VMT ASSESSMENT

Michael Baker
INTERNATIONAL

We Make a Difference

TECHNICAL MEMORANDUM

To: Brian Parno, Stirling Development

From: Jacob Swim TE, Michael Baker International
Dawn Wilson PE TE, Michael Baker International

CC: Alan Ashimine, Michael Baker International

Date: December 9, 2020

Subject: Southern California Logistics Airport Specific Plan Vehicle Miles Traveled (VMT) Assessment

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Introduction

The purpose of this memorandum is to document the VMT assessment for the proposed Southern California Logistics Airport (SCLA) Specific Plan Amendment (Project) located in the City of Victorville, California. A separate Traffic Impact Analysis focused on traffic operations is currently under development and City review with the latest draft dated April 23, 2020 for this project. This memorandum has been prepared to evaluate potential transportation impacts under California Environmental Quality Act (CEQA). **Table 1** provides key project information. **Exhibit 1** shows the location of the project and **Exhibit 2** shows the SCLA Specific Plan Amendment Development Area.

Table 1: Project Information

Item	Project Description
Project Title	Southern California Logistics Airport Specific Plan Amendment
Project Location	Situated on the previous George Air Force Base site located north of SR-18 (Palmdale Road), east of US-395, and west of I-15.
Existing Use	Approximately 3.8 million square feet (SF) of Industrial uses plus SCLA Support Facilities
Proposed Use	4,551,770 SF of Manufacturing; 15,612,680 SF of Light Warehouse; 2,525,080 SF of Light Industrial; 1,300 Employees for Airport Support Facility; 6,500 SF of Fast Food w/o Drive Thru; 18,000 SF of High-Turnover/Sit Down Restaurant; 36 Vehicle Fueling Positions for Service Station with Convenience Market; 33,000 SF Shopping Center; and 345,000 SF of General Office
Trip Generation	98,752 daily trips with 12,736 AM peak hour Trips & 13,354 PM peak hour trips
Project Area	Encompasses a total of approximately 1,264 acres

Exhibit 1: Project Location

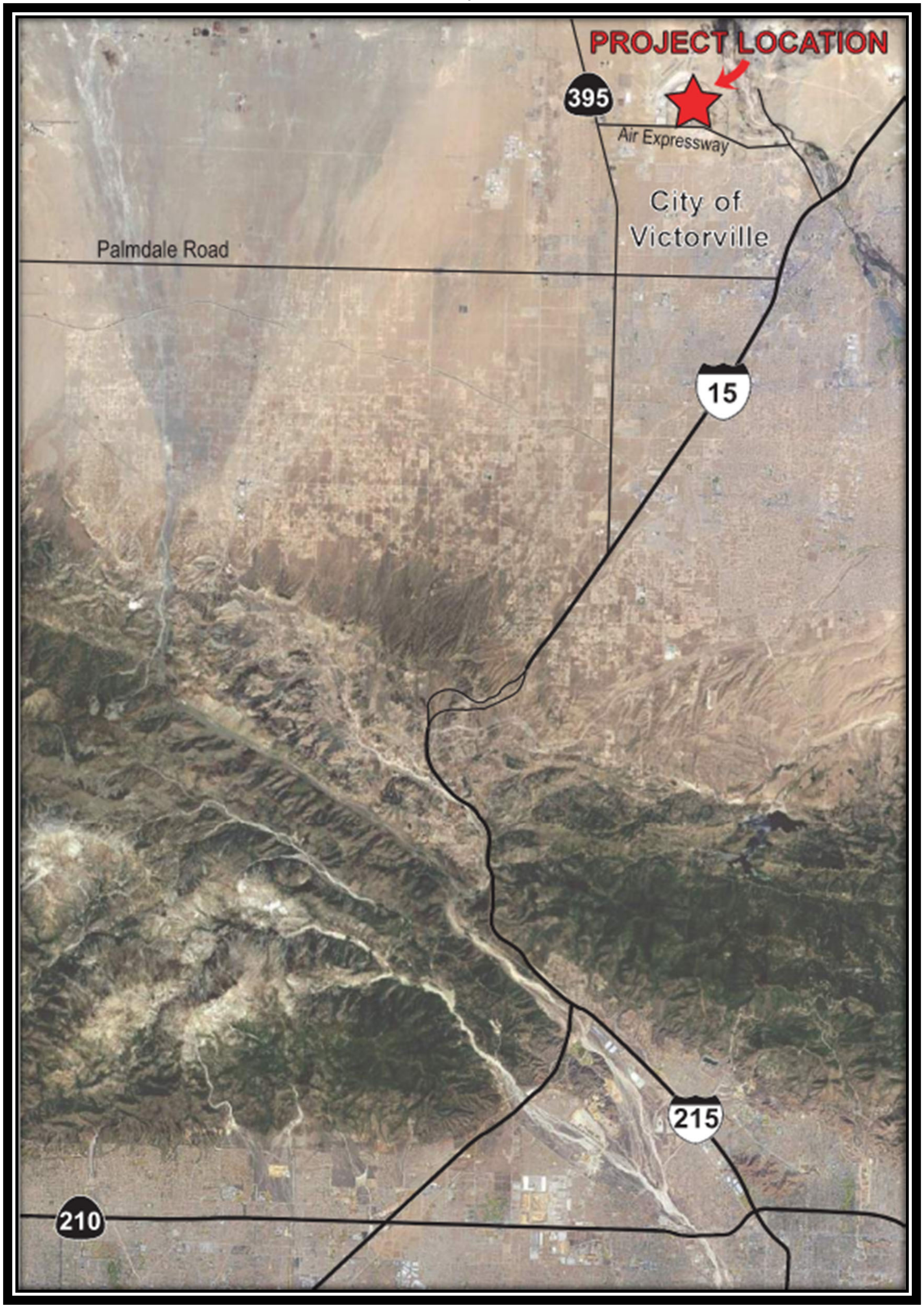
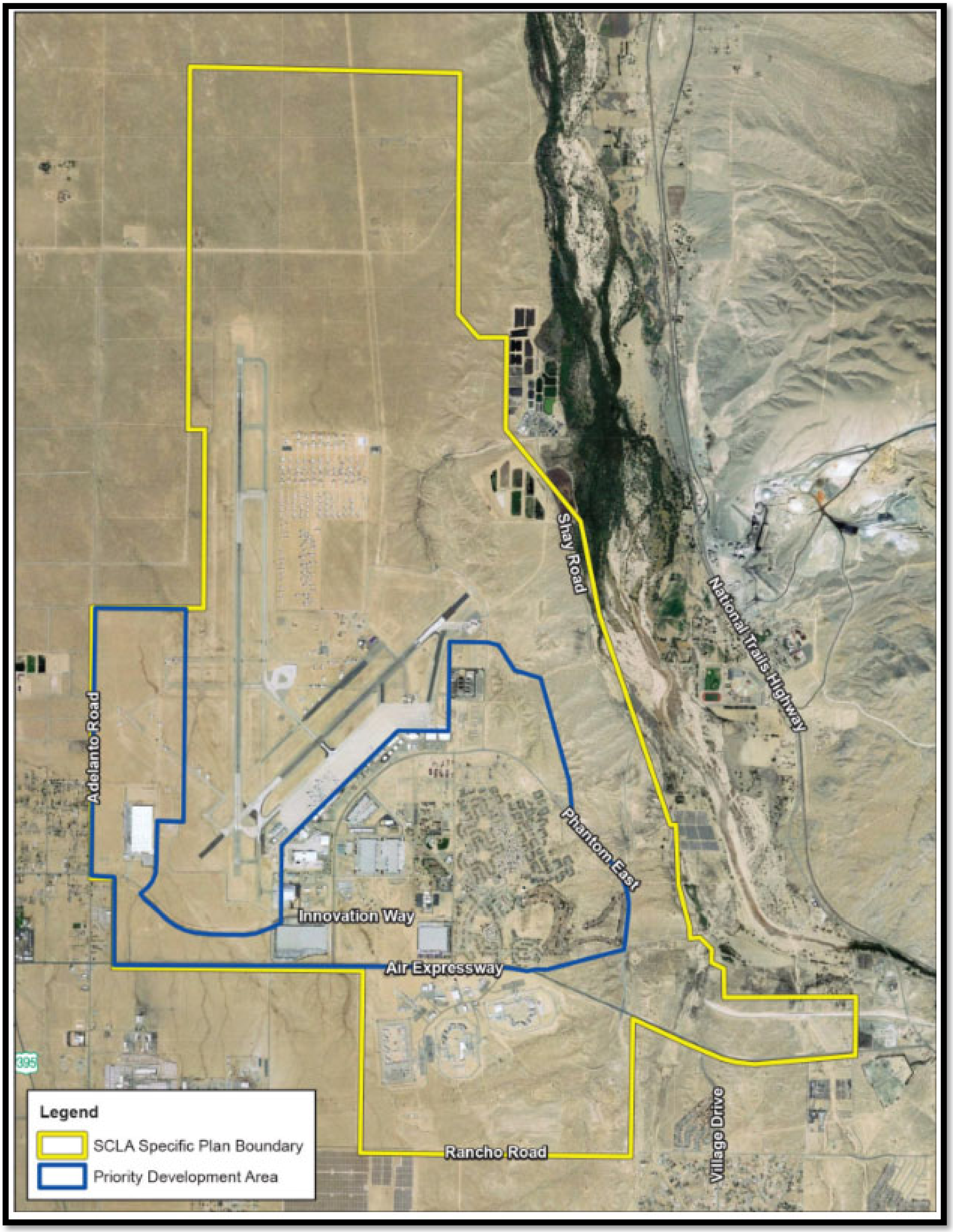


Exhibit 2: SCLA Specific Plan Amendment Development Area



Analysis Guidelines

City of Victorville Vehicle Miles Traveled Analysis Guidelines dated May 27, 2020 has been utilized as the primary resource in the development of this VMT analysis. The City participated in a collaborative study and working sessions with San Bernardino County Transportation Authority (SBCTA), which evaluated overall VMT methodologies such as thresholds, tools and mitigation options. Following participation in the study and working sessions, the City prepared their own guidelines. The guidelines follow state guidance with two exceptions that are backed by substantial evidence. The City VMT threshold is equal to or better than the General Plan buildout for low VMT areas (as opposed to OPR's 15% below existing conditions) and the small project threshold is 1,283 daily vehicle trips (as opposed to OPR's 110 trip). City of Victorville's guidelines are provided as **Attachment A** to this letter report.

Screening Criteria

As part of the City's guidelines, a project may be determined to have a less than significant impacts and may be screened out of requiring a detailed VMT analysis if either the daily vehicle trips generated by the project criteria **or** the land use type criteria are met. **Table 2** identifies the trip generation threshold and the land use types that are assumed to result in a less than significant transportation impact under CEQA and do not require a detailed quantitative VMT assessment.

Table 2: Screening Criteria for Land Use Projects Exempt from VMT Calculation

Screening	Screening Criteria	Project Evaluation	Result
Daily Vehicle Trip Thresholds	Project results in a net increase of 1,285 or less weekday daily trips.	Project is expected to generate 98,752 weekday daily trips.	Does Not Meet Criteria
Land Use Types	The following land use types will used for screening: • Single Family or Multifamily Residential – 136 dwelling units or less. • Office – 227,000 SF or less • Retail – 122,000 SF or less • Warehousing – 829,000 SF or less • Light Industrial – 296,000 SF or less • K-12 Public School • Daycare / Childcare / Pre-K • Affordable Housing • Student Housing • Community Institutions, Social Services and Public Buildings	Project includes • 4,551,770 SF of Manufacturing; • 15,612,680 SF of Light Warehouse; • 2,525,080 SF of Light Industrial; • 1,300 Employees for Airport Support Facility; • 36 Vehicle Fueling Positions for Service Station with Convenience Market; • 345,000 SF of General Office and • 57,500 SF of combined retail	Does Not Meet Criteria

The project does not meet any of the Screening Criteria for land use projects which would allow a determination of a less-than-significant impact on VMT. Therefore, a project specific VMT assessment is required.

VMT Threshold of Significance

According to the *City of Victorville Vehicle Miles Traveled Analysis Guidelines,* a project is considered to have a significant impact if the project VMT per service population is less than the City's VMT General Plan buildout per service population.

Project Level VMT Assessment

Michael Baker enlisted the assistance of Translutions, Inc. to conduct the project specific travel demand modeling evaluation for the Project using the San Bernardino Transportation Analysis Model (SBTAM). The model was updated to reflect the employment for the project traffic analysis zones (TAZs). Employee forecasts were based on the square feet per employee for each land use using information from the SCAG Employment Density Report conversion factors. This results in approximately 13,820 employees for the project. **Table 3** summarizes the employee estimates.

Table 3: Employee Estimates

TAZ	Land Use	Size in Thousand Square Feet (KSF)	Square Feet / Employee* OR Employee/KSF	Total Number of Employees
53912101	Manufacturing	4,551.77	1,538	2,960
53912202	Light Warehouse	15,612.68	2,111	7,396
53912101	Light Industrial	2,525.08	1,538	1,642
53912201	Fast Food w/o Drive Thru	6.50	5.2	34
53912201	High Turnover/Sitdown	18.00	5.3	95
53912205	Shopping Center	33.00	1,392	24
53912203	General Office	345.00	1,014	340
53912204	Airport Support Facility	1,300 Employees	1	1,300
53912201	Service Station w/Conv. Market	36 VFP	0.84	30
Total Number of Employees				**13,820**

** Used SCAG Employment Density Report for conversion factors.*

The SCLA Specific Plan includes a mix of land uses such as manufacturing, light warehouse, light industrial, airport support facilities, shopping center, restaurant, gas station, and general office. The warehouse and manufacturing components of the project would be a combination of employee trips and truck trips. Whereas the shopping center, restaurant, and gas station would be a combination of employee trips and patron trips. Given the mix of employee, patron and truck trips anticipated for the site, VMT per service population is the appropriate VMT metric for the project and is consistent with the City's guidelines.

For modeling purposes, the Productions/Attractions or PA method can isolate trip purpose and truck VMT but does not account for trips with one trip end outside the model boundary. Origin/Destination or OD method cannot isolate trip purpose or truck VMT but does include all trips including those with one trip end outside the model boundary. The PA method can be used if the project is of a single land use type and OD method for a mixed-use project. For the SCLA project, both the PA and OD methods were evaluated in the VMT model to determine the projects VMT based on individual land uses and the mix of land uses. The City guidelines recommend mixed use project evaluate VMT based on the OD method.

The VMT travel demand model calculation results are shown in **Table 4**. As stated previously, the impact threshold is assumed to be based on VMT per service population. The Project is estimated to generate a daily total (Production-Attraction, PA) VMT of 328,593 and a daily total (Origins-Destinations, OD) VMT of 496,940. The resulting Total PA VMT/Service Population is 23.8 (328,593 VMT / 13,820 service population) and total OD VMT/Service Population is 36.0 (496,940 VMT / 13,820).

A comparison of the Project PA VMT/Service Population (23.8 Total VMT/Service Population) to the Citywide VMT/Service Population (25.0 Total VMT/Service Population) shows that the Project VMT/Service Population is anticipated to be 95% of the City VMT/Service Population. The Project OD VMT/Service Population (36.0 Total VMT/Service Population) compared to the Citywide VMT/Service Population (36.2 Total VMT/Service Population) is anticipated to be 99% of the City VMT/Service Population. **Therefore, the project is NOT anticipated to result in a significant transportation impact.**

Table 4: VMT Summary

	Year 2040	
	City of Victorville* (General Plan Buildout)	**SCLA (Project)**
Total Daily Project PA VMT		328,593
Total Daily Project OD VMT		496,940
Total Project Employees		**13,820**
PA VMT Per Service Population	25.0	23.8
OD VMT Per Service Population	36.2	36.0
Percent of City Average	**95%**	**99%**

** Threshold values obtained from SBCTA Screening Tool (https://devapps.fehrandpeers.com/sbctavmt/)*

Mitigation Measures

Since the project is projected to not result in a significant transportation impact, mitigation measures have not been identified.

Conclusions

Our review of the SCLA Specific Plan determined that the project does not meet the screening criteria established by the City and thus a VMT assessment was required. Evaluation of the year 2040 project VMT/service population determined that using both the PA and OD methods, the Project VMT/service population falls below the City's General Plan VMT/service population and therefore, **the project is forecast to have a less than significant transportation impact.**

If you have any questions pertaining to the results summarized in this letter, please call me at (760) 603-6266.

Sincerely,

Dawn Wilson, PE, TE
Associate Vice President | Transportation Planning Manager

ATTACHMENT A

City of Victorville VMT Guidelines

SPECIAL MEETING OF THE PLANNING COMMISSION
OF THE CITY OF VICTORVILLE

MAY 27, 2020
5:00 P.M. SPECIAL MEETING

VICTORVILLE CITY HALL IS CLOSED TO THE PUBLIC
Join by phone or WebEx at:
(415) 655-0045 AC: 287 734 038
victorvilleca.webex.com/meet/planning

TELECONFERENCE NOTICE

This meeting is being held in accordance with the Brown Act as currently in effect under the State Emergency Services Act, the Governor's Emergency Declaration related to COVID-19, and the Governor's Executive Order N-29-20 issued on March 17, 2020 that allows attendance by members of the Planning Commission, City Staff, and the public to participate and conduct the meeting by teleconference.

NOTICE TO THE PUBLIC:

TO PROVIDE PUBLIC COMMENT DURING THE PLANNING COMMISSION MEETING PLEASE DIAL **(415) 655-0045** AND ENTER ACCESS CODE: **287 734 038** OR JOIN VIA WEBEX BY TYPING THE FOLLOWING LINK IN YOUR BROWSER: VICTORVILLECA.WEBEX.COM/MEET/PLANNING

IN COMPLIANCE WITH THE AMERICANS WITH DISABILITIES ACT, IF YOU NEED SPECIAL ASSISTANCE TO PARTICIPATE IN THIS MEETING, PLEASE CONTACT THE DEVELOPMENT DEPARTMENT SECRETARY AT (760) 955-5135 NO LATER THAN 72 HOURS PRIOR TO THE MEETING

SPECIAL MEETING

5:00 P.M.

CALL TO ORDER

ROLL CALL

INVOCATION & PLEDGE OF ALLEGIANCE

PUBLIC HEARINGS

1. PLAN20-00011 – VEHICLE MILES TRAVELED (VMT)

PROJECT – A WORKSHOP OF THE PLANNING COMMISSION OF THE CITY OF VICTORVILLE TO DISCUSS "VEHICLE MILES TRAVELED" (VMT) THRESHOLDS OF SIGNIFICANCE FOR PURPOSES OF ANALYZING TRANSPORTATION IMPACTS UNDER THE CALIFORNIA ENVIRONMENTAL QUALITY ACT AND POSSIBLE ACTION BY THE PLANNING COMMISSION TO APPROVE A RESOLUTION RECOMMENDING CITY COUNCIL ADOPTION OF VMT THRESHOLDS OF SIGNIFICANCE

PUBLIC COMMENTS

PRESENTATION OF REPORTS BY COMMISSION MEMBERS AND STAFF

ADJOURNMENT

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PUBLIC HEARINGS

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PLANNING COMMISSION STAFF REPORT

DATE:	MAY 27, 2020	**AGENDA NO. 1**
CASE:	PLAN20-00011	
SUBJECT:	A WORKSHOP OF THE PLANNING COMMISSION OF THE CITY OF VICTORVILLE TO DISCUSS "VEHICLE MILES TRAVELED" (VMT) THRESHOLDS OF SIGNIFICANCE FOR PURPOSES OF ANALYZING TRANSPORTATION IMPACTS UNDER THE CALIFORNIA ENVIRONMENTAL QUALITY ACT AND POSSIBLE ACTION BY THE PLANNING COMMISSION TO APPROVE A RESOLUTION RECOMMENDING CITY COUNCIL ADOPTION OF VMT THRESHOLDS OF SIGNIFICANCE	
APPLICANT:	CITY OF VICTORVILLE - DEVELOPMENT DEPARTMENT	
LOCATION:	CITYWIDE	

I. STAFF RECOMMENDATION:

Staff recommends that the Planning Commission conduct a public hearing, receive testimony regarding the proposal and take the following actions:

1. **Environmental Assessment** – Recommend that the City Council find the adoption of the attached Resolution is not a project under Section 15378(b)(5) of the California Environmental Quality Act (CEQA) because it involves an administrative activity involving process only and would not result in any direct or indirect physical changes to the environment; and

2. **Code Amendment -** Adopt Resolution No. P-20-010, recommending City Council approval of Case No. PLAN20-00011 adopting "Vehicle Miles Traveled" (VMT) thresholds of significance for purposes of analyzing transportation impacts under Sections 15064.3 of the California Environmental Quality Act.

II. SUMMARY:

Staff will be providing a power point presentation at the Planning Commission workshop to help the Commission understand the basics of VMT and the VMT process.

The California Environmental Quality Act (CEQA) is California's most comprehensive environmental law. Generally, it requires public agencies to evaluate the environmental effects of a project before action is taken. CEQA also aims to prevent significant environmental effects from occurring as a result of agency actions by requiring agencies to avoid or reduce, when feasible, the significant environmental impacts of their decisions.

As a result of Senate Bill SB743, on December 28, 2018, the Office of Administrative Law approved a comprehensive update to the CEQA Guidelines which also included implementation metrics for Vehicle Miles Traveled (VMT) to replace Level of Service (LOS), which rates and grades (A-F) for the level of traffic congestion. VMT however, measures the total amount of weekday miles driven from home and to work, shopping and back home again. Since VMT is a new method in analyzing transportation impacts, Staff has been working with the San Bernardino County Transportation Authority (SBCTA), traffic consultant Translutions and traffic consultant Fehr and Peers to update the City's method to analyze traffic impacts. The proposed CEQA traffic methodology developed through that process includes VMT thresholds specific to Victorville. Staff is proposing to adopt Vehicle Miles Traveled thresholds and include them as part of the local CEQA process per CEQA Guidelines Section 15064.3.

III. STAFF ANALYSIS:

1. Discussion.

Vehicle Miles Traveled Thresholds

As mentioned, VMT is the new metric for transportation analysis which focuses on the overall miles traveled by vehicles within a region, resulting in automobile delay (Level of Service - LOS) to be no longer used as criteria for determining a significant environmental effect under CEQA. This approach has an added inherent emphasis on reducing greenhouse gas emissions. All cities in the State of California are encouraged to adopt individual VMT thresholds through a public hearing process no later than July 1, 2020, otherwise the State Office of Planning and Research (OPR) VMT Guidance will become effective wholesale for the jurisdiction, including more restrictive VMT Thresholds for projects. Therefore, Fehr & Peers, assisted in review and development of methodology for project generated VMT thresholds for Victorville, and other San Bernardino County cities. Traffic consultant Translutions, Inc. assisted in developing land use and trip based thresholds.

CEQA Guidelines Section 15064.7(c) allows a Lead Agency to consider Thresholds of Significance previously adopted or recommended by other public agencies or recommended by experts, provided the decision of the Lead Agency to adopt such thresholds is supported by substantial evidence. Therefore, the City of Victorville is not required to adhere to OPR's recommendations and can set its own thresholds that are supported by substantial evidence.

City Staff participated in a collaborative study led by SBCTA which evaluated the tools, thresholds, and mitigation options appropriate for the San Bernardino County region. Staff attended several workshops in 2019 and 2020 on Vehicle Miles Traveled. VMT thresholds for Victorville have been proposed to be adopted as the method to analyze CEQA transportation impacts. Those thresholds are all consistent with OPR guidance, with two exceptions backed by substantial evidence, including:

- VMT project generation equal to or better than the General Plan future buildout for Low VMT areas, whereas OPR guidance suggests 15% below existing conditions. This threshold is VMT Threshold Option #3 of four SBCTA options developed by Fehr and Peers (See Attachment 'C'); and

- Projects by land use type or other projects that generate less than 1,283 daily vehicle trips (See the VMT screening process below), whereas OPR guidance suggests 110 trips.

As a result, automobile delay, as measured by LOS, generally no longer constitutes a significant environmental effect under CEQA. Adopting VMT thresholds however, does not preclude the City from using LOS analysis to comply with Congestion Management Plan requirements or to conduct a project specific transportation analysis.

The VMT Thresholds will become effective upon adoption by the City Council. New projects or projects that have not circulated CEQA documents for public review before the effective date must comply with the City's new CEQA Guidelines.

Vehicle Miles Traveled Screening Process

There are three types of screening of a proposed project, which are demonstrated by substantial evidence (CEQA Guidelines Section 15064). A proposed project would not be required to prepare an independent VMT Analysis if exempted by one or more of the following screening methods.

- **Transit Priority Area (TPA) Screening -** With exceptions, projects located within one half mile of a TPA may be presumed to have a less than significant impact. Victorville does not have any TPA's as defined by PRC 21064.3 – Major Transit Stops within HQTA's, therefore this screening method will not be utilized.

- **Low VMT Area Screening** – Developed with the San Bernardino County Traffic Analysis Model (SBTAM), the travel forecasting model for individual Traffic Analysis Zones (TAZ), total daily VMT (Baseline VMT levels) per service population (population + employment) was estimated for each jurisdictions TAZ. Developers for proposed residential and office projects can utilize a screening tool to identify if the project is within a low VMT-generating area and therefore be exempt. If Victorville adopts the VMT threshold mentioned above (VMT project generation equal to or better than the General Plan future buildout) it will not only be less restrictive than OPR technical advice, but will allow for a greater number of exempt projects because of addition exempt low VMT areas (See Attachment 'B'). However, proposed projects must be consistent with existing land use and not increase the rate or length of existing trips. This methodology is based the Implementation Study (within Attachment 'C') conducted for SBCTA.

- **Daily Trip and Land Use Type Screening** – In this category, OPR set the recommended threshold at 110 daily trips based on the daily traffic count of a 10,000 square foot office building, which is an existing CEQA categorical exemption. The Technical Advisory states, "*CEQA provides a categorical exemption for existing facilities, including additions to existing structures of up to 10,000 square feet, so long as the project is in an area where public infrastructure is available to allow for maximum planned development and the project is not in an environmentally sensitive area. (CEQA Guidelines, § 15301, subd. (e)(2).)*" However, OPR's criteria for selecting this categorical exemption as a threshold is arbitrary and is not supported by a correlation in greenhouse gas emissions (GHG) reduction.

Based on the intent and goals of SB-743 to promote the reduction in greenhouse gas emissions, staff is recommending the City base their thresholds from a GHG emissions perspective. Translutions, Inc. provides justification of daily trip and land use type thresholds based on the thresholds the governing Air Quality Management Districts use to determine if a project is will have a significant impact based on the Metric Tons of CO2 Equivalents per year a project would product. Attachment D provided substantial evidence that allows the City to establish realistic thresholds with a nexus to GHG reduction.

To summarize Translutions, Inc. evaluation, the following unit counts are anticipated to have less than significant impacts:

- Single Family Residential – 136 Dwelling Units
- Multi-Family (Low Rise) Residential – 136 Dwelling Units
- Office – 227,000 square feet
- Retail – 122,000 square feet
- Warehousing – 829,000 square feet
- Light Industrial – 296,000 square feet
- For land uses not included described above, the project would have a threshold of 1,285 daily weekday trips

Staff has included additional land use project types that are allowed to be screened from doing a VMT analysis, as authorized by OPR, such as affordable housing, student housing and K-12 public schools.

Projects that cannot be screened will be required to prepare an independent VMT Analysis through the SBTAM model prior to the formal submittal of a project. If VMT thresholds are exceeded, changes to the project or mitigation to the project must be done to reduce the level to less than significant. Some possible changes and mitigation are shown below.

- Modify the projects built environment characteristics to reduce the VMT generated by the project. For instance, a residential tract development could reduce the number of houses (density) or add a market, and/or a church and/or a park (add land diversity) to capture trips.

- Implement Transportation Demand Management (TDM) measures to reduce VMT generated by the project. TDM measures rely on strategies to reduce vehicle travel through incentives and disincentives. For instance, mixing of land uses within a development.

- Participate in a VMT impact fee program with a nexus to VMT reduction that would use fees for transit, bicycle or pedestrian improvements that reduce VMT.

- Participate in a VMT mitigation bank/exchange program that matches VMT generators with reducers within or outside jurisdiction boundaries to reduce VMT generated by the project.

MJS/SW

Attachments:
Attachment A – Resolution No. P-20-010 and Vehicle Miles Traveled (VMT) Analysis Guidelines
Attachment B – Screenshots of SBCTA VMT Threshold Options from Screening Tool
Attachment C – Various SBCTA VMT Reports from Fehr and Peers
Attachment D – Translution, INC, Memorandum Dated May 21, 2020

THE STAFF RECOMMENDATION MAY BE ACCEPTED OR REJECTED BY THE PLANNING COMMISSION AND THE CITY COUNCIL AFTER ITS OWN ANALYSIS AND CONSIDERATION OF PUBLIC TESTIMONY PRESENTED AT THE HEARING. THE PLANNING COMMISSION ACTION IS A RECOMMENDATION TO THE CITY COUNCIL ONLY.

ATTACHMENT 'A'

RESOLUTION NO. P-20-010

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF VICTORVILLE RECOMMENDING TO THE CITY COUNCIL THE ADOPTION OF "VEHICLE MILES TRAVELED" THRESHOLDS OF SIGNIFICANCE FOR PURPOSES OF ANALYZING TRANSPORTATION IMPACTS UNDER THE CALIFORNIA ENVIRONMENTAL QUALITY ACT

WHEREAS, a public hearing was held on the 27th day of May 2020, pursuant to Title 7, Division I, Chapter 4, of the Government Code, State of California, to hear arguments for and against the issue; and

WHEREAS, the Planning Commission finds that all materials that constitute the record of proceedings upon which its decision is based, shall be located with the City of Victorville Clerk, located at 14343 Civic Drive, Victorville, CA; and

WHEREAS, the California Environmental Quality Act Guidelines ("CEQA Guidelines") encourage public agencies to develop and publish generally applicable "thresholds of significance" to be used in determining the significance of a project's environmental effects; and

WHEREAS, CEQA Guidelines section 15064.7(a) defines a threshold of significance as "an identifiable quantitative, qualitative or performance level of a particular environmental effect, noncompliance with which means the effect will normally be determined to be significant by the agency and compliance with which means the effect normally will be determined to be less than significant"; and

WHEREAS, CEQA Guidelines section 15064.7(b) requires that thresholds of significance must be adopted by ordinance, resolution, rule, or regulations, developed through a public review process, and be supported by substantial evidence; and

WHEREAS, pursuant to CEQA Guidelines section 15064.7(c), when adopting thresholds of significance, a public agency may consider thresholds of significance adopted or recommended by other public agencies provided that the decision of the agency is supported by substantial evidence; and

WHEREAS, the City of Victorville Planning Commission recommends adoption of the Vehicle Miles Traveled (VMT) thresholds of significance as set forth in the Exhibit 1 of this resolution, as supported by substantial evidence; and

WHEREAS, Senate Bill 743, enacted in 2013 and codified in Public Resources Code section 21099, required changes to the CEQA Guidelines regarding the criteria for determining the significance of transportation impacts of projects; and

WHEREAS, in 2018, the Governor's Office of Planning and Research ("OPR") proposed, and the California Natural Resources Agency certified and adopted, new CEQA Guidelines section 15064.3 that identifies vehicle miles traveled ("VMT") – meaning the amount and distance of automobile travel attributable to a project – as the most appropriate metric to evaluate a project's transportation impacts; and

WHEREAS, as a result, automobile delay, as measured by "level of service" ("LOS") and other similar metrics, will generally no longer constitute a significant environmental effect under CEQA; and

WHEREAS, CEQA Guidelines section 15064.3 requires agencies to stop treating automobile delay/LOS as an environmental impact effective on July 1, 2020, though public agencies may elect to be governed by this section immediately; and

WHEREAS, the City of Victorville, through this public review process consisting of Staff presentations before the Planning Commission workshop, wishes to adopt the VMT thresholds of significance for determining the significance of transportation impacts that are recommended by experts in the field of traffic engineering and supported by substantial evidence.

NOW, THEREFORE, BE IT RESOLVED by the Planning Commission, pursuant to Chapter 2.12.090 of the Victorville Municipal Code, that it recommends to the City Council of the City of Victorville approval of Case No. PLAN20-00011, the adoption of "Vehicle Miles Traveled" thresholds of significance, as described in Exhibit ‘1’, for purposes of analyzing transportation impacts under the California Environmental Quality Act.

PASSED, APPROVED AND ADOPTED this 27th day of May, 2020.

ROB KURTH, CHAIRMAN
VICTORVILLE PLANNING COMMISSION

ATTEST:

SCOTT WEBB,
PLANNING COMMISSION SECRETARY

Exhibit '1'
City of Victorville

Vehicle Miles Traveled (VMT) Analysis Guidelines

Project Screening Criteria
Projects that will not require a VMT analysis can be screened using either the daily vehicle trips generated by project or the project's land use type.

Daily Vehicle Trip thresholds
The project results in a net increase of 1,285 or less weekday daily trips. The Institute of Transportation Engineers (ITE) Trip Generation Manual, latest edition will be used to estimate the daily trip generation. If the ITE Trip Generation Manual does not have studies specific to a land use, other trip generation traffic studies may be used.

Land Use Types
The following land use types will be used for screening.
- Single family or Multifamily Residential - 136 dwelling units or less
- Office – 227,000 square feet
- Retail – 122,000 square feet
- Warehousing – 829,000 square feet
- Light Industrial – 296,000 square feet
- K-12 Public School
- Daycare/Childcare/Pre-K
- Affordable housing
- Student Housing
- Community Institutions, Social Services and Public Buildings

Project Generated Methodology
Either the Production/Attraction (PA) or Origin/Destination (OD) methods can be used. For projects with a single land use type the PA method will be used. For projects with mixed land use types the OD method will be used.

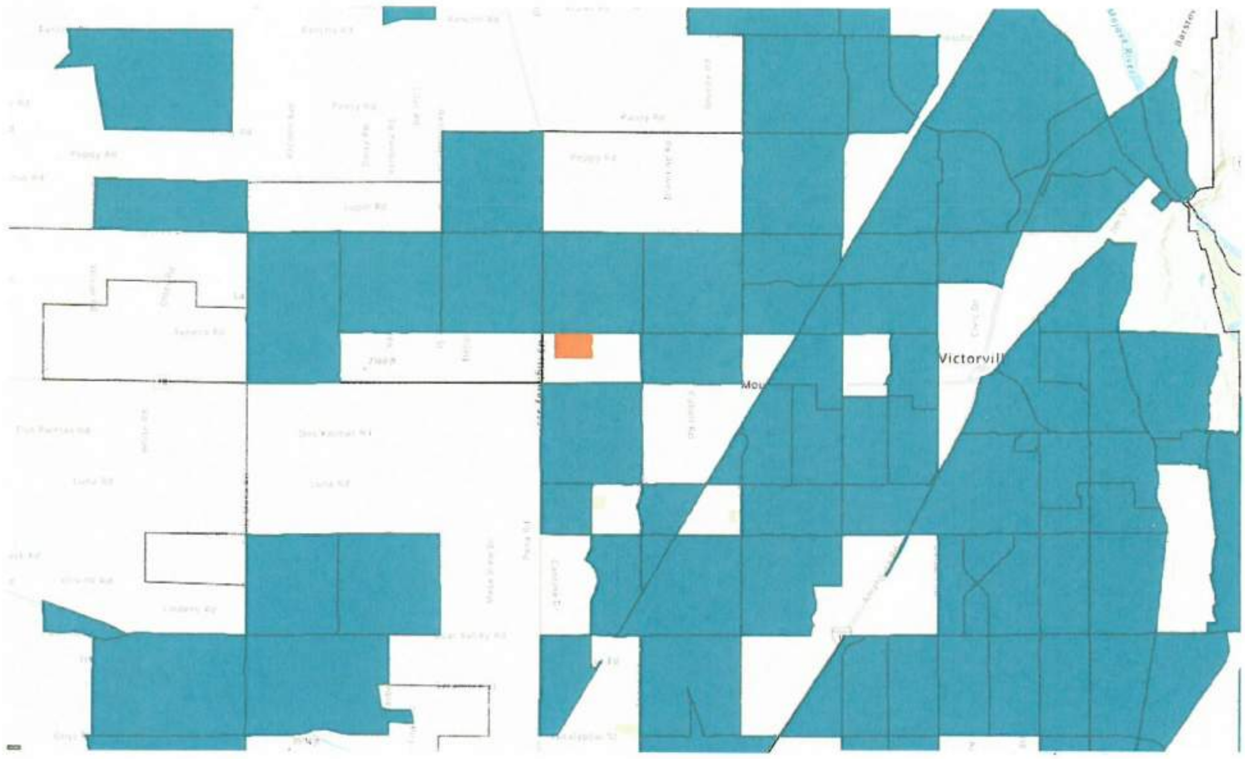
Benchmark
The benchmark used will be the City Limits as the boundary.

Thresholds
Thresholds shall be consistent with the Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) future year VMT projections for the City's General Plan buildout. A project's VMT generation per service population shall be less than the City's VMT General Plan buildout per service population. However, feasible mitigation measures may be identified to reduce the project VMT below the thresholds.

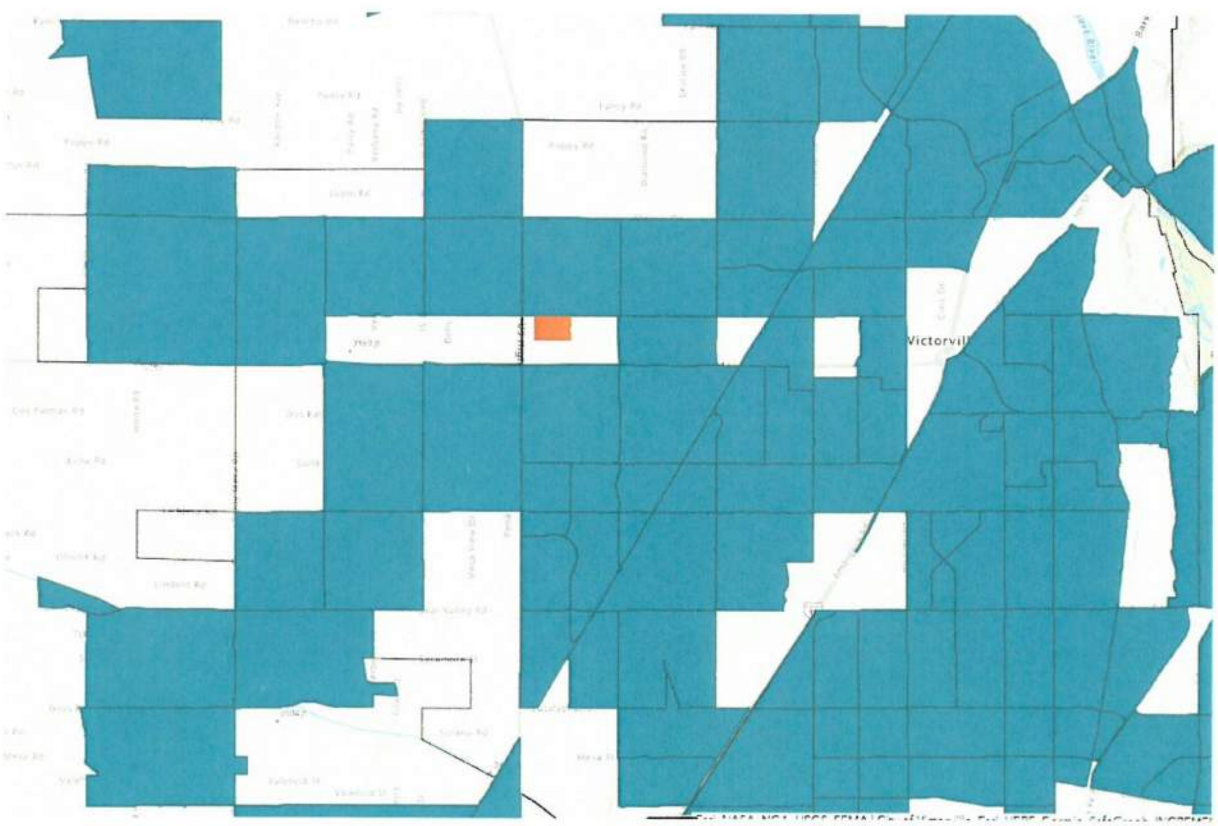
Level of Service Analysis (LOS)
LOS analysis thresholds identified in the City's General Plan and Traffic Impact Analysis guidelines will continue to be used to analyze traffic impacts, in addition to VMT impact analysis.

Model Used for VMT Analysis
The model used for VMT analysis will be the San Bernardino County Transportation Analysis Model (SBCTAM), maintained by the San Bernardino County Transportation Authority (SBCTA).

ATTACHMENT ‘B’



0% Baseline at Existing Conditions Option #4 (Shaded TAZs include Low VMT exempt areas)



0% Baseline at GP Buildout Option #3 (Shaded TAZs include Low VMT exempt areas)

14.3% Baseline at Existing Option #2 (Shaded TAZs include Low VMT exempt areas)

15% Baseline at Existing Option #1 (Shaded TAZs include Low VMT exempt areas)

ATTACHMENT ‘C’

SBCTA: City VMT Guidelines Decision Checklist

Topic Area	Decision	Notes
STEP 01 **Project Screening Criteria: Daily Trip Threshold**	☐ **Yes** - Include • How many trips per day? ☐ ☐ • Instead of trip-based, VMT-based ☐ **No** - Do not include	OPR recommends a threshold of **110** daily trips for project screening. This is based on the number of trips generated by **10,000** sf of office space. As trips are only one component of VMT, this screening criteria should be carefully considered. Alternatively, a screening threshold based on VMT could be applied.
STEP 02 **Project Screening Criteria: Land Use Types**	☐ **Any changes** (subtractions or additions) to current list: • Local serving retail (50 ksf or less) • K-12 Public School • Daycare/Childcare/Pre-K • Affordable housing • Student Housing • Community Institutions (Public Library, Fire station, Local Government	Any land use types that are local serving in your community should be considered for this screening. **List changes here:**
STEP 03 **Project Generated VMT Methodology: PA or OD**	☐ **PA** - Productions/Attractions ☐ **OD** - Origin/Destination ☐ **Both** - PA when single use and OD when mixed use	PA method can isolate trip purpose and truck VMT, but does not account for trips with one trip end outside the model boundary. OD method cannot isolate trip purpose or truck VMT, but does include all trips including those with one trip end outside the model boundary. Both methods can be identified in the TIA guidelines, with the selection of method can be used based on if the project is of a single land use type (PA) or mixed use (OD).
STEP 04 **Project Generated VMT Methodology: Benchmarks**	☐ **City** ☐ **County**	Each City must choose their appropriate boundary for a regional benchmark for all impacts.
STEP 05 **Project Generated VMT Methodology: Threshold Options**	☐ **OPTION 1** - Rely on the OPR Technical Advisory Thresholds (**15%** Below Existing) ☐ **OPTION 2** - Set Thresholds Consistent with Lead Agency Air Quality, GHG Reduction, and Energy Conservation Goals (**14.3%** Below Existing) ☐ **OPTION 3** - Set Thresholds Consistent with RTP/SCS Future Year VMT Projections by Jurisdiction or Sub-Region (Better than General Plan Buildout) ☐ **OPTION 4** - Set Thresholds Based on Baseline VMT Performance (Better than Existing)	See SBCTA SB 743 Implementation Thresholds Assessment dated 11/11/19 for more information.
STEP 06 **Level of Service (LOS)**	☐ **Include** - intersection or roadway LOS analysis as part of the City's TIA Guidelines, although this analysis would not be used to determine CEQA impacts ☐ **Do not include** any LOS analysis in the City's TIA Guidelines	

FAQ

Evaluating Transportation Impacts in CEQA
Based on New Guidelines as Directed by SB 743

What was the legislative intent of SB 743 (2013)?

1. Balance the needs of congestion management with the following statewide goals
   a. Reduction of greenhouse gas emissions
   b. Infill development
   c. Public health through active transportation
2. Ensure that the environmental impacts of traffic such as noise, air pollution, and safety concerns continue to be addressed and mitigated through CEQA

What does the new CEQA Section 15064.3 adopted by the state in December 2018 require?

1. A project's effect on automobile delay (i.e., Level of Service) shall not constitute a significant environmental impact under CEQA.
2. A lead agency may adopt these provisions immediately, but no later than July 1, 2020.
3. VMT is the "most appropriate" measure of transportation impacts.
4. Other relevant considerations may include effects on transit and non-motorized travel.
5. VMT exceeding an applicable threshold may indicate a significant impact
6. Projects may be presumed to have a less than significant VMT impact if they are located in a transit priority area (TPA) or would reduce VMT.
7. A lead agency has discretion to choose the most appropriate methodology to evaluate a project's VMT
8. A lead agency may use models to estimate a project's VMT, and may revise those VMT estimates based on substantial evidence
9. Any assumptions used to estimate VMT must be documented and explained

What decisions do a local agency need to make to implement these new guidelines?

1. VMT Metric?
   a. VMT in absolute terms or
   b. VMT per capita, VMT per employee, VMT per service population ...
2. VMT Methodology?
   a. How to calculate VMT – travel model, spreadsheet tool, other methods

- **b** Total VMT or partial VMT associated with select vehicle types, land uses, and/or trip purposes/tours
- **c** Project generated VMT versus project effect on VMT

3 VMT Impact Significance Threshold?

- **a** Threshold: Level of reduction in VMT below existing conditions?
- **b** Thresholds: (1) Project VMT and (2) Cumulative Impacts (project's effect on VMT)
- **c** Thresholds: (1) Land Use Projects, (2) Land Use Plans, (3) Transportation Projects
- **d** Is the level of VMT reduction compared to regional VMT, citywide VMT, or other baseline?
- **e** For cities and counties, are VMT impacts best addressed at the general plan level given that all land use decisions only influence land use supply and CEQA Section 15183 provides streamlining for subsequent projects?

4 VMT Mitigation Options?

- **a** VMT mitigation options for land use projects involve either changing the physical design of the project (i.e., its density, mix of use, street design, etc.) or requiring trip reduction strategies as part of a transportation demand management (TDM) program.
  - **i** Are cities and counties willing to require stringent TDM programs with annual monitoring and adjustments if projects do not accomplish required VMT reductions?
  - **ii** Should cities and counties instead rely on mitigation programs such as impact fee programs that are based on a VMT-reduction nexus?

How does the OPR *Technical Advisory* recommend implementing CEQA Section 15064.3?

1 If a lead agency uses a travel model as the basis for establishing thresholds, that same model must be used for subsequent project level VMT analyses.

2 For land use projects and plans, the *Technical Advisory* states, "*OPR recommends that a per capita or per employee VMT that is fifteen percent below that of existing development may be a reasonable threshold*" *based on substantial evidence related to the state's GHG reduction goals.*

- **a** *Residential Project Threshold – A proposed project exceeding a level of 15 percent below existing VMT per capita may indicate a significant transportation impact. Existing VMT per capita may be measured as regional VMT per capita or city VMT per capita.*
- **b** *Office Project Threshold – A proposed project exceeding a level of 15 percent below existing regional VMT per employee may indicate a significant transportation impact.*
- **c** *Retail Project Threshold – A net increase in total VMT may indicate a significant transportation impact.*

FAQ

Evaluating Transportation Impacts in CEQA
Based on New Guidelines as Directed by SB 743

- **d** *Mixed-Use Projects – Lead agencies can evaluate each component of a mixed-use project independently and apply the significance threshold for each project type included... Alternatively, a lead agency may consider only the project's dominant use. In the analysis of each use, a project should take credit for internal capture.*

3 For transportation projects, the *Technical Advisory* states:
- **a** *Because a roadway expansion project can induce substantial VMT, incorporating quantitative estimates of induced VMT is critical to calculating both transportation and other impacts of the projects.*
- **b** *Transit and active transportation projects generally reduce VMT and therefore are presumed to cause a less-than-significant impact on transportation.*

4 The *Technical Advisory* expands Section 15064.3 options for VMT impact screening using the presumption that certain projects will have less than significant VMT impacts based on location within a low VMT generating area or by being a locally serving retail project.

5 Impacts to Transit – *lead agencies should consider impacts to transit systems and bicycle and pedestrian networks. ...a project that blocks access to a transit stop or blocks a transit routes itself may interfere with transit functions.*

Is a lead agency required to follow recommendations in the *Technical Advisory*?

1. The *Technical Advisory* helps lead agencies think about the variety of implementation questions they face with respect to shifting to a new VMT metric.
2. The guidance is not a recipe for SB 743 implementation since lead agencies must still make their own specific decisions about methodology, thresholds, and mitigation. For cities and counties, these decisions must be consistent with their general plan, which may not be aligned with state GHG reduction goals upon which the Technical Advisory is based.
3. A lead agency has the discretion to choose the most appropriate methodology and thresholds to evaluate a project's VMT. A lead agency may take into account both its own policy goals and context in developing a VMT methodology and thresholds.

FAQ

Evaluating Transportation Impacts in CEQA
Based on New Guidelines as Directed by SB 743

What are the pros and cons of following the *Technical Advisory* guidance with respect to CEQA defensibility?

PROS

1 Aligns with state goals for GHG reduction, infill development, transit, active transportation, and public health.
2 Requires limited effort to implement.
3 Creates VMT impact screening opportunities for housing, employment, transit, bicycle, pedestrian, and minor roadway projects.
4 Includes specific thresholds.

CONS

1 Recommends only reporting partial VMT for individual land uses, trip purposes/tours, and vehicle types. This could be interpreted as presenting an inadequate or incomplete analysis when compared to the current practice of reporting total VMT for air quality, GHG, and energy impact analysis.
2 Includes evidence that a 15 percent reduction from baseline may not be sufficient to achieve statewide goals for GHG reduction.
3 Does not consider local general plan role in setting threshold expectations.
4 Includes inconsistent threshold expectations based on the same land use and transportation context.

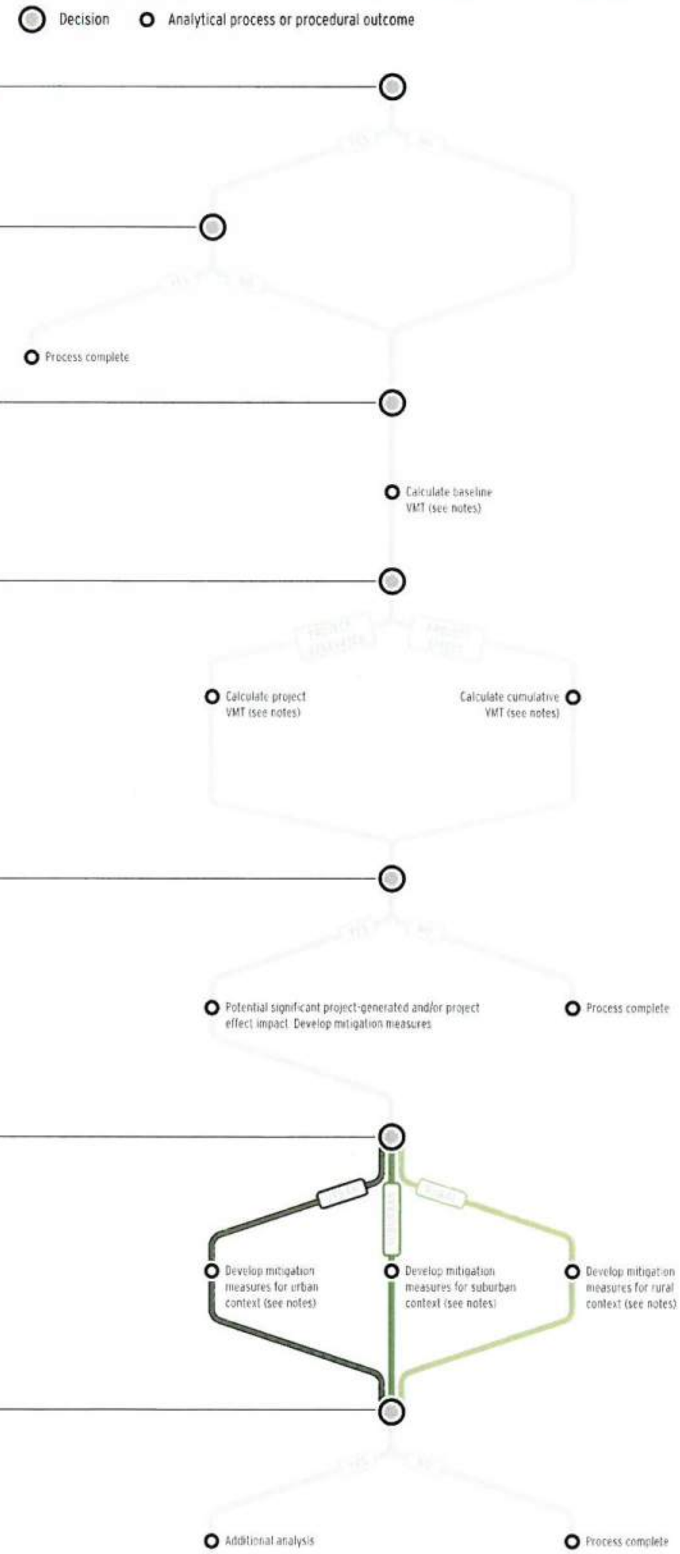
What other challenges should a lead agency consider?

1 Direct application of the *Technical Advisory* results in significant and unavoidable VMT impacts for projects in jurisdictions with limited transit service and low land use densities even when those projects are consistent with the local general plan.
2 Lead agencies have often used transportation demand management (TDM) strategies as mitigation to reduce VMT. Most TDM strategies are project site and building tenant dependent. Since this information is typically unknown during the project entitlement and environmental review process, a lead agency must think about whether it can guarantee TDM mitigation outcomes. This implies that ongoing monitoring and adjustment of the TDM strategies may be required and that impacts are likely to remain significant even with mitigation due to the uncertainty associated with building tenant performance over time.
3 Caltrans has published a *Draft TISG* (February 2020) that endorses the OPR Technical Advisory methodology and thresholds (Page 8). This sets the expectation that local agencies will use the OPR recommended VMT impact thresholds for all land use plans and projects.

FEHR & PEERS

OPR Steps	Project Questions
Step 1 Screening	Is the project type: Transit; Active transportation; One of the road project types on pages 20 and 21 of the OPR Technical Advisory*? (See Page 2 for complete list)
	Does substantial evidence exist to support a finding that the project will not generate new VMT? (Refer to the SBCTA web tool)
Step 2 Establishing Baseline VMT Levels	What are the baseline VMT levels? (Refer to the SBCTA web tool)
Step 3 Establishing VMT	What are the baseline and future estimates for project-generated VMT? What is the future estimate for project effect on VMT?
Step 4 Identifying Significant Impacts	Do the VMT forecasts from Step 3 exceed the VMT thresholds from Step 3 or is the project inconsistent with the RTP or RTP/SCS?
Step 5 Developing Mitigation Measures	What is the surrounding land use context?
Step 6 Identifying Impacts of Mitigation	Do the mitigations require new or expanded facilities/ services that may have environmental impacts that require evaluation under CEQA?

Procedural Flowchart



OPR Steps	Analysis Procedures	Technical Notes
Step 1 Screening	Per the OPR technical advisory: Projects that would not likely lead to a substantial or measurable increase in vehicle travel, and therefore generally should not require an induced travel analysis, include: • Rehabilitation, maintenance, replacement, safety, and repair projects designed to improve the condition of existing transportation assets and that do not add additional motor vehicle capacity • Roadside safety devices or hardware installation such as median barriers and guardrails Roadway shoulder enhancements to provide "breakdown space," dedicated space for use only by transit vehicles, to provide bicycle access, or to otherwise improve safety, but which will not be used as automobile vehicle travel lanes • Addition of an auxiliary lane of less than one mile in length designed to improve roadway safety • Installation, removal, or reconfiguration of traffic lanes that are not for through traffic, such as left, right, and U-turn pockets, two-way left turn lanes, or emergency breakdown lanes that are not utilized as through lanes • Addition of roadway capacity on local or collector streets provided the project also substantially improves conditions for pedestrians, cyclists, and, if applicable, transit • Conversion of existing general purpose lanes (including ramps) to managed lanes or transit lanes, or changing lane management in a manner that would not substantially increase vehicle travel • Addition of a new lane that is permanently restricted to use only by transit vehicles • Reduction in number of through lanes • Grade separation to separate vehicles from rail, transit, pedestrians or bicycles, or to replace a lane in order to separate preferential vehicles (e.g., HOV, HOT, or trucks) from general vehicles • Installation, removal, or reconfiguration of traffic control devices, including Transit Signal Priority (TSP) features • Installation of traffic metering systems, detection systems, cameras, changeable message signs and other electronics designed to optimize vehicle, bicycle, or pedestrian flow • Timing of signals to optimize vehicle, bicycle, or pedestrian flow • Installation of roundabouts or traffic circles • Installation or reconfiguration of traffic calming devices • Adoption of or increase in tolls • Addition of tolled lanes, where tolls are sufficient to mitigate VMT increase • Initiation of new transit service • Conversion of streets from one-way to two-way operation with no net increase in number of traffic lanes • Removal or relocation of off-street or on-street parking spaces • Adoption or modification of on-street parking or loading restrictions (including meters, time limits, accessible spaces, and preferential/reserved parking permit programs) • Addition of traffic wayfinding signage • Rehabilitation and maintenance projects that do not add motor vehicle capacity • Addition of new or enhanced bike or pedestrian facilities on existing streets/highways or within existing publicrights-of-way • Addition of Class I bike paths, trails, multi-use paths, or other off-road facilities that serve nonmotorized travel • Installation of publicly available alternative fuel/charging infrastructure • Addition of passing lanes, truck climbing lanes, or truck brake-check lanes in rural areas that do not increase overall vehicle capacity along the corridor	
Step 2 Establishing Baseline VMT Levels		Baseline should be tied to the date of the NOP release. Hence, baseline VMT calculations may require obtaining current year data or interpolating between base year and future year model estimates.
Step 3 Establishing VMT Threshold	**Project-Generated VMT** Use the same year as baseline VMT to determine the base year. Future year should be set at the latest RTP horizon year. VMT should be calculated using the latest version of SBTAM using the PA or OD method. **Project Effect on VMT** Use the RTP horizon year. VMT should be calculated using the latest version of SBTAM and the boundary method.	Lead agencies have the option to select a threshold. As part of the SBCTA SB 743 Implementation Study, local jurisdictions reviewed threshold and methodology options. Refer to the latest guidelines where the project is located to determine which threshold and methodology apply.

SB743 Procedural Notes (2/2)

FEHR & PEERS

OPR Steps	Analysis Procedures	Technical Notes
Step 4 Identifying Significant Impacts	Identify significant impacts for all impact scenarios. Significant Impact may occur if project's Step 3 VMT exceeds Step 3 threshold or the project is found inconsistent with the RTP or RTP/SCS (i.e., the project generates more VMT than the adopted RTP or RTP/SCS).	
Step 5 Developing Mitigation Measures	As part of the SBCTA SB 743 Implementation Study, mitigation measures considered most appropriate for San Bernardino County were identified. Refer to this list. Note that different mitigation strategies will be applicable for different contexts and land use types.	Refer to latest CAPCOA and CARB research when quantifying mitigation potential. Substantial evidence is required for all potential mitigation measures.
Step 6 Identifying Impacts of Mitigation	Mitigation actions can create other environmental impacts. Mitigation actions that require the expansion of existing facilities or services or the creation of new facilities or services may have an effect on the environment that should be evaluated as prescribed by CEQA Guidelines Section 15126.4(a)(1)(D).	

TECHNICAL MEMORANDUM

Date: 11.11.19

To: Steve Smith (SBCTA), Josh Lee (SBCTA), Albert Espinoza (City of Rancho Cucamonga), Jason Welday (City of Rancho Cucamonga), Baldwin Ngai (City of Rancho Cucamonga)
From: Jason Pack, PE and Delia Votsch, PE

Subject: SB 743 Implementation Thresholds Assessment OC18-0585

This technical memorandum summarizes the consultant team assessment of potential VMT thresholds for land use projects and land use plans to comply with SB 743. For all transportation projects, lead agencies have the discretion to select their own metrics and thresholds, consistent with CEQA, and no change to current practice is required. Hence, the remainder of this memo will focus on land use thresholds and is organized into four sections.

- Section 1 - Background on CEQA Thresholds
- Section 2 - OPR VMT Threshold Recommendations
- Section 3 - Recommendations for SBCTA member agencies

Section 1 – Background on CEQA Thresholds

Establishing thresholds requires complying with the new statutes added by SB 743 and traditional guidance contained in CEQA Guidelines Section 15064.7 and new language being proposed as part of the *Proposed Updates to the CEQA Guidelines*, December 2018, California Governor's Office of Planning and Research (see excerpts below).

§ 15064. Determining the Significance of the Environmental Effects Caused by a Project.

(a) Determining whether a project may have a significant effect plays a critical role in the CEQA process.

(1) If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, the agency shall prepare a draft EIR.

(2) When a final EIR identifies one or more significant effects, the lead agency and each responsible agency shall make a finding under Section 15091 for each significant effect and may need to make a statement of overriding considerations under Section 15093 for the project.

(b) **(1)** The determination of whether a project may have a significant effect on the environment calls for careful judgment on the part of the public agency involved, based to the extent possible on scientific and factual data. An ironclad definition of significant effect is not always possible because the significance of an activity may vary with the setting. For example, an activity which may not be significant in an urban area may be significant in a rural area.

(2) Thresholds of significance, as defined in Section 15064.7(a), may assist lead agencies in determining whether a project may cause a significant impact. When using a threshold, the lead agency should briefly explain how compliance with the threshold means that the project's impacts are less than significant. Compliance with the threshold does not relieve a lead agency of the obligation to consider substantial evidence indicating that the project's environmental effects may still be significant.

Source: http://resources.ca.gov/ceqa/docs/2018_CEQA_FINAL_TEXT_122818.pdf

§ 15064.7. Thresholds of Significance.

(a) ~~**Each public agency is encouraged to develop and publish thresholds of significance that the agency uses in the determination of the significance of environmental effects.**~~ A threshold of significance is an identifiable quantitative, qualitative or performance level of a particular environmental effect, non-compliance with which means the effect will normally be determined to be significant by the agency and compliance with which means the effect normally will be determined to be less than significant.

(b) **Each public agency is encouraged to develop and publish thresholds of significance that the agency uses in the determination of the significance of environmental effects.** Thresholds of significance to be adopted for general use as part of the lead agency's environmental review process must be adopted by ordinance, resolution, rule, or regulation, and developed through a public review process and be supported by substantial evidence. **Lead agencies may also use thresholds on a case-by-case basis as provided in Section 15064(b)(2).**

(c) When adopting **or using** thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence.

(d) Using environmental standards as thresholds of significance promotes consistency in significance determinations and integrates environmental review with other environmental program planning and regulation. Any public agency may adopt or use an environmental standard as a threshold of significance. In adopting or using an environmental standard as a threshold of significance, a public agency shall explain how the particular requirements of that environmental standard reduce project impacts, including cumulative impacts, to a level that is less than significant, and why the environmental standard is relevant to the analysis of the project under consideration. For the purposes of this subdivision, an "environmental standard" is a rule of general application that is adopted by a public agency through a public review process and that is all of the following:

(1) a quantitative, qualitative or performance requirement found in an ordinance, resolution, rule, regulation, order, plan or other environmental requirement;

(2) adopted for the purpose of environmental protection;

(3) addresses the environmental effect caused by the project; and,

(4) applies to the project under review.

Source: http://resources.ca.gov/ceqa/docs/2018_CEQA_FINAL_TEXT_122818.pdf

In summary, this threshold setting guidance emphasizes the need to use substantial evidence[1] to help determine when a project will cause an unacceptable environmental condition or outcome. For SB 743, the specific outcome of focus is the change a project will cause in vehicle miles of travel (VMT). Since VMT is already used to determine air quality, energy, and greenhouse gas (GHG) impacts as part of CEQA compliance[2], the challenge for lead agencies is to answer the question, **"What type or amount of change in VMT constitutes a significant impact solely for transportation purposes?"**

Section 2 - OPR VMT Threshold Recommendations

SB 743 includes the following two legislative intent statements, which were used to help guide OPR's VMT threshold decisions.

1) *Ensure that the environmental impacts of traffic, such as noise, air pollution, and safety concerns, continue to be properly addressed and mitigated through the California Environmental Quality Act.*

2) *More appropriately balance the needs of congestion management with statewide goals related to infill development, promotion of public health through active transportation, and reduction of greenhouse gas emissions.*

The threshold recommendations are found in the *CEQA Guidelines* and the *Technical Advisory*. Specific excerpts and threshold highlights are provided below.

> CEQA Guidelines Section 15064.3
>
> *(b) Criteria for Analyzing Transportation Impacts.*
>
> *(1) Land Use Projects. Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less than significant transportation impact. Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be considered to have a less than significant transportation impact.*
>
> *(2) Transportation Projects. Transportation projects that reduce, or have no impact on, vehicle miles traveled should be presumed to cause a less than significant transportation impact. For roadway capacity projects, agencies have discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements. To the extent that such impacts have already been adequately addressed at a programmatic level, such as in a regional transportation plan EIR, a lead agency may tier from that analysis as provided in Section 15152.*

[1] Per the CEQA Guidelines Section 15384, substantial evidence must be based in fact, rather than conclusions or base assertions.

[2] The methodology used to calculate VMT for GHG purposes should be reviewed to confirm if it is consistent with SB 743 guidance and requirements. For example, if VMT calculated for GHG emissions is truncated at a model's jurisdictional boundaries, that may require modifications for SB 743 purposes.

Technical Advisory on Evaluating Transportation Impacts in CEQA (page 10)

Based on OPR's extensive review of the applicable research, and in light of an assessment by the California Air Resources Board quantifying the need for VMT reduction in order to meet the State's long-term climate goals, ***OPR recommends that a per resident or per employee VMT that is fifteen percent below that of existing development may be a reasonable threshold****.*

Technical Advisory on Evaluating Transportation Impacts in CEQA (page 18)

As with projects, agencies should analyze VMT outcomes of land use plans across the full area over which the plan may substantively affect travel patterns, including beyond the boundary of the plan or jurisdiction's geography. And as with projects, VMT should be counted in full rather than split between origin and destination. (Emissions inventories have sometimes spit cross-boundary trips in order to sum to a regional total, but CEQA requires accounting for the full impact without truncation or discounting). Analysis of specific plans may employ the same thresholds described above for projects. A general plan, area plan, or community plan may have a significant impact on transportation if proposed new residential, office, or retail land uses would in aggregate exceed the respective thresholds recommended above.

Technical Advisory on Evaluating Transportation Impacts in CEQA – Rural Projects Outside of MPOs (page 19)

In rural areas of non-MPO counties (i.e., areas not near established or incorporated cities or towns), fewer options may be available for reducing VMT, and significance thresholds may be best determined on a case-by-case basis. Note, however, that clustered small towns and small town main streets may have substantial VMT benefits compared to isolated rural development, similar to the transit oriented development described above.

These (and the other) threshold recommendations in the *Technical Advisory* rely on the following evidence associated with the state's GHG reduction goals and targets in combination with environmental case law.

- Assembly Bill 32 (2006) requires statewide greenhouse gas reductions to 1990 levels by 2020 and continued reductions beyond 2020.
- Senate Bill 32 (2016) requires at least a 40 percent reduction in greenhouse gas emissions by 2030.
- Pursuant to Senate Bill 375 (2008), the California Air Resources Board establishes greenhouse gas reduction targets for metropolitan planning organizations (MPOs) to achieve based on land use patterns and transportation systems specified in Regional Transportation Plans and Sustainable

Community Strategies. Current targets for the largest metropolitan planning organizations range from 13% to 16% reductions by 2035.

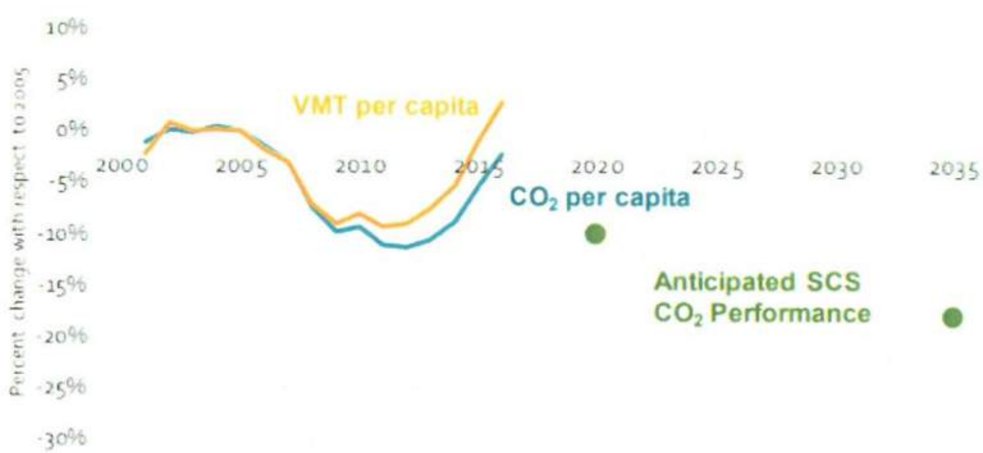
- Executive Order B-30-15 (2015) sets a GHG emissions reduction target of 40 percent below 1990 levels by 2030.
- Executive Order S-3-05 (2005) sets a GHG emissions reduction target of 80 percent below 1990 levels by 2050.
- Executive Order B-16-12 (2012) specifies a GHG emissions reduction target of 80 percent below 1990 levels by 2050 specifically for transportation.
- Senate Bill 391 requires the California Transportation Plan to support 80 percent reduction in GHGs below 1990 levels by 2050.
- The California Air Resources Board Mobile Source Strategy (2016) describes California's strategy for containing air pollutant emissions from vehicles and quantifies VMT growth compatible with achieving state targets.
- The California Air Resources Board's 2017 Climate Change Scoping Plan Update: The Strategy for Achieving California's 2030 Greenhouse Gas Target describes California's strategy for containing greenhouse gas emissions from vehicles and quantifies VMT growth compatible with achieving state targets.
- The Caltrans Strategic Management Plan (2015) calls for a 15 percent reduction in VMT per resident compared to 2010 levels, by 2020.
- California Air Resources Board 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals (2019) identifies a 16.8 percent reduction in automobile VMT per resident below existing (2018) levels to achieve statewide GHG reduction goals.

Lead agencies should note that the OPR recommended VMT thresholds are almost exclusively based on GHG and air pollution reduction goals. While this is one of the SB 743 legislative intent objectives, a less clear connection is made to the other legislative intent objectives to encourage infill development and promote active transportation. And, as noted above, GHG impacts are already addressed in another CEQA section.

Another important distinction within the Technical Advisory is how projects within different land use contexts are treated. The general expectation that a 15 percent reduction below that of existing development may be reasonable is proposed for projects within metropolitan planning organizations (MPOs). For rural areas outside MPOs, the Technical Advisory recognizes that VMT mitigation options are limited so thresholds may need to be set on a case-by-case basis.

The recognition that land use context matters when it comes to the potential VMT mitigation options and effectiveness is important. The MPO boundary distinction is not relevant to the feasibility of VMT mitigation. A rural or suburban area inside or outside an MPO boundary will have very similar limitations when it comes to the feasibility of VMT reduction options. As such, land use context and not MPO status should be the defining criteria for setting threshold expectations. The land use context is also relevant to the potential range of effectiveness associated with VMT reduction strategies. The Technical Advisory relies on the *Quantifying Greenhouse Gas Mitigation Measures*, CAPCOA, 2010 resource document to help justify the 15 percent reduction threshold stating, "...fifteen percent reduction in VMT are achievable at the project level in a variety of place types...". A more accurate reading of the CAPCOA document is that a fifteen percent is the ***maximum*** reduction when combining multiple mitigation strategies for the suburban center place type. For suburban place types, 10% is the maximum and requires a project to contain a diverse land use mix, workforce housing, and project-specific transit. It is also important to note that the maximum percent reductions were not based on data or research comparing the actual performance of VMT reduction strategies in these place types. Instead, the percentages were derived from a limited comparison of aggregate citywide VMT performance for Sebastopol, San Rafael, and San Mateo where VMT performance ranged from 0 to 17 percent below the statewide VMT/resident average based on data collected prior to 2002. Little to evidence exists about the long-term performance of similar TDM strategies in different land use contexts. As such, VMT reductions from TDM strategies cannot be guaranteed in most cases.

Statewide CO_2 and Vehicle Miles Traveled (VMT) Per Capita Trend with Respect to Anticipated Performance of Current SB 375 SCSs[2]



Source: CDTFA, U.S.EIA, U.S.EPA, CARB

[2] CO_2 and VMT calculated based on California Department of Tax and Fee Administration (CDTFA) gasoline fuel sales data

California VMT Trends

Source: *2018 Progress Repot California's Sustainable Communities and Climate Protection Act*, California Air Reserves Board, 2018

Section 3 - Recommendations for SBCTA member agencies

How should lead agencies approach VMT threshold setting given their discretion? Since an impact under CEQA begins with a change to the existing environment, a starting level for potential thresholds would the baseline (i.e., existing condition) VMT, VMT per resident, VMT per employee, or VMT per service population[3]. Since VMT will increase or fluctuate with population and employment growth, changes in economic activity, and expansion of new vehicle travel choices (i.e., Uber, Lyft, Chariot, autonomous vehicles, etc.), expressing VMT measurement in an efficiency metric form allows for more direct comparisons to baseline conditions[4] when it comes to land use projects, land use plans, and transportation projects. Establishing a threshold such as baseline VMT per service population would be essentially setting an expectation that future land uses perform similar to existing land uses. If this is the floor, then expectations for VMT reduction can increase depending on a community's values related to vehicle use and its associated effects on mobility, economic activity, and environmental consequences. Working towards the 15-percent reduction recommended in the Technical Advisory becomes more feasible as the land use context becomes more urban with higher densities and high-quality transit systems. In central cities, the 15-percent reduction can be surpassed because of the close proximity of land uses and the multiple options for accessing destinations by walking, using bicycles or scooters, sharing vehicles, and using transit.

While OPR has developed specific recommended VMT impact thresholds for project-related impacts, current practice has not sufficiently evolved where a clear line can be drawn between 'acceptable' and 'unacceptable' levels of VMT change for the sole purpose of determining a significant transportation impact especially when considering land use context. Furthermore, OPR's Guidance is only a recommendation and not binding law. Until SB 743, VMT changes were viewed through an environmental lens that focused on the relationship to fuel consumption and emissions. For transportation purposes, VMT has traditionally been used to evaluate whether land use or transportation decisions resulted in greater dependency on vehicle travel. Trying to determine whether a portion of someone's daily vehicle travel is unacceptable or would constitute a significant transportation impact is generally not clear to lead agencies.

Another consideration in threshold setting is how to address cumulative VMT impacts and whether addressing them in the general plan EIR is advantageous for streamlining the review of subsequent land use and transportation projects given CEQA relief available through SB 375 or CEQA Guidelines Section 15183. This section of the Guidelines may relieve a project of additional environmental review if the

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[3] Service population is defined as the sum of residents and employees

[4] Baseline conditions are typically defined as the year when a Notice of Preparation for an EIR is issued, rather than a specific year

environmental impact was adequately addressed in the general plan EIR, if there are no project-specific significant effects which are specific to the project on its site, and if the project is consistent with the general plan (see below).

> **15183. PROJECTS CONSISTENT WITH A COMMUNITY PLAN OR ZONING**
> (a) CEQA mandates that projects which are consistent with the development density established by existing zoning, community plan, or general plan policies for which an EIR was certified shall not require additional environmental review, except as might be necessary to examine whether there are project-specific significant effects which are peculiar to the project or its site. This streamlines the review of such projects and reduces the need to prepare repetitive environmental studies.

The use of Section 15183 also addresses cumulative impacts as acknowledged in Section 15130(e).

> **15130. DISCUSSION OF CUMULATIVE IMPACTS**
> (e) If a cumulative impact was adequately addressed in a prior EIR for a community plan, zoning action, or general plan, and the project is consistent with that plan or action, then an EIR for such a project should not further analyze that cumulative impact, as provided in Section 15183(j).

For cities in the San Bernardino County region, addressing VMT impacts in general plan EIRs could be useful in understanding how VMT reduction should be balanced against other community values when it comes to setting new VMT impact thresholds for SB 743.

Given this information, lead agencies have at least five options for setting thresholds as outlined below. Under any option, the lead agency must develop its own substantial evidence to support their preferred threshold and should consider multiple perspectives. These perspectives include those from the community in general as well as specific stakeholder perspectives from the development community and environmental protection groups. A threshold that is too stringent could lead to a permanent significant and unavoidable VMT impact finding increasing the cost of environmental review for developers. Conversely, a threshold that does not result in any significant impacts could lead to missed opportunities to reasonably reduce VMT and related environmental impacts. In either case, attracting the attention of specific stakeholder groups can lead to CEQA challenges, which are often determined based on the strength of substantial evidence supporting lead agency decisions.

OPTION 1 – Rely on the OPR Technical Advisory Thresholds

The first option is to simply rely on the threshold recommendations contained in the OPR Technical Advisory. As noted above, the general expectation is that land use projects should be measured against a 15 percent reduction below that of existing baseline conditions. Specific VMT thresholds for residential, office (work-related), and retail land uses are summarized below.

- Residential projects – A proposed project exceeding a level of 15 percent below existing (baseline) VMT per resident may indicate a significant transportation impact. Existing VMT per resident may be measured as regional VMT per resident or as city VMT per resident.
- Office projects – A proposed project exceeding a level of 15 percent below existing (baseline) regional VMT per employee may indicate a significant transportation impact.
- Retail projects – A net increase in total VMT may indicate a significant transportation impact.

For land use plans (i.e., a general plan, area plan, or community plan), a significant impact would occur if the respective thresholds above were exceeded in aggregate. This means that new population and employment growth combined the planned transportation network would need to generate future VMT per resident or VMT per worker that is less than 85 percent of the baseline value to be considered less than significant. Land use project and land use plans would also need to be consistent with the applicable RTP/SCS.

A potential limitation of the OPR recommendations is that the substantial evidence used to justify the thresholds is largely based on the state's air quality and GHG goals. Four main issues arise from this reliance.

- The OPR recommended threshold does not establish a level of VMT reduction that would result in the state meeting it's air quality and GHG goals according to the *California Air Resources Board 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals* (2019). This may create confusion with air quality and GHG impact analysis in environmental documents, which should already address the influence of VMT.

- The OPR recommended thresholds do not directly reflect expectations related to the other SB 743 objectives related to statewide goals to promote public health through active transportation, infill development, multimodal networks, and a diversity of land uses. Recommending a reduction below baseline levels is consistent with these objectives, but the numerical value has not been tied to specific statewide values for each objective or goal.

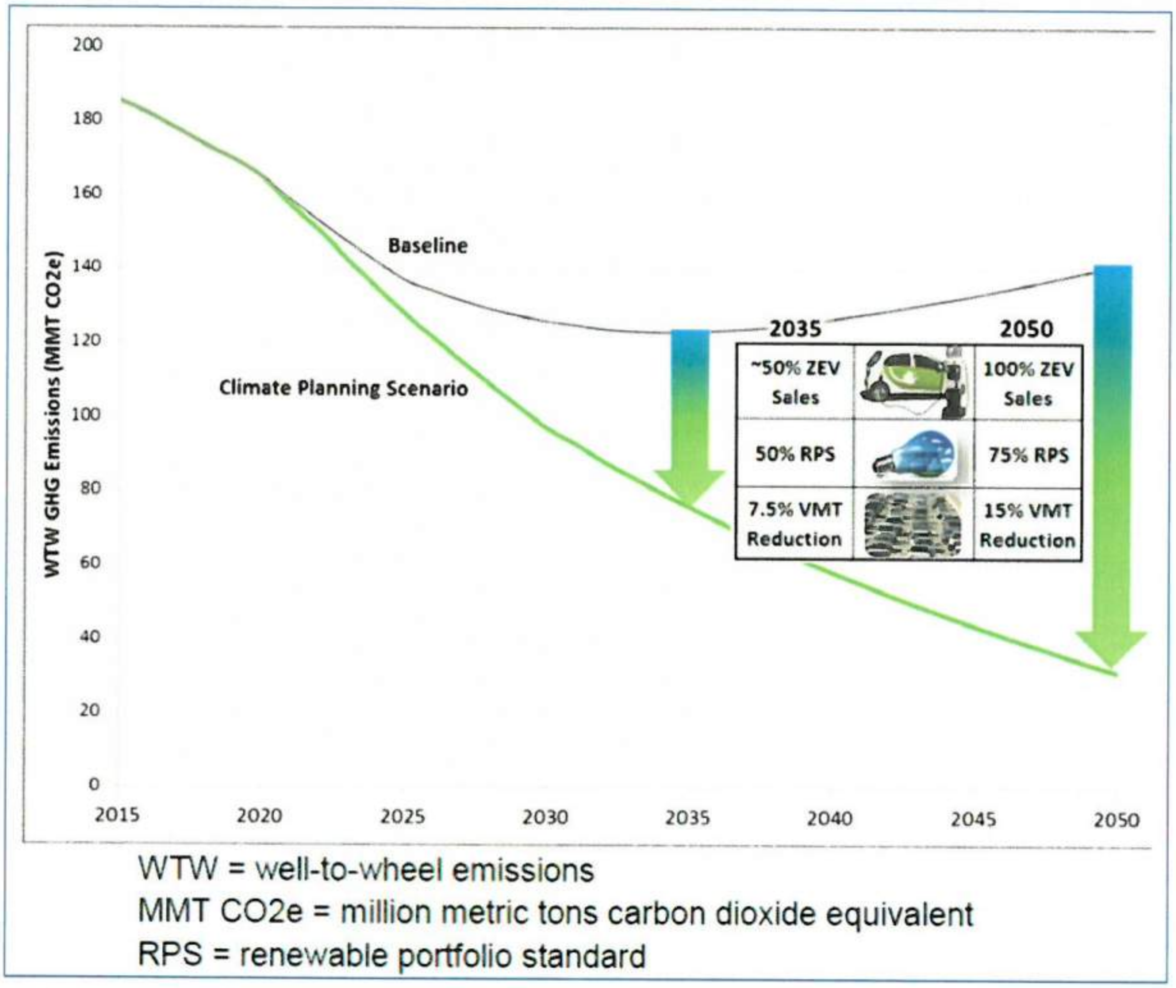
- State expectations for air quality and GHG may not align with local/lead agency expectations. Using state expectations for a local lead agency threshold may create inconsistencies with local city or county general plans.
- Each agency relying upon OPR's recommended threshold should still develop and set forth the substantial evidence explaining why OPR's recommendation is appropriate for the individual agency adopting it.

OPTION 2 – Set Thresholds Consistent with Lead Agency Air Quality, GHG Reduction, and Energy Conservation Goals

This option sets a threshold consistent with a lead agency's air quality, GHG reduction, and energy conservation goals. A local agency would have to provide substantial evidence justifying why any threshold would meet statewide GHG goals. This approach requires that local air quality and GHG reduction goals in general plans, climate action plans, or GHG reduction plans comply with the legislation and associated plans described above on pages 5 and 6. In general, most of the expectations set through legislation are related to the state's GHG reduction goals that were originally captured in EO S-3-05.

- 2000 levels by 2010
- 1990 levels by 2020
- 80 percent below 1990 levels by 2050

SB 32 expanded on these goals and added the expectation that the state should reach 40 percent below 1990 levels by 2030 followed by SB 391 that requires the California Transportation Plan to support 80 percent reduction in GHGs below 1990 levels by 2050. With respect to the land use and transportation sectors, SB 375 tasked ARB with setting specific GHG reduction goals through the RTP/SCSs prepared by MPOs. The ARB *Scoping Plan* and *Mobile Source Strategy* provide analysis related to how the state can achieve the legislative and executive goals while the Caltrans *Strategic Management Plan* and *Smart Mobility Framework* provide supportive guidance and metrics. An important recognition of the ARB *Scoping Plan* and *Mobile Source Strategy* is that the initial SB 375 targets were not aggressive enough. The state needs to achieve a reduction of 7 percent below projected 2030 VMT levels and 15 percent below projected 2050 VMT levels associated with the first round of RTP/SCSs (see chart below).



Statewide On-Road GHG Emissions

Source: https://www.arb.ca.gov/cc/sb375/final_staff_proposal_sb375_target_update_october_2017.pdf (pg. 12)

Note that the baseline trend in the chart did not consider key disruptive trends such as transportation network companies (TNCs) and autonomous vehicles (AVs) so it is possible that baseline VMT may be higher. Further, the climate planning scenario did not consider the recently issued Governor's Executive Order (EO) B-55-18 that establishes the goal to achieve carbon neutrality no later than 2045. Consideration of these factors would increase the level of VMT reduction needed to achieve the State's climate goals.

The most recent ARB analysis contained in *California Air Resources Board 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals*, January 2019 recommends project specific VMT reduction thresholds of 16.8 percent reduction from baseline for light-duty vehicle VMT (i.e., passenger cars and light trucks) or a 14.3 percent reduction for total VMT (i.e., all vehicles) – see excerpt below. These reductions are dependent on MPO RTP/SCS targets being met, which may not be a reasonable assumption for CEQA purposes given the information presented above from the *2018 Progress Report*

California's Sustainable Communities and Climate Protection Act. Also, ARB does not provide details about whether the VMT values should be compared against jurisdictional or regional baseline values. Since the analysis was based on statewide data, it may be reasonable to presume that the reduction expectation is a fair-share expectation for all jurisdictions.

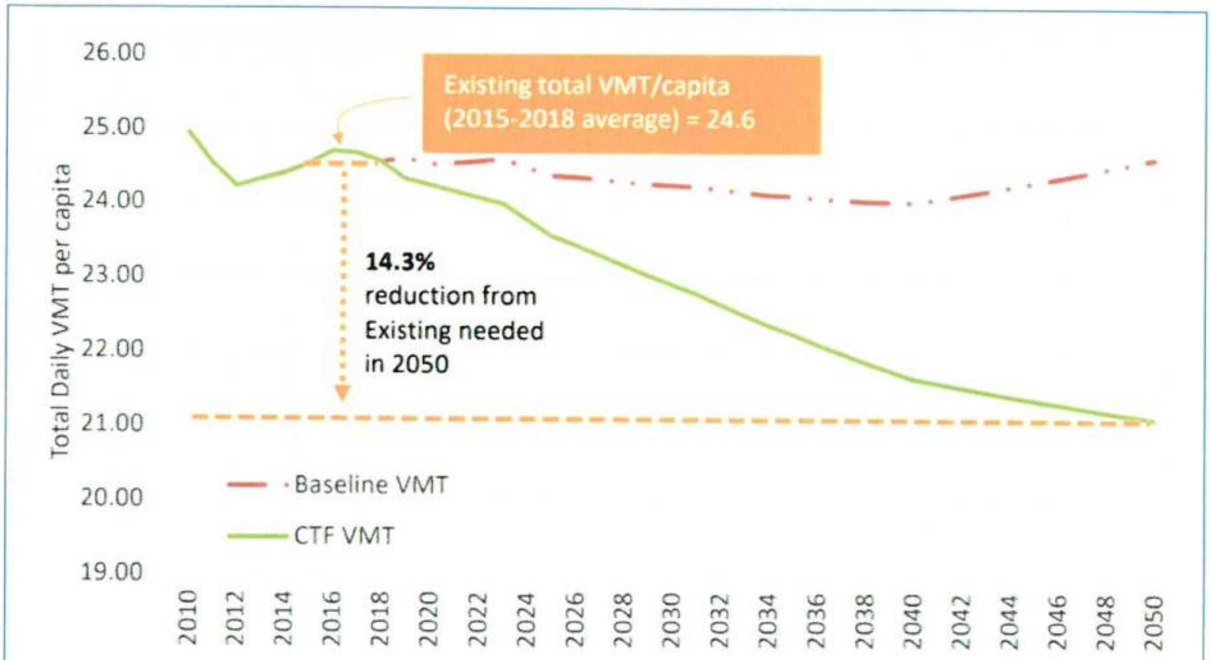


Figure 2: California Total Daily VMT Per Capita

ARB Recommended Total VMT per Resident Threshold

Source: *California Air Resources Board 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals*, January 2019

One benefit of relying on ARB or other state agencies for a threshold recommendation is the CEQA Guidelines provision in Section 15064.7(c) highlighted below.

§ 15064.7. Thresholds of Significance.

(a) ~~Each public agency is encouraged to develop and publish thresholds of significance that the agency uses in the determination of the significance of environmental effects.~~ A threshold of significance is an identifiable quantitative, qualitative or performance level of a particular environmental effect, non-compliance with which means the effect will normally be determined to be significant by the agency and compliance with which means the effect normally will be determined to be less than significant.

(b) **Each public agency is encouraged to develop and publish thresholds of significance that the agency uses in the determination of the significance of environmental effects.** Thresholds of significance to be adopted for general use as part of the lead agency's environmental review process must be adopted by ordinance, resolution, rule, or regulation, and developed through a public review process and be supported by substantial evidence. **Lead agencies may also use thresholds on a case-by-case basis as provided in Section 15064(b)(2).**

(c) When adopting **or using** thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence.

ARB meets the criteria of being a public agency and having noted expertise in the areas of VMT and emissions analysis. Further, the recommended threshold values above were developed in specific consideration of SB 743 requirements.

One other agency threshold to consider is Caltrans. The Local Development-Intergovernmental Review (LD-IGR) Branch at Caltrans (http://www.dot.ca.gov/hq/tpp/offices/ocp/igr_ceqa.html) has responsibility to reduce potential adverse impacts of local development on the state transportation system. As part of its responsibilities, each district branch performs reviews of CEQA environmental documents for local land use projects. These reviews include providing expectations for transportation impact analysis such as metrics and thresholds. Caltrans has published initial guidance related to SB 743 implementation.

- *Local Development – Intergovernmental Review Program Interim Guidance*, Caltrans, November 9, 2016 (http://www.dot.ca.gov/hq/tpp/documents/RevisedInterimGuidance11092016.pdf)

An important part of the Caltrans guidance are the following expectations for thresholds and impact findings related to VMT.

A. Comment on Vehicle Miles Traveled associated with the project.

Reviewers should comment on vehicle miles traveled resulting from the land use project, applying local agency thresholds or absent those, thresholds recommended ~~by the most recent draft of~~ in ~~OPR's~~ adopted CEQA Guidelines ~~and~~ or OPR's approved Technical Advisory. If an assessment of VMT is not presented, Caltrans should request it be presented. Though SB 743 clarifies requirements for transportation analysis, a VMT analysis is already needed to meet other CEQA requirements.[1] Methods for assessing VMT should be compared to the methods recommended in the OPR's approved Technical Advisory. Where methods are not consistent with the recommendations in the Technical Advisory, Caltrans should comment on those methods. Where the project exhibits less than threshold VMT, Caltrans comments should acknowledge the project's transportation efficiency. Where the project exhibits greater than threshold VMT, Caltrans should request mitigation. Examples of mitigation measures are included in the OPR Technical Advisory. Contact ~~the~~ Caltrans SB 743 Program Implementation Manager, Alyssa Begley, for assistance with VMT calculation.

Source: http://www.dot.ca.gov/hq/tpp/documents/RevisedInterimGuidance11092016.pdf

When Caltrans reviews CEQA documents, they may function as a reviewing agency or a responsible agency. In a responsible agency role, Caltrans has approval authority over some component of the project such as an encroachment permit for access to the state highway system. Comments from Caltrans should be adequately addressed, and special attention should be paid to those comments when Caltrans serves as a responsible agency since an adequate response may be required to obtain their required approval. The interim guidance above does not endorse the *Technical Advisory* recommendations for thresholds; it only requires IGR staff to 'comment' on VMT analysis. However, Caltrans is working to establish specific VMT thresholds per conversations with Alyssa Begley, SB 743 Program Implementation Manager with Caltrans. Further, Caltrans may have already establish GHG thresholds that could also serve as VMT thresholds.

In the draft *Interim Guidance: Determining CEQA Significance For Greenhouse Gas Emissions for Projects on the State Highway System,* California Department of Transportation, 2018, Caltrans recommends that any increase in GHG emissions would constitute a significant impact (see excerpt below).

Scenario 3		
Compare	Existing to Build, If there is an	Increase
and	No Build to Build, If there is a	Decrease
		Generally Considered Significant

Alternative	CO_2e Emissions (Metric Tons/Year)
Existing/Baseline 20XX	400
Future/Design-Year 20XX	
No Build	600
Build Alternative	500

Scenario 4		
Compare	Existing to Build If there is an	Increase
and	No Build to Build If there is an	Increase
		Generally Considered Significant

Alternative	CO_2e Emissions (Metric Tons/Year)
Existing/Baseline 20XX	500
Future/Design-Year 20XX	
No Build	700
Build Alternative	900

Interim Caltrans GHG Thresholds

Source: *Interim Guidance: Determining CEQA Significance For Greenhouse Gas Emissions for Projects on the State Highway System,* California Department of Transportation, 2018

Since any increase in VMT would result in an increase in GHG emissions, lead agencies could rely on this Caltrans threshold for VMT purposes using the same 15064.7(c) provision above. Using this threshold would result in most land use projects and land use plans resulting in significant impacts but it would also result in the maximum feasible mitigation for VMT.

OPTION 3 – Set Thresholds Consistent with RTP/SCS Future Year VMT Projections by Jurisdiction or Sub-Region

VMT is a composite metric that is created as an output of combining a community's long-term population and growth projections with its long-term transportation network (i.e., the general plan). Other variables are also in play related to travel behavior, but land use changes and transportation network modifications are the items largely influenced or controlled by cities and counties. As such, every city and county unincorporated area within SBCTA already has a VMT growth budget. This is the amount of VMT that is forecast to be generated from their general plans combined with other travel behavior inputs for the region as captured in the RIVTAM or SCAG regional travel forecasting models as part of regional planning and the RTP/SCS. This VMT growth has already been 'approved' by the community, the region, and the state and could serve as the basis of a VMT threshold expressed as a VMT growth budget or as a VMT efficiency metric based on the future year VMT per resident, VMT per employee, or VMT per service population. The measurement of VMT could occur at the jurisdictional or sub-region level.

Potential limitations of this approach relate to model sensitivity and forecast accuracy/reasonableness. If a general plan includes policies or implementation programs designed to reduce VMT through transportation demand management (TDM) strategies, the regional models did not likely include these effects. Further, current regional models do not capture major disruptive trend effects such as TNCs, AVs, and internet shopping. The regional models may also have other issues with forecasting accuracy or reasonableness due to a disconnect between RTP/SCS expectations and the realities of transportation investments and local agency land use decisions as noted in the *2018 Progress Report California's Sustainable Communities and Climate Protection Act,* California Air Resources Board, November 2018.

OPTION 4 – Set Thresholds Based on Baseline VMT Performance

As noted above, an impact under CEQA begins with a change to the existing or baseline environment. There are a range of approaches to using this starting point for VMT impact analysis. At one end of the spectrum is 'total daily VMT' generated under baseline conditions. Setting this value as the threshold for a jurisdiction could result in a fixed budget that would limit increases such that even small increases could result in a significant impact. Alternatively, the baseline VMT per resident, VMT per employee, or VMT per service population could be used to establish an efficiency metric basis for impact evaluation. Using this form of VMT would mean that future land use projects would be expected to perform no worse than existing land use projects and only projects that cause an increase in the rate of VMT generation would cause significant impacts. Since VMT will increase or fluctuate with population and employment growth, changes in economic activity, and expansion of new vehicle travel choices (i.e., Uber, Lyft, AVs, etc.), expressing VMT measurement in an efficiency metric form allows for more direct comparisons to baseline conditions when it comes to land use projects, land use plans, and transportation projects. Setting a threshold based on baseline levels should consider how the threshold complies with the SB 743 statute provisions described at the beginning of this memo as well as whether VMT reduction strategies are feasible in the jurisdiction.

OPTION 5 – Set Thresholds Based on Maximum Achievable VMT Reduction

Programs and practices designed to reduce VMT are referred to as transportation demand management (TDM) strategies. TDM strategies range from programs such as employers providing subsidized or free transit passes to constructing new infrastructure such as bicycle or pedestrian paths. The VMT reduction associated with different TDM measures has been published in research papers. In August 2010 the California Air Pollution Control Officers Association (CAPCOA) published *Quantifying Greenhouse Gas Mitigation Measures.* This report identified 50 transportation measures, 41 of which are applicable at the building and site level. Of these strategies, only a few are likely to be effective in rural or suburban settings such as those found in San Bernardino County. As such, a threshold could be based on the maximum achievable reduction in VMT, based on the TDM measures that would be feasible in the jurisdiction in which the project is located.

The August 2010 CAPCOA report identified an estimate for the expected reduction associated with each TDM measure. The most current research now suggests that these expected reduction targets are aggressive and not achievable in most areas. Implementation of several TDM measures can vary significantly for similar areas and uses. For example, any TDM measures associated with employment uses are dependent upon the employer. Office buildings in the same neighborhood with different tenants may not achieve the same reduction targets.

The maximum achievable reduction is also influenced by key factors such as urban context, the size of the project, and access to transit. Detailed analysis would be required to determine the feasible mitigation measures for a specific project and location. However, a 15% threshold, as identified by OPR, would not be feasible throughout most of the unincorporated and rural areas of the county. Areas in the West Valley with high quality transit could potentially achieve a reduction between 5% and 10%, while the more rural and unincorporated areas of San Bernardino County would have a lower maximum achievable reduction, likely less than 4%.

FEHR & PEERS

TECHNICAL MEMORANDUM

Date: 11.11.19

To: Steve Smith (SBCTA), Josh Lee (SBCTA), Albert Espinoza (City of Rancho Cucamonga), Jason Welday (City of Rancho Cucamonga), Baldwin Ngai (City of Rancho Cucamonga)

From: Jason Pack, PE and Delia Votsch, PE

Subject: SB 743 Implementation Mitigation and TDM Strategy Assessment OC18-0585

This technical memorandum summarizes our assessment of new research related to transportation demand management (TDM) effectiveness for reducing vehicle miles of travel (VMT). The purpose of this work was to understand what options are available to mitigate VMT, to compile new TDM information that has been published in research papers since release of the *Quantifying Greenhouse Gas Mitigation Measures*, CAPCOA, August 2010 and to identify those strategies suited to SBCTA member jurisdictions given the varying land use context. The land use and transportation context for SBCTA presents a challenge to the effectiveness of common TDM strategies for VMT reduction when applied at individual project sites due to limited travel choices. The matrix in Attachment A summarizes the overall evaluation of all the CAPCOA strategies while the matrix in Attachment B identifies the top twelve strategies suited for the study area.

Mitigation Programs

The approach to the overall assessment includes two parts. The first part evaluated how VMT reduction strategies or projects could be developed or incorporated into existing funding programs such as Transportation Impact Fee (TIF) program. The purpose of incorporating VMT reduction strategies directly into existing programs is to provide greater certainty and effectiveness for VMT impact mitigation. The second part of the assessment identified potential new mitigation program concepts that may be worthy of further evaluation.

Existing Programs

Most SBCTA member jurisdictions maintain Traffic Impact Fees. These programs collect a fair-share fee payment from new development to contribute to the cost of a capital improvement program (CIP) consisting of long-term transportation network expansion projects identified to accommodate planned population and employment growth. A common theme for the existing programs is that they focus on vehicle trips or vehicle LOS as the key metric for determining deficiencies and developing CIP projects.

In their current form, most of the impact fees would not qualify as VMT impact mitigation programs. Most CIPs include roadway capacity expansion that contributes to VMT increases. Expanding roadway capacity in congested areas induces new vehicle travel that diminishes congestion relief benefits and generates new VMT and emissions. Refer to the following websites for more research information and technical details.

- http://www.dot.ca.gov/newtech/researchreports/reports/2015/10-12-2015-NCST_Brief_InducedTravel_CS6_v3.pdf
- https://www.arb.ca.gov/cc/sb375/policies/hwycapacity/highway_capacity_brief.pdf
- https://trrjournalonline.trb.org/doi/abs/10.3141/2653-02

Many CIPs also include operational improvements, such as signal coordination projects, which would not contribute to an increase in VMT. Most CIPs also include some transit, bicycle, and pedestrian projects that could contribute to VMT reduction.

If the transit, bicycle, and pedestrian projects were separated into a stand-alone CIP with a supporting nexus study based on VMT reduction, then a new VMT fee program could be developed that is dedicated to VMT impact mitigation. This could be a new program implemented by the SBCTA member jurisdictions as a collaborative or as individual jurisdictions. An example of this type of program has been developed the City of Los Angeles as part of their Coastal Transportation Corridor Specific Plan and West Los Angeles Transportation Improvement and Mitigation Specific Plan. Details are provided at the following website. http://www.westsidemobilityplan.com/ctcspwla-timp-final-eir/

It may also be possible for a development project applicant to fully fund a transit, bicycle, or pedestrian project from a CIP as an alternative to paying the fee directly. Some fee programs currently allow fee credits for development that expedites and completes CIP-identified projects. Using this option requires inclusion of the mitigation in a development agreement or an EIR.

Managing and reducing demand could accomplish the goal of reducing peak period VMT. The main source of congestion is typically defined as vehicles move too slowly (i.e., peak period speeds are lower than posted speed limits). This definition of congestion describes a symptom and fails to recognize that peak period travel consists of vehicles with poor seat utilization caused by not managing demand more effectively and mispricing travel demand. The existing roadway network has a limited capacity and this capacity is routinely filled up during peak periods in San Bernardino County by vehicles with solo drivers (i.e., low seat utilization). Further, limited facilities exist that prioritize travel by high occupancy vehicles. Increasing vehicle speeds and reducing delays substantially requires much greater seat utilization in existing vehicles (i.e., private vehicles and public transit). This change would also reduce VMT. Hence, refocusing on the combination of congestion management and VMT reduction would result in a different CIP that could qualify as VMT impact mitigation.

New Mitigation Program Concepts

Beyond the conventional programs described above are two new concepts that are not currently available in The SBCTA area. For purposes of this study, these programs are defined as follows.

- **VMT Mitigation Exchange** – An exchange program is a concept where VMT generators can select from a pre-approved list of mitigation projects that may be located within the same jurisdiction or possibly from a larger area. The intent is to match the project's needed VMT reduction with a specific mitigation project of matching size and to provide evidence that the VMT reduction will reasonably occur.

- **VMT Mitigation Bank** – A mitigation bank is intended to serve as an entity or organization that pools fees from development projects across multiple jurisdictions to spend on larger scale mitigation projects. This concept differs from the more conventional impact fee program approach described above in that the fees are directed to a few larger projects that have the potential for a more significant reduction in VMT and the program is regional in nature.

As these new mitigation program concepts are still evolving, the specific descriptions and elements of the programs will likely change. The first resource document to describe and assess these programs was recently published by U.C. Berkeley and is entitled, "Implementing SB 743, An Analysis of Vehicle Miles Traveled Banking and Exchange Frameworks," The University of California Institute of Transportation Studies, October 2018. This document is a useful starting place for a dialogue about these programs.

The findings of the report are supportive of these concepts noting the following about the reasoning for their consideration.

> *Yet while methods for reducing VMT impacts—such as mileage pricing mechanisms, direct investments in new public transit infrastructure, transit access subsidies, and infill development incentives—are well understood, they may be difficult in some cases to implement as mitigation projects directly linked or near to individual developments. As a result, broader and more flexible approaches to mitigation may be necessary. In response, state and local policy makers are considering the creation of mitigation "banks" or "exchanges." In a mitigation bank, developers*

would commit funds instead of undertaking specific on-site mitigation projects, and then a local or regional authority could aggregate these funds and deploy them to top-priority mitigation projects throughout the jurisdiction. Similarly, in a mitigation exchange, developers would be permitted to select from a list of pre-approved mitigation projects throughout the jurisdiction (or propose their own), without needing to mitigate their transportation impacts on-site. Both models can be applied at a city, county, regional, and potentially state scale, depending on local development patterns, transportation needs and opportunities, and political will.

This reasoning is important for lead agencies in the SBCTA area because mitigating VMT impacts on a project-by-project basis is challenging especially in suburban land use contexts where travel choices are limited. That said, the UCB report and research conducted for this study identified the following key challenges with these types of programs.

- Challenges for Mitigation Exchanges
  - Potential mismatch between funds and mitigation projects available
  - Potential for reduced oversight of project selection
  - Difficulty in verifying VMT reductions and their sustainability especially with VMT generation changing over time due to disruptive transportation trends such as transportation network companies (TNCs) and autonomous vehicles (AVs)
  - Difficulty in demonstrating an essential nexus
  - Potential opposition to mitigation not directly occurring in the project impact area especially if impacts are concentrated in or near disadvantaged communities and the mitigation occurs in more affluent areas

- Challenges for Mitigation Banks
  - Increased need to conduct careful CEQA/Mitigation Fee Act analysis
  - Accounting challenge in delay from fee payment to project funding
  - Greater need for program administration budget
  - Political difficulty in distributing mitigation projects and coordinating across jurisdictions
  - Difficulty in verifying VMT reductions and their sustainability especially with VMT generation changing over time due to disruptive transportation trends such as transportation network companies (TNCs) and autonomous vehicles (AVs)
  - Difficulty in demonstrating an essential nexus
  - Potential opposition to mitigation not directly occurring in the project impact area especially if impacts are concentrated in or near disadvantaged communities and the mitigation occurs in more affluent areas

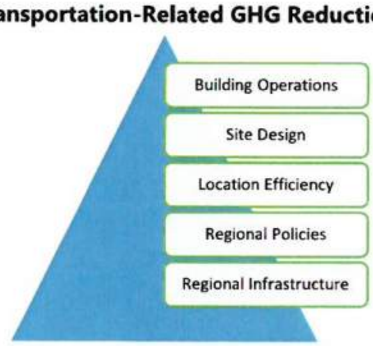
Another important element for either of these concepts is to have an entity that is responsible for establishing, operating, and maintaining the program. This is a potential role for a sub-regional or regional entity especially for programs that would extend mitigation projects beyond individual jurisdictional boundaries. A key part of 'operations' is that the entity will need the capability to provide verification of the VMT reduction performance and to adjust the program projects over time. Whether the entity is regional or sub-regional is another important consideration. A sub-regional entity could help minimize potential concerns about mitigation not occurring near the project site or in the same community.

The potential desire for VMT Mitigation Exchanges or Banks may depend on how lead agencies and developers respond to the initial implementation of SB 743 currently schedule to go into effect July 1, 2020. If many projects are found to have significant VMT impacts and problems occur with finding feasible mitigation measures for individual projects, then interest may grow for more program-based mitigation.

TDM Strategies

This information can be used as part of the SB 743 implementation to determine potentially feasible VMT mitigation measures for individual land use projects in the SBCTA area. An important consideration for the mitigation effectiveness is the scale for TDM strategy implementation. The biggest effects of TDM strategies on VMT (and resultant emissions) derive from regional policies related to land use location efficiency and infrastructure investments that support transit, walking, and bicycling. While there are many measures that can influence VMT and emissions that relate to site design and building operations, they have smaller effects that are often dependent on final building tenants. **Figure 1** presents a conceptual illustration of the relative importance of scale.

Figure 1: Transportation-Related GHG Reduction Measures



Of the 50 transportation measures presented in the CAPCOA 2010 report *Quantifying Greenhouse Gas Mitigation Measures*, 41 are applicable at building and site level. The remaining nine are functions of, or depend on, site location and/ or actions by local and regional agencies or funders. **Table 1** summarizes the strategies according to the scope of implementation and the agents who would implement them.

TABLE 1: SUMMARY OF TRANSPORTATION-RELATED CAPCOA MEASURES

Scope	Agents	CAPCOA Strategies (see full CAPCOA list below)
Building Operations	Employer, Manager	**26 total** from five CAPCOA strategy groups: • **3** from 3.2 Site Enhancements group • **3** from 3.3 Parking Pricing Availability group • **15** from 3.4 Commute Trip Reduction group • **2** from 3.5 Transit Access group • **3** from 3.7 Vehicle Operations group
Site Design	Owner, Architect	**15 total** from three strategy groups: • **6** from 3.1 Land Use group • **6** from 3.2 Site Enhancements group • **1** from 3.3 Parking group • **2** from 3.6 Road Access group
Location Efficiency	Developer, Local Agency	**3 shared** with Regional and Local Policies
Alignment with Regional and Local Policies	Regional and local agencies	**3 shared** with Location Efficiency
Regional Infrastructure and Services	Regional and local agencies	**6 total**

Of these strategies, some are likely to be effective in denser areas, while others will be less applicable in rural or suburban setting. In the SBCTA area, key factors that determine which reduction measures will be effective such as density and access to transit vary throughout and within the jurisdictions. To help narrow the list, we reviewed how land use context could influence each strategy's effectiveness and identified the seven for more detailed review. These strategies are described in Attachment B and listed below. Please note that disruptive trends, including but not limited to, transportation network companies (TNCs), autonomous vehicles (AVs), internet shopping, and micro-transit may affect the future effectiveness of these strategies.

1. Increase diversity of land uses – This strategy focuses on inclusion of mixed uses within projects or in consideration of the surrounding area to minimize vehicle travel in terms of both the number of trips and the length of those trips.

2. Provide pedestrian network improvements – This strategy focuses on creating a pedestrian network within the project and connecting to nearby destinations. Projects in the SBCTA area range in size, so the emphasis of this strategy for smaller projects would likely be the construction of network improvements that connect the project sites directly to nearby destinations. For larger projects, this strategy could focus on the development of a robust pedestrian network within the project itself. Alternatively, implementation could occur through an impact fee program such as the TUMF or benefit/assessment district based on local or regional plans.

3. Provide traffic calming measures and low-stress bicycle network improvements – This strategy combines the CAPCOA research focused on traffic calming with new research on providing a low-stress bicycle network. Traffic calming creates networks with low vehicle speeds and volumes that are more conducive to walking and bicycling. Building a low-stress bicycle network produces a similar outcome. Implementation options are similar to strategy 2 above. One potential change in this strategy over time is that e-bikes (and e-scooters) could extend the effective range of travel on the bicycle network, which could enhance the effectiveness of this strategy.

4. Implement car-sharing program – This strategy reduces the need to own a vehicle or reduces the number of vehicles owned by a household by making it convenient to access a shared vehicle for those trips where vehicle use is essential. Note that implementation of this strategy would require regional or local agency implementation and coordination and would not likely be applicable for individual development projects.

5. Increase transit service frequency and speed – This strategy focuses on improving transit service convenience and travel time competitiveness with driving. While the SBCTA area has fixed route rail and bus service that could be enhanced, it's also possible that new forms of low-cost demand-responsive transit service could be provided. The demand-responsive service could be provided as subsidized trips by contracting to private TNCs or Taxi companies. Alternatively, a public transit operator could provide the subsidized service but would need to improve on traditional cost effectiveness by relying on TNC ride-hailing technology, using smaller vehicles sized to demand, and flexible driver employment terms where drivers are paid by trip versus by hour. This type of service would reduce wait times for travelers and improve the typical in-vehicle travel time compared to traditional transit. Note that implementation of this strategy would require regional or local agency implementation, substantial changes to current transit practices, and would not likely be applicable for individual development projects.

6. Encourage telecommuting and alternative work schedules – This strategy relies of effective internet access and speeds to individual project sites/buildings to provide the opportunity for telecommuting. The effectiveness of the strategy depends on the ultimate building tenants and this should be a factor in considering the potential VMT reduction.

7. Provide ride-sharing programs – This strategy focuses on encouraging carpooling and vanpooling by project site/building tenants and has similar limitations as strategy 10 above.

Because of the limitations noted above, strategies 1, 2, 3, 4, and 7 are initially considered the highest priorities for individual land use project mitigation subject to review and discussion with the project team.

The VMT reduction strategies can be quantified using CACPOA calculation methodologies and recent ARB research findings. Attachment C provides calculation methodologies for each of the mitigations provided above, along with their range of effectiveness.

Summary

To help understand the full range of VMT impact mitigation and their benefits and challenges, Table 2 provides a high-level summary comparison.

Table 2 – Summary of VMT Impact Mitigation Options			
Mitigation Option	**Description**	**Benefits**	**Challenges**
No feasible action	This option recognizes that feasible mitigation is not available due to the land use or transportation context.	- Recognizes the limitations of VMT impact mitigation when alternatives to driving are not reasonably available.	Could result in more significant and unavoidable (SAU) impacts that require an EIR instead of a negative declaration.
Change project	This option would tend to focus on changing built environment characteristics of a project such as its land use density or diversity to reduce vehicle travel.	- Mitigation may not require long-term monitoring (see substantial evidence summarized in the *SB 743 Implementation TDM Strategy Assessment Technical Memorandum dated 6.11.18*). - Mitigation reduces VMT (and other vehicle travel) in immediate vicinity of the project site.	Project applicants may resist land use or other built environment changes due to financial concerns and market feasibility.
TDM	This option relies on strategies to reduce vehicle travel through incentives and disincentives often tied to the cost and convenience of vehicle travel.	- Mitigation reduces VMT (and other vehicle travel) in immediate vicinity of the project site. - Multiple mitigation strategies to choose from such that a project applicant may find co-benefits from the strategies also serving as project amenities.	- Mitigation monitoring required because effectiveness depends on building tenants, which can change over time. As a result, impacts will remain SAU. - Creates potential financial equity issues between existing and new land uses. Existing land use with TDM mitigation will have lower operating costs. - Limited reduction based on applicable or relevant strategies
Impact fee program	This option requires developing a new impact fee program with a nexus	- Provides clear expectations for	- Requires lead agency to develop stakeholder support and funding to

Table 2 – Summary of VMT Impact Mitigation Options

Mitigation Option	Description	Benefits	Challenges
	based on VMT reduction. This type of nexus would allow the fee program capital improvement program (CIP) to include transit, bicycle, pedestrian and other types of projects that can demonstrate VMT reduction effectiveness.	developers about the VMT mitigation costs. - Increases funding for VMT reduction projects such that larger and more effective projects may be implemented. - May result in greater levels of VMT reduction compared to project-by-project mitigation.	create and maintain the fee program. - Mitigation (e.g., CIP projects) may not occur in immediate vicinity of the project site where impacts of vehicle travel will be most directly felt by neighbors.
Mitigation bank/exchange	This option matches VMT generators with VMT reducers within or beyond jurisdictional boundaries through a third party.	- Could create mitigation options that may not otherwise be available or feasible. - Not limited to jurisdictional boundaries. - Could create incentive for new innovative mitigation ideas.	- Requires an entity capable of operating and maintaining the program with the ability to verify VMT reductions. - Mitigation may not occur in immediate vicinity of the project site where impacts of vehicle travel will be most directly felt by neighbors.
General plan coverage	This option would address VMT impacts through a general plan update or amendment EIR and rely on CEQA Guidelines Section 15183 for subsequent project streamlining (as summarized in the *SB 743 Implementation Thresholds Assessment Technical Memorandum dated 10.31.18*).	- Addresses VMT reduction expectations in consideration of other jurisdictional objectives. - Offers a wider range of mitigation options than at the project-scale. - For subsequent projects consistent with the general plan, additional VMT impact analysis would not be required.	- General plan updates or amendments require substantial time and funding commitments.

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ATTACHMENT A

Comparison of CAPCOA Strategies Versus New Research Since 2010

CAPCOA Category	CAPCOA #	CAPCOA Strategy	CAPCOA Reduction	Strength of Substantial Evidence for CEQA Impact Analysis?	New Information Since CAPCOA Was Published in 2010		
					New information	Change in VMT reduction compared to CAPCOA	Literature or Evidence Cited
Land Use/Location	3.1.1	LUT-1 Increase Density	0.8% - 30% VMT reduction due to increase in density	Adequate	Increasing residential density is associated with lower VMT per capita. Increased residential density in areas with high jobs access may have a greater VMT change than increases in regions with lower jobs access. The range of reductions is based on a range of elasticities from -0.04 to -0.22. The low end of the reductions represents a -0.04 elasticity of demand in response to a 10% increase in residential units or employment density and a -0.22 elasticity in response to 50% increase to residential/employment density.	0.4% -10.75%	Primary sources: Boarnet, M. and Handy, S. (2014). Impacts of Residential Density on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm Secondary source: Stevens, M. (2017). Does Compact Development Make People Drive Less? Journal of the American Planning Association, 83(1), 7-18.
Land Use/Location	3.1.9	LUT-9 Improve Design of Development	3.0% - 21.3% reduction in VMT due to increasing intersection density vs. typical ITE suburban development	Adequate	No update to CAPCOA literature; advise applying CAPCOA measure only to large developments with significant internal street structure.	Same	N/A
Land Use/Location	3.1.4	LUT-4 Increase Destination Accessibility	6.7%-20% VMT reduction due to decrease in distance to major job center or downtown	Adequate	Reduction in VMT due to increased regional accessibility (jobs gravity). Locating new development in areas with good access to destinations reduces VMT by reducing trip lengths and making walking, biking, and transit trips more feasible. Destination accessibility is measured in terms of the number of jobs (or other attractions) reachable within a given travel time, which tends to be highest at central locations and lowest at peripheral ones.	0.5%-12%	Primary sources: Handy, S. et al. (2014). Impacts of Network Connectivity on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm Handy, S. et al. (2013). Impacts of Regional Accessibility on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm Secondary source: Holtzclaw, et al. (2002.) Location Efficiency: Neighborhood and Socioeconomic Characteristics Determine Auto Ownership and Use – Studies in Chicago, Los Angeles, and Chicago. Transportation Planning and Technology, Vol. 25, pp. 1-27.

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Land Use/ Location	3.1.3	LUT-3 Increase Diversity of Urban and Suburban Developments	9%-30% VMT reduction due to mixing land uses within a single development	Adequate	1] VMT reduction due to mix of land uses within a single development. Mixing land uses within a single development can decrease VMT (and resulting GHG emissions), since building users do not need to drive to meet all of their needs. 2] Reduction in VMT due to regional change in entropy index of diversity. Providing a mix of land uses within a single neighborhood can decrease VMT (and resulting GHG emissions), since trips between land use types are shorter and may be accommodated by non-auto modes of transport. For example when residential areas are in the same neighborhood as retail and office buildings, a resident does not need to travel outside of the neighborhood to meet his/her trip needs. At the regional level, reductions in VMT are measured in response to changes in the entropy index of land use diversity.	1] 0%-12% 2] 0.3%-4%	1] Ewing, R. and Cervero, R. (2010). Travel and the Built Environment - A Meta-Analysis. Journal of the American Planning Association,76(3),265-294. Cited in California Air Pollution Control Officers Association. (2010).Quantifying Greenhouse Gas Mitigation Measures. Retrieved from: http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf Frank, L., Greenwald, M., Kavage, S. and Devlin, A. (2011). An Assessment of Urban Form and Pedestrian and Transit Improvements as an Integrated GHG Reduction Strategy. WSDOT Research Report WA-RD 765.1. Washington State Department of Transportation. Retrieved from: http://www.wsdot.wa.gov/research/reports/fullreports/765.1.pdf Nasri, A. and Zhang, L. (2012). Impact of Metropolitan-Level Built Environment on Travel Behavior. Transportation Research Record: Journal of the Transportation Research Board, 2323(1), 75-79. Sadek, A. et al. (2011). Reducing VMT through Smart Land-Use Design. New York State Energy Research and Development Authority. Retrieved from: https://www.dot.ny.gov/divisions/engineering/technical-services/trans-r-and-d-repository/C-08-29%20Final%20Report_December%202011%20%282%29.pdf Spears, S.et al. (2014). Impacts of Land-Use Mix on Passenger Vehicle Use and Greenhouse Gas Emissions- Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm 2] Zhang, Wengia et al. "Short- and Long-Term Effects of Land Use on Reducing Personal Vehicle Miles of Travel."
Land Use/ Location	3.1.5	LUT-5 Increase Transit Accessibility	0.5%-24.6% reduce in VMT due to locating a project near high-quality transit	Adequate	1) VMT reduction when transit station is provided within 1/2 mile of development (compared to VMT for sites located outside 1/2 mile radius of transit). Locating high density development within 1/2 mile of transit will facilitate the use of transit by people traveling to or from the Project site. The use of transit results in a mode shift and therefore reduced VMT. 2] Reduction in vehicle trips due to implementing TOD. A project with a residential/commercial center designed around a rail or bus station, is called a transit-oriented development (TOD). The project description should include, at a minimum, the following design features: - A transit station/stop with high-quality, high-frequency bus service located within a 5-10 minute walk (or roughly ½ mile from stop to edge of development), and/or - A rail station located within a 20 minute walk (or roughly ½ mile from station to edge of development) - Fast, frequent, and reliable transit service connecting to a high percentage of regional destinations - Neighborhood designed for walking and cycling	1) 0%-5.8% 2] 0%-7.3%	1] Lund, H. et al. (2004). Travel Characteristics of Transit-Oriented Development in California. Oakland, CA: Bay Area Rapid Transit District, Metropolitan Transportation Commission, and Caltrans. Tal, G. et al. (2013). Policy Brief on the Impacts of Transit Access (Distance to Transit) Based on a Review of the Empirical Literature. California Air Resources Board. Retrieved from: https://www.arb.ca.gov/cc/sb375/policies/transitaccess/transit_access_brief120313.pdf 2] Zamir, K. R. et al. (2014). Effects of Transit-Oriented Development on Trip Generation, Distribution, and Mode Share in Washington, D.C., and Baltimore, Maryland. Transportation Research Record: Journal of the Transportation Research Board. 2413, 45-53. DOI: 10.3141/2413-05

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Land Use/ Location	3.1.6	LUT-6 Integrate Affordable and Below Market Rate Housing	0.04%-1.20% reduction in VMT for making up to 30% of housing units BMR	Weak - Should only be used where supported by local data on affordable housing trip generation.	Observed trip generation indicates substantial local and regional variation in trip making behavior at affordable housing sites. Recommend use of ITE rates or local data for senior housing.	N/A	"Draft Memorandum: Infill and Complete Streets Study, Task 2.1: Local Trip Generation Study." *Measuring the Miles: Developing new metrics for vehicle travel in LA.* City of Los Angeles, April 19, 2017.
Neighborhood Site Enhancements	3.2.1	SDT-1 Provide Pedestrian Network Improvements	0%-2% reduction in VMT for creating a connected pedestrian network within the development and connecting to nearby destinations	Adequate	VMT reduction due to provision of complete pedestrian networks. Only applies if located in an area that may be prone to having a less robust sidewalk network.	0.5%-5.7%	Handy, S. et al. (2014). Impacts of Pedestrian Strategies on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm
Neighborhood Site Enhancements	3.2.2	SDT-2 Provide Traffic Calming Measures	0.25%-1% VMT reduction due to traffic calming on streets within and around the development	Adequate	Reduction in VMT due to expansion of bike networks in urban areas. Strategy only applies to bicycle facilities that provide a dedicated lane for bicyclists or a completely separated right-of-way for bicycles and pedestrians. Project-level definition: Enhance bicycle network citywide (or at similar scale), such that a building entrance or bicycle parking is within 200 yards walking or bicycling distance from a bicycle network that connects to at least one of the following: at least 10 diverse uses; a school or employment center, if the project total floor area is 50% or more residential; or a bus rapid transit stop, light or heavy rail station, commuter rail station, or ferry terminal. All destinations must be 3-mile bicycling distance from project site. Include educational campaigns to encourage bicycling.	0%-1.7%	Zahabi, S. et al. (2016). Exploring the link between the neighborhood typologies, bicycle infrastructure and commuting cycling over time and the potential impact on commuter GHG emissions. Transportation Research Part D: Transport and Environment. 47, 89-103.
Neighborhood Site Enhancements	3.2.3	SDT-3 Implement an NEV Network	0.5%-12.7% VMT reduction for GHG emitting vehicles, depending on level of local NEV penetration	Weak - not recommended without supplemental data	Limited evidence and highly limited applicability. Use with supplemental data only	N/A	City of Lincoln, MHM Engineers & Surveyors. Neighborhood Electric Vehicle Transportation Program Final Report, Issued 04/05/05, and City of Lincoln, A Report to the California Legislature as required by Assembly Bill 2353, Neighborhood Electric Vehicle Transportation Plan Evaluation, January 1, 2008. Cited in: California Air Pollution Control Officers Association. (2010). Quantifying Greenhouse Gas Mitigation Measures. Retrieved from: http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf

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Neighborhood Site Enhancements	3.4.9	TRT-9 Implement Car-Sharing Program	0.4% - 0.7% VMT reduction due to lower vehicle ownership rates and general shift to non driving modes	Adequate	Vehicle trip reduction due to car-sharing programs; reduction assumes 1%-5% penetration rate. Implementing car-sharing programs allows people to have on-demand access to a shared fleet of vehicles on an as-needed basis, as a supplement to trips made by non-SOV modes. Transit station-based programs focus on providing the "last-mile" solution and link transit with commuters' final destinations. Residential-based programs work to substitute entire household based trips. Employer-based programs provide a means for business/day trips for alternative mode commuters and provide a guaranteed ride home option. The reduction shown here assumes a 1%-5% penetration rate.	0.3%-1.6%	Lovejoy, K. et al. (2013). Impacts of Carsharing on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm *Need to verify with more recent UCD research*
Parking Pricing	3.3.1	PDT-1 Limit Parking Supply	5%-12.5% VMT reduction in response to reduced parking supply vs. ITE parking generation rate	Weak - not recommended. Fehr & Peers has developed new estimates for residential land use only that may be used.	CAPCOA reduction range derived from estimate of reduced vehicle ownership, not supported by observed trip or VMT reductions. Evidence is available for mode shift due to presence/absence of parking in high-transit urban areas; additional investigation ongoing	Higher	Fehr & Peers estimated a linear regression formula based on observed data from multiple locations. Resulting equation produces maximum VMT reductions for residential land use only of 30% in suburban locations and 50% in urban locationt based on parking supply percentage reductions.
Parking Pricing	3.3.2	PDT-2 Unbundle Parking Costs from Property Cost	2.6% - 13% VMT reduction due to decreased vehicle ownership rates	Adequate - conditional on the agency not requiring parking minimums and pricing/managing on-street parking (i.e., residential parking permit districts, etc.)	Reduction in VMT, primarily for residential uses, based on range of elasticities for vehicle ownership in response to increased residential parking fees. Does not account for self-selection. Only applies if the city does not require parking minimums and if on-street parking is priced and managed (i.e., residential parking permit districts)	2%-12%	Victoria Transport Policy Institute (2009). Parking Requirement Impacts on Housing Affordability. Retrieved March 2010 from: http://www.vtpi.org/park-hou.pdf

TDM STRATEGY EVALUATION - DRAFT V 1.0

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Parking Pricing	3.3.3	PDT-3 Implement Market Price Public Parking	2.8%-5.5% VMT reduction due to "park once" behavior and disincentive to driving	Adequate	Implement a pricing strategy for parking by pricing all central business district/employment center/retail center on-street parking. It will be priced to encourage park once" behavior. The benefit of this measure above that of paid parking at the project only is that it deters parking spillover from project supplied parking to other public parking nearby, which undermine the vehicle miles traveled (VMT) benefits of project pricing. It may also generate sufficient area-wide mode shifts to justify increased transit service to the area. VMT reduction applies to VMT from visitor/customer trips only. Reductions higher than top end of range from CAPCOA report apply only in conditions with highly constrained on-street parking supply and lack of comparably-priced off-street parking.	2.8%-14.5%	Clinch, J.P. and Kelly, J.A. (2003). Temporal Variance Of Revealed Preference On-Street Parking Price Elasticity. Dublin: Department of Environmental Studies, University College Dublin. Retrieved from: http://www.ucd.ie/gpep/research/workingpapers/2004/04-02.pdf. Cited in Victoria Transport Policy Institute (2017). Transportation Elasticities: How Prices and Other Factors Affect Travel Behavior. Retrieved from: http://www.vtpi.org/tdm/tdm11.htm Hensher, D. and King, J. (2001). Parking Demand and Responsiveness to Supply, Price and Location in Sydney Central Business District. Transportation Research A. 35(3), 177-196. Millard-Ball, A. et al. (2013). Is the curb 80% full or 20% empty? Assessing the impacts of San Francisco's parking pricing experiment. Transportation Research Part A. 63(2014), 76-92. Shoup, D. (2011). The High Cost of Free Parking. APA Planners Press. p. 290. Cited in Pierce, G. and Shoup, D. (2013). Getting the Prices Right. Journal of the American Planning Association. 79(1), 67-81.
Transit System	3.5.3	TST-3 Expand Transit Network	0.1-8.2% VMT reduction in response to increase in transit network coverage	Adequate	Reduction in vehicle trips due to increased transit service hours or coverage. Low end of reduction is typical of project-level implementation (payment of impact fees and/or localized improvements).	0.1%-10.5%	Handy, S. et al. (2013). Impacts of Transit Service Strategies on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm
Transit System	3.5.4	TST-4 Increase Transit Service Frequency/Speed	0.02%-2.5% VMT reduction due to reduced headways and increased speed and reliability	Adequate	Reduction in vehicle trips due to increased transit frequency/decreased headway. Low end of reduction is typical of project-level implementation (payment of impact fees and/or localized improvements).	0.3%-6.3%	Handy, S. et al. (2013). Impacts of Transit Service Strategies on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm
Transit System	3.5.1	TST-1 Provide a Bus Rapid Transit System	0.02%-3.2% VMT reduction by converting standard bus system to BRT system	Adequate	No new information identified.	Same	N/A
Commute Trip Reduction	3.4.1	TRT-1 Implement CTR Program - Voluntary	1.0%-6.2% commute VMT reduction due to employer-based mode shift program	Adequate - Effectiveness is building/tenant specific. Do not use with "TRT-2 Implement CTR Program - Required Implementation/Monitoring" or with CAPCOA strategies TRT-3.4.3 through TRT-3.4.9.	Reduction in vehicle trips in response to employer-led TDM programs. The CTR program should include all of the following to apply the effectiveness reported by the literature: - Carpooling encouragement - Ride-matching assistance - Preferential carpool parking - Flexible work schedules for carpools - Half time transportation coordinator - Vanpool assistance - Bicycle end-trip facilities (parking, showers and lockers)	1.0%-6.0%	Boarnet, M. et al. (2014). Impacts of Employer-Based Trip Reduction Programs and Vanpools on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from https://arb.ca.gov/cc/sb375/policies/policies.htm
Commute Trip Reduction	3.4.2	TRT-2 Implement CTR Program - Required Implementation/Monitoring	4.2%-21.0% commute VMT reduction due to employer-based mode shift program with required monitoring and reporting	Adequate - Effectiveness is building/tenant specific. Do not use with "TRT-1 Implement CTR Program - Voluntary" or with CAPCOA strategies TRT-3.4.3 through TRT-3.4.9	Limited evidence available. Anecdotal evidence shows high investment produces high VMT/vehicle trip reductions at employment sites with monitoring requirements and specific targets.	Same	Nelson/Nygaard (2008). South San Francisco Mode Share and Parking Report for Genentech, Inc (p. 8). Cited in: California Air Pollution Control Officers Association. (2010). Quantifying Greenhouse Gas Mitigation Measures. Retrieved from: http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf

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Commute Trip Reduction	3.4.4	TRT-4 Implement Subsidized or Discounted Transit Program	0.3%-20% commute VMT reduction due to transit subsidy of up to $6/day	Adequate - Effectiveness is building/tenant specific. Do not use with "TRT-1 Implement CTR Program - Voluntary" or "TRT-2 Implement CTR Program - Required Implementation/Monitoring."	1) Reduction in vehicle trips in response to reduced cost of transit use, assuming that 10-50% of new bus trips replace vehicle trips. 2) Reduction in commute trip VMT due to employee benefits that include transit. 3) Reduction in all vehicle trips due to reduced transit fares system-wide, assuming 25% of new transit trips would have been vehicle trips.	1) 0.3%-14% 2) 0-16% 3) 0.1% to 6.9%	1) Victoria Transport Policy Institute. (2017). Understanding Transport Demands and Elasticities. Online TDM Encyclopedia. Retrieved from: http://www.vtpi.org/tdm/tdm11.htm 2) Carolina, P. et al. (2016). Do Employee Commuter Benefits Increase Transit Ridership? Evidence rom the NY-NJ Region. Washington, DC: Transportation Research Board. 96th Annual Meeting 3) Handy, S. et al. (2013). Impacts of Transit Service Strategies on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm
Commute Trip Reduction	3.4.15	TRT-15 Employee Parking Cash-Out	0.6%-7.7% commute VMT reduction due to implementing employee parking cash-out	Weak - Effectiveness is building/tenant specific. Research data is over 10 years old (1997).	Shoup case studies indicate a reduction in commute vehicle trips due to implementing cash-out without implementing other trip-reduction strategies.	3%-7.7%	Shoup, D. (1997). Evaluating the Effects of Cashing Out Employer-Paid Parking: Eight Case Studies. Transport Policy. California Air Resources Board. Retrieved from: https://www.arb.ca.gov/research/apr/past/93-308a.pdf. This citation was listed as an alternative literature in CAPCOA.
Commute Trip Reduction	3.4.14	TRT-14 Price Workplace Parking	0.1%-19.7% commute VMT reduction due to mode shift	Adequate - Effectiveness is building/tenant specific.	Reduction in commute vehicle trips due to priced workplace parking, effectiveness depends on availability of alternative modes. Workplace parking pricing may include explicitly charging for parking, implementing above market rate pricing, validating parking only for invited guests, not providing employee parking and transportation allowances, and educating employees about available alternatives.	0.5%-14%	Primary sources: Concas, S. and Nayak, N. (2012). A Meta-Analysis of Parking Price Elasticity. Washington, DC: Transportation Research Board. 2012 Annual Meeting. Dale, S. et al. (2016). Evaluating the Impact of a Workplace Parking Levy on Local Traffic Congestion: The Case of Nottingham UK. Washington, DC: Transportation Research Board. 96th Annual Meeting Secondary sources: Victoria Transport Policy Institute. (2017). Understanding Transport Demands and Elasticities. Online TDM Encyclopedia. Retrieved from: http://www.vtpi.org/tdm/tdm11.htm Spears, S. et al. (2014). Impacts of Parking Pricing on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm
Commute Trip Reduction	3.4.6	TRT-6 Encourage Telecommuting and Alternative Work Schedules	0.07%-5.5% commute VMT reduction due to reduced commute trips	Adequate - Effectiveness is building/tenant specific. Do not use with "TRT-1 Implement CTR Program - Voluntary" or "TRT-2 Implement CTR Program - Required Implementation/Monitoring."	VMT reduction due to adoption of telecommuting. Alternative work schedules could take the form of staggered starting times, flexible schedules, or compressed work weeks.	0.2%-4.5%	Handy, S. et al. (2013). Policy Brief on the Impacts of Telecommuting Based on a Review of the Empirical Literature. California Air Resources Board. Retrieved from: https://www.arb.ca.gov/cc/sb375/policies/telecommuting/telecommuting_brief120313.pdf
Commute Trip Reduction	3.4.7	1) TRT-7 Implement CTR Marketing 2) Launch Targeted Behavioral Interventions	0.8%-4.0% commute VMT reduction due to employer marketing of alternatives	Adequate - Effectiveness is building/tenant specific. Do not use with "TRT-1 Implement CTR Program - Voluntary" or "TRT-2 Implement CTR Program - Required Implementation/Monitoring."	1) Vehicle trips reduction due to CTR marketing; 2) Reduction in VMT from institutional trips due to targeted behavioral intervention programs	1) 0.9% to 26% 2) 1%-6%	1) Pratt, Dick. Personal communication regarding the Draft of TCRP 95 Traveler Response to Transportation System Changes – Chapter 19 Employer and Institutional TDM Strategies. Transit Cooperative Research Program. Cited in California Air Pollution Control Officers Association. (2010) Quantifying Greenhouse Gas Mitigation Measures. Retrieved from: http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf Dill, J. and Mohr, C. (2010). Long-Term Evaluation of Individualized Marketing Programs for Travel Demand Management. Portland, OR: Transportation Research and Education Center (TREC). Retrieved from: http://pdxscholar.library.pdx.edu/usp_fac 2) Brown, A. and Ralph, K. (2017.) "The Right Time and Place to Change Travel Behavior: An Experimental Study." Washington, DC: Transportation Research Board, 2017 Annual Meeting. Retrieved from: https://trid.trb.org/view.aspx?id=1437253

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Commute Trip Reduction	3.4.11	TRT-11 Provide Employer-Sponsored Vanpool/Shuttle	0.3%-13.4% commute VMT reduction due to employer-sponsored vanpool and/or shuttle service	Adequate - Effectiveness is building/tenant specific	1) Reduction in commute vehicle trips due to implementing employer sponsored vanpool and shuttle programs; 2) Reduction in commute vehicle trips due to vanpool incentive programs; 3) Reduction in commute vehicle trips due to employer shuttle programs	1) 0.5%-5.0% 2) 0.3%-7.4% 3) 1.4%-6.8%	1) Concas, Sisinnio, Winters, Philip, Wambalaba, Francis. (2005). Fare Pricing Elasticity, Subsidies, and Demand for Vanpool Services. Transportation Research Record: Journal of the Transportation Research Board, 1924, pp 215-223. 2) Victoria Transport Policy Institute. (2015). Ridesharing: Carpooling and Vanpooling. Online TDM Encyclopedia. Retrieved from: http://vtpi.org/tdm/tdm34.htm 3) ICF. (2014). GHG Impacts for Commuter Shuttles Pilot Program.
Commute Trip Reduction	3.4.3	TRT-3 Provide Ride-Sharing Programs	1%-15% commute VMT reduction due to employer ride share coordination and facilities	Adequate - Effectiveness is building/tenant specific. Do not use with "TRT-1 Implement CTR Program - Voluntary" or "TRT-2 Implement CTR Program - Required Implementation/Monitoring."	Commute vehicle trips reduction due to employer ride-sharing programs. Promote ride-sharing programs through a multi-faceted approach such as: - Designating a certain percentage of parking spaces for ride sharing vehicles - Designating adequate passenger loading and unloading and waiting areas for ride-sharing vehicles - Providing an app or website for coordinating rides	2.5%-8.3%	Victoria Transport Policy Institute. (2015). Ridesharing: Carpooling and Vanpooling. Online TDM Encyclopedia. Retrieved from: http://vtpi.org/tdm/tdm34.htm
Commute Trip Reduction	3.4.10	TRT-10 Implement a School Pool Program	7.2%-15.8% reduction in school VMT due to school pool implementation	Adequate - School VMT only	Limited new evidence available, not conclusive	Same	Transportation Demand Management Institute of the Association for Commuter Transportation. TDM Case Studies and Commuter Testimonials. Prepared for the US EPA. 1997. (p. 10, 36-38) WayToGo 2015 Annual Report. Accessed on March 12, 2017 from http://www.waytogo.org/sites/default/files/attachments/waytogo-annual-report-2015.pdf
Commute Trip Reduction	3.4.13	TRT-13 Implement School Bus Program	38%-63% reduction in school VMT due to school bus service implementation	Adequate - School VMT only	VMT reduction for school trips based on data beyond a single school district. School district boundaries are also a factor to consider. VMT reduction does not appear to be a factor that was considered in a select review of CA boundaries. VMT reductions apply to school trip VMT only	5%-30%	Wilson, E., et al. (2007). The implications of school choice on travel behavior and environmental emissions. Transportation Research Part D: Transport and Environment 12(2007), 506-518.
Not Applicable - not a CAPCOA strategy	Not Applicable - not a CAPCOA strategy	Not Applicable - not a CAPCOA strategy	Not Applicable - not a CAPCOA strategy	Not Applicable - not a CAPCOA strategy	Bikeshare car trip substitution rate of 7-19% based on data from Washington DC and Minneapolis/St. Paul. Annual VMT reduction of 151,000 and 57,000, respectively. Includes VMT for rebalancing and maintenance. VMT reduction of 0.023 miles per day per bikeshare member estimated for Bay Area bikeshare, utilizing Minneapolis/St. Paul data from study above.	57,000-151,000 annual VMT reduction, based on two large US cities. VMT reduction of 0.023 miles per day per member, based on one large US city estimate.	Fishman, E., Washington, S., & Haworth, N. (2014). Bike share's impact on car use: Evidence from the United States, Great Britain, and Australia. Transportation Research Part D: Transport and Environment, 31, 13-20. TDM Methodology: Impact of Carsharing Membership, Transit Passes, Bikesharing Membership, Unbundled Parking, and Parking Supply Reductions on Driving. Center for Neighborhood Technology, Peter Haas and Cindy Copp, with TransForm staff, May 5, 2016.

FEHR PEERS

ATTACHMENT B

Relevant Strategies for Implementation in SBCTA Jurisdictions Due to Land Use Context

CAPCOA Category	CAPCOA #	CAPCOA Strategy	CAPCOA Reduction	Strength of Substantial Evidence for CEQA Impact Analysis?	New Information Since CAPCOA Was Published in 2010		
					New information	Change in VMT reduction compared to CAPCOA(1)	Literature or Evidence Cited
Land Use/ Location	3.1.3	LUT-3 Increase Diversity of Urban and Suburban Developments	9%-30% VMT reduction due to mixing land uses within a single development	Adequate	1) VMT reduction due to mix of land uses within a single development; 2) Reduction in VMT due to regional change in entropy index of diversity.	1) 0%-12% 2) 0.3%-4%	1) Ewing, R. and Cervero, R. (2010). Travel and the Built Environment - A Meta-Analysis. Journal of the American Planning Association,76(3),265-294. Cited in California Air Pollution Control Officers Association. (2010).Quantifying Greenhouse Gas Mitigation Measures. Retrieved from: http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf Frank, L., Greenwald, M., Kavage, S. and Devlin, A. (2011). An Assessment of Urban Form and Pedestrian and Transit Improvements as an Integrated GHG Reduction Strategy. WSDOT Research Report WA-RD 765.1. Washington State Department of Transportation. Retrieved from: http://www.wsdot.wa.gov/research/reports/fullreports/765.1.pdf Nasri, A. and Zhang, L. (2012). Impact of Metropolitan-Level Built Environment on Travel Behavior. Transportation Research Record: Journal of the Transportation Research Board, 2323(1), 75-79. Sadek, A. et al. (2011). Reducing VMT through Smart Land-Use Design. New York State Energy Research and Development Authority. Retrieved from: https://www.dot.ny.gov/divisions/engineering/technical-services/trans-r-and-d-repository/C-08-29%20Final%20Report_December%202011%20%282%29.pdf Spears, S.et al. (2014). Impacts of Land-Use Mix on Passenger Vehicle Use and Greenhouse Gas Emissions- Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm 2) Zhang, Wengia et al. "Short- and Long-Term Effects of Land Use on Reducing Personal Vehicle Miles of Travel."
Neighborhood Site Enhancements	3.2.1	SDT-1 Provide Pedestrian Network Improvements	0%-2% reduction in VMT for creating a connected pedestrian network within the development and connecting to nearby destinations	Adequate	VMT reduction due to provision of complete pedestrian networks.	0.5%-5.7%	Handy, S. et al. (2014). Impacts of Pedestrian Strategies on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm
Neighborhood Site Enhancements	3.2.2	SDT-2 Provide Traffic Calming Measures	0.25%-1% VMT reduction due to traffic calming on streets within and around the development	Adequate	Reduction in VMT due to building out a low-stress bike network, reduction in VMT due to expansion of bike networks in urban areas.	0%-1.7%	1) California Air Resources Board. (2016). Greenhouse Gas Quantification Methodology for the California Transportation Commission Active Transportation Program Greenhouse Gas Reduction Fund Fiscal Year 2016-17. Retrieved from https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/ctc_atp_finalqm_16-17.pdf. 2) Zahabi, S. et al. (2016). Exploring the link between the neighborhood typologies, bicycle infrastructure and commuting cycling over time and the potential impact on commuter GHG emissions. Transportation Research Part D: Transport and Environment, 47, 89-103.
Neighborhood Site Enhancements	3.4.9	TRT-9 Implement Car Sharing Program	0.4% - 0.7% VMT reduction due to lower vehicle ownership rates and general shift to non-driving modes	Adequate	Vehicle trip reduction due to car-sharing programs; reduction assumes 1%-5% penetration rate. Car sharing effect on VMT is still evolving due to TNC effects. UCD research showed less effect on car ownership due to car sharing participation and an uncertain effect on VMT.	0.3%-1.6%	Lovejoy, K. et al. (2013). Impacts of Carsharing on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm Clewlow, Regina R. and Mishra, Gouri Shankar. (2017). Disruptive Transportation: The Adoption, Utilization, and Impacts of Ride-Hailing in the United States. UC Davis: Institute of Transportation Studies. Research Report - UCD-ITS-RR-17-07.
Transit System	3.5.4	TST-4 Increase Transit Service Frequency/Speed	0.02%-2.5% VMT reduction due to reduced headways and increased speed and reliability	Adequate	Reduction in vehicle trips due to increased transit frequency/decreased headway.	0.3%-6.3%	Handy, S. et al. (2013). Impacts of Transit Service Strategies on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm

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Relevant Strategies for Implementation in SBCTA Jurisdictions Due to Land Use Context

					New Information Since CAPCOA Was Published in 2010		
CAPCOA Category	CAPCOA #	CAPCOA Strategy	CAPCOA Reduction	Strength of Substantial Evidence for CEQA Impact Analysis?	New information	Change in VMT reduction compared to CAPCOA(1)	Literature or Evidence Cited
Commute Trip Reduction	3.4.6	TRT-6 Encourage Telecommuting and Alternative Work Schedules	0.07%-5.5% commute VMT reduction due to reduced commute trips	Adequate - Effectiveness is building/tenant specific. Do not use with "TRT-1 Implement CTR Program - Voluntary" or "TRT-2 Implement CTR Program - Required Implementation/Monitoring."	VMT reduction due to adoption of telecommuting	0.2%-4.5%	Handy, S. et al. (2013). Policy Brief on the Impacts of Telecommuting Based on a Review of the Empirical Literature. California Air Resources Board. Retrieved from: https://www.arb.ca.gov/cc/sb375/policies/telecommuting/telecommuting_brief120313.pdf
Commute Trip Reduction	3.4.3	TRT-3 Provide Ride-Sharing Programs	1%-15% commute VMT reduction due to employer ride share coordination and facilities	Adequate - Effectiveness is building/tenant specific. Do not use with "TRT-1 Implement CTR Program - Voluntary" or "TRT-2 Implement CTR Program - Required Implementation/Monitoring."	Commute vehicle trips reduction due to employer ride sharing programs	2.5%-8.3%	Victoria Transport Policy Institute. (2015). Ridesharing: Carpooling and Vanpooling. Online TDM Encyclopedia. Retrieved from: http://vtpi.org/tdm/tdm34.htm

NOTES:

(1) For specific VMT reduction ranges, refer to the cited literature.

ATTACHMENT 'D'

translutions
the transportation solutions company

memorandum

DATE: May 21, 2020

TO: Brian Gengler, P.E., T.E., City Engineer

FROM: Sandipan Bhattacharjee, P.E., T.E., AICP, ENV-SP

SUBJECT: Screening Criteria for Vehicle Miles Traveled

Translutions, Inc. (Translutions) is pleased to provide this memorandum discussing the background of Senate Bill 743 (SB-743) which will change transportation impacts under the California Environmental Quality Act (CEQA).

BACKGROUND

Senate Bill 743 (Steinberg, 2013), which was codified in Public Resources Code section 21099, required changes to the guidelines for implementing CEQA (CEQA Guidelines) (Cal. Code Regs., Title 14, Div. 6, Ch. 3, § 15000 et seq.) regarding the analysis of transportation impacts. As one appellate court recently explained: "During the last 10 years, the Legislature has charted a course of long-term sustainability based on denser infill development, reduced reliance on individual vehicles and improved mass transit, all with the goal of reducing greenhouse gas emissions. Section 21099 is part of that strategy . . . ." (Covina Residents for Responsible Development v. City of Covina (2018) 21 Cal.App.5th 712, 729.) ***Pursuant to Section 21099, the criteria for determining the significance of transportation impacts must "promote the reduction of greenhouse gas emissions***, the development of multimodal transportation networks, and a diversity of land uses." (Id., subd. (b)(1); see generally, adopted CEQA Guidelines, § 15064.3, subd. (b) [Criteria for Analyzing Transportation Impacts].) To that end, in developing the criteria, OPR has proposed, and the California Natural Resources Agency (Agency) has certified and adopted, changes to the CEQA Guidelines that identify vehicle miles traveled (VMT) as the most appropriate metric to evaluate a project's transportation impacts. With the California Natural Resources Agency's certification and adoption of the changes to the CEQA Guidelines, automobile delay, as measured by "level of service" and other similar metrics, generally no longer constitutes a significant environmental effect under CEQA. (Pub. Resources Code, § 21099, subd. (b)(3).)

It should be noted that SB 743 (the legislation) does not specify any screening thresholds or impact criteria for transportation impacts using VMT. In fact, the legislation does not even specify VMT as the metric – but directs the OPR to identify the appropriate metric. The OPR evaluated several metrics including VMT, Automobile Trips Generated, Multimodal LOS, Fuel Use, and Motor Vehicle Hours Traveled, and ultimately settled on VMT. SB 743 includes legislative intent to help guide the development of the new criteria for transportation impacts to align with Green House Gas (GHG) reduction. For example, Section 1 of the legislation states: *"New methodologies under the California Environmental Quality Act are needed for evaluating transportation impacts that are better able to promote* ***the state's goals of reducing greenhouse gas emissions and traffic-related air pollution****, promoting the development of a multimodal transportation system, and providing clean, efficient access to destinations."* Further, subdivision (b) of the new Section 21099 requires that the new criteria *"promote the* ***reduction of greenhouse gas emissions****, the development of multimodal transportation networks, and a diversity of land uses."*

OPR'S TECHNICAL ADVISORY

To assist in the process, the OPR released several technical advisories. The technical advisory states that *"...(it) is one in a series of advisories provided by the Governor's Office of Planning and Research (OPR) as a service to professional*

planners, land use officials, and CEQA practitioners. OPR issues technical assistance on issues that broadly affect the practice of land use planning and the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.). (Gov. Code, § 65040, subds. (g), (l), (m).) ***The purpose of this document is to provide advice and recommendations, which agencies and other entities may use at their discretion. This document does not alter lead agency discretion in preparing environmental documents subject to CEQA. This document should not be construed as legal advice.*** *"*
Therefore, the OPR agrees and recommends that lead agencies choose and implement their thresholds.

SCREENING THRESHOLDS RECOMMENDED BY OPR

Many agencies use "screening thresholds" to quickly identify when a project should be expected to cause a less-than-significant impact without conducting a detailed study. (See e.g., CEQA Guidelines, §§ 15063(c)(3)(C), 15128, and Appendix G.) As explained below, this technical advisory suggests that lead agencies may screen out VMT impacts using project size, maps, transit availability, and provision of affordable housing. The Technical Advisory recommends the following thresholds:

> **Screening Threshold for Small Projects.** Many local agencies have developed screening thresholds to indicate when detailed analysis is needed. Absent substantial evidence indicating that a project would generate a potentially significant level of VMT, or inconsistency with a Sustainable Communities Strategy (SCS) or general plan, *projects that generate or attract fewer than 110 trips per day generally may be assumed to cause a less-than significant transportation impact.*
>
> **Analysis.** To set this 110-trip threshold, the OPR uses a CEQA exemption for additions to existing structures of up to 10,000 square feet. The Technical Advisory states, "*CEQA provides a categorical exemption for existing facilities, including additions to existing structures of up to 10,000 square feet, so long as the project is in an area where public infrastructure is available to allow for maximum planned development and the project is not in an environmentally sensitive area. (CEQA Guidelines, § 15301, subd. (e)(2).) Typical project types for which trip generation increases relatively linearly with building footprint (i.e., general office building, single tenant office building, office park, and business park) generate or attract an additional 110-124 trips per 10,000 square feet. Therefore, absent substantial evidence otherwise, it is reasonable to conclude that the addition of 110 or fewer trips could be considered not to lead to a significant impact*". It should be noted that many land uses generate significantly higher trips than the 110 daily-trip threshold. For example, a 10,000 square foot Drive-In Bank generates 1,000 daily trips. Similarly, a 10,000 square foot drugstore with drive through window would generate 1,092 daily trips, and a USPS would generate 1,039 trips. **Therefore, there are many land-uses where the 10,000 square foot exemption would result in substantially higher trips than the 110-trip threshold used by the OPR.**
>
> **Recommendation.** Based on the intent and stated goals of SB-743, the City has evaluated land uses in the City from a GHG emissions perspective. In San Bernardino County, there are two Air Quality Management Districts – the Mojave Desert AQMD (MDAQMD) and the South Coast AQMD (SCAQMD). The MDAQMD uses a threshold of 100,000 Metric Tons (MT) of CO2 Equivalents (CO2e) per year as a threshold to identify significant impacts[1]. The SCAQMD in its *Interim CEQA GHG Significance Threshold for Stationary Sources, Rules and Plans*[2] recommends a screening threshold of 3,000 MT of CO2e per year for residential and commercial sectors and 10,000 MT of CO2e per year for industrial projects.

[1] *MDAQMD California Environmental Quality Act (CEQA) And Federal Conformity Guidelines (http://www.mdaqmd.ca.gov/home/showdocument?id=538)*
[2] *http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/ghgboardsynopsis.pdf?sfvrsn=2*

Understanding that although the City is in the MDAQMD area, the SCAQMD's recommendations are the most stringent in San Bernardino County. Therefore, various land uses were evaluated using City specific average trip lengths by trip purpose from the San Bernardino Transportation Analysis Model (SBTAM) and evaluated in the context of the SCAQMD threshold of 3,000 MT of CO2e per annum. Table A summarizes the findings of the evaluation. The GHG emissions were calculated based on 100 units (DU or 1,000 square feet). The resulting emissions were compared to the SCAQMD threshold of 3,000 MT CO2e/year and the number of units to trigger the threshold was calculated.

Table A – Greenhouse Gas and Trip Generation Thresholds

	Calculations Using 100 Units						Less Than Significant (3,000 MT of CO2e)	
Land Use	**#**	**Units**	**CO2e (MT)**	**Mobile CO2e**	**Weekday Trip Generation Rate**	**Weekday Trips**	Units	Trips
Single Family Residential	100	DU	2,204	1,551	9.44	944	136	1,285
Multi Family (Low Rise) Residential	100	DU	1,621	1,212	7.32	732	185	1,355
Office	100	TSF	1,321	828	9.74	974	227	2,212
Retail	100	TSF	2,463	1,902	37.75	3,775	122	4,598
Warehouse No Refrigeration, No Rail	100	TSF	362	105	1.74	174	829	1,442
Light Industrial	100	TSF	1,015	347	4.96	496	296	1,466

As seen from the above table, the following unit counts are anticipated to have less than significant impacts –

- Single Family Residential – 136 Dwelling Units
- Multi-Family (Low Rise) Residential – 136 Dwelling Units
- Office – 227,000 square feet
- Retail – 122,000 square feet
- Warehousing – 829,000 square feet
- Light Industrial – 296,000 square feet

For land uses not included in the table above, the most restrictive daily trip threshold (1,285 trips) from the table above could be used at the City Engineers' discretion.

PUBLIC COMMENTS

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SUBJECT: PUBLIC COMMENTS ON PLANNING MATTERS

In compliance with the Brown Act, it is necessary for the Planning Commission to make available time for members of the public to address the Planning Commission on items of interest that fall within the Planning Commission's subject matter jurisdiction.

Please limit the length of your comments to 3 minutes.

SW:ko

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REPORTS
BY COMMISSION
MEMBERS & STAFF

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MEMORANDUM

SUBJECT: PRESENTATION OF REPORTS BY COMMISSION MEMBERS

An opportunity is provided for Planning Commissioners to present items of interest at this time.

SW:ko

TRAFFIC IMPACT ANALYSIS

Michael Baker INTERNATIONAL

TRAFFIC IMPACT ANALYSIS

Southern California Logistics Airport Specific Plan

Prepared for: Stirling Development
27422 Portola Parkway, Suite 300
Foothill Ranch, CA 92610

April 23, 2020

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TABLE OF CONTENTS

LIST OF EXHIBITS

LIST OF TABLES

APPENDICES

1 EXECUTIVE SUMMARY

This study analyzes the forecast traffic conditions associated with the proposed development of the Southern California Logistics Airport Specific Plan (SCLA SP) area in the City of Victorville. The project is situated on the previous George Air Force Base site located north of SR-18 (Palmdale Road), east of US-395, and west of I-15. The proposed SCLA Specific Plan is projected to be built out by Year 2038.

This study evaluates traffic conditions that include AM and PM peak hour intersection level of service analysis, and applicable signal warrant analysis for the following scenarios:

- Existing;
- Existing With Project Buildout;
- Forecast Year 2040 Without HDC Without Project;
- Forecast Year 2040 Without HDC With Project;
- Forecast Year 2040 With HDC Without Project;
- Forecast Year 2040 With HDC With Project

The proposed project is forecast to generate approximately 98,752 net new Passenger Car Equivalent (PCE) daily trips which includes approximately 12,736 net new AM peak hour PCE trips and approximately 13,354 net new PM peak hour PCE trips.

Level of Service Analysis Results

The results of the Existing analysis show that all intersections are forecast to operate at acceptable levels of service (LOS D or better) with the exception of the following locations:

Existing Conditions			
Intersection		AM Peak Hour	PM Peak Hour
5 -	US-395/Adelanto Road	LOS F	LOS F
13 -	Nevada Ave/Air Expressway	LOS F	Acceptable
15 -	Phantom East/Air Expressway	LOS E	Acceptable
20 -	I-15 SB Ramps/Palmdale Road	Acceptable	LOS E
21 -	I-15 NB Ramps/Palmdale Road	Acceptable	LOS F

The results of the intersection analysis under Existing With Project Buildout analysis show 11 of the 34 intersections studied are forecast to operate at an acceptable level of service (LOS D or better) and 23 intersections operate at a deficient level of service (LOS E or worse) during the AM peak hour. During the PM peak hour, 5 intersections operate an acceptable level of service and 29 intersections operate at a deficient level of service. Of these locations that are operating deficiently, 27 of the 34 locations are forecast to result in a significant impact according to the City of Victorville significance criteria.

The mitigation measures shown in **Table ES-1** have been identified to achieve an acceptable level of service where possible and fully mitigate project forecast significant impacts at the study intersections for Existing With Project Buildout conditions. With the implementation of the identified mitigation measures however, the following 12 locations would continue to operate at a deficient level of service with the project and the project would result in unavoidable significant impacts:

Existing With Project Conditions			
Intersection		AM Peak Hour	PM Peak Hour
3 -	US-395 / Air Expressway	LOS F	LOS F
4 -	US-395 / Rancho Road	LOS F	LOS F
5 -	US-395 / Adelanto Road	Acceptable	LOS F
6 -	US-395 / Palmdale Road	LOS F	LOS F
9 -	Adelanto Road / Air Expressway	LOS E	Acceptable
11 -	Gateway Drive / Air Expressway	Acceptable	LOS F
12 -	Phantom West / Air Expressway	LOS F	Acceptable
13 -	Nevada Avenue / Air Expressway	LOS F	Acceptable
15 -	Phantom East / Air Expressway	Acceptable	LOS F
18 -	I-15 SB Ramps / National Trails Hwy	LOS F	Acceptable
19 -	I-15 NB Ramps / National Trails Hwy	LOS F	Acceptable
41 -	Perimeter Road / Phantom East	Acceptable	LOS F

The results of the intersection analysis under Forecast Year 2040 Without HDC Without Project conditions show that all study intersections are forecast to operate at acceptable levels of service (LOS D or better) with the exception of the following intersections:

Forecast Year 2040 Without HDC Without Project Conditions			
Intersection		AM Peak Hour	PM Peak Hour
5 -	US-395 / Adelanto Road	LOS F	LOS F
6 -	US-395 / Palmdale Road	LOS E	LOS F
15 -	Phantom East / Air Expressway	LOS F	LOS E
17 -	National Trails Hwy / Air Expressway	LOS F	Acceptable
18 -	I-15 SB Ramps / National Trails Hwy	Acceptable	LOS E

The results of the intersection analysis under Forecast Year 2040 Without HDC With Project analysis show that 18 of the 37 intersections studied are forecast to operate at an acceptable level of service (LOS D or better) and 19 intersections operate at a deficient level of service (LOS E or worse) during the AM peak hour. During the PM peak hour, 15 intersections operate at an acceptable level of service and 22 intersections operate at a deficient level of service. Of these locations that are operating deficiently, 22 of the 37 locations are forecast to result in a significant impact according to the City of Victorville significance criteria.

The mitigation measures shown in **Table ES-2** have been identified to achieve an acceptable level of service where possible and fully mitigate project forecast significant impacts at the study intersections for Forecast Year 2040 Without HDC With Project Buildout conditions. With the implementation of the identified mitigation measures however, the following 9 locations would continue to operate at a deficient level of service with the project and the project would result in unavoidable significant impacts:

Forecast Year 2040 Without HDC With Project With Improvements Conditions		
Intersection	**AM Peak Hour**	**PM Peak Hour**
3 - US-395 / Air Expressway	Acceptable	LOS F
4 - US-395 / Rancho Road	LOS F	LOS F
5 - US-395 / Adelanto Road	Acceptable	LOS E
6 - US-395 / Palmdale Road	LOS F	LOS F
11 - Gateway Drive / Air Expressway	Acceptable	LOS E
12 - Phantom West / Air Expressway	LOS E	LOS E
13 - Nevada Avenue / Air Expressway	LOS E	Acceptable
15 - Phantom East / Air Expressway	LOS F	LOS E
26 - Phantom East / Palmdale Road	Acceptable	LOS F

A future Caltrans freeway facility, the "High Desert Corridor" (HDC), is proposed to be constructed within the project study area. Additionally, the need for a major north/south freeway facility has been identified in the form of the US-395 Freeway. These facilities would provide critical regional access for the entire Victor Valley and is integral to the proposed development of the SCLA Specific Plan area. This study takes the proposed HDC and US-395 freeways into consideration as likely future circulation system enhancements and assumes they are fully constructed by the Forecast Year 2040.

The results of the intersection analysis under Forecast Year 2040 With HDC Without Project conditions show that all study intersections are forecast to operate at acceptable levels of service (LOS D or better) with the exception of the following intersections:

Forecast Year 2040 With HDC Without Project Conditions		
Intersection	**AM Peak Hour**	**PM Peak Hour**
5 - US-395 / Adelanto Rad	LOS F	LOS F
6 - US-395 / Palmdale Road	Acceptable	LOS E
31 - Phantom West / HDC WB Ramps	LOS F	LOS E

The results of the intersection analysis under Forecast Year 2040 With HDC With Project analysis show that 26 of the 42 intersections studied are forecast to operate at an acceptable level of service (LOS D or better) and 16 intersections operate at a deficient level of service (LOS E or worse) during the AM peak hour. During the PM peak hour, 26 intersections operate at an acceptable level of service and 16 intersections operate at a deficient level of service. Of these locations that are operating deficiently, 18 of the 42 locations are forecast to result in a significant impact according to the City of Victorville significance criteria.

The mitigation measures shown in **Table ES-3** have been identified to achieve an acceptable level of service where possible and fully mitigate project forecast significant impacts at the study intersections for Forecast Year 2040 With HDC With Project Buildout conditions. With the implementation of the identified mitigation measures however, the following one intersection would continue to operate at a deficient level of service with the project and the project would result in unavoidable significant impacts:

Forecast Year 2040 With HDC With Project With Improvements Conditions		
Intersection	**AM Peak Hour**	**PM Peak Hour**
6 - US-395 / Air Expressway	LOS F	LOS F

It is anticipated that SCLA Specific Plan TDM measures will be developed that will reduce development trips made during the critical peak hours. Additionally, while the long-range analysis assumes that a large portion of the SCLA Specific Plan will develop as industrial and comprising of manufacturing (25%) and warehouse (75%). Programmatic limitations on the ability to achieve 25% manufacturing development could result in significant reductions in peak hour traffic generation since employee commute trips are lower for warehouse uses.

Signal Warrants

A signal warrant analysis has been prepared for Forecast Year 2040 With Project conditions both without and with the HDC. Warrants are based on guidelines set for by the California Manual of Uniform Traffic Control Devices (CA MUTCD) for all unsignalized study intersections found to be operating at unacceptable levels of service. All unsignalized study intersections meet the applicable signal warrant for both Forecast Year conditions.

City of Victorville Funding Mechanism

The City of Victorville plans to engage a consultant in September or October of 2019 to conduct an update of the City's Development Impact Fee (DIF) Program. This effort is estimated by the City to take approximately one year. The DIF will establish updated development impact fees on new residential and commercial development in the City. This study will provide the City with the necessary technical documentation to support adoption of the DIF Program, which will apply to future development in the City. Transportation facility needs will be evaluated for a projected development conditions in a horizon year (possibly 2040). The study will then calculate justifiable impact fees that may be levied for each land use based on the proportionate share of the total facility use that each land use represents. As a development impact fee, the DIF can be charged only to new development and must be based on the impact of new development on transportation facilities infrastructure. The purpose of this study is to establish the nexus (or reasonable relationship) between new development that will occur in the City and the need for additional public facility improvements due to this new development. This study will include the identification of selected roadway improvements critical to increase citywide roadway system capacity to accommodate future development. The DIF update will include all the arterial roads and interchanges in the General Plan Circulation Map, including SCLA. However, it will not include the High Desert Corridor and its interchanges.

If the updated DIF Program is in effect at the time future development occurs within the SCLA Specific Plan, the SCLA development would be subject to established DIF fee payments according to the development land use type and the adopted DIF payment schedule. Intersection and roadway impacts identified in the SCLA TIA will be satisfied by the DIF payments if the required mitigation measure is a component of the City's DIF Roadway Projects list. Any roadway system improvements needed to mitigate SCLA Project impacts that are not covered by the DIF program will be assessed to the Project on a "fair share" contribution basis.

Fair share calculations have been conducted for the purposes of this analysis and can be found in **Appendix O**.

TABLE ES-1, EXISTING WITH PROJECT BUILDOUT MITIGATION MEASURES

Intersection	Impacted Peak Hour	Existing Without Project	Existing With Project	Existing With Project Buildout Recommended Mitigation	Existing With Project With Mitigation
		Delay[1] - LOS	Delay[1] - LOS		Delay[1] - LOS
1 - US-395 / Chamberlain Way	PM	10.2 - B	**>80.0 - F[2]**	• Install westbound dedicated left-turn-lane	14.6 - B
2 - US - 395 / Bartlett Ave	PM	12.1 - B	**69 - E**	• Install northbound dedicated right-turn-lane • Install westbound dedicated right-turn-lane	52.6 - D
3 - US - 395 / Air Expressway	AM	16.6 - B	**>80.0 - F[2]**	• Install second and third northbound through-lanes and one northbound dedicated right-turn-lane with a free movement • Install second and third southbound through-lanes and one southbound dedicated right-turn-lane • Install dedicated eastbound left-turn-lane; Modify eastbound shared through/left-turn lane to a dedicated through lane; Install one shared through/right-turn lane • Install three westbound left-turn lanes	29.0 - C
	PM	24.0 - C	**>80.0 - F[2]**		**>80.0 - F[2]**
4 - US - 395 / Rancho Rd	AM	15.7 - B	**>80.0 - F[2]**	• Install second northbound left-turn-lane, third northbound through-lane, and one northbound dedicated right-turn-lane • Install third southbound through-lane and southbound dedicated right-turn-lane	**>80.0 - F[2]**
	PM	15.3 - B	**>80.0 - F[2]**		**>80.0 - F[2]**
5 - US - 395 /Adelanto Rd	AM	**>50.0 - F[2]**	**>50.0 - F[2]**	• Signalize Intersection • Install second and third northbound through-lanes and northbound left-turn-lane • Install second southbound through-lanes; Install third combination shared through/right-turn-lane; Install southbound left-turn-lane • Restripe westbound approach to include dedicate left-turn-lane and a shared through/right-turn-lane	52.2 - D
	PM	**>50.0 - F[2]**	**>50.0 - F[2]**		79.4 - E
6 - US - 395 / Palmdale Rd	AM	41.6 - D	**>80.0 - F[2]**	• Install third northbound through-lanes; second left-turn-lane; and dedicated right-turn-lane • Install third southbound through-lane • Install eastbound dedicated right-turn-lane	**>80.0 - F[2]**
	PM	50.7 - D	**>80.0 - F[2]**		**>80.0 - F[2]**
8 - Adelanto Rd / Innovation Way / Bartlett Ave	AM	7.4 - A	**>50.0 - F[2]**	• Signalize Intersection	22.6 - C
	PM	7.5 - A	**>50.0 - F[2]**		11.1 - B

Intersection	Impacted Peak Hour	Existing Without Project	Existing With Project	Existing With Project Buildout Recommended Mitigation	Existing With Project With Mitigation
		Delay[1] - LOS	Delay[1] - LOS		Delay[1] - LOS
9 - Adelanto Rd / Air Expressway	AM	18.1 - B	**>80.0 - F[2]**	• Install two northbound dedicated right-turn-lanes with an overlap phase • Install a southbound dedicated right-turn-lane with an overlap phase • Install third eastbound through-lane; fourth combination shared through/right-turn-lane; and second eastbound left-turn-lane	**69.1 - E**
	PM	16.1 - B	**>80.0 - F[2]**	• Install third eastbound through-lane; fourth combination shared through/right-turn-lane; and second eastbound left-turn-lane	50.7 - D
11 - Gateway Dr / Air Expressway	AM	4.9 - A	**>80.0 - F[2]**	• Install southbound dedicated right-turn-lane with an overlap phase • Install third and fourth eastbound through lanes and second eastbound left-turn-lane	51.9 - D
	PM	5.5 - A	**>80.0 - F[2]**	• Install third and fourth westbound through-lanes and second westbound right-turn-lane with an overlap phase	**>80.0 - F[2]**
12 - Phantom West / Air Expressway	AM	23.9 - C	**>80.0 - F[2]**	• Install third southbound left-turn-lane; install southbound right-turn free movement • Install second and third eastbound through-lanes and second eastbound left-turn-lane	**>80.0 - F[2]**
	PM	18.6 - B	**>80.0 - F[2]**	• Install third and fourth westbound through-lanes	**70.9 - E**
13 - Nevada Ave / Air Expressway	AM	**>80.0 - F[2]**	**>80.0 - F[2]**	• Install second southbound left-turn-lane and second southbound right-turn-lane • Install third and fourth eastbound through-lane, and second eastbound left-turn-lane	**>80.0 - F[2]**
	PM	13.7 - B	**>80.0 - F[2]**	• Install third and fourth westbound through-lanes; Install westbound dedicated right-turn-lane with an overlap phase	43.5 - D
14 - George Blvd / Air Expressway	AM	34.5 - C	**>80.0 - F[2]**	• Install third eastbound through lane and fourth combination through/shared right-turn-lane	22.9 - C
	PM	34.8 - C	**>80.0 - F[2]**	• Install third and fourth westbound through lanes	20.2 - C
15 - Phantom East / Air Expressway	AM	76.7 - E	**>80.0 - F[2]**	• Install third and fourth eastbound through-lanes	53.3 - D
	PM	10.8 - B	**>80.0 - F[2]**	• Install third and fourth westbound through-lanes	**>80.0 - F[2]**
16 - Village Dr / Air Expressway	AM	11.2 - B	**>80.0 - F[2]**	• Install northbound dedicated right-turn-lane • Install third and fourth eastbound through-lanes; Install eastbound right-turn overlap phase	48.8 - D
	PM	19.2 - B	**>80.0 - F[2]**	• Install third and fourth westbound through-lanes	46.6 - D

Intersection	Impacted Peak Hour	Existing Without Project Delay[1] - LOS	Existing With Project Delay[1] - LOS	Existing With Project Buildout Recommended Mitigation	Existing With Project With Mitigation Delay[1] - LOS
17 - National Trails Highway / Air Expressway	AM	24.6 - C	**>80.0 - F[2]**	• Reconfigure intersection to make Air Expressway the east/west through movement and the north leg of National Trails Highway a "T" • Install two southbound left-turn-lanes and southbound right-turn lane • Install two eastbound left-turn-lanes and two eastbound through-lanes • Install three westbound through-lanes and one westbound right-turn-lane	**>80.0 - F[2]**
	PM	16.5 - B	**>80.0 - F[2]**		13.6 - B
18 - I-15 Southbound Ramps / National Trails Hwy	AM	18.6 - B	**>80.0 - F[2]**	• Install second northbound left-turn-lane • Convert southbound dedicated right-turn-lane to a free movement • Install second eastbound left-turn-lane	**>80.0 - F[2]**
	PM	21.2 - C	**>80.0 - F[2]**		38.1 - D
19 - I-15 Northbound Ramps / National Trails Hwy	AM	24.7 - C	**>80.0 - F[2]**	• Install two southbound dedicated right-turn-lanes • Install second eastbound left-turn-lane	**>80.0 - F[2]**
	PM	22.3 - C	**>80.0 - F[2]**		**75.3 - E**
35 - Phantom West / Innovation Dr	AM	9.7 - A	**>50.0 - F[2]**	• Signalize Intersection	27.5 - C
	PM	9.0 - A	**>50.0 - F[2]**		54.7 - D
36 - Phantom West / Aerospace Dr	AM	8.8 - A	**>50.0 - F[2]**	• Signalize Intersection • Install northbound dedicated right-turn-lane • Install southbound dedicated right-turn-lane	4.1 - A
	PM	9.3 - A	**>50.0 - F[2]**		8.5 - A
37 - Phantom West /Mustang St	AM	9.7 - A	**>50.0 - F[2]**	• Install median modifications to restrict eastbound and westbound left turns	13.8 - B
	PM	9.3 - A	**>50.0 - F[2]**		13.3 - B
38 - Phantom West / Sabre Blvd	AM	10.2 - B	**>50.0 - F[2]**	• Signalize Intersection • Install northbound dedicated right-turn-lane • Install southbound dedicated right-turn-lane	6.0 - A
	PM	9.4 - A	**>50.0 - F[2]**		11.6 - B
40 - Nevada Ave / Phantom East	PM	9.0 - A	**>50.0 - F[2]**	• Install All-Way-Stop • Install northbound left-turn-lane	16.9 - C
41 - Phantom East / Perimeter Road	AM	8.7 - A	**>50.0 - F[2]**	• Install All-Way-Stop • Install southbound right-turn-lane	**36.9 - E**
	PM	8.9 - A	**>50.0 - F[2]**		17.5 - C

Intersection	Impacted Peak Hour	Existing Without Project	Existing With Project	Existing With Project Buildout Recommended Mitigation	Existing With Project With Mitigation
		Delay[1] - LOS	Delay[1] - LOS		Delay[1] - LOS
42 - Gateway Dr / Innovation Way	AM	8.5 - A	**>50.0 - F[2]**	• Signalize Intersection • Install east leg of the intersection • Install three northbound through-lanes and one northbound dedicated right-turn-lane • Install second and third southbound through lanes and one southbound left-turn lane • Install one eastbound through-lanes and one eastbound shared through/right-turn-lane • Install one westbound left-turn-lane, one westbound through-lane, and one westbound shared through/right-turn-lane	49.5 - D
	PM	8.7 - A	**>50.0 - F[2]**		54.3 - D
43 - Nevada Ave / Innovation Dr / McCoy Circle	AM	0.0 - A	**>50.0 - F[2]**	• Signalize Intersection • Install east leg of the intersection • Install second northbound left-turn-lane, two northbound through-lanes, and one northbound dedicated right-turn-lane • Install one southbound left-turn-lane and two southbound through-lanes • Install two eastbound through-lanes and one eastbound dedicated right-turn-lane with a channelized yield movement • Install two westbound left-turn-lanes, one westbound through-lane, and one westbound shared through/right-turn-lane	22.0 - C
	PM	0.0 - A	**>50.0 - F[2]**		43.1 - D
45 - Phantom East / Sabre Boulevard	AM	Does Not Exist Without Project	**>50.0 - F[2]**	• Install All-Way-Stop • Install west leg of the intersection to include one shared left/through/right-turn-lane • Install east leg of the intersection to include one left-turn-lane and one shared through/right-turn-lane	27.5 - D
	PM		**>50.0 - F[2]**		32.1 - D
46 - Phantom East / Innovation Way	PM	Does Not Exist Without Project	**>50.0 - F[2]**	• Signalize Intersection • Install west leg of the intersection to include one eastbound shared left/through-lane and one eastbound dedicated right-turn-lane with a channelized yield movement	11.7 - B

Note: Deficient intersection operation indicated in **bold**.

[1] Average seconds of delay per vehicle.

[2] Delay exceeds 80.0 seconds for signalized intersection or 50.0 seconds for unsignalized intersections; Level of Service F per HCM

LOS = level of service; TWSC = Two-Way Stop Control; OWSC = One-Way Stop Control

TABLE ES-2, FORECAST YEAR 2040 WITHOUT HDC WITH PROJECT BUILDOUT MITIGATION MEASURES

Mitigation Measure	Intersection	Impacted Peak Hour	Forecast Year 2040 Without HDC Without Project	Forecast Year 2040 Without HDC With Project	Forecast Year 2040 Without HDC With Project Recommended Mitigation	With Mitigation	Project Responsibility
			Delay[1] - LOS	Delay[1] - LOS		Delay[1] - LOS	
MM-1	3 - US-395 / Air Expressway	AM PM	17.8 - B 21.2 - C	**>80.0 - F[2]** **>80.0 - F[2]**	• Modify northbound right-turn lane to a free movement	54.5 - D **>80.0 - F[2]**	DIF
MM-2	4 - US-395 / Rancho Road	AM PM	12.6 - B 14.6 - B	**>80.0 - F[2]** **>80.0 - F[2]**	• Restripe westbound approach to include two left-turn-lanes, one through lane, and one shared through/right-turn-lane	**>80.0 - F[2]** **>80.0 - F[2]**	DIF
MM-3	5 - US-395 / Adelanto Road	AM PM	**>50.0 - F[2]** **>50.0 - F[2]**	**>50.0 - F[2]** **>50.0 - F[2]**	• Signalize Intersection • Restripe westbound approach to include dedicated left-turn-lane and a shared through/right-turn-lane	52.5 - D **80.0 - E**	DIF
MM-4	6 - US-395 / Palmdale Road	AM PM	59.8 - E >80.0 - F2	**>80.0 - F[2]** **>80.0 - F[2]**	• Install overlap phasing on all right-turn movements	**>80.0 - F[2]** **>80.0 - F[2]**	DIF
MM-5	9 - Adelanto Road / Air Expressway	AM PM	19.8 - C 17.7 - B	**>80.0 - F[2]** **>80.0 - F[2]**	• Install second northbound right-turn-lane with a right-turn overlap phase • Install third westbound through-lanes; Install dedicated westbound right-turn-lane with an overlap phase. • Install third combination eastbound shared through/right-turn-lane	54.7 - D 52.2 - D	
MM-6	10 - Adelanto Road / Rancho Road	AM PM	11.4 - B 11.9 - B	**>50.0 - F[2]** **>50.0 - F[2]**	• Signalize Intersection	6.6 - A 8.4 - A	
MM-7	11 - Gateway Drive / Air Expressway	AM PM	6.2 - A 7.1 - A	**>80.0 - F[2]** **>80.0 - F[2]**	• Install third eastbound through-lane; Install second eastbound left-turn-lane • Install second southbound left-turn-lane; Install southbound right-turn overlap phase. • Install third westbound through-lane; Install second westbound right-turn lane with overlap phase	44.2 - D **77.0 - E**	
MM-8	12- Phantom West / Air Expressway	AM PM	37.1 - D 32.7 - C	**>80.0 - F[2]** **>80.0 - F[2]**	• Install southbound right-turn overlap phase • Install second eastbound left-turn-lane	**79.8 - E** **61.9 - E**	

Mitigation Measure	Intersection	Impacted Peak Hour	Forecast Year 2040 Without HDC Without Project	Forecast Year 2040 Without HDC With Project	Forecast Year 2040 Without HDC With Project Recommended Mitigation	With Mitigation	Project Responsibility
			Delay[1] - LOS	Delay[1] - LOS		Delay[1] - LOS	
MM-9	13- Nevada Ave / Air Expressway	AM	8 - A	**>80.0 - F[2]**	• Install second southbound left-turn-lane and second southbound right-turn-lane • Install second eastbound left-turn-lane • Install one westbound dedicated right-turn-lane with an overlap phase	**77.2 - E**	
		PM	7.9 - A	**>80.0 - F[2]**		46.2 - D	
MM-10	15- Phantom East / Air Expressway	AM	>80.0 - F2	**>80.0 - F[2]**	• Restripe northbound approach to include one dedicated left-turn lane, one through-lane, and one shared through/right-turn-lane. • Install second southbound through-lane; Install second southbound left-turn-lane. • Convert westbound right-turn-lane to a free movement	**>80.0 - F[2]**	
		PM	**62.0 - E**	**>80.0 - F[2]**		**78.2 - E**	
MM-11	17 - National Trails Highway / Air Expressway	AM	**>80.0 - F2**	**>80.0 - F[2]**	• Reconfigure intersection to make Air Expressway the east/west through movement and the north leg of National Trails Highway a "T" • Install two southbound left-turn-lanes and southbound right-turn lane • Install two eastbound left-turn-lanes and two eastbound through-lanes • Install three westbound through-lanes and one westbound right-turn-lane	38.4 - D	
		PM	14.7 - B	**>80.0 - F[2]**		13.1 - B	
MM-12	18 - I-15 Southbound Ramps / National Trails Hwy	AM	52.9 - D	**>80.0 - F[2]**	• Install second northbound left-turn-lane • Convert southbound dedicated right-turn-lane to a free movement • Install second eastbound left-turn-lane; Install eastbound right-turn overlap phase	54.0 - D	
		PM	71.3 - E	**>80.0 - F[2]**		39.0 - D	
MM-13	19 - I-15 Northbound Ramps / National Trails Hwy	AM	27.4 - C	**>80.0 - F[2]**	• Install second southbound dedicated right-turn-lane	37.3 - D	
		PM	26.6 - C	**>80.0 - F[2]**		44.2 - D	
MM-14	26 - Phantom East / Palmdale Road	AM	6.9 - A	**>80.0 - F[2]**	• Install second southbound left-turn-lane. • Install southbound right-turn overlap phase. • Install westbound right-turn overlap phase.	54.7 - D	
		PM	6.9 - A	**>80.0 - F[2]**		**>80.0 - F[2]**	
MM-15	35 - Phantom West / Innovation Dr	AM	9.4 - A	**>50.0 - F[2]**	• Signalize Intersection.	20.2 - C	100.0%
		PM	8.7 - A	**>50.0 - F[2]**		46.2 - D	100.0%

Mitigation Measure	Intersection	Impacted Peak Hour	Forecast Year 2040 Without HDC Without Project	Forecast Year 2040 Without HDC With Project	Forecast Year 2040 Without HDC With Project Recommended Mitigation	With Mitigation	Project Responsibility
			Delay[1] - LOS	Delay[1] - LOS		Delay[1] - LOS	
MM-16	36 - Phantom West / Aerospace Dr	AM	8.7 - A	**>50.0 - F[2]**	• Signalize intersection • Install northbound dedicated right-turn-lane • Install southbound dedicated right-turn-lane	4.2 - A	100.0%
		PM	9.1 - A	**>50.0 - F[2]**		7.8 - A	100.0%
MM-17	38 - Phantom West / Sabre Blvd	AM	9.9 - A	**32.9 - F[2]**	• Install All-Way-Stop • Modify northbound approach to include a one shared left/through-lane and one shared through/right-turn-lane • • Modify southbound approach to include a one shared left/through-lane and one shared through/right-turn-lane	21.0 - C	100.0%
		PM	9.1 - A	**>50.0 - F[2]**		18.4 - B	100.0%
MM-18	40 - Nevada Ave/Phantom East	PM	8.8 - A	**>50.0 - F2**	• Install All-Way Stop	14.4 - B	100.0%
MM-19	42 - Gateway Drive / Innovation Way	AM	8.5 - A	**>50.0 - F[2]**	• Signalize Intersection. • Construct east leg of the intersection. • Install one northbound through lane and one shared through/right-turn-lane • Install one southbound left-turn-lane and a second southbound shared through/right-turn-lane. • Install one eastbound through-lane and second shared through/right-turn-lane • Install a westbound left-turn-lane, one westbound through-lane, and one shared through/right-turn-lane	42.1 - D	100.0%
		PM	8.6 - A	**>50.0 - F[2]**		38.5 - D	100.0%
MM-20	43 - Nevada Ave / Innovation Dr / McCoy Circle	AM	0.0 - A	**>50.0 - F[2]**	• Signalize Intersection • Construct east leg of the intersection • Install one northbound through lane and one shared through/right-turn-lane • Install a southbound left-turn-lane, one southbound through-lane, and one southbound dedicated right-turn-lane • Install eastbound through-lane • Install two westbound left-turn-lanes, and a westbound shared through/right-turn-lane	43.6 - D	100.0%
		PM	0.0 - A	**>50.0 - F[2]**		40.0 - D	100.0%

Mitigation Measure	Intersection	Impacted Peak Hour	Forecast Year 2040 Without HDC Without Project	Forecast Year 2040 Without HDC With Project	Forecast Year 2040 Without HDC With Project Recommended Mitigation	With Mitigation	Project Responsibility
			Delay[1] - LOS	Delay[1] - LOS		Delay[1] - LOS	
MM-21	45 - Phantom East / Sabre Boulevard	AM	Does Not Exist Without Project	**>50.0 - F[2]**	• Install All-Way-Stop • Install west leg of the intersection to include one shared left/through/right-turn-lane • Install east leg of the intersection to include one shared left/through/right-turn-lane	30.8 - D	100.0%
		PM		**>50.0 - F[2]**		35.0 - D	100.0%
MM-22	46 - Phantom East / Innovation Way	PM	Does Not Exist Without Project	**>50.0 - F[2]**	• Signalize Intersection • Install west leg of the intersection to include one eastbound shared left/through-lane and one eastbound dedicated right-turn-lane with a channelized yield movement • Install dedicated northbound left-turn-lane • Modify Southbound approach to include one shared through/right-turn-lane	11.0 - B	100.0%

Note: Deficient intersection operation indicated in **bold**.

[1] Average seconds of delay per vehicle.

[2] Delay exceeds 80.0 seconds for signalized intersection or 50.0 seconds for unsignalized intersections; Level of Service F per HCM

LOS = level of service; TWSC = Two-Way Stop Control; OWSC = One-Way Stop Control

TABLE ES-3, FORECAST YEAR 2040 WITH HDC WITH PROJECT BUILDOUT MITIGATION MEASURES

Mitigation Measure	Intersection	Impacted Peak Hour	Forecast Year 2040 With HDC Without Project Delay[1] - LOS	Forecast Year 2040 With HDC With Project Delay[1] - LOS	Forecast Year 2040 With HDC With Project Recommended Mitigation	With Mitigation Delay[1] - LOS	Project Responsibility
MM-23	3 - US-395 / Air Expressway	AM PM	17.9 - B 20.3 - C	**>80.0 - F[2]** **>80.0 - F[2]**	• Modify northbound right-turn lane to a free movement • Install eastbound dedicated right-turn-lane	26.0 - C 54.7 - D	
MM-24	4 - US-395 / Rancho Road	PM	23.9 - C	**>80.0 - F[2]**	• Restripe westbound approach to include two left-turn-lanes, one through lane, and one shared through/right-turn-lane	54.7 - D	
MM-25	5 - US-395 / Adelanto Road	AM PM	**>50.0 - F[2]** **>50.0 - F[2]**	**>50.0 - F[2]** **>50.0 - F[2]**	• Signalize Intersection	4.9 - A 27.1 - C	
MM-26	6 - US-395 / Palmdale Road	AM PM	48.9 - D **>80.0 - F[2]**	**>80.0 - F[2]** **>80.0 - F[2]**	• Install overlap phasing on all right-turn movements	**>80.0 - F[2]** **>80.0 - F[2]**	
MM-27	9 - Adelanto Road / Air Expressway	AM	16.3 - B	**76.5 - E**	• Install northbound right-turn overlap phase	54.5 - D	
MM-28	10 - Adelanto Road / Rancho Road	PM	11.5 - B	**>50.0 - F[2]**	• Signalize Intersection	7.2 - A	
MM-29	11 - Gateway Drive / Air Expressway	AM PM	32.6 - C 45 - D	**>80.0 - F[2]** **>80.0 - F[2]**	• Install second eastbound left-turn-lane • Install second southbound right-turn-lane; Install southbound right-turn overlap phase.	21.1 - C 20.7 - C	
MM-30	27 - US-395 / HDC WB Ramps	PM	29.4 - C	**>80.0 - F[2]**	• Reconfigure westbound approach to include one left-turn-lane, one shared left/through-lane; Install second westbound dedicated right-turn-lane • Convert third southbound through-lane to a shared through/right-turn-lane	44.7 - D	
MM-31	31 - Phantom East /HDC WB Ramps	AM	19.9 - B	**>80.0 - F[2]**	• Modify westbound right-turn-lane to include a channelized yield right-turn movement	0.9 - A	
MM-32	35 - Phantom West / Innovation Dr	AM PM	9.4 - A 8.7 - A	**>50.0 - F[2]** **>50.0 - F[2]**	• Signalize Intersection. • Install second northbound left turn lane and one northbound dedicated right-turn-lane with a right-turn overlap phase • Install southbound dedicated right-turn-lane • Install second eastbound through lane and convert dedicated right-turn to a free right movement • Install second westbound through lane	30.7 - C 54.3 - D	100.0% 100.0%

Mitigation Measure	Intersection	Impacted Peak Hour	Forecast Year 2040 With HDC Without Project	Forecast Year 2040 With HDC With Project	Forecast Year 2040 With HDC With Project Recommended Mitigation	With Mitigation	Project Responsibility
			Delay[1] - LOS	Delay[1] - LOS		Delay[1] - LOS	
MM-33	36 - Phantom West / Aerospace Dr	AM	8.7 - A	**>50.0 - F[2]**	• Signalize intersection • Install northbound dedicated right-turn-lane • Install southbound dedicated right-turn-lane	4.1 - A	100.0%
		PM	9.1 - A	**>50.0 - F[2]**		9.5 - A	100.0%
MM-34	37 - Phantom West /Mustang St	AM	9.5 - A	**>50.0 - F[2]**	• Install median modifications to eliminate eastbound and westbound left turns	14.3 - B	100.0%
		PM	9.2 - A	**49.8 - F[2]**		13.7 - B	100.0%
MM-35	38 - Phantom West / Sabre Blvd	AM	10 - A	**>50.0 - F[2]**	• Signalize intersection • Install northbound dedicated right-turn-lane	5.3 - A	100.0%
		PM	9.1 - A	**>50.0 - F[2]**		9.5 - A	100.0%
MM-36	41 - Perimeter Road / Phantom East	AM	8.7 - A	**>50.0 - F[2]**	• Install southbound dedicated right-turn-lane • Install westbound dedicated right-turn-lane	29.2 - D	100.0%
		PM	8.8 - A	**45.1 - F[2]**		14.6 - B	100.0%
MM-37	42 - Gateway Drive / Innovation Way	AM	8.5 - A	**>50.0 - F[2]**	• Signalize Intersection • Construct east leg of the intersection • Install two northbound through-lanes and one northbound dedicated right-turn-lane with an overlap phase • Install one southbound left-turn-lane and a second southbound through-lane • Install two eastbound through-lanes and one eastbound dedicated right-turn-lane • Install a westbound left-turn-lane, two westbound through-lanes, and two westbound right-turn-lanes with a right-turn overlap phase	43.6 - D	100.0%
		PM	8.6 - A	**>50.0 - F[2]**		54.8 - D	100.0%
MM-38	43 - Nevada Ave / Innovation Dr / McCoy Circle	AM	0.0 - A	**>50.0 - F[2]**	• Signalize Intersection • Construct east leg of the intersection • Install one northbound shared through/right-turn-lane • Install a southbound left-turn-lane • Install one eastbound through-lane and one shared through/right-turn-lane • Install a westbound left-turn-lane, a westbound through-lane, and a shared through/right-turn-lane	10.6 - B	100.0%
		PM	0.0 - A	**>50.0 - F[2]**		13.6 - B	100.0%

Mitigation Measure	Intersection	Impacted Peak Hour	Forecast Year 2040 With HDC Without Project	Forecast Year 2040 With HDC With Project	Forecast Year 2040 With HDC With Project Recommended Mitigation	With Mitigation	Project Responsibility
			Delay[1] - LOS	Delay[1] - LOS		Delay[1] - LOS	
MM-39	45 - Phantom East / Sabre Boulevard	AM	Does Not Exist Without Project	**>50.0 - F[2]**	• Signalize Intersection • Install west leg of the intersection to include one shared left/through/right-turn-lane • Install east leg of the intersection to include one shared left/through/right-turn-lane	13.3 - B	100.0%
		PM		**>50.0 - F[2]**		44.0 - D	100.0%
MM-40	46 - Phantom East / Innovation Way	AM	Does Not Exist Without Project	**>50.0 - F[2]**	• Signalize Intersection • Install second northbound left-turn-lane • Install west leg of the intersection to include one eastbound shared left/through-lane and one eastbound dedicated right-turn-lane with a channelized yield movement • Install westbound left-turn-lane	11.0 - B	100.0%
		PM		**>50.0 - F[2]**		16.1 - B	100.0%

Note: Deficient intersection operation indicated in **bold**.

[1] Average seconds of delay per vehicle.

[2] Delay exceeds 80.0 seconds for signalized intersection or 50.0 seconds for unsignalized intersections; Level of Service F per HCM

LOS = level of service; TWSC = Two-Way Stop Control; OWSC = One-Way Stop Control

2 INTRODUCTION

This study analyzes the forecast traffic conditions associated with the proposed development of the Southern California Logistics Airport (SCLA) Specific Plan area in the City of Victorville.

Exhibit 1 shows the regional location of the project site. **Exhibit 2** shows the draft SCLA Specific Plan area.

The proposed project encompasses a total of approximately 1,264 acres as part of the SCLA Specific Plan area. The total new development of the proposed project is estimated around 24 million square feet of building area. The SCLA SP is proposed to be constructed over approximately 20-year period and is projected to be built out by Year 2038.

The proposed project is forecast to generate approximately 98,752 net new Passenger Car Equivalent (PCE) daily trips which includes approximately 12,736 net new AM peak hour PCE trips and approximately 13,354 net new PM peak hour PCE trips.

As required by San Bernardino County, this traffic impact study has been prepared in accordance with the *County of San Bernardino Traffic Impact Study Guidelines* (Revised April 9, 2014) and the *Guidelines for CMP Traffic Impact Analysis Reports in San Bernardino County*. The scope of this traffic study was coordinated with the City of Victorville.

2.1 STUDY AREA

The study evaluates the following 46 intersections during the AM and PM peak hours in the vicinity of the project site as shown in **Exhibit 3**:

Existing Intersections:

1. US-395 / Chamberlain Way
2. US-395 / Bartlett Avenue
3. US-395 / Air Expressway
4. US-395 / Rancho Road
5. US-395 / Adelanto Road
6. US-395 / Palmdale Road
7. Adelanto Road / Chamberlain Way - Momentum
8. Adelanto Road / Bartlett Avenue – Innovation Way
9. Adelanto Road / Air Expressway
10. Adelanto Road / Rancho Road
11. Air Expressway / Gateway Drive
12. Air Expressway / Phantom West
13. Air Expressway / Nevada Avenue
14. Air Expressway / George Boulevard
15. Air Expressway / Phantom East
16. Air Expressway / Village Drive
17. Air Expressway / National Trails Highway
18. I-15 SB Ramps / National Trails Highway
19. I-15 NB Ramps / National Trails Highway
20. I-15 SB Ramps / Palmdale Road
21. I-15 NB Ramps / Palmdale Road
22. I-15 NB Direct Ramps / Mariposa Road

Future Off-Site Intersections:

23. Adelanto Road / Calusa Road
24. Adelanto Road / El Mirage Road - Navigation
25. Phantom East / Mojave Road
26. Phantom East / Palmdale Road

High Desert Corridor Intersections:

27. HDC EB Ramps / US-395
28. HDC WB Ramps / US-395
29. HDC EB Ramps / Phantom West
30. HDC WB Ramps / Phantom West
31. HDC EB Ramps / Phantom East
32. HDC WB Ramps / Phantom West
33. HDC EB Ramps / National Trails Highway
34. HDC WB Ramps / National Trails Highway

On-Site Intersections:

35. Phantom West / Innovation Drive
36. Phantom West / Aerospace Drive
37. Phantom West / Mustang Street
38. Phantom West / Sabre Boulevard
39. Phantom West / George Boulevard
40. Phantom East / Nevada Avenue
41. Phantom East / Perimeter Road
42. Gateway Drive / Innovation Way
43. Nevada Avenue / Innovation Drive
44. Sabre Boulevard / George Boulevard
45. Phantom East / Sabre Boulevard
46. Phantom East / Innovation Drive

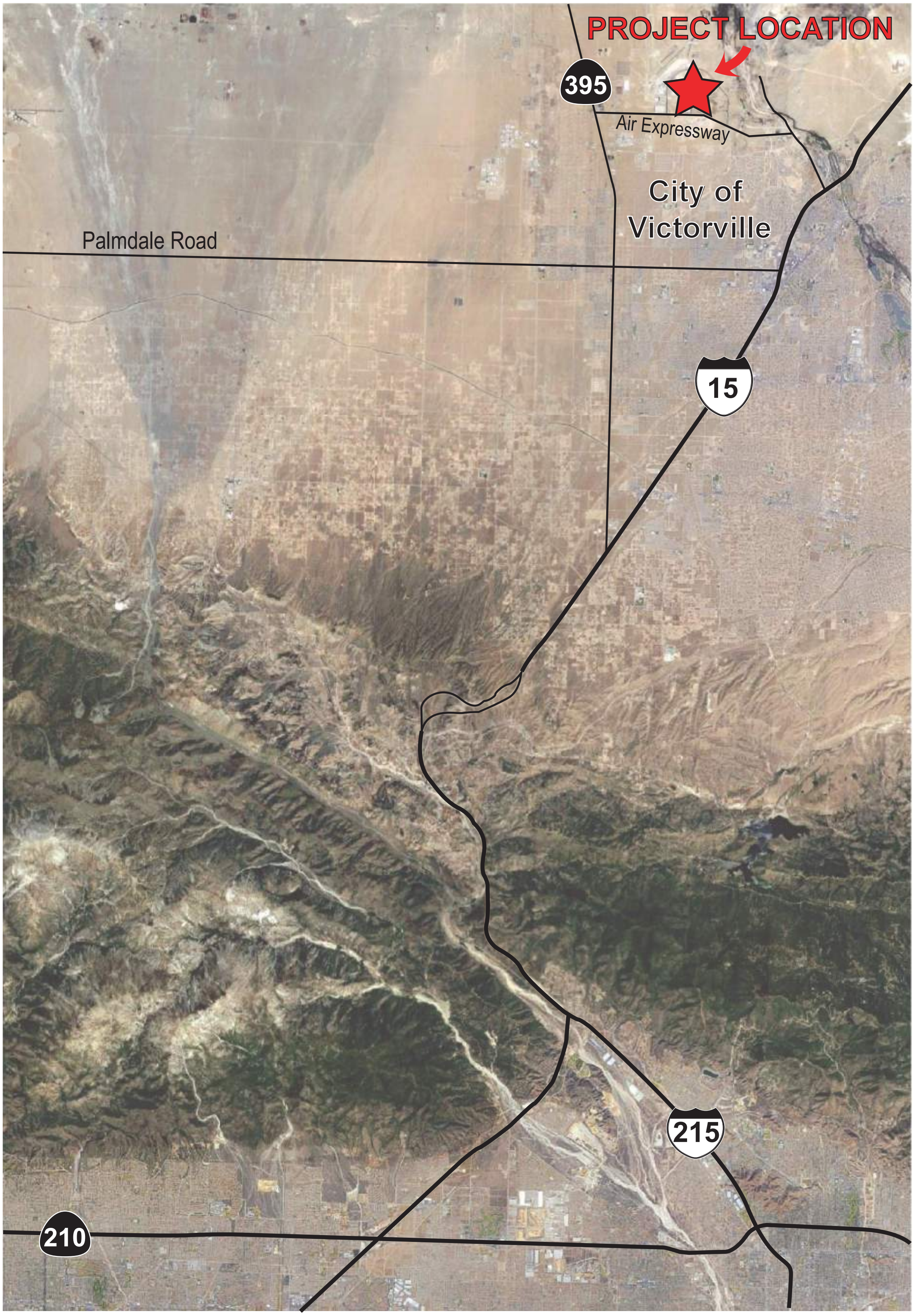
These study locations are analyzed for the following study scenarios:

- Existing;
- Existing With Project Buildout;
- Forecast Year 2040 Without HDC Without Project;
- Forecast Year 2040 Without HDC With Project;
- Forecast Year 2040 With HDC Without Project;
- Forecast Year 2040 With HDC With Project

In addition, the following project development phases are analyzed:

- Phase 1 Completion (Year 2023)
- Phase 2 Completion (Year 2028)
- Phase 3 Completion (Year 2033)
- Phase 4 Completion (Year 2038)

The analysis of Phase 5 is covered in the Forecast Year 2040 buildout analyses without and with the High Desert Corridor.



Not to Scale

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Regional Project Location

Exhibit 1

August 2018
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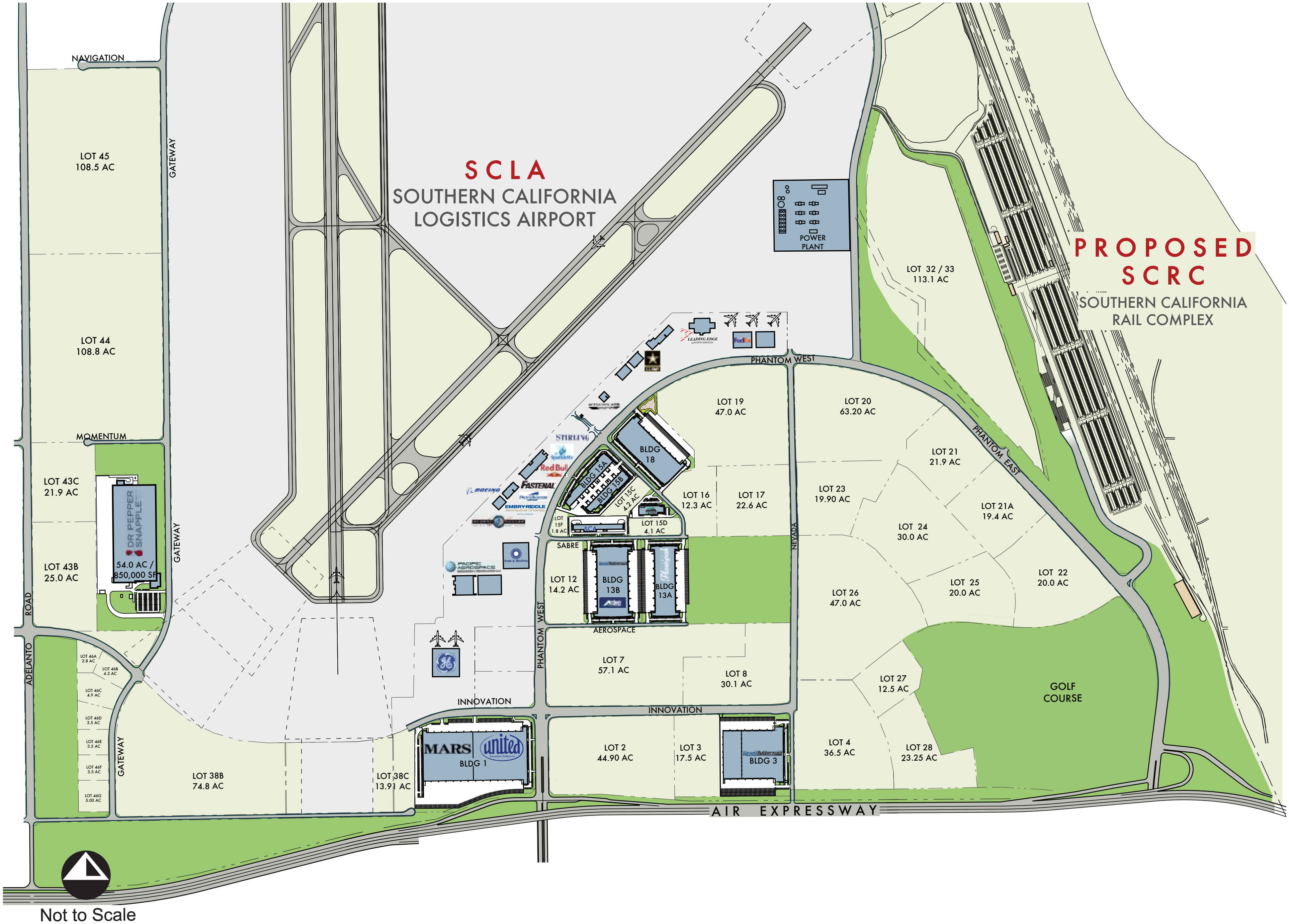

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INTERNATIONAL

Source: Stirling Development

August 2018
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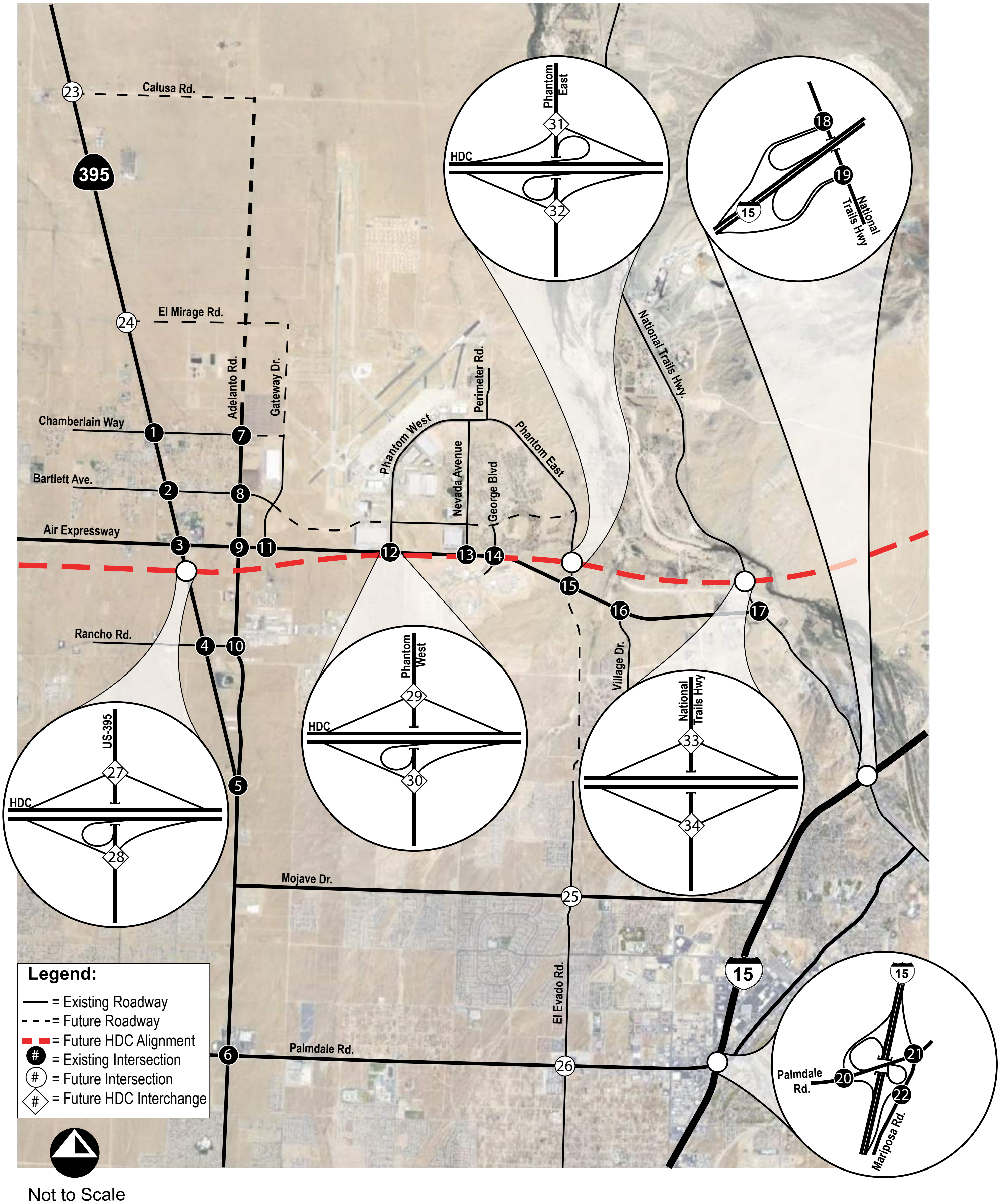
SCLA Specific Plan Area

Exhibit 2



Michael Baker INTERNATIONAL

Project Study Area

Exhibit 3

March 2020
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2.2 ANALYSIS METHODOLOGY

Level of Service (LOS) is commonly used as a qualitative description of intersection operation and is based on the capacity of the intersection and the volume of traffic using the intersection. The Highway Capacity Manual (HCM) 2010 analysis methodology is utilized to determine the operation LOS of the study intersections.

The *HCM* analysis methodology describes the operation of an intersection using a range of level of service from LOS A (free-flow conditions) to LOS F (severely congested conditions), based on the corresponding stopped delay experienced per vehicle for study intersections as shown in **Table 1**.

TABLE 1 - LEVEL OF SERVICE & DELAY RANGE

Level of Service	Description	Control Delay (seconds/vehicle)	
		Signalized Intersections	Unsignalized Intersections
A	Operates with very low delay and most vehicles do not stop.	≤ 10.0	≤ 10.0
B	Operates with very high progression and short cycle length. Few vehicles experience delays.	10.1 - 20.0	10.0 - 15.0
C	Operates at a moderate cycle length with significant number of vehicles stopping.	21.1 - 35.0	15.1 - 25.0
D	Operates with noticeable congestion and long cycle lengths. Vechicles experience longer delays and many vehicles stop.	35.1 - 55.0	25.1 - 35.0
E	Operates with significant delay, extensive queuing and unfavorable progression.	55.1 - 80.0	35.1 - 50.0
F	Operates with long cycle length very poor progression. Arrival rates exceed capacity of the intersection. Extensive queuing occurs.	> 80.0	> 50.0

SOURCE: HCM 2010

Level of service is based on the average stopped delay per vehicle for all movements of signalized intersections and all-way stop-controlled intersections; for one-way or two-way stop-controlled intersections, LOS is based on the worst stop-controlled approach.

A computer software program called *Synchro* v. 9.2 is a direct application of HCM methodology and was used to analyze the study intersections.

2.3 THRESHOLDS OF SIGNIFICANCE

The City of Victorville has adopted level of service "D" or better as acceptable operating conditions for intersections during the peak hour. In accordance with the City's guidelines, the following types of traffic impacts are considered to be significant under California Environmental Quality Act (CEQA):

- *If a development project would worsen an intersection peak hour LOS to E or worse, it is considered a significant impact that must be mitigated.*
- *If a development project would worsen an already deficient intersection by two percent or more, it is considered a significant impact that must be mitigated.*

3 EXISTING CONDITIONS

3.1 SURROUNDING ROADWAY NETWORK

The characteristics of the roadway system in the vicinity of the project site are described below:

I-15 (Mojave Freeway) provides north-south regional access to the Victorville area with six-lanes plus paved shoulders. Interstate 15 originates in San Diego County, trending northeast-southwest through the City of Victorville. Interstate 15 is currently built to its ultimate classification as a four to six-lane freeway.

US-395 is a two-lane undivided roadway trending in the north-south direction through the City of Victorville. The highway includes shoulders and frequent passing lanes. US-395 is classified as a Super Arterial per the City of Victorville General Plan Circulation Element with the ultimate condition having three-lanes in each direction. Phase 1 of construction between Victorville and Adelanto to widen US-395 to four lanes is expected to begin in late 2018 and conclude in 2021. The posted speed limit is 50 miles per hour.

Adelanto Road is a two-lane undivided roadway trending in the north-south direction. Between Air Expressway and Bartlett Avenue it transitions to a four-lane roadway. Adelanto Road is functionally classified as a Super Arterial per the City of Victorville General Plan Circulation Element with the ultimate condition having three-lanes in each direction, painted median, bike-lanes, and on-street parking. The posted speed limit is 40 miles per hour.

Palmdale Road (SR-18) is a four-lane roadway trending in the east-west direction. Between the US-395 it is undivided, transitions to a divided roadway with a two-way-left-turn-lane east of Amethyst Road. Palmdale Road becomes 7th Street east of the I-15 freeway. Palmdale Road is functionally classified as a Super Arterial per the City of Victorville General Plan Circulation Element. The posted speed limit is 55 miles per hour.

Air Expressway is a four-lane undivided roadway trending in the east-west direction. Air Expressway is functionally classified as a Major Arterial per the City of Victorville General Plan Circulation Element. The posted speed limit is 60 miles per hour.

Phantom West is a four-lane divided roadway with a painted median trending in the north-south direction that transitions to Phantom East and loops back to Air Expressway. Phantom West is functionally classified as an Eight Lane Divided roadway between Air Expressway and Innovation Drive and as a Super Arterial between Innovation Drive and Nevada Avenue per the City of Victorville General Plan Circulation Element. The posted speed limit is 50 miles per hour. On-street parking is prohibited.

Nevada Avenue is a two-lane undivided roadway trending in the north-south direction and is functionally classified as a Major Arteria per the City of Victorville General Plan Circulation Element l. There is no posted speed limit and on-street parking is prohibited.

Innovation Way is a two-lane extension of Bartlett Avenue trending in the east-west direction between Adelanto Road and Gateway Drive. Innovation Way is functionally classified as a Super Arterial per the City of Victorville General Plan Circulation Element.

Innovation Drive is a two-lane undivided roadway trending in the east-west direction between Phantom West and Nevada Avenue and a partially constructed four-lane roadway west of Phantom West. Future improvements would connect Innovation Drive and Innovation Way and extend from Adelanto Road and Phantom East. Innovation Drive is functionally classified as a Super Arterial per the City of Victorville General Plan Circulation Element.

3.2 EXISTING CITY OF VICTORVILLE CIRCULATION PLAN

Exhibit 4 shows the proposed City of Victorville General Plan Circulation Element Roadway System. This shows the classification and configuration of arterial highways planned to serve the ultimate development defined by the land use element of the General Plan.

Exhibit 5a through **Exhibit 5e** shows the proposed City of Victorville General Plan Circulation Element Roadway Classification Standards.

3.3 EXISTING TRAFFIC VOLUMES

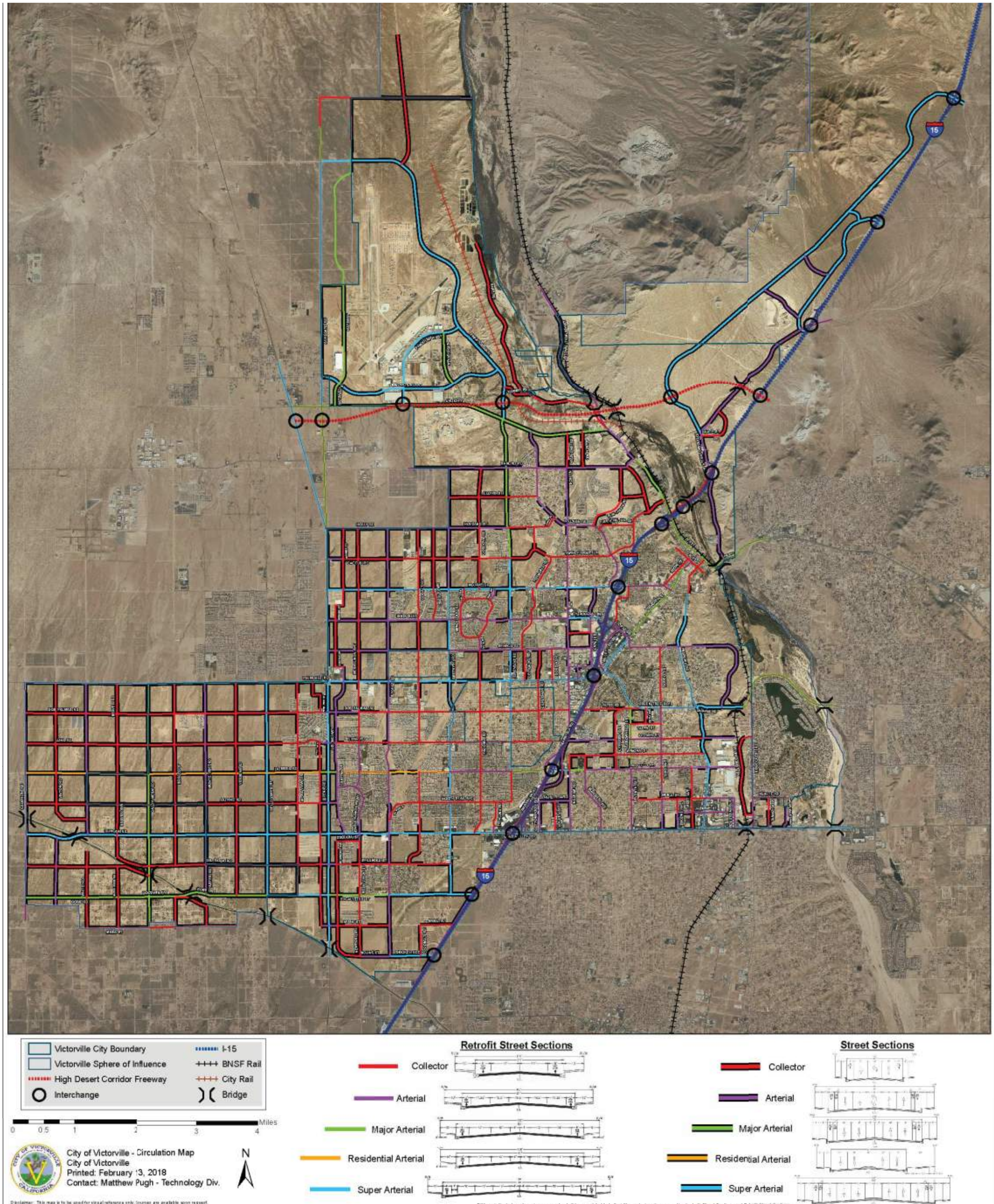
To determine the existing operations of the study intersections, peak hour intersection movement counts were collected in June 2017 and May 2018. AM peak period counts were generally collected between 6:30 AM to 9:30 AM and PM peak period counts were generally collected from 3:30 PM to 5:30 PM. The counts used in this analysis were taken from the highest hour within the peak periods counted for each intersection. These counts were axle specific and identified passenger cars, 2-axle trucks, 3-axle trucks, and 4+ axle trucks.

In order to account for truck traffic in the area, these raw volumes were converted to passenger car equivalents (PCE) in accordance with the *Guidelines for CMP Traffic Impact Analysis Reports in San Bernardino County*. The following factors were used to convert truck trips to PCE's:

- 2-axle trucks = 1.5 PCE
- 3-axle trucks = 2.0 PCE
- 4+ axle trucks = 3.0 PCE

Detailed count data is contained in **Appendix A**.

Exhibit 6a-6d shows the Existing study intersection lane configurations. **Exhibit 7a-7d** shows the AM and PM peak hour volumes at the study intersections.



Source:
City of Victorville - Draft Proposed

City of Victorville Circulation Element Roadway System

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Exhibit 4

August 2018
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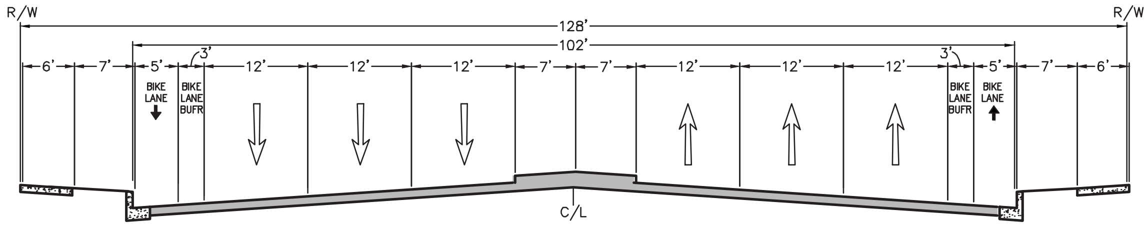
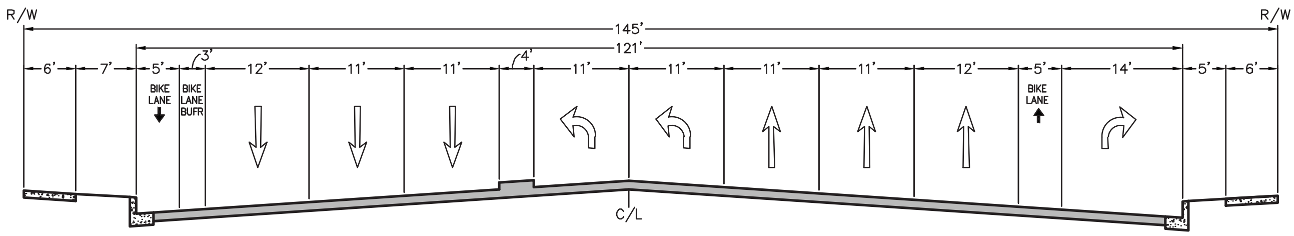
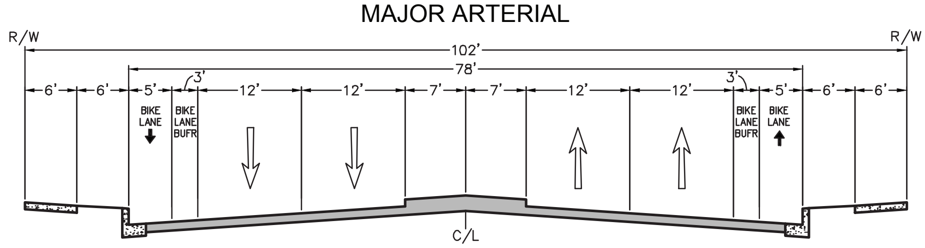
SUPER ARTERIAL



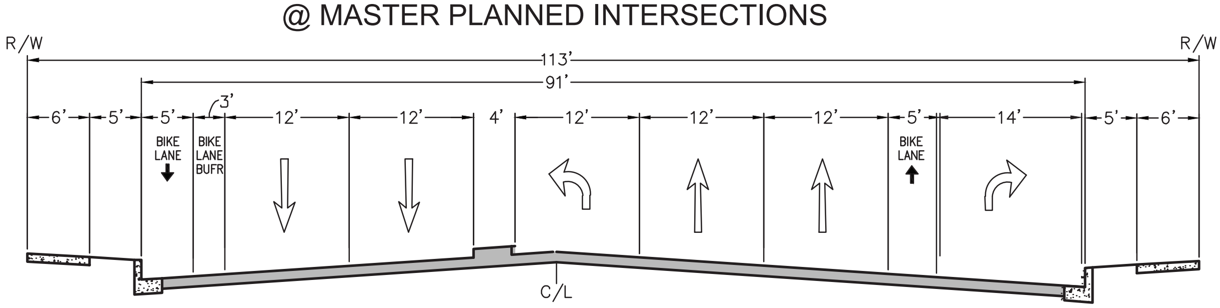
SUPER ARTERIAL @ MASTER PLANNED INTERSECTIONS



MAJOR ARTERIAL



MAJOR ARTERIAL @ MASTER PLANNED INTERSECTIONS



Source:
City of Victorville Draft Proposed

City of Victorville Circulation Element Roadway Classification Standards

Exhibit 5a

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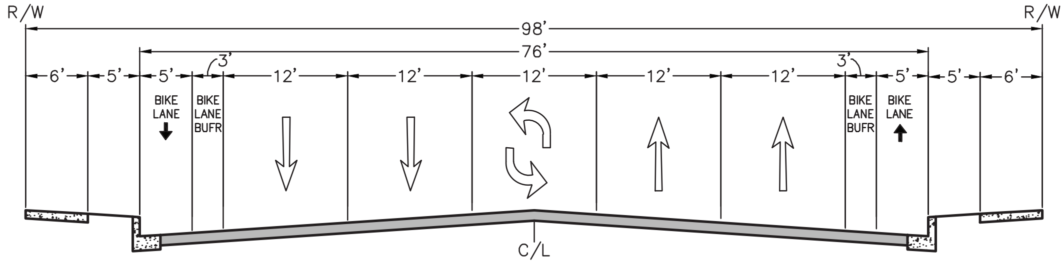
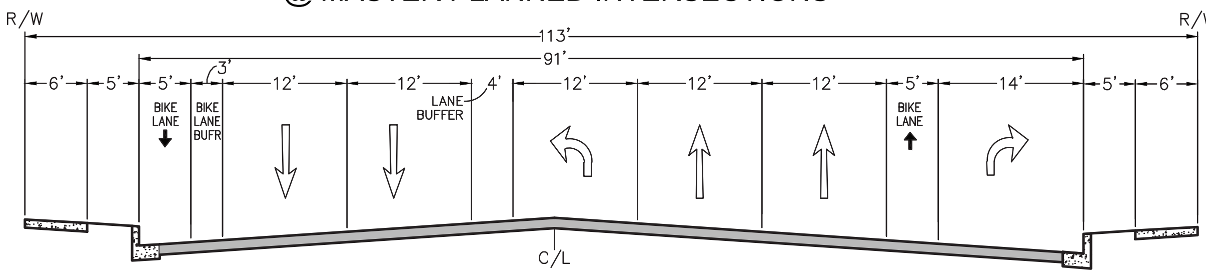
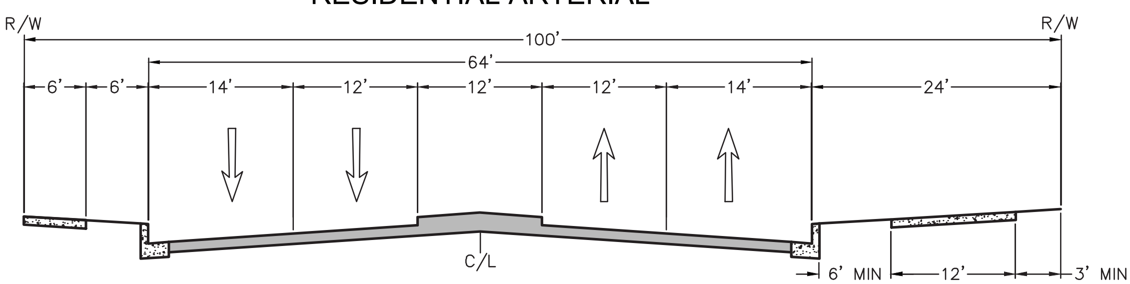
ARTERIAL



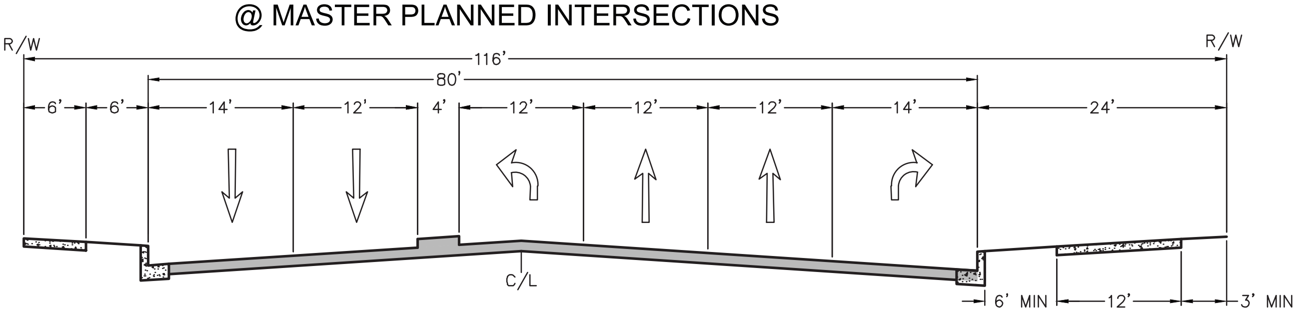
ARTERIAL
@ MASTER PLANNED INTERSECTIONS



RESIDENTIAL ARTERIAL



RESIDENTIAL ARTERIAL
@ MASTER PLANNED INTERSECTIONS



Source:
City of Victorville General Plan Circulation Element (FIgure Circ-3b)

City of Victorville Circulation Element Roadway Classification Standards (ctd)

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Exhibit 5b

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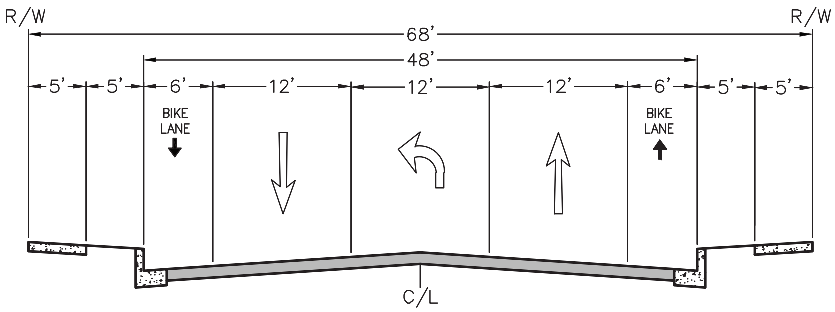
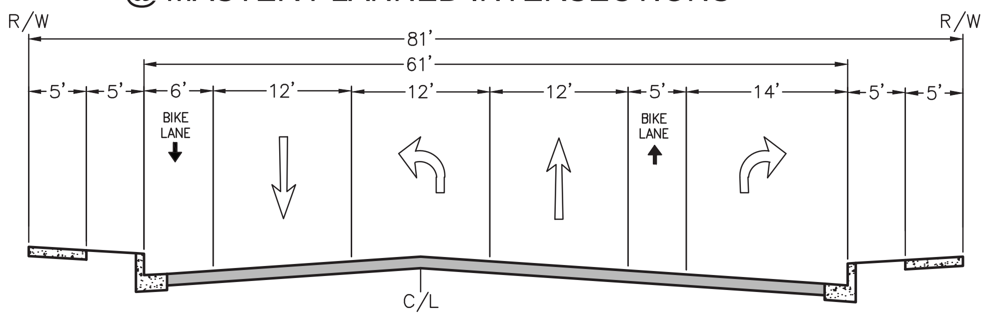
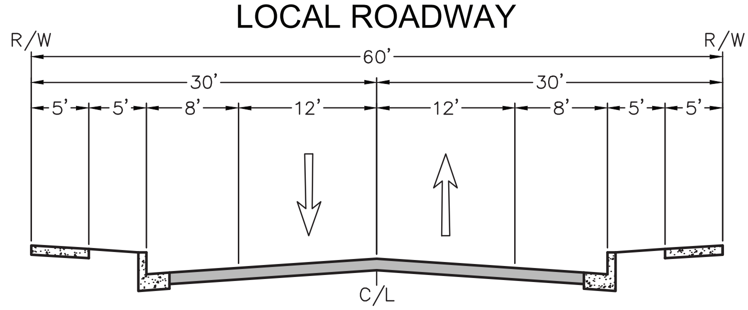
COLLECTOR



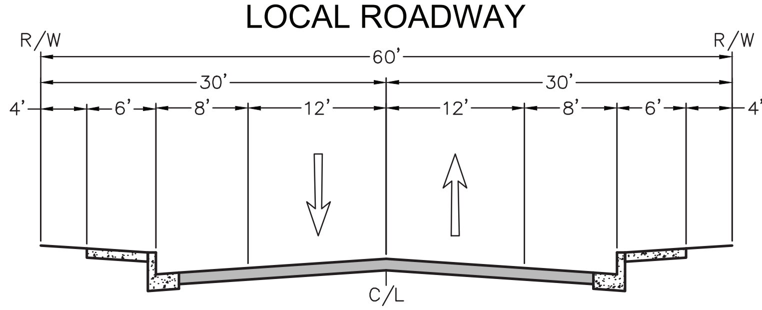
COLLECTOR @ MASTER PLANNED INTERSECTIONS



OPTION #1 LOCAL ROADWAY



OPTION #2 LOCAL ROADWAY



Source:
City of Victorville General Plan Circulation Element (FIgure Circ-3c)

City of Victorville Circulation Element Roadway Classification Standards (ctd)

Exhibit 5c

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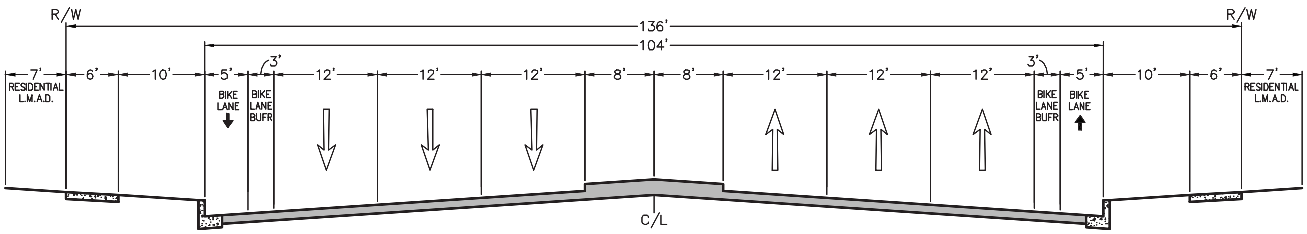
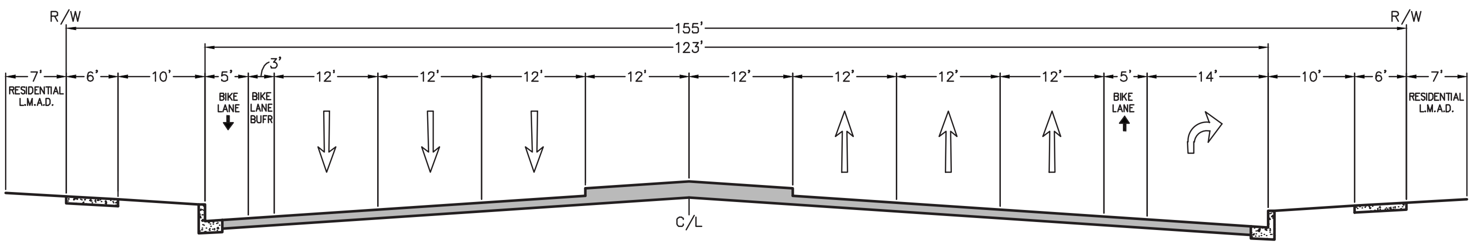
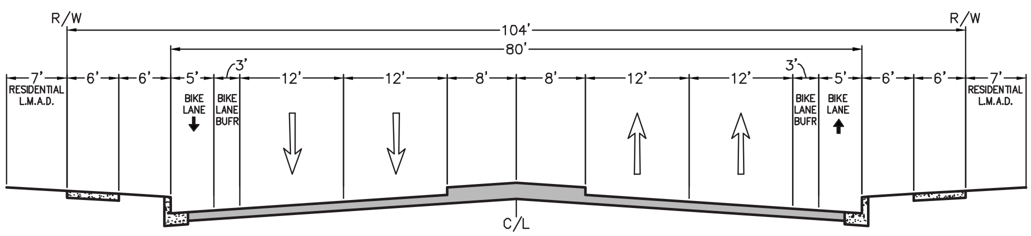
SUPER ARTERIAL w/ RESIDENTIAL L.M.A.D.



SUPER ARTERIAL w/ RESIDENTIAL L.M.A.D.
@ MASTER PLANNED INTERSECTIONS



MAJOR ARTERIAL w/ RESIDENTIAL L.M.A.D.



Not to Scale

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City of Victorville Circulation Element
Roadway Classification Standards (ctd)

Exhibit 5d

August 2018
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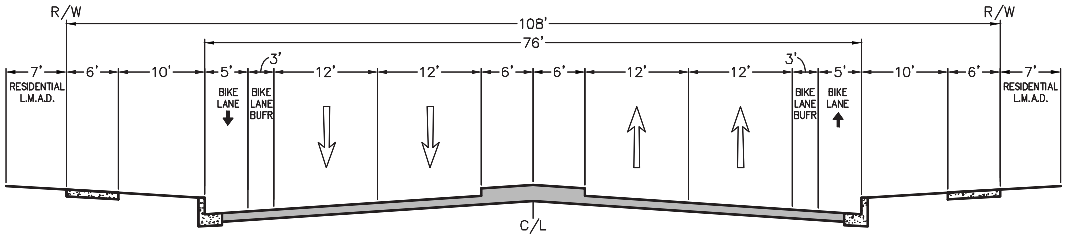
RESIDENTIAL ARTERIAL w/ RESIDENTIAL L.M.A.D.



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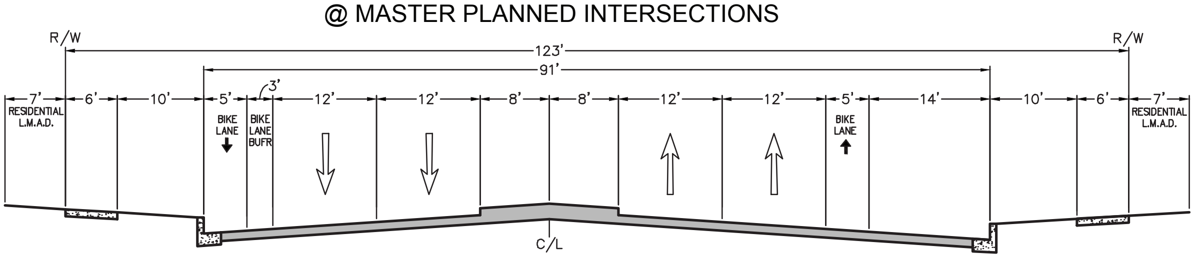
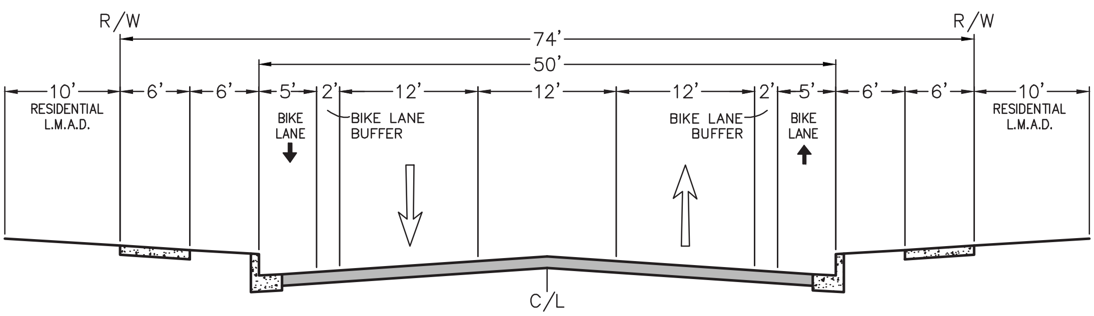
@ MASTER PLANNED INTERSECTIONS



COLLECTOR w/ RESIDENTIAL L.M.A.D.



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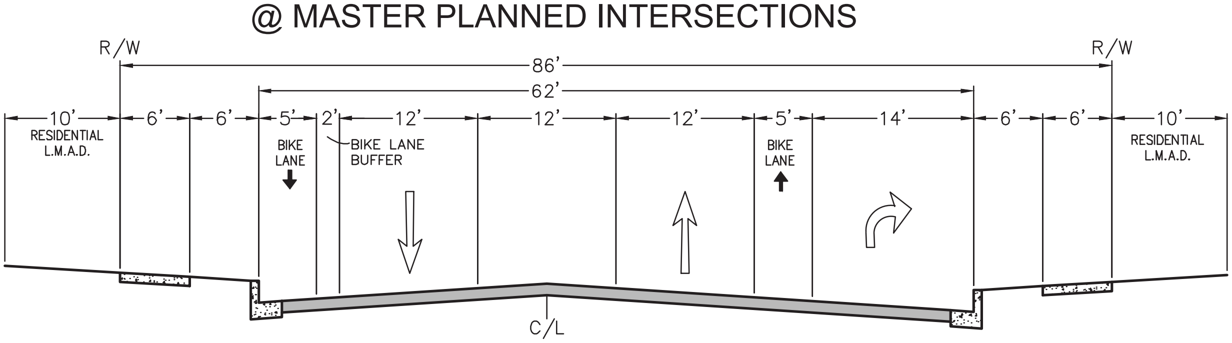
@ MASTER PLANNED INTERSECTIONS



Not to Scale

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City of Victorville Circulation Element
Roadway Classification Standards (ctd)

Exhibit 5e

August 2018
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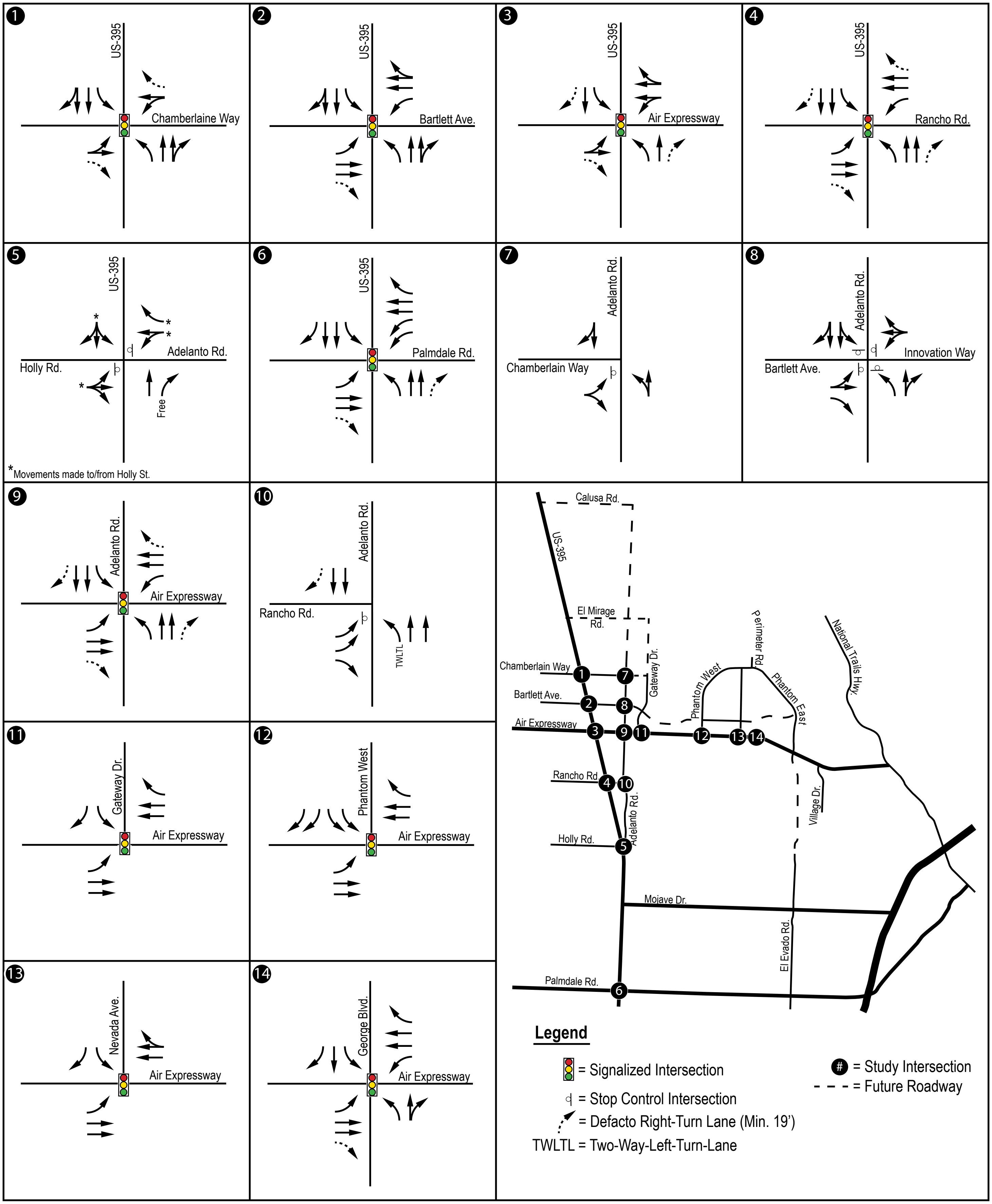

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Existing Intersection Lane Configuration

March 2020
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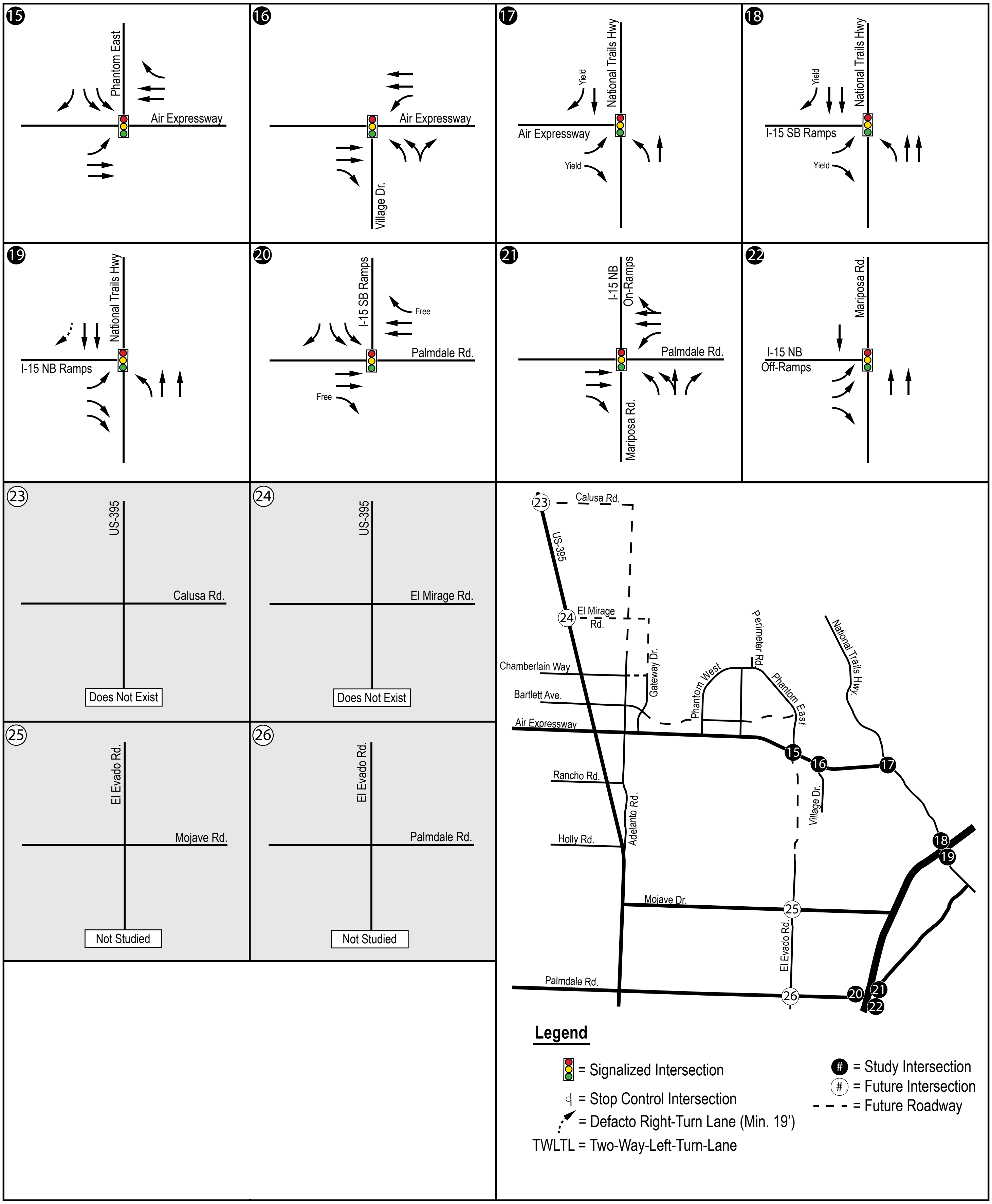
Exhibit 6a



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Existing Intersection Lane Configuration

March 2020
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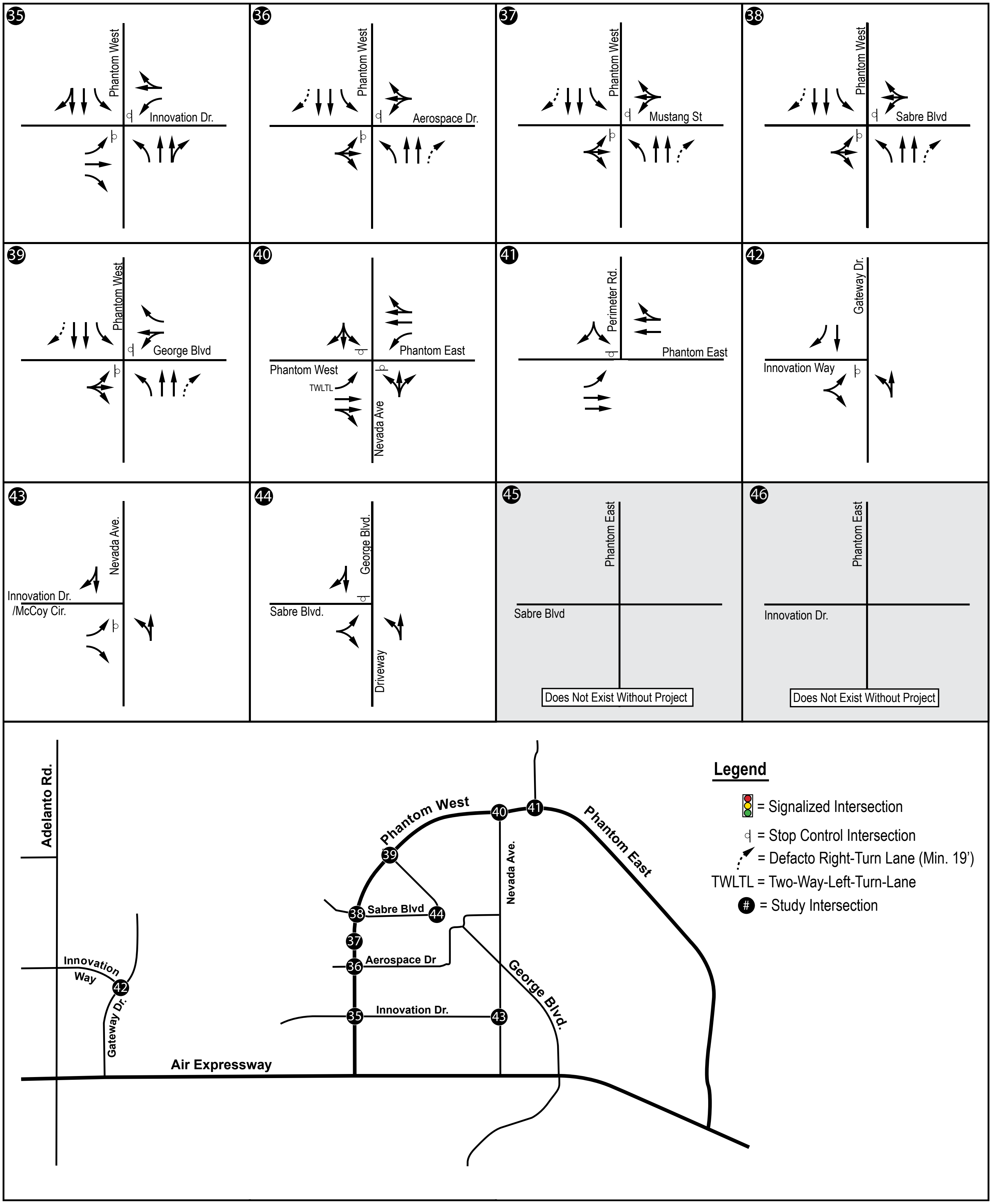
Exhibit 6b



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Existing Intersection Lane Configuration

March 2020
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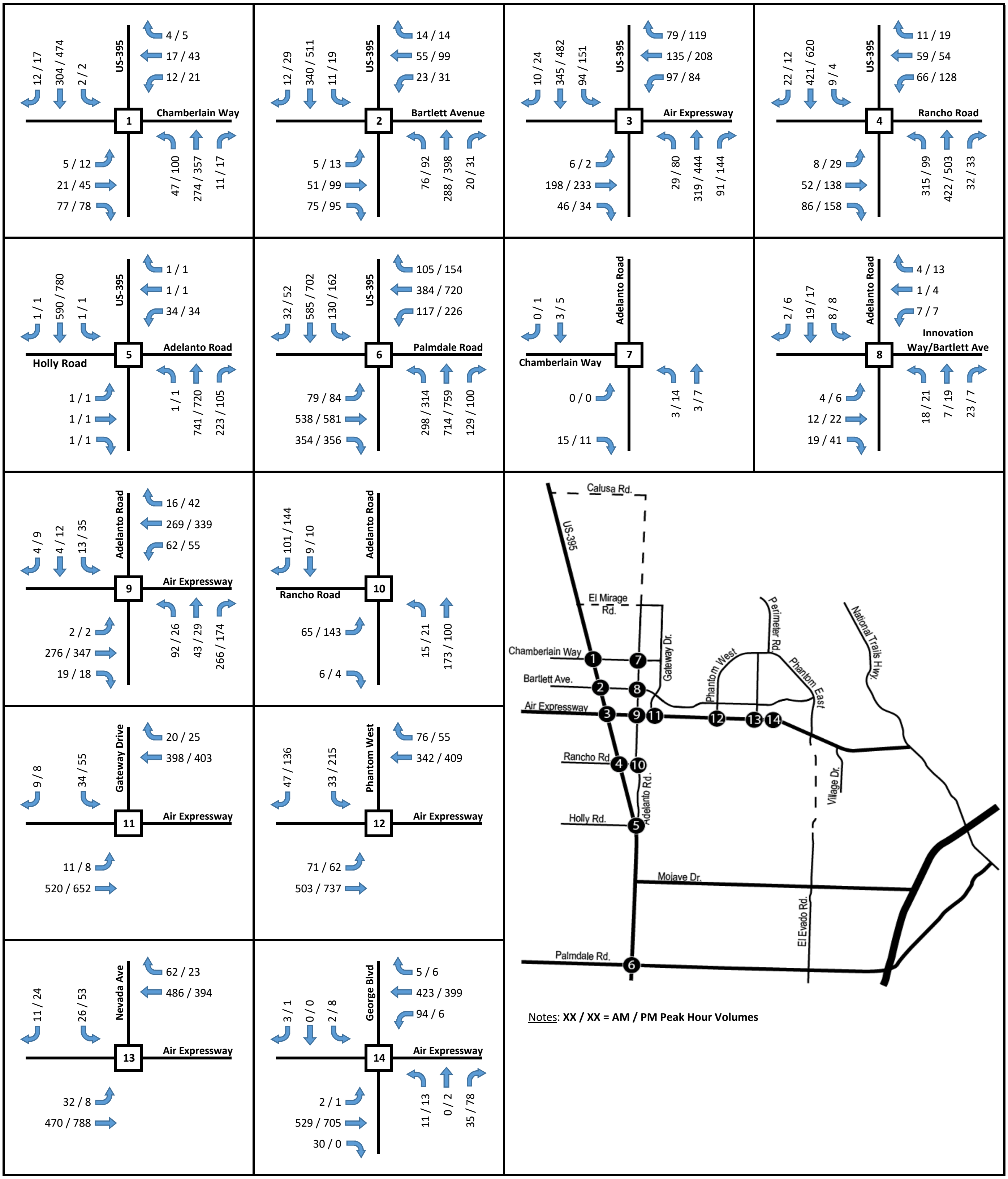
Exhibit 6c



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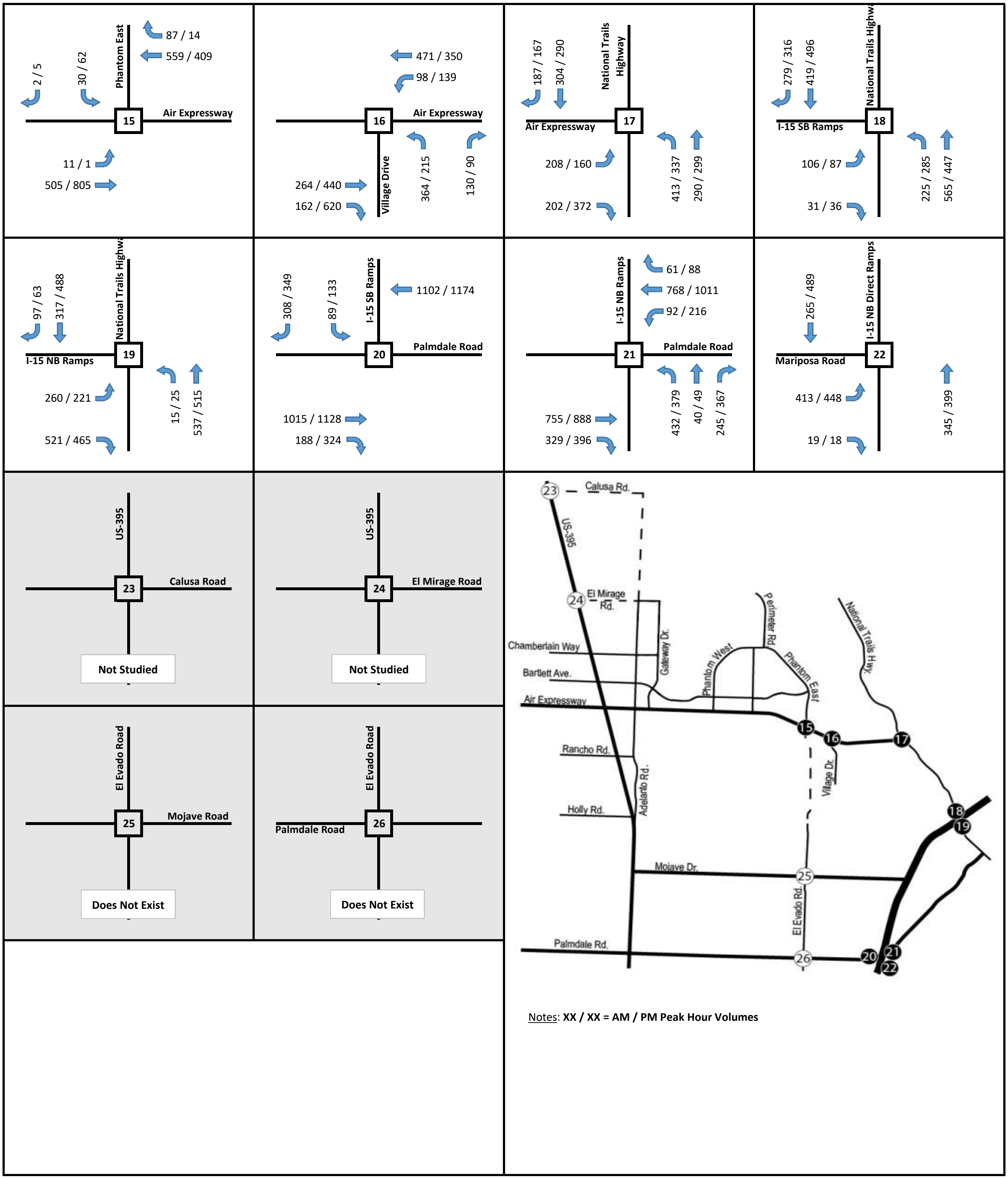
Existing AM/PM Peak Hour Volumes

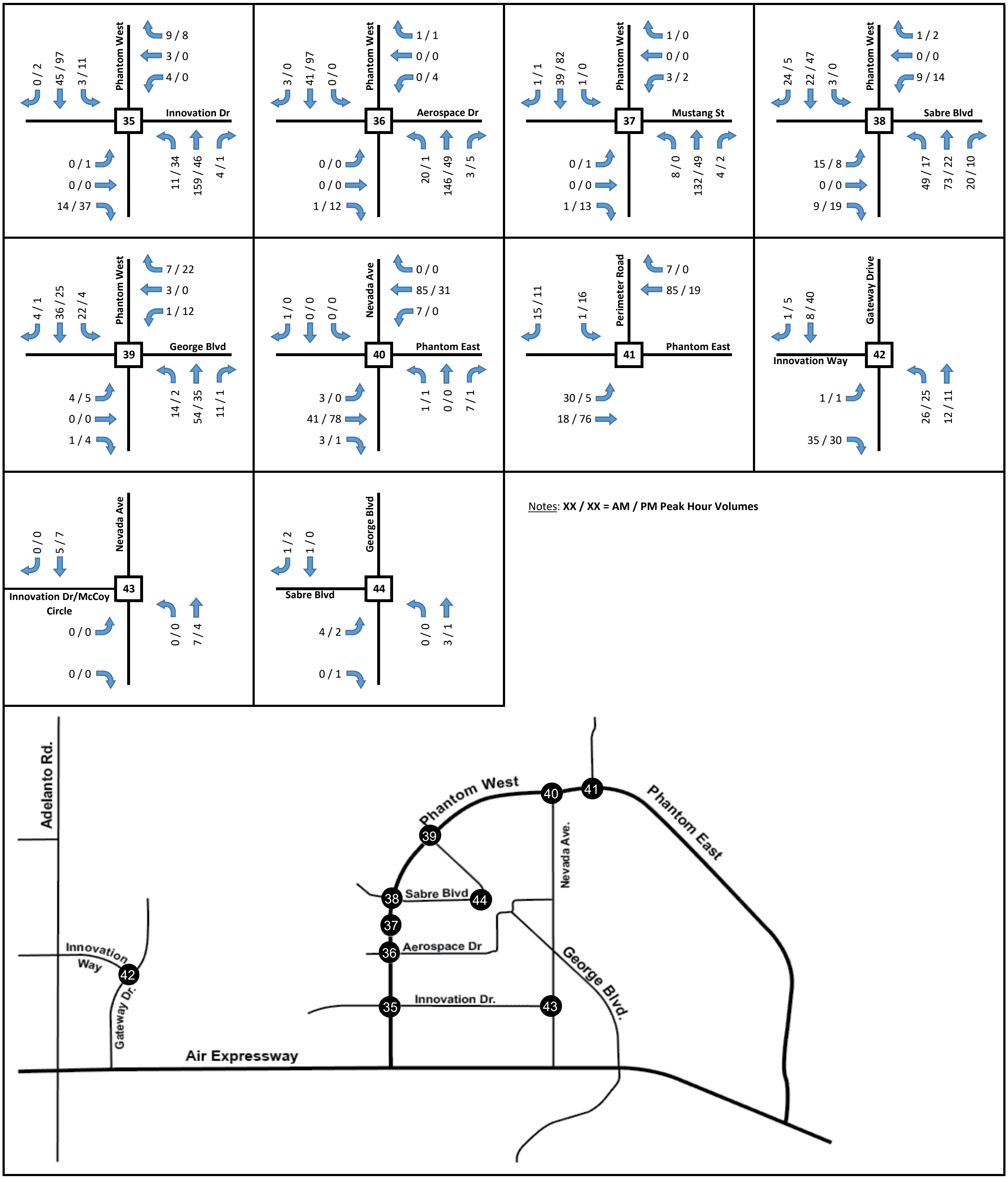
Exhibit 7a



Michael Baker INTERNATIONAL

Existing AM/PM Peak Hour Volumes (ctd)

Exhibit 7b



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INTERNATIONAL

Existing AM/PM Peak Hour Volumes (ctd)

Exhibit 7c

3.4 EXISTING PEAK HOUR STUDY INTERSECTION LOS

Table 2 summarizes existing conditions AM and PM peak hour level of service for all study intersections. Detailed analysis sheets are contained in **Appendix B**.

TABLE 2, EXISTING AM/PM PEAK HOUR INTERSECTION LOS

Study Intersection		Traffic Control	Existing Conditions					
			AM			PM		
			Delay[1]	-	LOS	Delay[1]	-	LOS
1 -	US-395/Chamberlain Way	Signal	9.2	-	A	10.2	-	B
2 -	US-395/Bartlett Avenue	Signal	10.9	-	B	12.1	-	B
3 -	US-395/Air Expressway	Signal	16.6	-	B	24.0	-	C
4 -	US-395/Rancho Road	Signal	15.7	-	B	15.3	-	B
5 -	US-395/Adelanto Road	TWSC	**>50.0**	-	**F[2]**	**>50.0**	-	**F[2]**
6 -	US-395/Palmdale Road	Signal	41.6	-	D	50.7	-	D
7 -	Adelanto Road/Chamberlain Way	OWSC	8.4	-	A	8.4	-	A
8 -	Adelanto Road/Innovation Way/Bartlett Ave	AWSC	7.4	-	A	7.5	-	A
9 -	Adelanto Road/Air Expressway	Signal	18.1	-	B	16.1	-	B
10 -	Adelanto Road/Rancho Road	OWSC	9.5	-	A	9.7	-	A
11 -	Gateway Drive/Air Expressway	Signal	4.9	-	A	5.5	-	A
12 -	Phantom West/Air Expressway	Signal	23.9	-	C	18.6	-	B
13 -	Nevada Ave/Air Expressway	Signal	**>80.0**	-	**F[2]**	13.7	-	B
14 -	George Blvd/Air Expressway	Signal	34.5	-	C	34.8	-	C
15 -	Phantom East/Air Expressway	Signal	**76.7**	-	**E**	10.8	-	B
16 -	Village Drive/Air Expressway	Signal	11.2	-	B	19.2	-	B
17 -	National Trails Highway/Air Expressway	Signal	24.6	-	C	16.5	-	B
18 -	I-15 SB Ramps/National Trails Highway	Signal	18.6	-	B	21.2	-	C
19 -	I-15 NB Ramps/National Trails Highway	Signal	24.7	-	C	22.3	-	C
20 -	I-15 SB Ramps/Palmdale Road	Signal	50.2	-	D	**69.1**	-	**E**
21 -	I-15 NB Ramps/Palmdale Road	Signal	17.7	-	B	**>80.0**	-	**F[2]**
22 -	I-15 NB Direct Ramps/Mariposa Road	Signal	17.6	-	B	25.0	-	C
23 -	US-395/Calusa Road	Not Studied						
24 -	US-395/El Mirage Road	Not Studied						
25 -	El Evado Road/Mojave Road	Not Studied						
26 -	El Evado Road/Palmdale Road	Not Studied						
27 -	US-395/HDC WB Ramps	Not Studied						
28 -	US-395/HDC EB Ramps	Not Studied						
29 -	Phantom West/HDC WB Ramps	Not Studied						
30 -	Phantom West/HDC EB Ramps	Not Studied						
31 -	Phantom East/HDC WB Ramps	Not Studied						
32 -	Phantom East/HDC EB Ramps	Not Studied						
33 -	National Trails Highway/HDC WB Ramps	Not Studied						
34 -	National Trails Highway/HDC EB Ramps	Not Studied						
35 -	Phantom West/Innovation Dr	TWSC	9.7	-	A	9.0	-	A
36 -	Phantom West/Aerospace Dr	TWSC	8.8	-	A	9.3	-	A
37 -	Phantom West/Mustang St	TWSC	9.7	-	A	9.3	-	A
38 -	Phantom West/Sabre Blvd	TWSC	10.2	-	B	9.4	-	A
39 -	Phantom West/George Blvd	TWSC	9.4	-	A	8.7	-	A
40 -	Nevada Ave/Phantom East	TWSC	8.6	-	A	9.0	-	A
41 -	Perimeter Road/Phantom East	TWSC	8.7	-	A	8.9	-	A

Study Intersection	Traffic Control	Existing Conditions					
		AM			PM		
		Delay[1]	-	LOS	Delay[1]	-	LOS
42 - Gateway Drive/Innovation Way	TWSC	8.5	-	A	8.7	-	A
43 - Nevada Ave/Innovation Dr/McCoy Circle	OWSC	0.0	-	A	0.0	-	A
44 - George Blvd/Sabre Blvd	OWSC	7.2	-	A	9.1	-	A
45 - Phantom East/Sabre Blvd	Does Not Exist Without Project						
46 - Phantom East/Innovation Dr	Does Not Exist Without Project						

Note: Deficient intersection operation indicated in **bold**.

[1] Average seconds of delay per vehicle.

[2] Delay exceeds 80.0 seconds for signalized intersection or 50.0 seconds for unsignalized intersections; Level of Service F per HCM

LOS = level of service; TWSC = Two-Way Stop Control; OWSC = One-Way Stop Control

As shown in **Table 2**, all study intersections are currently operating at an acceptable level of service (LOS D or better) for Existing conditions with the exception of the following locations:

Existing Conditions		
Intersection	AM Peak Hour	PM Peak Hour
5 - US-395/Adelanto Road	LOS F	LOS F
13 - Nevada Ave/Air Expressway	LOS F	Acceptable
15 - Phantom East/Air Expressway	LOS E	Acceptable
20 - I-15 SB Ramps/Palmdale Road	Acceptable	LOS E
21 - I-15 NB Ramps/Palmdale Road	Acceptable	LOS F

4 PROPOSED PROJECT

The proposed project encompasses a total of approximately 1,264 acres as part of the SCLA Specific Plan area. The total new development of the proposed project is estimated around 24 million square feet of building area. The SCLA SP is proposed to be constructed over approximately 25-year period and is projected to be built out by Year 2040.

Stirling Development provided Michael Baker with a detailed breakdown of planned land uses by parcel lot number within the specific plan area. Additional land use and employment projections were provided by the City of Victorville for the SCLA airport-side development. The land uses included in the SCLA SP include:

- Manufacturing
- Light Warehouse
- Light Industrial
- Heavy Industrial
- Airport Support Facilities
- Fast Food Restaurants
- High Turnover Restaurants
- Gas Station
- Retail
- General Office

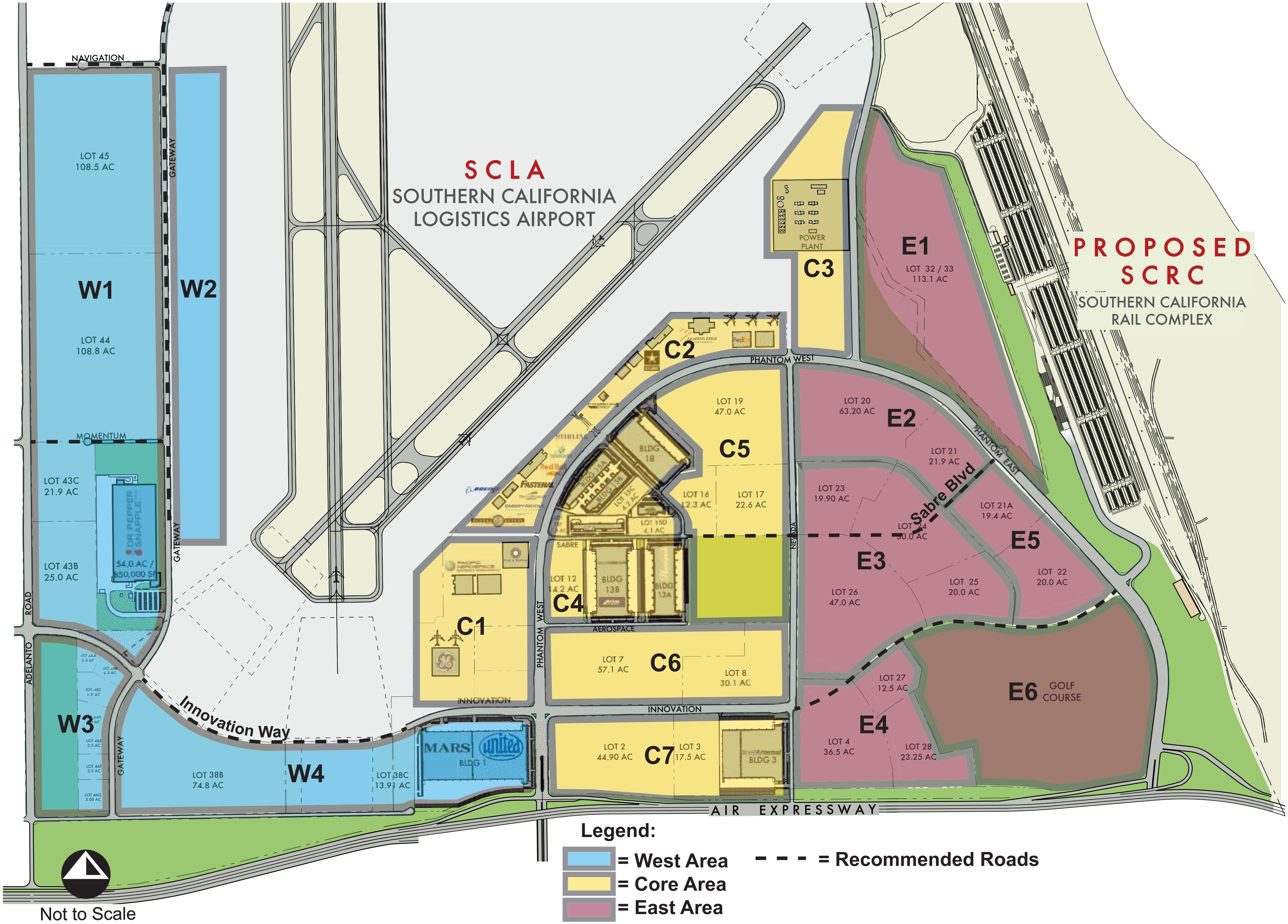
For the proposes of developing vehicle trip generation and trip assignments, the land parcel lots were aggregated into sub-areas. These sub-areas were then grouped into Westside, Central Core, and Eastside specific plan areas.

Exhibit 8 shows the draft SCLA Specific Plan traffic analysis sub-areas.

4.1 ON-SITE SPECIFIC PLAN ROADWAY NETWORK IMPROVEMENTS

Within the SCLA Specific Plan area, new on-site roadway network connections will be constructed. For the purposes of this analysis, all "with project" conditions assume the following modifications to the circulation system within the Specific Plan Area:

- Extension of Adelanto Road from Chamberlain Way to El Mirage Road (2-lanes)
- Extension of Gateway Road from Innovation Way to El Mirage Road (2-lanes)
- Extension of Innovation Way from Gateway Drive to Phantom West (4-lanes)
- Extension of Innovation Drive from Nevada Avenue to Phantom East (2-4 lanes)
- Extension of Sabre Boulevard from George Boulevard to Phantom East (2-lanes)
- Construction of Navigation as a continuation of El Mirage Road from Adelanto Road to Gateway Drive (2-lanes)
- Construction of Momentum as a continuation of Chamberlain Way from Adelanto Road to Gateway Drive (2-lanes)
- Widening of Innovation Drive from Phantom West to Nevada Avenue (4-lanes)
- Elimination of George Boulevard from Air Expressway to Sabre Boulevard



Source: Stirling Development

SCLA Specifc Plan Traffic Analysis Sub-Areas

Exhibit 8

August 2018
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4.2 PROJECT FORECAST TRIP GENERATION

In order to calculate vehicle trips forecast to be generated by the proposed development, the *Institute of Transportation Engineers (ITE) 10th Edition Trip Generation Manual (2017)* trip generation rates were utilized. The ITE trip generation rates were used to calculate the number of vehicle trips that would be generated by the various planned land uses as described above. The airport support facility trip generation is driven by the employment projections and is based on a refined employee-based rate for warehouse type use. **Table 3** summarizes the ITE trip generation rates used.

To account for truck trips for specific land uses (i.e. manufacturing, light warehouse, light industrial, heavy industrial), the trip generation was broken down by vehicle type (passenger cars, 2-axle trucks, 3-axle trucks, and 4+ axle trucks) based on percentages from the *South Coast Air Quality Management District (SCAQMD)*. These vehicle trips were then converted to passenger car equivalents (PCE's) based on the following factors:

- 2-axle = 1.5 PCE
- 3-axle = 2.0 PCE
- 4+ axle = 3.0 PCE

TABLE 3, ITE TRIP GENERATION RATES

Land Use	ITE Code	Daily Trip Rate	AM Peak Hour Trip Rate		PM Peak Hour Trip Rate	
			Rate	In : Out	Rate	In : Out
Airport Support Facility	(1)	3.9 / Emp	1.0 / Emp	72% : 28%	1.0 / Emp	35% : 65%
General Light Industrial	110	4.96 / KSF	0.7 / KSF	88% : 12%	0.63 / KSF	13% : 87%
Manufacturing	140	3.93 / KSF	0.62 / KSF	77% : 23%	0.67 / KSF	31% : 69%
Warehousing	150	1.74 / KSF	0.17 / KSF	77% : 23%	0.19 / KSF	27% : 73%
High-Cube Warehouse	154	1.4 / KSF	0.08 / KSF	77% : 23%	0.1 / KSF	28% : 72%
Business Hotel	312	5.08 / Occ. Room	0.56 / Occ. Room	53% : 47%	0.45 / Occ. Room	55% : 45%
General Office	710	9.74 / KSF	1.16 / KSF	86% : 14%	1.15 / KSF	16% : 84%
Shopping Center	820	37.75 / KSF	0.94 / KSF	62% : 38%	3.81 / KSF	48% : 52%
High Turnover/Sit Down Rest	932	112.18 / KSF	9.94 / KSF	55% : 45%	9.77 / KSF	62% : 38%
Fast Food w/o Drive Thru	933	346.23 / KSF	25.1 / KSF	60% : 40%	28.34 / KSF	50% : 50%
Fast Food with Drive Thru	934	470.95 / KSF	40.19 / KSF	51% : 49%	32.67 / KSF	52% : 48%
Serv.Station w/ Conven.Mkt	945	205.36 / Fuel Position	12.47 / Fuel Position	51% : 49%	13.99 / Fuel Position	51% : 49%

Source: 2017 ITE Trip Generation Manual, 10th Edition

(1) Modified rate based on ITE Code 150 - Warehouse

Emp = Employee; KSF = 1,000 square feet

Table 4 shows the trip generation summary for the SCLA Specific Plan broken out by land use. Detailed trip generation tables and land use summaries are provided in **Appendix C.**

TABLE 4, SCLA SP PROPOSED PROJECT TRIP GENERATION

Land Use	Intensities	ADT	AM Peak Hour Trips			PM Peak Hour Trips		
			Total	Inbound	Outbound	Total	Inbound	Outbound
Manufacturing	4,551.77 KSF	26,169	4,139	3,187	952	4,474	1,393	3,081
Light Warehouse	15,612.68 KSF	40,133	3,951	3,053	898	4,403	1,184	3,219
Light Industrial	2,525.08 KSF	18,323	2,587	2,276	311	2,330	304	2,026
Airport Support Facility	1,300 Emp	5,071	1,300	937	363	1,300	455	845
Fast Food w/o Drive Thru	6.50 KSF	2,251	163	98	65	185	92	93
High Turnover/Sit Down Rest	18.00 KSF	2,019	179	98	81	176	110	66
Serv.Station w/ Conven.Mkt	36 VFP	7,393	449	229	220	504	257	247
Shopping Center	33.00 KSF	1,246	31	20	11	126	60	66
General Office	345.00 KSF	3,360	401	345	56	398	64	334
Reductions [1]		-7,213	-464	-249	-215	-542	-284	-258
SCLA Net New Trips		98,752	12,736	9,994	2,742	13,354	3,635	9,719

Notes: ITE 10th Edition

All volumes are shown in PCE's.

ADT = Average Daily Trips; KSF = 1,000 square feet, Emp = employees; VFP = vehicle fueling position

[1] Reductions include pass-by trips and internal trips and have been applied to commercial uses only (i.e. restaurant 50%, retail=35%%, gas station=60%)

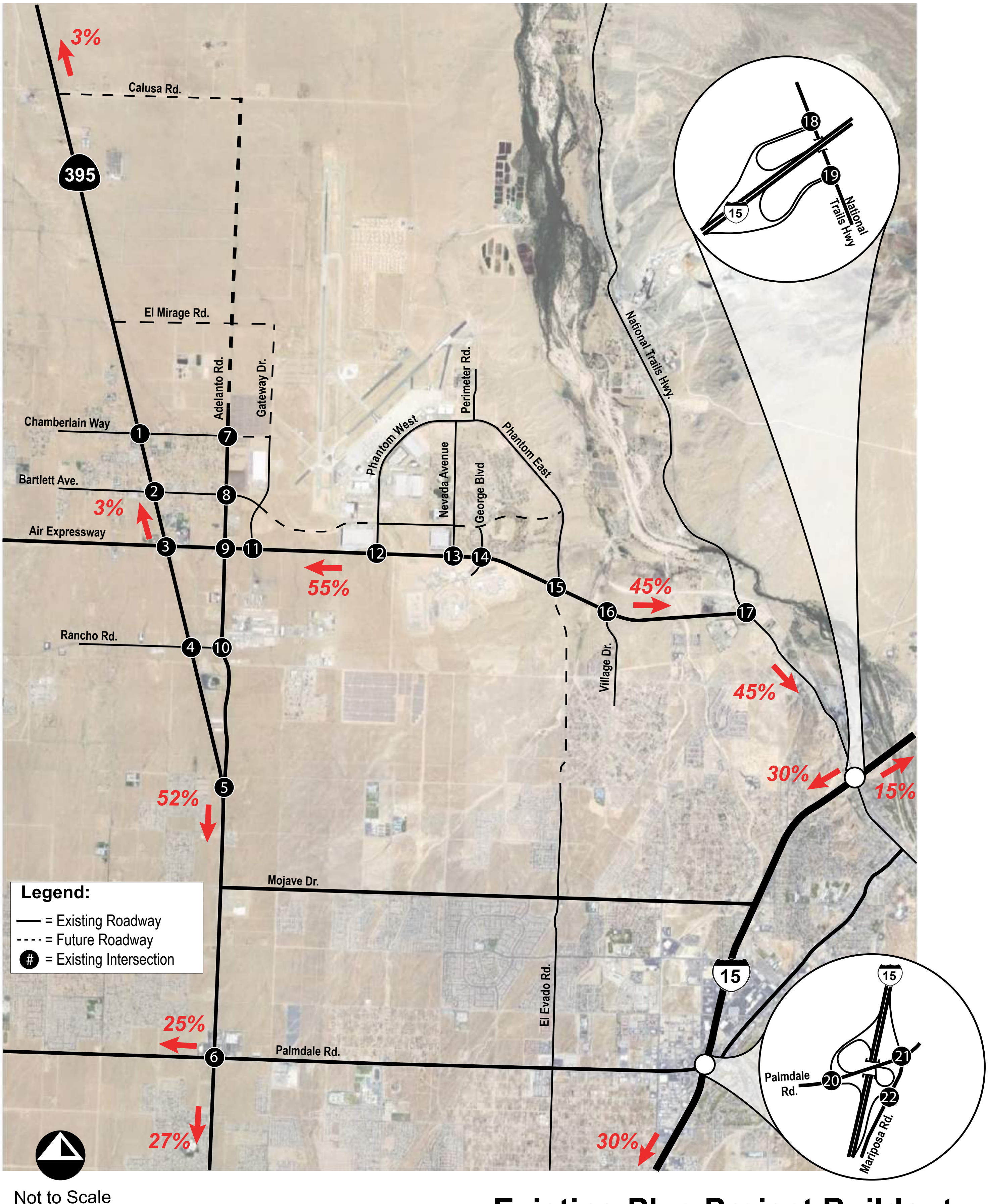
As shown in **Table 4**, the SCLA SP is projected to generate approximately 98,752 net new daily PCE trips with 12,736 AM peak hour trips (9,994 in / 2,742 out) and approximately 13,354 PM peak hour trips (3,635 in / 9,719 out) by the specific plan build out. It should be noted that trip reductions have been applied to proposed commercial uses such as retail, gas stations, and restaurants to account for pass-by trip and for trips that would be internal to the land parcel lot in which the commercial use is located or trips between immediately adjacent lots that are close enough to allow for convenient pedestrian access. Detailed trip generation tables and land use summaries are provided in **Appendix C.**

4.3 TRIP DISTRIBUTION AND TRIP ASSIGNMENT OF PROPOSED PROJECT

The distribution of SCLA SP trips has been based on trip distribution characteristics developed for the previous project traffic studies as well as traffic patterns reflected in the existing counts at the key intersections along Air Expressway.

Exhibit 9 shows the forecast trip percent distribution of the proposed project within the study area based on the existing circulation network. **Exhibit 10** shows the forecast trip percent distribution of the proposed project within the study area based on the Forecast Year 2040 Without HDC buildout roadway network. **Exhibit 11** shows the forecast trip percent distribution of the proposed project within the study area based on the Forecast Year 2040 With HDC buildout roadway network. The trips were manually assigned onto the roadways surrounding each sub area in a logical manner that considered the likely location of access points around the perimeter of the individual sub areas and subsequently assigned to principal access roads that would carry the trips to and from the regional routes.

Exhibit 12 - **Exhibit 14** shows the corresponding forecast assignment of AM and PM peak hour project-generated trips assuming the trip percent distribution shown in **Exhibit 9** - **Exhibit 11** respectively. All trips are shown as PCE's.



Existing Plus Project Buildout Trip Distribution

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Exhibit 9

March 2020
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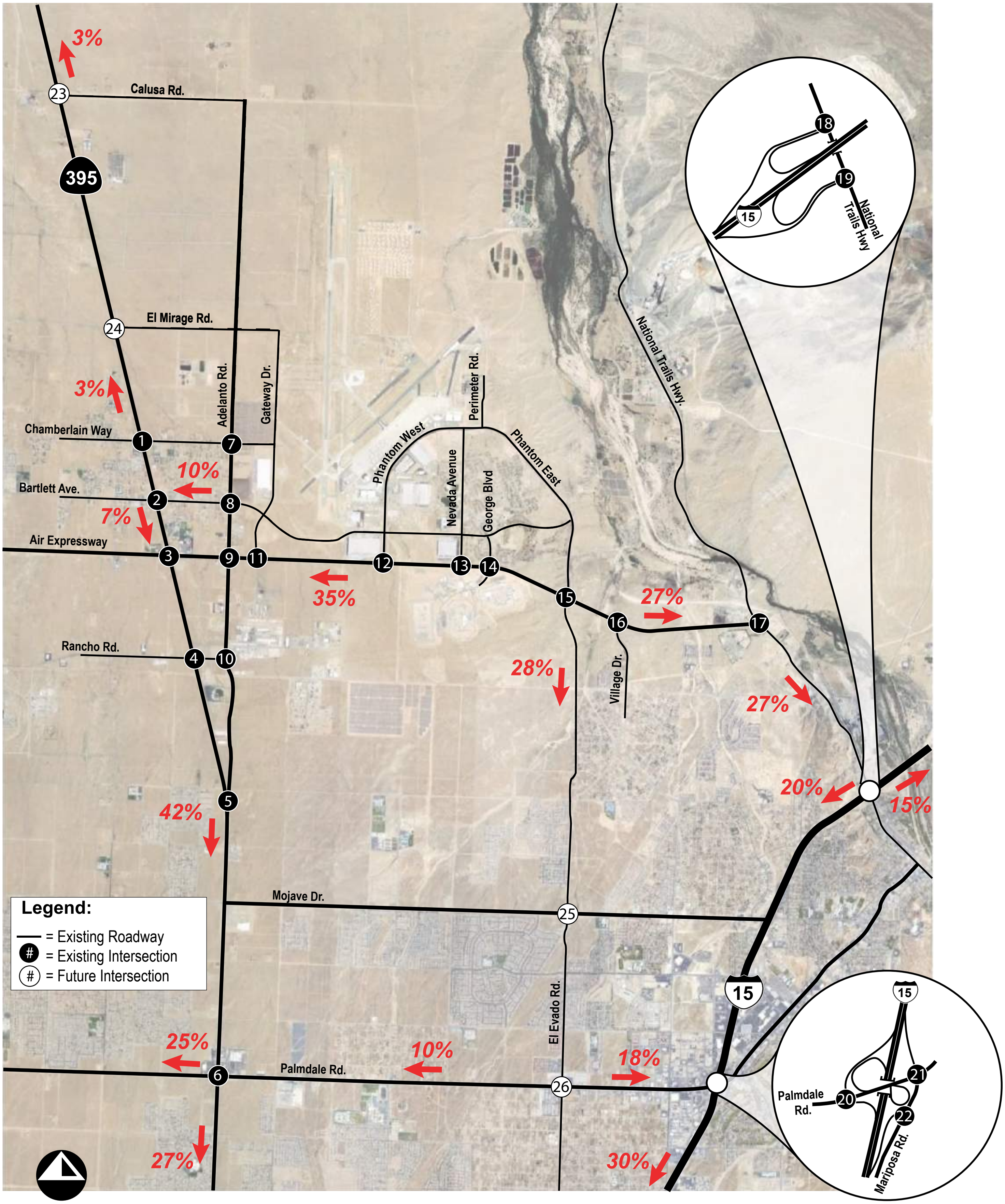

Not to Scale

Michael Baker INTERNATIONAL

Forecast Year 2040 Without HDC With Project Buildout Trip Distribution

Exhibit 10

March 2020
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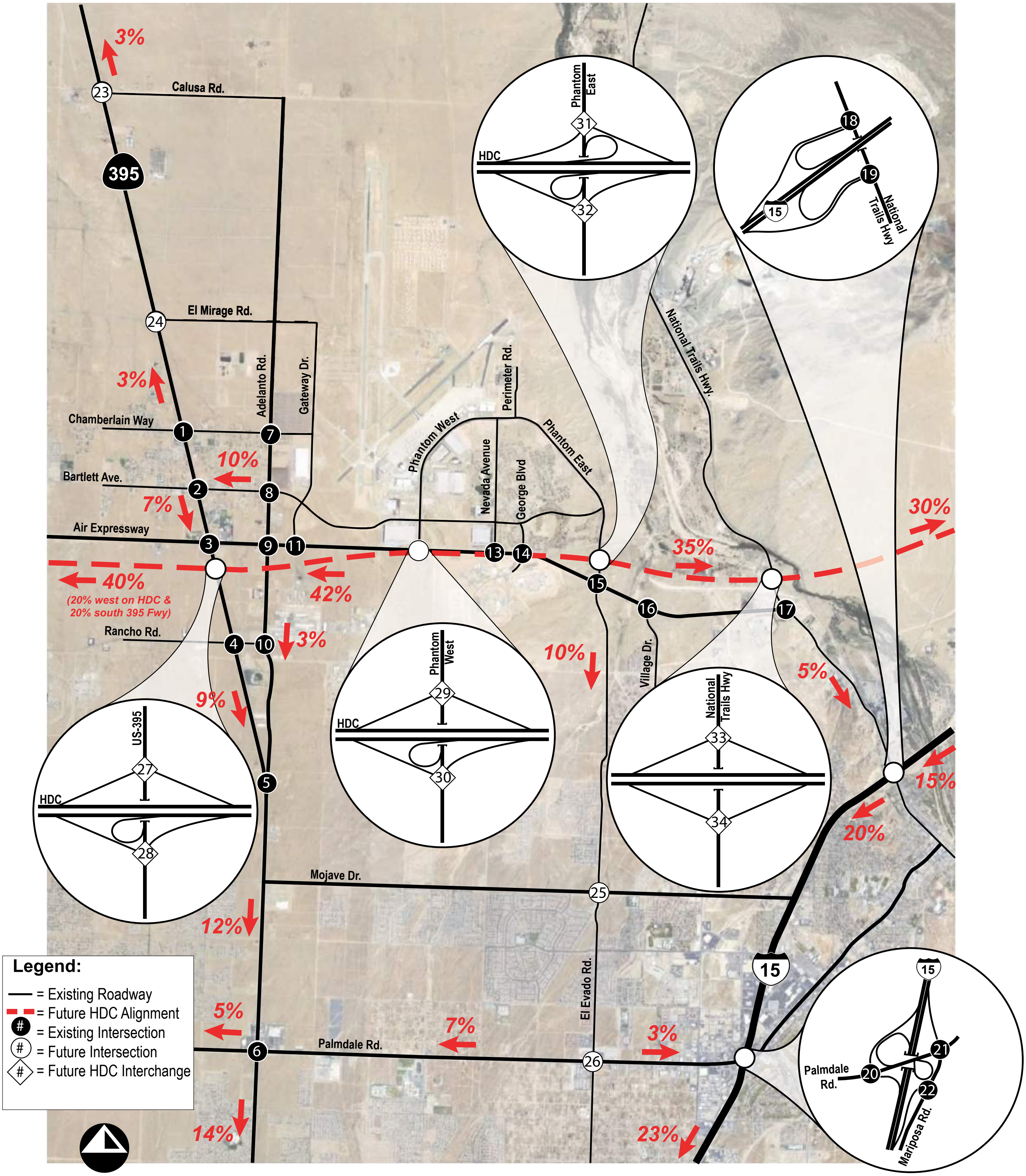

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Forecast Year 2040 With HDC With Project Buildout Trip Distribution

Exhibit 11

March 2020
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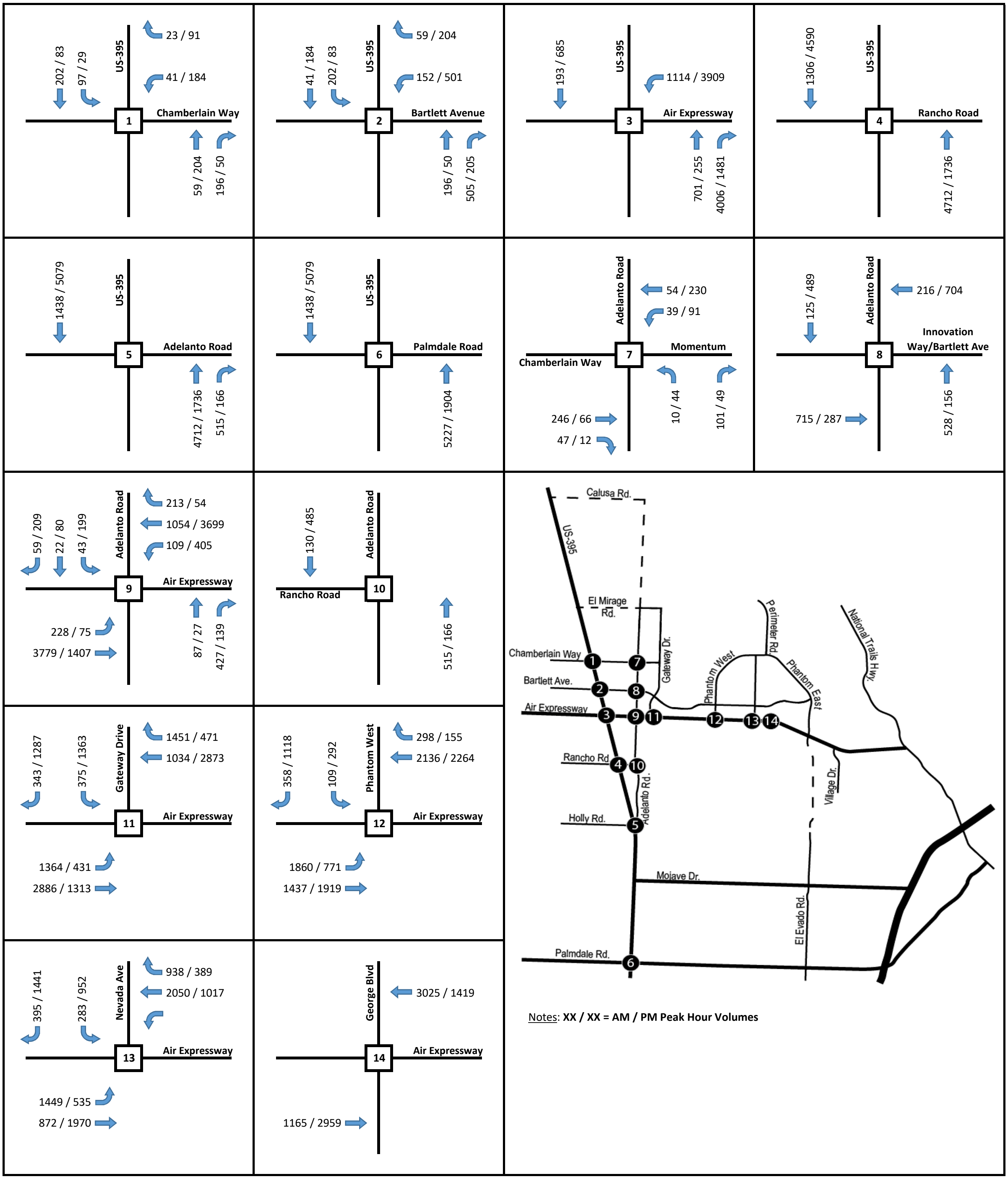

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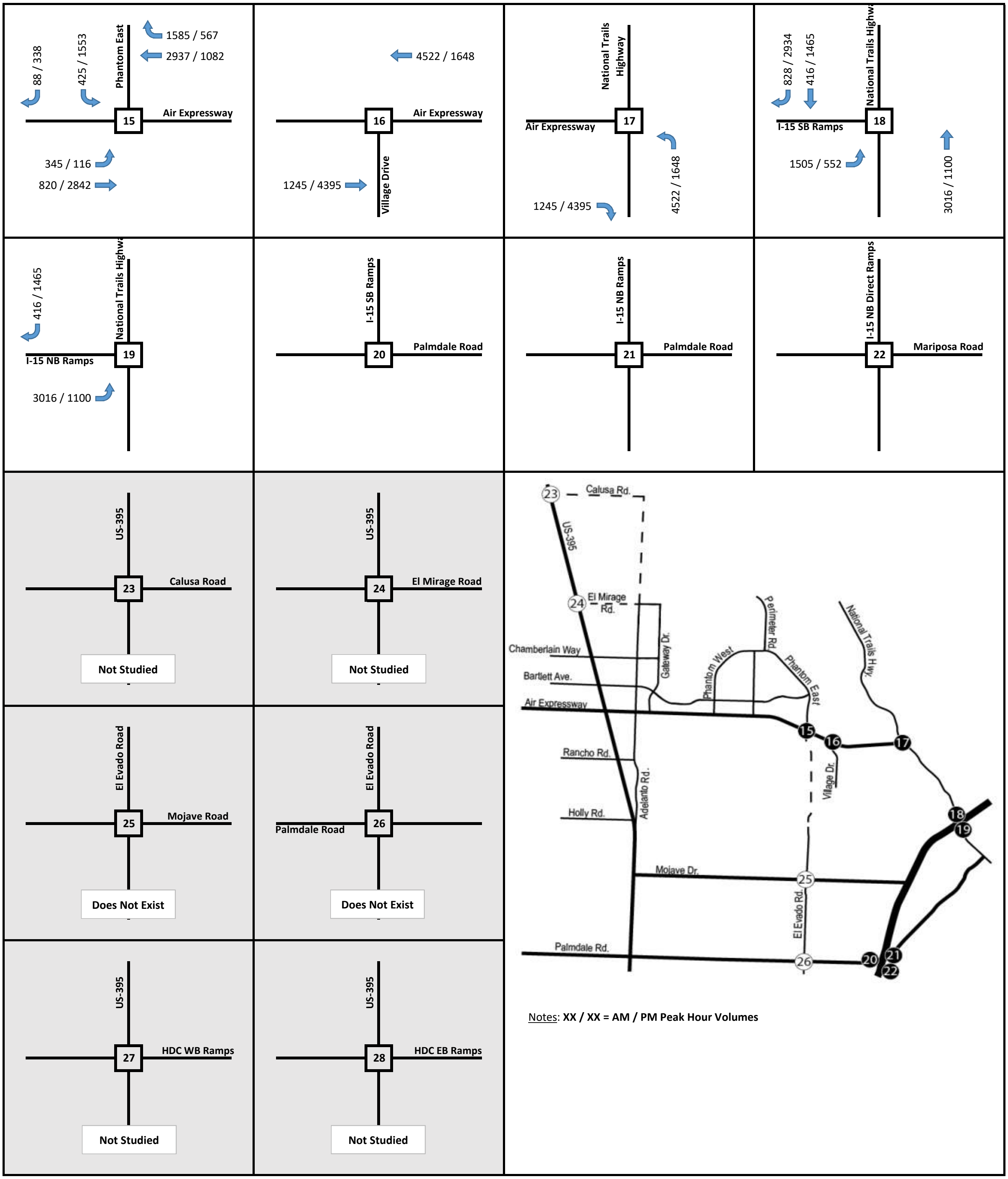
AM/PM Peak Hour Project Trip Assignment - Existing Plus Project Buildout

Exhibit 12a



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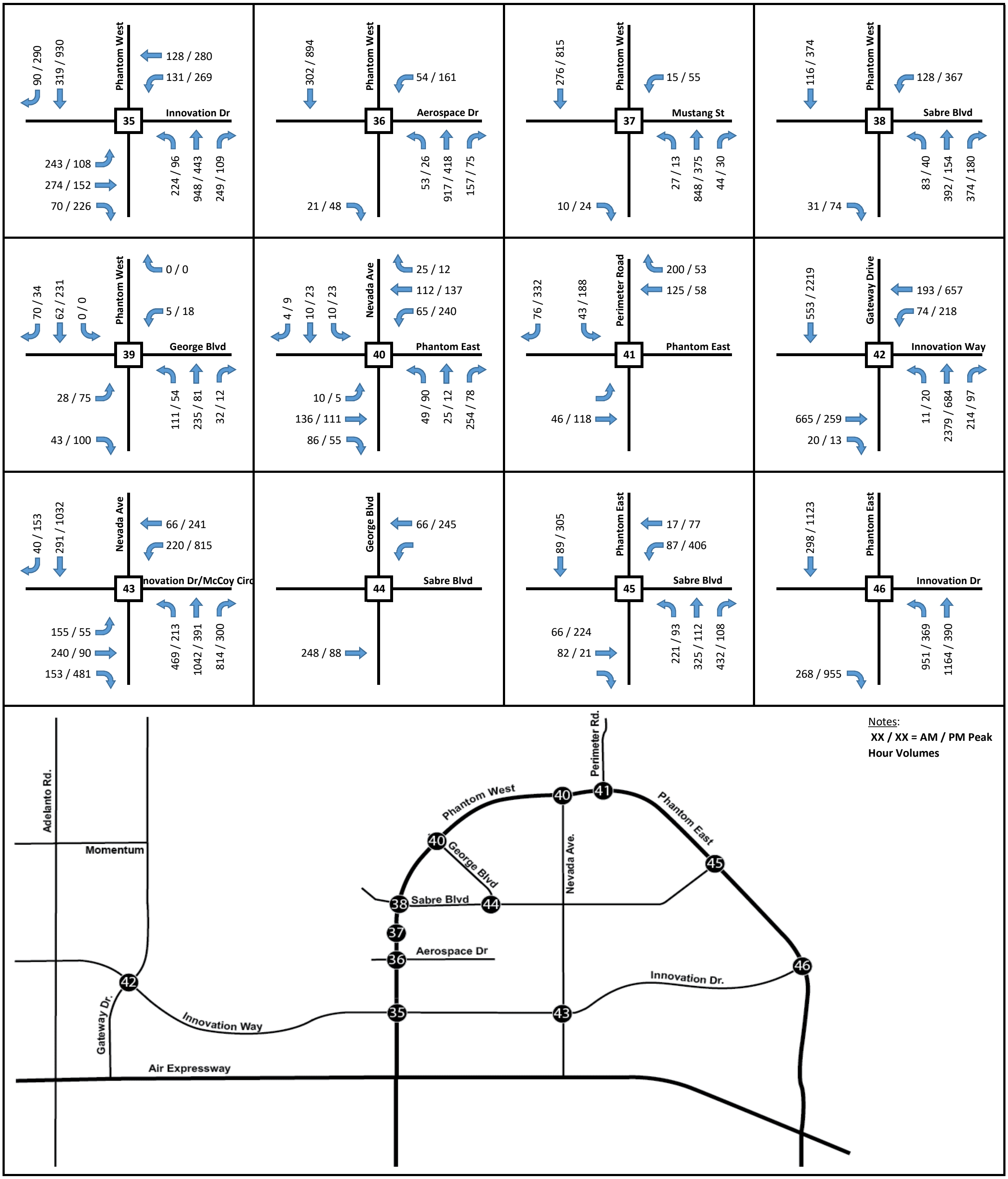
AM/PM Peak Hour Project Trip Assignment - Existing Plus Project Buildout (ctd)

Exhibit 12b



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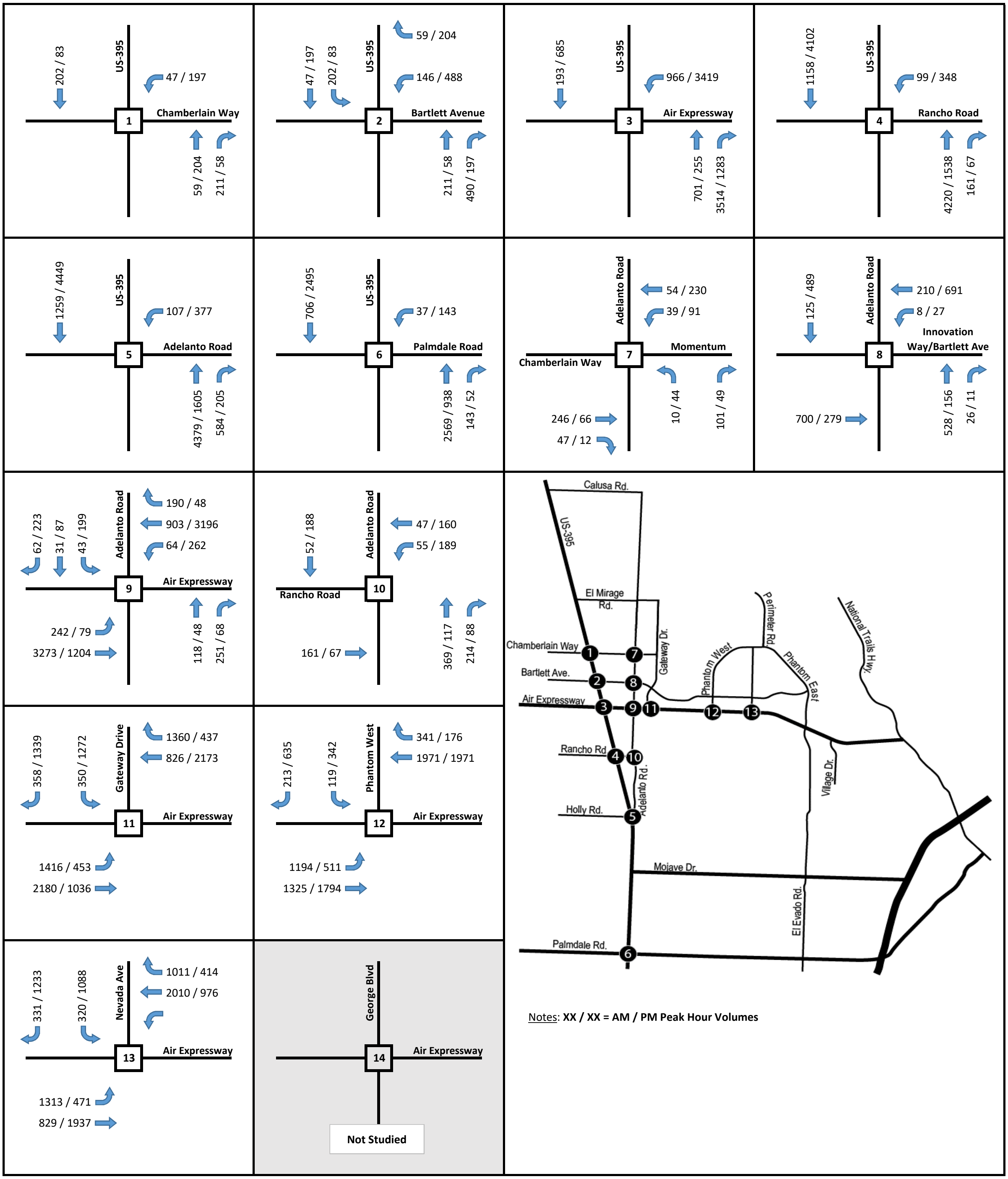
AM/PM Peak Hour Project Trip Assignment - Existing Plus Project Buildout (ctd)

Exhibit 12c



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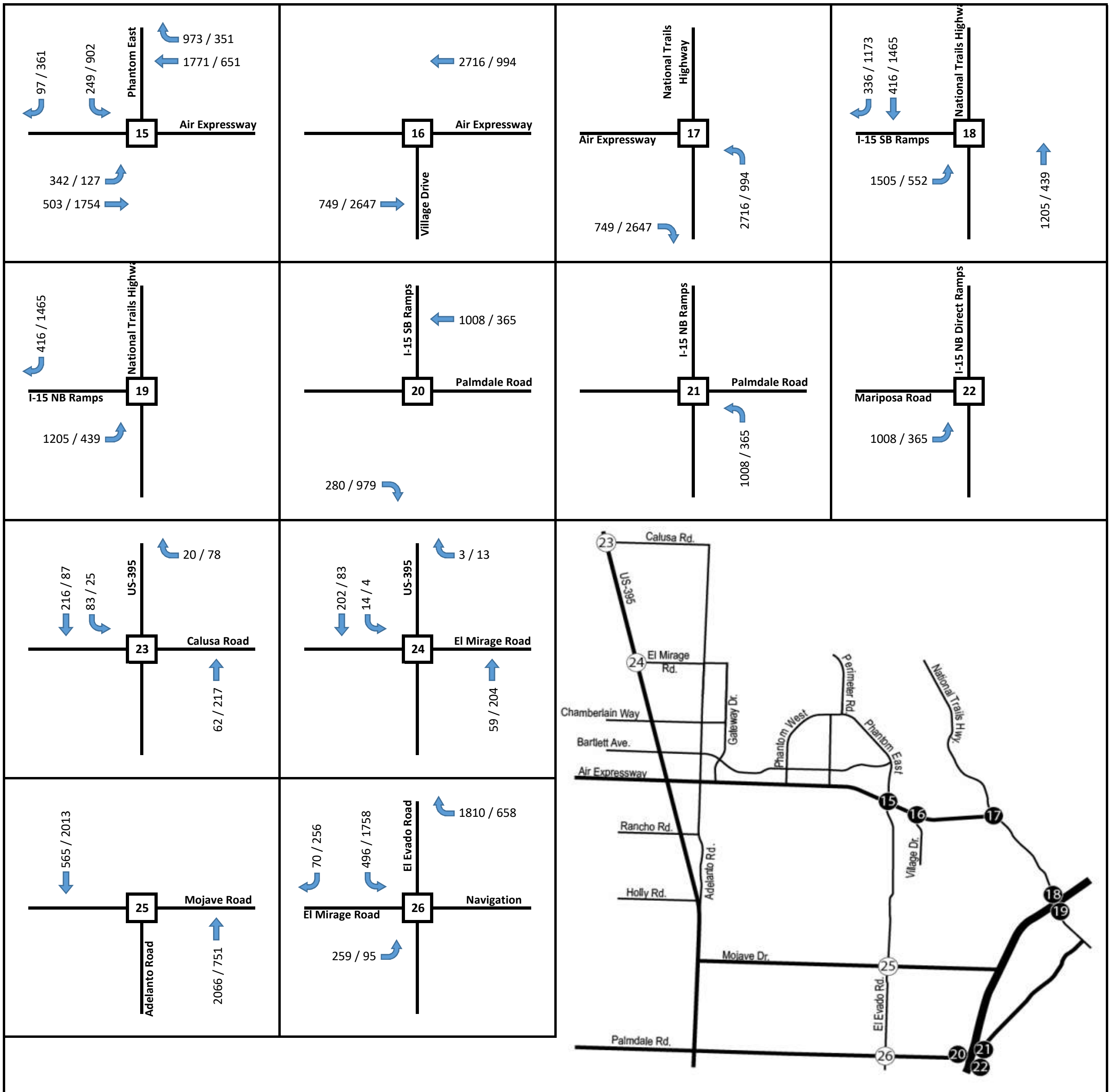
AM/PM Peak Hour Project Trip Assignment - Forecast Year 2040 Without HDC With Project

Exhibit 13a



Notes: **XX / XX = AM / PM Peak Hour Volumes**

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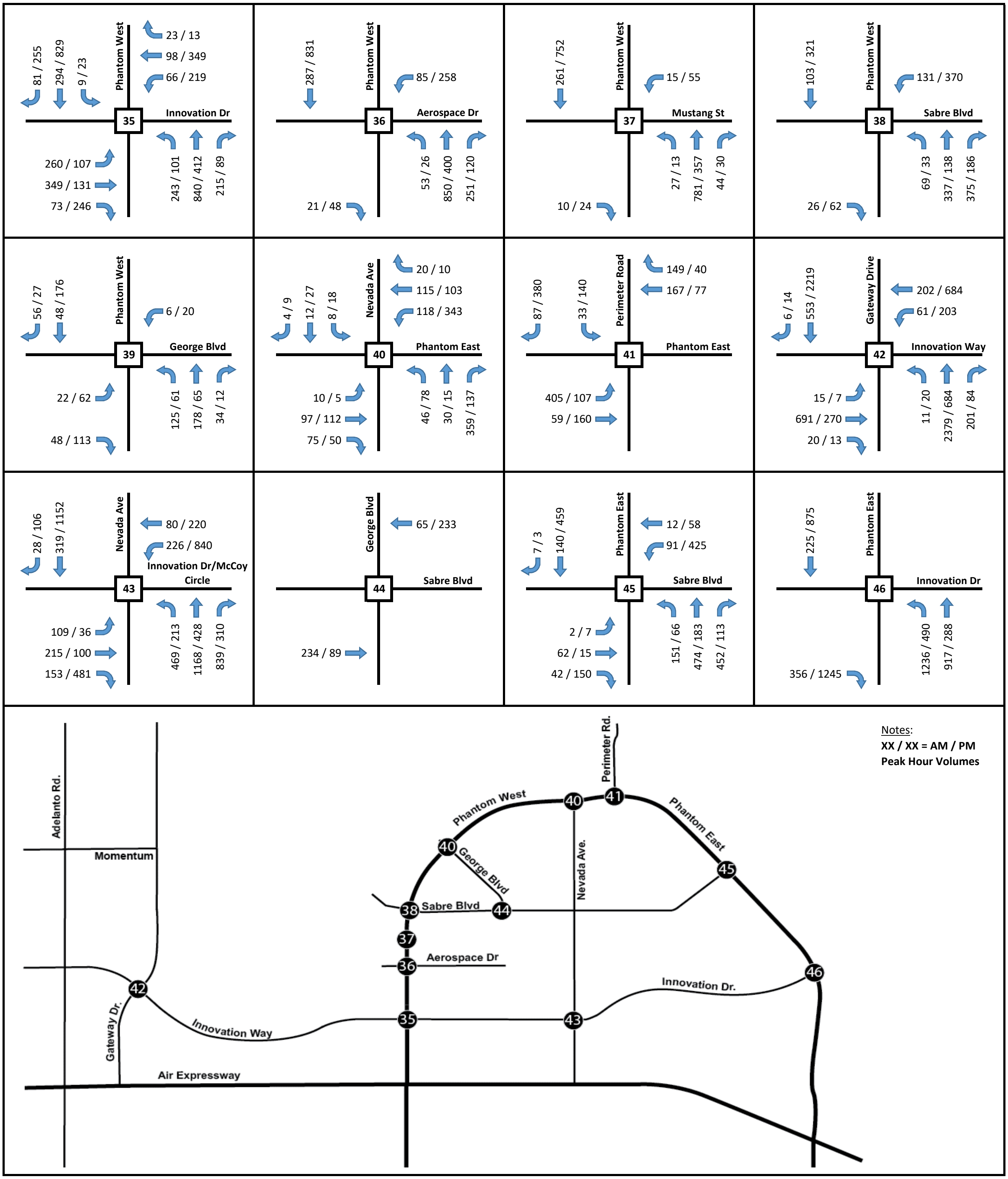
AM/PM Peak Hour Project Trip Assignment
- Forecast Year 2040 Without HDC With Project (ctd)

Exhibit 13b



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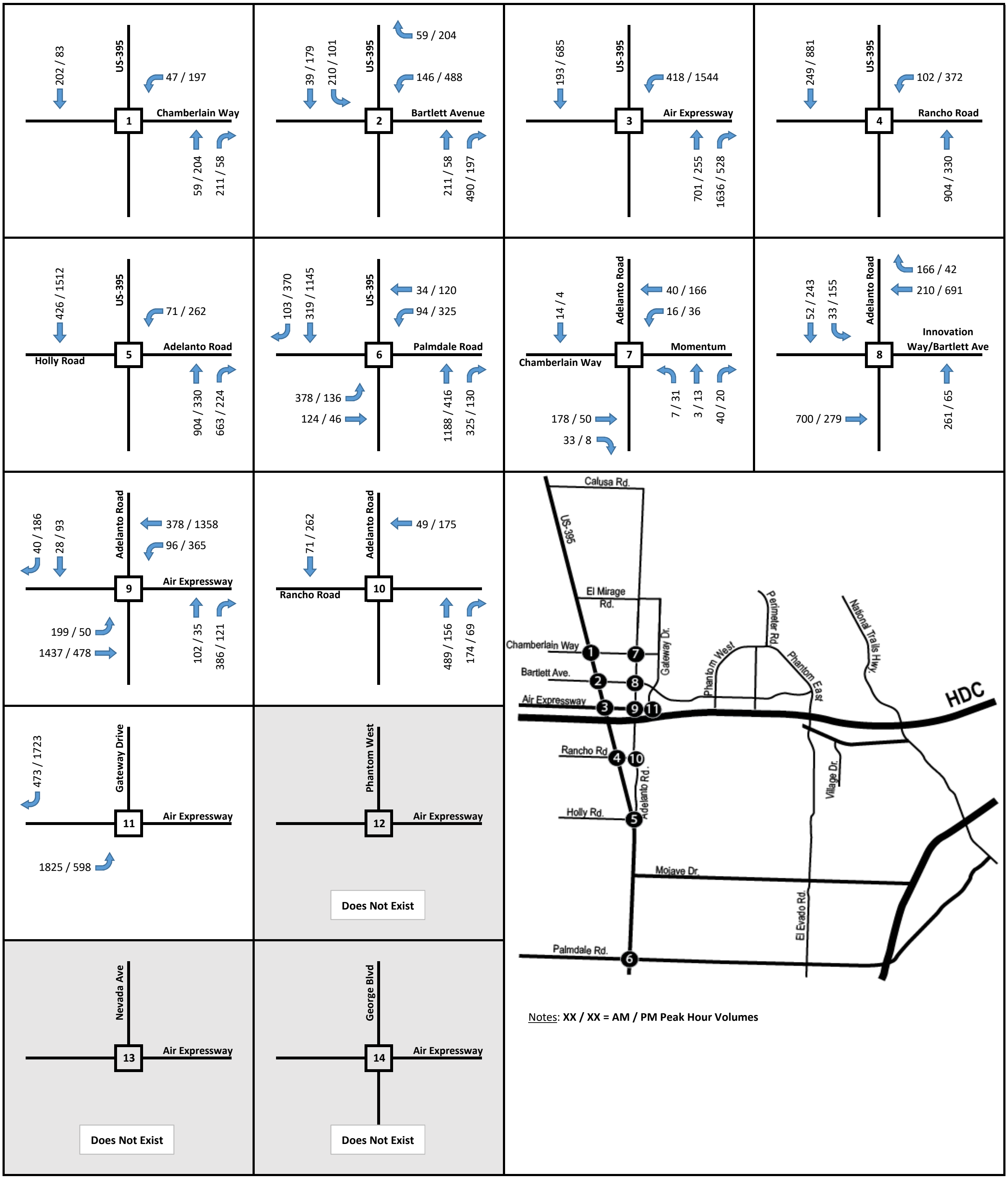
AM/PM Peak Hour Project Trip Assignment - Forecast Year 2040 Without HDC With Project (ctd)

Exhibit 13c



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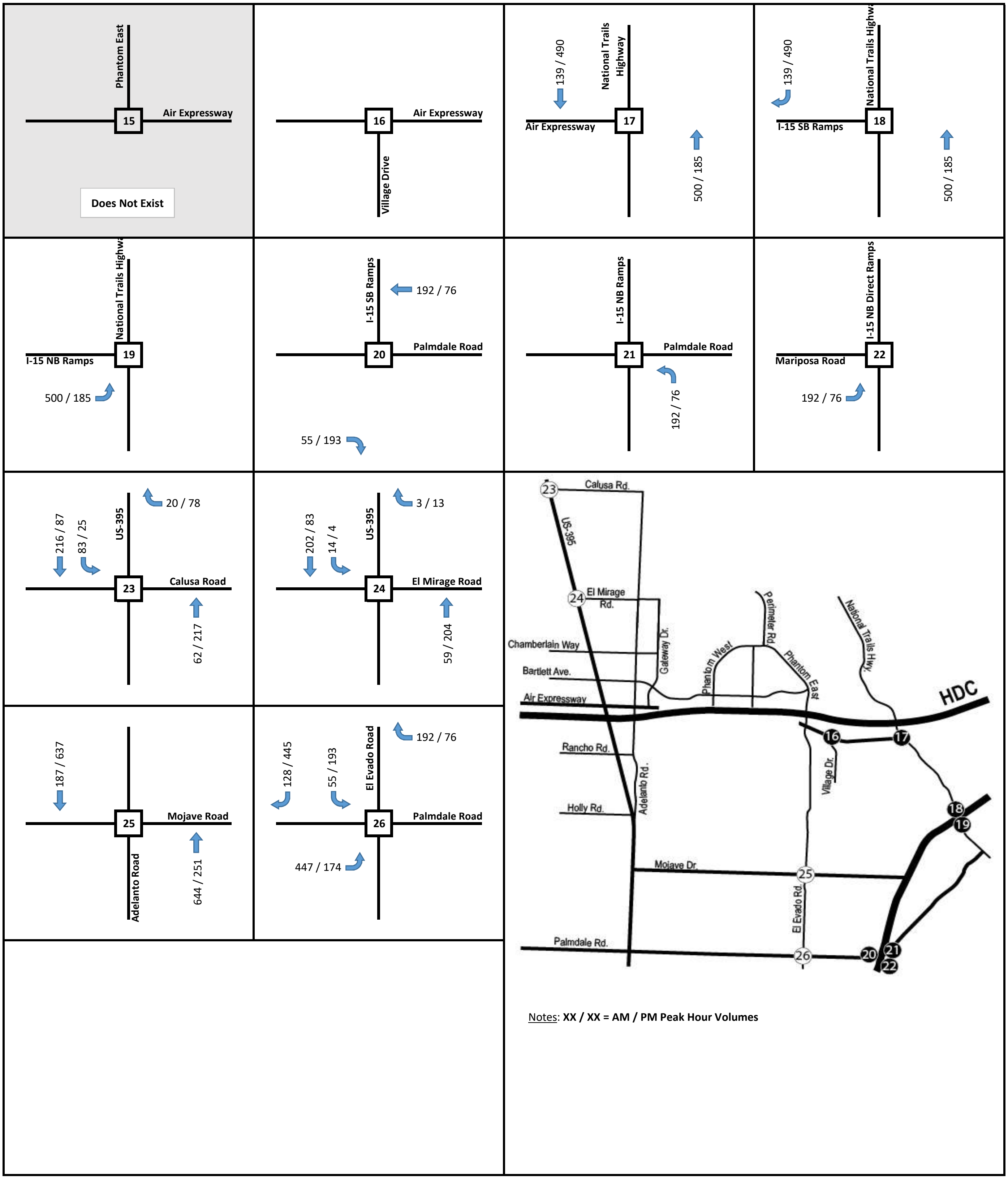
AM/PM Peak Hour Project Trip Assignment - Forecast Year 2040 With Project

Exhibit 14a



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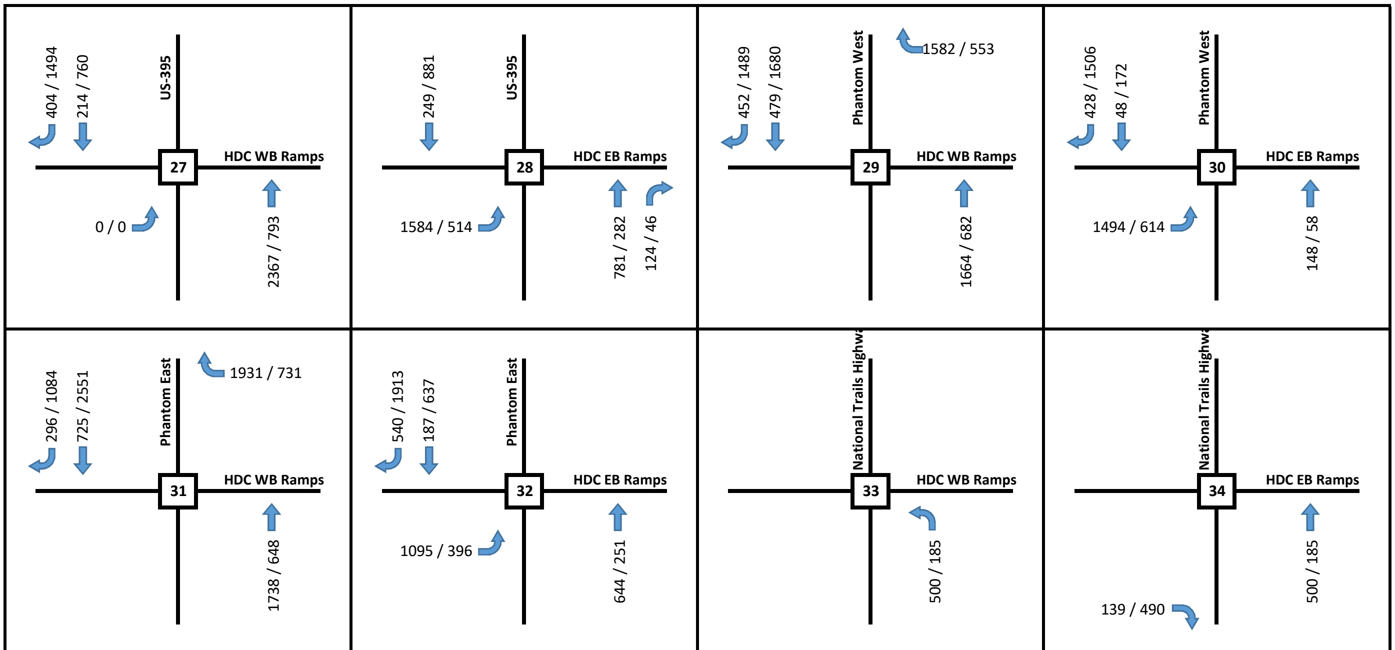
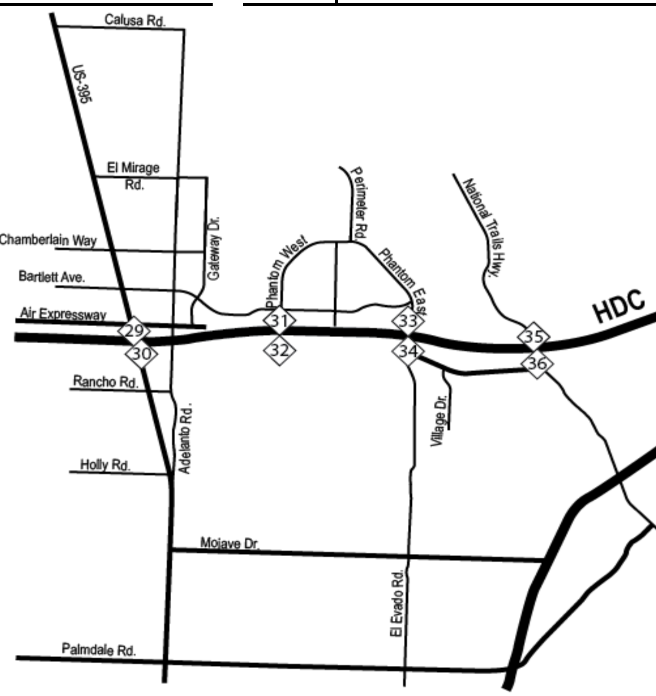
AM/PM Peak Hour Project Trip Assignment - Forecast Year 2040 With Project

Exhibit 14b



Notes: **XX / XX = AM / PM Peak Hour Volumes**



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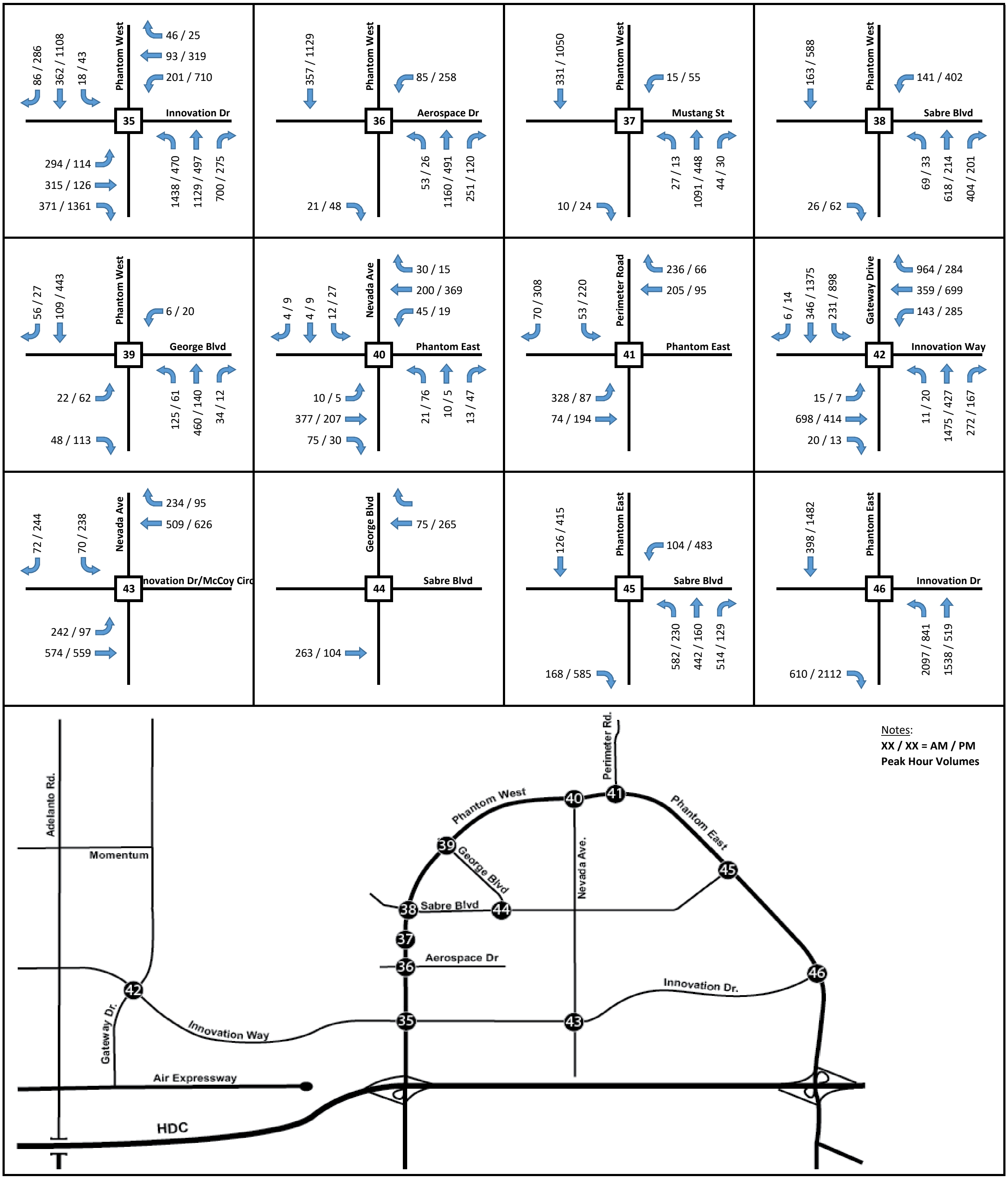
AM/PM Peak Hour Project Trip Assignment - Forecast Year 2040 With Project

Exhibit 14c



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AM/PM Peak Hour Project Trip Assignment - Forecast Year 2040 With Project

Exhibit 14d

5 EXISTING WITH PROJECT BUILDOUT

This section analyzes the potential traffic impacts from the addition of project related trips to the existing conditions traffic volumes at the study intersections. It is important to note that this analysis assumes the existing roadway network configuration which limits the routing options of project related traffic as well as area background traffic. In reality, the study area roadway system will be changing significantly by the time the SCLA Specific Plan area is fully developed. With the addition of new roadway connections and regional freeway facilities will likely redistribute and spread traffic throughout the area. Some of these connections to the roadway network would include:

- Proposed construction of the High Desert Corridor and the 395-Freeway
- Planned extension of Phantom East to/from the south between Air Expressway and Palmdale Rd.

Because of these considerations, the analysis findings and identified intersection improvement needs for this scenario are for "informational purposes" only.

5.1 EXISTING WITH PROJECT BUILDOUT TRAFFIC VOLUMES

Existing With Project Buildout traffic volumes are derived by adding trips forecast to be generated by the proposed project to existing traffic volumes.

Exhibit 15a-15c shows the forecast Existing With Project Buildout AM/PM peak hour volumes at study intersections.

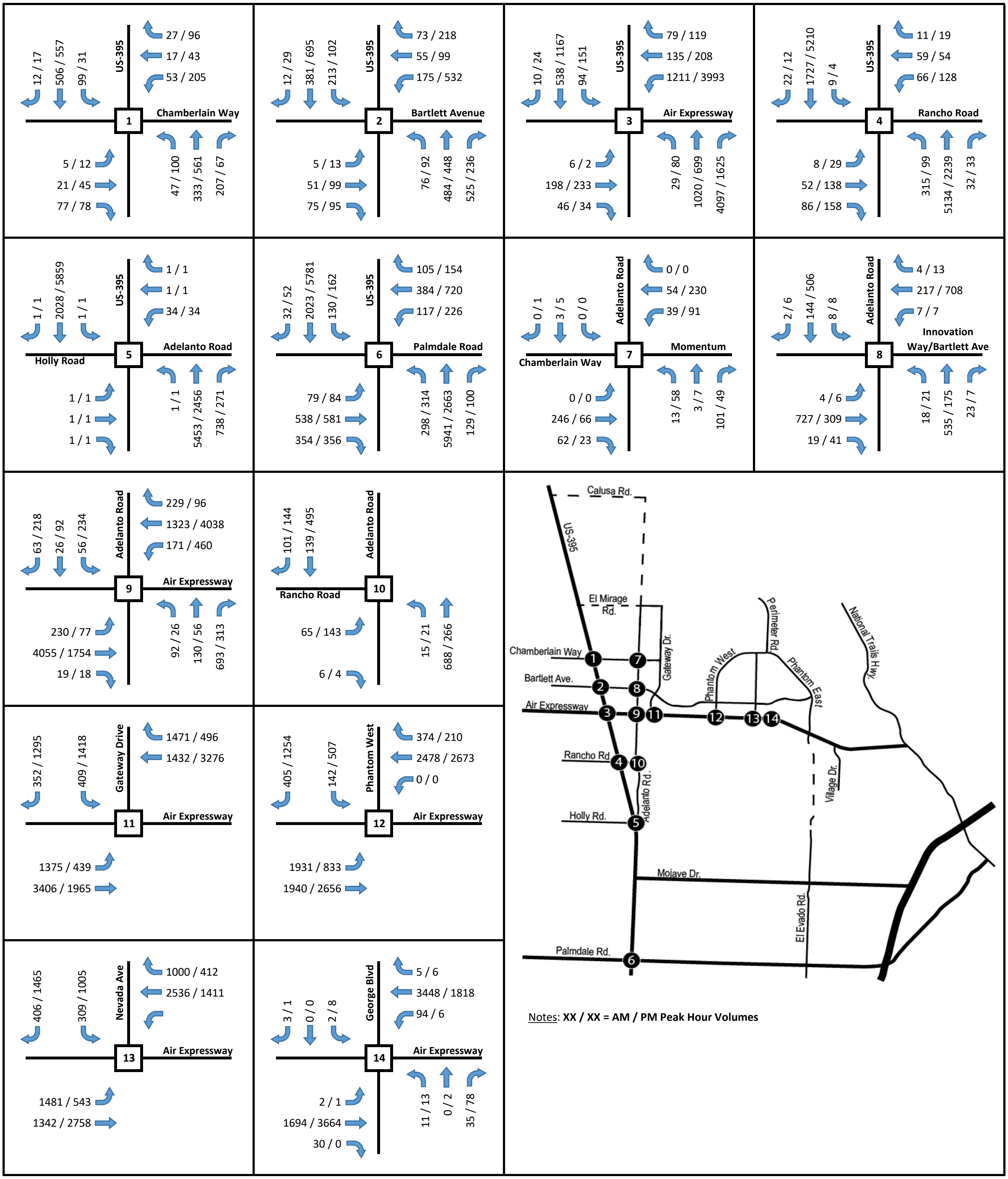
5.2 EXISTING WITH PROJECT BUILDOUT PEAK HOUR STUDY INTERSECTION LOS

Table 5 summarizes Existing With Project AM and PM peak hour level of service for all study intersections. Detailed analysis sheets are contained in **Appendix D**.

As shown, 11 of the 34 intersections studied in the Existing With Project Buildout conditions are forecast to operate at an acceptable level of service (LOS D or better) and 23 intersections operate at a deficient level of service (LOS E or worse) during the AM peak hour. During the PM peak hour, 5 intersections operate an acceptable level of service and 29 intersections operate at a deficient level of service.

According to the City of Victorville significance criteria, 27 of the 34 intersections would be significantly impacted during one or both peak hours as a result of the proposed project and therefore require mitigation.

It is not likely that the SCLA project would be fully developed under these conditions. In this scenario, the project will add a significant amount of project trips to the existing street network which is missing some key regional roadway connections. Without these important facilities the roadway network is forecast to operate poorly under Existing With Project Buildout conditions.



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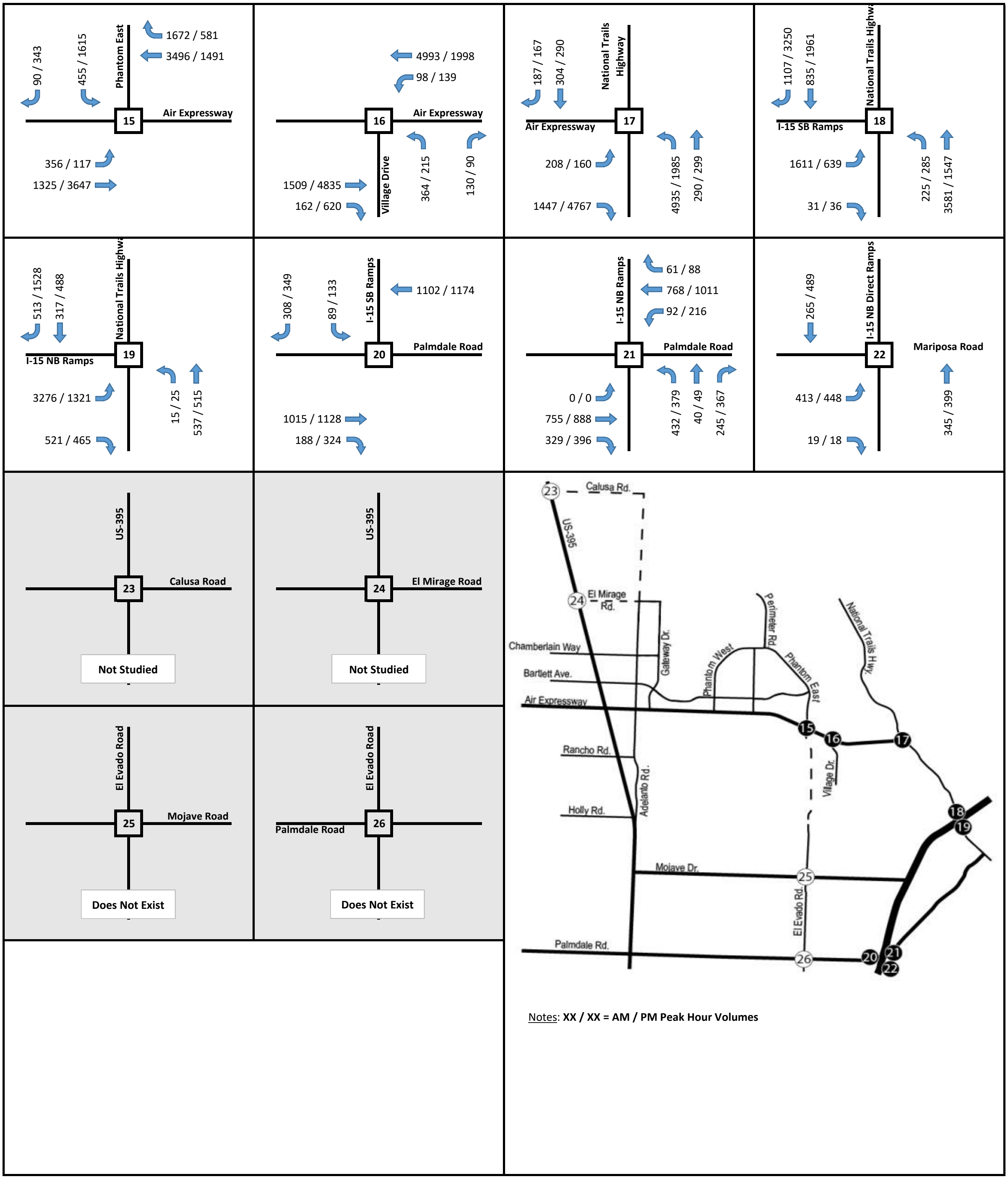
Existing Plus Project Buildout AM/PM Peak Hour Volumes

Exhibit 15a



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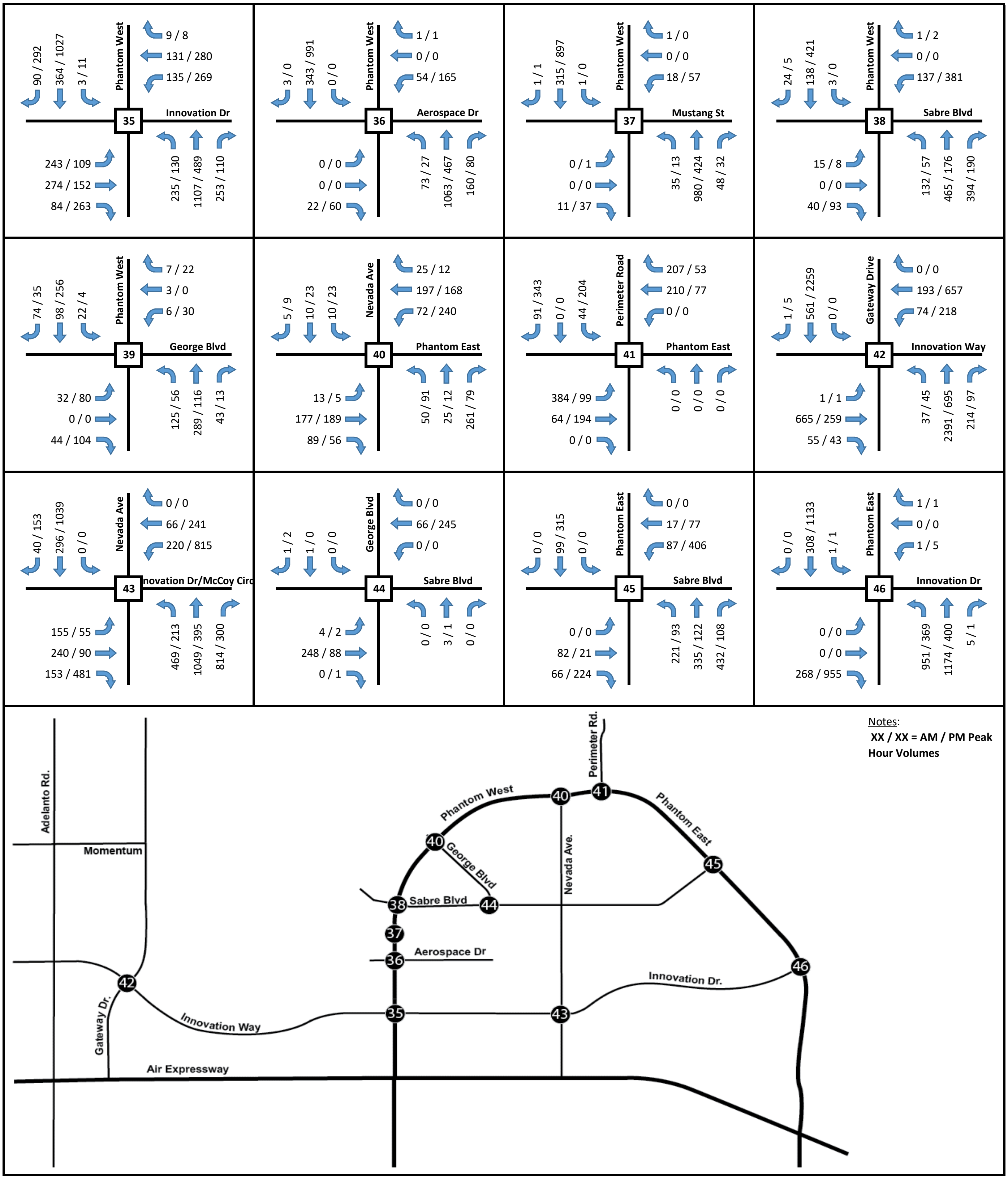
Existing Plus Project Buildout
AM/PM Peak Hour Volumes (ctd)
Exhibit 15b



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Existing Plus Project Buildout AM/PM Peak Hour Volumes (ctd)

Exhibit 15c

TABLE 5, EXISTING WITH PROJECT BUILDOUT AM/PM PEAK HOUR INTERSECTION LOS

Study Intersection	Traffic Control	Existing Conditions				Existing With Project Conditions				Significant Impact?[3]	
		AM		PM		AM		PM			
		Delay[1]	LOS	Delay[1]	LOS	Delay[1]	LOS	Delay[1]	LOS	AM	PM
1 - US-395/Chamberlain Way	Signal	9.2	A	10.2	B	18.7	B	**>80.0**	**F[2]**	No	**YES**
With Improvements						11.3	B	14.6	B	No	No
2 - US-395/Bartlett Avenue	Signal	10.9	B	12.1	B	31.5	C	**69.0**	**E**	No	**YES**
With Improvements						39.7	D	52.6	D	No	No
3 - US-395/Air Expressway	Signal	16.6	B	24.0	C	**>80.0**	**F[2]**	**>80.0**	**F[2]**	**YES**	**YES**
With Improvements						29.0	C	**>80.0**	**F[2]**	No	**YES**
4 - US-395/Rancho Road	Signal	15.7	B	15.3	B	**>80.0**	**F[2]**	**>80.0**	**F[2]**	**YES**	**YES**
With Improvements						**>80.0**	**F[2]**	**>80.0**	**F[2]**	**YES**	**YES**
5 - US-395/Adelanto Road	TWSC	**>50.0**	**F[2]**	**>50.0**	**F[2]**	**>50.0**	**F[2]**	**>50.0**	**F[2]**	**YES**	**YES**
With Improvements	Signal					52.2	D	**79.4**	**E**	No	**YES**
6 - US-395/Palmdale Road	Signal	41.6	D	50.7	D	**>80.0**	**F[2]**	**>80.0**	**F[2]**	**YES**	**YES**
With Improvements						**>80.0**	**F[2]**	**>80.0**	**F[2]**	**YES**	**YES**
7 - Adelanto Road/Chamberlain Way- Momentum	TWSC	8.4	A	8.4	A	13.1	B	17.4	C	No	No
8 - Adelanto Road/Innovation Way/Bartlett Ave	AWSC	7.4	A	7.5	A	**>50.0**	**F[2]**	**>50.0**	**F[2]**	**YES**	**YES**
With Improvements	Signal					22.6	C	11.1	B	No	No
9 - Adelanto Road/Air Expressway	Signal	18.1	B	16.1	B	**>80.0**	**F[2]**	**>80.0**	**F[2]**	**YES**	**YES**
With Improvements						**69.1**	**E**	50.7	D	**YES**	No
10 - Adelanto Road/Rancho Road	OWSC	9.5	A	9.7	A	12.5	B	16.1	C	No	No
11 - Gateway Drive/Air Expressway	Signal	4.9	A	5.5	A	**>80.0**	**F[2]**	**>80.0**	**F[2]**	**YES**	**YES**
With Improvements						51.9	D	**>80.0**	**F[2]**	No	**YES**
12 - Phantom West/Air Expressway	Signal	23.9	C	18.6	B	**>80.0**	**F[2]**	**>80.0**	**F[2]**	**YES**	**YES**
With Improvements						**>80.0**	**F[2]**	**70.9**	**E**	**YES**	**YES**
13 - Nevada Ave/Air Expressway	Signal	**>80.0**	**F[2]**	13.7	B	**>80.0**	**F[2]**	**>80.0**	**F[2]**	**YES**	**YES**
With Improvements						**>80.0**	**F[2]**	43.5	D	**YES**	No
14 - George Blvd/Air Expressway	Signal	34.5	C	34.8	C	**>80.0**	**F[2]**	**>80.0**	**F[2]**	**YES**	**YES**
With Improvements						22.9	C	20.2	C	No	No
15 - Phantom East/Air Expressway	Signal	**76.7**	**E**	10.8	B	**>80.0**	**F[2]**	**>80.0**	**F[2]**	**YES**	**YES**
With Improvements						53.3	D	**>80.0**	**F[2]**	No	**YES**
16 - Village Drive/Air Expressway	Signal	11.2	B	19.2	B	**>80.0**	**F[2]**	**>80.0**	**F[2]**	**YES**	**YES**
With Improvements						48.8	D	46.6	D	No	No
17 - National Trails Highway/Air Expressway	Signal	24.6	C	16.5	B	**>80.0**	**F[2]**	**>80.0**	**F[2]**	**YES**	**YES**
With Improvements						**>80.0**	**F[2]**	13.6	D	**YES**	No

Study Intersection	Traffic Control	Existing Conditions		Existing With Project Conditions		Significant Impact?[3]	
		AM	PM	AM	PM		
		Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS	AM	PM
18 - I-15 SB Ramps/National Trails Highway	Signal	18.6 - B	21.2 - C	**>80.0 - F[2]**	**>80.0 - F[2]**	**YES**	**YES**
With Improvements				**>80.0 - F[2]**	38.1 - D	**YES**	No
19 - I-15 NB Ramps/National Trails Highway	Signal	24.7 - C	22.3 - C	**>80.0 - F[2]**	**>80.0 - F[2]**	**YES**	**YES**
With Improvements				**>80.0 - F[2]**	**75.3 - E**	**YES**	**YES**
20 - I-15 SB Ramps/Palmdale Road	Signal	50.2 - D	**69.1 - E**	50.2 - D	**69.1 - E**	No	No
21 - I-15 NB Ramps/Palmdale Road	Signal	17.7 - B	**>80.0 - F[2]**	17.7 - B	**>80.0 - F[2]**	No	No
22 - I-15 NB Direct Ramps/Mariposa Road	Signal	17.6 - B	25.0 - C	17.6 - B	25.0 - C	No	No
23 - US-395/Calusa Road	Not Studied						
24 - US-395/El Mirage Road	Not Studied						
25 - El Evado Road/Mojave Road	Not Studied						
26 - El Evado Road/Palmdale Road- Navigation	Not Studied						
27 - US-395/HDC WB Ramps	Not Studied						
28 - US-395/HDC EB Ramps	Not Studied						
29 - Phantom West/HDC WB Ramps	Not Studied						
30 - Phantom West/HDC EB Ramps	Not Studied						
31 - Phantom East/HDC WB Ramps	Not Studied						
32 - Phantom East/HDC EB Ramps	Not Studied						
33 - National Trails Highway/HDC WB Ramps	Not Studied						
34 - National Trails Highway/HDC EB Ramps	Not Studied						
35 - Phantom West/Innovation Dr	TWSC	9.7 - A	9.0 - A	**>50.0 - F[2]**	**>50.0 - F[2]**	**YES**	**YES**
With Improvements				27.5 - C	54.7 - D	No	No
36 - Phantom West/Aerospace Dr	TWSC	8.8 - A	9.3 - A	**>50.0 - F[2]**	**>50.0 - F[2]**	**YES**	**YES**
With Improvements				4.1 - A	8.5 - A	No	No
37 - Phantom West/Mustang St	TWSC	9.7 - A	9.3 - A	**>50.0 - F[2]**	**>50.0 - F[2]**	**YES**	**YES**
With Improvements				13.8 - B	13.3 - B	No	No
38 - Phantom West/Sabre Blvd	TWSC	10.2 - B	9.4 - A	**>50.0 - F[2]**	**>50.0 - F[2]**	**YES**	**YES**
With Improvements				6.0 - A	11.6 - B	No	No
39 - Phantom West/George Blvd	TWSC	9.4 - A	8.7 - A	15.1 - C	19.1 - C	No	No
40 - Nevada Ave/Phantom East	TWSC	8.6 - A	9.0 - A	19.5 - C	**>50.0 - F[2]**	No	**YES**
With Improvements				16.2 - C	16.9 - C	No	No
41 - Perimeter Road/Phantom East	TWSC	8.7 - A	8.9 - A	**>50.0 - F[2]**	**>50.0 - F[2]**	**YES**	**YES**
With Improvements				**36.9 - E**	17.5 - C	**YES**	No

Study Intersection	Traffic Control	Existing Conditions				Existing With Project Conditions				Significant Impact?[3]	
		AM		PM		AM		PM			
		Delay[1]	LOS	Delay[1]	LOS	Delay[1]	LOS	Delay[1]	LOS	AM	PM
42 - Gateway Drive/Innovation Way	TWSC	8.5	A	8.7	A	**>50.0**	**F[2]**	**>50.0**	**F[2]**	**YES**	**YES**
With Improvements						49.5	D	54.3	D	No	No
43 - Nevada Ave/Innovation Dr/McCoy Circle	OWSC	0.0	A	0.0	A	**>50.0**	**F[2]**	**>50.0**	**F[2]**	**YES**	**YES**
With Improvements						22.0	C	43.1	D	No	No
44 - George Blvd/Sabre Blvd	TWSC	7.2	A	9.1	A	12.1	B	10.9	B	No	No
45 - Phantom East/Sabre Blvd	TWSC	Does Not Exist Without Project				**>50.0**	**F[2]**	**>50.0**	**F[2]**	**YES**	**YES**
With Improvements						27.5	D	32.1	D	No	No
46 - Phantom East/Innovation Dr	TWSC	Does Not Exist Without Project				13.6	B	**>50.0**	**F[2]**	No	**YES**
With Improvements						10.2	B	11.7	B	No	No

Note: Deficient intersection operation indicated in **bold**.

[1] Average seconds of delay per vehicle.

[2] Delay exceeds 80.0 seconds for signalized intersection or 50.0 seconds for unsignalized intersections; Level of Service F per HCM

[3] Delay deteriorates from acceptable (LOS D or better) to unacceptable (LOS E or F) OR change in delay for an already deficient intersection by 2% or more

LOS = level of service; TWSC = Two-Way Stop Control; OWSC = One-Way Stop Control

5.3 EXISTING WITH PROJECT BUILDOUT MITIGATION MEASURES

Table 6 shows the mitigation measures that have been identified to reduce the traffic impacts at the intersections that are expected to operate at deficient levels of service with the project. These mitigation measures are generally consistent with those improvements identified by the City of Victorville circulation element as shown in **Exhibit 4** and **Exhibits 5a-5e** and do not provide improvements beyond what can be accommodated by these classifications.

Table 5 summarizes the AM and PM peak hour level of service assuming the implementation of the identified improvements. With the implementation of the identified mitigation measures, the following 12 locations would continue to operate at deficient levels of service with the project and would result in unavoidable significant impacts:

Existing With Project Conditions		
Intersection	**AM Peak Hour**	**PM Peak Hour**
3 - US-395 / Air Expressway	LOS F	LOS F
4 - US-395 / Rancho Road	LOS F	LOS F
5 - US-395 / Adelanto Road	Acceptable	LOS F
6 - US-395 / Palmdale Road	LOS F	LOS F
9 - Adelanto Road / Air Expressway	LOS E	Acceptable
11 - Gateway Drive / Air Expressway	Acceptable	LOS F
12 - Phantom West / Air Expressway	LOS F	Acceptable
13 - Nevada Avenue / Air Expressway	LOS F	Acceptable
15 - Phantom East / Air Expressway	Acceptable	LOS F
18 - I-15 SB Ramps / National Trails Hwy	LOS F	Acceptable
19 - I-15 NB Ramps / National Trails Hwy	LOS F	Acceptable
41 - Perimeter Road / Phantom East	Acceptable	LOS F

Exhibit 16a-16b shows the Existing With Project Buildout mitigated lane configurations

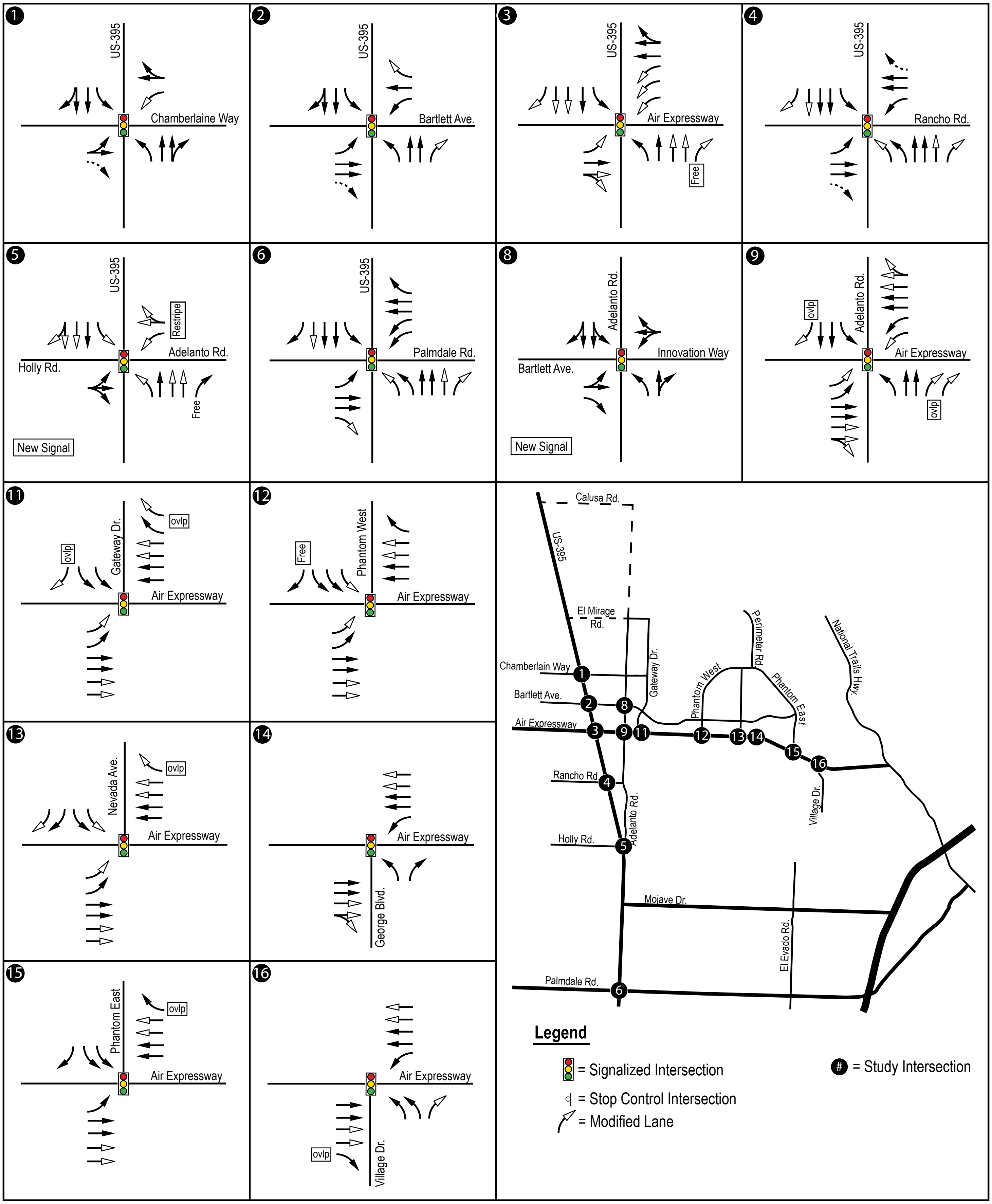
TABLE 6, EXISTING WITH PROJECT BUILDOUT RECOMMENDED MITIGATION

Intersection	Existing With Project Buildout Recommended Mitigation
1 - US-395 / Chamberlain Way	• Install westbound dedicated left-turn-lane
2 - US - 395 / Bartlett Ave	• Install northbound dedicated right-turn-lane • Install westbound dedicated right-turn-lane
3 - US - 395 / Air Expressway	• Install second and third northbound through-lanes and one northbound dedicated right-turn-lane with a free movement • Install second and third southbound through-lanes and one southbound dedicated right-turn-lane • Install dedicated eastbound left-turn-lane; Modify eastbound shared through/left-turn lane to a dedicated through lane; Install one shared through/right-turn lane • Install three westbound left-turn lanes

Intersection	Existing With Project Buildout Recommended Mitigation
4 - US - 395 / Rancho Rd	• Install second northbound left-turn-lane, third northbound through-lane, and one northbound dedicated right-turn-lane • Install third southbound through-lane and southbound dedicated right-turn-lane
5 - US - 395 /Adelanto Rd	• Signalize Intersection • Install second and third northbound through-lanes and northbound left-turn-lane • Install second southbound through-lanes; Install third combination shared through/right-turn-lane; Install southbound left-turn-lane • Restripe westbound approach to include dedicate left-turn-lane and a shared through/right-turn-lane
6 - US - 395 / Palmdale Rd	• Install third northbound through-lanes; second left-turn-lane; and dedicated right-turn-lane • Install third southbound through-lane • Install eastbound dedicated right-turn-lane
8 - Adelanto Rd / Innovation Way / Bartlett Ave	• Signalize Intersection
9 - Adelanto Rd / Air Expressway	• Install two northbound dedicated right-turn-lanes with an overlap phase • Install a southbound dedicated right-turn-lane with an overlap phase • Install third eastbound through-lane; fourth combination shared through/right-turn-lane; and second eastbound left-turn-lane • Install third eastbound through-lane; fourth combination shared through/right-turn-lane; and second eastbound left-turn-lane
11 - Gateway Dr / Air Expressway	• Install southbound dedicated right-turn-lane with an overlap phase • Install third and fourth eastbound through lanes and second eastbound left-turn-lane • Install third and fourth westbound through-lanes and second westbound right-turn-lane with an overlap phase
12 - Phantom West / Air Expressway	• Install third southbound left-turn-lane; install southbound right-turn free movement • Install second and third eastbound through-lanes and second eastbound left-turn-lane • Install third and fourth westbound through-lanes
13 - Nevada Ave / Air Expressway	• Install second southbound left-turn-lane and second southbound right-turn-lane • Install third and fourth eastbound through-lane, and second eastbound left-turn-lane • Install third and fourth westbound through-lanes; Install westbound dedicated right-turn-lane with an overlap phase
14 - George Blvd / Air Expressway	

Intersection	Existing With Project Buildout Recommended Mitigation
	• Install third eastbound through lane and fourth combination through/shared right-turn-lane • Install third and fourth westbound through lanes
15 - Phantom East / Air Expressway	• Install third and fourth eastbound through-lanes • Install third and fourth westbound through-lanes
16 - Village Dr / Air Expressway	• Install northbound dedicated right-turn-lane • Install third and fourth eastbound through-lanes; Install eastbound right-turn overlap phase • Install third and fourth westbound through-lanes
17 - National Trails Highway / Air Expressway	• Reconfigure intersection to make Air Expressway the east/west through movement and the north leg of National Trails Highway a "T" • Install two southbound left-turn-lanes and southbound right-turn lane • Install two eastbound left-turn-lanes and two eastbound through-lanes • Install three westbound through-lanes and one westbound right-turn-lane
18 - I-15 Southbound Ramps / National Trails Hwy	• Install second northbound left-turn-lane • Convert southbound dedicated right-turn-lane to a free movement • Install second eastbound left-turn-lane
19 - I-15 Northbound Ramps / National Trails Hwy	• Install two southbound dedicated right-turn-lanes • Install second eastbound left-turn-lane
35 - Phantom West / Innovation Dr	• Signalize Intersection
36 - Phantom West / Aerospace Dr	• Signalize Intersection • Install northbound dedicated right-turn-lane • Install southbound dedicated right-turn-lane
37 - Phantom West /Mustang St	• Install median modifications to restrict eastbound and westbound left turns
38 - Phantom West / Sabre Blvd	• Signalize Intersection • Install northbound dedicated right-turn-lane • Install southbound dedicated right-turn-lane
40 - Nevada Ave / Phantom East	• Install All-Way-Stop • Install northbound left-turn-lane
41 - Phantom East / Perimeter Road	• Install All-Way-Stop • Install southbound right-turn-lane

Intersection	Existing With Project Buildout Recommended Mitigation
42 - Gateway Dr / Innovation Way	• Signalize Intersection • Install east leg of the intersection • Install three northbound through-lanes and one northbound dedicated right-turn-lane • Install second and third southbound through lanes and one southbound left-turn lane • Install one eastbound through-lanes and one eastbound shared through/right-turn-lane • Install one westbound left-turn-lane, one westbound through-lane, and one westbound shared through/right-turn-lane
43 - Nevada Ave / Innovation Dr / McCoy Circle	• Signalize Intersection • Install east leg of the intersection • Install second northbound left-turn-lane, two northbound through-lanes, and one northbound dedicated right-turn-lane • Install one southbound left-turn-lane and two southbound through-lanes • Install two eastbound through-lanes and one eastbound dedicated right-turn-lane with a channelized yield movement • Install two westbound left-turn-lanes, one westbound through-lane, and one westbound shared through/right-turn-lane
45 - Phantom East / Sabre Boulevard	• Install All-Way-Stop • Install west leg of the intersection to include one shared left/through/right-turn-lane • Install east leg of the intersection to include one left-turn-lane and one shared through/right-turn-lane
46 - Phantom East / Innovation Way	• Signalize Intersection • Install west leg of the intersection to include one eastbound shared left/through-lane and one eastbound dedicated right-turn-lane with a channelized yield movement



Existing With Project Buildout
Mitigated Intersection Lane Configuration

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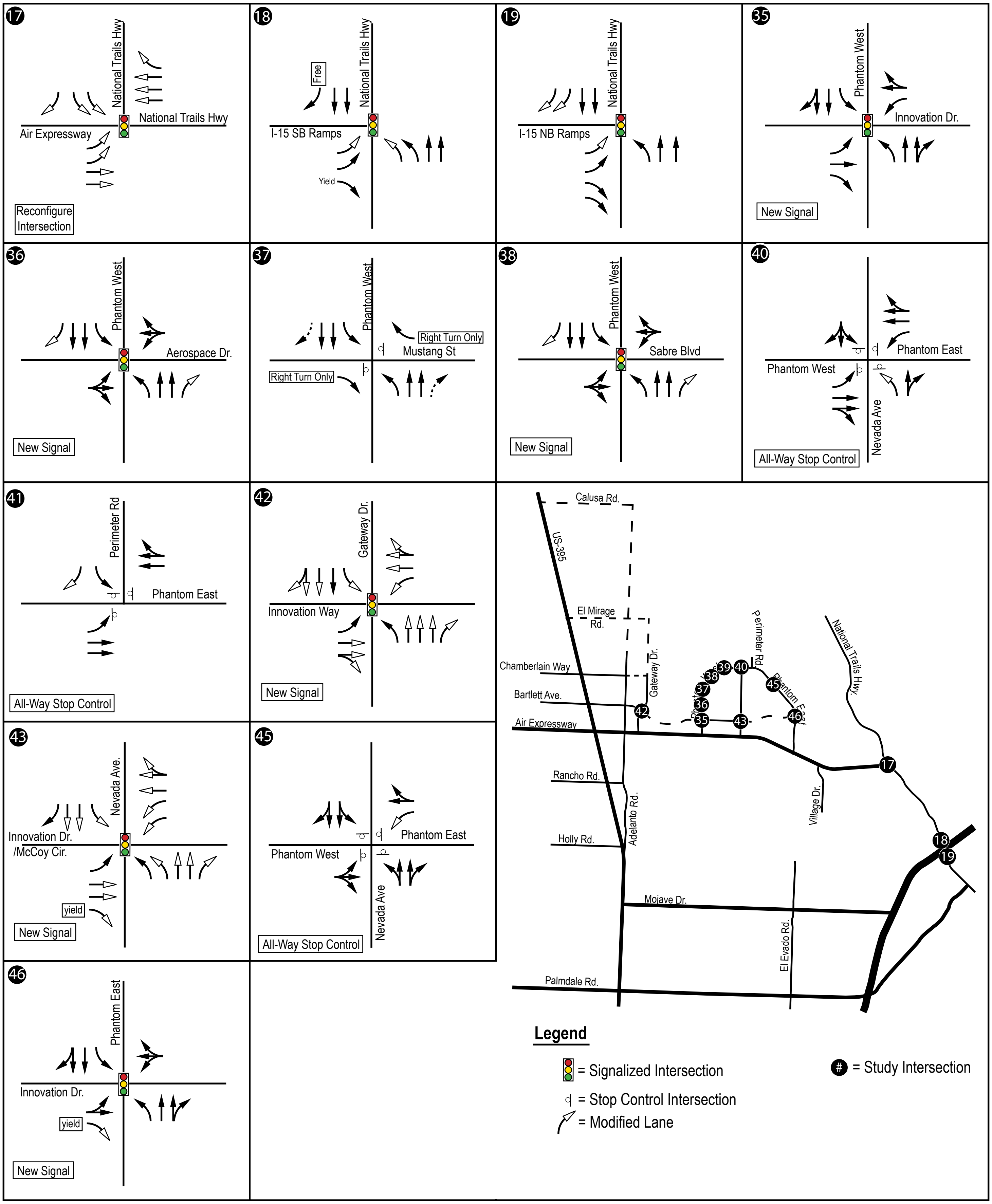
Exhibit 16a



Existing With Project Buildout
Mitigated Intersection Lane Configuration (ctd)

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Exhibit 16b

6 FORECAST YEAR 2040 WITHOUT HDC WITHOUT PROJECT

This section analyzes the potential impacts for Forecast Year 2040 Without HDC Without Project conditions. This scenario assumes complete buildout of the City of Victorville roadway network consistent with the circulation map shown in **Exhibit 4** with the exception of the High Desert Corridor.

6.1 FORECAST YEAR 2040 WITHOUT HDC REGIONAL NETWORK IMPROVEMENTS

Forecast Year 2040 Without HDC conditions assumes the following modifications to the roadway circulation system within the study area:

Without Project:

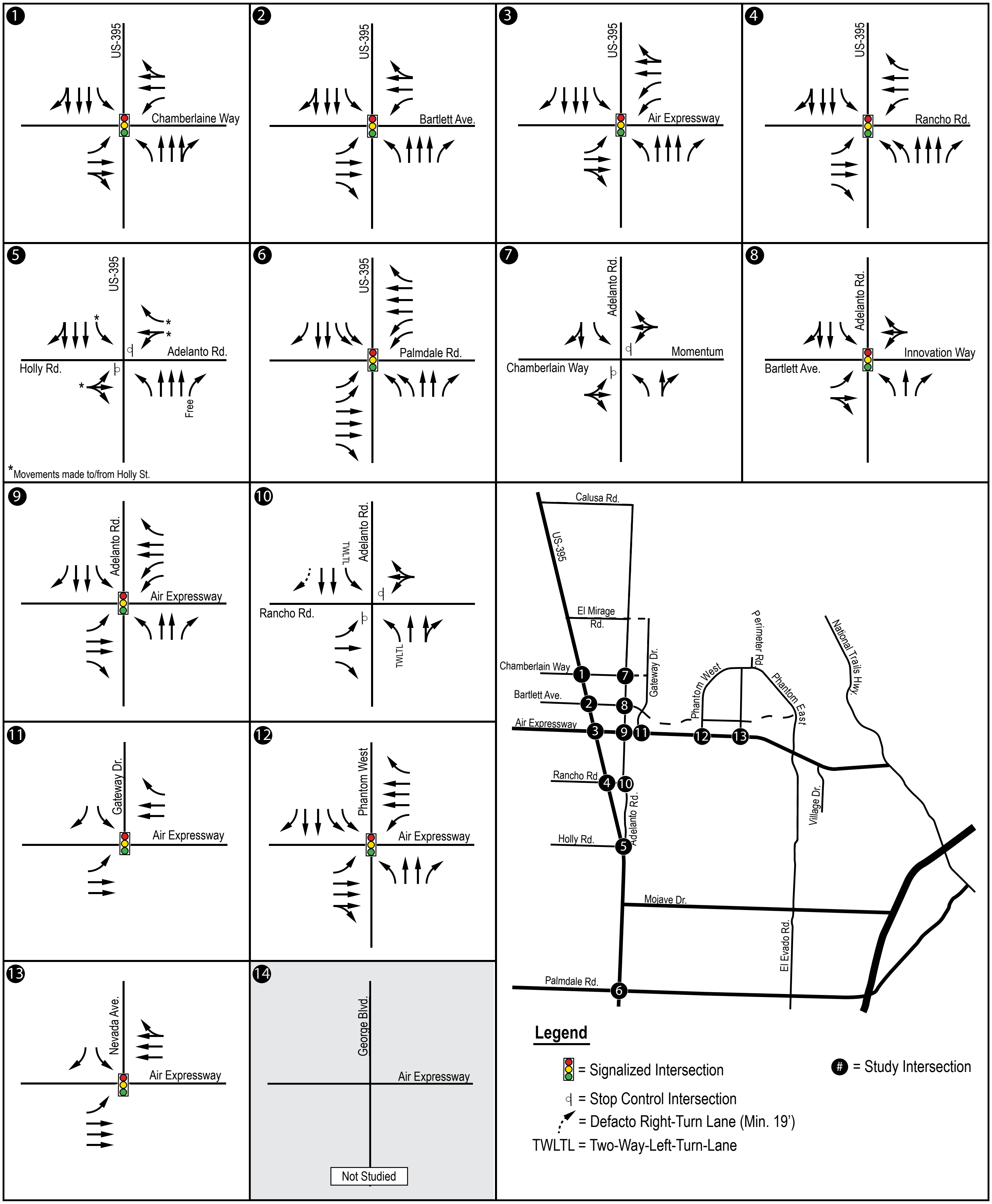
- Extension of Phantom East from Air Expressway to Palmdale Road (existing El Evado Road alignment) (2-lanes)
- Extension of El Mirage Road from US-395 to Adelanto Road (2-lanes)
- Extension of Adelanto Road from El Mirage Road to Calusa Road (2-lanes)
- Construction of Calusa Road from US-395 to Adelanto Road (2-lanes)

With Project:

- Extension of Adelanto Road from Chamberlain Way to El Mirage Road (2-lanes)
- Extension of Gateway Road from Innovation Way to El Mirage Road (2-lanes)
- Extension of Innovation Way from Gateway Drive to Phantom West (4-lanes)
- Extension of Innovation Drive from Nevada Avenue to Phantom East (2-4 lanes)
- Extension of Sabre Boulevard from George Boulevard to Phantom East (2-lanes)
- Construction of Navigation as a continuation of El Mirage Road from Adelanto Road to Gateway Drive (2-lanes)
- Construction of Momentum as a continuation of Chamberlain Way from Adelanto Road to Gateway Drive (2-lanes)
- Widening of Innovation Drive from Phantom West to Nevada Avenue (4-lanes)
- Elimination of George Boulevard from Air Expressway to Sabre Boulevard

Exhibit 17a-17c shows the Forecast Year 2040 Without HDC buildout roadway network intersection lane configurations which includes the network assumptions discussed above.

While the proposed plan shows a roadway connection at Momentum as an extension of Chamberlain Way between Adelanto Road and Gateway Drive, this connection is *not* considered critical. While included in this analysis, the elimination of Momentum would not result in any impacts beyond what has been identified in this report.



Forecast Year 2040 Without HDC Intersection Lane Configuration

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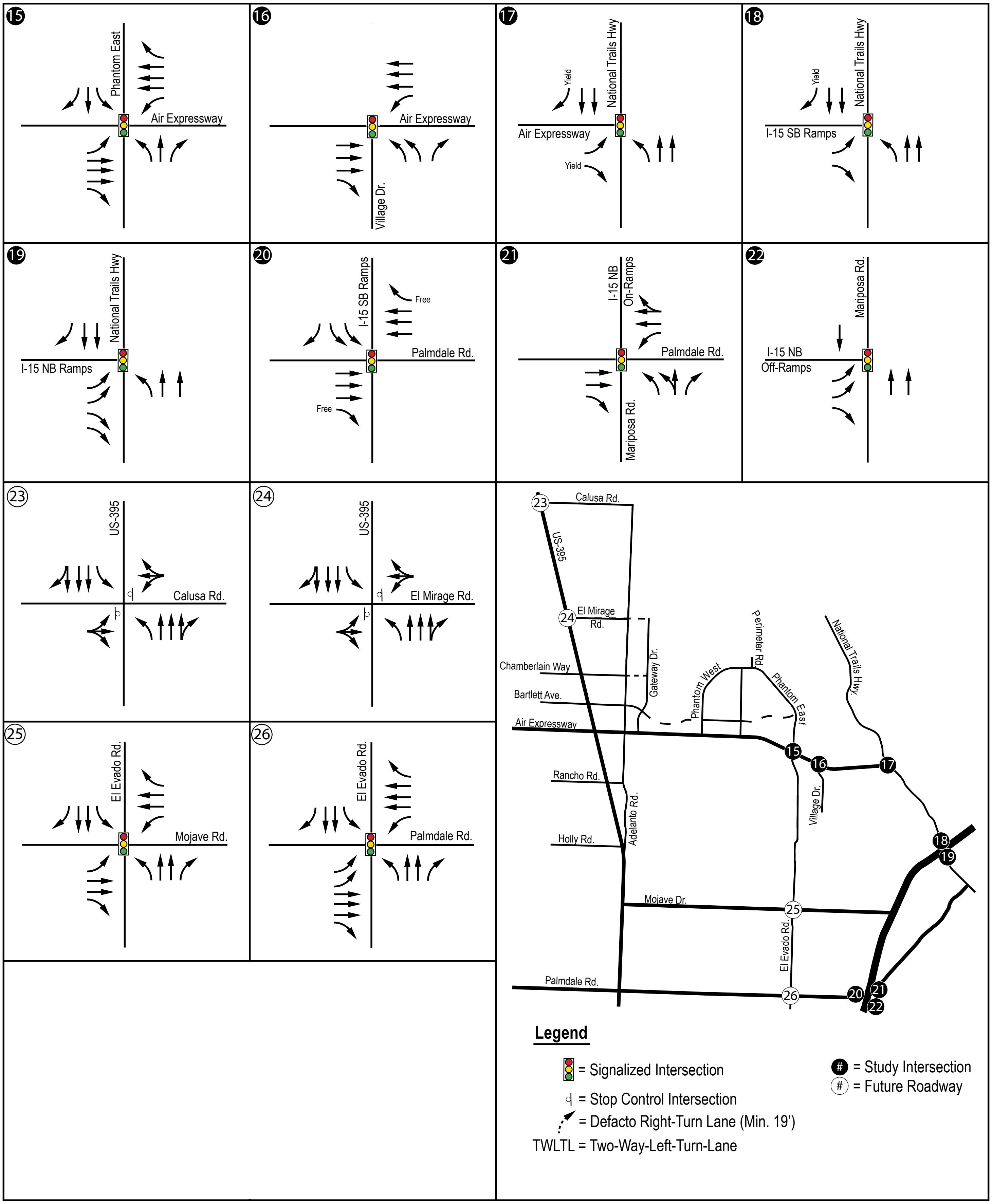
Exhibit 17a



Forecast Year 2040 Without HDC Intersection Lane Configuration

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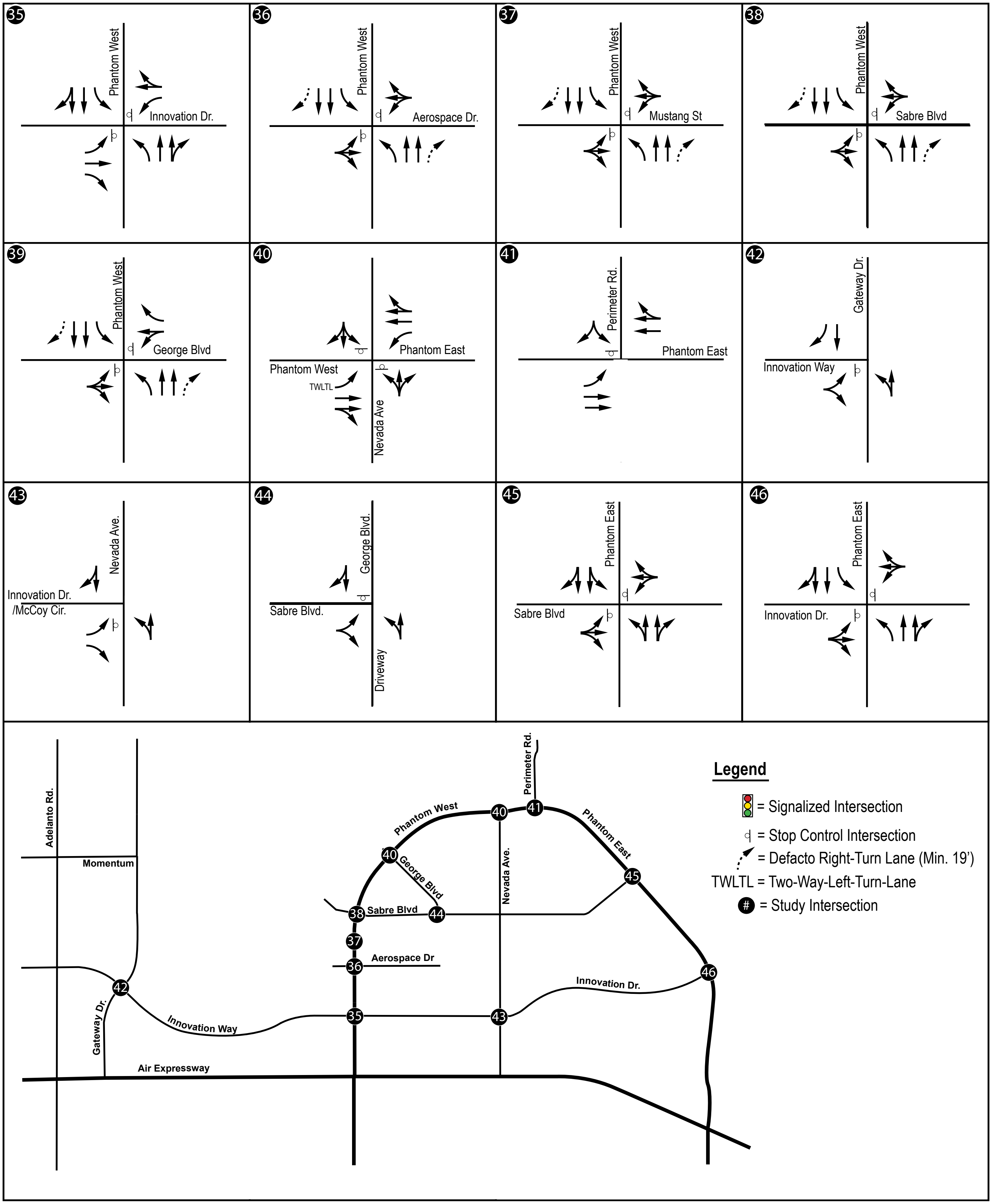
Exhibit 17b



Forecast Year 2040 Without HDC Intersection Lane Configuration

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Exhibit 17c

6.2 FORECAST YEAR 2040 WITHOUT HDC WITHOUT PROJECT TRAFFIC VOLUMES

Forecast Year 2040 Without HDC Without Project traffic volumes are derived by applying a 2% per year ambient growth rate to existing traffic volumes at all study intersections with the exception of those located within the specific plan area (Intersections 37-46). Traffic growth within the SCLA Specific Plan area is anticipated to be attributed to development within the specific plan area only and no other growth has been applied to Intersections 37-46. For the purposes of this analysis, the ambient growth was applied to existing year 2018 volumes for 22 years until the forecast year for buildout of which is anticipated to be year 2040 With HDC. This represents a total of 44% growth in traffic volumes.

Exhibit 18a-18c shows the Forecast Year 2040 Without HDC AM and PM peak hour trips at study intersections assuming full buildout of the City of Victorville roadway network with the exception of the High Desert Corridor.

6.3 FORECAST YEAR 2040 WITHOUT HDC WITHOUT PROJECT PEAK HOUR STUDY INTERSECTION LOS

Table 7 summarizes Forecast Year 2040 Without HDC Without Project AM and PM peak hour level of service for all study intersections. Detailed analysis sheets are contained in **Appendix E**.

TABLE 7, FORECAST YEAR 2040 WITHOUT HDC WITHOUT PROJECT AM/PM PEAK HOUR INTERSECTION LOS

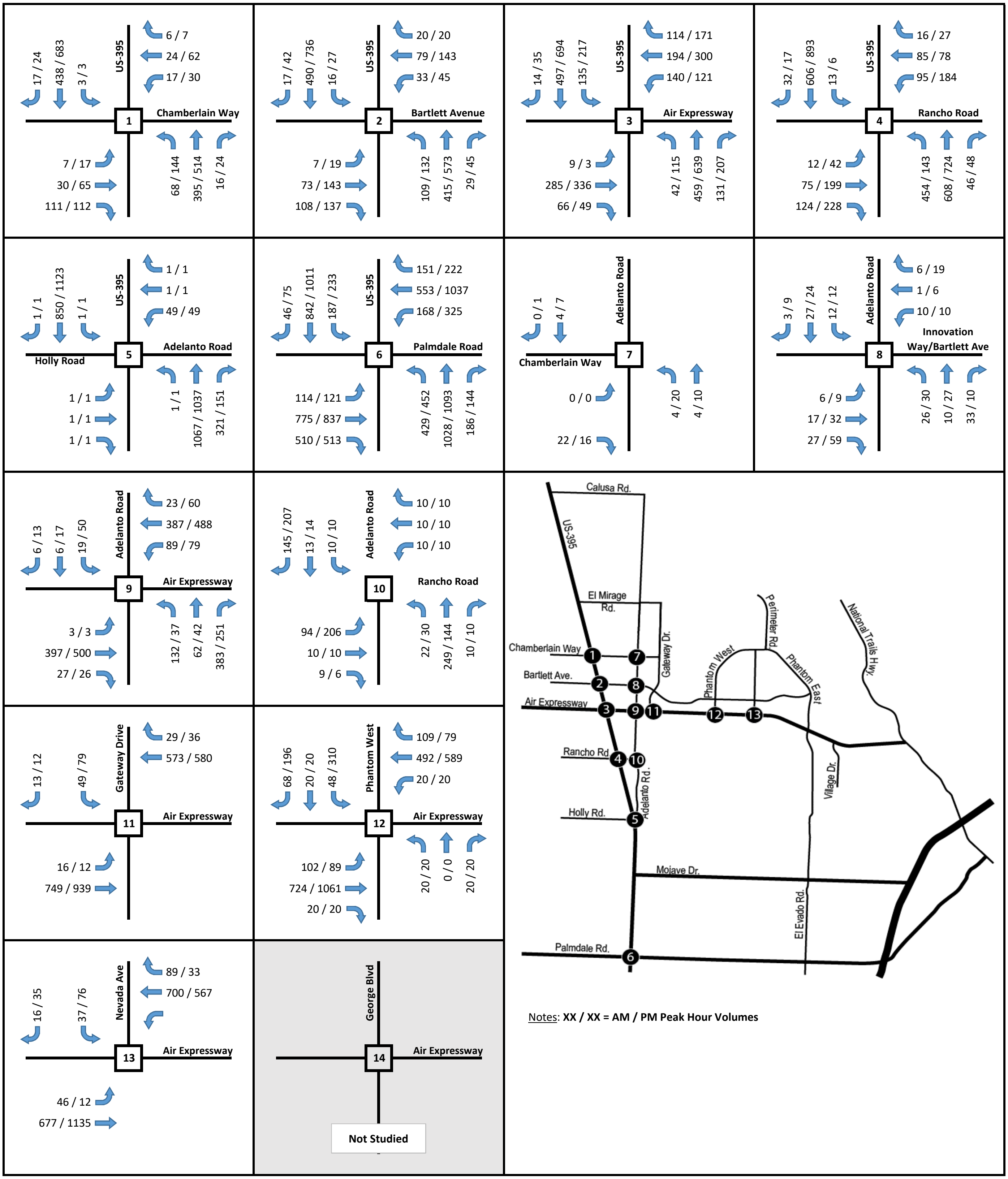
Study Intersection		Traffic Control	Forecast Year 2040 Without HDC Without Project Conditions					
			AM			PM		
			Delay[1]	-	LOS	Delay[1]	-	LOS
1 -	US-395/Chamberlain Way	Signal	9.2	-	A	10.4	-	B
2 -	US-395/Bartlett Avenue	Signal	10.7	-	B	11.9	-	B
3 -	US-395/Air Expressway	Signal	17.8	-	B	21.2	-	C
4 -	US-395/Rancho Road	Signal	12.6	-	B	14.6	-	B
5 -	US-395/Adelanto Road	TWSC	**>50.0**	**-**	**F[2]**	**>50.0**	**-**	**F[2]**
6 -	US-395/Palmdale Road	Signal	**59.8**	**-**	**E**	**>80.0**	**-**	**F[2]**
7 -	Adelanto Road/Chamberlain Way	OWSC	8.4	-	A	8.4	-	A
8 -	Adelanto Road/Innovation Way/Bartlett Ave	Signal	4.8	-	A	5.4	-	A
9 -	Adelanto Road/Air Expressway	Signal	19.8	-	C	17.7	-	B
10 -	Adelanto Road/Rancho Road	TWSC	11.4	-	B	11.9	-	B
11 -	Gateway Drive/Air Expressway	Signal	6.2	-	A	7.1	-	A
12 -	Phantom West/Air Expressway	Signal	37.1	-	D	32.7	-	C
13 -	Nevada Ave/Air Expressway	Signal	8.0	-	A	7.9	-	A
14 -	George Blvd/Air Expressway	Not Studied						
15 -	Phantom East/Air Expressway	Signal	**>80.0**	**-**	**F[2]**	**62.0**	**-**	**E**
16 -	Village Drive/Air Expressway	Signal	10.6	-	B	29.4	-	C
17 -	National Trails Highway/Air Expressway	Signal	**>80.0**	**-**	**F[2]**	14.7	-	B
18 -	I-15 SB Ramps/National Trails Highway	Signal	52.9	-	D	**71.3**	**-**	**E**
19 -	I-15 NB Ramps/National Trails Highway	Signal	27.4	-	C	26.6	-	C
20 -	I-15 SB Ramps/Palmdale Road	Signal	14.6	-	B	17.7	-	B
21 -	I-15 NB Ramps/Palmdale Road	Signal	21.5	-	C	42.0	-	D

Study Intersection		Traffic Control	Forecast Year 2040 Without HDC Without Project Conditions					
			AM			PM		
			Delay[1]	-	LOS	Delay[1]	-	LOS
22 -	I-15 NB Direct Ramps/Mariposa Road	Signal	12.9	-	B	13.1	-	B
23 -	US-395/Calusa Road	TWSC	12.0	-	B	14.2	-	B
24 -	US-395/El Mirage Road	TWSC	9.5	-	A	9.7	-	A
25 -	El Evado Road/Mojave Road	Signal	6.8	-	A	6.9	-	A
26 -	El Evado Road/Palmdale Road	Signal	6.9	-	A	6.9	-	A
27 -	US-395/HDC WB Ramps	Not Studied						
28 -	US-395/HDC EB Ramps	Not Studied						
29 -	Phantom West/HDC WB Ramps	Not Studied						
30 -	Phantom West/HDC EB Ramps	Not Studied						
31 -	Phantom East/HDC WB Ramps	Not Studied						
32 -	Phantom East/HDC EB Ramps	Not Studied						
33 -	National Trails Highway/HDC WB Ramps	Not Studied						
34 -	National Trails Highway/HDC EB Ramps	Not Studied						
35 -	Phantom West/Innovation Dr	TWSC	9.4	-	A	8.7	-	A
36 -	Phantom West/Aerospace Dr	TWSC	8.7	-	A	9.1	-	A
37 -	Phantom West/Mustang St	TWSC	9.4	-	A	9.1	-	A
38 -	Phantom West/Sabre Blvd	TWSC	9.9	-	A	9.1	-	A
39 -	Phantom West/George Blvd	TWSC	9.3	-	A	8.7	-	A
40 -	Nevada Ave/Phantom East	TWSC	8.5	-	A	8.8	-	A
41 -	Perimeter Road/Phantom East	TWSC	8.7	-	A	8.8	-	A
42 -	Gateway Drive/Innovation Way	OWSC	8.5	-	A	8.6	-	A
43 -	Nevada Ave/Innovation Dr/McCoy Circle	OWSC	0.0	-	A	0.0	-	A
44 -	George Blvd/Sabre Blvd	OWSC	0.0	-	A	0.0	-	A
45 -	Phantom East/Sabre Blvd	Does Not Exist Without Project						
46 -	Phantom East/Innovation Dr	Does Not Exist Without Project						

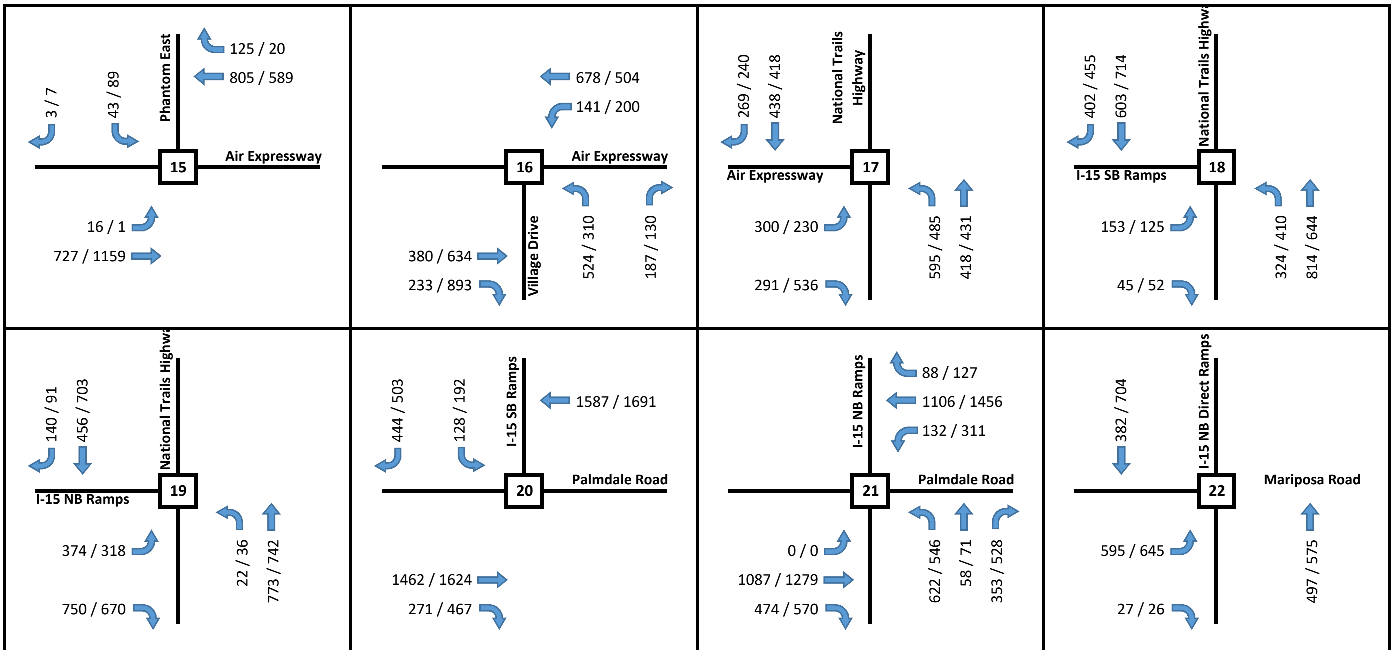
Note: Deficient intersection operation indicated in **bold**.
[1] Average seconds of delay per vehicle.
[2] Delay exceeds 80.0 seconds for signalized intersection or 50.0 seconds for unsignalized intersections; Level of Service F per HCM
LOS = level of service; TWSC = Two-Way Stop Control; OWSC = One-Way Stop Control

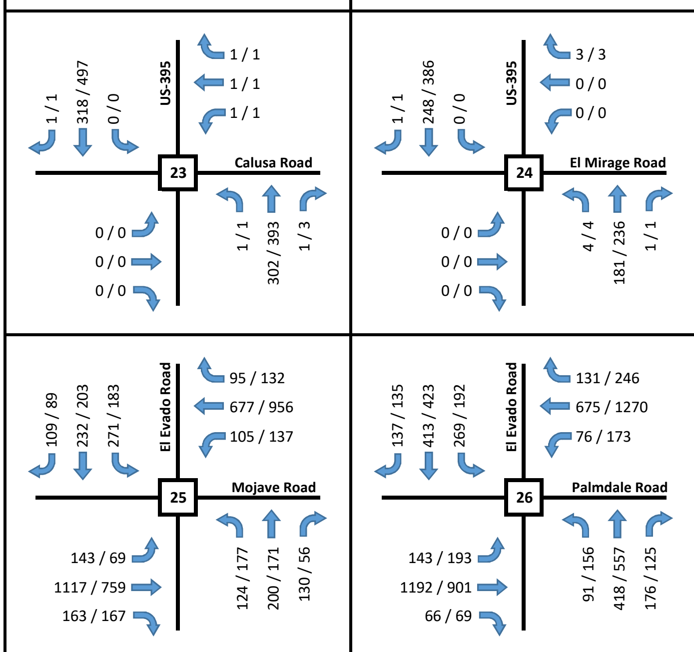
Assuming the intersection approach lane configurations shown in **Exhibits 17a-17c**, all study intersections are forecast to operate at LOS D or better during the peak hour for Forecast Year 2040 Without HDC Without Project conditions with the exception of the following locations:

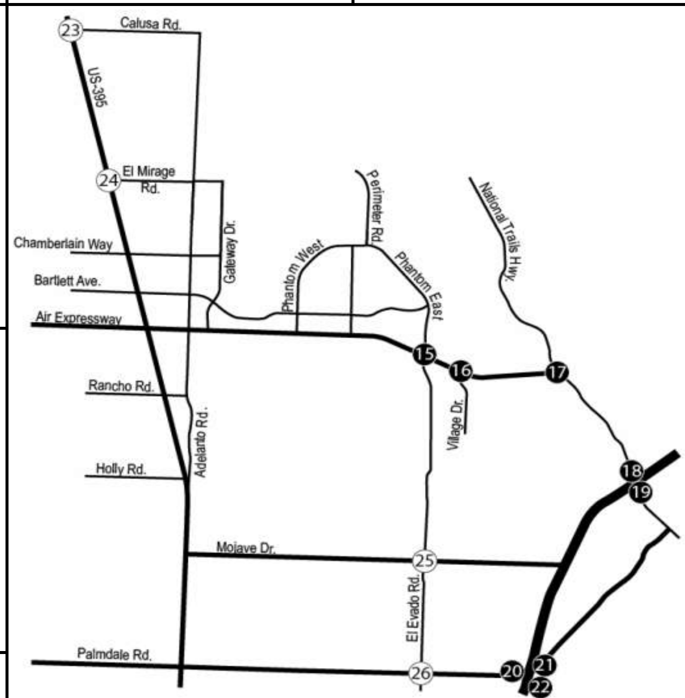
Forecast Year 2040 Without HDC Without Project Conditions			
Intersection		AM Peak Hour	PM Peak Hour
5 -	US-395 / Adelanto Road	LOS F	LOS F
6 -	US-395 / Palmdale Road	LOS E	LOS F
15 -	Phantom East / Air Expressway	LOS F	LOS E
17 -	National Trails Hwy / Air Expressway	LOS F	Acceptable
18 -	I-15 SB Ramps / National Trails Hwy	Acceptable	LOS E



Forecast Year 2040 Without HDC
Without Project AM/PM Peak Hour Volumes
Exhibit 18a







Notes: **XX / XX = AM / PM Peak Hour Volumes**

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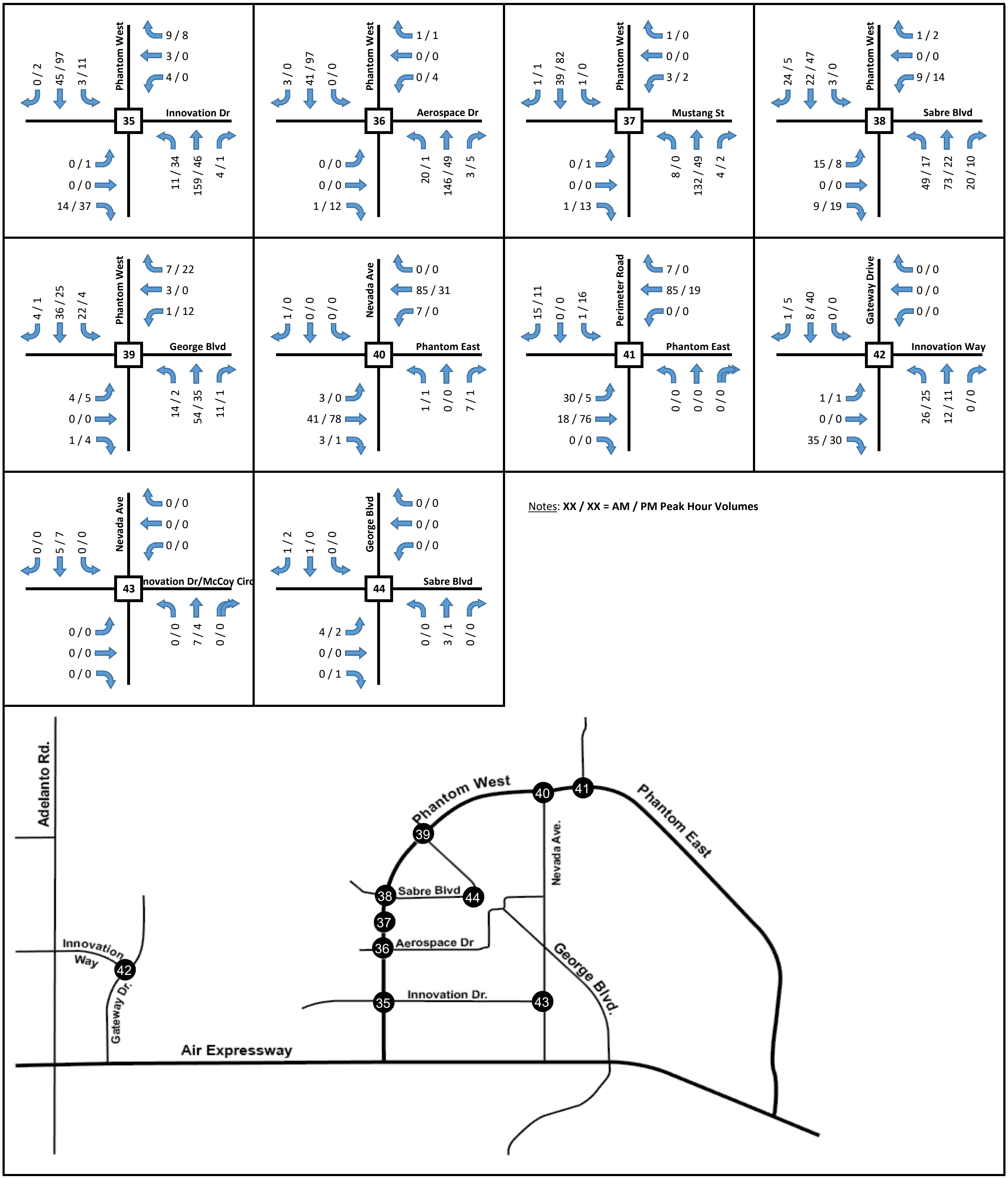
Forecast Year 2040 Without HDC Without Project AM/PM Peak Hour Volumes

Exhibit 18b



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Forecast Year 2040 Without HDC
Without Project AM/PM Peak Hour Volumes
Exhibit 18c

7 FORECAST YEAR 2040 WITHOUT HDC WITH PROJECT

7.1 FORECAST YEAR 2040 WITHOUT HDC WITH PROJECT TRAFFIC VOLUMES

Forecast Year 2040 Without HDC With Project traffic volumes are derived by adding trips forecast to be generated by the SCLA Specific Plan area to Forecast Year 2040 Without HDC Without Project conditions traffic volumes.

Exhibit 19a-19c shows the Forecast Year 2040 Without HDC With Project AM and PM peak hour trips at study intersections assuming full buildout of the City of Victorville roadway network.

7.2 FORECAST YEAR 2040 WITHOUT HDC WITH PROJECT PEAK HOUR STUDY INTERSECTION LOS

Table 8 summarizes Forecast Year 2040 Without HDC With Project AM and PM peak hour level of service for all study intersections. Detailed analysis sheets are contained in **Appendix F**.

As shown in **Table 8**, assuming the intersection approach lane configurations shown in **Exhibit 17a-17c**, 18 of the 37 intersections studied in the Forecast Year 2040 Without HDC With Project conditions are forecast to operate at an acceptable level of service (LOS D or better) and 19 intersections operate at a deficient level of service (LOS E or worse) during the AM peak hour. During the PM peak hour, 15 intersections operate an acceptable level of service and 22 intersections operate at a deficient level of service.

According to the City of Victorville significance criteria, 22 of the 37 locations would result in a significant impact during at least one peak-hour period as a result of the proposed project and therefore require mitigation.

7.3 FORECAST YEAR 2040 WITHOUT HDC WITH PROJECT MITIGATION MEASURES

Table 9 lists the mitigation measures that have been identified to reduce the traffic impacts at the intersections that are expected to operate at deficient levels of service with the project. **Table 8** also summarizes the AM and PM peak hour level of service assuming the implementation of the identified improvements.

With the implementation of identified mitigation measures, the following locations would continue to operate at deficient levels of service with the project and would result in unavoidable significant impacts:

Forecast Year 2040 Without HDC With Project With Improvements Conditions		
Intersection	AM Peak Hour	PM Peak Hour
3 - US-395 / Air Expressway	Acceptable	LOS F
4 - US-395 / Rancho Road	LOS F	LOS F
5 - US-395 / Adelanto Road	Acceptable	LOS E
6 - US-395 / Palmdale Road	LOS F	LOS F
11 - Gateway Drive / Air Expressway	Acceptable	LOS E
12 - Phantom West / Air Expressway	LOS E	LOS E
13 - Nevada Avenue / Air Expressway	LOS E	Acceptable
15 - Phantom East / Air Expressway	LOS F	LOS E
18 - I-15 SB Ramps / National Trails Hwy	Los F	Acceptable
19 - I-15 NB Ramps / National Trails Hwy	LOS F	Acceptable
26 - Phantom East / Palmdale Road	Acceptable	LOS F

Exhibit 20a-20b shows the Forecast Year 2040 Without HDC With Project mitigated lane configurations.

It should be noted that TDM measures will most likely be developed that will reduce development trips made during the critical peak hours. Additionally, while the long-range analysis assumes that a large portion of the SCLA Specific Plan will develop as industrial and comprising of manufacturing (25%) and warehouse (75%). Programmatic limitations on the ability to achieve 25% manufacturing development could result in significant reductions in peak hour traffic generation since employee commute trips are lower for warehouse uses.

Table 8, Forecast Year 2040 Without HDC With Project AM/PM Peak Hour Intersection LOS

Study Intersection	Traffic Control	Forecast Year 2040 Without HDC Without Project Conditions		Forecast Year 2040 Without HDC With Project Conditions		Significant Impact?[3]	
		AM Delay[1] - LOS	PM Delay[1] - LOS	AM Delay[1] - LOS	PM Delay[1] - LOS	AM	PM
1 - US-395/Chamberlain Way	Signal	9.2 - A	10.4 - B	9.7 - A	14.6 - B	No	No
2 - US-395/Bartlett Avenue	Signal	10.7 - B	11.9 - B	21.9 - C	38.3 - D	No	No
3 - US-395/Air Expressway	Signal	17.8 - **B**	21.2 - C	**>80.0 - F[2]**	**>80.0 - F[2]**	**YES**	**YES**
With Improvements				54.5 - D	**>80.0 - F[2]**	No	**YES**
4 - US-395/Rancho Road	Signal	12.6 - **B**	14.6 - B	**>80.0 - F[2]**	**>80.0 - F[2]**	**YES**	**YES**
With Improvements				**>80.0 - F[2]**	**>80.0 - F[2]**	**YES**	**YES**
5 - US-395/Adelanto Road	TWSC	**>50.0 - F[2]**	**>50.0 - F[2]**	**>50.0 - F[2]**	**>50.0 - F[2]**	**YES**	**YES**
With Improvements				52.5 - D	**80.0 - E**	No	**YES**
6 - US-395/Palmdale Road	Signal	**59.8 - E**	**>80.0 - F[2]**	**>80.0 - F[2]**	**>80.0 - F[2]**	**YES**	**YES**
With Improvements				**>80.0 - F[2]**	**>80.0 - F[2]**	**YES**	**YES**
7 - Adelanto Road/Chamberlain Way- Momentum	OWSC	8.4 - A	8.4 - A	12.7 - B	15.7 - C	No	No
8 - Adelanto Road/Innovation Way/Bartlett Ave	Signal	4.8 - A	5.4 - A	9.7 - A	10.2 - B	No	No
9 - Adelanto Road/Air Expressway	Signal	19.8 - C	17.7 - B	**>80.0 - F[2]**	**>80.0 - F[2]**	**YES**	**YES**
With Improvements				54.7 - D	52.2 - D	No	No
10 - Adelanto Road/Rancho Road	TWSC	11.4 - B	11.9 - B	**>50.0 - F[2]**	**>50.0 - F[2]**	**YES**	**YES**
With Improvements				6.6 - A	8.4 - A	No	No
11 - Gateway Drive/Air Expressway	Signal	6.2 - A	7.1 - A	**>80.0 - F[2]**	**>80.0 - F[2]**	**YES**	**YES**
With Improvements				44.2 - D	**77.0 - E**	No	**YES**
12 - Phantom West/Air Expressway	Signal	37.1 - D	32.7 - C	**>80.0 - F[2]**	**>80.0 - F[2]**	**YES**	**YES**
With Improvements				**79.8 - E**	**61.9 - E**	**YES**	**YES**
13 - Nevada Ave/Air Expressway	Signal	8.0 - A	7.9 - A	**>80.0 - F[2]**	**>80.0 - F[2]**	**YES**	**YES**
With Improvements				**77.2 - E**	46.2 - D	**YES**	No
14 - George Blvd/Air Expressway	Not Studied						
15 - Phantom East/Air Expressway	Signal	**>80.0 - F[2]**	**62.0 - E**	**>80.0 - F[2]**	**>80.0 - F[2]**	**YES**	**YES**
With Improvements				**>80.0 - F[2]**	**78.2 - E**	**YES**	**YES**

Study Intersection	Traffic Control	Forecast Year 2040 Without HDC Without Project Conditions		Forecast Year 2040 Without HDC With Project Conditions		Significant Impact?[3]	
		AM	PM	AM	PM		
		Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS	AM	PM
16 - Village Drive/Air Expressway	Signal	10.6 - B	29.4 - C	25.1 - C	36.2 - D	No	No
17 - National Trails Highway/Air Expressway	Signal	**>80.0 - F[2]**	14.7 - B	**>80.0 - F[2]**	**>80.0 - F[2]**	**YES**	**YES**
With Improvements				38.4 - D	13.1 - B	No	No
18 - I-15 SB Ramps/National Trails Highway	Signal	52.9 - D	**71.3 - E**	**>80.0 - F[2]**	**>80.0 - F[2]**	**YES**	**YES**
With Improvements				54.0 - D	39.0 - D	No	No
19 - I-15 NB Ramps/National Trails Highway	Signal	27.4 - C	26.6 - C	**>80.0 - F[2]**	**>80.0 - F[2]**	**YES**	**YES**
With Improvements				37.3 - D	44.2 - D	No	No
20 - I-15 SB Ramps/Palmdale Road	Signal	14.6 - B	17.7 - B	22.1 - C	18.2 - B	No	No
21 - I-15 NB Ramps/Palmdale Road	Signal	21.5 - C	42.0 - D	48.0 - D	44.2 - D	No	No
22 - I-15 NB Direct Ramps/Mariposa Road	Signal	12.9 - B	13.1 - B	24.5 - C	17.9 - B	No	No
23 - US-395/Calusa Road	TWSC	12.0 - B	14.2 - B	11.1 - B	12.7 - B	No	No
24 - US-395/El Mirage Road	TWSC	9.5 - A	9.7 - A	9.7 - A	10.6 - B	No	No
25 - El Evado Road/Mojave Road	Signal	6.8 - A	6.9 - A	53.6 - D	53.6 - D	No	No
26 - El Evado Road/Palmdale Road	Signal	6.9 - A	6.9 - A	**>80.0 - F[2]**	**>80.0 - F[2]**	**YES**	**YES**
With Improvements				54.7 - D	**>80.0 - F[2]**	No	**YES**
27 - US-395/HDC WB Ramps	Not Studied						
28 - US-395/HDC EB Ramps	Not Studied						
29 - Phantom West/HDC WB Ramps	Not Studied						
30 - Phantom West/HDC EB Ramps	Not Studied						
31 - Phantom East/HDC WB Ramps	Not Studied						
32 - Phantom East/HDC EB Ramps	Not Studied						
33 - National Trails Highway/HDC WB Ramps	Not Studied						
34 - National Trails Highway/HDC EB Ramps	Not Studied						
35 - Phantom West/Innovation Dr	TWSC	9.4 - A	8.7 - A	**>50.0 - F[2]**	**>50.0 - F[2]**	**YES**	**YES**
With Improvements				20.2 - C	46.2 - D	No	No
36 - Phantom West/Aerospace Dr	TWSC	8.7 - A	9.1 - A	**>50.0 - F[2]**	**>50.0 - F[2]**	**YES**	**YES**
With Improvements				4.2 - A	7.8 - A	No	No
37 - Phantom West/Mustang St	TWSC	9.4 - A	9.1 - A	33.8 - D	27.4 - D	No	No

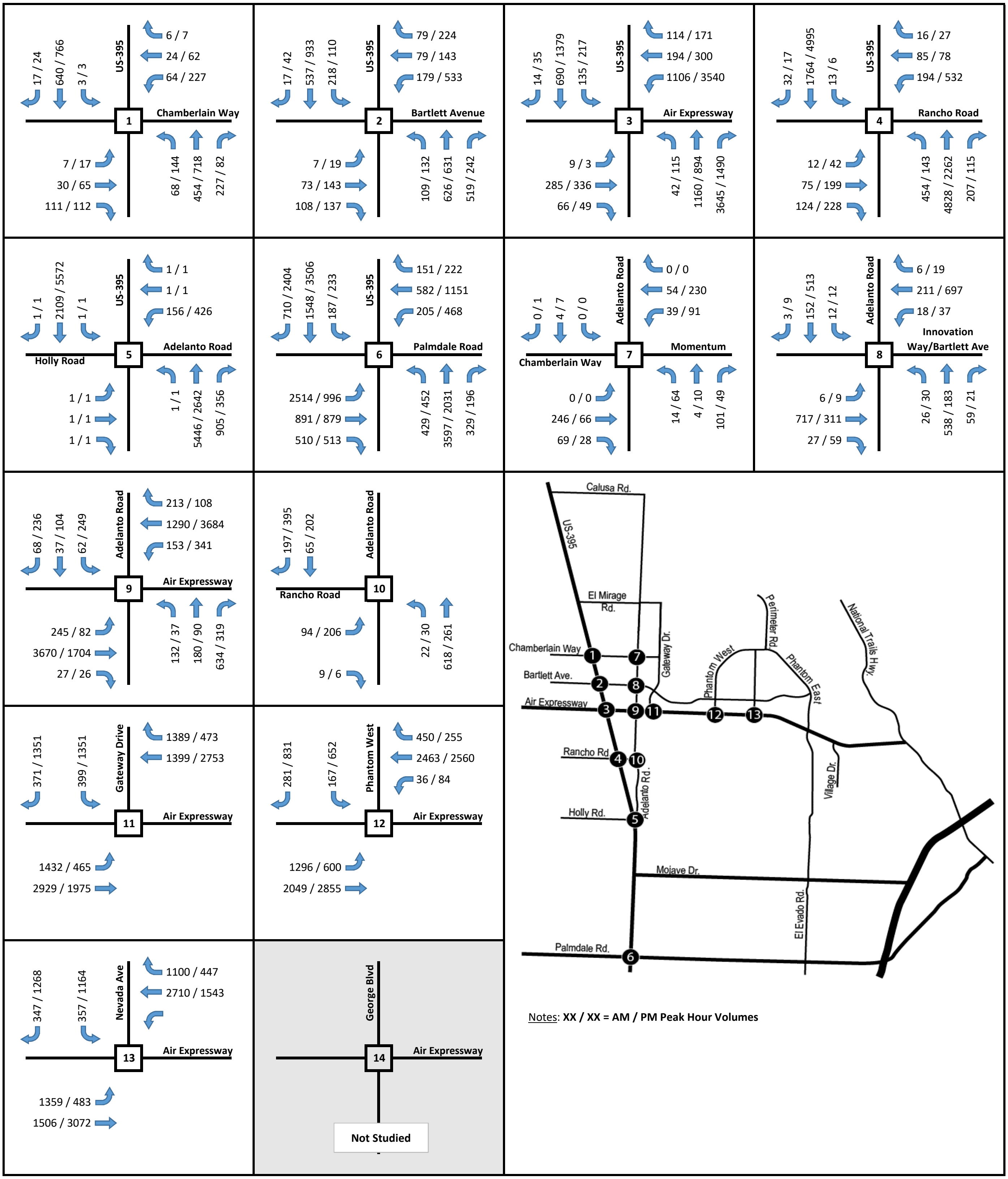
Study Intersection	Traffic Control	Forecast Year 2040 Without HDC Without Project Conditions AM Delay[1] - LOS	Forecast Year 2040 Without HDC Without Project Conditions PM Delay[1] - LOS	Forecast Year 2040 Without HDC With Project Conditions AM Delay[1] - LOS	Forecast Year 2040 Without HDC With Project Conditions PM Delay[1] - LOS	Significant Impact?[3] AM	Significant Impact?[3] PM
38 - Phantom West/Sabre Blvd	TWSC	9.9 - A	9.1 - A	32.9 - D	**>50.0 - F[2]**	No	**YES**
With Improvements				21.0 - C	18.4 - B	No	No
39 - Phantom West/George Blvd	TWSC	9.3 - A	8.7 - A	13.5 - B	11.9 - B	No	No
40 - Nevada Ave/Phantom East	TWSC	8.5 - A	8.8 - A	19.2 - C	**>50.0 - F[2]**	No	**YES**
With Improvements				15.7 - B	14.4 - B	No	No
41 - Perimeter Road/Phantom East	TWSC	8.7 - A	8.8 - A	31.5 - D	23.4 - C	No	No
42 - Gateway Drive/Innovation Way	OWSC	8.5 - A	8.6 - A	**>50.0 - F[2]**	**>50.0 - F[2]**	**YES**	**YES**
With Improvements				42.1 - D	38.5 - D	No	No
43 - Nevada Ave/Innovation Dr/McCoy Circle	OWSC	0.0 - A	0.0 - A	**>50.0 - F[2]**	**>50.0 - F[2]**	**YES**	**YES**
With Improvements				43.6 - D	40.0 - D	No	No
44 - George Blvd/Sabre Blvd	OWSC	0.0 - A	0.0 - A	11.2 - B	11.2 - B	No	No
45 - Phantom East/Sabre Blvd	Does Not Exist Without Project			**>50.0 - F[2]**	**>50.0 - F[2]**	**YES**	**YES**
With Improvements				30.8 - D	35.0 - D	No	No
46 - Phantom East/Innovation Dr	Does Not Exist Without Project			21.4 - C	**>50.0 - F[2]**	No	**YES**
With Improvements				11.7 - B	11.0 - B	No	No

Note: Deficient intersection operation indicated in **bold**.

[1] Average seconds of delay per vehicle.

[2] Delay exceeds 80.0 seconds for signalized intersection or 50.0 seconds for unsignalized intersections; Level of Service F per HCM

[3] Delay deteriorates from acceptable (LOS D or better) to unacceptable (LOS E or F) OR change in delay for an already deficient intersection by 2% or more



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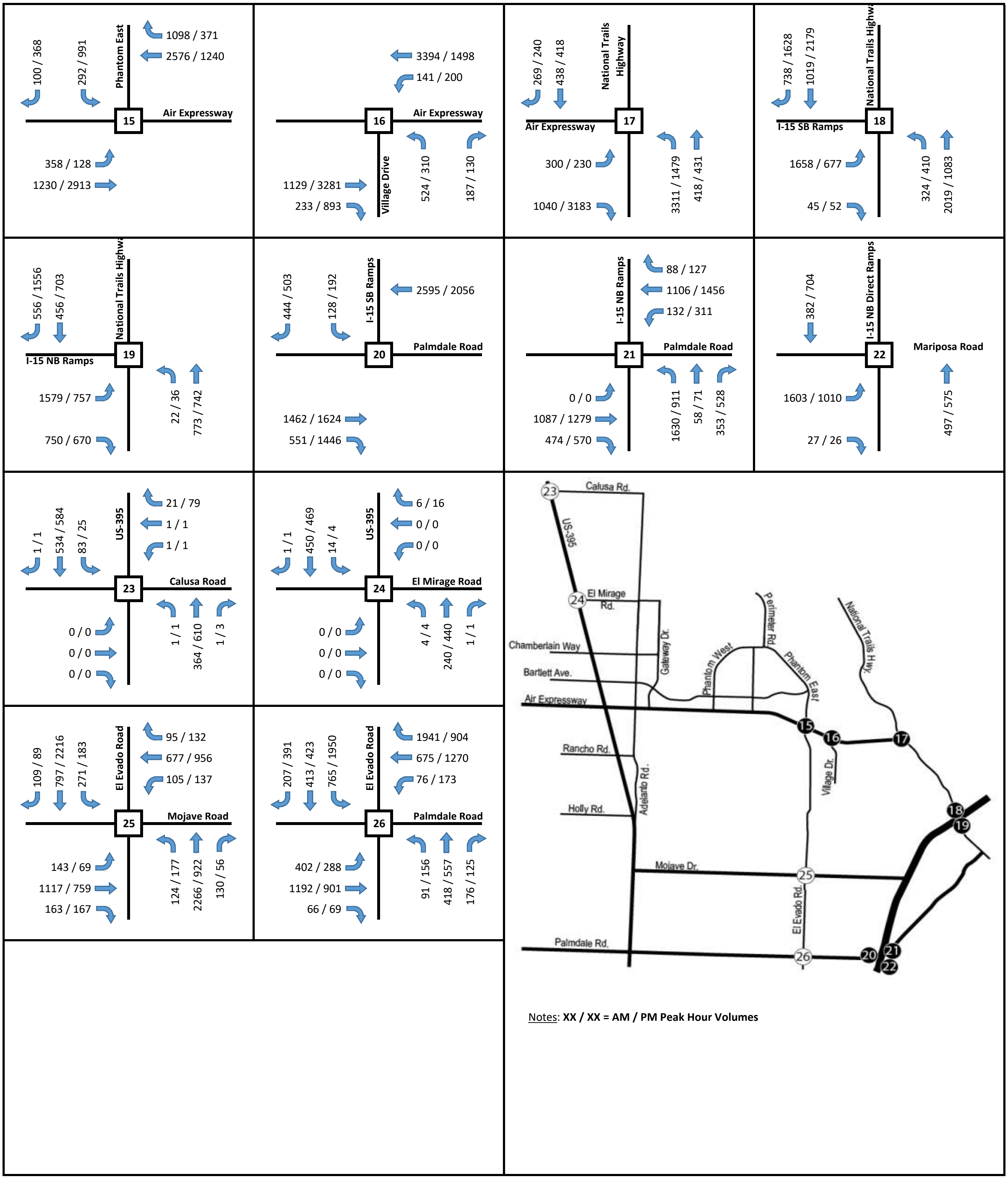
Forecast Year 2040 Without HDC
With Project AM/PM Peak Hour Volumes
Exhibit 19a



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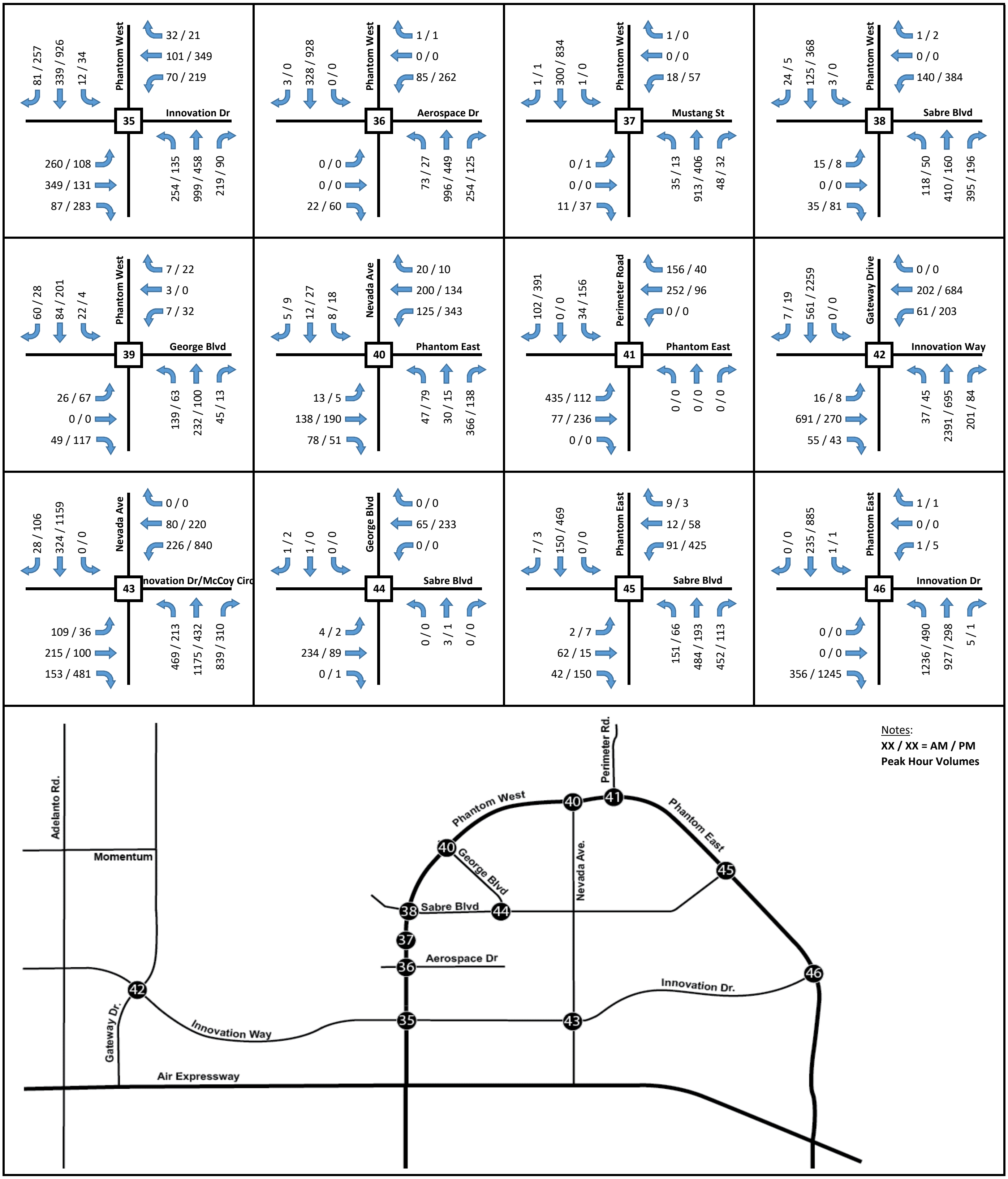
Forecast Year 2040 Without HDC With Project AM/PM Peak Hour Volumes

Exhibit 19b



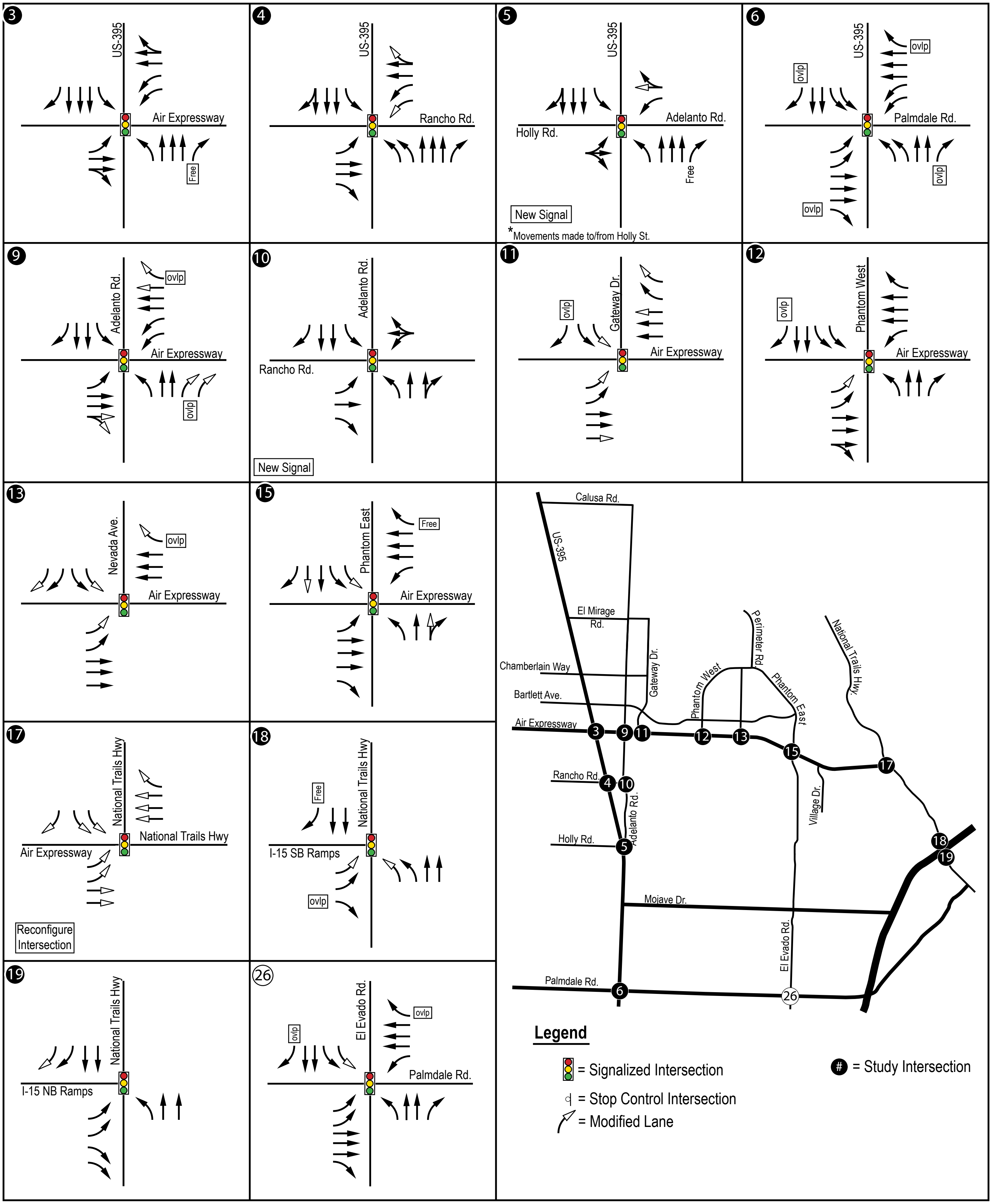
Forecast Year 2040 Without HDC
With Project AM/PM Peak Hour Volumes
Exhibit 19c

Table 9, Forecast Year 2040 Without HDC With Project Recommended Mitigation

Mitigation Measure	Intersection	Forecast Year 2040 Without HDC With Project Recommended Mitigation
MM-1	3 - US-395 / Air Expressway	• Modify northbound right-turn lane to a free movement
MM-2	4 - US-395 / Rancho Road	• Restripe westbound approach to include two left-turn-lanes, one through lane, and one shared through/right-turn-lane
MM-3	5 - US-395 / Adelanto Road	• Signalize Intersection • Restripe westbound approach to include dedicated left-turn-lane and a shared through/right-turn-lane
MM-4	6 - US-395 / Palmdale Road	• Install overlap phasing on all right-turn movements
MM-5	9 - Adelanto Road / Air Expressway	• Install second northbound right-turn-lane with a right-turn overlap phase • Install third westbound through-lanes; Install dedicated westbound right-turn-lane with an overlap phase. • Install third combination eastbound shared through/right-turn-lane
MM-6	10 - Adelanto Road / Rancho Road	• Signalize Intersection
MM-7	11 - Gateway Drive / Air Expressway	• Install third eastbound through-lane; Install second eastbound left-turn-lane • Install second southbound left-turn-lane; Install southbound right-turn overlap phase. • Install third westbound through-lane; Install second westbound right-turn lane with overlap phase
MM-8	12- Phantom West / Air Expressway	• Install southbound right-turn overlap phase • Install second eastbound left-turn-lane
MM-9	13- Nevada Ave / Air Expressway	• Install second southbound left-turn-lane and second southbound right-turn-lane

Mitigation Measure	Intersection	Forecast Year 2040 Without HDC With Project Recommended Mitigation
		• Install second eastbound left-turn-lane • Install one westbound dedicated right-turn-lane with an overlap phase
MM-10	15- Phantom East / Air Expressway	• Restripe northbound approach to include one dedicated left-turn lane, one through-lane, and one shared through/right-turn-lane. • Install second southbound through-lane; Install second southbound left-turn-lane. • Convert westbound right-turn-lane to a free movement
MM-11	17 - National Trails Highway / Air Expressway	• Reconfigure intersection to make Air Expressway the east/west through movement and the north leg of National Trails Highway a "T" • Install two southbound left-turn-lanes and southbound right-turn lane • Install two eastbound left-turn-lanes and two eastbound through-lanes • Install three westbound through-lanes and one westbound right-turn-lane
MM-12	18 - I-15 Southbound Ramps / National Trails Hwy	• Install second northbound left-turn-lane • Convert southbound dedicated right-turn-lane to a free movement • Install second eastbound left-turn-lane; Install eastbound right-turn overlap phase
MM-13	19 - I-15 Northbound Ramps / National Trails Hwy	• Install second southbound dedicated right-turn-lane
MM-14	26 - Phantom East / Palmdale Road	• Install second southbound left-turn-lane. • Install southbound right-turn overlap phase. • Install westbound right-turn overlap phase.
MM-15	35 - Phantom West / Innovation Dr	• Signalize Intersection.
MM-16	36 - Phantom West / Aerospace Dr	• Signalize intersection • Install northbound dedicated right-turn-lane • Install southbound dedicated right-turn-lane
MM-17	38 - Phantom West / Sabre Blvd	• Install All-Way-Stop • Modify northbound approach to include a one shared

Mitigation Measure	Intersection	Forecast Year 2040 Without HDC With Project Recommended Mitigation
		left/through-lane and one shared through/right-turn-lane • Modify southbound approach to include a one shared left/through-lane and one shared through/right-turn-lane
MM-18	40 - Nevada Ave/Phantom East	• Install All-Way Stop
MM-19	42 - Gateway Drive / Innovation Way	• Signalize Intersection. • Construct east leg of the intersection. • Install one northbound through lane and one shared through/right-turn-lane • Install one southbound left-turn-lane and a second southbound shared through/right-turn-lane. • Install one eastbound through-lane and second shared through/right-turn-lane • Install a westbound left-turn-lane, one westbound through-lane, and one shared through/right-turn-lane
MM-20	43 - Nevada Ave / Innovation Dr / McCoy Circle	• Signalize Intersection • Construct east leg of the intersection • Install one northbound through lane and one shared through/right-turn-lane • Install a southbound left-turn-lane, one southbound through-lane, and one southbound dedicated right-turn-lane • Install eastbound through-lane • Install two westbound left-turn-lanes, and a westbound shared through/right-turn-lane
MM-21	45 - Phantom East / Sabre Boulevard	• Install All-Way-Stop • Install west leg of the intersection to include one shared left/through/right-turn-lane • Install east leg of the intersection to include one shared left/through/right-turn-lane
MM-22	46 - Phantom East / Innovation Way	• Signalize Intersection • Install west leg of the intersection to include one eastbound shared left/through-lane and one eastbound dedicated right-turn-lane with a channelized yield movement • Install dedicated northbound left-turn-lane • Modify Southbound approach to include one shared through/right-turn-lane



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Forecast Year 2040 Without HDC With Project Mitigated Intersection Lane Configuration

March 2020
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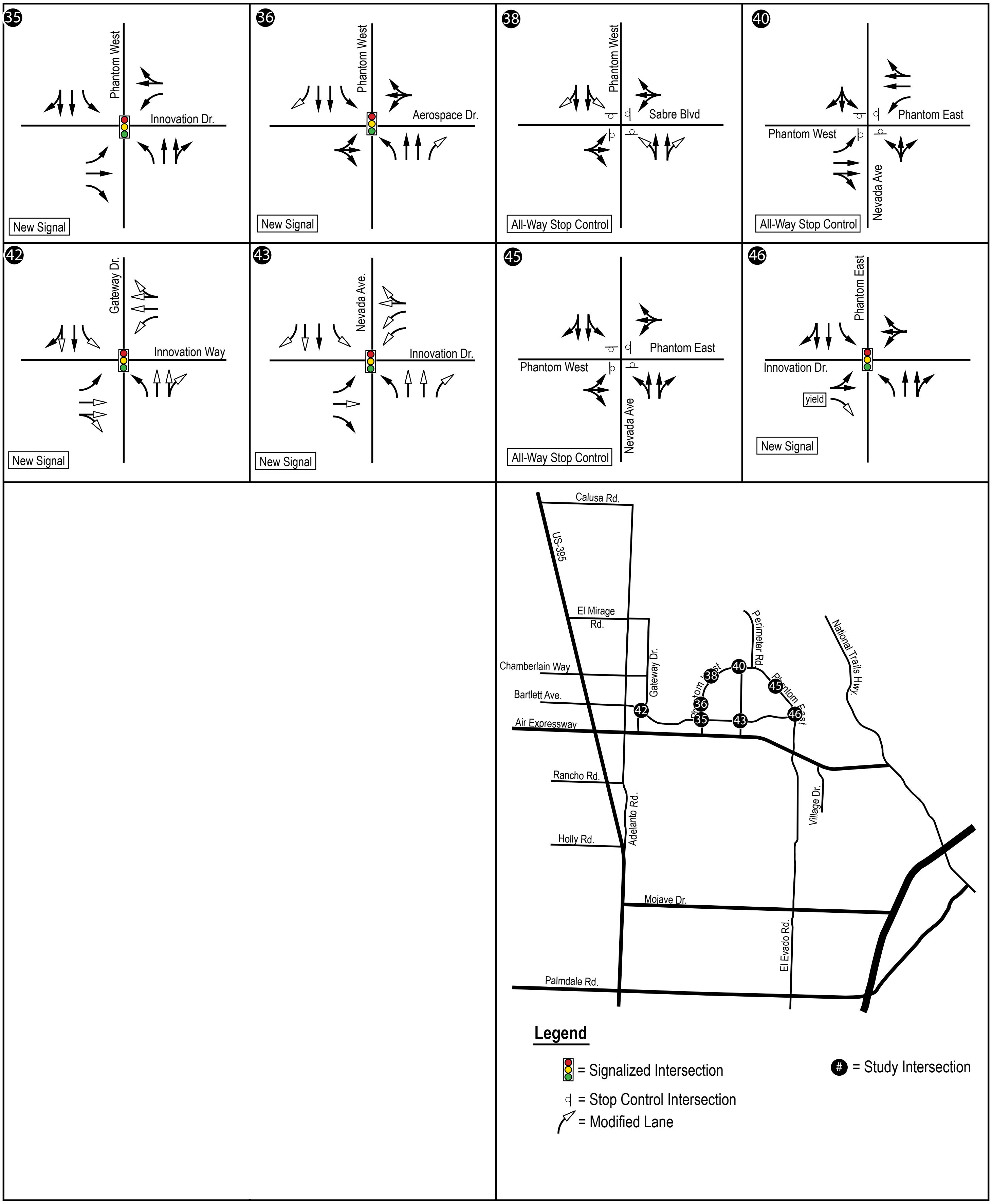
Exhibit 20a



Forecast Year 2040 Without HDC With Project Mitigated Intersection Lane Configuration (ctd)

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Exhibit 20b

8 FORECAST YEAR 2040 WITH HDC WITHOUT PROJECT

This section analyzes the potential impacts for Forecast Year 2040 With HDC Without Project conditions. This scenario assumes complete buildout of the City of Victorville roadway network consistent with the circulation map shown in **Exhibit 4**. In addition, this scenario assumes complete buildout of the High Desert Corridor (HDC) through the study area as well as the US-395 Freeway to the west of the existing US-395 alignment.

8.1 FORECAST YEAR 2040 WITH HDC REGIONAL NETWORK IMPROVEMENTS

The High Desert Corridor is a multi-modal link between SR-14 in Los Angeles and SR-18 in San Bernardino County. The proposed 63-mile-long freeway would provide critical regional access for the entire Victor Valley and would prove integral to the proposed development of the SCLA Specific Plan area. Within the study area, the HDC would replace Air Expressway as the major east-west corridor.

In addition to the HDC, the need for a major north/south freeway facility has been identified in the form of the US-395 Freeway. Various studies have been conducted in recent years that analyze the feasibility of such a regional facility including the Victor Valley Area Transportation Study (SANBAG, 2008) and the US-395 Transportation Concept Report (Caltrans, 2017). The ultimate proposed highway system which includes a US-395 Freeway facility to the west of the current alignment as well as the HDC is shown in **Appendix G**.

Forecast Year 2040 With HDC conditions assumes the construction of the US-395 Freeway facility outside of the study area. In addition, this analysis assumes the following modifications to the roadway circulation system within the study area:

<u>Without Project:</u>

- Construction of the High Desert Corridor as a grade-separated freeway facility
    - Construction of interchange at US-395
    - Construction of interchange at Phantom West
    - Construction of Interchange at Phantom East
    - Construction of interchange at National Trails Hwy
- Extension of Phantom East from Air Expressway to Palmdale Road (existing El Evado Road alignment) (2-lanes)
- Extension of El Mirage Road from US-395 to Adelanto Road (2-lanes)
- Extension of Adelanto Road from El Mirage Road to Calusa Road (2-lanes)
- Construction of Calusa Road from US-395 to Adelanto Road (2-lanes)
- Elimination of Air Expressway approximately ¾ mile east of Gateway Drive
    - Elimination of intersection of Air Expressway and Nevada Avenue

With Project:

- Extension of Adelanto Road from Chamberlain Way to El Mirage Road (2-lanes)
- Extension of Gateway Road from Innovation Way to El Mirage Road (2-lanes)
- Extension of Innovation Way from Gateway Drive to Phantom West (4-lanes)
- Extension of Innovation Drive from Nevada Avenue to Phantom East (2-4 lanes)
- Extension of Sabre Boulevard from George Boulevard to Phantom East (2-lanes)
- Construction of Navigation as a continuation of El Mirage Road from Adelanto Road to Gateway Drive (2-lanes)
- Construction of Momentum as a continuation of Chamberlain Way from Adelanto Road to Gateway Drive (2-lanes)
- Widening of Innovation Drive from Phantom West to Nevada Avenue (4-lanes)
- Elimination of George Boulevard from Air Expressway to Sabre Boulevard

It should be noted for this analysis, the intersections of Air Expressway at Phantom West (Intersection 12) and Phantom East (Intersection 15) have been replaced by the HDC westbound and eastbound ramps (Intersection's 31-35) and the intersections of Air Expressway at George Blvd and Nevada Avenue (Intersection 13 & 14) have been removed consistent with the modifications discussed above.

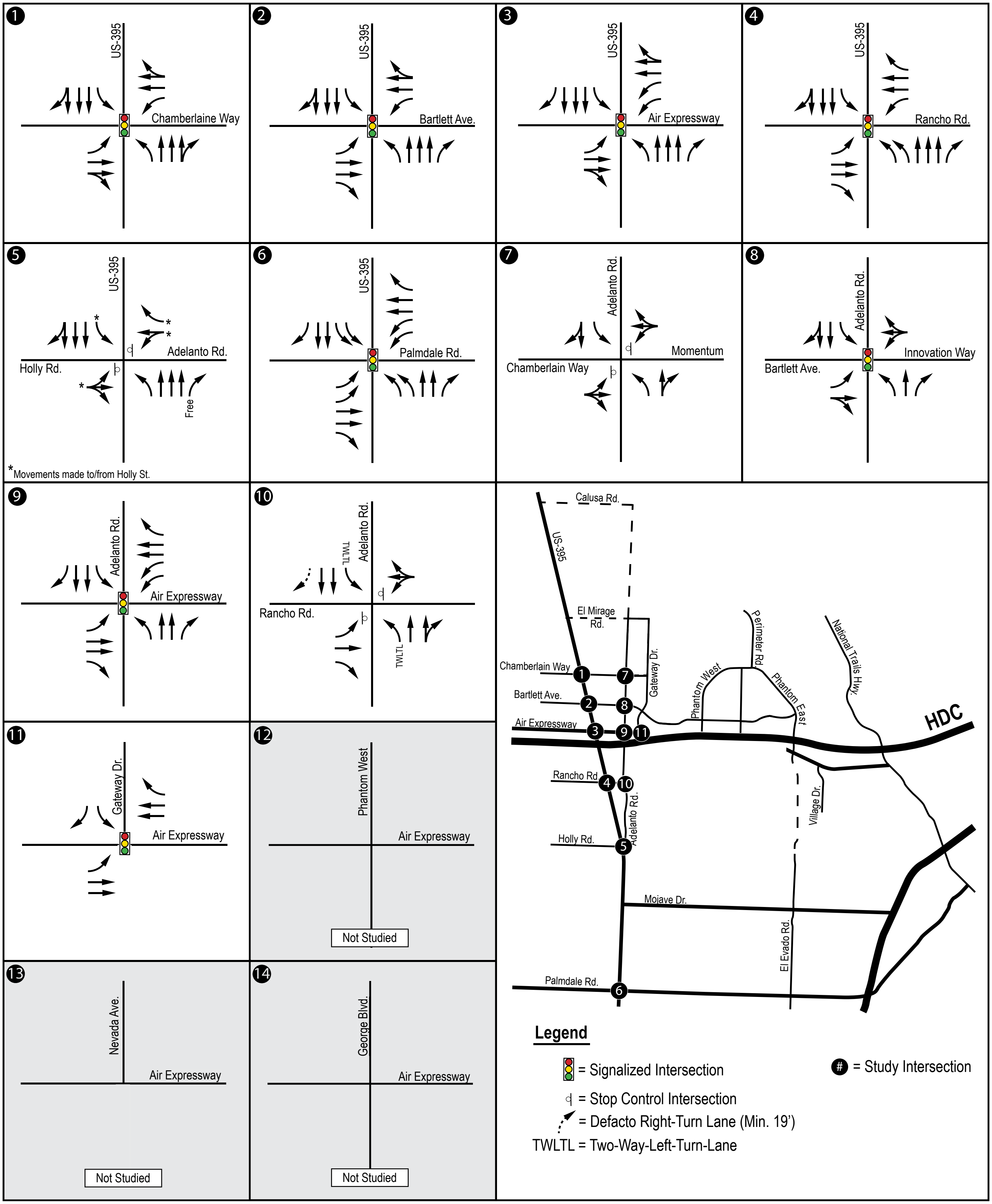
Exhibit 21a-21d shows the Forecast Year 2040 With HDC buildout roadway network intersection lane configurations which includes the network assumptions discussed above.

While the proposed plan shows a roadway connection at Momentum as an extension of Chamberlain Way between Adelanto Road and Gateway Drive, this connection is *not* considered critical. While included in this analysis, the elimination of Momentum would not result in any impacts beyond what has been identified in this report.

8.2 FORECAST YEAR 2040 WITH HDC WITHOUT PROJECT TRAFFIC VOLUMES

Forecast Year 2040 With HDC Without Project traffic volumes are derived by applying a 2% per year ambient growth rate to existing traffic volumes at all study intersections with the exception of those located within the specific plan area (Intersections 37-46). Traffic growth within the SCLA Specific Plan area is anticipated to be attributed to development within the specific plan area only and no other growth has been applied to Intersections 37-46. For the purposes of this analysis, the ambient growth was applied to existing year 2018 volumes for 22 years until the forecast year for buildout of which is anticipated to be year 2040 With HDC. This represents a total of 44% growth in traffic volumes.

Exhibit 22a-22d shows the Forecast Year 2040 With HDC Without Project AM and PM peak hour trips at study intersections assuming the construction of the High Desert Corridor and full buildout of the City of Victorville roadway network.



Forecast Year 2040 With HDC Intersection Lane Configuration

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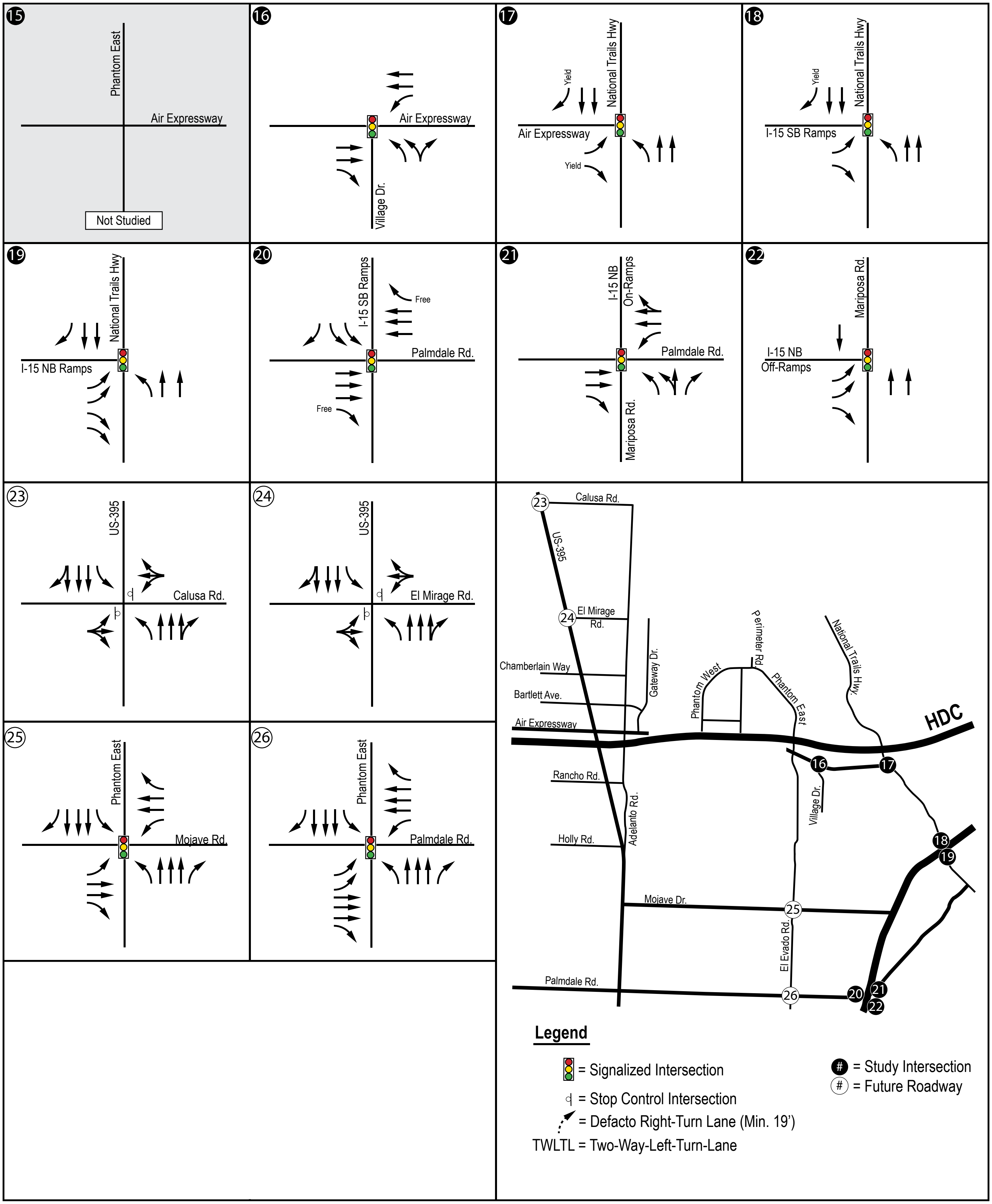
Exhibit 21a



Forecast Year 2040 With HDC Intersection Lane Configuration

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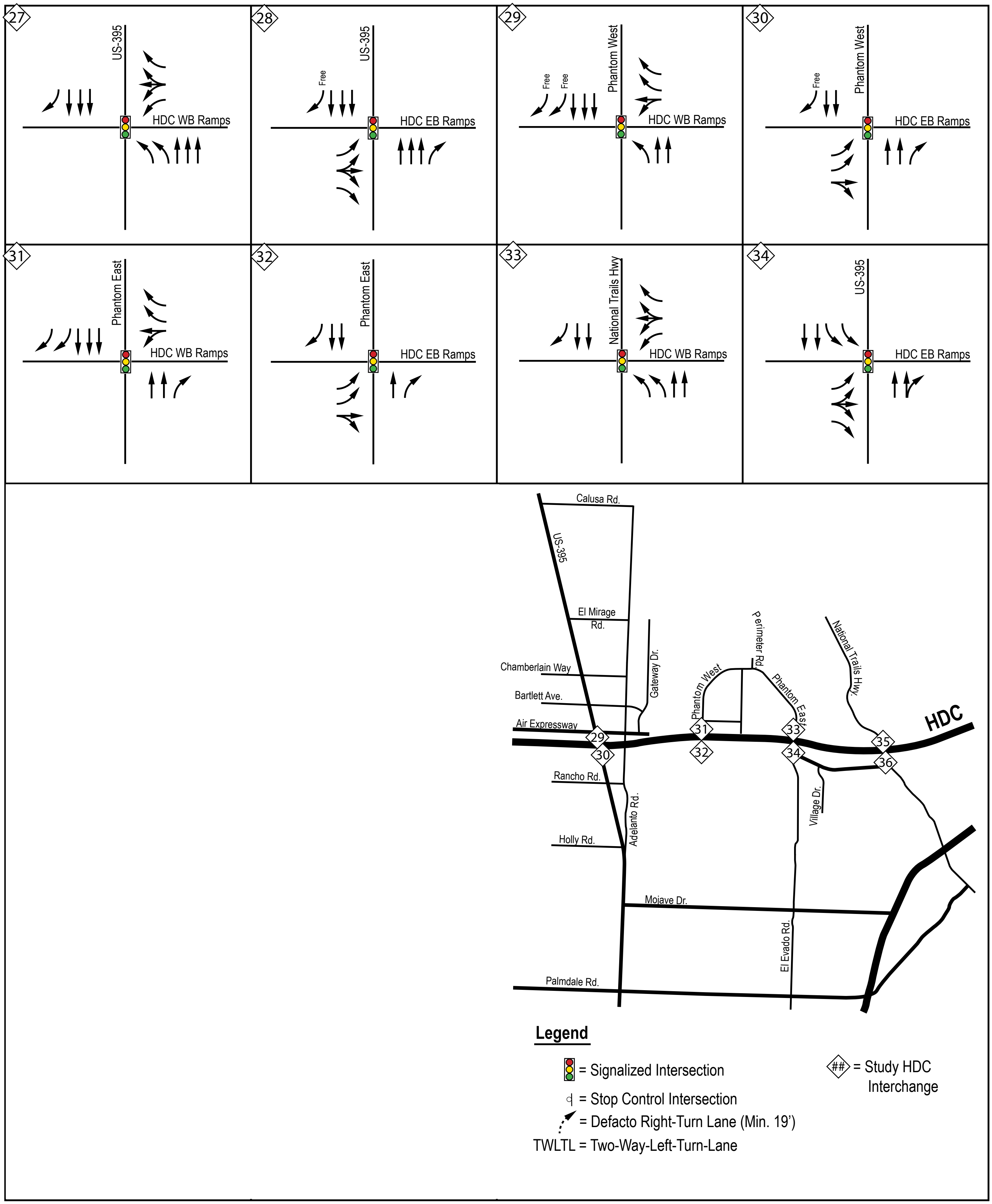
Exhibit 21b



Forecast Year 2040 With HDC Intersection Lane Configuration

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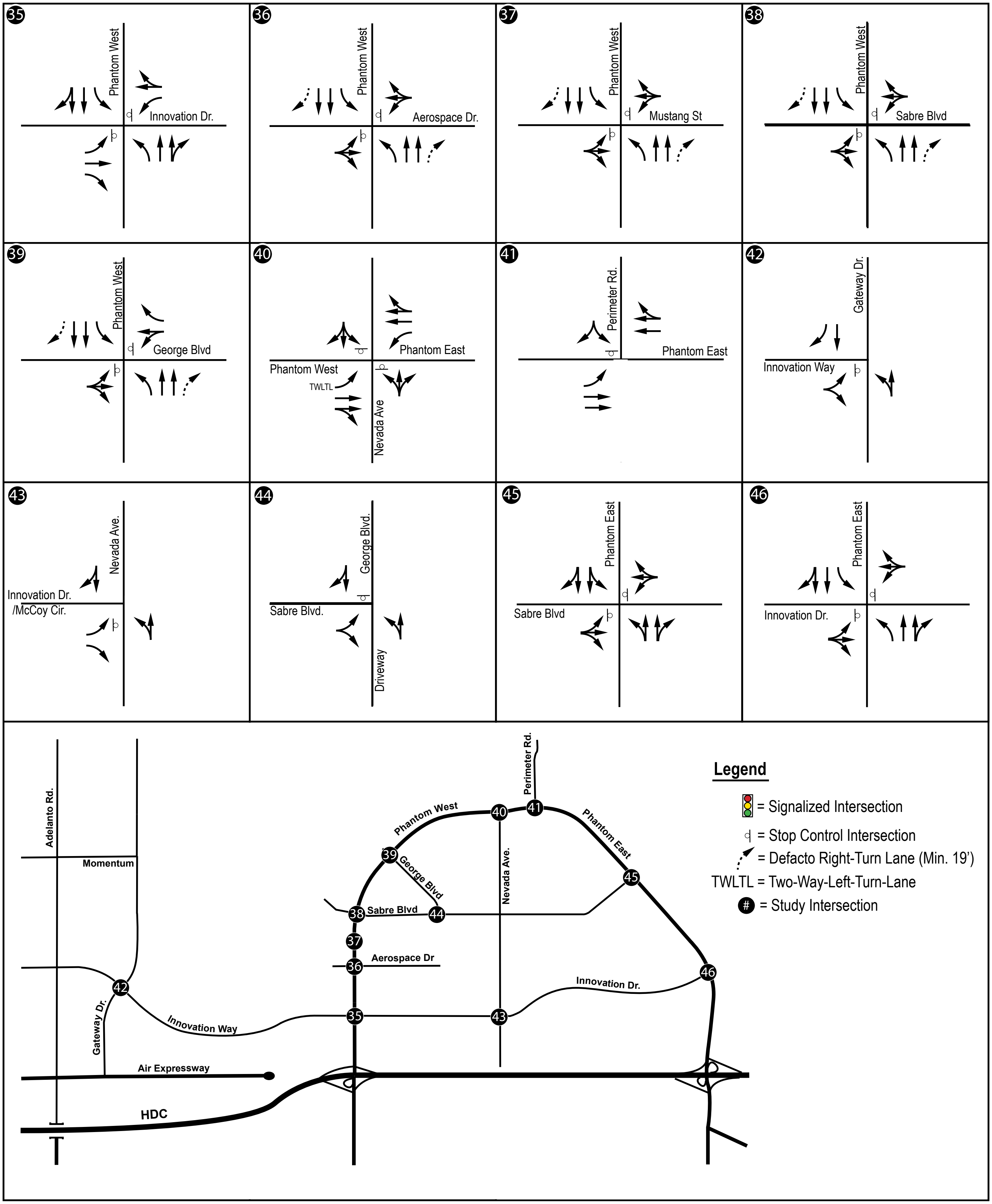
Exhibit 21c



Forecast Year 2040 With HDC Intersection Lane Configuration

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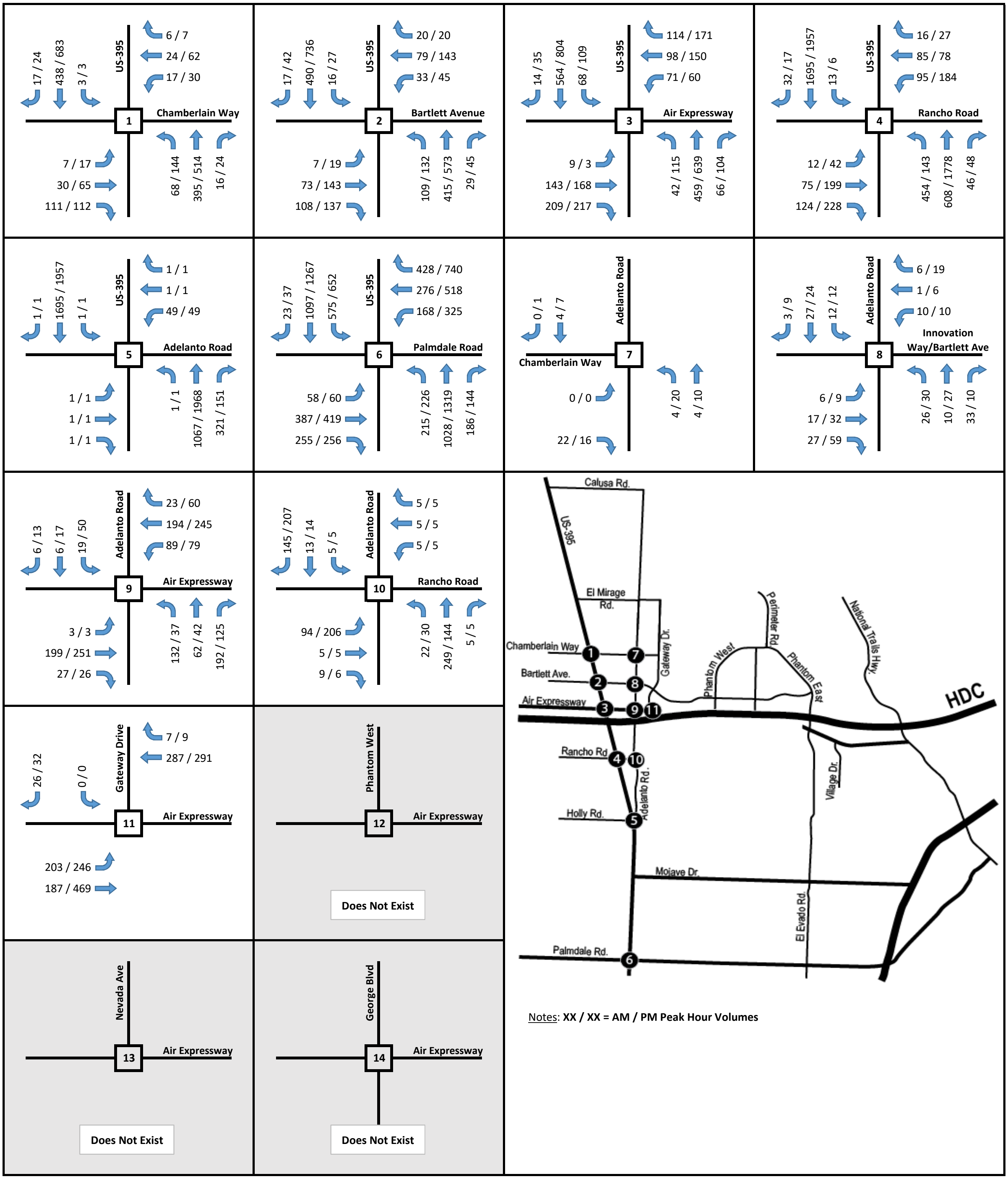
Exhibit 21d



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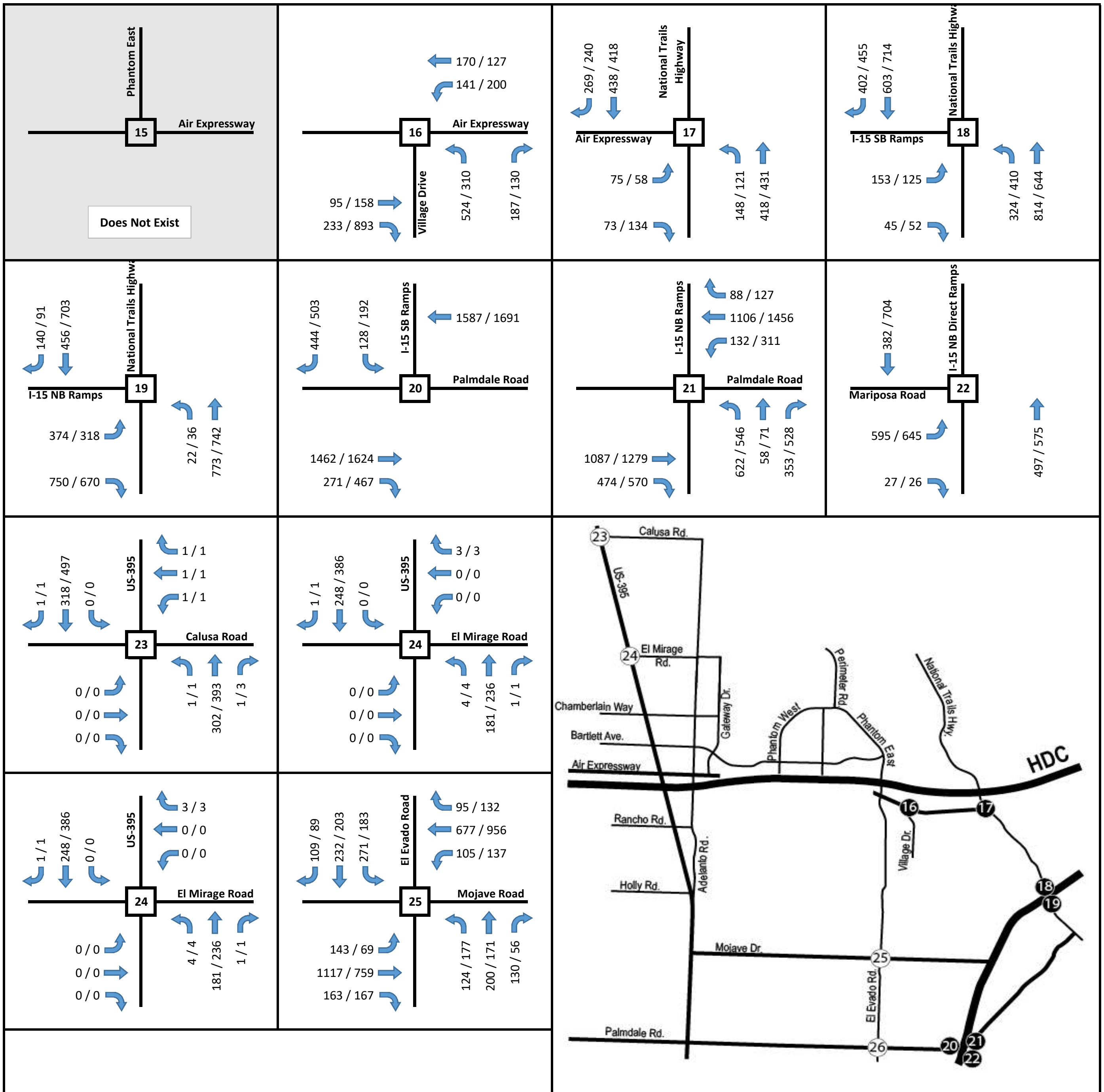
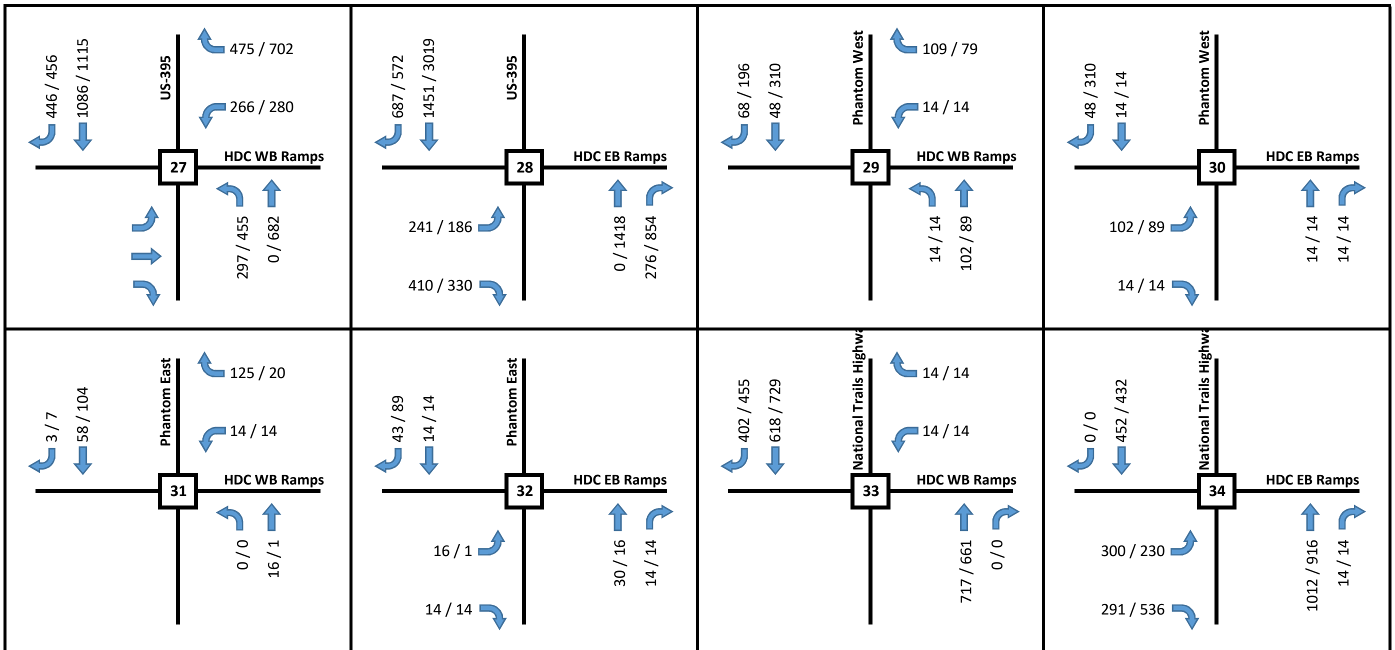
Forecast Year 2040 With HDC
Without Project AM/PM Peak Hour Volumes (ctd)
Exhibit 22a

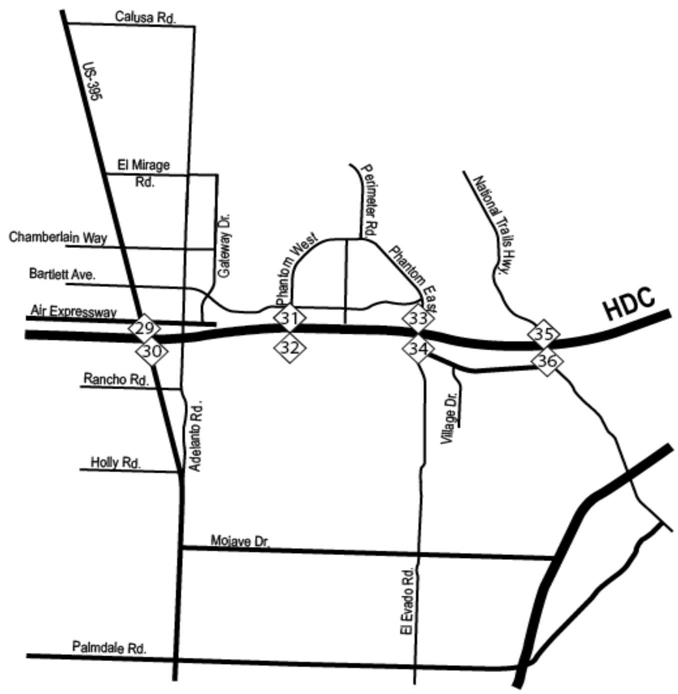


Notes: XX / XX = AM / PM Peak Hour Volumes

Forecast Year 2040 With HDC
Without Project AM/PM Peak Hour Volumes (ctd)
Exhibit 22b



<u>Notes</u>: **XX / XX = AM / PM Peak Hour Volumes**



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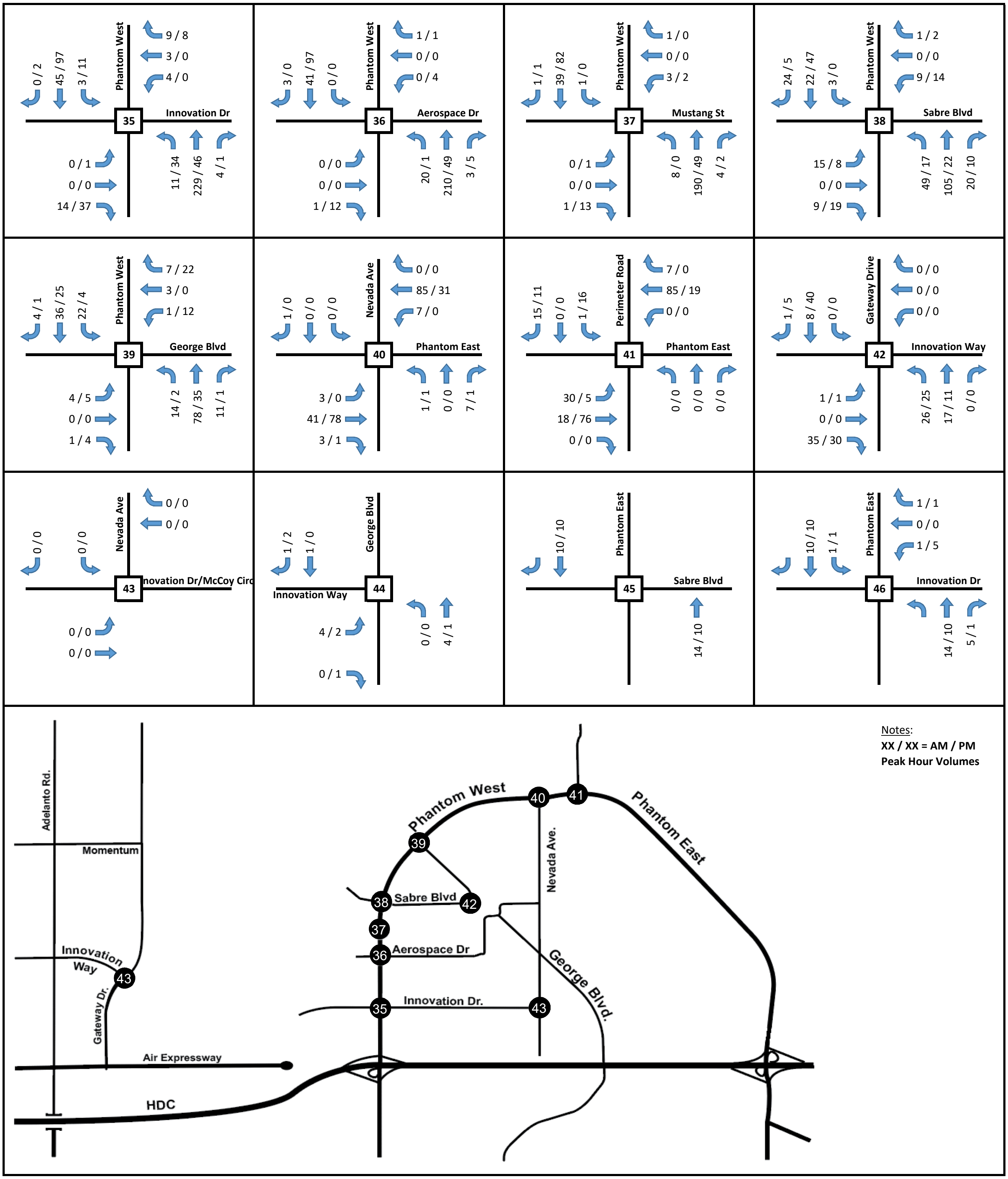
Forecast Year 2040 With HDC Without Project AM/PM Peak Hour Volumes (ctd)

Exhibit 22c



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Forecast Year 2040 With HDC
Without Project AM/PM Peak Hour Volumes (ctd)
Exhibit 22d

8.3 FORECAST YEAR 2040 WITH HDC WITHOUT PROJECT PEAK HOUR STUDY INTERSECTION LOS

Table 10 summarizes Forecast Year 2040 With HDC Without Project AM and PM peak hour level of service for all study intersections. Detailed analysis sheets are contained in **Appendix H**.

TABLE 10, FORECAST YEAR 2040 WITH HDC WITHOUT PROJECT AM/PM PEAK HOUR INTERSECTION LOS

Study Intersection		Traffic Control	Forecast Year 2040 With HDC Without Project Conditions					
			AM			PM		
			Delay[1]	-	LOS	Delay[1]	-	LOS
1 -	US-395/Chamberlain Way	Signal	8.8	-	A	12.2	-	B
2 -	US-395/Bartlett Avenue	Signal	10.9	-	B	13.6	-	B
3 -	US-395/Air Expressway	Signal	17.9	-	B	20.3	-	C
4 -	US-395/Rancho Road	Signal	19.1	-	B	23.9	-	C
5 -	US-395/Adelanto Road	TWSC	**>50.0**	-	**F[2]**	**>50.0**	-	**F[2]**
6 -	US-395/Palmdale Road	Signal	48.9	-	D	**78.7**	-	**E**
7 -	Adelanto Road/Chamberlain Way	OWSC	8.4	-	A	8.4	-	A
8 -	Adelanto Road/Innovation Way/Bartlett Ave	AWSC	5.0	-	A	5.7	-	A
9 -	Adelanto Road/Air Expressway	Signal	16.3	-	B	15.1	-	B
10 -	Adelanto Road/Rancho Road	TWSC	11.1	-	B	11.5	-	B
11 -	Gateway Drive/Air Expressway	Signal	32.6	-	C	45.0	-	D
12 -	Phantom West/Air Expressway	Not Studied						
13 -	Nevada Ave/Air Expressway	Not Studied						
14 -	George Blvd/Air Expressway	Not Studied						
15 -	Phantom East/Air Expressway	Not Studied						
16 -	Village Drive/Air Expressway	Signal	12.5	-	B	35.2	-	D
17 -	National Trails Highway/Air Expressway	Signal	8.1	-	A	7.4	-	A
18 -	I-15 SB Ramps/National Trails Highway	Signal	17.2	-	B	17.9	-	B
19 -	I-15 NB Ramps/National Trails Highway	Signal	42.1	-	D	26.0	-	C
20 -	I-15 SB Ramps/Palmdale Road	Signal	14.6	-	B	17.7	-	B
21 -	I-15 NB Ramps/Palmdale Road	Signal	21.1	-	C	43.2	-	D
22 -	I-15 NB Direct Ramps/Mariposa Road	Signal	13.2	-	B	13.5	-	B
23 -	US-395/Calusa Road	TWSC	12.0	-	B	14.2	-	B
24 -	US-395/El Mirage Road	TWSC	9.5	-	A	9.7	-	A
25 -	El Evado Road/Mojave Road	Signal	15.4	-	B	10.9	-	B
26 -	El Evado Road/Palmdale Road	Signal	15.4	-	B	31.5	-	C
27 -	US-395/HDC WB Ramps	Signal	18.2	-	B	29.4	-	C
28 -	US-395/HDC EB Ramps	Signal	11.6	-	B	11.0	-	B
29 -	Phantom West/HDC WB Ramps	Signal	**>80.0**	-	**F[2]**	**77.4**	-	**E**
30 -	Phantom West/HDC EB Ramps	Signal	32.3	-	C	29.3	-	C
31 -	Phantom East/HDC WB Ramps	Signal	19.9	-	B	8.1	-	A
32 -	Phantom East/HDC EB Ramps	Signal	36.8	-	D	5.5	-	A
33 -	National Trails Highway/HDC WB Ramps	Signal	9.8	-	A	9.7	-	A
34 -	National Trails Highway/HDC EB Ramps	Signal	12.7	-	B	28.7	-	C
35 -	Phantom West/Innovation Dr	TWSC	9.4	-	A	8.7	-	A
36 -	Phantom West/Aerospace Dr	TWSC	8.7	-	A	9.1	-	A
37 -	Phantom West/Mustang St	TWSC	9.5	-	A	9.2	-	A
38 -	Phantom West/Sabre Blvd	TWSC	10.0	-	A	9.1	-	A

Study Intersection	Traffic Control	Forecast Year 2040 With HDC Without Project Conditions					
		AM			PM		
		Delay[1]	-	LOS	Delay[1]	-	LOS
39 - Phantom West/George Blvd	TWSC	9.3	-	A	8.7	-	A
40 - Nevada Ave/Phantom East	TWSC	8.5	-	A	8.8	-	A
41 - Perimeter Road/Phantom East	TWSC	8.7	-	A	8.8	-	A
42 - Gateway Drive/Innovation Way	OWSC	8.5	-	A	8.6	-	A
43 - Nevada Ave/Innovation Dr/McCoy Circle	OWSC	0.0	-	A	0.0	-	A
44 - George Blvd/Sabre Blvd	OWSC	7.2	-	A	9.0	-	A
45 - Phantom East/Sabre Blvd	Does Not Exist Without Project						
46 - Phantom East/Innovation Dr	Does Not Exist Without Project						

Note: Deficient intersection operation indicated in **bold**.
[1] Average seconds of delay per vehicle.
[2] Delay exceeds 80.0 seconds for signalized intersection or 50.0 seconds for unsignalized intersections; Level of Service F per HCM
LOS = level of service; TWSC = Two-Way Stop Control; OWSC = One-Way Stop Control

Assuming the intersection approach lane configurations shown in **Exhibits 21a-21d**, all study intersections are forecast to operate at LOS D or better during the peak hour for Forecast Year 2040 With HDC Without Project conditions with the exception of the following locations:

Forecast Year 2040 With HDC Without Project Conditions		
Intersection	AM Peak Hour	PM Peak Hour
5 - US-395 / Adelanto Rad	LOS F	LOS F
6 - US-395 / Palmdale Road	Acceptable	LOS E
31 - Phantom West / HDC WB Ramps	LOS F	LOS E

9 FORECAST YEAR 2040 WITH HDC WITH PROJECT

9.1 FORECAST YEAR 2040 WITH HDC WITH PROJECT TRAFFIC VOLUMES

Forecast Year 2040 With HDC With Project traffic volumes are derived by adding trips forecast to be generated by the SCLA Specific Plan area to Forecast Year 2040 With HDC Without Project conditions traffic volumes.

Exhibit 23a-23d shows the Forecast Year 2040 With HDC With Project AM and PM peak hour trips at study intersections assuming the construction of the High Desert Corridor and full buildout of the City of Victorville roadway network.

9.2 FORECAST YEAR 2040 WITH HDC WITH PROJECT PEAK HOUR STUDY INTERSECTION LOS

Table 11 summarizes Forecast Year 2040 With HDC With Project AM and PM peak hour level of service for all study intersections. Detailed analysis sheets are contained in **Appendix I**.

As shown in **Table 11**, assuming the intersection approach lane configurations shown in **Exhibit 15a-15d**, 26 of the 42 intersections studied in the Forecast Year 2040 With HDC With Project conditions are forecast to operate at an acceptable level of service (LOS D or better) and 16 intersections operate at a deficient level of service (LOS E or worse) during the AM peak hour. During the PM peak hour, 26 intersections operate an acceptable level of service and 16 intersections operate at a deficient level of service.

According to the City of Victorville significance criteria, 18 of the 44 locations would result in a significant impact during at least one peak-hour period as a result of the proposed project and therefore require mitigation.

9.3 FORECAST YEAR 2040 WITH HDC WITH PROJECT MITIGATION MEASURES

Table 12 lists the mitigation measures that have been identified to reduce the traffic impacts at the intersections that are expected to operate at deficient levels of service with the project. **Table 11** also summarizes the AM and PM peak hour level of service assuming the implementation of the identified improvements.

With the implementation of identified mitigation measures, all study intersections are expected to operate at acceptable levels of service in the Forecast Year 2040 With HDC With Project condition. With the exception of the following location:

Forecast Year 2040 With HDC With Project Conditions		
Intersection	**AM Peak Hour**	**PM Peak Hour**
6 - US-395 / Air Expressway	LOS F	LOS F

Exhibit 24a-24b shows the Forecast Year 2040 With HDC With Project mitigated lane configurations.

It should be noted that TDM measures will most likely be developed that will reduce development trips made during the critical peak hours. Additionally, while the long-range analysis assumes that a large portion of the SCLA Specific Plan will develop as industrial and comprising of manufacturing (25%) and warehouse (75%). Programmatic limitations on the ability to achieve 25% manufacturing development could result in significant reductions in peak hour traffic generation since employee commute trips are lower for warehouse uses.

Table 11, Forecast Year 2040 With HDC With Project AM/PM Peak Hour Intersection LOS

Study Intersection	Traffic Control	Forecast Year 2040 With HDC Without Project Conditions		Forecast Year 2040 With HDC With Project Conditions		Significant Impact?[3]	
		AM	PM	AM	PM		
		Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS	AM	PM
1 - US-395/Chamberlain Way	Signal	8.8 - A	12.2 - B	9.8 - A	17.1 - B	No	No
2 - US-395/Bartlett Avenue	Signal	10.9 - B	13.6 - B	23.7 - C	41.2 - D	No	No
3 - US-395/Air Expressway	Signal	17.9 - B	20.3 - C	**>80.0 - F[2]**	**>80.0 - F[2]**	**YES**	**YES**
With Improvements				26.0 - C	54.7 - D	No	No
4 - US-395/Rancho Road	Signal	19.1 - B	23.9 - C	25.9 - C	**>80.0 - F[2]**	No	**YES**
With Improvements				28.5 - C	54.7 - D	No	No
5 - US-395/Adelanto Road	TWSC	**>50.0 - F[2]**	**>50.0 - F[2]**	**>50.0 - F[2]**	**>50.0 - F[2]**	**YES**	**YES**
With Improvements				4.9 - A	27.1 - C	No	No
6 - US-395/Palmdale Road	Signal	48.9 - D	**78.7 - F[2]**	**>80.0 - F[2]**	**>80.0 - F[2]**	**YES**	**YES**
With Improvements				**>80.0 - F[2]**	**>80.0 - F[2]**	**YES**	**YES**
7 - Adelanto Road/Chamberlain Way- Momentum	OWSC	8.4 - A	8.4 - A	11.1 - B	12.4 - B	No	No
8 - Adelanto Road/Innovation Way/Bartlett Ave	AWSC	5.0 - A	5.7 - A	7.4 - A	10.1 - B	No	No
9 - Adelanto Road/Air Expressway	Signal	16.3 - B	15.1 - B	**76.5 - E**	34.3 - C	**YES**	No
With Improvements				54.5 - D	27.4 - C	No	No
10 - Adelanto Road/Rancho Road	TWSC	11.1 - B	11.5 - B	34.7 - D	**>50.0 - F[2]**	No	**YES**
With Improvements				5.3 - A	7.2 - A	No	No
11 - Gateway Drive/Air Expressway	Signal	32.6 - C	45.0 - D	**>80.0 - F[2]**	**>80.0 - F[2]**	**YES**	**YES**
With Improvements				21.1 - C	20.7 - C	No	No
12 - Phantom West/Air Expressway	Not Studied						
13 - Nevada Ave/Air Expressway	Not Studied						
14 - George Blvd/Air Expressway	Not Studied						
15 - Phantom East/Air Expressway	Not Studied						
16 - Village Drive/Air Expressway	Signal	12.5 - B	35.2 - D	12.1 - B	35.6 - D	No	No
17 - National Trails Highway/Air Expressway	Signal	8.1 - A	7.4 - A	8.6 - A	8.0 - A	No	No
18 - I-15 SB Ramps/National Trails Highway	Signal	17.2 - B	17.9 - B	13.4 - B	15.6 - B	No	No
19 - I-15 NB Ramps/National Trails Highway	Signal	42.1 - D	26.0 - C	33.5 - C	43.9 - D	No	No
20 - I-15 SB Ramps/Palmdale Road	Signal	14.6 - B	17.7 - B	15.3 - B	18.6 - B	No	No
21 - I-15 NB Ramps/Palmdale Road	Signal	21.1 - C	43.2 - D	23.6 - C	46.6 - D	No	No

Study Intersection	Traffic Control	Forecast Year 2040 With HDC Without Project Conditions		Forecast Year 2040 With HDC With Project Conditions		Significant Impact?[3]	
		AM	PM	AM	PM		
		Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS	AM	PM
22 - I-15 NB Direct Ramps/Mariposa Road	Signal	13.2 - B	13.5 - B	12.0 - B	10.8 - B	No	No
23 - US-395/Calusa Road	TWSC	12.0 - B	14.2 - B	11.4 - B	12.8 - B	No	No
24 - US-395/El Mirage Road	TWSC	9.5 - A	9.7 - A	9.8 - A	10.6 - B	No	No
25 - El Evado Road/Mojave Road	Signal	15.4 - B	10.9 - B	27.6 - C	18.9 - B	No	No
26 - National Trails Highway/HDC WB Ramps- Navigation	Signal	15.4 - B	31.5 - C	39.3 - D	54.9 - D	No	No
27 - US-395/HDC WB Ramps	Signal	18.2 - B	29.4 - C	30.3 - C	**>80.0 - F[2]**	No	**YES**
With Improvements				33.4 - C	44.7 - D	No	No
28 - US-395/HDC EB Ramps	Signal	11.6 - B	11.0 - B	46.8 - D	39.2 - D	No	No
29 - Phantom West/HDC WB Ramps	Signal	**>80.0 - F[2]**	**77.4 - E**	**>80.0 - F[2]**	37.2 - D	No	No
30 - Phantom West/HDC EB Ramps	Signal	32.3 - C	29.3 - C	23.1 - C	38.4 - D	No	No
31 - Phantom East/HDC WB Ramps	Signal	19.9 - B	8.1 - A	**>80.0 - F[2]**	21.8 - C	**YES**	No
With Improvements				0.9 - A	2.0 - A	No	No
32 - Phantom East/HDC EB Ramps	Signal	36.8 - D	5.5 - A	31.7 - C	32.3 - C	No	No
33 - National Trails Highway/HDC WB Ramps	Signal	9.8 - A	9.7 - A	14.4 - B	11.0 - B	No	No
34 - National Trails Highway/HDC EB Ramps	Signal	12.7 - B	28.7 - C	18.7 - B	42.5 - D	No	No
35 - Phantom West/Innovation Dr	TWSC	9.4 - A	8.7 - A	**>50.0 - F[2]**	**>50.0 - F[2]**	**YES**	**YES**
With Improvements				30.7 - C	54.3 - D	No	No
36 - Phantom West/Aerospace Dr	TWSC	8.7 - A	9.1 - A	**>50.0 - F[2]**	**>50.0 - F[2]**	**YES**	**YES**
With Improvements				4.1 - A	9.5 - A	No	No
37 - Phantom West/Mustang St	TWSC	9.5 - A	9.2 - A	**>50.0 - F[2]**	**49.8 - E**	**YES**	**YES**
With Improvements				14.3 - B	13.7 - B	No	No
38 - Phantom West/Sabre Blvd	TWSC	10.0 - A	9.1 - A	**>50.0 - F[2]**	**>50.0 - F[2]**	**YES**	**YES**
With Improvements				5.3 - A	9.5 - A	No	No
39 - Phantom West/George Blvd	TWSC	9.3 - A	8.7 - A	19.1 - C	13.9 - B	No	No
40 - Nevada Ave/Phantom East	TWSC	8.5 - A	8.8 - A	17.1 - C	16.1 - C	No	No
41 - Perimeter Road/Phantom East	TWSC	8.7 - A	8.8 - A	**>50.0 - F[2]**	**45.1 - E**	**YES**	**YES**
With Improvements				29.2 - D	14.6 - B	No	No
42 - Gateway Drive/Innovation Way	OWSC	8.5 - A	8.6 - A	**>50.0 - F[2]**	**>50.0 - F[2]**	**YES**	**YES**
With Improvements				43.6 - D	54.8 - D	No	No

Study Intersection	Traffic Control	Forecast Year 2040 With HDC Without Project Conditions		Forecast Year 2040 With HDC With Project Conditions		Significant Impact?[3]	
		AM	PM	AM	PM		
		Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS	AM	PM
43 - Nevada Ave/Innovation Dr/McCoy Circle	OWSC	0.0 - A	0.0 - A	**>50.0 - F[2]**	**>50.0 - F[2]**	**YES**	**YES**
With Improvements				10.6 - B	13.6 - B	No	No
44 - George Blvd/Sabre Blvd	OWSC	7.2 - A	9.0 - A	11.5 - B	11.8 - B	No	No
45 - Phantom East/Sabre Blvd	Does Not Exist Without Project			**>50.0 - F[2]**	**>50.0 - F[2]**	**YES**	**YES**
With Improvements				13.3 - B	44.0 - D	No	No
46 - Phantom East/Innovation Dr	Does Not Exist Without Project			**>50.0 - F[2]**	**>50.0 - F[2]**	**YES**	**YES**
With Improvements				11.0 - B	16.1 - B	No	No

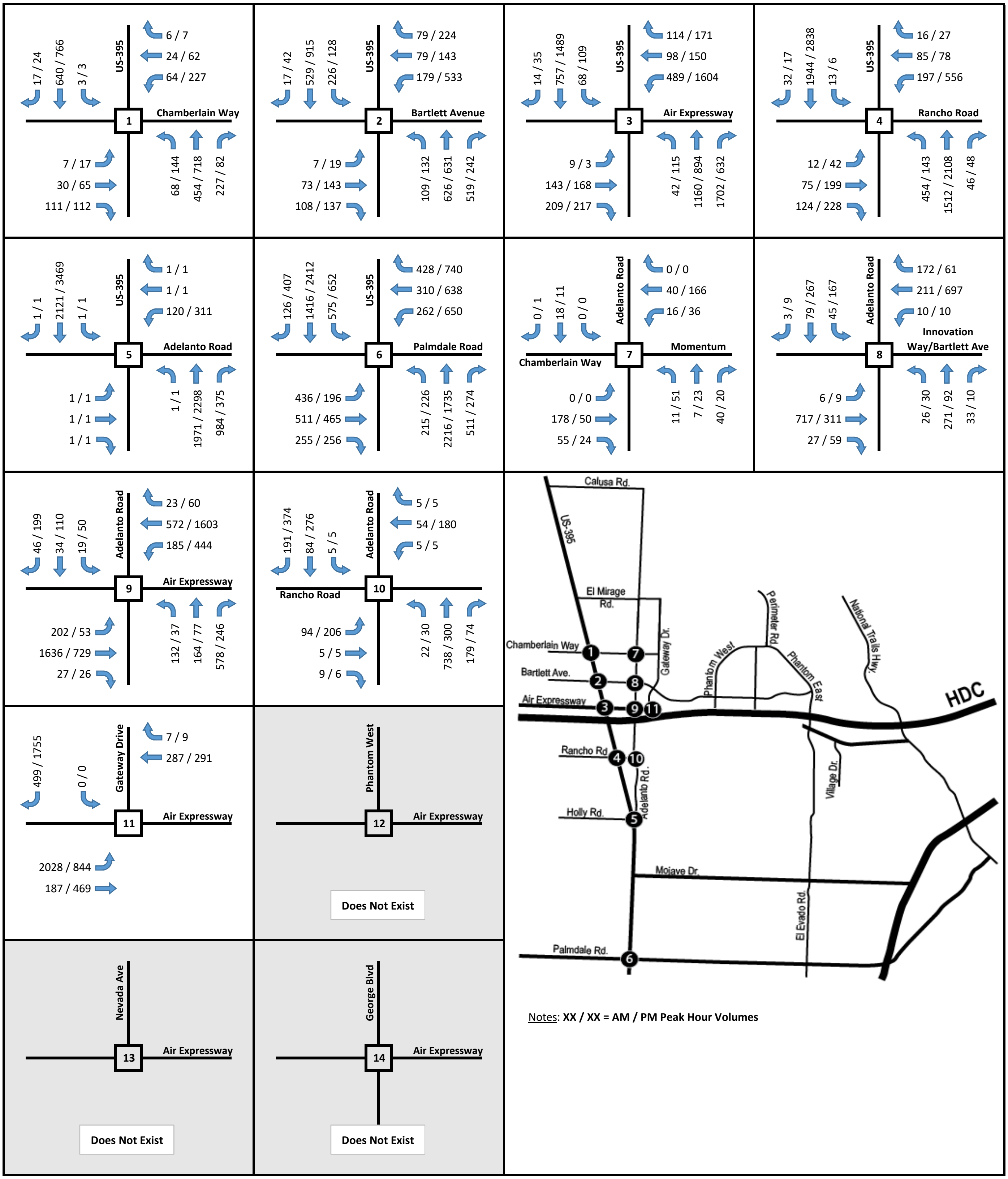
Note: Deficient intersection operation indicated in **bold**.

[1] Average seconds of delay per vehicle.

[2] Delay exceeds 80.0 seconds for signalized intersection or 50.0 seconds for unsignalized intersections; Level of Service F per HCM

[3] Delay deteriorates from acceptable (LOS D or better) to unacceptable (LOS E or F) OR change in delay for an already deficient intersection by 2% or more

LOS = level of service; TWSC = Two-Way Stop Control; OWSC = One-Way Stop Control



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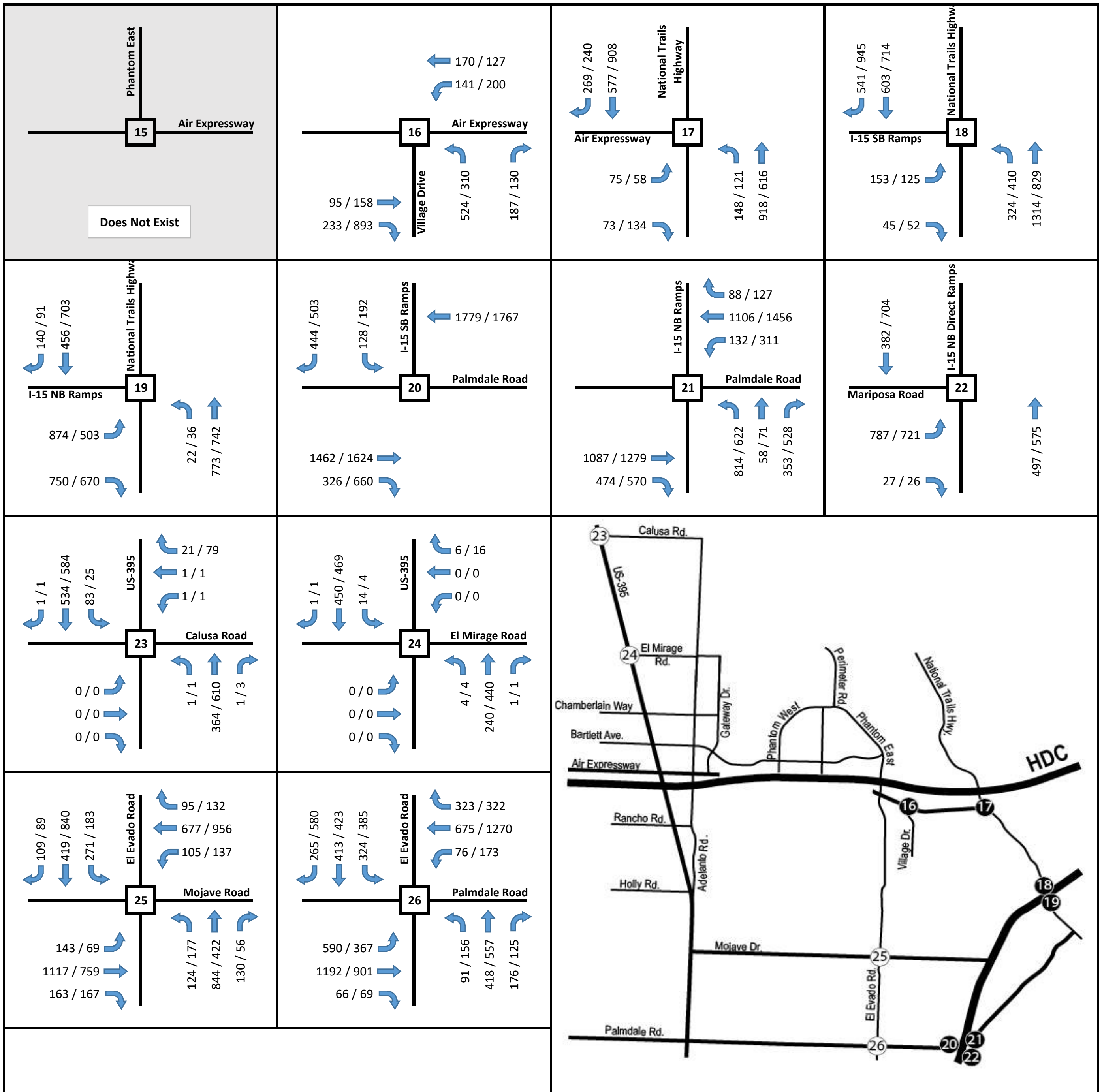
Forecast Year 2040 With HDC With Project
AM/PM Peak Hour Volumes

Exhibit 23a



Notes: **XX / XX = AM / PM Peak Hour Volumes**

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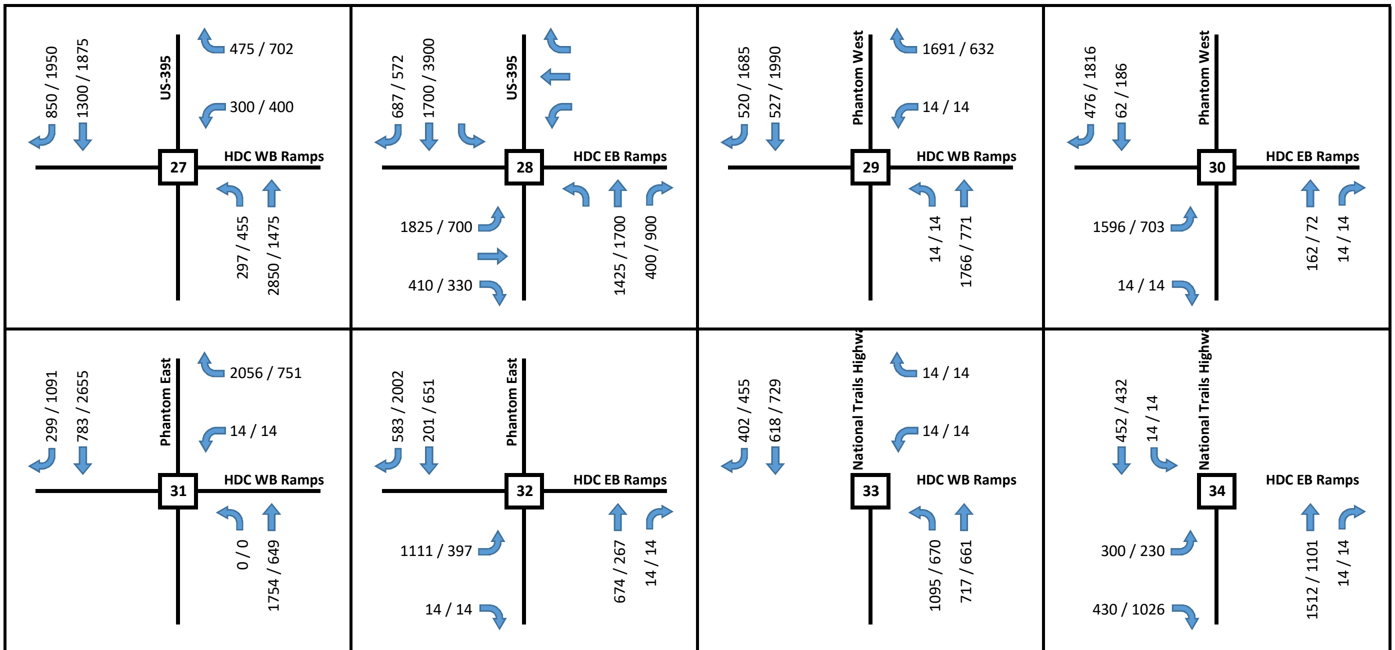
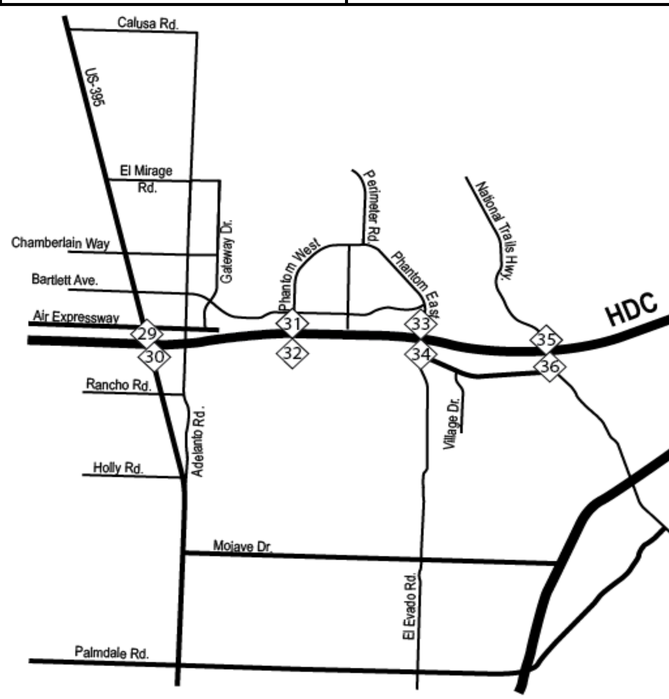
Forecast Year 2040 With HDC With Project AM/PM Peak Hour Volumes (ctd)

Exhibit 23b



Notes: **XX / XX = AM / PM Peak Hour Volumes**



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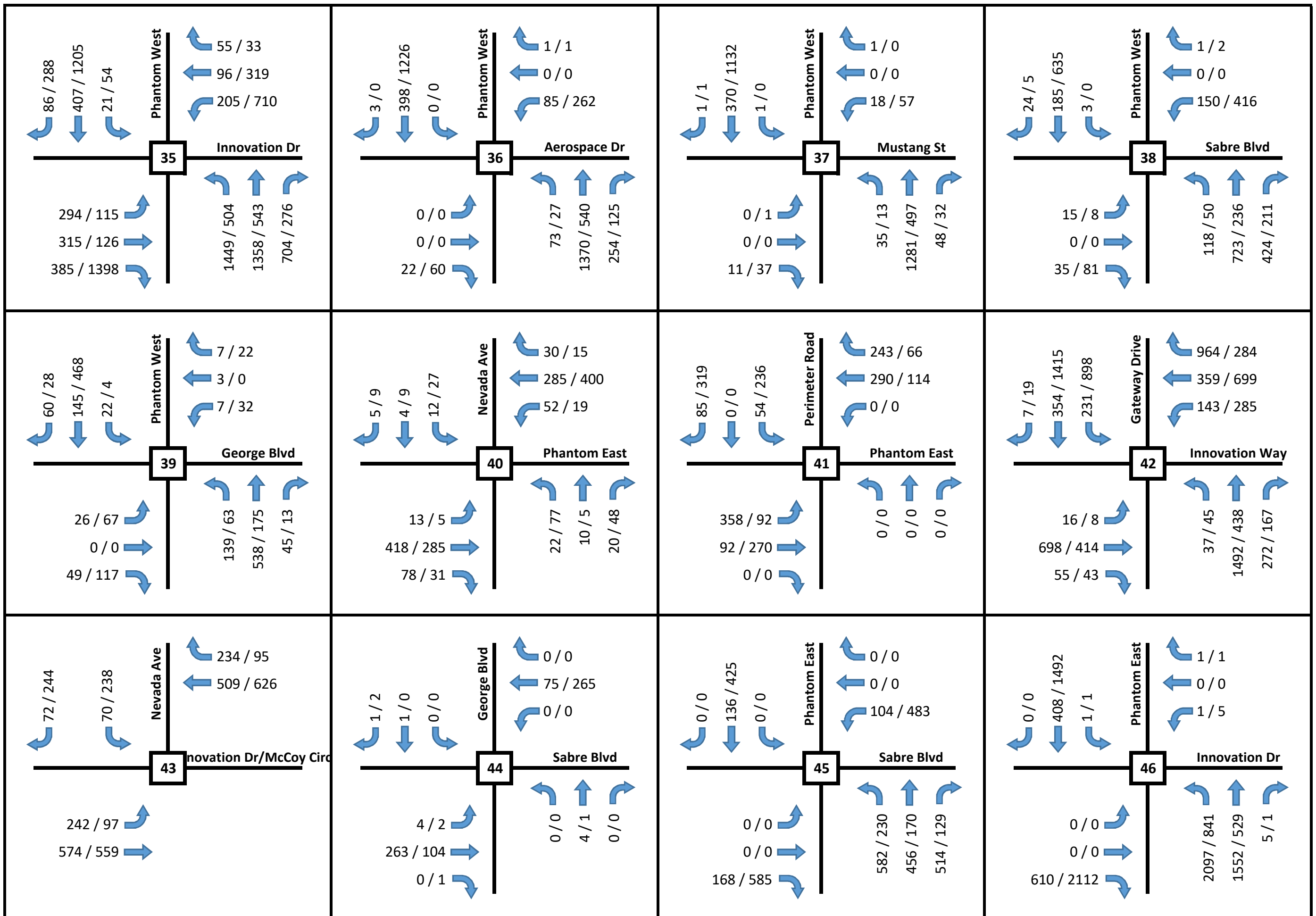
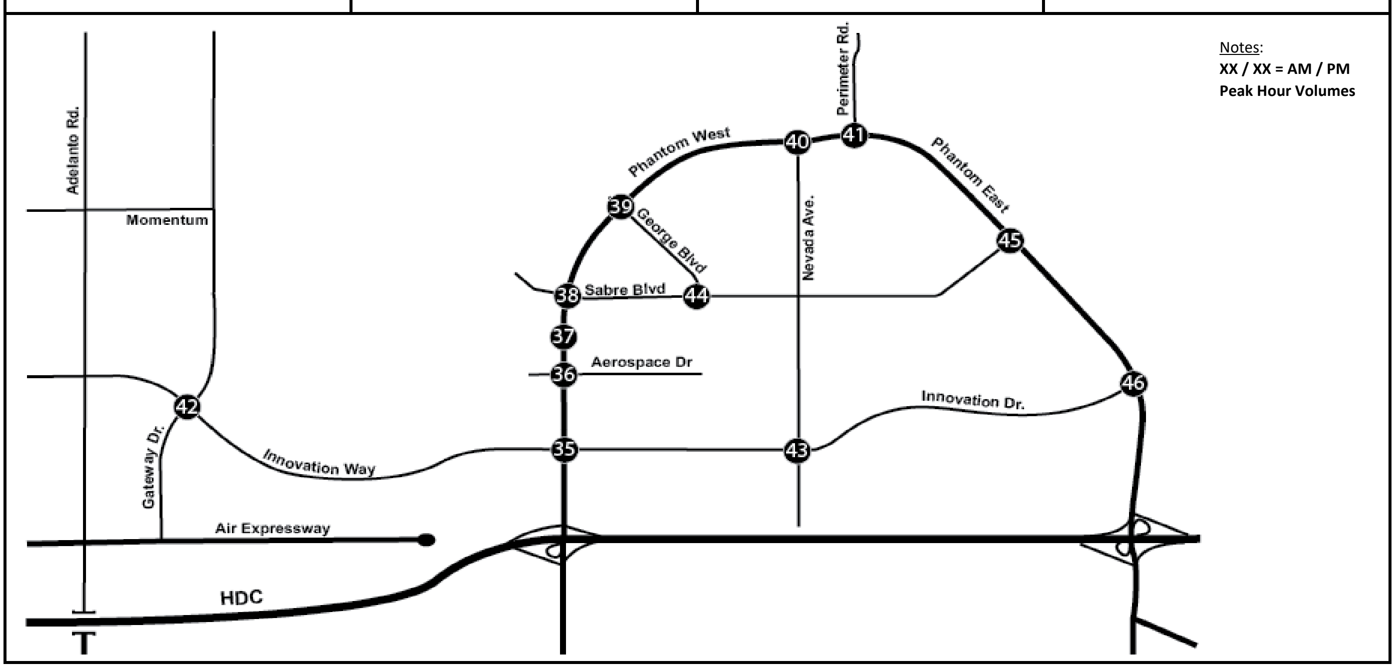
Forecast Year 2040 With HDC With Project
AM/PM Peak Hour Volumes (ctd)

Exhibit 23c





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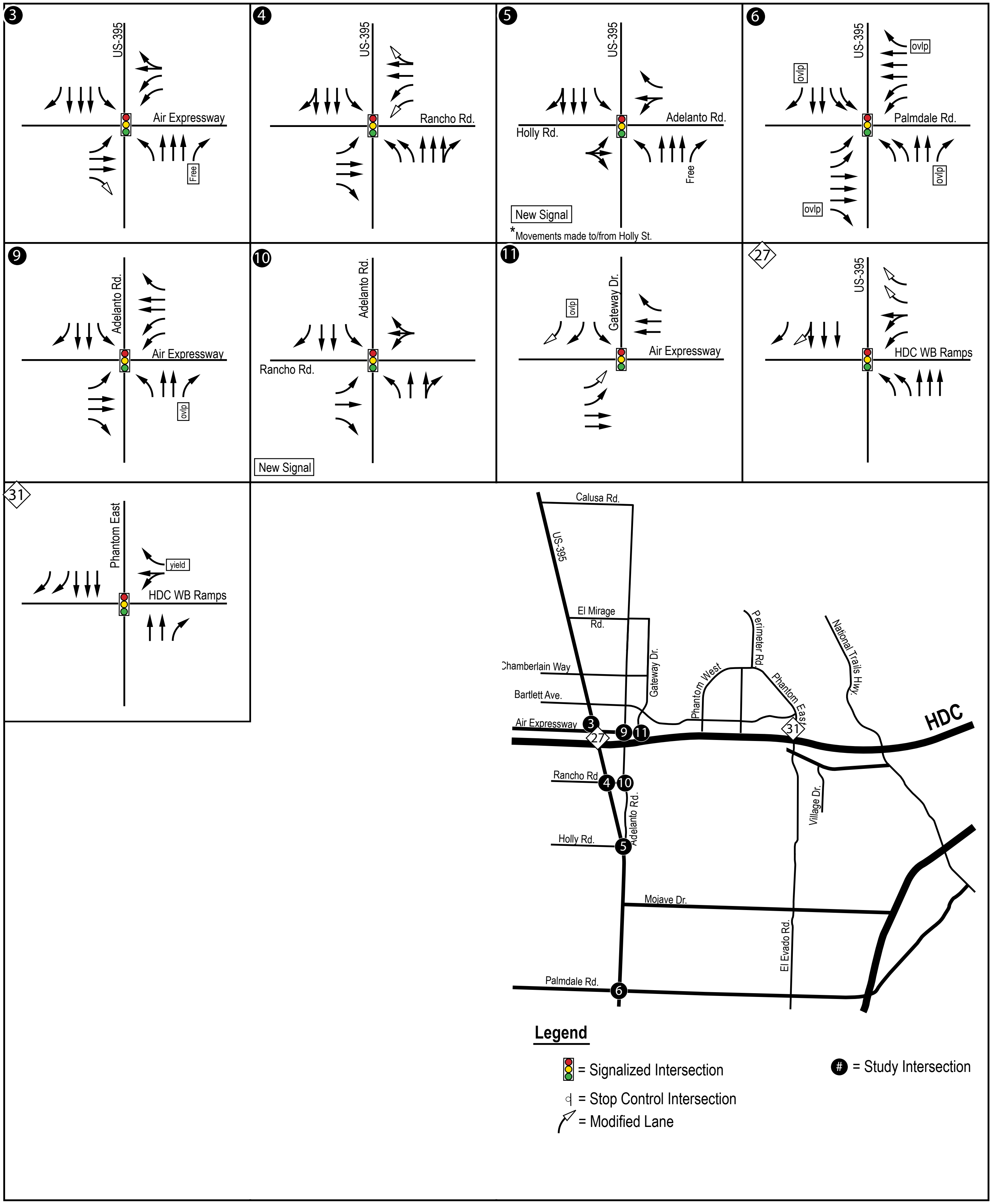
Forecast Year 2040 With HDC With Project
AM/PM Peak Hour Volumes (ctd)
Exhibit 23d

TABLE 12, FORECAST YEAR 2040 WITH HDC WITH PROJECT RECOMMENDED MITIGATION

Mitigation Measure	Intersection	Forecast Year 2040 With HDC With Project Recommended Mitigation
MM-23	3 - US-395 / Air Expressway	• Modify northbound right-turn lane to a free movement • Install eastbound dedicated right-turn-lane
MM-24	4 - US-395 / Rancho Road	• Restripe westbound approach to include two left-turn-lanes, one through lane, and one shared through/right-turn-lane
MM-25	5 - US-395 / Adelanto Road	• Signalize Intersection
MM-26	6 - US-395 / Palmdale Road	• Install overlap phasing on all right-turn movements
MM-27	9 - Adelanto Road / Air Expressway	• Install northbound right-turn overlap phase
MM-28	10 - Adelanto Road / Rancho Road	• Signalize Intersection
MM-29	11 - Gateway Drive / Air Expressway	• Install second eastbound left-turn-lane • Install second southbound right-turn-lane; Install southbound right-turn overlap phase.
MM-30	27 - US-395 / HDC WB Ramps	• Reconfigure westbound approach to include one left-turn-lane, one shared left/through-lane; Install second westbound dedicated right-turn-lane • Convert third southbound through-lane to a shared through/right-turn-lane
MM-31	31 - Phantom East /HDC WB Ramps	• Modify westbound right-turn-lane to include a channelized yield right-turn movement
MM-32	35 - Phantom West / Innovation Dr	• Signalize Intersection. • Install second northbound left turn lane and one northbound dedicated right-turn-lane with a right-turn overlap phase • Install southbound dedicated right-turn-lane • Install second eastbound through lane and convert dedicated right-turn to a free right movement • Install second westbound through lane
MM-33	36 - Phantom West / Aerospace Dr	• Signalize intersection • Install northbound dedicated right-turn-lane • Install southbound dedicated right-turn-lane
MM-34	37 - Phantom West /Mustang St	• Install median modifications to eliminate eastbound and westbound left turns
MM-35	38 - Phantom West / Sabre Blvd	• Signalize intersection • Install northbound dedicated right-turn-lane

Mitigation Measure	Intersection	Forecast Year 2040 With HDC With Project Recommended Mitigation
MM-36	41 - Perimeter Road / Phantom East	• Install southbound dedicated right-turn-lane • Install westbound dedicated right-turn-lane
MM-37	42 - Gateway Drive / Innovation Way	• Signalize Intersection • Construct east leg of the intersection • Install two northbound through-lanes and one northbound dedicated right-turn-lane with an overlap phase • Install one southbound left-turn-lane and a second southbound through-lane • Install two eastbound through-lanes and one eastbound dedicated right-turn-lane • Install a westbound left-turn-lane, two westbound through-lanes, and two westbound right-turn-lanes with a right-turn overlap phase
MM-38	43 - Nevada Ave / Innovation Dr / McCoy Circle	• Signalize Intersection • Construct east leg of the intersection • Install one northbound shared through/right-turn-lane • Install a southbound left-turn-lane • Install one eastbound through-lane and one shared through/right-turn-lane • Install a westbound left-turn-lane, a westbound through-lane, and a shared through/right-turn-lane
MM-39	45 - Phantom East / Sabre Boulevard	• Signalize Intersection • Install west leg of the intersection to include one shared left/through/right-turn-lane • Install east leg of the intersection to include one shared left/through/right-turn-lane
MM-40	46 - Phantom East / Innovation Way	• Signalize Intersection • Install second northbound left-turn-lane • Install west leg of the intersection to include one eastbound shared left/through-lane and one eastbound dedicated right-turn-lane with a channelized yield movement • Install westbound left-turn-lane



Forecast Year 2040 With HDC With Project Mitigated Intersection Lane Configuration

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March 2020
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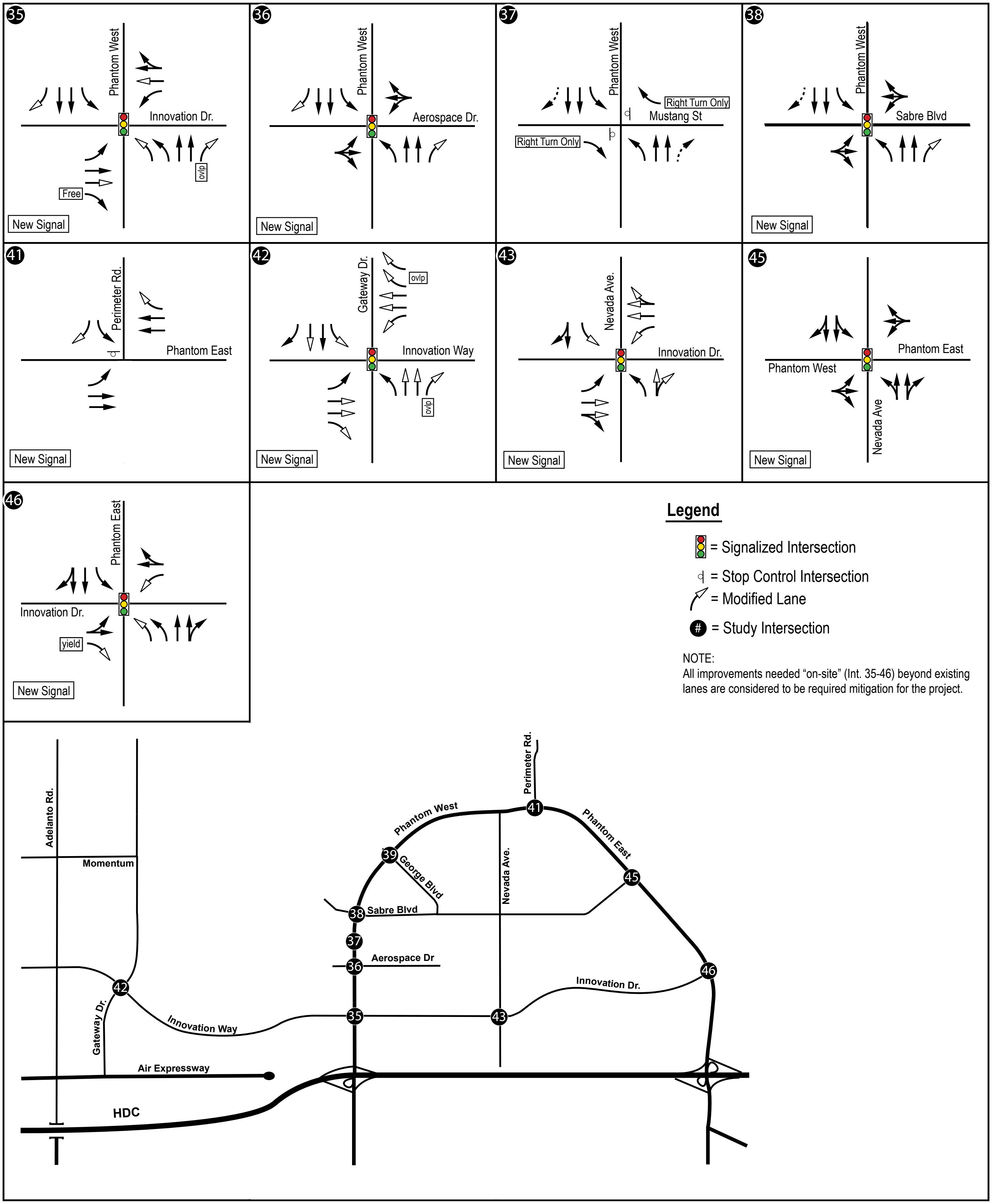
Exhibit 24a



Forecast Year 2040 With HDC With Project
Mitigated Intersection Lane Configuration (ctd)

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March 2020
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Exhibit 24b

10 PHASING ANALYSIS

The development of the SCLA Specific Plan Area is proposed to be constructed over approximately 25-year period and is projected to be built out by Year 2040. The following project development phases have been analyzed as part of this traffic study:

- Phase 1 Completion (Year 2023)
- Phase 2 Completion (Year 2028)
- Phase 3 Completion (Year 2033)
- Phase 4 Completion (Year 2038)

The analysis of Phase 5 (Project Buildout) is covered in the Forecast Year 2040 buildout analyses without and with the High Desert Corridor.

Study intersection locations that were forecast to operation at deficient levels of service for the Forecast Year 2040 With Project condition were further analyzed for each development phase in order to determine when specific improvements would be necessary.

Table 13 summarizes the Project Development Phasing AM and PM peak hour level of service for the study intersections that are forecast to operate at deficient levels of service for the Forecast Year 2040 Without HDC With Project condition.

Table 14 lists the mitigations measures that have been identified for each development phase shown to operate deficiently for each phase. The identified measures are forecast to reduce the incremental traffic impacts associated with the project for each phase. **Table 13** also summarizes the AM and PM peak hour level of service assuming the implementation of the identified improvements.

For reach subsequent development phase, the operations analysis assumes the implantation of the previous phases' improvements.

10.1 DEVELOPMENT PHASE 1

Development Phase 1 (Year 2023) analysis assumes the existing onsite and offsite roadway network with the exception of the widening of US-395.

The widening of US-395 from 2-lanes to 4-lanes is estimated to be completed by 2022. As part of the widening, the following improvements are assumed:

- Widening of US-395 from Air Expressway to Adelanto Road
- Improvements to the intersection of US-395 and Air Expressway (Int. 3)
    - Eastbound approach to include one left-turn-lane, one through-lane, and one shared through/right-turn-lane
    - Westbound approach to include one left-turn-lane, one through-lane, and one shared through/right-turn-lane
- Removal of northbound free movement from US-395 onto Adelanto Road (Int. 5)
- Holly Road (Int. 5) to be restricted to right-turns only from Holly Road onto US-395

The following improvements are necessary to serve the on-site developments in Phase 1:

- Extension of El Mirage Road from US-395 to Adelanto Road
- Extension of Adelanto Road from Chamberlain Way to El Mirage Road
- Extension of Gateway Road from Innovation Way to El Mirage Road
- Construction of Navigation as a continuation of El Mirage Road from Adelanto Road to Gateway Drive
- Construction of Momentum as a continuation of Chamberlain Way from Adelanto Road to Gateway Drive

As shown in **Table 13**, the locations below require improvements as described in **Table 14**. Detailed analysis sheets for Phase 1 are contained in **Appendix J**.

Phase 1 Conditions				
Intersection		**AM Peak Hour**	**PM Peak Hour**	**Significant Impact?**
3 -	US-395/Air Expressway	Acceptable	LOS E	No
6 -	US-395/Palmdale Road	LOS E	LOS F	No
17 -	National Trails Hwy/Air Expressway	LOS F	Acceptable	No

10.2 DEVELOPMENT PHASE 2

Phase 2 (Year 2028) assumes the incremental mitigation improvements described in Phase 1. In addition, the extension of Innovation Way from Gateway Drive to Phantom West is necessary to serve the on-site developments in Phase 2.

As shown in **Table 13**, the locations below require improvements as described in **Table 14**. Detailed analysis sheets for Phase 2 are contained in **Appendix K**.

Phase 2 Conditions				
Intersection		**AM Peak Hour**	**PM Peak Hour**	**Significant Impact?**
3 -	US-395/Air Expressway	LOS F	LOS F	No
6 -	US-395/Palmdale Road (1)	LOS F	LOS F	**YES**
9 -	Adelanto Road/Air Expressway	LOS E	Acceptable	No
11 -	Gateway Drive/Air Expressway	LOS F	LOS F	No
17 -	National Trails Hwy/Air Expressway	LOS F	Acceptable	No
18 -	I-15 SB Ramps/National Trails Hwy	LOS F	Acceptable	No
19 -	I-15 NB Ramps/National Trails Hwy	LOS F	Acceptable	No
35 -	Phantom West/Innovation Drive	LOS F	LOS F	No
42 -	Gateway Drive/Innovation Drive	LOS F	LOS F	No

(1) Mitigation Measures Fully Implemented this Phase

With the implementation of the identified mitigation measures, the intersection of US-395 and Palmdale Road (Int 6) would continue to operate at a deficient level of service and would result in an unavoidable significant impact. Due to right of way constraints, it is not feasible to improve this location beyond what is identified in this analysis. All other unmitigable impacts would occur in Phase 4 or Phase 5 (buildout).

10.3 DEVELOPMENT PHASE 3

Phase 3 (Year 2033) assumes the incremental mitigation improvements described in Phase 1 & 2. In addition, the construction of the east leg of the intersection of Nevada Avenue and Innovation Drive/McCoy Circle is necessary to serve the on-site development in Phase 3.

As US-395 approaches capacity, it is estimated that increases in regional trips to and from the south would naturally shift to National Trails Highway as an alternative route. Therefore, Phase 3 distribution assumes approximately 3% of regional project traffic that is forecast to travel to and from the south shifts from US-395 to National Trails Highway

As shown in **Table 13**, the locations below require improvements as described in **Table 14**. Detailed analysis sheets for Phase 3 are contained in **Appendix L**.

Phase 3 Conditions			
Intersection	**AM Peak Hour**	**PM Peak Hour**	**Significant Impact?**
3 - US-395/Air Expressway (1)	Acceptable	LOS F	No
5 - US-395/Adelanto Road	LOS E	LOS F	No
6 - US-395/Palmdale Road	Deficient	Deficient	**YES**
9 - Adelanto Road/Air Expressway	LOS F	LOS E	No
11 - Gateway Drive/Air Expressway (1)	Acceptable	LOS F	No
12 - Phantom West/Air Expressway	LOS F	LOS E	No
13 - Nevada Avenue/Air Expressway	LOS F	LOS F	No
15 - Phantom East/Air Expressway	Acceptable	LOS E	No
17 - National Trails Hwy/Air Expressway	LOS F	Acceptable	No
18 - I-15 SB Ramps/National Trails Hwy	LOS F	LOS F	No
19 - I-15 NB Ramps/National Trails Hwy (1)	LOS F	Acceptable	No
43 - Nevada Avenue/Innovation Drive	LOS E	LOS F	No

(1) Mitigation Measures Fully Implemented this Phase

During Phase 3, the intersections of US-395 and Air Expressway (Int 3), US-395 and Adelanto Road (Int 5) as well as Gateway Drive and Air Expressway (Int 11) are fully improved to the ultimate buildout as identified in this analysis.

10.4 DEVELOPMENT PHASE 4

Phase 4 (Year 2038) assumes the incremental mitigation improvements described in Phase 1, 2, & 3. In addition, the following on-site improvements are required to serve on-site development in Phase 4:

- Extension of Sabre Boulevard from Nevada Avenue to Phantom East
- Extension of Innovation Drive from Nevada Avenue to Phantom East

The following off-site improvements are assumed consistent with the City of Victorville roadway network Circulation Element:

- Extension of Phantom East from Air Expressway to Palmdale Road (existing El Evado Road alignment)
- Extension of Phantom West south of Air Expressway
- Extension of Adelanto Road from El Mirage Road to Calusa Road (2-lanes)
- Construction of Calusa Road from US-395 to Adelanto Road (2-lanes)

As shown in **Table 13**, the locations below require improvements as described in **Table 14**. Detailed analysis sheets for Phase 4 are contained in **Appendix M**.

Phase 4 Conditions			
Intersection	**AM Peak Hour**	**PM Peak Hour**	**Significant Impact?**
3 - US-395/Air Expressway	Acceptable	Deficient	**YES**
4 - US-395/Ranch Road (1)	LOS F	LOS F	**YES**
5 - US-395/Adelanto Road	LOS F	LOS F	No
6 - US-395/Palmdale Road	Deficient	Deficient	**YES**
11 - Gateway Drive/Air Expressway	Acceptable	Deficient	**YES**
13 - Nevada Avenue / Air Expressway (1)	LOS	LOS E	No
15 - Phantom East/Air Expressway (1)	LOS F	LOS	**YES**
26 - El Evado Road/Palmdale Road	LOS F	LOS F	**YES**
36 - Phantom West/Aerospace (1)	LOS E	Acceptable	No
42 - Gateway Drive/Innovation Way (1)	LOS E	Acceptable	No
43 - Nevada Avenue/Innovation Drive	LOS E	LOS E	No

(1) Mitigation Measures Fully Implemented this Phase

With the implementation of the identified mitigation measures, the intersections of US-395 and Rancho Road (Int 4), Phantom East and Air Expressway (Int 15), as well as El Evado Road and Palmdale Road (Int 26) would continue to operate at deficient levels of service and would result in unavoidable significant impacts at these intersections. In addition, Phase 4 traffic increases to the locations that were fully improved in Phase 3 would also cause these locations to operate deficiently. All other unmitigatable impacts would occur in Phase 5 (buildout).

10.5 DEVELOPMENT PHASE 5

The analysis of Phase 5 (Project Buildout) is covered in the Forecast Year 2040 buildout analyses without and with the High Desert Corridor. Refer to **Chapter 7** and **Chapter 9** of this report.

Table 13, Project Development Phasing AM/PM Peak Hour Intersection LOS

Study Intersection	Phase 1 Conditions		Phase 2 Conditions		Phase 3 Conditions		Phase 4 Conditions		Forecast Year 2040 Without HDC With Project Conditions (Phase 5)	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
	Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS
3 - US-395/Air Expressway	54.6 - D	**72.8 - E**	**>80.0 - F[2]**	**>80.0 - F[2]**	26.2 - C	**>80.0 - F[2]**	**Identified Improvements Fully Implemented in Phase 3**		**>80.0 - F[2]**	**>80.0 - F[2]**
With Improvements	28.7 - C	43.7 - D	19.9 - B	53.9 - D	20.2 - C	54.8 - D			54.5 - D	**>80.0 - F[2]**
4 - US-395/Rancho Road	20.4 - C	28.5 - C	24.4 - C	54.5 - D	48.4 - D	53.9 - D	**>80.0 - F[2]**	**>80.0 - F[2]**	**>80.0 - F[2]**	**>80.0 - F[2]**
With Improvements	-	-	-	-	-	-	52.6 - D	**79.7 - E**	**>80.0 - F[2]**	**>80.0 - F[2]**
5 - US-395/Adelanto Road	15.1 - C	15.5 - C	26.6 - D	15.6 - C	**45.0 - E**	**>50.0 - F[2]**	**>80.0 - F[2]**	**>80.0 - F[2]**	**>50.0 - F[2]**	**>50.0 - F2**
With Improvements	-	-	-	-	19.1 - B	37.5 - D	15.2 - B	38.4 - D	**52.5 - D**	**80.0 - E**
6 - US-395/Palmdale Road	**59.4 - E**	**>80.0 - F[2]**	**>80.0 - F[2]**	**>80.0 - F[2]**	**Identified Improvements Fully Implemented in Phase 2**				**>80.0 - F[2]**	**>80.0 - F[2]**
With Improvements	42.3 - D	55.0 - D	**>80.0 - F[2]**	**>80.0 - F[2]**					**>80.0 - F[2]**	**>80.0 - F[2]**
9 - Adelanto Road/Air Expressway	23.8 - C	18.5 - B	**75.9 - E**	38.7 - D	**>80.0 - F[2]**	**57.8 - E**	55.0 - D	54.3 - D	**>80.0 - F[2]**	**>80.0 - F[2]**
With Improvements	-	-	51.8 - D	26.3 - C	54.9 - D	27.9 - C	-	-	54.7 - D	52.2 - D
10 - Adelanto Road/Rancho Road	9.7 - A	10.0 - A	11.1 - B	12.4 - B	11.0 - B	12.5 - B	33.1 - D	31.9 - D	**>50.0 - F[2]**	**>50.0 - F[2]**
With Improvements	-	-	-	-	-	-	-	-	6.6 - A	8.4 - A
11 - Gateway Drive/Air Expressway	8.0 - A	9.8 - A	**>80.0 - F[2]**	**>80.0 - F[2]**	46.9 - D	**>80.0 - F[2]**	**Identified Improvements Fully Implemented in Phase 3**		**>80.0 - F[2]**	**>80.0 - F[2]**
With Improvements			50.4 - D	36.6 - D	21.1 - C	54.6 - D			44.2 - D	**77.0 - E**
12 - Phantom West/Air Expressway	31.4 - C	26.5 - C	53.7 - D	47.9 - D	**>80.0 - F[2]**	**79.7 - E**	54.9 - D	52.2 - D	**>80.0 - F[2]**	**>80.0 - F[2]**
With Improvements	-	-	-	-	31.2 - C	31.3 - C	-	-	**79.8 - E**	**61.9 - E**
13 - Nevada Ave/Air Expressway	53.5 - D	35.7 - D	28.0 - C	37.2 - D	**>80.0 - F[2]**	**>80.0 - F[2]**	**>80.0 - F[2]**	**>80.0 - F[2]**	**>80.0 - F[2]**	**>80.0 - F[2]**
With Improvements	-	-	-	-	40.8 - D	49.5 - D	51.1 - D	53.2 - D	**77.2 - E**	46.2 - D
15 - Phantom East/Air Expressway	12.2 - B	13.5 - B	12.5 - B	14.5 - B	52.3 - D	**78.0 - E**	**>80.0 - F[2]**	>80.0 - **F[2]**	**>80.0 - F[2]**	**>80.0 - F[2]**
With Improvements	-	-	-	-	10.8 - B	14.8 - B	**>80.0 - F[2]**	**78.5 - E**	**>80.0 - F[2]**	**78.2 - E**
17 - National Trails Highway/Air Expressway	**>80.0 - F[2]**	26.3 - C	**>80.0 - F[2]**	21.3 - C	**>80.0 - F[2]**	26.1 - C	41.2 - D	12.9 - B	**>80.0 - F[2]**	**>80.0 - F[2]**
With Improvements	20.0 - B	14.1 - B	52.9 - D	13.3 - B	37.9 - D	13.3 - B	-	-	38.4 - D	13.1 - B
18 - I-15 SB Ramps/National Trails Highway	28.8 - C	22.0 - C	**>80.0 - F[2]**	48.3 - D	**>80.0 - F[2]**	**>80.0 - F[2]**	22.9 - C	47.7 - D	**>80.0 - F[2]**	**>80.0 - F[2]**
With Improvements	-	-	48.5 - D	47.2 - D	48.3 - D	49.8 - D	-	-	54.0 - D	39.0 - D
19 - I-15 NB Ramps/National Trails Highway	37.1 - D	46.3 - D	**>80.0 - F[2]**	40.5 - D	**>80.0 - F[2]**	53.4 - D	**Identified Improvements Fully Implemented in Phase 3**		**>80.0 - F[2]**	**>80.0 - F[2]**
With Improvements	-	-	43.3 - D	25.3 - C	35.1 - D	27.9 - C			37.3 - D	44.2 - D
26 - El Evado Road/Palmdale Road	**Not Studied in these Phases**						**>80.0 - F[2]**	**>80.0 - F[2]**	**>80.0 - F[2]**	**>80.0 - F[2]**
With Improvements							**>80.0 - F[2]**	**68.2 - E**	54.7 - D	**>80.0 - F[2]**
35 - Phantom West/Innovation Dr	21.5 - C	20.8 - C	**>50.0 - F[2]**	**>50.0 - F[2]**	6.6 - A	8.3 - A	8.3 - A	10.0 - A	**>50.0 - F[2]**	**>50.0 - F[2]**
With Improvements	-	-	5.7 - A	7.7 - A	-	-	-	-	20.2 - C	46.2 - D

Study Intersection	Phase 1 Conditions		Phase 2 Conditions		Phase 3 Conditions		Phase 4 Conditions		Forecast Year 2040 Without HDC With Project Conditions (Phase 5)	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
	Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS
36 - Phantom West/Aerospace Dr	10.2 - B	14.8 - B	11.0 - B	16.0 - C	11.0 - B	18.3 - C	**36.4 - E**	32.8 - D	**>50.0 - F[2]**	**>50.0 - F[2]**
With Improvements	-	-	-	-	-	-	3.5 - A	4.8 - A	4.2 - A	7.8 - A
38 - Phantom West/Sabre Blvd	18.4 - C	14.6 - B	19.3 - C	15.1 - C	23.2 - C	21.4 - C	24.2 - C	30.1 - D	32.9 - D	**>50.0 - F[2]**
With Improvements	-	-	-	-	-	-	-	-	21.0 - C	18.4 - B
40 - Nevada Ave/Phantom East	11.9 - B	12.4 - B	11.4 - B	12.4 - B	11.5 - B	11.0 - B	12.7 - B	11.7 - B	19.2 - C	**>50.0 - F[2]**
With Improvements	-	-	-	-	-	-	-	-	15.7 - B	14.4 - B
42 - Gateway Drive/Innovation Way	8.6 - A	8.8 - A	**>50.0 - F[2]**	**>50.0 - F[2]**	53.0 - D	44.8 - D	**62.3 - E**	51.9 - D	**>50.0 - F[2]**	**>50.0 - F[2]**
With Improvements	-	-	10.8 - B	17.2 - B	-	-	37.1 - D	38.7 - D	42.1 - D	38.5 - D
43 - Nevada Ave/Innovation Dr/McCoy Circle	9.0 - A	11.8 - B	9.7 - A	11.2 - B	**43.9 - E**	**>50.0 - F[2]**	**59.3 - E**	**75.0 - E**	**>50.0 - F[2]**	**>50.0 - F[2]**
With Improvements	-	-	-	-	6.0 - A	7.9 - A	38.6 - D	21.3 - C	43.6 - D	40.0 - D
45 - Phantom East/Sabre Blvd	**Not Studied in these Phases**								**>50.0 - F[2]**	**>50.0 - F[2]**
With Improvements									30.8 - D	35.0 - D
46 - Phantom East/Innovation Dr	**Not Studied in these Phases**						17.9 - C	16.2 - C	21.4 - C	**>50.0 - F[2]**
With Improvements							-	-	11.7 - B	11.0 - B

Note: Deficient intersection operation indicated in **bold**.

[1] Average seconds of delay per vehicle.

[2] Delay exceeds 80.0 seconds for signalized intersection or 50.0 seconds for unsignalized intersections; Level of Service F per HCM

[3] Delay deteriorates from acceptable (LOS D or better) to unacceptable (LOS E or F) OR change in delay for an already deficient intersection by 2% or more

Table 14, Project Development Phasing Recommended Mitigation

Mitigation Measure	Intersection	Phase 1	Phase 2	Phase 3	Phase 4	Forecast Year 2040 Without HDC With Project Conditions (Phase 5)
MM-1	3 - US-395 / Air Expressway	• Install northbound right-turn overlap phase	• Install northbound channelized yield right-turn-lane • Install eastbound dedicated right-turn-lane • Install second westbound left-turn-lane	• Install a third northbound through-lane and convert dedicated right-turn to a free right movement	Identified Improvements Fully Implemented in Phase 3	
MM-2	4 - US-395 / Rancho Road	(1)	(1)	(1)	• Install third northbound through-lane; Install second northbound left-tun-lane • Install third southbound through-lane • Install second westbound left-turn-lane	Identified Improvements Fully Implemented in Phase 4
MM-3	5 - US-395 / Adelanto Road	(1)	(1)	• Signalize Intersection • Install dedicated northbound left-turn-lane • Install dedicated southbound left-turn-lane	• Install third northbound through-lane • Install third southbound left-turn-lane	• Restripe westbound approach to include two left-turn-lanes, one through lane, and one shared through/right-turn-lane
MM-4	6 - US-395 / Palmdale Road	• Install second northbound left-turn-lane • Install eastbound right-turn overlap phase	• Install third eastbound through-lane • Install third westbound through-lane • Install overlap phasing on all right-turn movements	Fully Improved in Phase 2		
MM-5	9 - Adelanto Road / Air Expressway	(1)	• Install northbound right-turn overlap phase	• Install third combination eastbound shared through/right-turn-lane • Install third combination westbound shared through/right-turn-lane	(1)	• Install second northbound right-turn-lane with a right-turn overlap phase • Install dedicated westbound right-turn-lane with an overlap phase
MM-6	10 - Adelanto Road / Rancho Road	(1)	(1)	(1)	(1)	• Signalize Intersection
MM-7	11 - Gateway Drive / Air Expressway	(1)	• Install second southbound left-turn-lap; Install southbound right-turn overlap phase • Install second eastbound left-turn-lane	• Install third eastbound through-lane • Install third westbound through-lane; Install second westbound right-turn-lane with an overlap phase	Identified Improvements Fully Implemented in Phase 3	
MM-8	12 - Phantom West / Air Expressway	(1)	(1)	• Install third eastbound through-lane; Install second eastbound left-turn-lane • Install third westbound left-turn-lane	(1)	• Install southbound right-turn overlap phase
MM-9	13 - Nevada Ave / Air Expressway	(1)	(1)	• Install third eastbound through-lane • Install third westbound through-lane; Install westbound dedicated right-turn-lane	• Install second southbound left-turn-lane; Install second southbound right-turn-lane • Install second eastbound left-turn-lane	Identified Improvements Fully Implemented in Phase 4
MM-10	15 - Phantom East / Air Expressway	(1)	(1)	• Install third eastbound through-lane • Install third westbound through-lane	• Install combination northbound shared through/right-turn-lane • Install second southbound through-lane • Convert westbound dedicated right-turn lane to a free movement	Identified Improvements Fully Implemented in Phase 4

Mitigation Measure	Intersection	Phase 1	Phase 2	Phase 3	Phase 4	Forecast Year 2040 Without HDC With Project Conditions (Phase 5)
MM-11	17 - National Trails Highway / Air Expressway	• Install second northbound left-turn-lane	• Install second southbound through-lane	• Install third northbound left-turn-lane	(1)	• Reconfigure intersection to make Air Expressway the east/west through movement and the north leg of National Trails Highway a "T" • Install two southbound left-turn-lanes and a southbound right-turn lane • Install two eastbound left-turn-lanes and two eastbound through-lanes Install three westbound through-lanes and one westbound right-turn-lane
MM-12	18 - I-15 Southbound Ramps / National Trails Hwy	(1)	• Install second northbound through-lane	• Install second eastbound left-turn-lane	(1)	• Convert southbound dedicated right-turn-lane to a free movement • Install eastbound right-turn overlap phase
MM-13	19 - I-15 Northbound Ramps / National Trails Hwy	(1)	• Install second northbound through-lane	• Install second southbound right-turn-lane	Identified Improvements Fully Implemented in Phase 3	
MM-14	26 - Phantom East / Palmdale Road	(1)	(1)	(1)	• Install second southbound left-turn lane • Install eastbound right-turn overlap phase	• Install westbound right-turn overlap
MM-15	35 - Phantom West / Innovation Dr	(1)	• Signalize Intersection	Identified Improvements Fully Implemented in Phase 2		
MM-16	36 - Phantom West / Aerospace Dr	(1)	(1)	(1)	• Signalize intersection • Install northbound dedicated right-turn-lane • Install southbound dedicated right-turn-lane	Identified Improvements Fully Implemented in Phase 4
MM-17	38 - Phantom West / Sabre Blvd	(1)	(1)	(1)	(1)	• Install All-Way-Stop • Modify northbound approach to include a one shared left/through-lane and one shared through/right-turn-lane • Modify southbound approach to include a one shared left/through-lane and one shared through/right-turn-lane
MM-18	40 - Nevada Ave/Phantom East	(1)	(1)	(1)	(1)	• Install All-Way Stop
MM-19	42 - Gateway Drive / Innovation Way	(1)	• Signalize Intersection • Construct east leg of intersection • Install one northbound dedicated left-turn-lane, one northbound through-lane, and a second shared through/right-turn-lane • Install one northbound dedicated left-turn-lane, one northbound through-lane, and a second shared through/right-turn-lane • Install westbound dedicated left-turn-lane and a shared through/right-turn-lane • Install eastbound dedicated left-turn-lane and a shared through/right-turn-lane	(1)	• Install second combination eastbound shared through/right-turn-lane • Install second combination westbound shared through/right-turn-lane	Identified Improvements Fully Implemented in Phase 4

Mitigation Measure	Intersection	Phase 1	Phase 2	Phase 3	Phase 4	Forecast Year 2040 Without HDC With Project Conditions (Phase 5)
MM-20	43 - Nevada Ave / Innovation Dr / McCoy Circle	(1)	(1)	• Signalize Intersection • Construct east leg of intersection • Install dedicated northbound left-turn-lane • Install dedicated southbound left-turn-lane • Install one westbound shared left/through/right-turn-lane	• Install dedicated eastbound left-turn-lane; Convert eastbound shared left/through-lane to a dedicated through-lane • Install two westbound left-turn-lanes	• Install one northbound through lane and one shared through/right-turn-lane • Install a southbound left-turn-lane, one southbound through lane, and one southbound dedicated right-turn-lane
MM-21	45 - Phantom East / Sabre Boulevard	(1)	(1)	(1)	(1)	• Install All-Way-Stop • Install west leg of the intersection to include one shared left/through/right-turn-lane • Install east leg of the intersection to include one shared left/through/right-turn-lane
MM-22	46 - Phantom East / Innovation Way	(1)	(1)	(1)	(1)	• Signalize Intersection • Install west leg of the intersection to include one eastbound shared left/through-lane and one eastbound dedicated right-turn-lane with a channelized yield movement • Install dedicated northbound left-turn-lane • Modify Southbound approach to include one shared through/right-turn-lane

Note:
(1) No Improvements are necessary for this phase

11 TRAFFIC SIGNAL WARRANT ANALYSIS

This section provides an overview of the California Manual on Uniform Traffic Control Devices (CA MUTCD) signal warrant analysis methodology. A traffic signal warrant analysis provides a procedure to determine whether installation of a traffic control signal is justified at a particular location. As part of this reports, signal warrants have been evaluated for Forecast Year 2040 With Project conditions without and with the HDC.

11.1 TRAFFIC SIGNAL WARRANT METHODOLOGY

11.1.1 Warrant 3: Peak-Hour Vehicular Volume

Warrant 3 is intended for use at a location where traffic conditions are such that for a minimum of one hour of an average day, the minor street traffic suffers undue delay when entering or crossing the major street. This signal warrant shall be applied when high occupancy vehicle complexes attract or discharge large numbers of vehicles over a short period of time. (i.e. offices, manufacturing plants, industrial complexes, etc.)

In accordance with CA MUTCD guidelines, the need for a traffic control signal shall be considered if an engineering study finds that the criteria in either of the following two categories are met:

A. If all three of the following conditions exist for the same one hour (any four consecutive 15-minute periods) of an average day
   a. The total stop delay experienced by the traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds: 4 vehicle hours for a one-lane approach; or 5 vehicle-hours for a two-lane approach; **and**
   b. The volume on the same minor street approach equals or exceeds 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes; **and**
   c. The total entering volume serviced during the hour equals or exceeds 650 vehicles per hour for intersections with three approaches or 800 vehicles per hour for intersections with four or more approaches.
B. The plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) of an average day falls above the applicable curve in Figure 4C-3 (see **Appendix N**) for the existing combination of approach lanes.

If the posted or statutory speed limit or the 85th percentile speed on the major street exceeds 40 MPH, or if the intersection lies within the built-up area of an isolated community having a population of less than 10,000, Figure 4C-4 may be used in place of 4C-3.

11.1.2 Warrant 6: Coordinated Signal System

Warrant 6 simply states that a traffic signal may be warranted in order to provide progressive movement in a coordinated signal system and allow for proper platooning of vehicles. The Phantom West/East corridor is expected to be a coordinated traffic signal system due to the close proximity of intersections and the heavy through movements on the major street and therefore these intersections would meet warrants for signalization under Forecast Year 2040 With Project conditions without and with the HDC.

11.2 TRAFFIC SIGNAL WARRANT ANALYSIS

11.2.1 Forecast Year 2040 Without HDC With Project

Traffic signal warrants were evaluated for the 9 study unsignalized intersections that are shown to operate at deficient levels of service for Forecast Year 2040 Without HDC With Project Conditions.

Table 13 shows the signal warrant analysis results for Forecast Year 2040 Without HDC With Project conditions. Detailed signal warrant analysis sheets are contained in **Appendix N**.

TABLE 15, FORECAST YEAR 2040 WITHOUT HDC WITH PROJECT TRAFFIC SIGNAL WARRANT SUMMARY

Study Intersection	Warrant 3: Peak Hour Traffic Signal Warrant Met?		Warrant 6: Coordinated Signal System Warrant Met?
	AM	PM	
5 - US-395/Adelanto Road	Yes	Yes	-
10 - Adelanto Road/Rancho Road	Yes	Yes	-
35 - Phantom West/Innovation Dr	Yes	Yes	Yes
36 - Phantom West/Aerospace Dr	Yes	Yes	Yes
38 - Phantom West/Sabre Blvd	Yes	Yes	Yes
39 - Phantom West/George Blvd	**NO**	**NO**	Yes
42 - Gateway Drive/Innovation Way	Yes	Yes	-
43 - Nevada Ave/Innovation Dr/McCoy Circle	Yes	Yes	-
46 - Phantom East/Innovation Dr	Yes	Yes	

11.2.2 Forecast Year 2040 With HDC With Project

Traffic signal warrants were evaluated for the 10 study unsignalized intersections that are shown to operate at deficient levels of service for Forecast Year 2040 With HDC With Project Conditions.

Table 13 shows the signal warrant analysis results for Forecast Year 2040 With HDC With Project conditions. Detailed signal warrant analysis sheets are contained in **Appendix N**.

TABLE 16, FORECAST YEAR 2040 WITH HDC WITH PROJECT TRAFFIC SIGNAL WARRANT SUMMARY

Study Intersection	Warrant 3: Peak Hour Traffic Signal Warrant Met?		Warrant 6: Coordinated Signal System Warrant Met?
	AM	PM	
5 - US-395/Adelanto Road	Yes	Yes	-
10 - Adelanto Road/Rancho Road	Yes	Yes	-
35 - Phantom West/Innovation Dr	Yes	Yes	Yes
36 - Phantom West/Aerospace Dr	Yes	Yes	Yes
38 - Phantom West/Sabre Blvd	Yes	Yes	Yes
39 - Phantom West/George Blvd	**NO**	Yes	Yes
42 - Gateway Drive/Innovation Way	Yes	Yes	-
43 - Nevada Ave/Innovation Dr/McCoy Circle	Yes	Yes	-
45 - Phantom East/Sabre Blvd	Yes	Yes	-
46 - Phantom East/Innovation Dr	Yes	Yes	-

As shown, all of the unsignalized study intersections meet Signal Warrant 3 as described above with the exception of the intersections of Phantom West at George Blvd. (Int. 39). Although these intersections do not meet Warrant 3 for peak hour volumes, the signalization of this location would be warranted according to Warrant 6 of the CA MUTCD.

12 FINDINGS AND RECOMMENDATIONS

This study analyzes the forecast traffic conditions associated with the proposed development of the Southern California Logistics Airport (SCLA) Specific Plan area in the City of Victorville. The proposed project encompasses 1,264 acres and is estimated to develop approximately 24 million square feet of building area by the year 2038.

The proposed project is forecast to generate approximately 98,752 net new Passenger Car Equivalent (PCE) daily trips which includes approximately 12,736 net new AM peak hour PCE trips and approximately 13,354 net new PM peak hour PCE trips.

Level of Service Analysis Results

The results of the Existing analysis show that all intersections are forecast to operate at acceptable levels of service (LOS D or better) with the exception of the following locations:

Existing Conditions		
Intersection	**AM Peak Hour**	**PM Peak Hour**
5 - US-395/Adelanto Road	LOS F	LOS F
13 - Nevada Ave/Air Expressway	LOS F	Acceptable
15 - Phantom East/Air Expressway	LOS E	Acceptable
20 - I-15 SB Ramps/Palmdale Road	Acceptable	LOS E
21 - I-15 NB Ramps/Palmdale Road	Acceptable	LOS F

The results of the intersection analysis under Existing With Project Buildout analysis show 11 of the 34 intersections studied are forecast to operate at an acceptable level of service (LOS D or better) and 23 intersections operate at a deficient level of service (LOS E or worse) during the AM peak hour. During the PM peak hour, 5 intersections operate an acceptable level of service and 29 intersections operate at a deficient level of service. Of these locations that are operating deficiently, 27 of the 34 locations are forecast to result in a significant impact according to the City of Victorville significance criteria.

The mitigation measures shown in **Table ES-1** have been identified to achieve an acceptable level of service where possible and fully mitigate project forecast significant impacts at the study intersections for Existing With Project Buildout conditions. With the implementation of the identified mitigation measures however, the following 12 locations would continue to operate at a deficient level of service with the project and the project would result in unavoidable significant impacts:

Existing With Project Conditions		
Intersection	**AM Peak Hour**	**PM Peak Hour**
3 - US-395 / Air Expressway	LOS F	LOS F
4 - US-395 / Rancho Road	LOS F	LOS F
5 - US-395 / Adelanto Road	Acceptable	LOS F
6 - US-395 / Palmdale Road	LOS F	LOS F

Existing With Project Conditions		
Intersection	**AM Peak Hour**	**PM Peak Hour**
9 - Adelanto Road / Air Expressway	LOS E	Acceptable
11 - Gateway Drive / Air Expressway	Acceptable	LOS F
12 - Phantom West / Air Expressway	LOS F	Acceptable
13 - Nevada Avenue / Air Expressway	LOS F	Acceptable
15 - Phantom East / Air Expressway	Acceptable	LOS F
18 - I-15 SB Ramps / National Trails Hwy	LOS F	Acceptable
19 - I-15 NB Ramps / National Trails Hwy	LOS F	Acceptable
41 - Perimeter Road / Phantom East	Acceptable	LOS F

The results of the intersection analysis under Forecast Year 2040 Without HDC Without Project conditions show that all study intersections are forecast to operate at acceptable levels of service (LOS D or better) with the exception of the following intersections:

Forecast Year 2040 Without HDC Without Project Conditions		
Intersection	**AM Peak Hour**	**PM Peak Hour**
5 - US-395 / Adelanto Road	LOS F	LOS F
6 - US-395 / Palmdale Road	LOS E	LOS F
15 - Phantom East / Air Expressway	LOS F	LOS E
17 - National Trails Hwy / Air Expressway	LOS F	Acceptable
18 - I-15 SB Ramps / National Trails Hwy	Acceptable	LOS E

The results of the intersection analysis under Forecast Year 2040 Without HDC With Project analysis show that 18 of the 37 intersections studied are forecast to operate at an acceptable level of service (LOS D or better) and 19 intersections operate at a deficient level of service (LOS E or worse) during the AM peak hour. During the PM peak hour, 15 intersections operate at an acceptable level of service and 22 intersections operate at a deficient level of service. Of these locations that are operating deficiently, 22 of the 37 locations are forecast to result in a significant impact according to the City of Victorville significance criteria.

The mitigation measures shown in **Table ES-2** have been identified to achieve an acceptable level of service where possible and fully mitigate project forecast significant impacts at the study intersections for Forecast Year 2040 Without HDC With Project Buildout conditions. With the implementation of the identified mitigation measures however, the following 9 locations would continue to operate at a deficient level of service with the project and the project would result in unavoidable significant impacts:

Forecast Year 2040 Without HDC With Project With Improvements Conditions		
Intersection	**AM Peak Hour**	**PM Peak Hour**
3 - US-395 / Air Expressway	Acceptable	LOS F
4 - US-395 / Rancho Road	LOS F	LOS F
5 - US-395 / Adelanto Road	Acceptable	LOS E
6 - US-395 / Palmdale Road	LOS F	LOS F
11 - Gateway Drive / Air Expressway	Acceptable	LOS E
12 - Phantom West / Air Expressway	LOS E	LOS E
13 - Nevada Avenue / Air Expressway	LOS E	Acceptable

Forecast Year 2040 Without HDC With Project With Improvements Conditions		
Intersection	**AM Peak Hour**	**PM Peak Hour**
15 - Phantom East / Air Expressway	LOS F	LOS E
26 - Phantom East / Palmdale Road	Acceptable	LOS F

A future Caltrans freeway facility, the "High Desert Corridor" (HDC), is proposed to be constructed within the project study area. Additionally, the need for a major north/south freeway facility has been identified in the form of the US-395 Freeway. These facilities would provide critical regional access for the entire Victor Valley and is integral to the proposed development of the SCLA Specific Plan area. This study takes the proposed HDC and US-395 freeways into consideration as likely future circulation system enhancements and assumes they are fully constructed by the Forecast Year 2040.

The results of the intersection analysis under Forecast Year 2040 With HDC Without Project conditions show that all study intersections are forecast to operate at acceptable levels of service (LOS D or better) with the exception of the following intersections:

Forecast Year 2040 With HDC Without Project Conditions		
Intersection	**AM Peak Hour**	**PM Peak Hour**
5 - US-395 / Adelanto Rad	LOS F	LOS F
6 - US-395 / Palmdale Road	Acceptable	LOS E
31 - Phantom West / HDC WB Ramps	LOS F	LOS E

The results of the intersection analysis under Forecast Year 2040 With HDC With Project analysis show that 26 of the 42 intersections studied are forecast to operate at an acceptable level of service (LOS D or better) and 16 intersections operate at a deficient level of service (LOS E or worse) during the AM peak hour. During the PM peak hour, 26 intersections operate at an acceptable level of service and 16 intersections operate at a deficient level of service. Of these locations that are operating deficiently, 18 of the 42 locations are forecast to result in a significant impact according to the City of Victorville significance criteria.

The mitigation measures shown in **Table ES-3** have been identified to achieve an acceptable level of service where possible and fully mitigate project forecast significant impacts at the study intersections for Forecast Year 2040 With HDC With Project Buildout conditions. With the implementation of the identified mitigation measures however, the following location would continue to operate at a deficient level of service with the project and the project would result in unavoidable significant impacts:

Forecast Year 2040 With HDC With Project With Improvements Conditions		
Intersection	**AM Peak Hour**	**PM Peak Hour**
6 - US-395 / Air Expressway	LOS F	LOS F

It is anticipated that SCLA Specific Plan TDM measures will be developed that will reduce development trips made during the critical peak hours. Additionally, while the long-range analysis assumes that a large portion of the SCLA Specific Plan will develop as industrial and comprising of manufacturing (25%) and warehouse (75%). Programmatic limitations on the ability to achieve 25% manufacturing development could result in significant reductions in peak hour traffic generation since employee commute trips are lower for warehouse uses.

Signal Warrants

A signal warrant analysis has been prepared for the Forecast Year 2040 With Project build out conditions without and with the HDC based on guidelines set for by the California Manual of Uniform Traffic Control Devices (CA MUTCD) for all unsignalized study intersections found to be operating at unacceptable levels of service. All unsignalized study intersections meet the applicable signal warrants for both buildout conditions.

City of Victorville Funding Mechanism

The City of Victorville plans to engage a consultant in September or October of 2019 to conduct an update of the City's Development Impact Fee (DIF) Program. This effort is estimated by the City to take approximately one year. The DIF will establish updated development impact fees on new residential and commercial development in the City. This study will provide the City with the necessary technical documentation to support adoption of the DIF Program, which will apply to future development in the City. Transportation facility needs will be evaluated for a projected development conditions in a horizon year (possibly 2040). The study will then calculate justifiable impact fees that may be levied for each land use based on the proportionate share of the total facility use that each land use represents. As a development impact fee, the DIF can be charged only to new development and must be based on the impact of new development on transportation facilities infrastructure. The purpose of this study is to establish the nexus (or reasonable relationship) between new development that will occur in the City and the need for additional public facility improvements due to this new development. This study will include the identification of selected roadway improvements critical to increase citywide roadway system capacity to accommodate future development. The DIF update will include all the arterial roads and interchanges in the General Plan Circulation Map, including SCLA. However, it will not include the High Desert Corridor and its interchanges.

If the updated DIF Program is in effect at the time future development occurs within the SCLA Specific Plan, the SCLA development would be subject to established DIF fee payments according to the development land use type and the adopted DIF payment schedule. Intersection and roadway impacts identified in the SCLA TIA will be satisfied by the DIF payments if the required mitigation measure is a component of the City's DIF Roadway Projects list. Any roadway system improvements needed to mitigate SCLA Project impacts that are not covered by the DIF program will be assessed to the Project on a "fair share" contribution basis.

Fair share calculations have been conducted for the purposes of this analysis and can be found in **Appendix O**.

TABLE 17, EXISTING WITH PROJECT BUILDOUT MITIGATION MEASURES

Intersection	Impacted Peak Hour	Existing Without Project	Existing With Project	Existing With Project Buildout Recommended Mitigation	Existing With Project With Mitigation
		Delay[1] - LOS	Delay[1] - LOS		Delay[1] - LOS
1 - US-395 / Chamberlain Way	PM	10.2 - B	**>80.0 - F[2]**	• Install westbound dedicated left-turn-lane	14.6 - B
2 - US - 395 / Bartlett Ave	PM	12.1 - B	**69 - E**	• Install northbound dedicated right-turn-lane • Install westbound dedicated right-turn-lane	52.6 - D
3 - US - 395 / Air Expressway	AM PM	16.6 - B 24.0 - C	**>80.0 - F[2]** **>80.0 - F[2]**	• Install second and third northbound through-lanes and one northbound dedicated right-turn-lane with a free movement • Install second and third southbound through-lanes and one southbound dedicated right-turn-lane • Install dedicated eastbound left-turn-lane; Modify eastbound shared through/left-turn lane to a dedicated through lane; Install one shared through/right-turn lane • Install three westbound left-turn lanes	29.0 - C **>80.0 - F[2]**
4 - US - 395 / Rancho Rd	AM PM	15.7 - B 15.3 - B	**>80.0 - F[2]** **>80.0 - F[2]**	• Install second northbound left-turn-lane, third northbound through-lane, and one northbound dedicated right-turn-lane • Install third southbound through-lane and southbound dedicated right-turn-lane	**>80.0 - F[2]** **>80.0 - F[2]**
5 - US - 395 /Adelanto Rd	AM PM	**>50.0 - F[2]** **>50.0 - F[2]**	**>50.0 - F[2]** **>50.0 - F[2]**	• Signalize Intersection • Install second and third northbound through-lanes and northbound left-turn-lane • Install second southbound through-lanes; Install third combination shared through/right-turn-lane; Install southbound left-turn-lane • Restripe westbound approach to include dedicate left-turn-lane and a shared through/right-turn-lane	52.2 - D 79.4 - E
6 - US - 395 / Palmdale Rd	AM PM	41.6 - D 50.7 - D	**>80.0 - F[2]** **>80.0 - F[2]**	• Install third northbound through-lanes; second left-turn-lane; and dedicated right-turn-lane • Install third southbound through-lane • Install eastbound dedicated right-turn-lane	**>80.0 - F[2]** **>80.0 - F[2]**
8 - Adelanto Rd / Innovation Way / Bartlett Ave	AM PM	7.4 - A 7.5 - A	**>50.0 - F[2]** **>50.0 - F[2]**	• Signalize Intersection	22.6 - C 11.1 - B

Intersection	Impacted Peak Hour	Existing Without Project	Existing With Project	Existing With Project Buildout Recommended Mitigation	Existing With Project With Mitigation
		Delay[1] - LOS	Delay[1] - LOS		Delay[1] - LOS
9 - Adelanto Rd / Air Expressway	AM	18.1 - B	**>80.0 - F[2]**	• Install two northbound dedicated right-turn-lanes with an overlap phase • Install a southbound dedicated right-turn-lane with an overlap phase • Install third eastbound through-lane; fourth combination shared through/right-turn-lane; and second eastbound left-turn-lane	**69.1 - E**
	PM	16.1 - B	**>80.0 - F[2]**	• Install third eastbound through-lane; fourth combination shared through/right-turn-lane; and second eastbound left-turn-lane	50.7 - D
11 - Gateway Dr / Air Expressway	AM	4.9 - A	**>80.0 - F[2]**	• Install southbound dedicated right-turn-lane with an overlap phase • Install third and fourth eastbound through lanes and second eastbound left-turn-lane	51.9 - D
	PM	5.5 - A	**>80.0 - F[2]**	• Install third and fourth westbound through-lanes and second westbound right-turn-lane with an overlap phase	**>80.0 - F[2]**
12 - Phantom West / Air Expressway	AM	23.9 - C	**>80.0 - F[2]**	• Install third southbound left-turn-lane; install southbound right-turn free movement • Install second and third eastbound through-lanes and second eastbound left-turn-lane	**>80.0 - F[2]**
	PM	18.6 - B	**>80.0 - F[2]**	• Install third and fourth westbound through-lanes	**70.9 - E**
13 - Nevada Ave / Air Expressway	AM	**>80.0 - F[2]**	**>80.0 - F[2]**	• Install second southbound left-turn-lane and second southbound right-turn-lane • Install third and fourth eastbound through-lane, and second eastbound left-turn-lane	**>80.0 - F[2]**
	PM	13.7 - B	**>80.0 - F[2]**	• Install third and fourth westbound through-lanes; Install westbound dedicated right-turn-lane with an overlap phase	43.5 - D
14 - George Blvd / Air Expressway	AM	34.5 - C	**>80.0 - F[2]**	• Install third eastbound through lane and fourth combination through/shared right-turn-lane	22.9 - C
	PM	34.8 - C	**>80.0 - F[2]**	• Install third and fourth westbound through lanes	20.2 - C
15 - Phantom East / Air Expressway	AM	76.7 - E	**>80.0 - F[2]**	• Install third and fourth eastbound through-lanes	53.3 - D
	PM	10.8 - B	**>80.0 - F[2]**	• Install third and fourth westbound through-lanes	**>80.0 - F[2]**
16 - Village Dr / Air Expressway	AM	11.2 - B	**>80.0 - F[2]**	• Install northbound dedicated right-turn-lane • Install third and fourth eastbound through-lanes; Install eastbound right-turn overlap phase	48.8 - D
	PM	19.2 - B	**>80.0 - F[2]**	• Install third and fourth westbound through-lanes	46.6 - D

Intersection	Impacted Peak Hour	Existing Without Project	Existing With Project	Existing With Project Buildout Recommended Mitigation	Existing With Project With Mitigation
		Delay[1] - LOS	Delay[1] - LOS		Delay[1] - LOS
17 - National Trails Highway / Air Expressway	AM	24.6 - C	**>80.0 - F[2]**	• Reconfigure intersection to make Air Expressway the east/west through movement and the north leg of National Trails Highway a "T" • Install two southbound left-turn-lanes and southbound right-turn lane • Install two eastbound left-turn-lanes and two eastbound through-lanes • Install three westbound through-lanes and one westbound right-turn-lane	**>80.0 - F[2]**
	PM	16.5 - B	**>80.0 - F[2]**		13.6 - B
18 - I-15 Southbound Ramps / National Trails Hwy	AM	18.6 - B	**>80.0 - F[2]**	• Install second northbound left-turn-lane • Convert southbound dedicated right-turn-lane to a free movement • Install second eastbound left-turn-lane	**>80.0 - F[2]**
	PM	21.2 - C	**>80.0 - F[2]**		38.1 - D
19 - I-15 Northbound Ramps / National Trails Hwy	AM	24.7 - C	**>80.0 - F[2]**	• Install two southbound dedicated right-turn-lanes • Install second eastbound left-turn-lane	**>80.0 - F[2]**
	PM	22.3 - C	**>80.0 - F[2]**		**75.3 - E**
35 - Phantom West / Innovation Dr	AM	9.7 - A	**>50.0 - F[2]**	• Signalize Intersection	27.5 - C
	PM	9.0 - A	**>50.0 - F[2]**		54.7 - D
36 - Phantom West / Aerospace Dr	AM	8.8 - A	**>50.0 - F[2]**	• Signalize Intersection • Install northbound dedicated right-turn-lane • Install southbound dedicated right-turn-lane	4.1 - A
	PM	9.3 - A	**>50.0 - F[2]**		8.5 - A
37 - Phantom West /Mustang St	AM	9.7 - A	**>50.0 - F[2]**	• Install median modifications to restrict eastbound and westbound left turns	13.8 - B
	PM	9.3 - A	**>50.0 - F[2]**		13.3 - B
38 - Phantom West / Sabre Blvd	AM	10.2 - B	**>50.0 - F[2]**	• Signalize Intersection • Install northbound dedicated right-turn-lane • Install southbound dedicated right-turn-lane	6.0 - A
	PM	9.4 - A	**>50.0 - F[2]**		11.6 - B
40 - Nevada Ave / Phantom East	PM	9.0 - A	**>50.0 - F[2]**	• Install All-Way-Stop • Install northbound left-turn-lane	16.9 - C
41 - Phantom East / Perimeter Road	AM	8.7 - A	**>50.0 - F[2]**	• Install All-Way-Stop • Install southbound right-turn-lane	**36.9 - E**
	PM	8.9 - A	**>50.0 - F[2]**		17.5 - C

Intersection	Impacted Peak Hour	Existing Without Project Delay[1] - LOS	Existing With Project Delay[1] - LOS	Existing With Project Buildout Recommended Mitigation	Existing With Project With Mitigation Delay[1] - LOS
42 - Gateway Dr / Innovation Way	AM	8.5 - A	**>50.0 - F[2]**	• Signalize Intersection • Install east leg of the intersection • Install three northbound through-lanes and one northbound dedicated right-turn-lane • Install second and third southbound through lanes and one southbound left-turn lane • Install one eastbound through-lanes and one eastbound shared through/right-turn-lane • Install one westbound left-turn-lane, one westbound through-lane, and one westbound shared through/right-turn-lane	49.5 - D
	PM	8.7 - A	**>50.0 - F[2]**		54.3 - D
43 - Nevada Ave / Innovation Dr / McCoy Circle	AM	0.0 - A	**>50.0 - F[2]**	• Signalize Intersection • Install east leg of the intersection • Install second northbound left-turn-lane, two northbound through-lanes, and one northbound dedicated right-turn-lane • Install one southbound left-turn-lane and two southbound through-lanes • Install two eastbound through-lanes and one eastbound dedicated right-turn-lane with a channelized yield movement • Install two westbound left-turn-lanes, one westbound through-lane, and one westbound shared through/right-turn-lane	22.0 - C
	PM	0.0 - A	**>50.0 - F[2]**		43.1 - D
45 - Phantom East / Sabre Boulevard	AM	Does Not Exist Without Project	**>50.0 - F[2]**	• Install All-Way-Stop • Install west leg of the intersection to include one shared left/through/right-turn-lane • Install east leg of the intersection to include one left-turn-lane and one shared through/right-turn-lane	27.5 - D
	PM		**>50.0 - F[2]**		32.1 - D
46 - Phantom East / Innovation Way	PM	Does Not Exist Without Project	**>50.0 - F[2]**	• Signalize Intersection • Install west leg of the intersection to include one eastbound shared left/through-lane and one eastbound dedicated right-turn-lane with a channelized yield movement	11.7 - B

Note: Deficient intersection operation indicated in **bold**.

[1] Average seconds of delay per vehicle.

[2] Delay exceeds 80.0 seconds for signalized intersection or 50.0 seconds for unsignalized intersections; Level of Service F per HCM

LOS = level of service; TWSC = Two-Way Stop Control; OWSC = One-Way Stop Control

TABLE 18, FORECAST YEAR 2040 WITHOUT HDC WITH PROJECT BUILDOUT MITIGATION MEASURES

Mitigation Measure	Intersection	Impacted Peak Hour	Forecast Year 2040 Without HDC Without Project	Forecast Year 2040 Without HDC With Project	Forecast Year 2040 Without HDC With Project Recommended Mitigation	With Mitigation	Project Responsibility
			Delay[1] - LOS	Delay[1] - LOS		Delay[1] - LOS	
MM-1	3 - US-395 / Air Expressway	AM PM	17.8 - B 21.2 - C	**>80.0 - F[2]** **>80.0 - F[2]**	• Modify northbound right-turn lane to a free movement	54.5 - D **>80.0 - F[2]**	DIF
MM-2	4 - US-395 / Rancho Road	AM PM	12.6 - B 14.6 - B	**>80.0 - F[2]** **>80.0 - F[2]**	• Restripe westbound approach to include two left-turn-lanes, one through lane, and one shared through/right-turn-lane	**>80.0 - F[2]** **>80.0 - F[2]**	DIF
MM-3	5 - US-395 / Adelanto Road	AM PM	**>50.0 - F[2]** **>50.0 - F[2]**	**>50.0 - F[2]** **>50.0 - F[2]**	• Signalize Intersection • Restripe westbound approach to include dedicated left-turn-lane and a shared through/right-turn-lane	52.5 - D **80.0 - E**	DIF
MM-4	6 - US-395 / Palmdale Road	AM PM	59.8 - E >80.0 - F2	**>80.0 - F[2]** **>80.0 - F[2]**	• Install overlap phasing on all right-turn movements	**>80.0 - F[2]** **>80.0 - F[2]**	DIF
MM-5	9 - Adelanto Road / Air Expressway	AM PM	19.8 - C 17.7 - B	**>80.0 - F[2]** **>80.0 - F[2]**	• Install second northbound right-turn-lane with a right-turn overlap phase • Install third westbound through-lanes; Install dedicated westbound right-turn-lane with an overlap phase. • Install third combination eastbound shared through/right-turn-lane	54.7 - D 52.2 - D	
MM-6	10 - Adelanto Road / Rancho Road	AM PM	11.4 - B 11.9 - B	**>50.0 - F[2]** **>50.0 - F[2]**	• Signalize Intersection	6.6 - A 8.4 - A	
MM-7	11 - Gateway Drive / Air Expressway	AM PM	6.2 - A 7.1 - A	**>80.0 - F[2]** **>80.0 - F[2]**	• Install third eastbound through-lane; Install second eastbound left-turn-lane • Install second southbound left-turn-lane; Install southbound right-turn overlap phase. • Install third westbound through-lane; Install second westbound right-turn lane with overlap phase	44.2 - D **77.0 - E**	
MM-8	12- Phantom West / Air Expressway	AM PM	37.1 - D 32.7 - C	**>80.0 - F[2]** **>80.0 - F[2]**	• Install southbound right-turn overlap phase • Install second eastbound left-turn-lane	**79.8 - E** **61.9 - E**	

Mitigation Measure	Intersection	Impacted Peak Hour	Forecast Year 2040 Without HDC Without Project	Forecast Year 2040 Without HDC With Project	Forecast Year 2040 Without HDC With Project Recommended Mitigation	With Mitigation	Project Responsibility
			Delay[1] - LOS	Delay[1] - LOS		Delay[1] - LOS	
MM-9	13- Nevada Ave / Air Expressway	AM	8 - A	**>80.0 - F[2]**	• Install second southbound left-turn-lane and second southbound right-turn-lane • Install second eastbound left-turn-lane • Install one westbound dedicated right-turn-lane with an overlap phase	**77.2 - E**	
		PM	7.9 - A	**>80.0 - F[2]**		46.2 - D	
MM-10	15- Phantom East / Air Expressway	AM	>80.0 - F2	**>80.0 - F[2]**	• Restripe northbound approach to include one dedicated left-turn lane, one through-lane, and one shared through/right-turn-lane. • Install second southbound through-lane; Install second southbound left-turn-lane. • Convert westbound right-turn-lane to a free movement	**>80.0 - F[2]**	
		PM	**62.0 - E**	**>80.0 - F[2]**		**78.2 - E**	
MM-11	17 - National Trails Highway / Air Expressway	AM	**>80.0 - F2**	**>80.0 - F[2]**	• Reconfigure intersection to make Air Expressway the east/west through movement and the north leg of National Trails Highway a "T" • Install two southbound left-turn-lanes and southbound right-turn lane • Install two eastbound left-turn-lanes and two eastbound through-lanes • Install three westbound through-lanes and one westbound right-turn-lane	38.4 - D	
		PM	14.7 - B	**>80.0 - F[2]**		13.1 - B	
MM-12	18 - I-15 Southbound Ramps / National Trails Hwy	AM	52.9 - D	**>80.0 - F[2]**	• Install second northbound left-turn-lane • Convert southbound dedicated right-turn-lane to a free movement • Install second eastbound left-turn-lane; Install eastbound right-turn overlap phase	54.0 - D	
		PM	71.3 - E	**>80.0 - F[2]**		39.0 - D	
MM-13	19 - I-15 Northbound Ramps / National Trails Hwy	AM	27.4 - C	**>80.0 - F[2]**	• Install second southbound dedicated right-turn-lane	37.3 - D	
		PM	26.6 - C	**>80.0 - F[2]**		44.2 - D	
MM-14	26 - Phantom East / Palmdale Road	AM	6.9 - A	**>80.0 - F[2]**	• Install second southbound left-turn-lane. • Install southbound right-turn overlap phase. • Install westbound right-turn overlap phase.	54.7 - D	
		PM	6.9 - A	**>80.0 - F[2]**		**>80.0 - F[2]**	
MM-15	35 - Phantom West / Innovation Dr	AM	9.4 - A	**>50.0 - F[2]**	• Signalize Intersection.	20.2 - C	100.0%
		PM	8.7 - A	**>50.0 - F[2]**		46.2 - D	100.0%

Mitigation Measure	Intersection	Impacted Peak Hour	Forecast Year 2040 Without HDC Without Project	Forecast Year 2040 Without HDC With Project	Forecast Year 2040 Without HDC With Project Recommended Mitigation	With Mitigation	Project Responsibility
			Delay[1] - LOS	Delay[1] - LOS		Delay[1] - LOS	
MM-16	36 - Phantom West / Aerospace Dr	AM	8.7 - A	**>50.0 - F[2]**	• Signalize intersection • Install northbound dedicated right-turn-lane • Install southbound dedicated right-turn-lane	4.2 - A	100.0%
		PM	9.1 - A	**>50.0 - F[2]**		7.8 - A	100.0%
MM-17	38 - Phantom West / Sabre Blvd	AM	9.9 - A	**32.9 - F[2]**	• Install All-Way-Stop • Modify northbound approach to include a one shared left/through-lane and one shared through/right-turn-lane • • Modify southbound approach to include a one shared left/through-lane and one shared through/right-turn-lane	21.0 - C	100.0%
		PM	9.1 - A	**>50.0 - F[2]**		18.4 - B	100.0%
MM-18	40 - Nevada Ave/Phantom East	PM	8.8 - A	**>50.0 - F2**	• Install All-Way Stop	14.4 - B	100.0%
MM-19	42 - Gateway Drive / Innovation Way	AM	8.5 - A	**>50.0 - F[2]**	• Signalize Intersection. • Construct east leg of the intersection. • Install one northbound through lane and one shared through/right-turn-lane • Install one southbound left-turn-lane and a second southbound shared through/right-turn-lane. • Install one eastbound through-lane and second shared through/right-turn-lane • Install a westbound left-turn-lane, one westbound through-lane, and one shared through/right-turn-lane	42.1 - D	100.0%
		PM	8.6 - A	**>50.0 - F[2]**		38.5 - D	100.0%
MM-20	43 - Nevada Ave / Innovation Dr / McCoy Circle	AM	0.0 - A	**>50.0 - F[2]**	• Signalize Intersection • Construct east leg of the intersection • Install one northbound through lane and one shared through/right-turn-lane • Install a southbound left-turn-lane, one southbound through-lane, and one southbound dedicated right-turn-lane • Install eastbound through-lane • Install two westbound left-turn-lanes, and a westbound shared through/right-turn-lane	43.6 - D	100.0%
		PM	0.0 - A	**>50.0 - F[2]**		40.0 - D	100.0%

Mitigation Measure	Intersection	Impacted Peak Hour	Forecast Year 2040 Without HDC Without Project	Forecast Year 2040 Without HDC With Project	Forecast Year 2040 Without HDC With Project Recommended Mitigation	With Mitigation	Project Responsibility
			Delay[1] - LOS	Delay[1] - LOS		Delay[1] - LOS	
MM-21	45 - Phantom East / Sabre Boulevard	AM	Does Not Exist Without Project	**>50.0 - F[2]**	• Install All-Way-Stop • Install west leg of the intersection to include one shared left/through/right-turn-lane • Install east leg of the intersection to include one shared left/through/right-turn-lane	30.8 - D	100.0%
		PM		**>50.0 - F[2]**		35.0 - D	100.0%
MM-22	46 - Phantom East / Innovation Way	PM	Does Not Exist Without Project	**>50.0 - F[2]**	• Signalize Intersection • Install west leg of the intersection to include one eastbound shared left/through-lane and one eastbound dedicated right-turn-lane with a channelized yield movement • Install dedicated northbound left-turn-lane • Modify Southbound approach to include one shared through/right-turn-lane	11.0 - B	100.0%

Note: Deficient intersection operation indicated in **bold**.

[1] Average seconds of delay per vehicle.

[2] Delay exceeds 80.0 seconds for signalized intersection or 50.0 seconds for unsignalized intersections; Level of Service F per HCM

LOS = level of service; TWSC = Two-Way Stop Control; OWSC = One-Way Stop Control

TABLE 19, FORECAST YEAR 2040 WITH HDC WITH PROJECT BUILDOUT MITIGATION MEASURES

Mitigation Measure	Intersection	Impacted Peak Hour	Forecast Year 2040 With HDC Without Project	Forecast Year 2040 With HDC With Project	Forecast Year 2040 With HDC With Project Recommended Mitigation	With Mitigation	Project Responsibility
			Delay[1] - LOS	Delay[1] - LOS		Delay[1] - LOS	
MM-23	3 - US-395 / Air Expressway	AM PM	17.9 - B 20.3 - C	**>80.0 - F[2]** **>80.0 - F[2]**	• Modify northbound right-turn lane to a free movement • Install eastbound dedicated right-turn-lane	26.0 - C 54.7 - D	
MM-24	4 - US-395 / Rancho Road	PM	23.9 - C	**>80.0 - F[2]**	• Restripe westbound approach to include two left-turn-lanes, one through lane, and one shared through/right-turn-lane	54.7 - D	
MM-25	5 - US-395 / Adelanto Road	AM PM	**>50.0 - F[2]** **>50.0 - F[2]**	**>50.0 - F[2]** **>50.0 - F[2]**	• Signalize Intersection	4.9 - A 27.1 - C	
MM-26	6 - US-395 / Palmdale Road	AM PM	48.9 - D **>80.0 - F[2]**	**>80.0 - F[2]** **>80.0 - F[2]**	• Install overlap phasing on all right-turn movements	**>80.0 - F[2]** **>80.0 - F[2]**	
MM-27	9 - Adelanto Road / Air Expressway	AM	16.3 - B	**76.5 - E**	• Install northbound right-turn overlap phase	54.5 - D	
MM-28	10 - Adelanto Road / Rancho Road	PM	11.5 - B	**>50.0 - F[2]**	• Signalize Intersection	7.2 - A	
MM-29	11 - Gateway Drive / Air Expressway	AM PM	32.6 - C 45 - D	**>80.0 - F[2]** **>80.0 - F[2]**	• Install second eastbound left-turn-lane • Install second southbound right-turn-lane; Install southbound right-turn overlap phase.	21.1 - C 20.7 - C	
MM-30	27 - US-395 / HDC WB Ramps	PM	29.4 - C	**>80.0 - F[2]**	• Reconfigure westbound approach to include one left-turn-lane, one shared left/through-lane; Install second westbound dedicated right-turn-lane • Convert third southbound through-lane to a shared through/right-turn-lane	44.7 - D	
MM-31	31 - Phantom East /HDC WB Ramps	AM	19.9 - B	**>80.0 - F[2]**	• Modify westbound right-turn-lane to include a channelized yield right-turn movement	0.9 - A	
MM-32	35 - Phantom West / Innovation Dr	AM PM	9.4 - A 8.7 - A	**>50.0 - F[2]** **>50.0 - F[2]**	• Signalize Intersection. • Install second northbound left turn lane and one northbound dedicated right-turn-lane with a right-turn overlap phase • Install southbound dedicated right-turn-lane • Install second eastbound through lane and convert dedicated right-turn to a free right movement • Install second westbound through lane	30.7 - C 54.3 - D	100.0% 100.0%

Mitigation Measure	Intersection	Impacted Peak Hour	Forecast Year 2040 With HDC Without Project Delay[1] - LOS	Forecast Year 2040 With HDC With Project Delay[1] - LOS	Forecast Year 2040 With HDC With Project Recommended Mitigation	With Mitigation Delay[1] - LOS	Project Responsibility
MM-33	36 - Phantom West / Aerospace Dr	AM	8.7 - A	**>50.0 - F[2]**	• Signalize intersection • Install northbound dedicated right-turn-lane • Install southbound dedicated right-turn-lane	4.1 - A	100.0%
		PM	9.1 - A	**>50.0 - F[2]**		9.5 - A	100.0%
MM-34	37 - Phantom West /Mustang St	AM	9.5 - A	**>50.0 - F[2]**	• Install median modifications to eliminate eastbound and westbound left turns	14.3 - B	100.0%
		PM	9.2 - A	**49.8 - F[2]**		13.7 - B	100.0%
MM-35	38 - Phantom West / Sabre Blvd	AM	10 - A	**>50.0 - F[2]**	• Signalize intersection • Install northbound dedicated right-turn-lane	5.3 - A	100.0%
		PM	9.1 - A	**>50.0 - F[2]**		9.5 - A	100.0%
MM-36	41 - Perimeter Road / Phantom East	AM	8.7 - A	**>50.0 - F[2]**	• Install southbound dedicated right-turn-lane • Install westbound dedicated right-turn-lane	29.2 - D	100.0%
		PM	8.8 - A	**45.1 - F[2]**		14.6 - B	100.0%
MM-37	42 - Gateway Drive / Innovation Way	AM	8.5 - A	**>50.0 - F[2]**	• Signalize Intersection • Construct east leg of the intersection • Install two northbound through-lanes and one northbound dedicated right-turn-lane with an overlap phase • Install one southbound left-turn-lane and a second southbound through-lane • Install two eastbound through-lanes and one eastbound dedicated right-turn-lane • Install a westbound left-turn-lane, two westbound through-lanes, and two westbound right-turn-lanes with a right-turn overlap phase	43.6 - D	100.0%
		PM	8.6 - A	**>50.0 - F[2]**		54.8 - D	100.0%
MM-38	43 - Nevada Ave / Innovation Dr / McCoy Circle	AM	0.0 - A	**>50.0 - F[2]**	• Signalize Intersection • Construct east leg of the intersection • Install one northbound shared through/right-turn-lane • Install a southbound left-turn-lane • Install one eastbound through-lane and one shared through/right-turn-lane • Install a westbound left-turn-lane, a westbound through-lane, and a shared through/right-turn-lane	10.6 - B	100.0%
		PM	0.0 - A	**>50.0 - F[2]**		13.6 - B	100.0%

Mitigation Measure	Intersection	Impacted Peak Hour	Forecast Year 2040 With HDC Without Project	Forecast Year 2040 With HDC With Project	Forecast Year 2040 With HDC With Project Recommended Mitigation	With Mitigation	Project Responsibility
			Delay[1] - LOS	Delay[1] - LOS		Delay[1] - LOS	
MM-39	45 - Phantom East / Sabre Boulevard	AM	Does Not Exist Without Project	**>50.0 - F[2]**	• Signalize Intersection • Install west leg of the intersection to include one shared left/through/right-turn-lane • Install east leg of the intersection to include one shared left/through/right-turn-lane	13.3 - B	100.0%
		PM		**>50.0 - F[2]**		44.0 - D	100.0%
MM-40	46 - Phantom East / Innovation Way	AM	Does Not Exist Without Project	**>50.0 - F[2]**	• Signalize Intersection • Install second northbound left-turn-lane • Install west leg of the intersection to include one eastbound shared left/through-lane and one eastbound dedicated right-turn-lane with a channelized yield movement • Install westbound left-turn-lane	11.0 - B	100.0%
		PM		**>50.0 - F[2]**		16.1 - B	100.0%

Note: Deficient intersection operation indicated in **bold**.

[1] Average seconds of delay per vehicle.

[2] Delay exceeds 80.0 seconds for signalized intersection or 50.0 seconds for unsignalized intersections; Level of Service F per HCM

LOS = level of service; TWSC = Two-Way Stop Control; OWSC = One-Way Stop Control