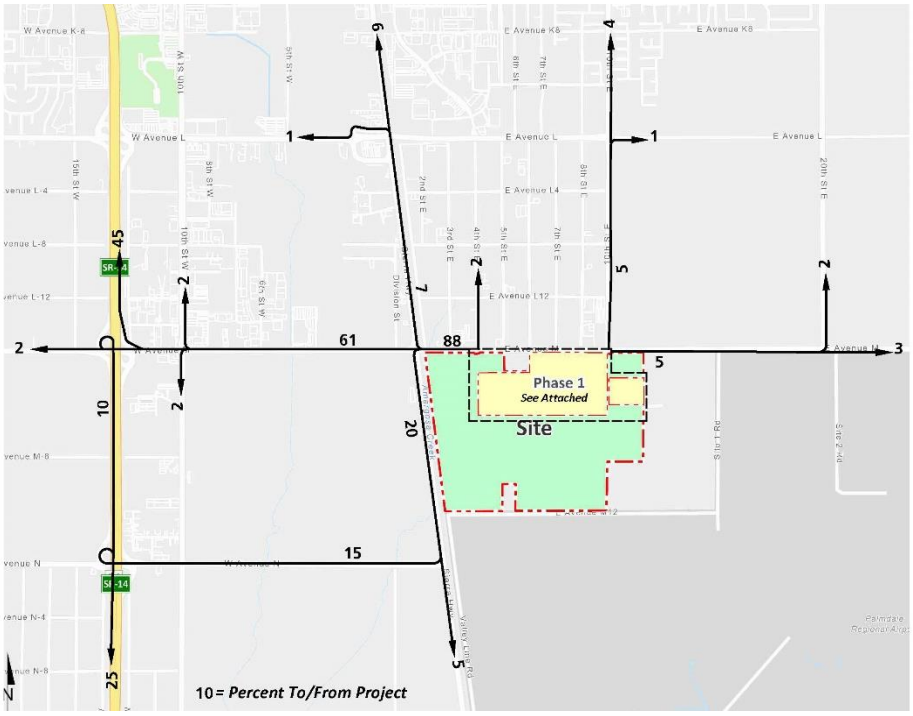
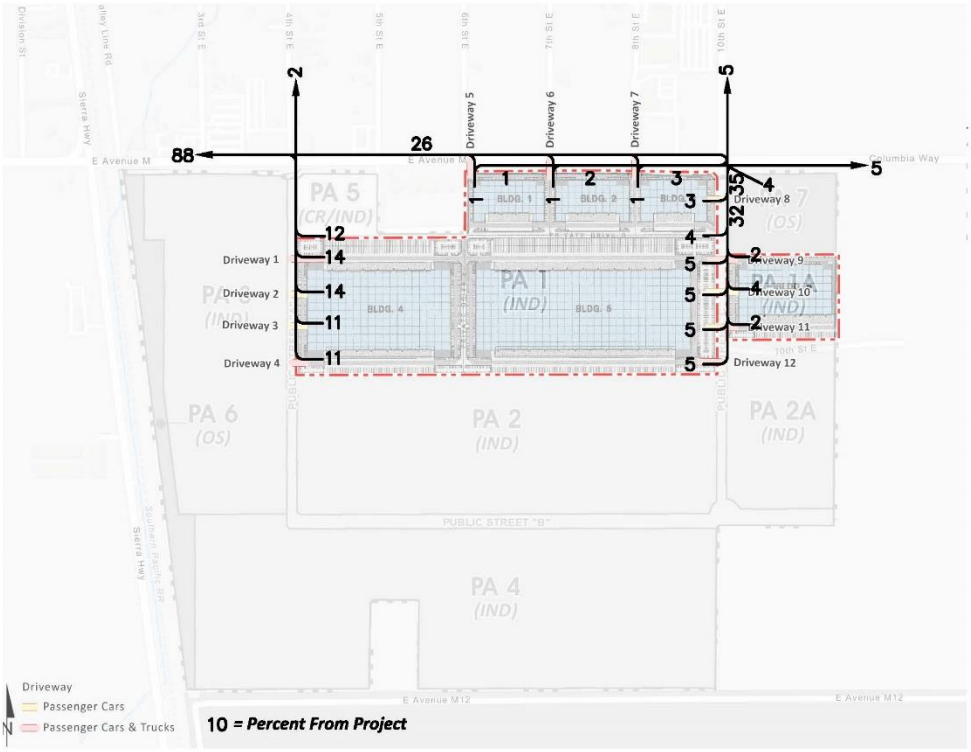


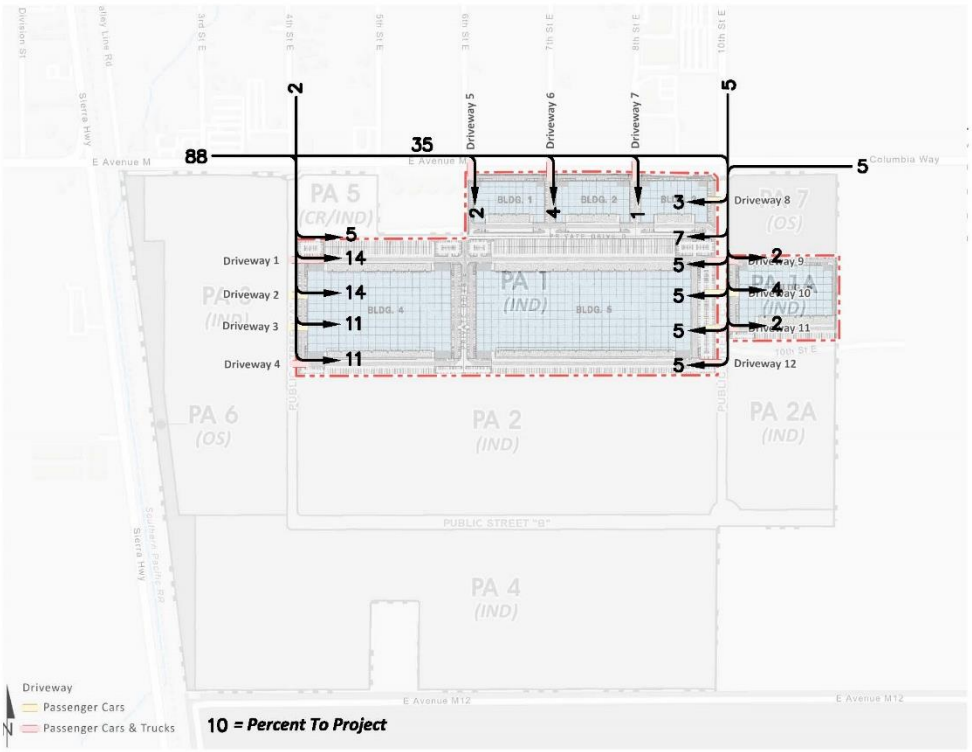
EXHIBIT 4-2: PROJECT (PASSENGER CAR) TRIP DISTRIBUTION



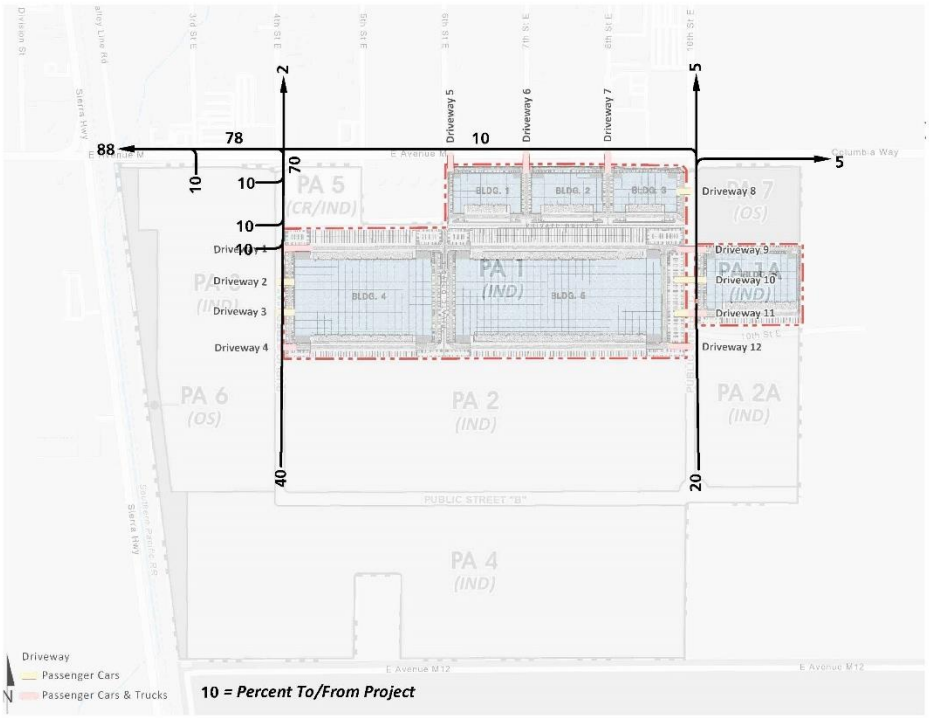
Phase 1 (Outbound):



Phase 1 (Inbound):



Phase 2:



Phase 3:

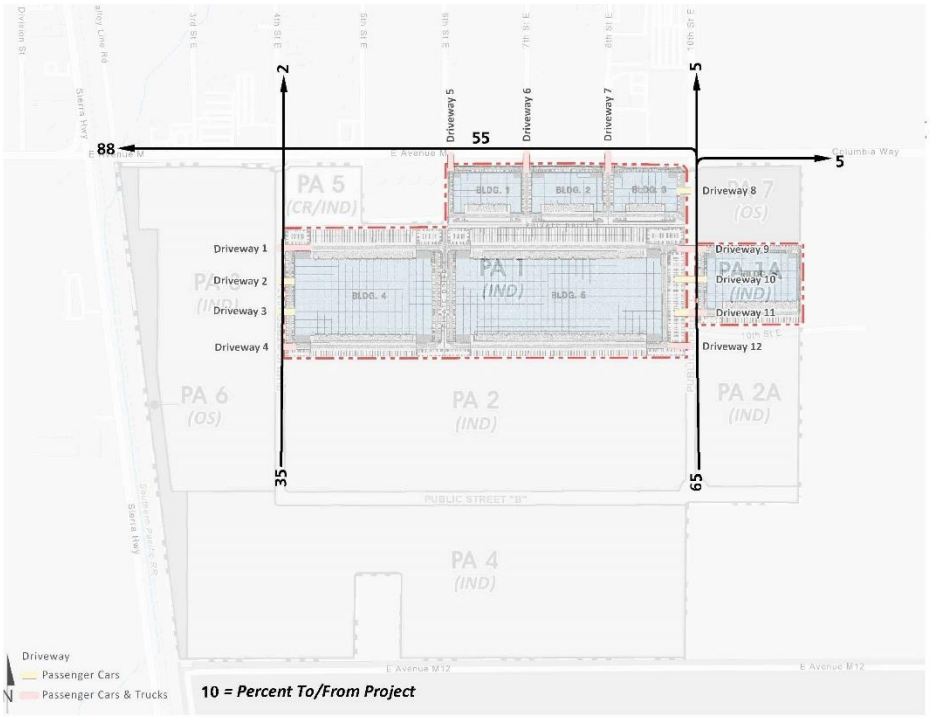
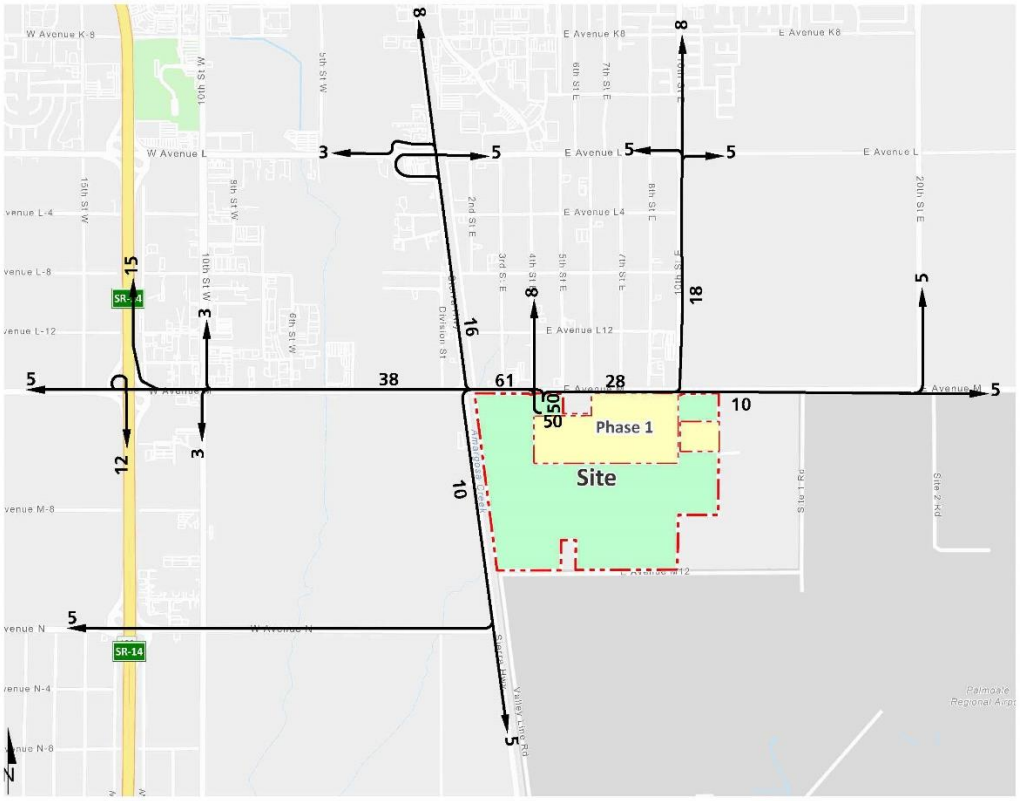
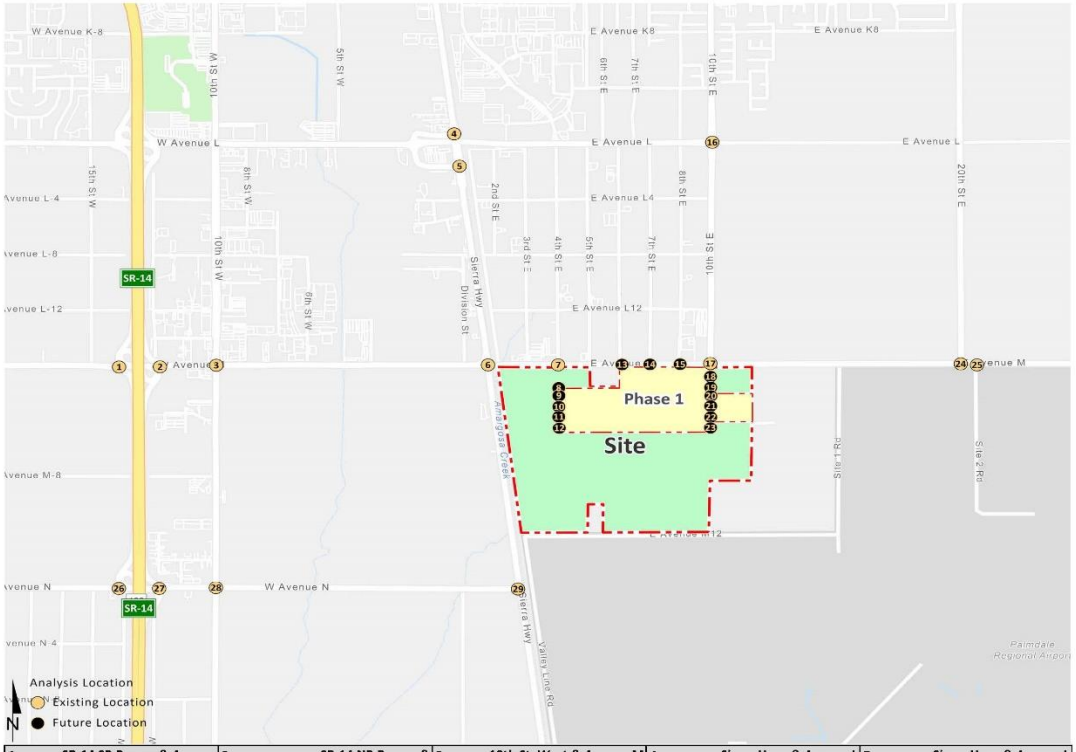


EXHIBIT 4-3: PROJECT (RETAIL) TRIP DISTRIBUTION



10 = ***Percent To/From Project***

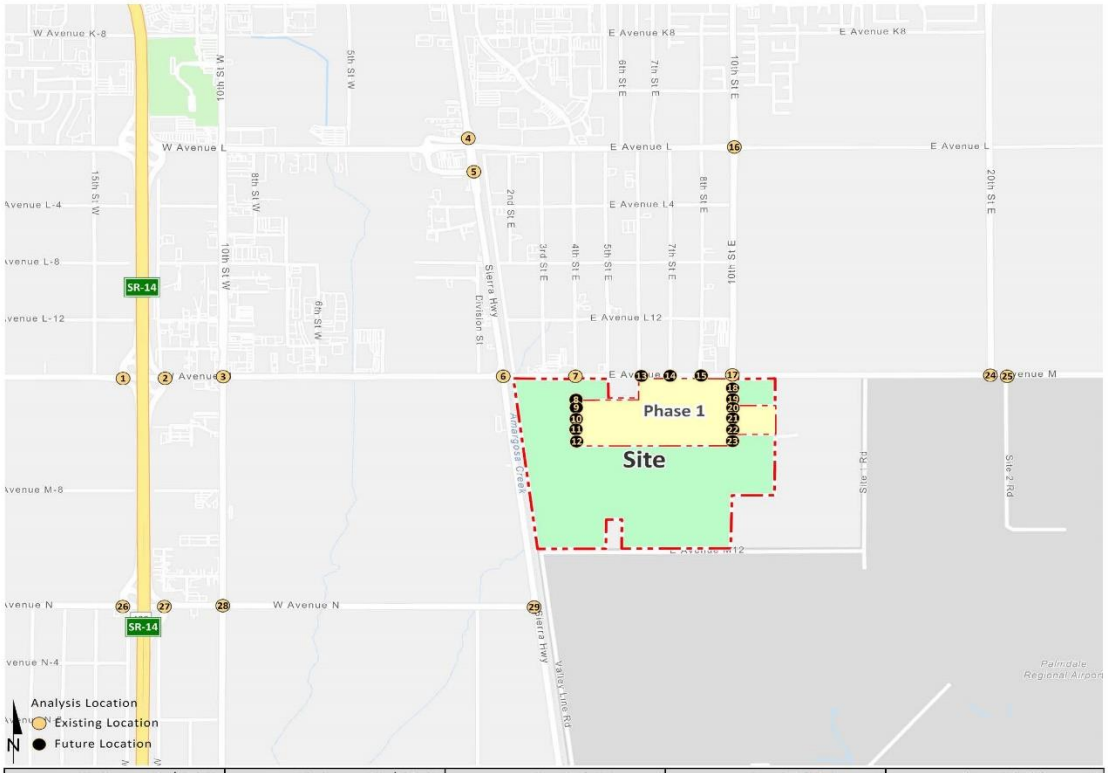
EXHIBIT 4-4: PROJECT ONLY (PHASE 1) TRAFFIC VOLUMES (ACTUAL VEHICLES) (PAGE 1 OF 2)



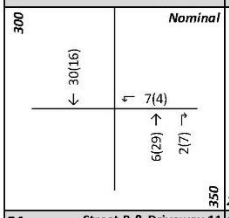
1 SR-14 SB Ramps & Avenue M	2 SR-14 NB Ramps & Avenue M	3 10th St. West & Avenue M	4 Sierra Hwy. & Avenue L West	5 Sierra Hwy. & Avenue L East
2,250 / 2,400 / 338(187) ↰ 25(81) ← 3(15) ↖ 2(2) / 15(8) → / Nominal / 150	1,700 / 4,700 / ↰ 76(334) ← 30(98) / 353(195) → / ↱ 84(51) / 2,400 / 550	150 / 4,950 / 15(8) ↰ ↱ 3(15) ← 105(432) ↖ 3(15) / 437(246) → / ↱ 15(8) / 4,700 / 150	550 / ← 48(28) / ↱ 2(7) ↑ 13(47) / Nominal / 600	600 / ← 48(28) / 7(4) ↱ / ↑ 15(54) / Nominal / 650
6 Sierra Hwy. & Avenue M	**7 4th St. & Avenue M/Columbia Wy.**	**8 Street A & Private Drive D**	**9 Street A & Driveway 1**	**10 Street A & Driveway 2**
650 / 7,150 / 55(32) ↰ ← 15(54) ← 111(461) ↖ 35(149) / 467(262) → / ↱ 151(84) / 4,950 / 1,550	150 / 2,600 / 15(8) ↓ / ← 51(211) / 269(152) → 404(226) ↲ / 109(453) ↱ ↑ 3(15) / 7,150 / 4,700	4,700 / 700 / 381(213) ← 38(21) ↲ / ↰ 23(92) / ↱ 89(376) / 4,000	4,000 / 1,200 / 272(151) ← 109(62) ↲ / ↰ 28(108) / ↱ 62(268) / 2,800	2,800 / 1,000 / 168(94) ← 103(56) ↲ / ↰ 22(102) / 1,800
11 Street A & Driveway 3	**12 Street A & Driveway 4**	**13 6th St./Driveway 5 & Avenue M**	**14 7th St./Driveway 6 & Avenue M**	**15 8th St./Driveway 7 & Avenue M**
1,800 / 800 / 87(50) ↓ 81(44) ↳ / ↰ 17(80) / ↑ 23(86) / 1,000	1,000 / 1,000 / 87(50) ↳ / ← 23(86) /	2,550 / ← 51(211) / 254(143) → 15(9) ↴ / ↱ 2(7) / 2,600 / 100	2,400 / ← 51(211) / 224(133) → 31(17) ↴ / ↱ 2(7) / 2,550 / 200	2,400 / ← 51(211) / 217(135) → 9(5) ↴ / ↱ 2(7) / 2,400 / 100

##(##) AM(PM) Peak Hour Intersection Volumes
Average Daily Trips

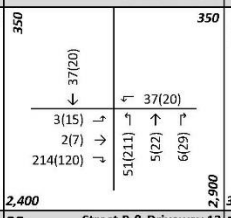
EXHIBIT 4-4: PROJECT ONLY (PHASE 1) TRAFFIC VOLUMES (ACTUAL VEHICLES) (PAGE 2 OF 2)



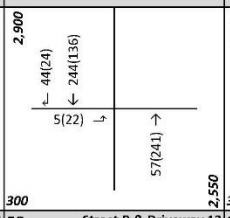
16 Challenger Wy./10th St. East & Avenue L



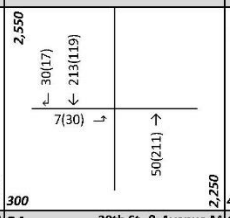
17 Challenger Wy./10th St. East & Avenue M



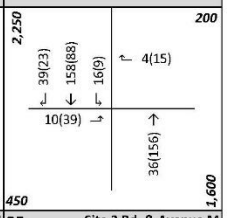
18 Street B & Driveway 8



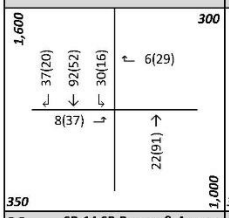
19 Street B & Driveway 9



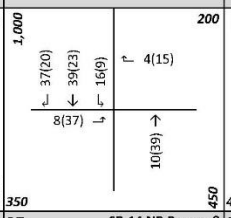
20 Street B & Driveway 10



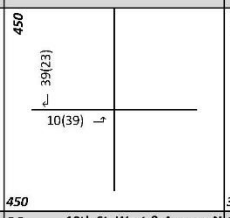
21 Street B & Driveway 11



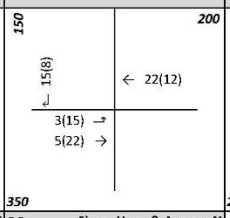
22 Street B & Driveway 12



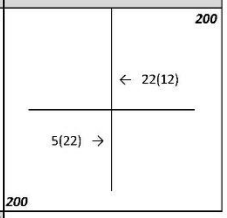
23 Street B & Driveway 13



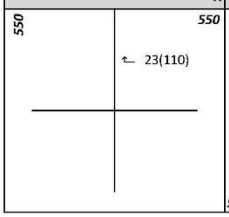
24 20th St. & Avenue M



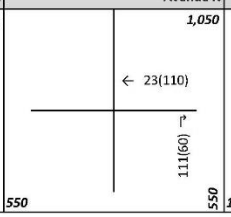
25 Site 2 Rd. & Avenue M



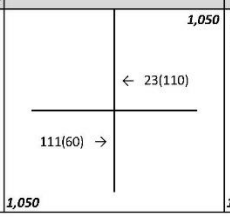
26 SR-14 SB Ramps & Avenue N



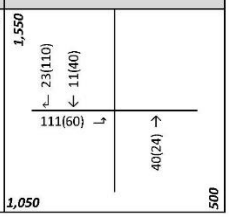
27 SR-14 NB Ramps & Avenue N



28 10th St. West & Avenue N

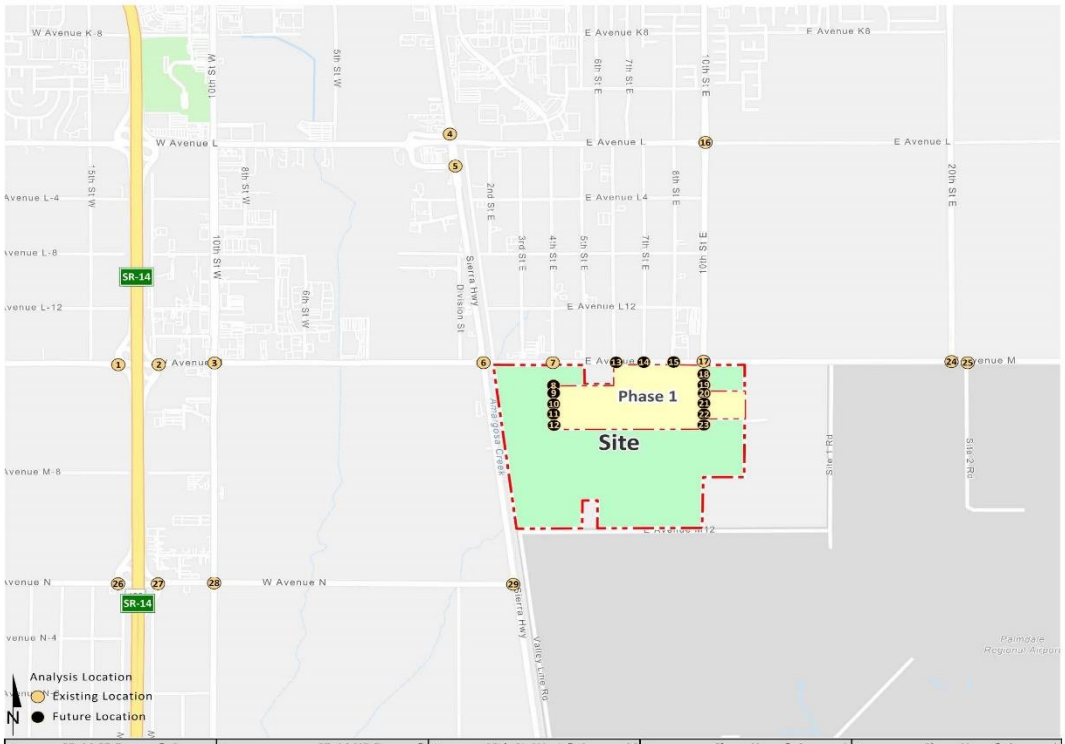


29 Sierra Hwy. & Avenue N



##(##) AM(PM) Peak Hour Intersection Volumes
Average Daily Trips

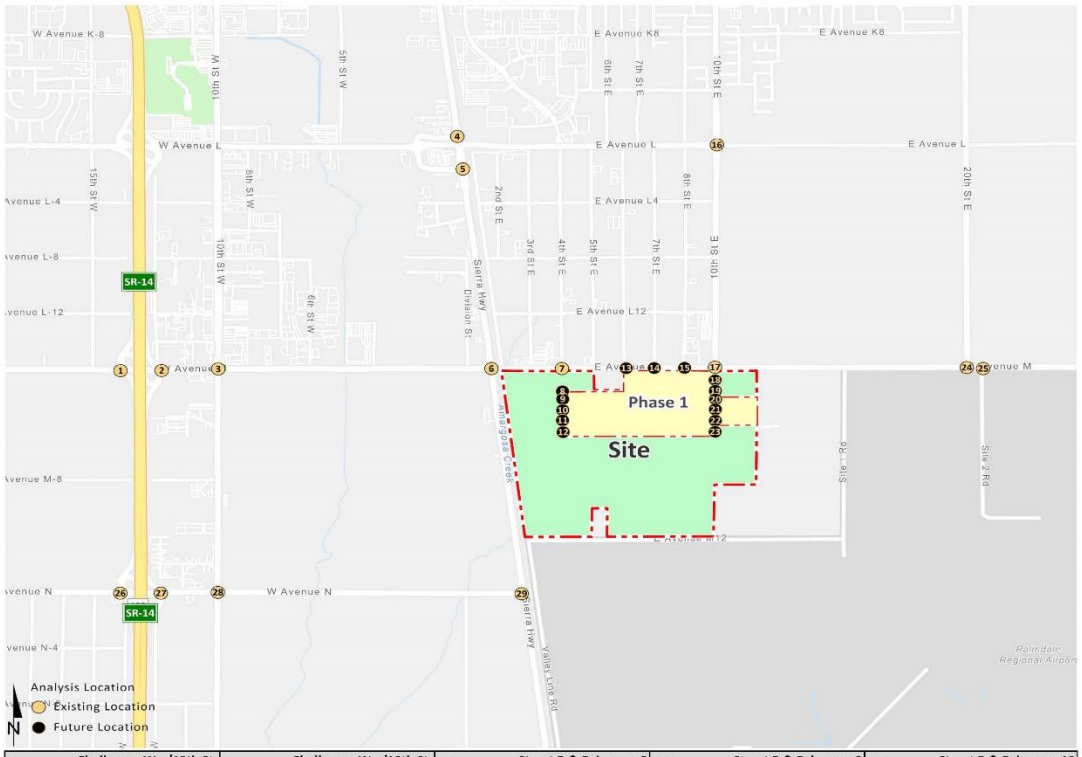
EXHIBIT 4-5: PROJECT ONLY (PROJECT BUILDOUT) TRAFFIC VOLUMES (ACTUAL VEHICLES) (PAGE 1 OF 2)



1 SR-14 SB Ramps & Avenue M	2 SR-14 NB Ramps & Avenue M	3 10th St. West & Avenue M	4 Sierra Hwy. & Avenue L West	5 Sierra Hwy. & Avenue L East
7,100 / 7,650 / Nominal / 500 835(612) ↰ 148(196) ← 18(34) ↳ 2(2) 41(30) →	5,200 / 14,800 / 7,650 / 1,950 ← 381(699) ← 168(232) 875(642) → 251(193) ↱	500 / 15,800 / 14,800 / 500 38(28) ↰ 17(32) ← 549(931) ↳ 17(32) 1127(835) → 38(28) ↱	1,950 / 2,100 / 200 135(101) ↓ 6(4) ↴ 10(17) ↱ 73(109) ↑	2,100 / 2,300 / 200 141(106) ↓ 21(15) ↴ 4(4) ↱ 82(126) ↑
6 Sierra Hwy. & Avenue M	**7 4th St. & Avenue M/Columbia Wy.**	**8 Street A & Private Drive D**	**9 Street A & Driveway 1**	**10 Street A & Driveway 2**
2,300 / 22,950 / 4,850 / 15,800 162(121) ↰ 86(131) ← 514(995) ↳ 246(317) 1134(890) → 69(0) ↰ 449(280) ↱ 69(0) ↴	600 / 7,100 / 20,700 / 22,000 44(32) ↓ ← 182(379) ↰ 0(48) 549(292) → 610(1011) ↰ 21(37) ↑ 0(48) ↱ 1123(925) ↴	13,400 / 700 / 11,600 / 1,100 83(82) ↰ 914(690) ↓ 38(21) ↳ 23(92) 64(57) → 453(755) ↑	11,600 / 1,200 / 9,250 / 1,100 83(82) ↰ 722(545) ↓ 109(62) ↳ 28(108) 64(57) → 361(591) ↑	9,250 / 1,000 / 8,250 619(489) ↓ 103(56) ↳ 22(102)
11 Street A & Driveway 3	**12 Street A & Driveway 4**	**13 6th St./Driveway 5 & Avenue M**	**14 7th St./Driveway 6 & Avenue M**	**15 8th St./Driveway 7 & Avenue M**
8,250 / 800 / 7,450 538(445) ↓ 81(44) ↳ 17(80) ↰ 323(408) ↑	7,450 / 1,000 / 6,450 451(394) ↓ 87(50) ↳ 23(86) ↰ 299(322) ↑	7,200 / 100 199(431) ← 528(337) → 2(7) ↱ 15(9) ↴	7,050 / 200 199(431) ← 498(327) → 2(7) ↱ 31(17) ↴	7,050 / 100 199(431) ← 491(329) → 2(7) ↱ 9(5) ↴

##(##) AM(PM) Peak Hour Intersection Volumes
Average Daily Trips

EXHIBIT 4-5: PROJECT ONLY (PROJECT BUILDOUT) TRAFFIC VOLUMES (ACTUAL VEHICLES) (PAGE 2 OF 2)



16 Challenger Wy./10th St. East & Avenue L	17 Challenger Wy./10th St. East & Avenue M	18 Street B & Driveway 8	19 Street B & Driveway 9	20 Street B & Driveway 10
1,000 / 300 ← 79(57) ← 23(17) 6(4) → 4(4) ↑ 35(66) ↑ 11(19) ↱ 100 / 1,450	1,450 / 1,250 ← 12(9) ↰ 87(63) 21(15) ↓ 87(63) 16(30) ↳ 9(16) → 468(290) ↳ 166(408) ↑ 34(59) ↑ 35(66) ↱ 7,050 / 8,250	8,250 44(24) ↓ 598(392) 5(22) ↳ 231(511) ↑ 300 / 7,900	7,900 30(17) ↓ 567(375) 7(30) ↳ 224(481) ↑ 300 / 7,600	7,600 / 200 39(23) ↓ 512(343) 16(9) ↳ ← 4(15) 10(39) ↳ 209(427) ↑ 450 / 7,000
21 Street B & Driveway 11	**22 Street B & Driveway 12**	**23 Street B & Driveway 13**	**24 20th St. & Avenue M**	**25 Site 2 Rd. & Avenue M**
7,000 / 300 37(20) ↓ 446(307) 30(16) ↳ ← 6(29) 8(37) ↳ 195(361) ↑ 350 / 6,350	6,350 / 200 37(20) ↓ 393(278) 16(9) ↳ ← 4(15) 8(37) ↳ 184(309) ↑ 350 / 5,800	5,800 39(23) ↓ 354(255) 10(39) ↳ 174(271) ↑ 450 / 5,350	500 / 750 41(30) ↓ ← 58(42) 18(34) ↳ 26(49) → 1,250	750 ← 58(42) 26(49) → 750
26 SR-14 SB Ramps & Avenue N	**27 SR-14 NB Ramps & Avenue N**	**28 10th St. West & Avenue N**	**29 Sierra Hwy. & Avenue N**	
1,550 / 1,650 ← 111(221) ← 4(4) 6(4) → 100	3,200 ← 114(226) 6(4) → 261(189) ↱ 1,650 / 1,550	3,200 ← 114(226) 267(194) → 3,200	4,850 114(226) ↓ 63(91) 267(194) → 114(86) ↑ 3,200 / 1,650	

##(##) AM(PM) Peak Hour Intersection Volumes
Average Daily Trips

4.5 BACKGROUND TRAFFIC

Pursuant to discussions with City staff, no ambient growth should be included if traffic associated with a list of cumulative development projects is included. As such, no ambient growth rate has been assumed for the future scenarios (2025 and 2032).

4.6 CUMULATIVE DEVELOPMENT TRAFFIC

A cumulative project list was developed for the purposes of this analysis through consultation with planning and engineering staff from the City of Palmdale and the nearby agency of the City of Lancaster. The cumulative projects listed are those that would generate traffic and would contribute traffic to study area intersections. Exhibit 4-6 illustrates the cumulative development location map. A summary of cumulative development projects and their proposed land uses are shown in Table 4-6. If applicable, the traffic generated by individual cumulative projects was manually added to the Without Project forecasts to ensure that traffic generated by the listed cumulative development projects in Table 4-6 are reflected as part of the background traffic. The Cumulative Only ADT and peak hour intersection turning movement volumes, in actual vehicles, are shown on Exhibit 4-7.

The near-term traffic analysis includes the following traffic conditions, with the various traffic components:

- EC (2025)
  - Existing 2022 counts
  - Cumulative Development traffic

- EPC (2025)
  - Existing 2022 counts
  - Cumulative Development traffic
  - Project (Phase 1) traffic

- EC (2032)
  - Existing 2022 counts
  - Cumulative Development traffic

- EPC (2032)
  - Existing 2022 counts
  - Cumulative Development traffic
  - Project (Project Buildout) traffic

EXHIBIT 4-6: CUMULATIVE DEVELOPMENT LOCATION MAP

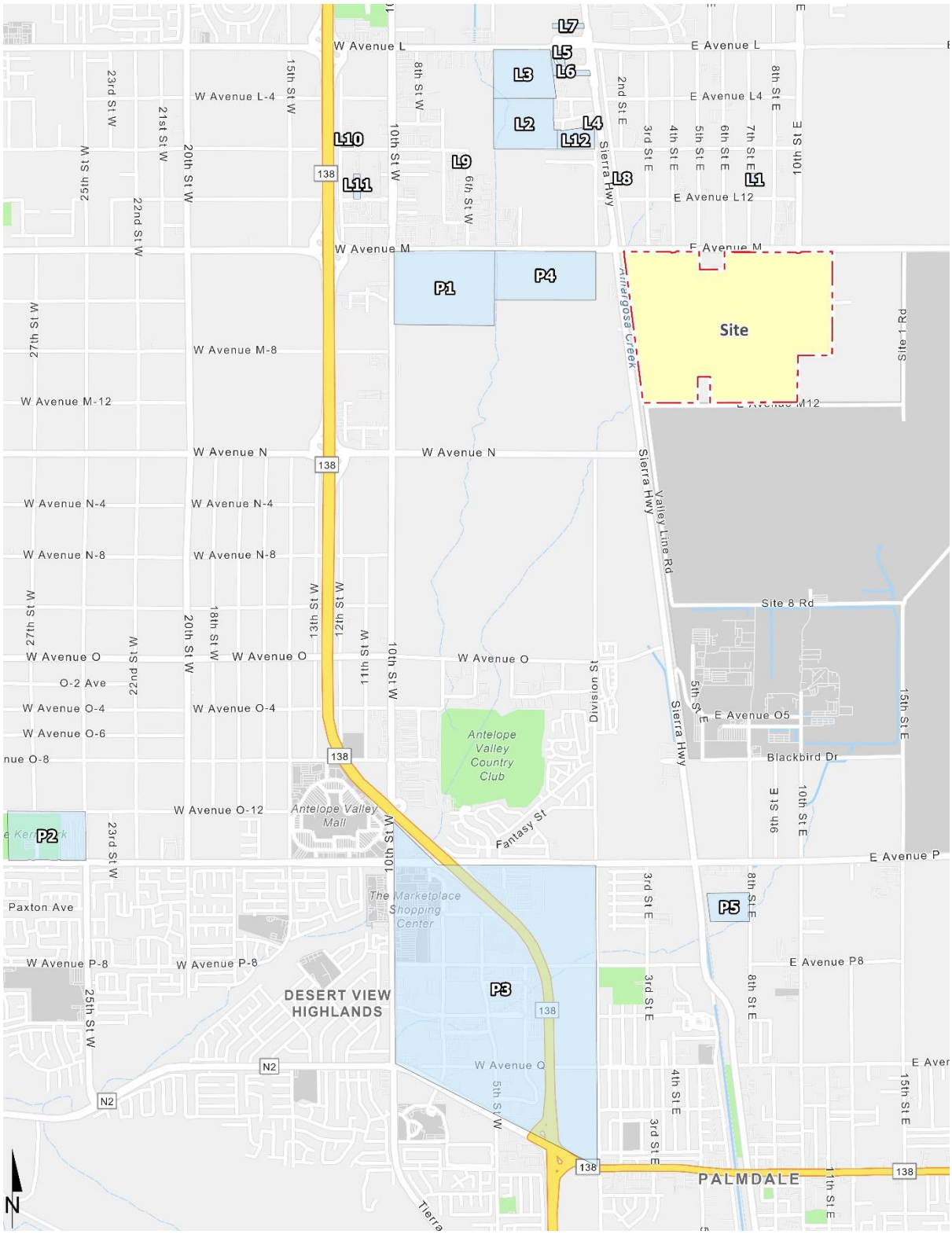
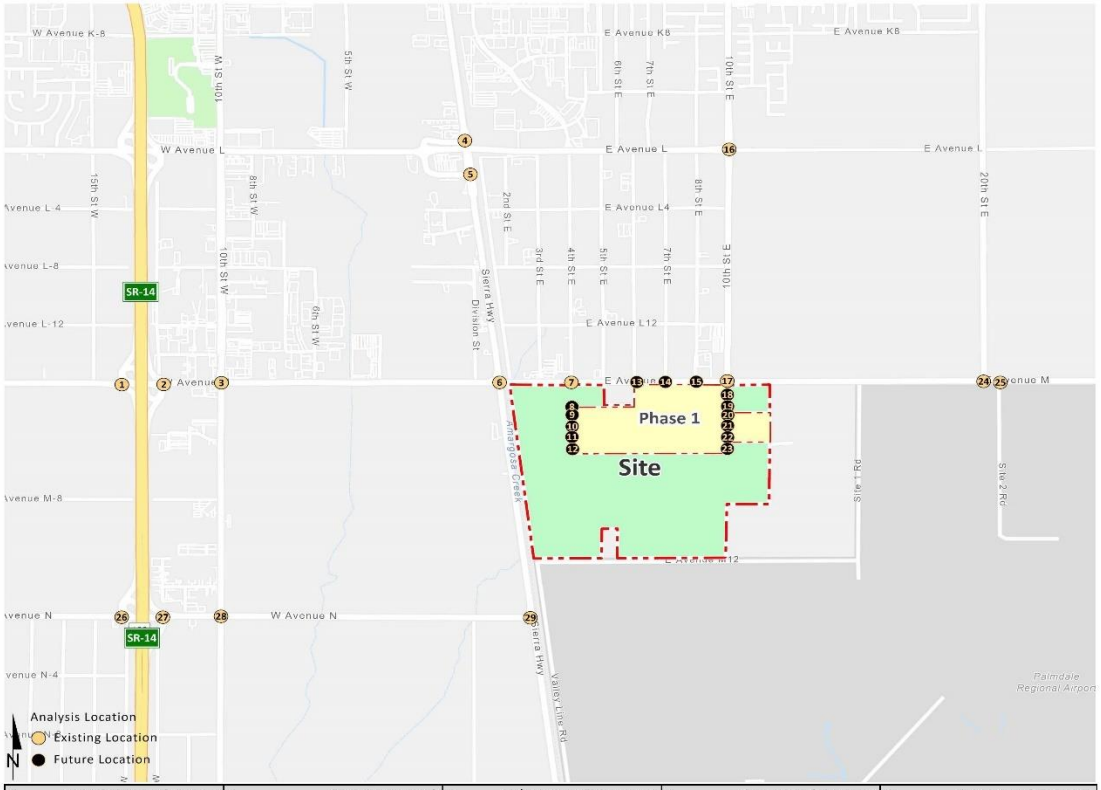


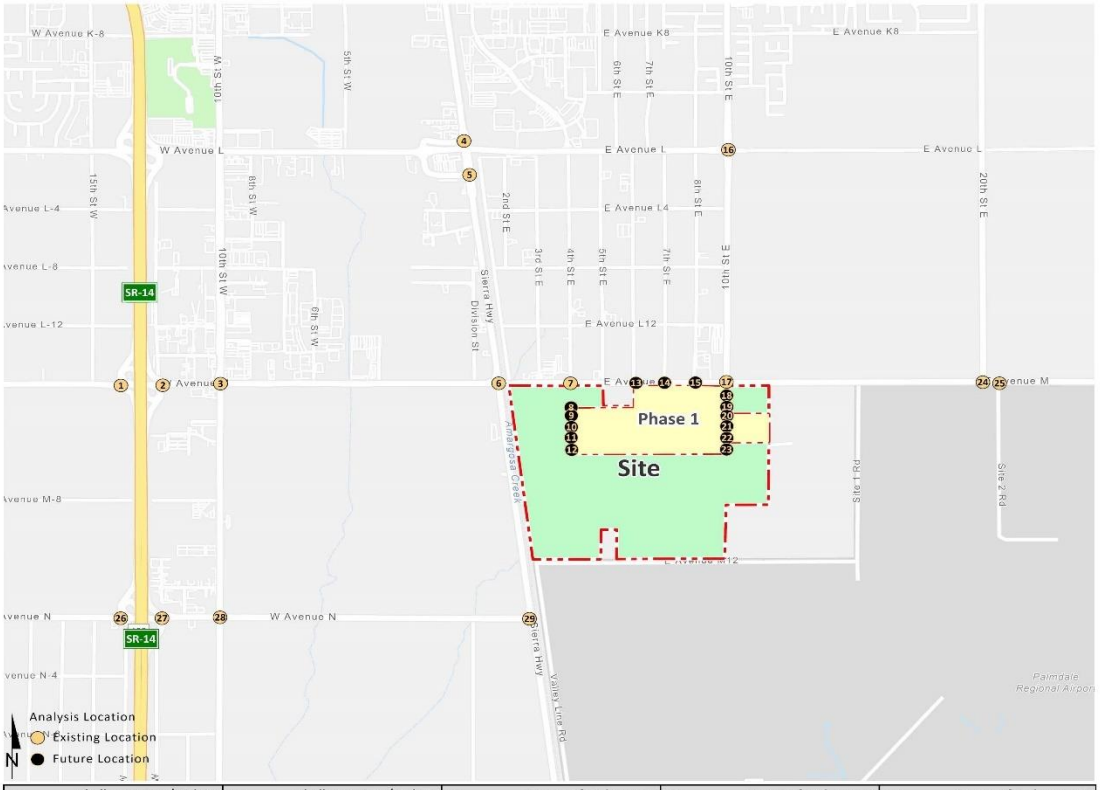
EXHIBIT 4-7: CUMULATIVE ONLY TRAFFIC VOLUMES (ACTUAL VEHICLES) (PAGE 1 OF 2)



1 SR-14 SB Ramps & Avenue M	2 SR-14 NB Ramps & Avenue M	3 10th St. West & Avenue M	4 Sierra Hwy. & Avenue L West	5 Sierra Hwy. & Avenue L East
6,450 / 8,400 1153(605) ↓ ← 17(70) ← 28(129) 91(51) → 1,050 / 850	6,450 / 15,700 ← 208(907) ← 45(199) ↱ 1243(656) → 162(74) 8,350 / 750	1,600 / 10,650 633(530) ↓ 71(39) ↳ ↑ 13(55) ← 158(729) ↰ 2(9) 915(428) → 490(304) ↲ ↰ ↑ ↱ 94(377) 158(815) 11(2) 15,700 / 20,350	12,300 / 12,450 21(6) ↲ 608(471) ↓ ↰ ↑ 1(1) ↲ 48(33) 154(735) 150 / 12,450	12,450 / 12,650 1(0) ↲ 725(471) ↓ 10(15) ⤷ ↰ ↑ 89(24) ↲ 12(2) 450(753) 150 / 12,650
6 Sierra Hwy. & Avenue M	**7 4th St. & Avenue M/Columbia Wy.**	**8 Street A & Private Drive D**	**9 Street A & Driveway 1**	**10 Street A & Driveway 2**
12,300 / 1,250 179(94) ↲ 433(390) ↓ ← 127(58) 32(141) ⤷ 32(106) → 29(149) ↴ ↰ ↑ 181(65) 135(585) 5,100 / 12,000	100 / 1,150 11(2) ↲ ← 116(56) 2(9) ⤷ 31(97) → 1,250			
11 Street A & Driveway 3	**12 Street A & Driveway 4**	**13 6th St./Driveway 5 & Avenue M**	**14 7th St./Driveway 6 & Avenue M**	**15 8th St./Driveway 7 & Avenue M**
		1,150 ← 116(56) 31(97) → 1,150	1,150 1(9) ↲ ← 115(47) 12(4) ⤷ 19(93) → 1,150	1,150 ← 115(47) 19(93) → 1,150

##(##) AM(PM) Peak Hour Intersection Volumes
Average Daily Trips

EXHIBIT 4-7: CUMULATIVE ONLY TRAFFIC VOLUMES (ACTUAL VEHICLES) (PAGE 2 OF 2)



16 Challenger Wy./10th St. East & Avenue L	17 Challenger Wy./10th St. East & Avenue M	18 Street B & Driveway 8	19 Street B & Driveway 9	20 Street B & Driveway 10
200 *Nominal*	200 950			
26(5) ←	27(5) ↲			
← 5(1)	← 87(42)			
3(22) →	4(23) →			
1(5) ↱	15(69) →			
200	1,150			

21 Street B & Driveway 11	22 Street B & Driveway 12	23 Street B & Driveway 13	24 20th St. & Avenue M	25 Site 2 Rd. & Avenue M
			950	950
			← 87(42)	← 87(42)
			15(69) →	15(69) →
			950	950

26 SR-14 SB Ramps & Avenue N	27 SR-14 NB Ramps & Avenue N	28 10th St. West & Avenue N	29 Sierra Hwy. & Avenue N
2,800	5,600	19,300 1,500	12,000
← 89(378)	← 89(378)	78(308) ↲ 574(493) ← 13(54) ↳	11(70) ↲ 451(468) ←
		← 70(43)	
		← 11(70)	
	↱	401(249) ↳	82(15) →
	483(264)	82(15) →	13(54) ↴
		↑	↰ ↑
		146(769)	70(43) 233(634)
2,800 2,800	2,800 2,800	5,600 13,550	1,500 12,200

##(##) AM(PM) Peak Hour Intersection Volumes
Average Daily Trips

TABLE 4-6: CUMULATIVE DEVELOPMENT LAND USE SUMMARY

No.	Project Name / Case Number	Land Use	Quantity	Units[1]
L1	CUP 18-06	Cannabis Cultivation and Maunfacturing Facility	31.705	TSF
L2	Grow-Op Farms (CUP 18-27)	Cannabis Cultivation and Maunfacturing Facility	160.816	TSF
L3	Lancaster 20th Street West (CUP 18-22)	Hotel	105	Rooms
L4	CUP 18-26	Special Needs Housing	85.042	TSF
L5	Lancaster Housing (CUP 18-08)	Residential Care	202.818	TSF
L6	CUP 20-04	Cannabis Cultivation and Maunfacturing Facility	22.843	TSF
	49-acre Warehouse Project	Warehousing	956.800	TSF
L7	SPR 22-02	Warehousing	28.895	TSF
L8	SPR 22-03	Mini Storage Facility	93.465	TSF
L9	DR 21-175	Warehousing	7.000	TSF
L10	CUP 19-04	Cannabis Cultivation and Maunfacturing Facility	22.000	TSF
L11	SPR 22-07	Industrial	17.000	TSF
L12	Forbes & Market Warehouse	Warehousing	233.600	TSF
L13	SPR 21-16	Industrial	19.488	TSF
L14	L4 Warehouse	Warehousing	216.230	TSF
P1	Palmdale Warehouse Project	Industrial	1,117.314	TSF
		Commercial	98.794	TSF
		Business Park	743.650	TSF
P2	Westside Softball and Event Complex	Park	60.0	AC
		Recreation Center	20.000	TSF
P3	Palmdale Trade and Commerce Center	Post Market Auto Sales/Service	300.000	TSF
		Off-Price/Promotion Centers	756.000	TSF
		Retail	1,645.000	TSF
		Commercial Office	2,177.000	TSF
		Industrial	2,767.000	TSF
		Hotel	82.000	TSF
P4	Palmdale Logistics Park	General Light Industrial	357.425	TSF
		High-Cube Fulfillment (Non-Sort)	1,072.275	TSF
P5	8th Street Industrial	High-Cube Fulfillment (Non-Sort)	384.800	TSF

[1] AC = Acres; TSF = Thousand Square Feet

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5 EC AND EPC (2025) TRAFFIC CONDITIONS

This section discusses the traffic forecasts for EC and EPC (2025) traffic conditions and the resulting intersection operations, traffic signal warrant, and off-ramp queuing analyses.

5.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for EC and EPC (2025) Projects conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the following:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for EPC (2025) conditions (e.g., intersection and roadway improvements at the Project's frontage and driveways).
- Driveways and those facilities assumed to be constructed by cumulative developments to provide site access are also assumed to be in place for both EC and EPC (2025) conditions (e.g., intersection and roadway improvements along the cumulative development's frontages).

5.2 EC AND EPC (2025) TRAFFIC VOLUME FORECASTS

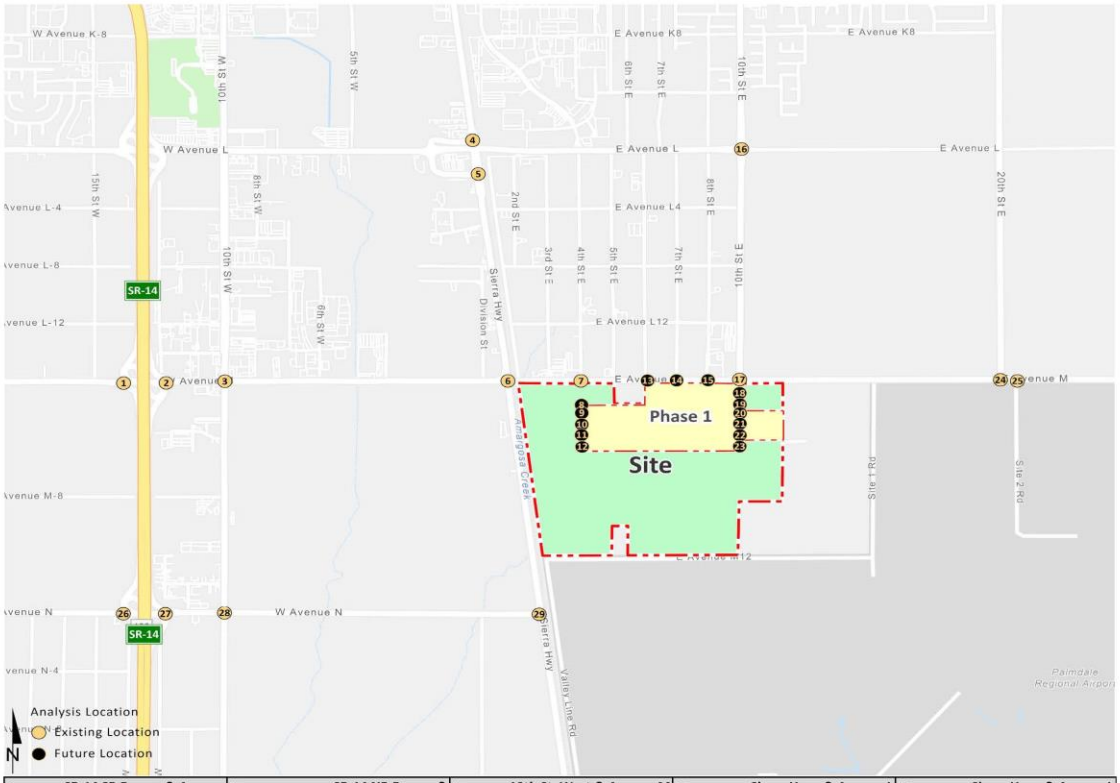
5.2.1 EC (2025) TRAFFIC CONDITIONS

This scenario includes Existing traffic volumes plus the addition of traffic generated by cumulative development projects. The weekday ADT and weekday peak hour intersection turning movement volumes, in actual vehicles, which can be expected for EC (2025) traffic conditions are shown on Exhibit 5-1.

5.2.2 EPC (2025) TRAFFIC CONDITIONS

This scenario includes Existing traffic volumes, the addition of traffic generated by cumulative development projects, and the addition of Project (Phase 1) traffic. The weekday ADT and weekday peak hour intersection turning movement volumes, in actual vehicles, which can be expected for EPC (2025) traffic conditions are shown on Exhibit 5-2.

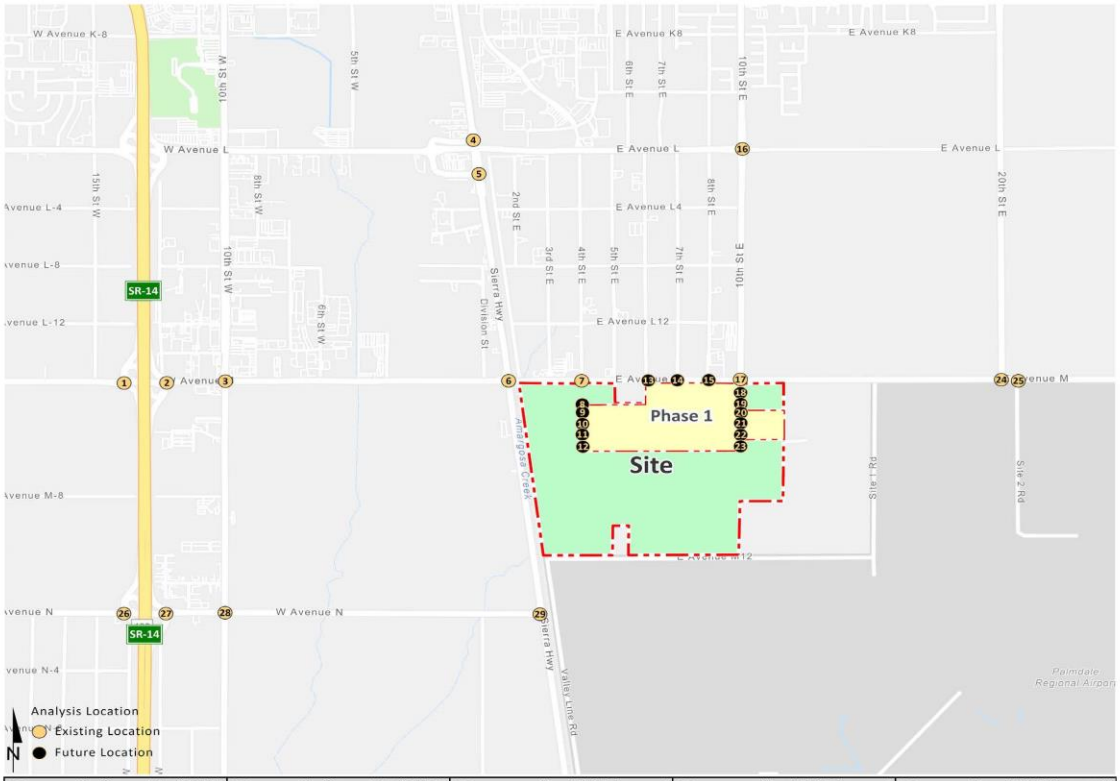
EXHIBIT 5-1: EC (2025) TRAFFIC VOLUMES (ACTUAL VEHICLES) (PAGE 1 OF 2)



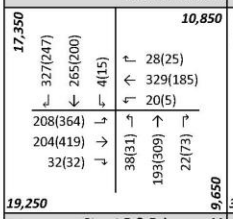
1 SR-14 SB Ramps & Avenue M	2 SR-14 NB Ramps & Avenue M	3 10th St. West & Avenue M	4 Sierra Hwy. & Avenue L West	5 Sierra Hwy. & Avenue L East
13,650 / 28,350 93(115) ↲ 853(487) ↳ ↑ 234(407) ← 401(737) ↰ 17(77) 695(352) → 215(104) ↲ 19,250 / 2,100	9,200 / 40,650 ↑ 274(896) ← 582(1124) 1442(815) → 105(24) ↲ 70(97) ↰ 370(337) ↱ 28,350 / 6,700	25,950 / 34,900 74(285) ↲ 650(862) ↓ 138(117) ↳ ↑ 128(178) ← 640(1387) ↰ 85(172) 192(155) → 1149(696) → 386(236) ↲ 116(321) ↰ 405(924) ↑ 97(95) ↱ 39,250 / 33,150	31,250 74(96) ↲ 887(1005) ↓ 14(16) → 106(165) ↲ 101(143) ↰ 775(1193) ↑ 6,050 / 34,050	34,050 15(17) ↲ 1048(1152) ↓ 57(81) → 113(169) ↲ 31(40) ↰ 974(1255) ↑ 4,350 / 35,700
6 Sierra Hwy. & Avenue M	**7 4th St. & Avenue M/Columbia Wy.**	**8 Street A & Private Drive D**	**9 Street A & Driveway 1**	**10 Street A & Driveway 2**
31,400 / 30,350 199(154) ↲ 716(888) ↓ 71(118) ↳ ↑ 119(83) ← 687(701) ↰ 277(319) 87(185) → 442(529) → 77(182) ↲ 244(197) ↰ 593(891) ↑ 464(310) ↱ 26,900 / 38,500	4,750 / 31,400 93(136) ↲ 10(27) ↳ ↑ 64(37) ← 1009(1061) 218(116) → 802(1004) → 34,200			
11 Street A & Driveway 3	**12 Street A & Driveway 4**	**13 6th St./Driveway 5 & Avenue M**	**14 7th St./Driveway 6 & Avenue M**	**15 8th St./Driveway 7 & Avenue M**
		Nominal / 31,600 2(1) ↲ 1(1) ↳ ↑ 1(0) ← 1092(1107) 819(1033) → 31,600	Nominal / 31,600 2(6) ↲ 2(2) ↳ ↑ 1(0) ← 1091(1100) 8(3) → 811(1031) → 31,600	31,600 ← 1092(1100) 813(1033) → 27,000

##(##) AM(PM) Peak Hour Intersection Volumes
Average Daily Trips

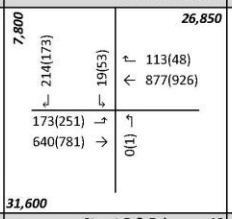
EXHIBIT 5-1: EC (2025) TRAFFIC VOLUMES (ACTUAL VEHICLES) (PAGE 2 OF 2)



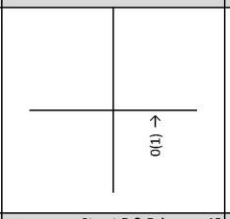
16 Challenger Wy./10th St. East & Avenue L



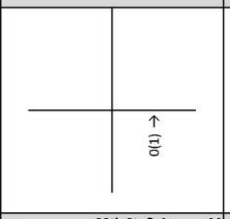
17 Challenger Wy./10th St. East & Avenue M



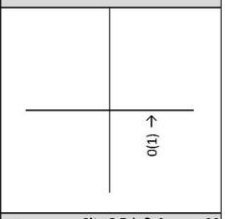
18 Street B & Driveway 8



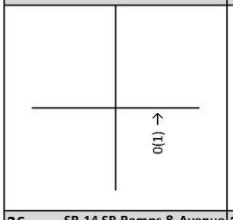
19 Street B & Driveway 9



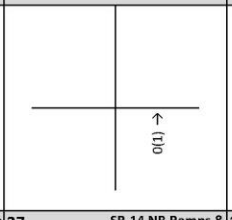
20 Street B & Driveway 10



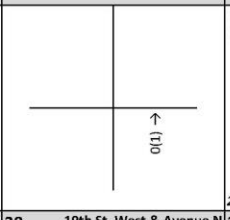
21 Street B & Driveway 11



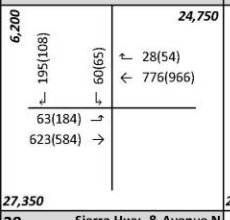
22 Street B & Driveway 12



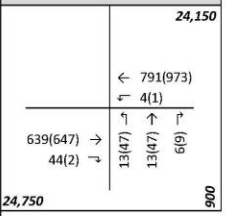
23 Street B & Driveway 13



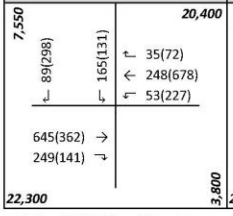
24 20th St. & Avenue M



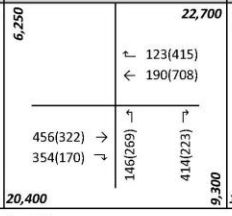
25 Site 2 Rd. & Avenue M



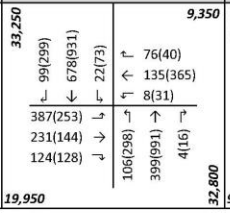
26 SR-14 SB Ramps & Avenue N



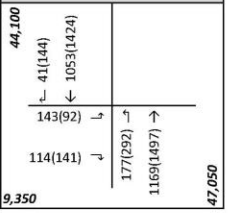
27 SR-14 NB Ramps & Avenue N



28 10th St. West & Avenue N

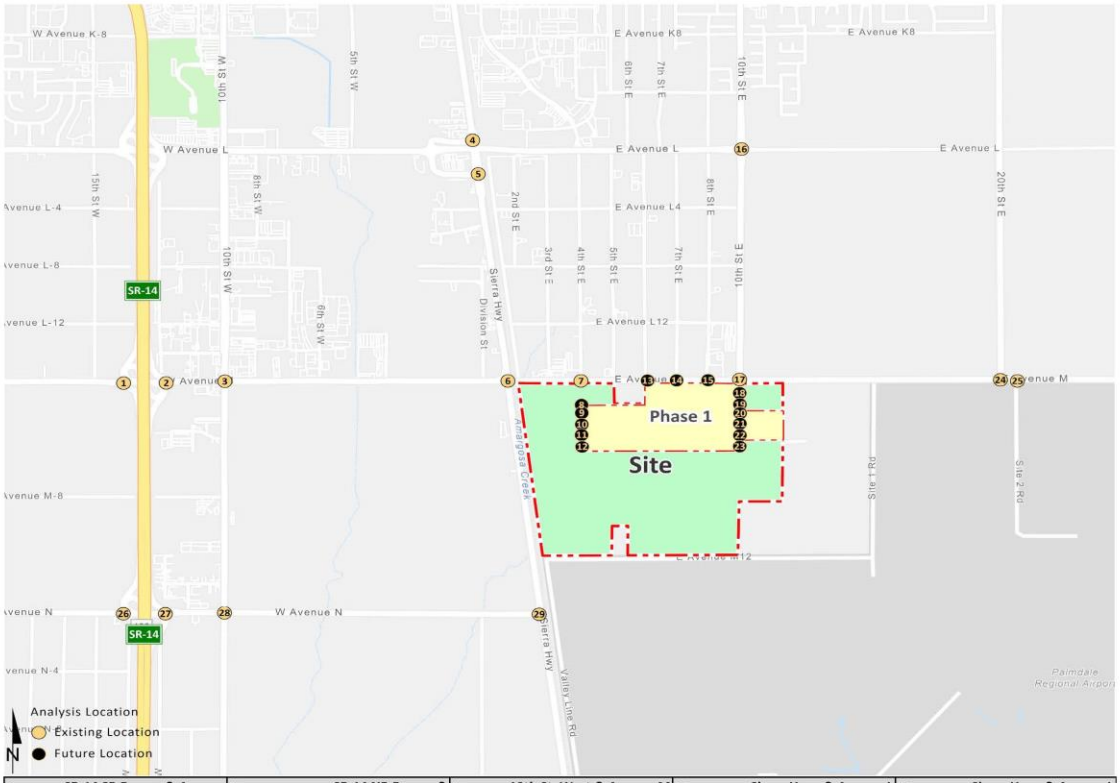


29 Sierra Hwy. & Avenue N

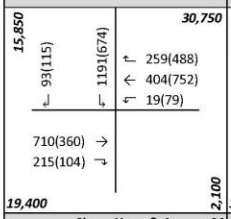


##(##) AM(PM) Peak Hour Intersection Volumes
Average Daily Trips

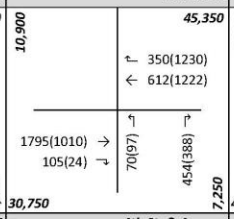
EXHIBIT 5-2: EPC (2025) TRAFFIC VOLUMES (ACTUAL VEHICLES) (PAGE 1 OF 2)



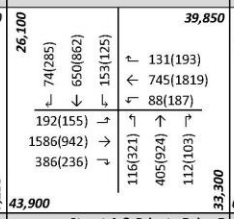
1 SR-14 SB Ramps & Avenue M



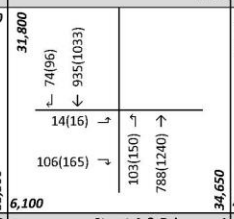
2 SR-14 NB Ramps & Avenue M



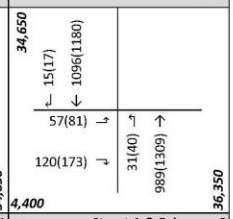
3 10th St. West & Avenue M



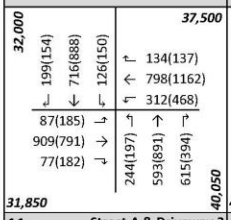
4 Sierra Hwy. & Avenue L West



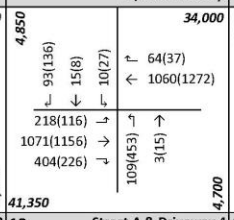
5 Sierra Hwy. & Avenue L East



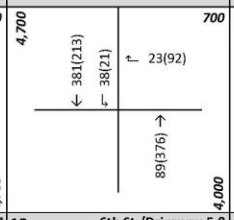
6 Sierra Hwy. & Avenue M



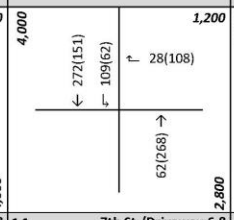
7 4th St. & Avenue M/Columbia Wy.



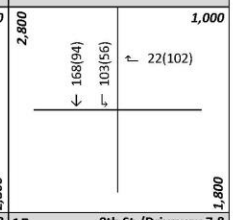
8 Street A & Private Drive D



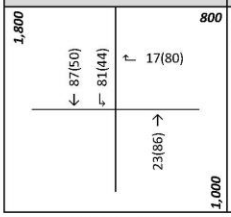
9 Street A & Driveway 1



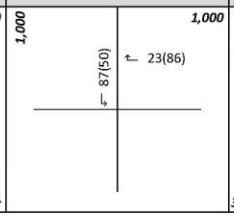
10 Street A & Driveway 2



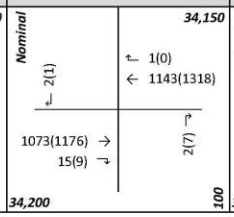
11 Street A & Driveway 3



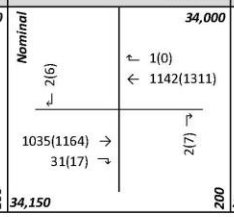
12 Street A & Driveway 4



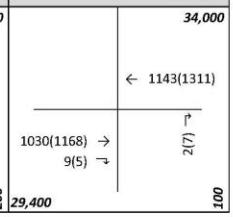
13 6th St./Driveway 5 & Avenue M



14 7th St./Driveway 6 & Avenue M

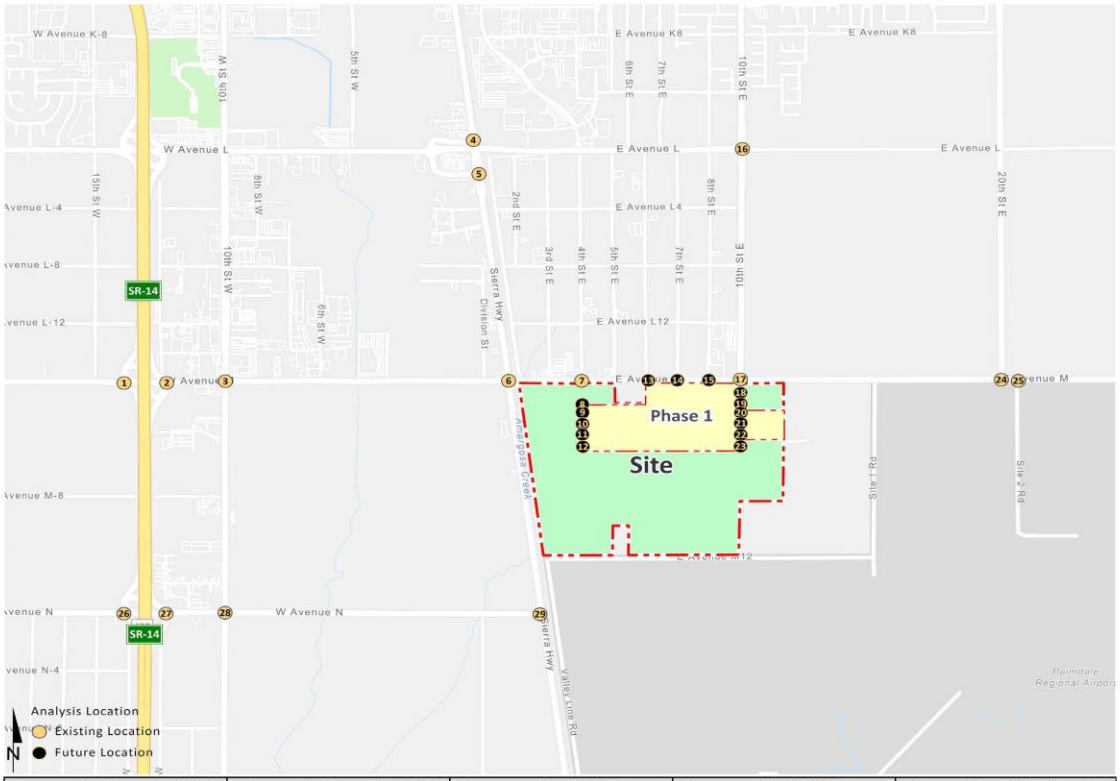


15 8th St./Driveway 7 & Avenue M



##(##) AM(PM) Peak Hour Intersection Volumes
Average Daily Trips

EXHIBIT 5-2: EPC (2025) TRAFFIC VOLUMES (ACTUAL VEHICLES) (PAGE 2 OF 2)



16 Challenger Wy./10th St. East & Avenue L

17,650 | 327(247) 295(216) 4(15) | 10,950
208(364) 204(419) 32(32) | 38(31) 199(338) 24(80) | 10,000
19,250

17 Challenger Wy./10th St. East & Avenue M

8,150 | 214(173) 37(20) 19(53) | 27,200
176(266) 642(788) 214(120) | 51(212) 5(22) 6(29) | 2,900
34,000

18 Street B & Driveway 8

2,900 | 44(24) 244(136) | 2,600
5(22) | 57(242)
300

19 Street B & Driveway 9

2,600 | 30(17) 213(119) | 2,250
7(30) | 50(212)
300

20 Street B & Driveway 10

2,250 | 39(23) 158(88) 16(9) | 200
10(39) | 36(157) | 1,650
450

21 Street B & Driveway 11

1,650 | 37(20) 92(52) 30(16) | 300
8(37) | 22(92) | 1,000
350

22 Street B & Driveway 12

1,000 | 37(20) 39(23) 16(9) | 200
8(37) | 10(40) | 450
350

23 Street B & Driveway 13

450 | 39(23) | 0
10(39) | 0(1)
450

24 20th St. & Avenue M

6,350 | 210(116) 60(65) | 24,950
66(199) 628(606) | 28(54) 798(978)
27,700

25 Site 2 Rd. & Avenue M

24,350
813(985) 4(1)
644(669) 44(2) | 13(47) 13(47) 6(9)
24,950 | 900

26 SR-14 SB Ramps & Avenue N

8,100 | 89(298) 165(131) | 20,950
645(362) 249(141) | 58(182) 248(678) 53(227) | 3,800
22,300

27 SR-14 NB Ramps & Avenue N

6,250 | 123(415) 213(818) | 23,750
456(322) 354(170) | 146(269) 525(283) | 9,800
20,950

28 10th St. West & Avenue N

33,250 | 99(299) 678(931) 22(73) | 10,450
387(253) 342(204) 124(128) | 76(40) 158(475) 8(31) | 32,800
21,050 | 106(298) 399(991) 4(16)

29 Sierra Hwy. & Avenue N

45,650 | 64(254) 1064(1464)
254(152) 114(141) | 177(292) 1209(1521) | 47,550
10,450

##(##) AM(PM) Peak Hour Intersection Volumes
Average Daily Trips

5.3 INTERSECTION OPERATIONS ANALYSIS

EC and EPC (2025) peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2 *Methodologies* of this TA. The intersection analysis results are summarized in Table 5-1 for EC (2025) traffic conditions, which indicates that the following study area intersections are anticipated to operate at an unacceptable LOS during the peak hours:

- SR-14 SB Ramps & Avenue M (#1) – LOS F AM and PM peak hours
- SR-14 NB Ramps & Avenue M (#2) – LOS F AM and PM peak hours
- 10th Street West & Avenue M (#3) – LOS F AM and PM peak hours
- Sierra Highway & Avenue M (#6) – LOS E AM peak hour; LOS F PM peak hour
- 6th Street/Driveway 5 & Avenue M (#13) – LOS E PM peak hour only
- 7th Street/Driveway 6 & Avenue M (#14) – LOS E AM peak hour only
- Challenger Way/10th Street East & Avenue M (#17) – LOS E AM peak hour; LOS F PM peak hour
- SR-14 SB Ramps & Avenue N (#26) – LOS F AM and PM peak hours
- SR-14 NB Ramps & Avenue N (#27) – LOS E AM peak hour; LOS F PM peak hour
- 10th Street West & Avenue N (#28) – LOS F AM and PM peak hours

With the addition of Phase 1 Project traffic, there are no additional study area intersections anticipated to operate at an unacceptable LOS during the peak hours under EPC (2025) traffic conditions. It should be noted, the following study area intersections are anticipated to improve operations compared to EC (2025) traffic conditions with the implementation of the Project design features, as discussed in Section 1.6 *Recommendations*:

- 6th Street/Driveway 5 & Avenue M (#13)
- 7th Street/Driveway 6 & Avenue M (#14)
- Challenger Way/10th Street East & Avenue M (#17)

The intersection operations analysis worksheets for EC and EPC (2025) traffic conditions are included in Appendices 5.1 and 5.2, respectively.

5.4 TRAFFIC SIGNAL WARRANTS ANALYSIS

The traffic signal warrant analysis for EC and EPC (2025) traffic conditions are based on the peak planning level ADT volume-based traffic signal warrants. There are no unsignalized study area intersections anticipated to meet a traffic signal warrant under EC and EPC (2025) traffic conditions (see Appendices 5.3 and 5.4).

TABLE 5-1: INTERSECTION ANALYSIS FOR EPC (2025) CONDITIONS

#	Intersection	Traffic Control[2]	EC (2025) Delay[1] (secs.) AM	EC (2025) Delay[1] (secs.) PM	EC (2025) Level of Service AM	EC (2025) Level of Service PM	EPC (2025) Delay[1] (secs.) AM	EPC (2025) Delay[1] (secs.) PM	EPC (2025) Level of Service AM	EPC (2025) Level of Service PM	Project-Related Increase in Delay (secs.)[3] AM	Project-Related Increase in Delay (secs.)[3] PM
1	SR-14 SB Ramps & Avenue M	CSS	**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**	**>3.0**	**>3.0**
2	SR-14 NB Ramps & Avenue M	CSS	**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**	**>3.0**	**>3.0**
3	10th St. West & Avenue M	TS	**90.1**	**178.1**	**F**	**F**	**166.4**	**>200.0**	**F**	**F**	**76.3**	**>5.0**
4	Sierra Hwy. & Avenue L West	TS	10.7	11.8	B	B	10.8	12.0	B	B	--	--
5	Sierra Hwy. & Avenue L East	TS	10.1	11.6	B	B	10.3	11.7	B	B	--	--
6	Sierra Hwy. & Avenue M	TS	**69.7**	**99.3**	**E**	**F**	**132.3**	**168.3**	**F**	**F**	**62.6**	**69.0**
7	4th St./Street A & Avenue M/Columbia Wy.	CSS/**TS**	26.4	31.1	D	D	30.9	47.1	C	D	--	--
8	Street A & Private Drive D		Future Intersection				9.0	11.9	A	B	--	--
9	Street A & Driveway 1		Future Intersection				8.8	10.8	A	B	--	--
10	Street A & Driveway 2		Future Intersection				8.6	9.8	A	A	--	--
11	Street A & Driveway 3		Future Intersection				8.5	9.1	A	A	--	--
12	Street A & Driveway 4		Future Intersection				0.0	0.0	A	A	--	--
13	6th St./Driveway 5 & Avenue M	CSS	31.9	**35.0**	D	**E**	13.4	13.9	B	B	--	--
14	7th St./Driveway 6 & Avenue M	CSS	**43.1**	25.0	**E**	D	14.7	15.4	B	C	--	--
15	8th St./Driveway 7 & Avenue M	CSS	0.0	0.0	A	A	14.5	15.3	B	C	--	--
16	Challenger Wy./10th St. East & Avenue L	RA	11.3	16.0	B	C	12.3	17.9	B	C	--	--
17	Challenger Wy./Street B & Avenue M	CSS/**TS**	**40.7**	**>100.0**	**E**	**F**	36.7	40.1	D	D	--	--
18	Street B & Driveway 8		Future Intersection				10.8	11.6	B	B	--	--
19	Street B & Private Drive D		Future Intersection				10.4	11.2	B	B	--	--
20	Street B & Driveway 9		Future Intersection				10.6	11.3	B	B	--	--
21	Street B & Driveway 10		Future Intersection				10.1	10.5	B	B	--	--
22	Street B & Driveway 11		Future Intersection				9.3	9.5	A	A	--	--
23	Street B & Driveway 12		Future Intersection				8.7	8.7	A	A	--	--
24	20th St. & Avenue M	TS	12.6	16.2	B	B	13.2	17.3	B	B	--	--
25	Site 2 Rd. & Avenue M	TS	5.3	6.6	A	A	5.3	6.6	A	A	--	--
26	SR-14 SB Ramps & Avenue N	CSS	**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**	--	--
27	SR-14 NB Ramps & Avenue N	CSS	**39.4**	**>100.0**	**E**	**F**	**91.5**	**>100.0**	**F**	**F**	--	--
28	10th St. West & Avenue N	TS	**145.2**	**179.4**	**F**	**F**	**146.6**	**193.8**	**F**	**F**	1.4	**14.4**
29	Sierra Hwy. & Avenue N	TS	24.4	26.9	C	C	44.5	35.5	D	D	--	--

* **BOLD** = Level of Service (LOS) does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

1 Per the Highway Capacity Manual (6th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the

2 TS = Traffic Signal; CSS = Cross-street Stop; **CSS** = Improvement

3 Project-related increase in delay is only calculated for deficient intersections within the jurisdiction of the City of Lancaster.

5.5 OFF-RAMP QUEUING ANALYSIS

Queuing analysis findings for EC and EPC (2025) are presented in Table 5-2. As shown in Table 5-2, the following movements are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for EC (2025) conditions:

- SR-14 SB Ramps & Avenue M (#1), SB left turn lane – AM peak hour only

With the addition of Phase 1 Project traffic, the following additional movement is anticipated experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for EPC (2025) conditions:

- SR-14 NB Ramps & Avenue M (#2), NB right turn lane – AM peak hour only

Worksheets for EC and EPC (2025) traffic conditions queuing analysis for are provided in Appendices 5.5 and 6.6, respectively.

TABLE 5-2: PEAK HOUR OFF-RAMP QUEUING SUMMARY FOR EPC (2025) CONDITIONS

			EC (2025)				EPC (2025)			
Intersection	Movement	Available Stacking Distance (Feet)	95th Percentile Queue (Feet) AM Peak	95th Percentile Queue (Feet) PM Peak	Acceptable? [1] AM	Acceptable? [1] PM	95th Percentile Queue (Feet)[2] AM Peak	95th Percentile Queue (Feet)[2] PM Peak	Acceptable? [1] AM	Acceptable? [1] PM
SR-14 SB Ramps & Avenue M (#1)	SBL	1,335	**2,583**	1,385 [2]	**No**	Yes	**3,828**	**2,085**	**No**	**No**
	SBR	330	18	38	Yes	Yes	18	40	Yes	Yes
SR-14 NB Ramps & Avenue M (#2)	NBL	1,375	225	245	Yes	Yes	270	295	Yes	Yes
	NBR	340	1,105 [2]	338 [2]	Yes	Yes	**1,618**	720 [2]	**No**	Yes
SR-14 SB Ramps & Avenue N (#26)	SBL	1,395	203	335	Yes	Yes	203	335	Yes	Yes
	SBR	335	13	160	Yes	Yes	13	160	Yes	Yes
SR-14 NB Ramps & Avenue N (#27)	NBL	1,380	55	388	Yes	Yes	58	463	Yes	Yes
	NBR	290	235	40	Yes	Yes	460 [2]	58	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.
[2] Although 95th percentile queue is anticipated to exceed the available storage for the turn lane, the adjacent through lane has sufficient storage to accommodate any spillover without spilling back and affecting the SR-14 Freeway mainline.

5.6 DEFICIENCIES AND IMPROVEMENTS

Improvements needed to achieve acceptable LOS have been identified at intersections or off-ramps that are anticipated to operate at a deficient LOS under EC and EPC (2025) traffic conditions.

5.6.1 IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

Improvement strategies have been recommended at intersections that have been identified as deficient under EC and EPC (2025) traffic conditions in an effort to achieve pre-Project delay or better. The effectiveness of the recommended improvement strategies to address EC and EPC (2025) traffic deficiencies are presented in Table 5-3. Worksheets for EC and EPC (2025), with improvements, intersection operations are provided in Appendix 5.7.

TABLE 5-3: INTERSECTION ANALYSIS FOR EPC (2025) CONDITIONS WITH IMPROVEMENTS

		Intersection Approach Lanes [1]												Delay[2] (secs.)		Level of Service	
	Traffic	Northbound			Southbound			Eastbound			Westbound						
	Control [3]	L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
1 SR-14 SB Ramps & Avenue M																	
With Improvements:	**TS**	0	0	0	**2**	0	1	0	**2**	1>>	0	**2**	1>>	23.5	14.9	C	B
2 SR-14 NB Ramps & Avenue M																	
With Improvements:	**TS**	1	0	1	0	0	0	0	**2**	1>>	0	**2**	1>>	35.4	14.1	D	B
3 10th St. West & Avenue M																	
With Improvements:	TS	**2**	2	0	**2**	2	1	**2**	**3**	**0**	**2**	**3**	**0**	52.1	**60.9**	D	**E**
6 Sierra Hwy. & Avenue M																	
With Improvements:	TS	1	2	**1>**	1	2	1>>	**2**	**3**	**0**	**2**	**3**	**0**	**69.6**	**87.6**	**E**	**F**
26 SR-14 SB Ramps & Avenue N																	
With Improvements:	**TS**	0	0	0	1	0	1	0	1	1>>	0	1	1>>	13.1	38.4	B	D
27 SR-14 NB Ramps & Avenue N																	
With Improvements:	**TS**	1	0	1	0	0	0	0	1	1>>	0	1	1>>	28.6	27.5	C	C
28 10th St. & Avenue N																	
With Improvements:	TS	1	2	0	1	2	0	1	**2**	1	1	**2**	0	47.5	**80.9**	D	**F**

* **BOLD** = Level of Service (LOS) does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; **1** = Improvement; >> = Free-Right Turn

[2] Per the Highway Capacity Manual (6th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal; **TS** = Improvement

5.6.2 IMPROVEMENTS TO ADDRESS DEFICIENCIES ON OFF-RAMP QUEUES

Improvement strategies have been recommended at study area off-ramps that have been identified as deficient under EC and EPC (2025) traffic conditions and are shown in Table 5-4. The improvements are consistent with the intersection improvements identified in Table 5-3.

TABLE 5-4: PEAK HOUR QUEUING SUMMARY FOR EPC (2025) CONDITIONS WITH IMPROVEMENTS

Intersection	Movement	Available Stacking Distance (Feet)	EPC (2025) With Improvements 95th Percentile Queue (Feet)[2]		Acceptable? [1]	
			AM Peak	PM Peak	AM	PM
SR-14 SB Ramps & Avenue M (#1)	SBL	1,335	646 [2]	329	Yes	Yes
	SBR	330	29	42	Yes	Yes
SR-14 NB Ramps & Avenue M (#2)	NBL	1,375	83	121	Yes	Yes
	NBR	340	698 [2,3]	525 [2,3]	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the

[2] 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

[3] Although 95th percentile queue is anticipated to exceed the available storage for the turn lane, the adjacent through lane has sufficient storage to accommodate any spillover without spilling back and affecting the SR-14 Freeway mainline.

Worksheets for EC and EPC (2025) conditions, with improvements, off-ramp queuing analysis worksheets are provided in Appendix 5.8.

6 EC AND EPC (2032) TRAFFIC CONDITIONS

This section discusses the traffic forecasts for EC and EPC (2032) traffic conditions and the resulting intersection operations, traffic signal warrant, and off-ramp queuing analyses.

6.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for EC and EPC (2032) Projects conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the following:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for EPC (2032) conditions (e.g., intersection and roadway improvements at the Project's frontage and driveways).
- Driveways and those facilities assumed to be constructed by cumulative developments to provide site access are also assumed to be in place for both EC and EPC (2032) conditions (e.g., intersection and roadway improvements along the cumulative development's frontages).

6.2 EC AND EPC (2032) TRAFFIC VOLUME FORECASTS

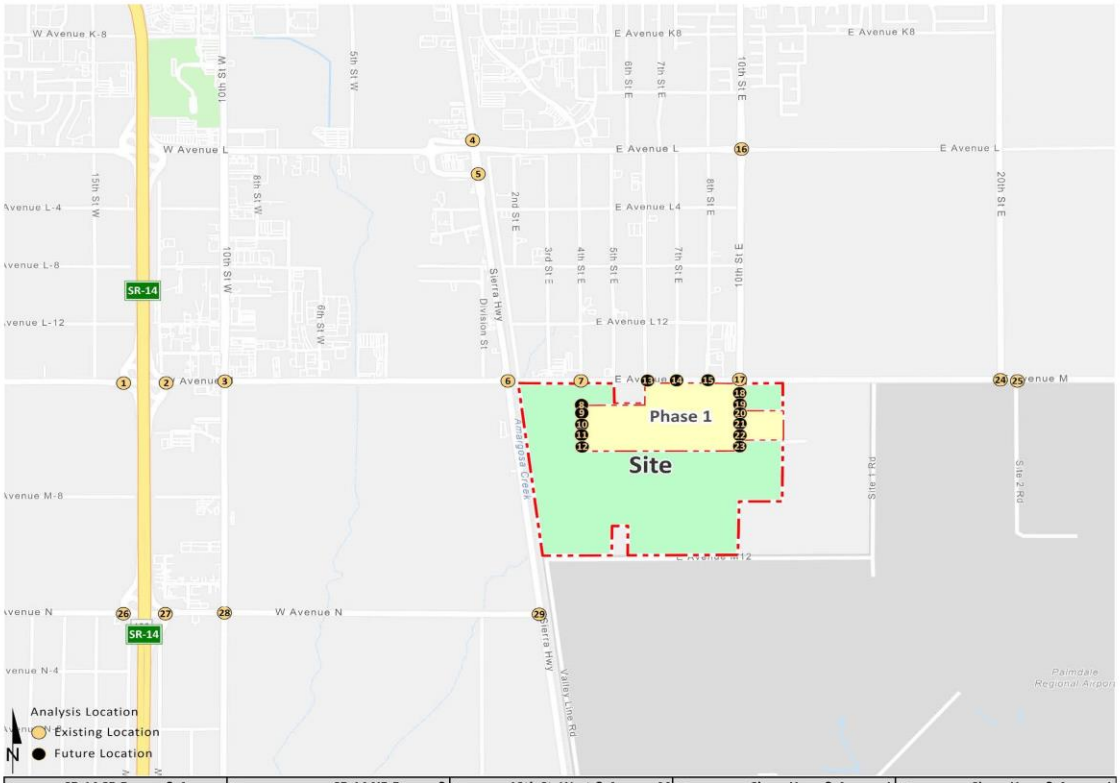
6.2.1 EC (2032) TRAFFIC CONDITIONS

This scenario includes Existing traffic volumes the addition of traffic generated by cumulative development projects. The weekday ADT and weekday peak hour intersection turning movement volumes, in actual vehicles, which can be expected for EC (2032) traffic conditions are shown on Exhibit 6-1.

6.2.2 EPC (2032) TRAFFIC CONDITIONS

This scenario includes Existing traffic volumes, the addition of traffic generated by cumulative development projects, and the addition of Project (Buildout) traffic. The weekday ADT and weekday peak hour intersection turning movement volumes, in actual vehicles, which can be expected for EPC (2032) traffic conditions are shown on Exhibit 6-2.

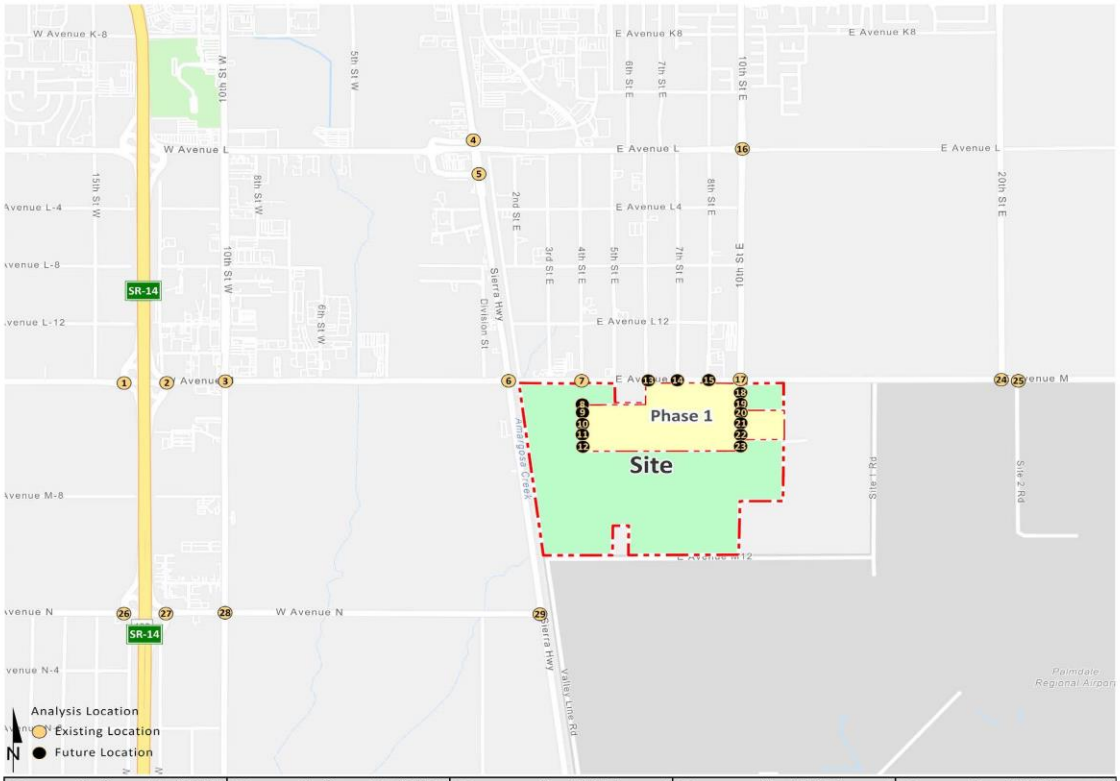
EXHIBIT 6-1: EC (2032) TRAFFIC VOLUMES (ACTUAL VEHICLES) (PAGE 1 OF 2)



1 SR-14 SB Ramps & Avenue M	2 SR-14 NB Ramps & Avenue M	3 10th St. West & Avenue M	4 Sierra Hwy. & Avenue L West	5 Sierra Hwy. & Avenue L East
16,200 / 31,700 93(115) ↲ 1314(729) ↳ ↑ 234(407) ← 408(765) ↰ 28(129) 731(372) → 215(104) ↲ 19,700 / 2,400	11,800 / 46,950 ↑ 357(1259) ← 600(1204) 1939(1077) → 105(24) ↲ 70(97) ↰ 435(367) ↱ 31,700 / 7,000	26,600 / 39,150 74(285) ↲ 903(1074) ↓ 166(133) ↳ ↑ 133(200) ← 703(1679) ↰ 86(176) 192(155) → 1515(867) → 582(358) ↲ ↰ 154(472) ↑ 468(1250) ↱ 101(96) 45,550 / 41,300	36,150 / 39,000 82(98) ↲ 1130(1193) ↓ 14(16) → 106(165) ↲ ↰ 120(156) ↑ 837(1487) 6,100 / 39,000	39,000 / 40,750 15(17) ↲ 1338(1340) ↓ 61(87) → 149(179) ↱ ↰ 36(41) ↑ 1154(1556) 4,450 / 40,750
6 Sierra Hwy. & Avenue M	**7 4th St. & Avenue M/Columbia Wy.**	**8 Street A & Private Drive D**	**9 Street A & Driveway 1**	**10 Street A & Driveway 2**
36,300 / 30,850 271(192) ↲ 889(1044) ↓ 71(118) ↳ ↑ 119(83) ← 738(724) ↰ 277(319) 100(241) → 455(571) → 89(242) ↲ ↰ 316(223) ↑ 647(1125) ↱ 464(310) 28,900 / 43,300	4,750 / 31,900 97(137) ↲ 10(27) ↳ ↑ 64(37) ← 1055(1083) 219(120) → 814(1043) → 34,750			
11 Street A & Driveway 3	**12 Street A & Driveway 4**	**13 6th St./Driveway 5 & Avenue M**	**14 7th St./Driveway 6 & Avenue M**	**15 8th St./Driveway 7 & Avenue M**
		Nominal / 32,050 2(1) ↲ 1(1) ↳ ↑ 1(0) ← 1138(1129) 831(1072) → 32,050	Nominal / 32,050 2(10) ↲ 2(2) ↳ ↑ 1(0) ← 1137(1119) 13(5) → 819(1068) → 32,050	32,050 ← 1138(1119) 821(1070) → 27,450

##(##) AM(PM) Peak Hour Intersection Volumes
Average Daily Trips

EXHIBIT 6-1: EC (2032) TRAFFIC VOLUMES (ACTUAL VEHICLES) (PAGE 2 OF 2)



16 Challenger Wy./10th St. East & Avenue L

17,450 | 10,850
327(247) ↓ 275(202) ↓ 4(15) ↓
28(25) ↑ 329(185) ↑ 22(5) ↑
208(364) → 204(419) → 32(32) →
38(31) ↑ 194(318) ↑ 22(75) ↑
19,250 | 9,750

17 Challenger Wy./10th St. East & Avenue M

7,900 | 27,200
225(175) ↓ 19(53) ↓
113(48) ↑ 912(943) ↑
175(260) → 646(809) →
0(1) ↑
32,050

18 Street B & Driveway 8

0(1) ↑

19 Street B & Driveway 9

0(1) ↑

20 Street B & Driveway 10

0(1) ↑

21 Street B & Driveway 11

0(1) ↑

22 Street B & Driveway 12

0(1) ↑

23 Street B & Driveway 13

0(1) ↑

24 20th St. & Avenue M

6,200 | 25,100
195(108) ↓ 60(65) ↓
28(54) ↑ 811(983) ↑
63(184) → 629(612) →
27,750

25 Site 2 Rd. & Avenue M

24,550
826(990) ↑ 4(1) ↑
645(675) → 44(2) →
13(47) ↑ 13(47) ↑ 6(9) ↑
25,100 | 900

26 SR-14 SB Ramps & Avenue N

7,550 | 21,550
89(298) ↓ 165(131) ↓
35(72) ↑ 248(678) ↑ 89(378) ↑
645(362) → 249(141) →
22,300 | 4,900

27 SR-14 NB Ramps & Avenue N

6,250 | 24,950
123(415) ↑ 225(859) ↑
456(322) → 354(170) →
146(269) ↑ 607(329) ↑
21,550 | 10,400

28 10th St. West & Avenue N

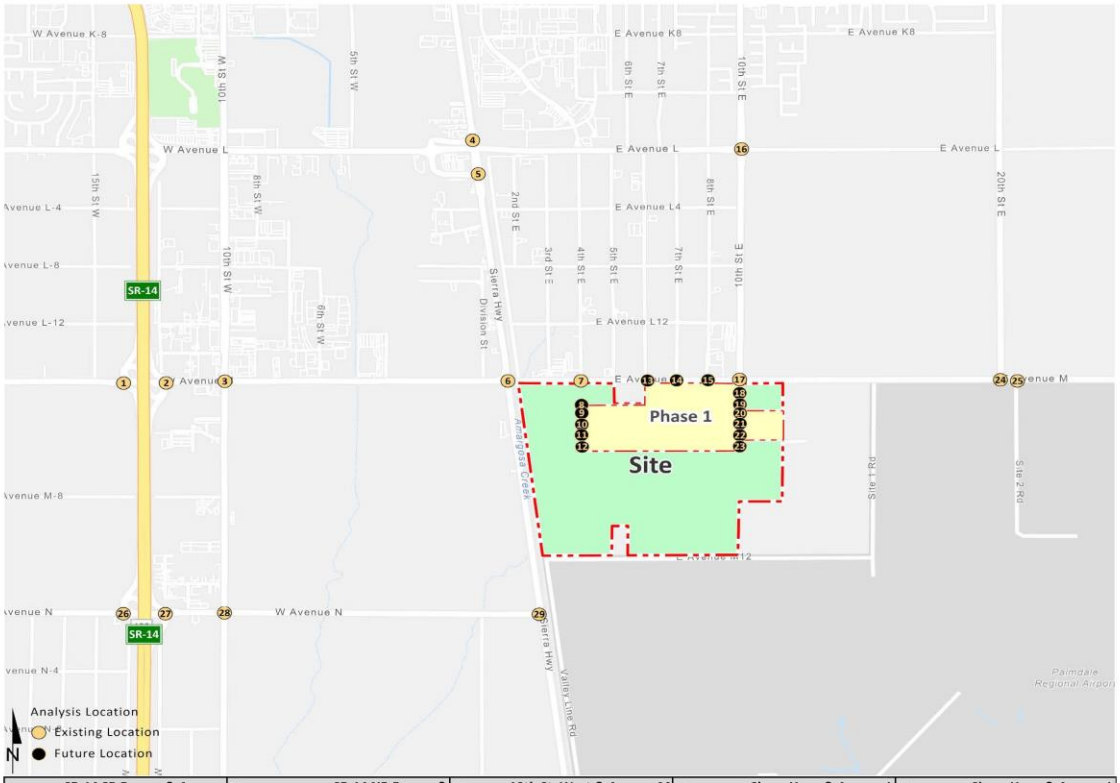
40,950 | 9,950
130(422) ↓ 907(1128) ↓ 27(94) ↓
104(58) ↑ 139(393) ↑ 8(31) ↑
547(352) → 264(150) → 124(128) →
106(298) ↑ 458(1298) ↑ 4(16) ↑
22,200 | 38,250

29 Sierra Hwy. & Avenue N

48,900
46(172) ↓ 1234(1611) ↓
176(98) → 119(163) →
205(309) ↑ 1262(1751) ↑
9,950 | 51,900

##(##) AM(PM) Peak Hour Intersection Volumes
Average Daily Trips

EXHIBIT 6-2: EPC (2032) TRAFFIC VOLUMES (ACTUAL VEHICLES) (PAGE 1 OF 2)



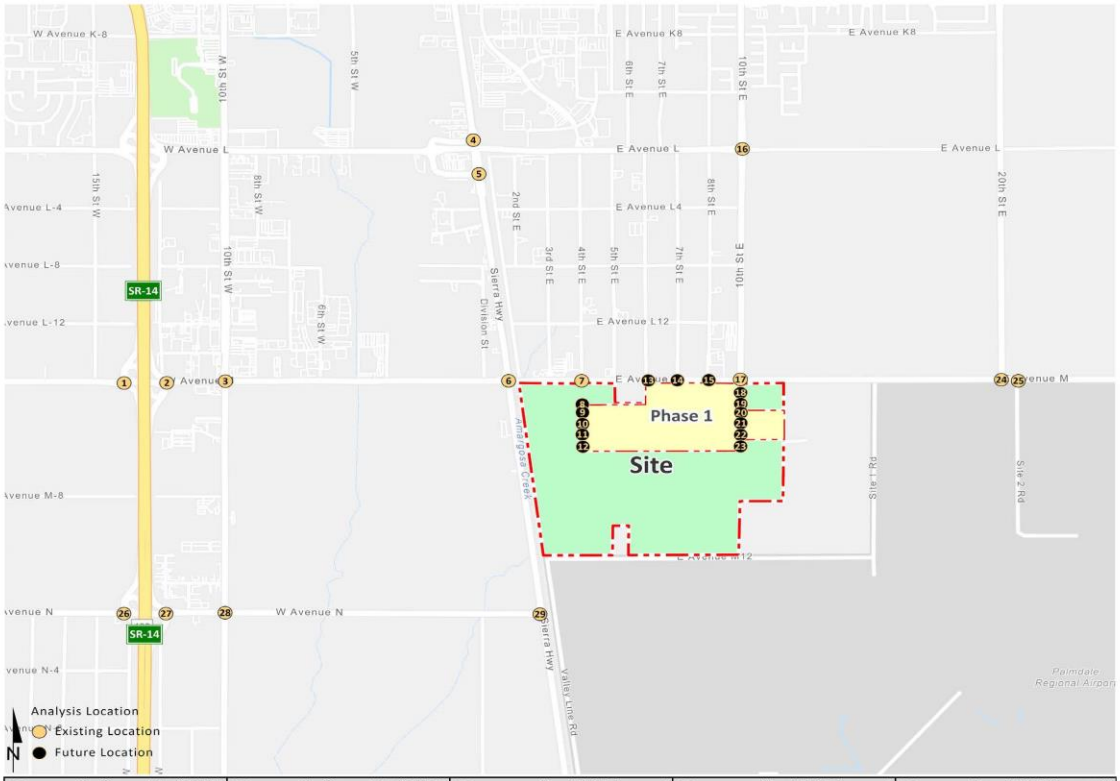
1 SR-14 SB Ramps & Avenue M	2 SR-14 NB Ramps & Avenue M	3 10th St. West & Avenue M	4 Sierra Hwy. & Avenue L West	5 Sierra Hwy. & Avenue L East
23,350 / 39,400	17,000 / 61,750	27,050 / 54,900	38,100	41,150
93(115) ↳ 2149(1341) ↲	738(1958) ↑ 768(1436) ←	74(285) ↳ 903(1074) ↓ 204(161) ↲	82(98) ↳ 1265(1294) ↓	15(17) ↳ 1479(1446) ↓
382(603) ↑ 426(799) ← 30(131) ↰	150(232) ↑ 1252(2610) ← 103(208) ↰	192(155) → 2642(1702) → 582(358) ↲	14(16) → 112(169) ↲	61(87) → 170(194) ↲
772(402) → 215(104) ↲	2814(1719) → 105(24) ↲	154(472) ↰ 468(1250) ↑ 139(124) ↱	130(173) ↰ 910(1596) ↑	40(45) ↰ 1236(1682) ↑
20,200 / 2,450	39,400 / 8,950	60,350 / 41,800	6,300 / 41,150	4,650 / 43,100

6 Sierra Hwy. & Avenue M	7 4th St. & Avenue M/Columbia Wy.	8 Street A & Private Drive D	9 Street A & Driveway 1	10 Street A & Driveway 2
38,600 / 53,750	5,350 / 39,000	13,400 / 700	11,600 / 1,200	9,250 / 1,000
271(192) ↳ 889(1044) ↓ 233(239) ↲	97(137) ↳ 44(32) ↓ 10(27) ↲	83(82) ↳ 914(690) ↓ 38(21) ↲	83(82) ↳ 722(545) ↓ 109(62) ↲	619(489) ↓ 103(56) ↲
205(214) ↑ 1252(1719) ← 523(636) ↰	64(37) ↑ 1237(1462) ← 0(48) ↰	23(92) ↑	28(108) ↑	22(102) ←
100(241) → 1589(1461) → 158(242) ↲	219(120) → 1363(1335) → 1123(925) ↲	64(57) ↳	64(57) ↳	
385(223) ↰ 647(1125) ↑ 913(590) ↱	610(1011) ↰ 21(37) ↑ 0(48) ↱	453(755) ↑	361(591) ↑	
44,700 / 48,150	56,700 / 20,700	1,100 / 11,600	1,100 / 9,250	8,250

11 Street A & Driveway 3	12 Street A & Driveway 4	13 6th St./Driveway 5 & Avenue M	14 7th St./Driveway 6 & Avenue M	15 8th St./Driveway 7 & Avenue M
8,250 / 800	7,450 / 1,000	Nominal / 39,250	Nominal / 39,150	39,100
538(445) ← 81(44) ↳	451(394) ← 87(50) ↳	2(1) ↳	2(10) ↳	1337(1550) ←
17(80) ↑	23(86) ↑	1(0) ← 1337(1560)	1(0) ← 1336(1550)	
323(408) →	299(322) →	1359(1409) → 15(9) ↲	1317(1395) → 31(17) ↲	1312(1399) → 9(5) ↲
		2(7) ↱	2(7) ↱	2(7) ↱
7,450	6,450	39,300 / 100	39,250 / 200	34,500 / 100

##(##) AM(PM) Peak Hour Intersection Volumes
Average Daily Trips

EXHIBIT 6-2: EPC (2032) TRAFFIC VOLUMES (ACTUAL VEHICLES) (PAGE 2 OF 2)



16 Challenger Wy./10th St. East & Avenue L

18,450		11,200
↳ 327(247) ↓ 354(259) ↲ 4(15)		↱ 28(25) ← 329(185) ↰ 45(22)
208(364) →	↱ 42(35)	
204(419) →	↑ 229(384)	
38(36) ↲	→ 33(94)	
19,400		11,150

17 Challenger Wy./10th St. East & Avenue M

9,300		28,450
↳ 246(190) ↓ 87(63) ↲ 19(53)		↱ 113(48) ← 924(952) ↰ 87(63)
191(290) →	↱ 166(409)	
655(825) →	↑ 34(59)	
468(290) ↲	→ 35(66)	
39,100		8,250

18 Street B & Driveway 8

8,250		
↳ 44(24) ↓ 598(392)		
5(22) →		
	→ 231(512)	
300		7,950

19 Street B & Driveway 9

7,950		
↳ 30(17) ↓ 567(375)		
7(30) →		
	→ 224(482)	
300		7,600

20 Street B & Driveway 10

7,600		200
↳ 39(23) ↓ 512(343) ↲ 16(9)		← 4(15)
10(39) →		
	→ 209(428)	
450		7,000

21 Street B & Driveway 11

7,000		300
↳ 37(20) ↓ 446(307) ↲ 30(16)		↱ 6(29)
8(37) →		
	→ 195(362)	
350		6,350

22 Street B & Driveway 12

6,350		200
↳ 37(20) ↓ 393(278) ↲ 16(9)		← 4(15)
8(37) →		
	→ 184(310)	
350		5,800

23 Street B & Driveway 13

5,800		
↳ 39(23) ↓ 354(255)		
10(39) →		
	→ 174(272)	
450		5,350

24 20th St. & Avenue M

6,700		25,850
↳ 236(138) ↲ 60(65)		↱ 28(54) ← 869(1025)
81(218) →		
655(661) →		
29,000		

25 Site 2 Rd. & Avenue M

		25,250
		← 884(1032) ↰ 4(1)
671(724) →	↱ 13(47)	
44(2) ↲	↑ 13(47)	
	→ 6(9)	
25,850		900

26 SR-14 SB Ramps & Avenue N

9,100		23,200
↳ 89(298) ↲ 165(131)		↱ 146(293) ← 252(682) ↰ 89(378)
651(366) →		
249(141) ↲		
22,450		4,900

27 SR-14 NB Ramps & Avenue N

6,250		28,100
		↱ 123(415) ← 339(1085)
462(326) →	↱ 146(269)	
354(170) ↲	→ 868(518)	
23,200		11,950

28 10th St. West & Avenue N

40,950		13,150
↳ 130(422) ↓ 907(1128) ↲ 27(94)		↱ 104(58) ← 253(619) ↰ 8(31)
547(352) →	↱ 106(298)	
531(344) →	↑ 458(1298)	
124(128) ↲	→ 4(16)	
25,400		38,250

29 Sierra Hwy. & Avenue N

53,750		
↳ 160(398) ↓ 1297(1702)		
443(292) →		
	↑ 205(309)	
119(163) ↲	→ 1376(1837)	
13,150		53,600

##(##) AM(PM) Peak Hour Intersection Volumes
Average Daily Trips

6.3 INTERSECTION OPERATIONS ANALYSIS

EC and EPC (2032) peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2 *Methodologies* of this TA. The intersection analysis results are summarized in Table 6-1 for EC (2032) traffic conditions, which indicates that the following study area intersections are anticipated to operate at an unacceptable LOS during the peak hours:

- SR-14 SB Ramps & Avenue M (#1) – LOS F AM and PM peak hours
- SR-14 NB Ramps & Avenue M (#2) – LOS F AM and PM peak hours
- 10th Street West & Avenue M (#3) – LOS F AM and PM peak hours
- Sierra Highway & Avenue M (#6) – LOS F AM and PM peak hours
- 6th Street/Driveway 5 & Avenue M (#13) – LOS E PM peak hour only
- 7th Street/Driveway 6 & Avenue M (#14) – LOS E AM peak hour only
- Challenger Way/10th Street East & Avenue M (#17) – LOS E AM peak hour; LOS F PM peak hour
- SR-14 SB Ramps & Avenue N (#26) – LOS F AM and PM peak hours
- SR-14 NB Ramps & Avenue N (#27) – LOS F AM and PM peak hours
- 10th Street West & Avenue N (#28) – LOS F AM and PM peak hours
- Sierra Highway & Avenue N (#29) – LOS E AM peak hour only

With the addition of Project (Buildout) traffic, the following additional study area intersection is anticipated to operate at an unacceptable LOS during the peak hours under EPC (2032) traffic conditions:

- 4th Street & Avenue M/Columbia Way (#7) – LOS F AM and PM peak hours

It should be noted, the deficiency at this location is likely attributable to the high through volumes along Avenue M as opposed to the traffic volumes associated with the proposed Project. The intersection operations analysis worksheets for EC and EPC (2032) traffic conditions are included in Appendices 6.1 and 6.2, respectively.

6.4 TRAFFIC SIGNAL WARRANTS ANALYSIS

The traffic signal warrant analysis for EC and EPC (2032) traffic conditions are based on the peak planning level ADT volume-based traffic signal warrants. There are no unsignalized study area intersections anticipated to meet a traffic signal warrant under EC and EPC (2032) traffic conditions (see Appendices 6.3 and 6.4).

TABLE 6-1: INTERSECTION ANALYSIS FOR EPC (2032) CONDITIONS

#	Intersection	Traffic Control[2]	EC (2032) Delay[1] (secs.) AM	EC (2032) Delay[1] (secs.) PM	EC (2032) Level of Service AM	EC (2032) Level of Service PM	EPC (2032) Delay[1] (secs.) AM	EPC (2032) Delay[1] (secs.) PM	EPC (2032) Level of Service AM	EPC (2032) Level of Service PM	Project-Related Increase in Delay (secs.)[3] AM	Project-Related Increase in Delay (secs.)[3] PM
1	SR-14 SB Ramps & Avenue M	CSS	**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**	**>3.0**	**>3.0**
2	SR-14 NB Ramps & Avenue M	CSS	**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**	**>3.0**	**>3.0**
3	10th St. West & Avenue M	TS	**188.8**	**>200.0**	**F**	**F**	**>200.0**	**>200.0**	**F**	**F**	**>5.0**	**>5.0**
4	Sierra Hwy. & Avenue L West	TS	11.4	12.8	B	B	12.6	14.4	B	B	--	--
5	Sierra Hwy. & Avenue L East	TS	10.5	12.3	B	B	11.5	13.3	B	B	--	--
6	Sierra Hwy. & Avenue M	TS	**109.9**	**166.0**	**F**	**F**	**>200.0**	**>200.0**	**F**	**F**	**>5.0**	**>5.0**
7	4th St./Street A & Avenue M/Columbia Wy.	CSS/**TS**	29.1	33.0	D	D	**>200.0**	**>200.0**	**F**	**F**	**>5.0**	**>5.0**
8	Street A & Private Drive D		Future Intersection				13.1	20.5	B	C	--	--
9	Street A & Driveway 1		Future Intersection				11.9	16.6	B	C	--	--
10	Street A & Driveway 2		Future Intersection				11.5	14.1	B	C	--	--
11	Street A & Driveway 3		Future Intersection				11.2	12.5	B	B	--	--
12	Street A & Driveway 4		Future Intersection				11.1	11.6	B	B	--	--
13	6th St./Driveway 5 & Avenue M	CSS	34.4	**37.2**	D	**E**	18.0	18.2	C	C	--	--
14	7th St./Driveway 6 & Avenue M	CSS	**48.1**	22.4	**E**	C	17.7	18.1	C	C	--	--
15	8th St./Driveway 7 & Avenue M	CSS	0.0	0.0	A	A	17.4	18.0	C	C	--	--
16	Challenger Wy./10th St. East & Avenue L	RA	11.6	16.4	B	C	15.2	23.8	C	C	--	--
17	Challenger Wy./Street B & Avenue M	CSS/**TS**	**43.7**	**>100.0**	**E**	**F**	**64.1**	**63.5**	**E**	**E**	**20.4**	--
18	Street B & Driveway 8		Future Intersection				20.0	22.0	D	C	--	--
19	Street B & Private Drive D		Future Intersection				19.2	21.3	C	C	--	--
20	Street B & Driveway 9		Future Intersection				22.3	22.5	C	C	--	--
21	Street B & Driveway 10		Future Intersection				20.3	22.1	C	C	--	--
22	Street B & Driveway 11		Future Intersection				17.8	18.4	C	B	--	--
23	Street B & Driveway 12		Future Intersection				14.4	14.5	B	B	--	--
24	20th St. & Avenue M	TS	12.7	16.2	B	B	14.8	20.4	B	C	--	--
25	Site 2 Rd. & Avenue M	TS	5.3	6.6	A	A	5.2	6.6	A	A	--	--
26	SR-14 SB Ramps & Avenue N	CSS	**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**	--	--
27	SR-14 NB Ramps & Avenue N	CSS	**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**E**	**F**	--	--
28	10th St. West & Avenue N	TS	**>200.0**	**>200.0**	**F**	**F**	**>200.0**	**>200.0**	**F**	**F**	**>5.0**	**>5.0**
29	Sierra Hwy. & Avenue N	TS	**57.7**	51.0	**E**	D	**132.8**	**101.2**	**F**	**F**	**75.1**	**50.2**

* **BOLD** = Level of Service (LOS) does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

1 Per the Highway Capacity Manual (6th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the

2 TS = Traffic Signal; CSS = Cross-street Stop; **CSS** = Improvement

3 Project-related increase in delay is only calculated for deficient intersections within the jurisdiction of the City of Lancaster.

6.5 OFF-RAMP QUEUING ANALYSIS

Queuing analysis findings for EC and EPC (2032) are presented in Table 6-2. As shown in Table 6-2, the following movements are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for EC (2032) conditions:

- SR-14 SB Ramps & Avenue M (#1), SB left turn lane – AM and PM peak hours
- SR-14 NB Ramps & Avenue M (#2), NB right turn lane – AM peak hour only

With the addition of Project (Buildout) traffic, the following additional movement is anticipated experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for EPC (2032) conditions:

- SR-14 NB Ramps & Avenue N (#27), NB right turn lane – AM peak hour only

Worksheets for EC and EPC (2032) traffic conditions queuing analysis for are provided in Appendices 6.5 and 6.6, respectively.

TABLE 6-2: PEAK HOUR OFF-RAMP QUEUING SUMMARY FOR EPC (2032) CONDITIONS

			EC (2032)				EPC (2032)			
		Available Stacking	95th Percentile Queue (Feet)		Acceptable? [1]		95th Percentile Queue (Feet)[2]		Acceptable? [1]	
Intersection	Movement	Distance (Feet)	AM Peak	PM Peak	AM	PM	AM Peak	PM Peak	AM	PM
SR-14 SB Ramps & Avenue M (#1)	SBL	1,335	**4,263**	**2,348**	**No**	**No**	**7,435**	**4,675**	**No**	**No**
	SBR	330	18	40	Yes	Yes	18	43	Yes	Yes
SR-14 NB Ramps & Avenue M (#2)	NBL	1,375	278	300	Yes	Yes	310	370	Yes	Yes
	NBR	340	**1,530**	663 [2]	**No**	Yes	**2,905**	**2,005**	**No**	**No**
SR-14 SB Ramps & Avenue N (#26)	SBL	1,395	255	450	Yes	Yes	260	450	Yes	Yes
	SBR	335	13	160	Yes	Yes	13	163	Yes	Yes
SR-14 NB Ramps & Avenue N (#27)	NBL	1,380	60	495	Yes	Yes	80	630	Yes	Yes
	NBR	290	690 [2]	75	Yes	Yes	**1,545**	213 [2]	**No**	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.
[2] Although 95th percentile queue is anticipated to exceed the available storage for the turn lane, the adjacent through lane has sufficient storage to accommodate any spillover without spilling back and affecting the SR-14 Freeway mainline.

6.6 DEFICIENCIES AND IMPROVEMENTS

Improvements needed to achieve acceptable LOS have been identified at intersections or off-ramps that are anticipated to operate at a deficient LOS under EC and EPC (2032) traffic conditions.

6.6.1 IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

Improvement strategies have been recommended at intersections that have been identified as deficient under EC and EPC (2032) traffic conditions in an effort to achieve pre-Project delay or better. The effectiveness of the recommended improvement strategies to address EC and EPC (2032) traffic deficiencies are presented in Table 6-3. Worksheets for EC and EPC (2032), with improvements, intersection operations are provided in Appendix 6.7.

6.6.2 IMPROVEMENTS TO ADDRESS DEFICIENCIES ON OFF-RAMP QUEUES

Improvement strategies have been recommended at study area off-ramps that have been identified as deficient under EC and EPC (2032) traffic conditions and are shown in Table 6-4. The improvements are consistent with the intersection improvements identified in Table 6-3. Worksheets for EC and EPC (2032) conditions, with improvements, off-ramp queuing analysis worksheets are provided in Appendix 6.8.

TABLE 6-3: INTERSECTION ANALYSIS FOR EPC (2032) CONDITIONS WITH IMPROVEMENTS

	Traffic	Intersection Approach Lanes [1]												Delay[2] (secs.)		Level of Service	
		Northbound			Southbound			Eastbound			Westbound						
	Control [3]	L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
1 SR-14 SB Ramps & Avenue M																	
With Improvements:	**TS**	0	0	0	**2**	0	1	0	**3**	1>>	0	**3**	1>>	**93.9**	37.9	**F**	D
2 SR-14 NB Ramps & Avenue M																	
With Improvements:	**TS**	1	0	1	0	0	0	0	**3**	1>>	0	**3**	1>>	**61.7**	17.5	**E**	B
3 10th St. West & Avenue M																	
With Improvements:	TS	**2**	**3**	0	**2**	**3**	1	**2**	**3**	**0**	**2**	**3**	**0**	**181.1**	**187.2**	**F**	**F**
6 Sierra Hwy. & Avenue M																	
With Improvements:	TS	**2**	**3**	**1>**	**2**	**3**	1>>	**2**	**4**	**0**	**2**	**4**	**0**	**93.2**	48.9	**F**	D
7 4th St. & Avenue M/Columbia Wy.																	
With Improvements:	**TS**	**2**	**1**	0	**1**	0	1	1	**4**	**1>**	**1**	**4**	1	38.6	45.8	D	D
17 Challenger Wy./10th St. East & Avenue M																	
With Improvements:	**TS**	**2**	**1**	0	1	**1**	**0**	1	**4**	0	**1**	**4**	**0**	28.7	25.8	C	C
26 SR-14 SB Ramps & Avenue N																	
With Improvements:	**TS**	0	0	0	1	0	1	0	**2**	1>>	0	**2**	1>>	13.7	**85.6**	B	**F**
27 SR-14 NB Ramps & Avenue N																	
With Improvements:	**TS**	1	0	1	0	0	0	0	**2**	1>>	0	**2**	1>>	22.3	**61.4**	C	**E**
28 10th St. & Avenue N																	
With Improvements:	TS	1	2	0	1	2	0	**2**	**2**	1	1	**2**	0	**63.2**	**126.3**	**E**	**F**
29 Sierra Hwy. & Avenue N																	
With Improvements:	TS	1	**3**	0	0	**3**	1	**2**	0	1	0	0	0	31.9	23.2	C	C

* **BOLD** = Level of Service (LOS) does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; **1** = Improvement; > = Right-Turn Overlap Phasing; >> = Free-Right Turn

[2] Per the Highway Capacity Manual (6th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal; **TS** = Improvement

TABLE 6-4: PEAK HOUR QUEUING SUMMARY FOR EPC (2032) CONDITIONS WITH IMPROVEMENTS

Intersection	Movement	Available Stacking Distance (Feet)	EPC (2032) With Improvements 95th Percentile Queue (Feet)[2]		Acceptable? [1]	
			AM Peak	PM Peak	AM	PM
SR-14 SB Ramps & Avenue M (#1)	SBL	1,335	1,233 [2]	748 [2]	Yes	Yes
	SBR	330	33	69	Yes	Yes
SR-14 NB Ramps & Avenue M (#2)	NBL	1,375	72	102	Yes	Yes
	NBR	340	1,207 [2,3]	972 [2,3]	Yes	Yes
SR-14 NB Ramps & Avenue N (#27)	NBL	1,380	91	403 [2]	Yes	Yes
	NBR	290	1,107 [2,3]	127	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the
[2] 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
[3] Although 95th percentile queue is anticipated to exceed the available storage for the turn lane, the adjacent through lane has sufficient storage to accommodate any spillover without spilling back and affecting the SR-14 Freeway mainline.

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7 LOCAL AND REGIONAL FUNDING MECHANISMS

Transportation improvements within the City of Palmdale are funded through a combination of improvements constructed by the Project, development impact fee programs or fair share contributions. Fee programs applicable to the Project are described below.

7.1 CITY OF PALMDALE DEVELOPMENT IMPACT FEE (DIF) PROGRAM

The Project is located within the City of Palmdale and therefore will be subject to City of Palmdale DIF in an effort to address development throughout the City. Traffic improvement needs may be eligible for a fee credit, at the discretion of the City of Palmdale, for specific improvements identified within the City's DIF program.

7.2 MEASURE M

Measure M, Los Angeles County's half-cent sales tax for transportation, was adopted by voters in 2016. Measure M funds a wide variety of transportation projects and services throughout the County, including local street repair, sidewalk repair, expansion of public transportation, earthquake retrofitting of bridges, and subsidizing transit fares.

7.3 FAIR SHARE CONTRIBUTION

Pursuant to discussions with the City of Palmdale, the City does not have an existing fair share program to collect fair share payments. As such, fair share has not been identified for this Project.

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8 REFERENCES

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