

I-5 / SR-56 Interchange Project

Traffic Volumes and Operations Report

Volume 1 of 2

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Prepared for
Dokken Engineering

Prepared by
Linscott, Law & Greenspan, Engineers



America's Finest City

THE CITY OF SAN DIEGO



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EXECUTIVE SUMMARY

Linscott, Law & Greenspan Engineers has been retained by Dokken Engineering to evaluate the potential traffic impacts due to the *I-5/SR-56 Interchange Project* in the City of San Diego. The following report was completed in preparation of a Project Report (PR) and will form the basis for the transportation section of the Environmental Document (ED). The project study area includes approximately 5.5 miles of I-5 between Carmel Mountain Road and Via de la Valle and 2.5 miles of SR-56 between I-5 and Carmel Valley Road. The scenarios and study area were determined in conjunction with Caltrans, City of San Diego and Dokken Engineering.

Currently, local streets and the surrounding communities experience increased demand and congestion during peak hours from I-5 and SR-56 traffic. The current network forces drivers to exit the freeway to travel between SB I-5 to EB SR-56 and WB SR-56 to NB I-5. This causes congestion at the El Camino Real and Carmel Valley Road intersections. A recent widening to the westbound SR-56 off-ramp at El Camino Real has improved current operations. During peak hours, in order to avoid traffic congestion at the I-5/SR-56 interchange, drivers use alternate routes including El Camino Real, Carmel Valley Road and Carmel Creek Road causing increased traffic on surface streets near the project area. The increased congestion negatively impacts the surrounding communities by increasing the traffic through neighborhoods. Continued regional development and inter-regional travel will further increase traffic volumes and reduce traffic operational quality.

The alternatives under consideration for the Interstate 5 (I-5)/ State Route 56 (SR-56) Interchange Project include the No Build, Auxiliary Lane (local street improvements), Direct Connector (new SB I-5 to EB SR 56 and WB SR 56 to NB I-5 connectors), Hybrid (only WB SR 56 to NB I-5 connector) and Hybrid with Flyover (WB SR 56 to NB I-5 connector and flyover from SB I-5 to EB SR 56). The description of each of these alternatives is discussed in Section 2.2 of this report.

Forecast volumes were developed for each of these alternatives for the interim year – Year 2015 and horizon year – Year 2030. LLG coordinated extensively with Caltrans, City of San Diego and Dokken Engineering regarding forecasting of traffic volumes.

Traffic Operational analyses were conducted for the project alternatives for the interim and horizon year scenarios. The report presents the results as per the *Highway Capacity Manual (HCM)* methodology for signalized and unsignalized intersections, freeway merge/diverge, ramp capacity analysis and weave locations. Street segments and freeway mainline segments were analyzed using a volume/capacity (V/C) method consistent with City of San Diego and Caltrans standards of practice, respectively. Finally, signalized intersections under Caltrans' jurisdiction were analyzed using the Intersecting Lane Vehicles (ILV) methodology required by Caltrans.

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APPENDICES

APPENDIX

- A. Intersection Calculation Sheets
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- C. Freeway Merge Calculation Sheets
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- I. Travel Time Study Calculation Worksheets

FINAL TRAFFIC STUDY
I-5/SR-56 INTERCHANGE PROJECT
 San Diego, California
 December 4, 2009

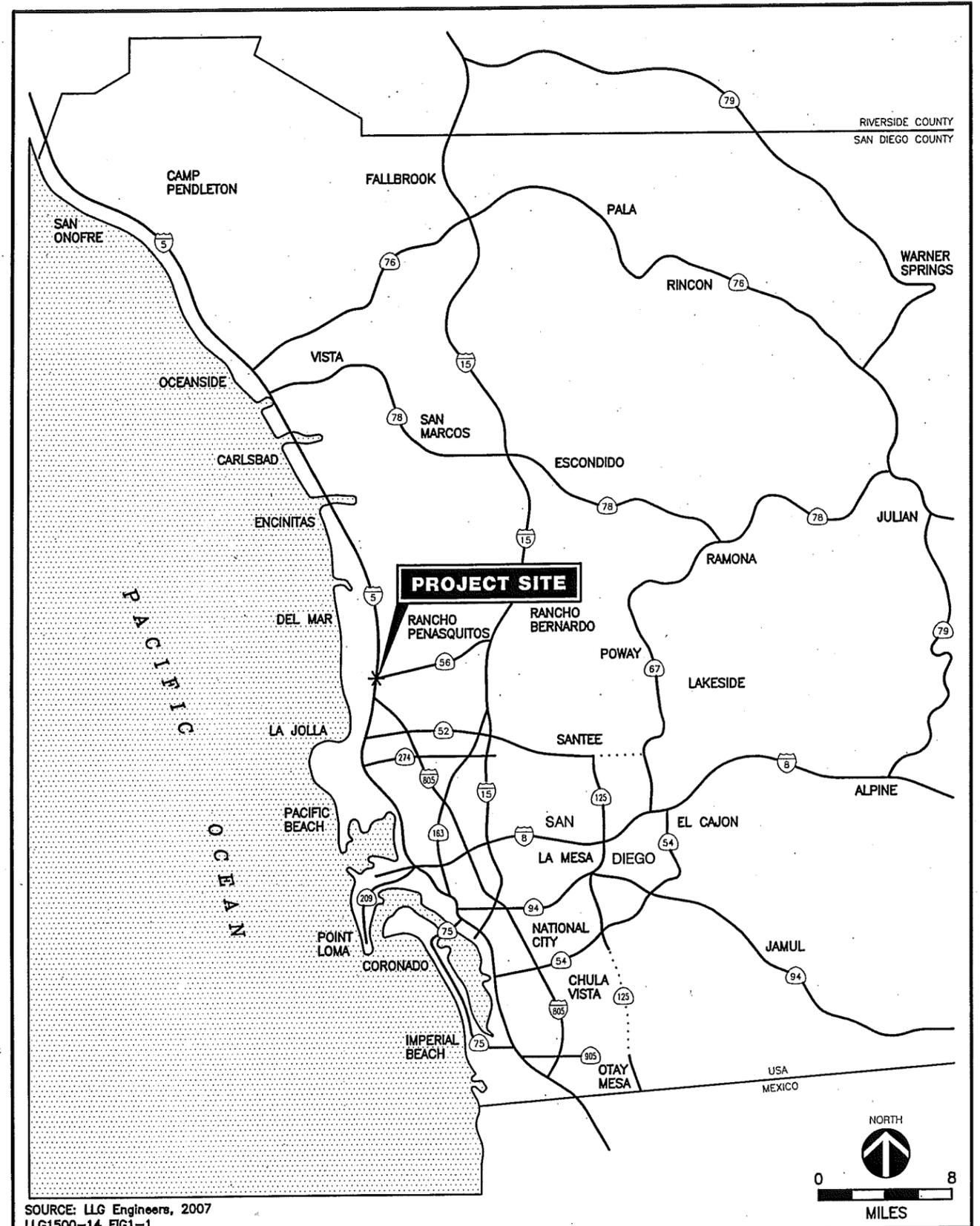
1.0 INTRODUCTION

Linscott, Law & Greenspan Engineers has been retained by Dokken Engineering to evaluate the potential traffic impacts due to the *I-5/SR-56 Interchange Project* in the City of San Diego. The following report was completed in preparation of a Project Report (PR) and will form the basis for the transportation section of the Environmental Document (ED). The project study area includes approximately 5.5 miles of I-5 between Carmel Mountain Road and Via de la Valle and 2.5 miles of SR-56 between I-5 and Carmel Valley Road. The roadway facilities within the study area fall under both Caltrans and City of San Diego jurisdictions. The project vicinity is shown in *Figure 1-1*. *Figure 1-2* illustrates in more detail the project area.

The following is a Traffic Volumes and Traffic Operations Report for the I-5/SR 56 Interchange Project.

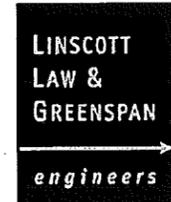
1.1 Study Area

The study area for this project was selected from the Technical Memorandum # 4 – Post SR-56 Conditions prepared by *Fehr & Peers*, which included 38 intersections, 40 street segments. An additional 3 intersections – I-5 Northbound ramps/ Carmel Mountain Road, I-5 Southbound ramps/ Carmel Mountain Road and Carmel Valley Road/ Del Mar Heights Road are analyzed in this traffic study. The intersections were analyzed during the AM and PM peak hours. The street segments were analyzed on a daily basis using average daily traffic (ADT) volumes. The project study area is discussed in detail in Section 3.0.



SOURCE: LLG Engineers, 2007
 LLG1500-14 FIG1-1

Figure 1-1
Vicinity Map



2.2 Project Alternatives

The following discussion summarizes the alternatives under consideration for the Interstate 5 (I-5) / State Route 56 (SR-56) Interchange Project.

2.2.1 No Build Alternative

The “No Build” scenario assumes the existing configuration for the I-5/SR-56 interchange. Future planned improvements, independent of the I-5/SR-56 project, were assumed to be in place. Such improvements include:

- I-5 freeway configuration is planned to include 10 general-purpose lanes (5 lanes in each direction) with 4 managed/ HOV lanes (two lanes in each direction) with direct access ramps (DAR’s) connections to HOV/managed lanes. As per I-5 North Coast Project, the direct access ramps are planned at Voigt Drive, Manchester Avenue, Cannon Road and Oceanside Boulevard at I-5.
- SR-56 freeway configuration in Year 2030 is planned to include 6 general-purpose lanes (3 lanes in each direction) with 2 managed/ HOV lanes (one lane in each direction). This alternative **does not include** the construction of direct connectors (southbound I-5 to eastbound SR-56 and from westbound SR-56 to northbound I-5 connectors). The 2004 Regional Transportation Plan (RTP) planned the facility to accommodate 6 mixed flow lanes and 2 HOV / managed lanes (6+2) in Year 2030. However, the 2007 RTP programmed the facility to include six mixed lanes and no HOV / managed lanes (6+0). To accommodate the worse configuration in this project, SR-56 has been modeled as a 4+0 facility (existing configuration) in Year 2015 and 6+2 facility in Year 2030.
- No improvements to the local streets are assumed.

2.2.2 Auxiliary Lane Alternative

The Auxiliary Lane Alternative proposes the construction of auxiliary lanes along southbound I-5 and westbound SR-56. Improvements to the southbound off-ramp and northbound on-ramp at Carmel Valley Road, intersection improvements along Carmel Valley Road east of I-5 and improvements to the eastbound El Camino Real on-ramp are also proposed. Additional auxiliary lanes, reconstruction of the Del Mar Heights Road overcrossing and associated operational improvements is also proposed with this alternative. *Section 4.1.2* and *Section 4.2.2* discusses these improvements in detail.

2.2.3 Direct Connector Alternative

The Direct Connector Alternative consists of the construction of direct connectors from southbound I-5 to eastbound SR-56 and from westbound SR-56 to northbound I-5. The direct connectors are proposed to join the bypass lanes adjacent to I-5. Currently, the northbound bypass lanes are in place and consist of 4 lanes south of the I-5/SR-56 interchange. The southbound bypass opened to traffic

on April 2, 2007 and consists of 4 lanes south of the I-5/SR-56 interchange, with 2 lanes leading to I-5 and 2 lanes leading to I-805 south of the split.

In the Direct Connector Alternative, the bypass is to be extended northerly in both directions to provide access to and from Del Mar Heights Road. This project proposes improvements between the Del Mar Heights Road interchange and SR-56 along I-5, Carmel Country Road interchange and I-5 along SR-56. This alternative also includes improvements to the surface streets, the addition of auxiliary lanes along SR-56 and I-5, interchange improvements, or new freeway-to-freeway connector ramps.

Section 4.1.3 and Section 4.2.3 discusses these improvements in detail.

2.2.4 Hybrid Alternative

The Hybrid Alternative is a “blend” of the Auxiliary Lane Alternative in the SB I-5 to EB SR 56 direction and the Direct Connector Alternative in the WB SR 56 to NB I-5 direction. This alternative includes similar local street improvements to those proposed in the Auxiliary Lane and Direct Connector Alternatives. Section 4.1.4 and Section 4.2.4 discusses these improvements in detail.

2.2.5 Hybrid with Flyover Alternative

This alternative includes a “flyover” in the SB I-5 to EB SR 56 direction and a Direct Connector in the WB SR 56 to NB I-5 direction. The Hybrid with Flyover Alternative involves the construction of a two-lane, one-way EB grade separated structure on Carmel Valley Road between I-5 and El Camino Real serving the SB I-5 to EB SR-56 traffic. This structure would merge into the EB SR-56 mainline between El Camino Real and Carmel Creek interchanges.

Section 4.1.5 and Section 4.2.5 discusses these improvements in detail.

2.3 Project Objectives

The objectives of this project are to:

- Maintain or improve future traffic levels of service in Year 2030 over the existing and forecasted level of service.
- Maintain or reduce off peak and peak hour delay for SR-56 traffic moving to & from the north on I-5.
- Maintain or reduce peak hour congestion at the El Camino Real/56 ramp termini.
- Maintain or reduce freeway related traffic bypassing the congestion by traveling through local communities during the peak hour.
- Maintain or reduce congestion on I-5 and SR-56 mainlines during the peak hour.
- Provide a facility that is compatible with future transit and other modal options.
- Follow the Regional Transportation Plan, Mobility 2030 – The Transportation Plan for the San Diego Region, SANDAG, April 2003

(2003 SANDAG RTP) where feasible and be in compliance with Federal and State regulations.

- Maintain the facility as an effective link in the intra-regional and inter-regional movement of people and goods.
- Avoid and minimize impacts to human and natural environment.

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3.0 EXISTING CONDITIONS

Effective evaluation of the traffic impacts associated with the I-5/SR-56 Interchange project requires an understanding of the existing transportation system within the project area.

The current *City of San Diego Street Design Manual* (November 2002) generally applies to new roadways only. The majority of roadways within the study area were built under the previous standards. Below provides a brief description of the standards of the current Street Design Manual. A discussion of the previous Street Design Manual (January 1997) is also provided.

“Current” City of San Diego Street Design Manual (November 2002)

Six-Lane Primary Arterials should be 98 feet wide in 142 feet of Right-of-Way (R/W), providing six through lanes, bike lanes, and a raised median/left-turn lane. Six-Lane Major Streets should be 112 feet wide in 140 to 152 feet of R/W, providing six through lanes, bike lanes, and a raised median/left-turn lane. Four-Lane Major Streets should be 76 feet wide in 120 feet of R/W, providing four through lanes, bike lanes, and a raised median/left-turn lane. Four-Lane Collectors with a Two-Way Left-Turn Lane should be 82 feet wide in 110 to 122 feet of R/W, providing four through lanes, bike lanes, left-turn lanes, and curbside parking. Two-Lane Collectors with a Two-Way Left-Turn Lane should be 54 feet wide in 78 to 94 feet of R/W and provide two through lanes, bike lanes, and curbside parking. Two-Lane Collectors with Bike Lanes should be 46 feet wide in 70 to 96 feet of R/W, providing two through lanes, bike lanes, and curbside parking. Two-Lane Collectors should be 36 feet wide in 60 to 86 feet of R/W and provide two through lanes and curbside parking.

“Previous” Street Design Manual (January 1997)

According to the *City of San Diego Street Design Manual*, Six-Lane Prime Arterials should be 102 feet wide in 122 feet of Right of Way (R/W), providing six through lanes, a raised median/left-turn lane and curbside parking. Six-Lane Major Streets should be 102 feet wide in 122 feet of Right of Way (R/W), providing six through lanes, a raised median/left-turn lane and curbside parking. Four-Lane Major Streets should be 78 feet wide in 98 feet of R/W, providing four through lanes, a raised median/left-turn lane and curbside parking. Four-Lane Collectors should be 72 feet wide in 92 feet of R/W, providing four through lanes, a painted median/ left-turn lane and curbside parking. Two-Lane Collectors should be 40 to 50 feet wide in 60 to 70 feet of R/W and provide two through lanes.

3.1 Existing Street Network

Interstate 5 (I-5) is a principal north-south Interstate Freeway facility. It has a posted speed limit of 65 miles per hour and provides direct access to Encinitas, Carlsbad, Oceanside, and San Diego and also to Orange and Los Angeles Counties to the north. Interstate 5 has been currently planned to accommodate 5 lanes plus 2 HOV lanes in each direction by Year 2030. Currently, the northbound bypass facility is in place and consists of 4 lanes south of the I-5/SR-56 interchange. The southbound bypass opened to traffic on April 2, 2007 and consists of 4 lanes south of the I-5/SR-56 interchange, with 2 lanes leading to I-5 and 2 lanes leading to I-805 south of the split.

SR-56 is currently a 4-lane State Route east-west interregional freeway facility connecting I-5 to I-15. It has a posted speed limit of 65 miles per hour. The 2004 RTP programmed the facility to accommodate 6 mixed flow lanes and 2 HOV/ managed lanes (6+2) in Year 2030. However, the 2007 RTP programmed the facility to include six mixed lanes and no HOV/managed lanes (6+0). To accommodate the worse configuration, SR-56 has been modeled as a 4+0 facility (existing configuration) for the interim Year 2015 and 6+2 facility for the long-term Year 2030. This project analyzes and studies various interim and build alternatives in the construction of direct connectors from southbound I-5 to eastbound SR-56 and from westbound SR-56 to northbound I-5. The project area includes four interchanges on SR-56 – El Camino Real, Carmel Creek Road, Carmel Country Road and Carmel Valley Road (also known as Camino Santa Fe).

Via de la Valle is classified in the Via de la Valle Community Plan as a 6-Lane Major Street from I-5 to San Andres Drive and a 4-Lane Major Street from San Andres Drive to the City border just east of El Camino Real. From El Camino Real to Paseo Delicias, Via de la Valle is classified as a Rural Collector on the County of San Diego Circulation Element. Bus stops are provided and the posted speed limit is generally 45 mph within the study area.

San Dieguito Road is classified as a Collector on the County of San Diego Circulation Element. San Dieguito Road is a 2-lane roadway divided by a two-way-left-turn lane in the immediate project vicinity. The posted speed limit on San Dieguito Road is 45 and 50 mph.

Del Mar Heights Road is currently built as a 4-lane undivided roadway from Camino Del Mar to I-5 and as 6-lane Primary Arterial from I-5 to Carmel Valley Road. Bus stops are provided and the posted speed limit is generally 40-55 mph within the study area. Bike lanes are provided and on-street parking is prohibited.

Townsgate Drive is currently built as a 4-lane Major Road from Del Mar Heights Road to El Camino Real. Bike lanes are provided and on-street parking is prohibited. The posted speed limit is 30 mph. The neighboring land uses are mainly office and business parks.

Carmel Valley Road is currently built as a 2-lane undivided roadway from Camino Del Mar to I-5 interchange ramps and as a six lane Prime Arterial from I-5 interchange ramps to El Camino Real. An enhanced raised center median is currently under construction on Carmel Valley Road from Mango Drive to Camino Del Mar. The posted speed limit on Carmel Valley Road from Camino Del Mar to Pointe Del Mar Way is 30 mph and Pointe Del Mar to I-5 interchange is 40 mph.

Valley Center Drive is currently built as a 4-lane Major Road from El Camino Real to Carmel Creek Road. The posted speed limit on Valley Center Drive is 40 mph. Bike lanes are provided and on-street parking is prohibited.

Carmel Mountain Road is currently built as a 5-lane Major Road from I-5 NB ramps to Vista Sorrento Parkway and as a 6-lane Primary Arterial from Vista Sorrento Parkway to El Camino Real.

Bike lanes are provided and on-street parking is prohibited on Carmel Mountain Road. A new interchange of Carmel Mountain Road with I-5 is currently under construction.

Camino Del Mar is currently built as a 3-lane Collector from Del Mar Heights Road to Carmel Valley Road and as a 2-lane Collector roadway south of Carmel Valley Road. The speed limit generally on Camino Del Mar is 30 mph and bike lanes are provided in both directions. On street parking is prohibited.

Mango Drive is currently built as a 2-lane Collector roadway from Del Mar Heights Road to Carmel Valley Road. On-street parking is provided on both sides of the road. The neighboring land uses are mainly residential.

Portofino Drive is currently built as a 2-lane Collector roadway from Del Mar Heights Road to Carmel Valley Road. On-street parking is provided on both sides of the road. The neighboring land uses are mainly residential.

High Bluff Drive is currently built as a 4-lane Major Road from Del Mar Heights Road to El Camino Real. The posted speed limit on High Bluff Drive is 30 mph. Bike lanes are provided and on-street parking is prohibited. The neighboring land uses are mainly office and business parks.

El Camino Real is currently built as 2-lane undivided roadway from Via de la Valle to Rosecroft Way. It is currently built as a 4-lane Major Road from Rosecroft Way to Del Mar Heights Road and as a six-lane Primary Arterial from Del Mar Heights Road to Carmel Mountain Road. The speed limit generally on El Camino Real is 50 mph and bike lanes are provided in both directions. On street parking is prohibited.

Carmel Country Road is currently built as a 4-lane Major Road from Del Mar Heights Road to SR-56 interchange ramps. The posted speed limit on Carmel Country Road is generally 45 mph. Bike lanes are provided and on-street parking is prohibited. The neighboring land uses are mainly residential.

Carmel Creek Road is currently built as a 4-lane Major Road from Carmel Country Road to SR-56 interchange ramps. The posted speed limit on Carmel Creek Road is generally 45 mph. Bike lanes are provided and parking is prohibited.

Carmel Canyon Road is currently built as a 4-lane Major Road from Del Mar Heights Road to Carmel Country Road. It extends west of Carmel Country Road as a 2-lane Collector called as Del Mar Trails Road. The posted speed limit on Carmel Canyon Road is generally 40 mph. Bike lanes are provided and on-street parking is prohibited. The neighboring land uses are mainly residential.

Carmel Valley Road/ Camino Santa Fe is currently built as a 4-lane Major Road from Del Mar Heights Road to SR-56 interchange ramps. Bike lanes are provided and on-street parking is prohibited. The neighboring land uses are mainly residential.

Figures 3-1a, 3-1b and 3-1c illustrate the existing traffic conditions for intersections, roadway segments and freeway facilities in the project vicinity.

3.2 Existing Traffic Volumes

Existing weekday AM/ PM peak hour traffic volumes and average daily volumes were used from the *Fehr and Peer Technical Memorandum # 3 and #4 Report*. The existing peak hour volume counts in Fehr and Peers study were conducted in September 2004 through March 2005. Significant roadway network changes like the opening of the I-5 Bypass facility and Carmel Mountain interchange have taken place since then and the existing traffic volumes were adjusted to reflect those changes.

LLG coordinated extensively with Caltrans Traffic Forecasting Branch (TFB) regarding the existing freeway and ramp traffic volumes. Existing freeway and ramp traffic volumes were utilized from the I-5 North Coast project to be consistent.

Figures 3-2a, 3-2b and 3-2c illustrate the existing traffic volumes for the intersections, local streets and the freeway facilities.

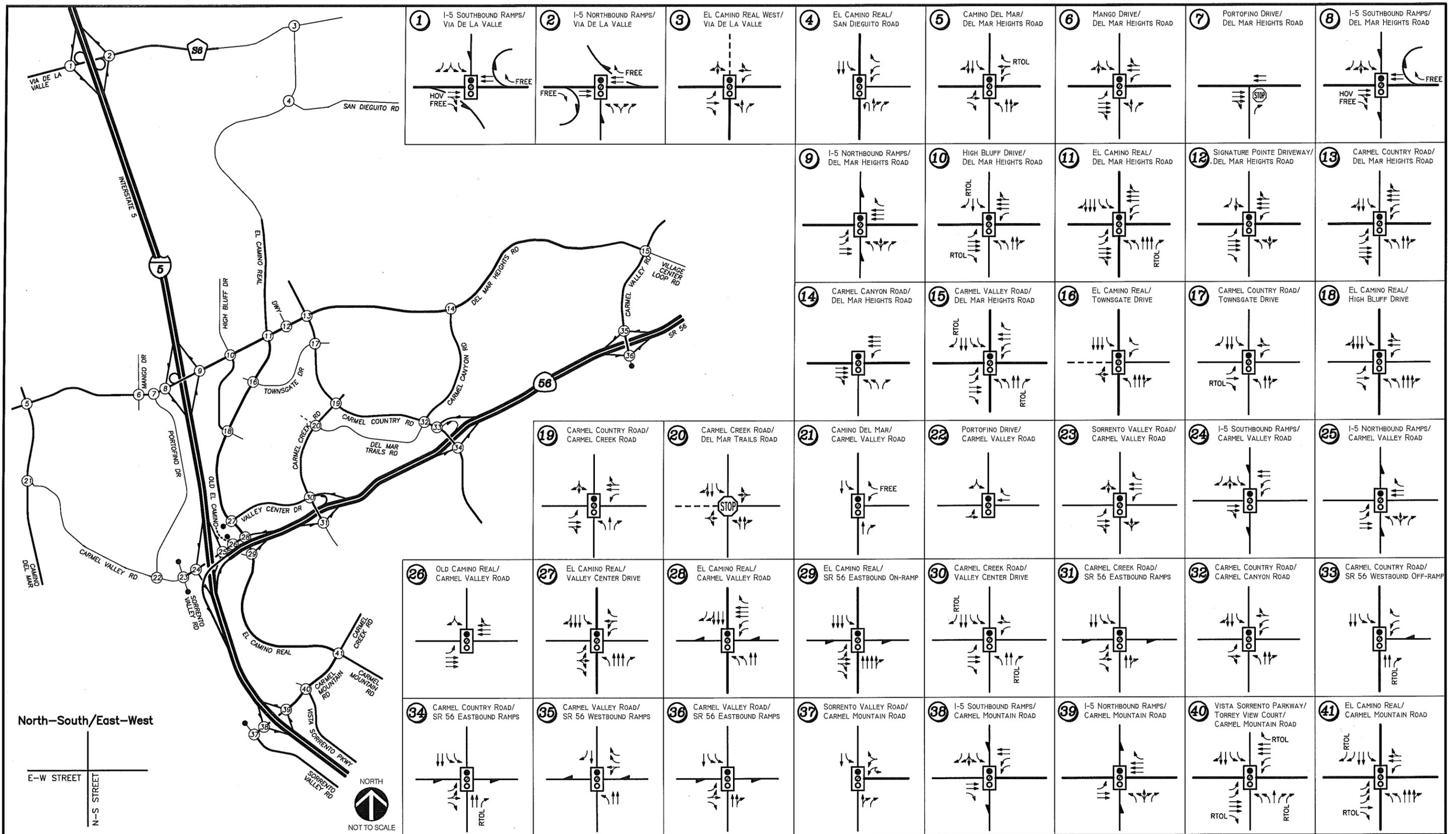


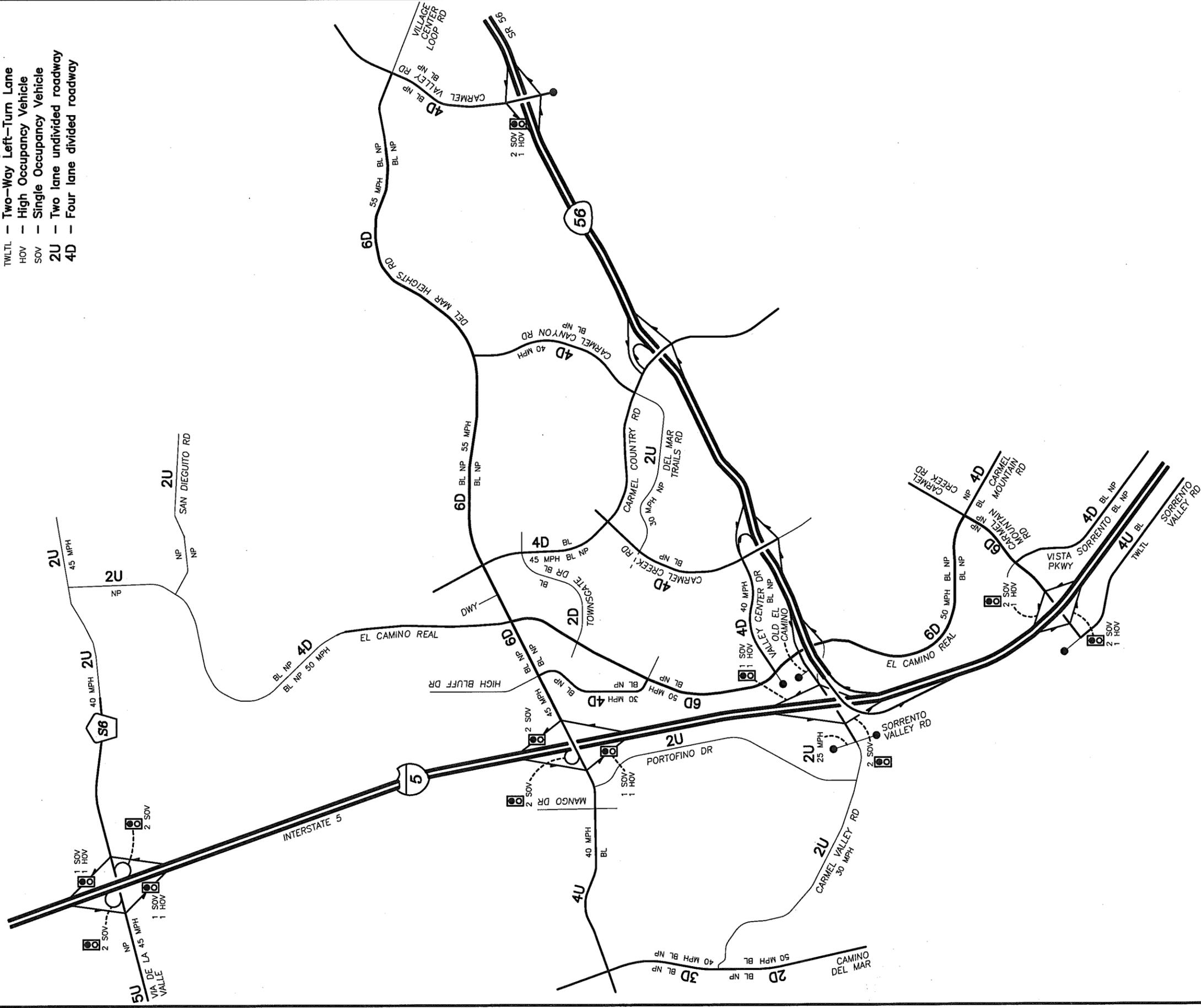
Figure 3-1a

Existing Network Conditions Intersections

LEGEND

- Ramp Meter Signal
- Bike Lane
- No Parking
- Two-Way Left-Turn Lane
- High Occupancy Vehicle
- Single Occupancy Vehicle
- Two lane undivided roadway
- Four lane divided roadway

- BL NP
- NP
- TW/TL
- HOV
- SOV
- 2U
- 4D



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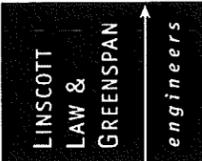


Figure 3-1b
 Existing Network Conditions
 Street Segments

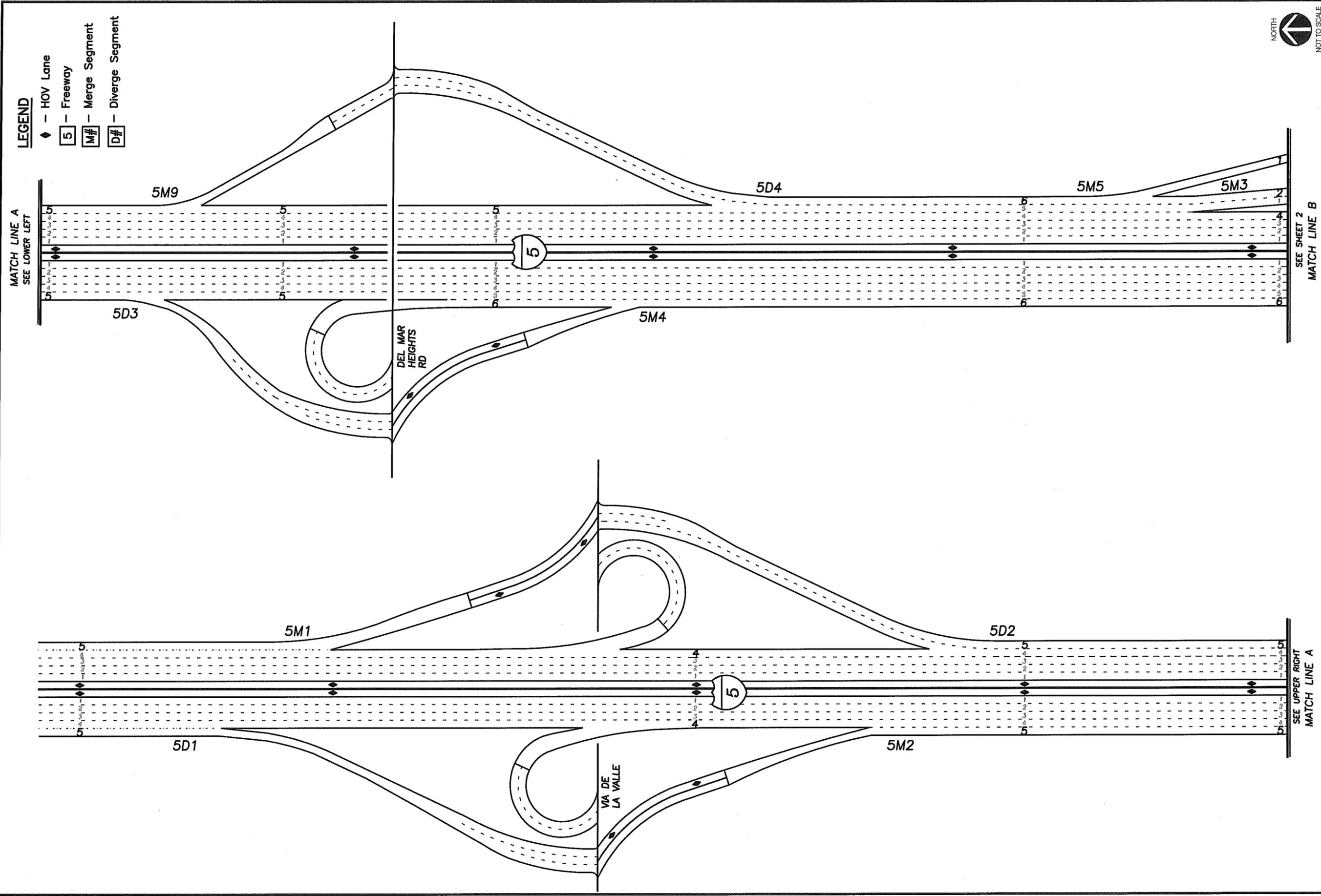
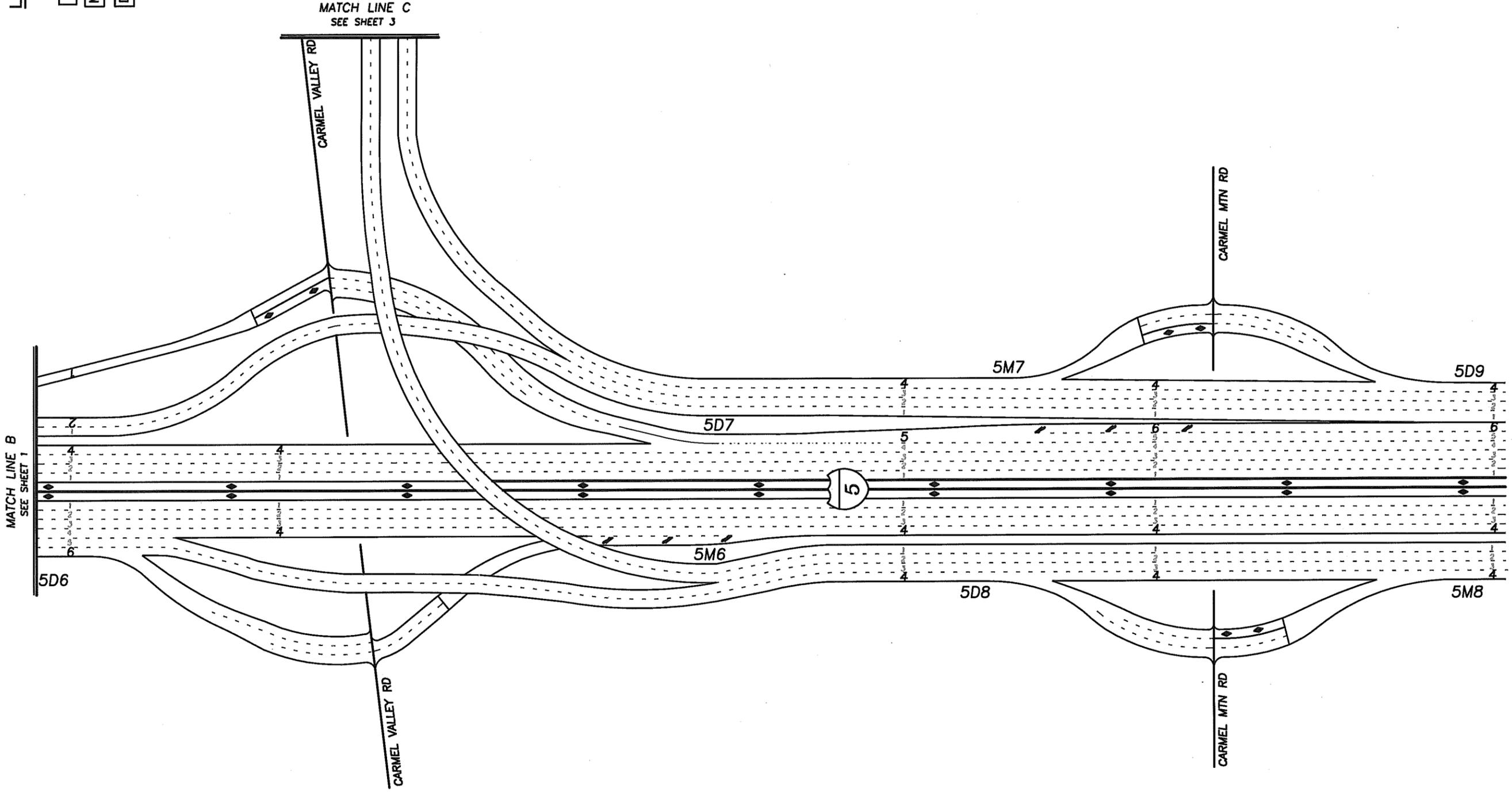


Figure 3-1c
(SHEET 1 OF 3)
Existing Network Conditions
Freeway Facilities

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LEGEND

- ◆ - HOV Lane
- 5 - Freeway
- M# - Merge Segment
- D# - Diverge Segment



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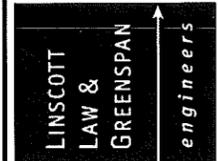
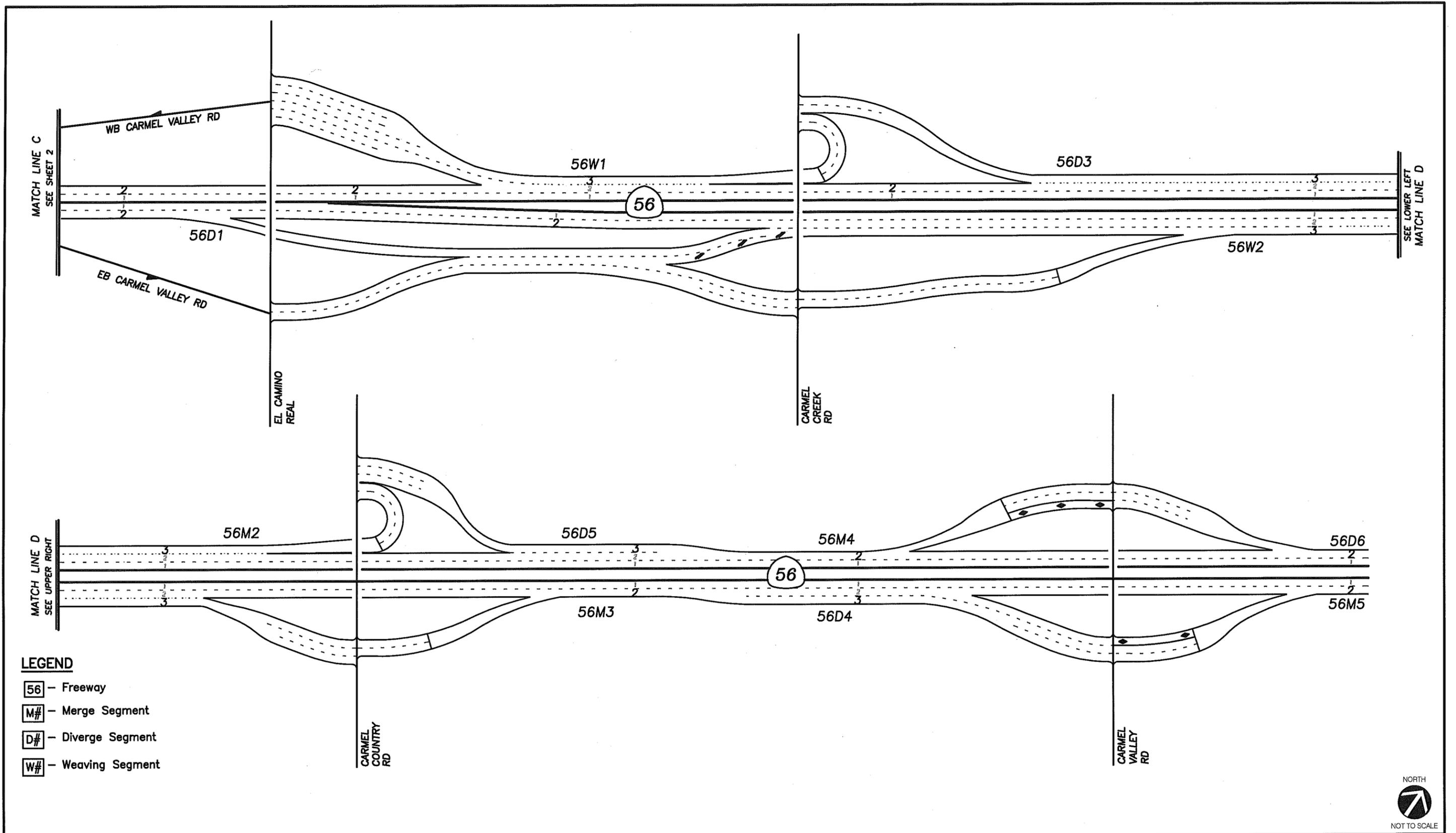


Figure 3-1c
(SHEET 2 OF 3)

**Existing Network Conditions
Freeway Facilities**



- LEGEND**
- 56 - Freeway
 - M# - Merge Segment
 - D# - Diverge Segment
 - W# - Weaving Segment



Figure 3-1c
(SHEET 3 OF 3)
**Existing Network Conditions
Freeway Facilities**

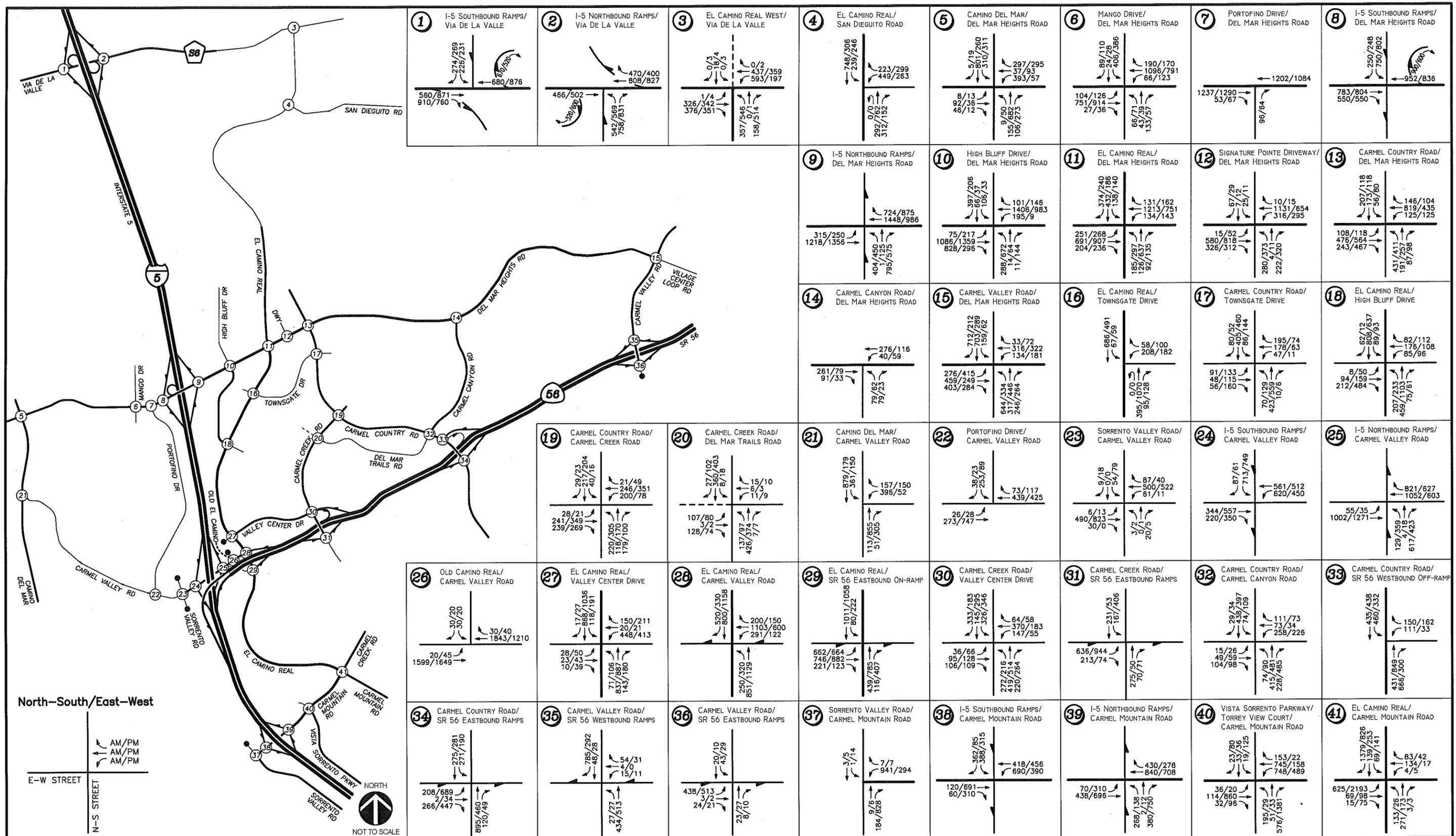


Figure 3-2a
Existing Traffic Volumes
Intersections

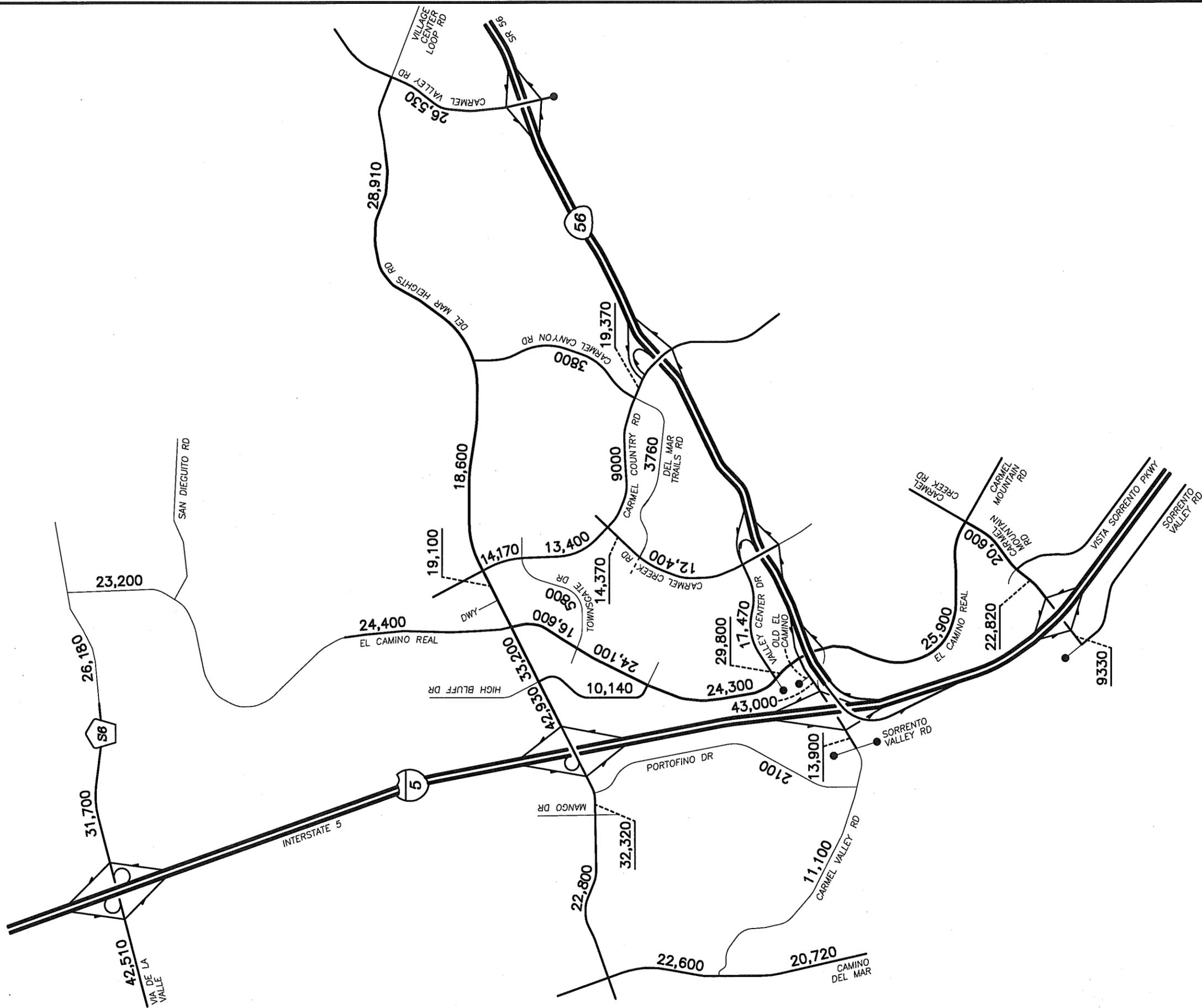
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**LINSOTT
LAW &
GREENSPAN**
engineers

NOTES:
- AM/PM peak hour volumes are shown at the intersections

LEGEND
⊗ - Indicates "study" intersection

NOTES:
 - ADT (Average Daily Traffic)
 shown midblock



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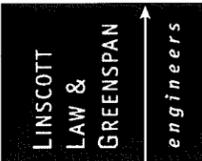
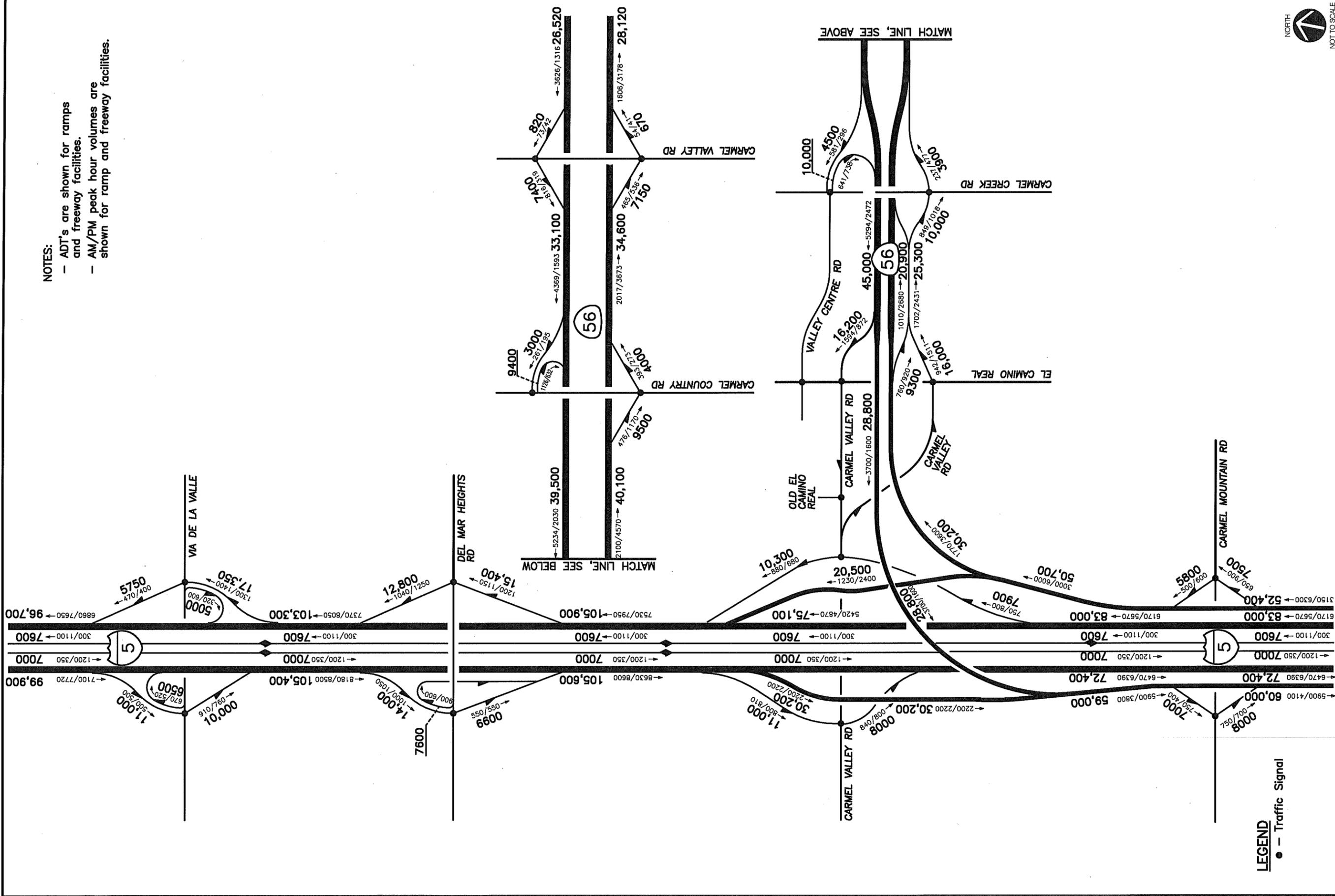


Figure 3-2b
 Existing Traffic Volumes
 Street Segments ADT

NOTES:
 - ADT's are shown for ramps and freeway facilities.
 - AM/PM peak hour volumes are shown for ramp and freeway facilities.



REV. 09/10/2009
 N:\1500-14\FIGURES\EXISTING & YEAR 2030 RUN C (FULL BUILD)\1500-14 EX & RUN C FIGURES.DWG

Figure 3-2c
 Existing Traffic Volumes
 Freeway and Ramp ADT

4.0 FUTURE YEAR NETWORK & VOLUMES

This section discusses the future year roadway network and forecasting process adopted for the various interim and horizon year scenarios. The City of San Diego, Caltrans, Dokken Engineering and LLG collectively developed and selected Year 2015 as an interim scenario and Year 2030 as the long-term scenario. The current traffic model (Series 10) uses Year 2030 as a horizon year. The I-5 North Coast study also used these as study years.

The alternatives were developed taking into consideration future traffic demands and travel patterns, construction staging and feasibility, and topographic/utility constraints. This report studied all the alternatives outlined in *Table 4-1*.

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TABLE 4-1
MODEL TRACKING SHEET

Run	Analysis Scenario/Model	Status	I-5 Mainline			SR 56 Mainline				Local Streets	Notes
			SR 56/Carmel Valley to Del Mar Heights	Del Mar Heights to Via De La Valle	North of Via De La Valle	I-5 to El Camino Real	El Camino Real to Carmel Creek	Carmel Creek to Carmel Country	Carmel Country to Carmel Valley		
-	Existing	DONE	10 Lanes; 2 lanes HOV + Bypass	10 lanes; 2 HOV	10 lanes; 2 HOV	EB: 2M WB: 2M	EB: 2M + 1A WB: 2M + 1A	EB: 2M WB: 2M	EB: 2M WB: 2M	No Improvements	-
A	2015 No Build	DONE	8 Lanes ; 4 lanes HOV + Bypass	12 lanes; 4 HOV	10 lanes; 4 HOV	EB: 2M WB: 2M	EB: 2M + 1A WB: 2M + 1A	EB: 2M WB: 2M	EB: 2M WB: 2M	No Improvements	I-5 – 10 + 4 as in NC project SR-56 – 4 + 0 (same as existing)
B	2015 Auxiliary Lane	DONE	8 Lanes; 4 lanes HOV + Bypass	12 lanes; 4 HOV	10 lanes; 4 HOV	EB: 2M WB: 2M	EB: 2M + 1A WB: 2M + 1A	EB: 2M WB: 2M + 1A	EB: 2M WB: 2M	Improvements	-
C	2015 Direct Connector	DONE	8 Lanes; 4 lanes HOV + Bypass	12 lanes; 4 HOV	10 lanes; 4 HOV	EB: 4M WB: 4M	EB: 4M WB: 4M + 1A	EB: 3M WB: 4M + 1A	EB: 2M WB: 2M	Improvements	I-5 – 10 + 4 as in NC project
D	2015 Hybrid	DONE	8 Lanes; 4 lanes HOV + Bypass	12 lanes; 4 HOV	10 lanes; 4 HOV	EB: 2M WB: 4M	EB: 2M + 1A WB: 4M + 1A	EB: 2M WB: 4M + 1A	EB: 2M WB: 2M	Improvements	Dir Connector – WB to NB Aux Lane Alt – SB to EB
D1	2015 Hybrid with flyover	DONE	8 Lanes; 4 lanes HOV + Bypass	12 lanes; 4 HOV	10 lanes; 4 HOV	EB: 2M WB: 4M	EB: 4M WB: 4M + 1A	EB: 3M WB: 4M + 1A	EB: 2M WB: 2M	Improvements	Dir Connector – WB to NB Flyover – SB to EB
E	2030 No Build	DONE	8 Lanes ; 4 lanes HOV + Bypass	12 lanes; 4 HOV	10 lanes; 4 HOV	EB: 2M WB: 2M	EB: 2M + 1A WB: 2M + 1A	EB: 3M + 1 HOV WB: 3M + 1 HOV	EB: 3M+ 1 HOV WB: 3M+ 1 HOV	No Improvements	I-5 NC Project minus WB to SB and EB to NB connectors. Run E derived from Run G.
F	2030 Auxiliary Lane	DONE	8 Lanes; 4 lanes HOV + Bypass	12 lanes; 4 HOV	10 lanes; 4 HOV	EB: 2M WB: 2M	EB: 2M + 1A WB: 2M + 1A	EB: 3M + 1 HOV WB: 3M + 1A + 1 HOV	EB: 3M+ 1 HOV WB: 3M+ 1 HOV	Improvements	-
G	2030 Direct Connector	DONE	8 Lanes; 4 lanes HOV + Bypass	12 lanes; 4 HOV	10 lanes; 4 HOV	EB: 4M WB: 4M	EB: 4M WB: 4M + 1A	EB: 4M + 1A WB: 3M + 1A + 1 HOV	EB: 3M+ 1 HOV WB: 3M+ 1 HOV	Improvements	WB to NB connector SB to EB connector I-5 North Coast Model Run
H	2030 Hybrid	DONE	8 Lanes; 4 lanes HOV + Bypass	12 lanes; 4 HOV	10 lanes; 4 HOV	EB: 2M WB: 4M	EB: 2M + 1A WB: 4M + 1A	EB: 3M + 1 HOV WB: 3M + 1A + 1 HOV	EB: 3M+ 1 HOV WB: 3M+ 1 HOV	Improvements	Direct Connector – WB to NB Aux Lane Alt – SB to EB
H1	2030 Hybrid with flyover	DONE	8 Lanes; 4 lanes HOV + Bypass	12 lanes; 4 HOV	10 lanes; 4 HOV	EB: 2M WB: 4M	EB: 4M WB: 4M + 1A	EB: 4M + 1A WB: 3M + 1A + 1 HOV	EB: 3M+ 1 HOV WB: 3M+ 1 HOV	Improvements	Direct Connector – WB to NB Flyover – SB to EB

General Notes:

1. The Direct Connector Alternative proposes two direct connectors – WB SR 56 to NB I-5 and SB I-5 to EB SR 56.
2. M– Mainlines or GP lanes; A – Auxiliary lanes, HOV – High Occupancy Vehicles or Carpool lanes.

NEED
NOT REQUIRED
DONE

4.1 Year 2015

The following section discusses the interim (Year 2015) network assumptions and traffic volumes for the various project scenarios.

4.1.1 Year 2015 "No Build Alternative" (Model Run A)

The Year 2015 "No Build" Alternative is based on the following assumptions:

- **I-5** freeway configuration is planned to include 10 general-purpose lanes (5 lanes in each direction) with 4 managed/ HOV lanes (two lanes in each direction) with direct access ramps (DAR's) connections to HOV/managed lanes (**10 + 4**). As per I-5 North Coast Project, the direct access ramps are planned at Voigt Drive, Manchester Avenue, Cannon Road and Oceanside Boulevard at I-5.
- **SR-56** freeway configuration in the interim Year 2015 is assumed to be the same as existing (4 general-purpose lanes and no HOV lanes). This alternative **does not include** the construction of direct connectors (southbound I-5 to eastbound SR 56 and from westbound SR 56 to northbound I-5 connectors).
- No improvements to the local streets are proposed with this alternative.

The Year 2015 No Build traffic volumes were developed on the same methodology used in forecasting the Year 2030 No Build traffic volumes. Based on a comparison of model volumes between Year 2015 Direct Connector (Run C) and Year 2015 No Build (Run A), the Direct Connector volumes show an increase of approximately 7400 ADT on SR-56 — East of Carmel Valley Road. LLG believes that these are new trips that are attracted due to the presence of the direct connectors and would use different routes like I-15 or SR-78 with a "no connectors" situation. The new volume to be re-routed for the Year 2015 No Build is 36,700 ADT (which is 16,700 ADT from the S-E connector + 20,000 W-N connector) minus the 7400 ADT (trips that were using the new connectors before would be using newer routes), which totals to 29,300 ADT.

With the cordon stations being Carmel Valley Road on SR-56 and Via de la Valle on I-5, different traffic patterns are anticipated based on distance, travel time, number of signals and congestion on SR-56. This re-routed 29,300 ADT might use a number of route diversions like Carmel Valley Road, Carmel Country Road and Carmel Creek Road to avoid congestion. LLG in discussions with Caltrans and City of San Diego developed the following traffic diversion percentages:

- Route A – Carmel Valley Road NB ramp at I-5 (70%)
- Route B – El Camino Real at SR-56 to Del Mar Heights Road (5%)
- Route C – Carmel Creek Road at SR-56 to Del Mar Heights Road (2%)
- Route D – Carmel Country Road at SR-56 to Del Mar Heights Road (15%)
- Route E – Carmel Valley Road at SR-56 to Del Mar Heights Road (5%)
- Route F – San Dieguito Road to Via de la Valle at I-5 (3%)

LLG coordinated with Caltrans regarding forecasting of Year 2015 No Build intersection peak hour volumes. The Year 2015 Direct Connector volumes were used as a baseline and based on the re-routing process described above, the No Build volumes were developed. The forecast volumes were checked for consistency between intersections.

Figure 4-1a, Figure 4-1b and Figure 4-1c illustrate the Year 2015 geometric conditions for the intersections, street segments and freeway facilities. *Figure 4-1d, 4-1e, and 4-1f* illustrate the Year 2015 No build traffic volumes for the intersections, street segments and freeway facilities. *Figure 4-1g* shows the difference in traffic volumes between Direct Connector (*Figure 4-3f*) and No Build (*Figure 4-1f*) traffic volumes. The No Build scenario yield higher volumes on all ramps, intersections and street segments.

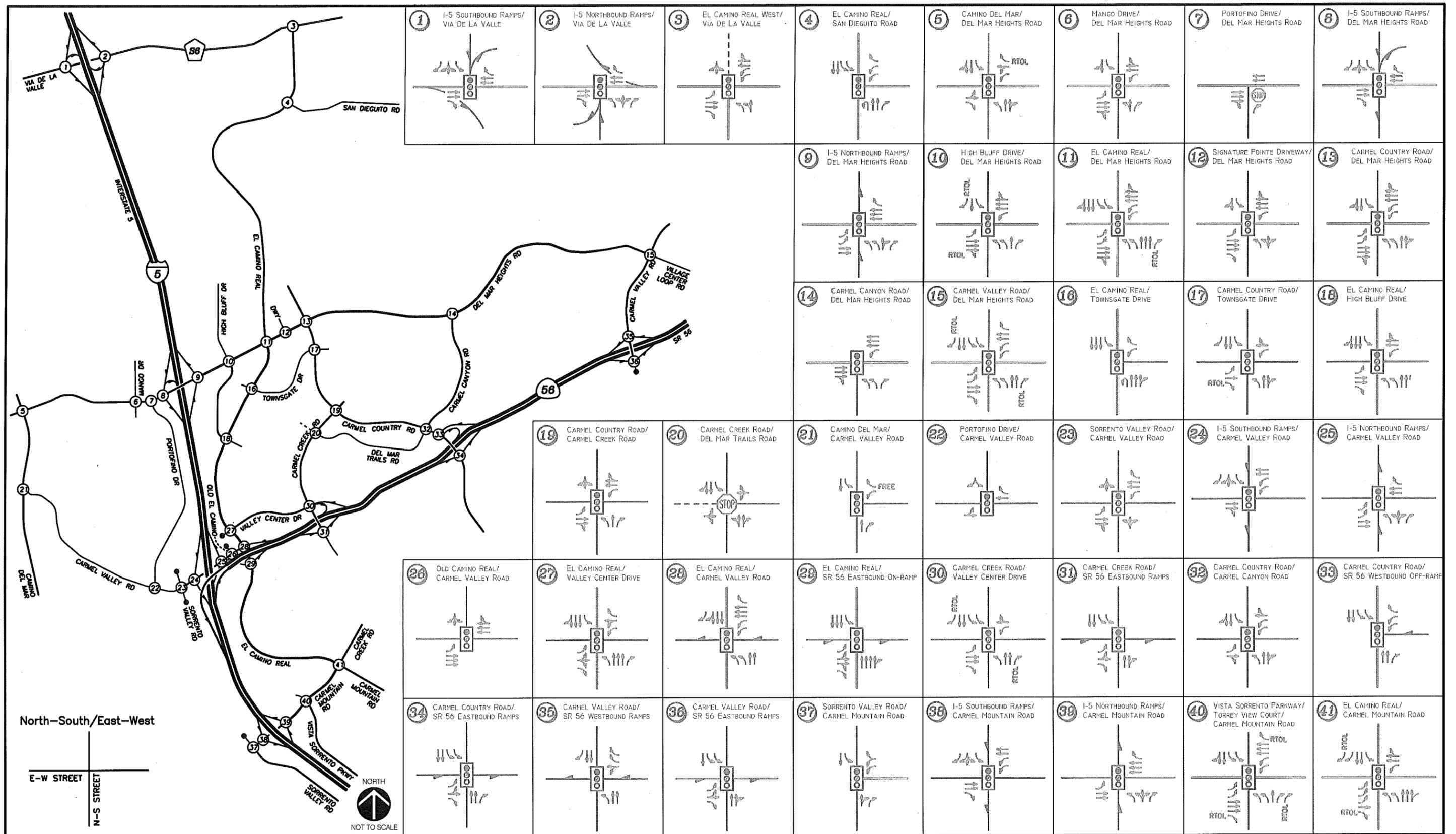


Figure 4-1a

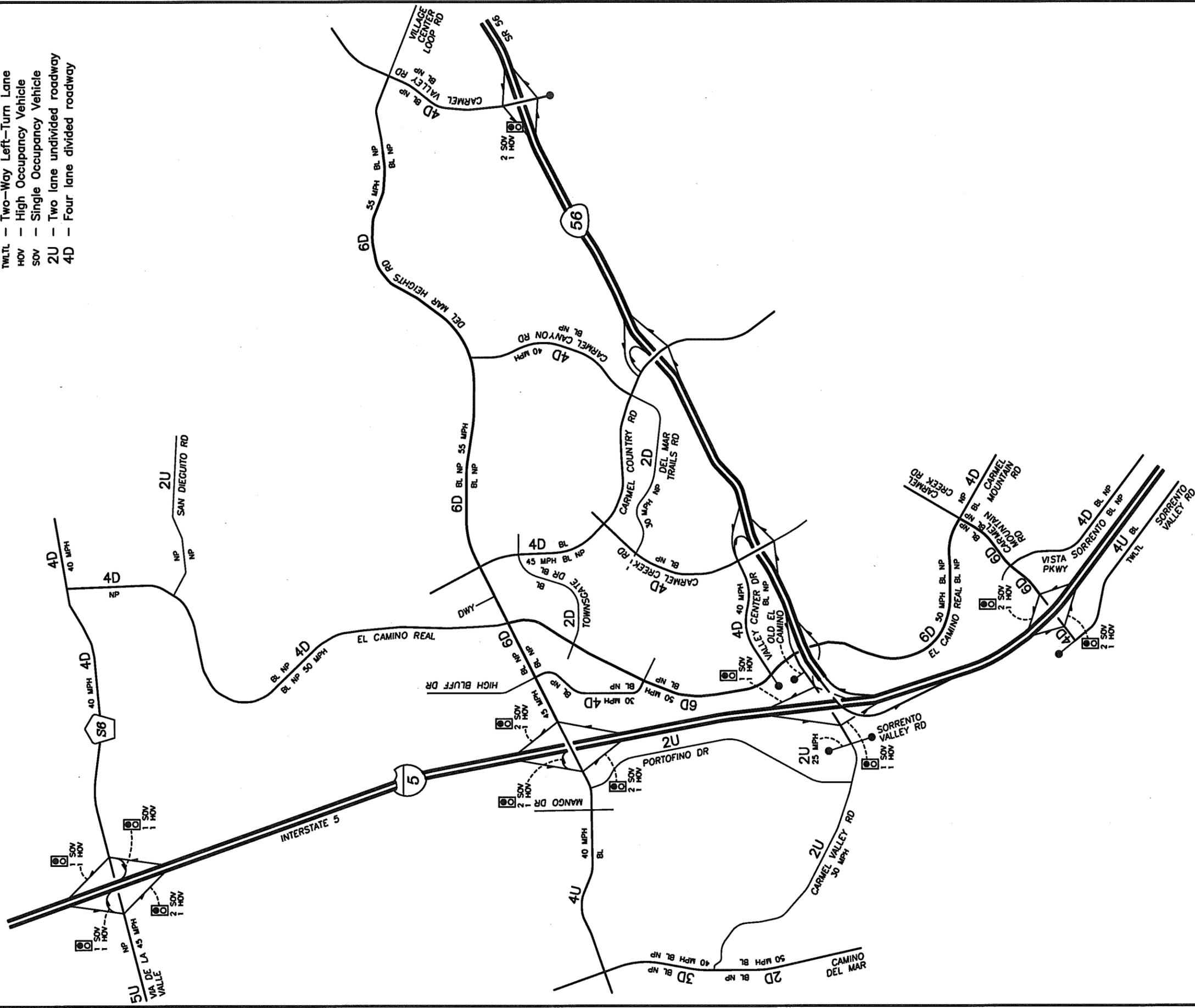
Year 2015 No Build (Model Run A) Network Conditions Intersections

REV. 02/26/2009
 N:\1500-14\FIGURES\YEAR 2015 NO BUILD\1500-14 RUN A FIGURES.DWG
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LEGEND

- Ramp Meter Signal
- Bike Lane
- No Parking
- Two-Way Left-Turn Lane
- High Occupancy Vehicle
- Single Occupancy Vehicle
- Two lane undivided roadway
- Four lane divided roadway

- BL —
- NP —
- TWLT —
- HOV —
- SOV —
- 2U —
- 4D —



REV. 09/10/2009
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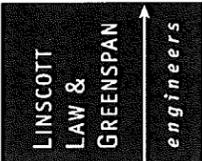
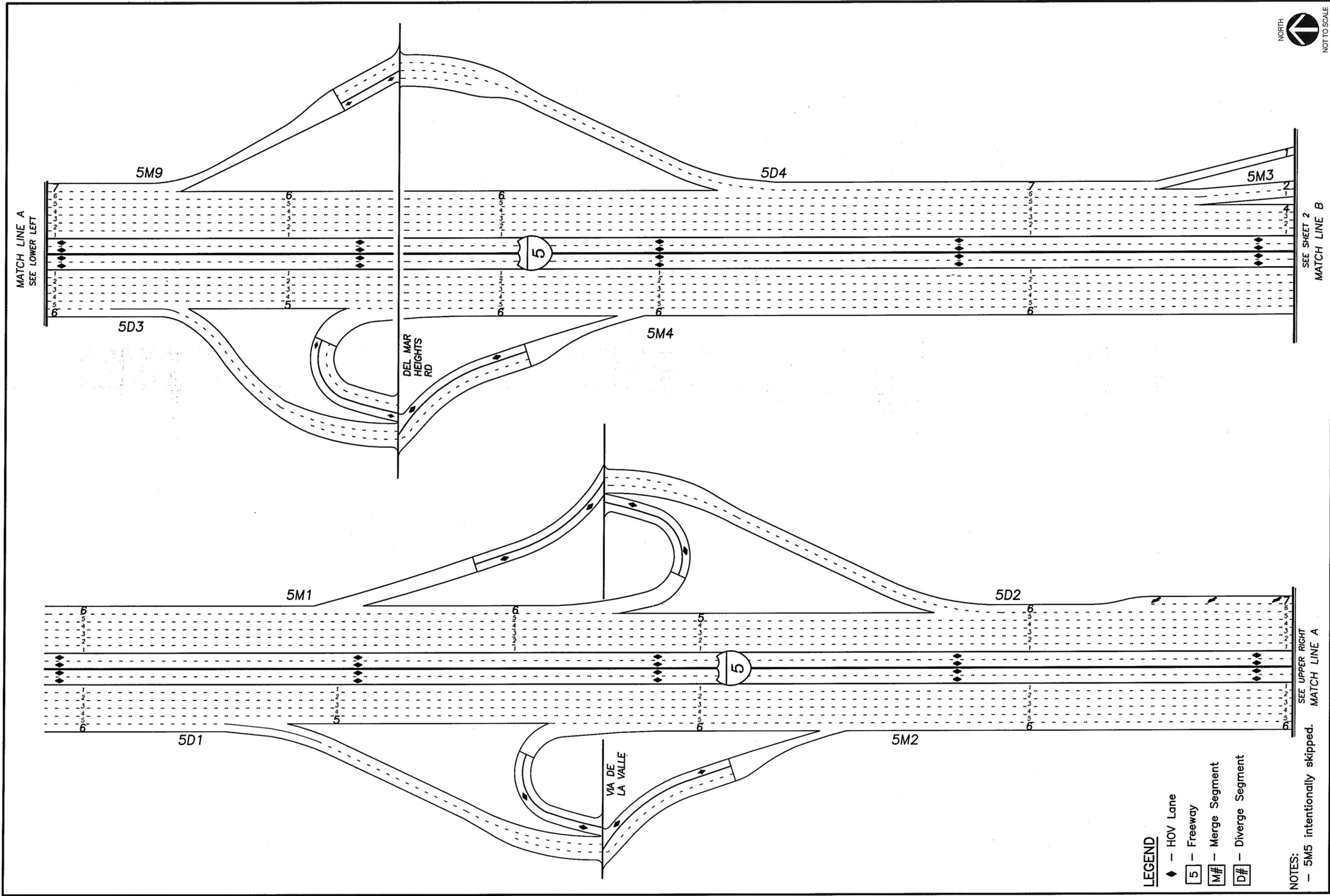


Figure 4-1b
 Year 2015 No Build (Model Run A) Network Conditions
 Street Segments



LEGEND

- ◆ - HOV Lane
- 5 - Freeway
- M# - Merge Segment
- D# - Diverge Segment

NOTES:
 - 5M5 intentionally skipped.

REV. 04/30/2009
 N:\1500-16\FIGURES\YEAR 2015 NO BUILD\1500-16 FIGURES I-S.DWG

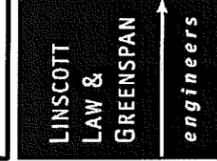
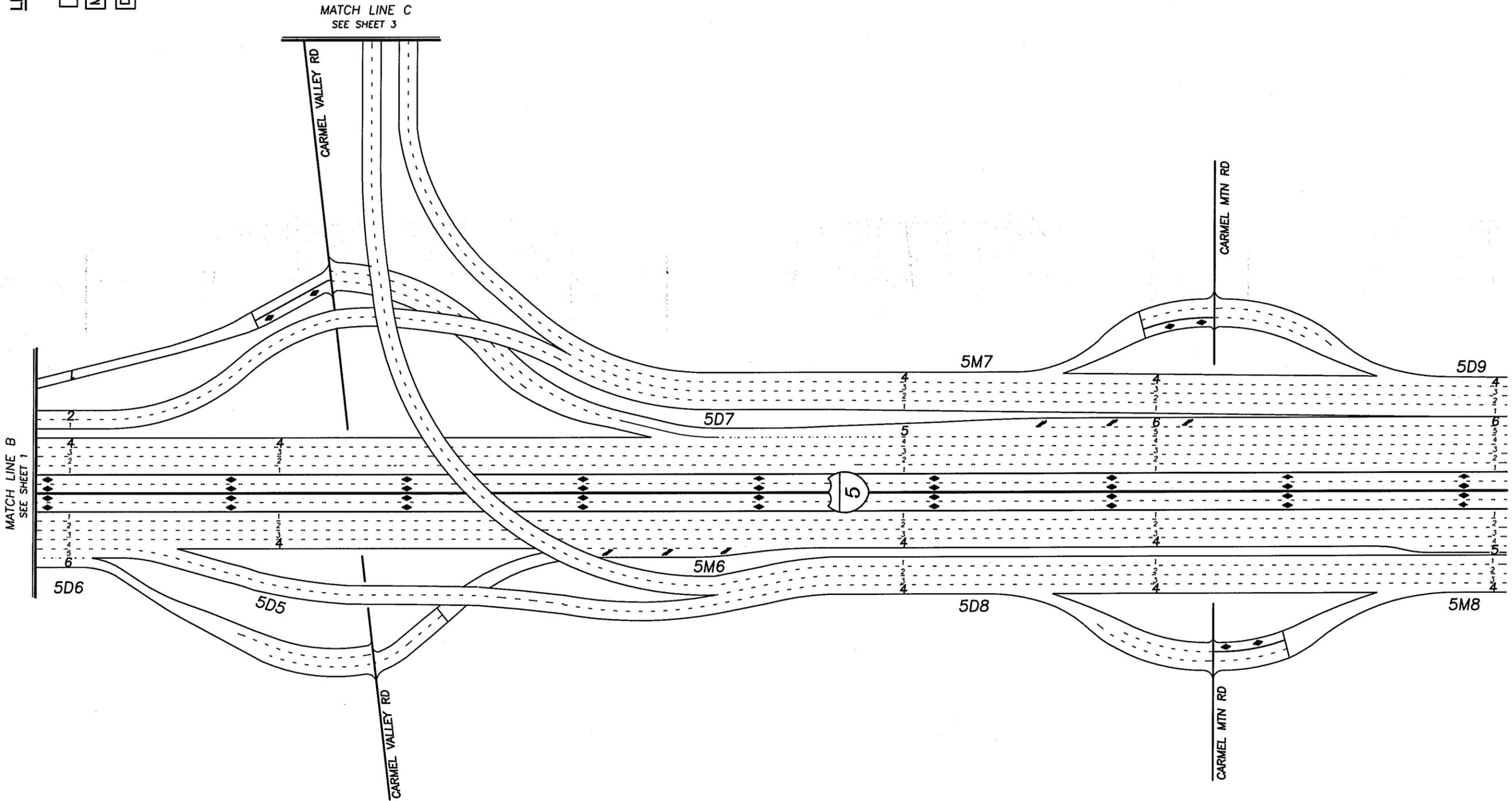


Figure 4-1c
 (SHEET 1 OF 3)
 Year 2015 No Build (Model Run A) Network Conditions
 Freeway Facilities

LEGEND

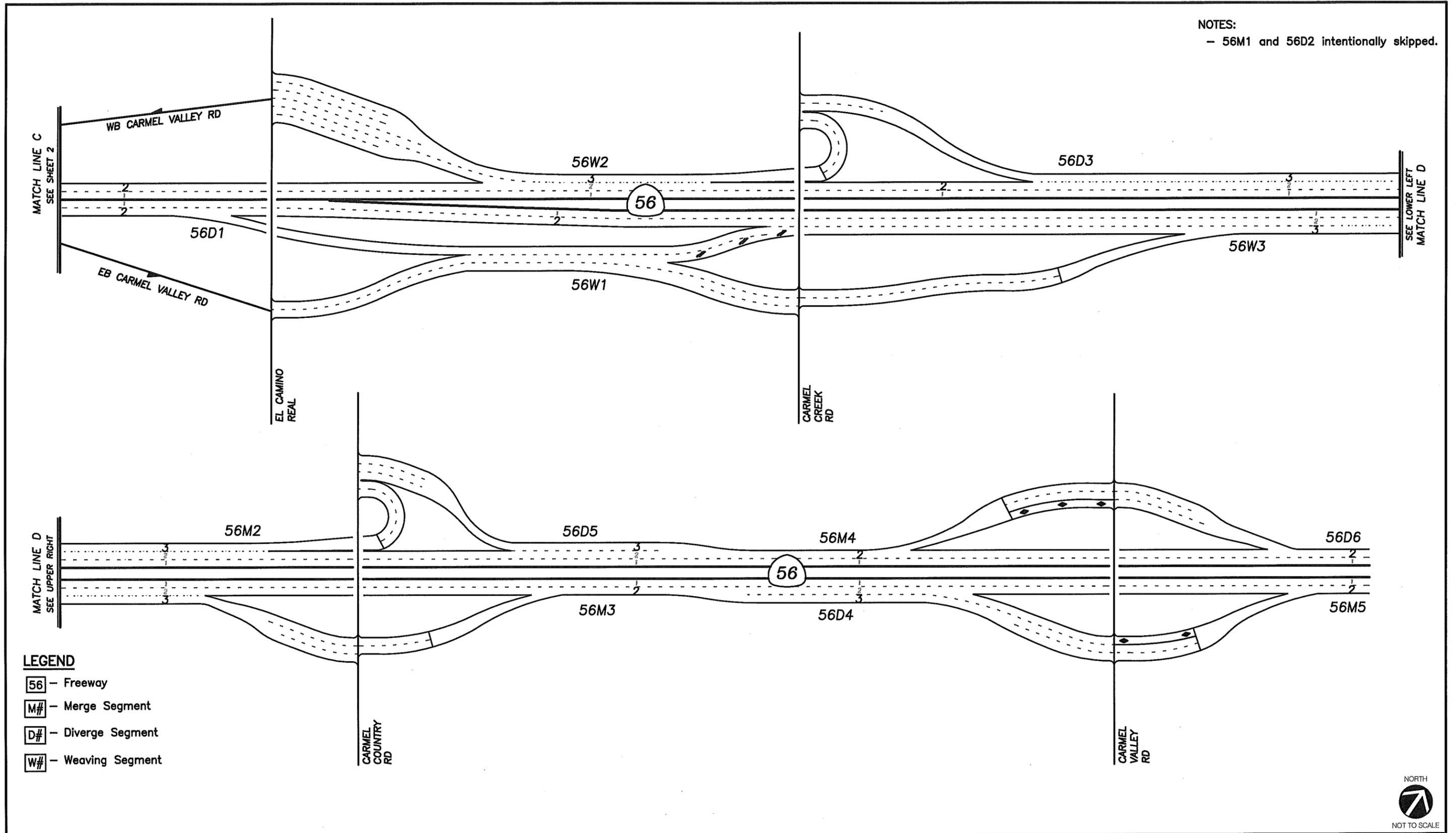
- ◆ - HOV Lane
- 5 - Freeway
- M# - Merge Segment
- D# - Diverge Segment



REV. 11/30/2009
N:\1500-16\FIGURES\YEAR 2015 NO BUILD\1500-16 FIGURES 1-5.DWG

Figure 4-1c
(SHEET 2 OF 3)
Year 2015 No Build (Model Run A) Network Conditions
Freeway Facilities

NOTES:
 - 56M1 and 56D2 intentionally skipped.



- LEGEND**
- 56 - Freeway
 - M# - Merge Segment
 - D# - Diverge Segment
 - W# - Weaving Segment



Figure 4-1c
 (SHEET 3 OF 3)
 Year 2015 No Build (Model Run A) Network Conditions
 Freeway Facilities

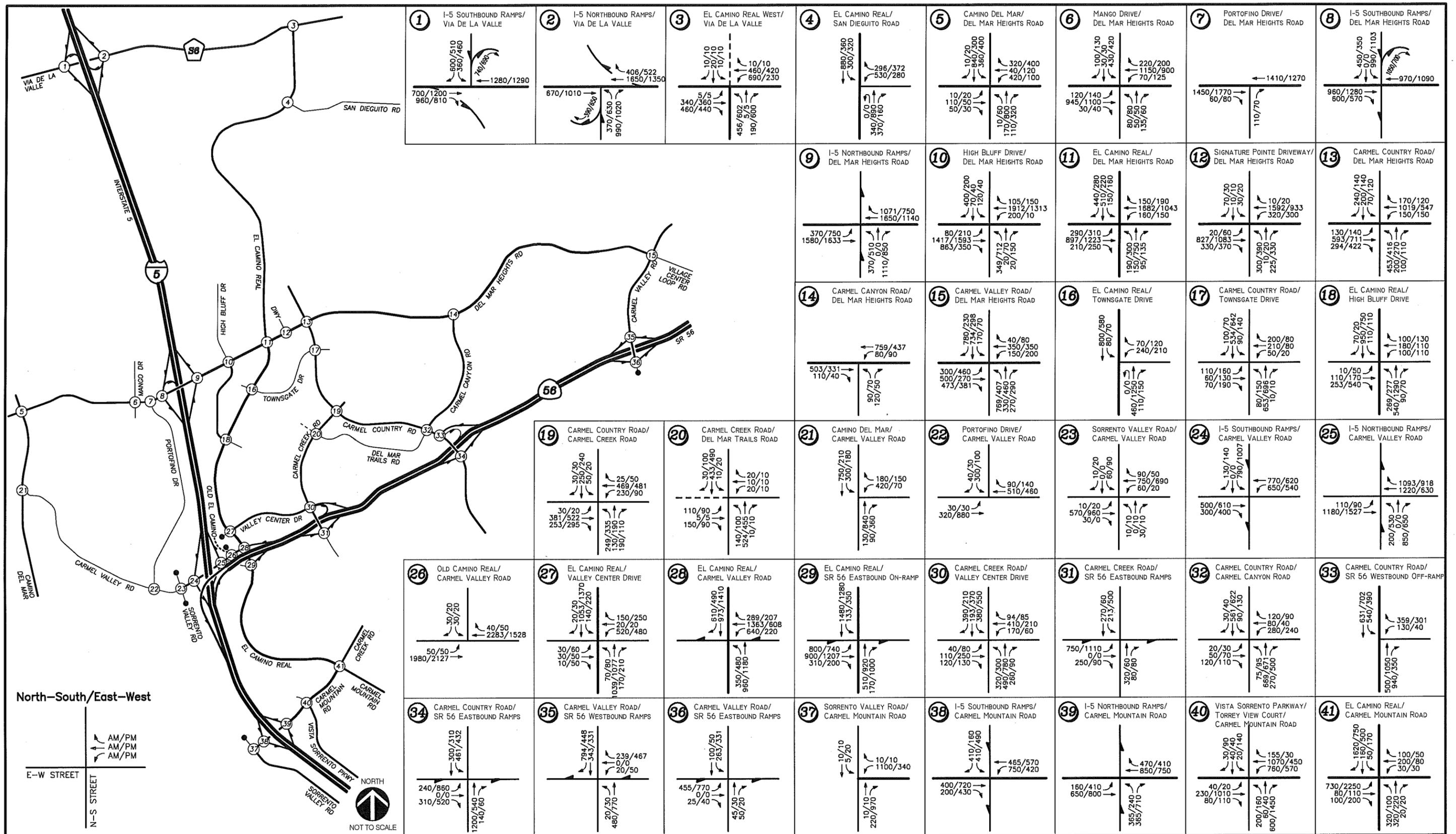


Figure 4-1d
Year 2015 No Build (Model Run A) Traffic Volumes Intersections

REV. 02/20/2009
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NOTES:
- AM/PM peak hour volumes are shown at the intersections

LEGEND
XX - Indicates "study" intersection

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NOTES:

- ADT's are shown for ramps and freeway facilities.
- AM/PM peak hour volumes are shown for ramp and freeway facilities.
- HOV Shift from I-5 SB Mainline between Carmel Valley Road and Carmel Mountain Road is 3600 ADT (360 AM/ 360 PM)
- Mainline Shift from I-5 HOV NB between Carmel Valley Road and Del Mar Heights Road is 3100 ADT (330 AM/ 380 PM)

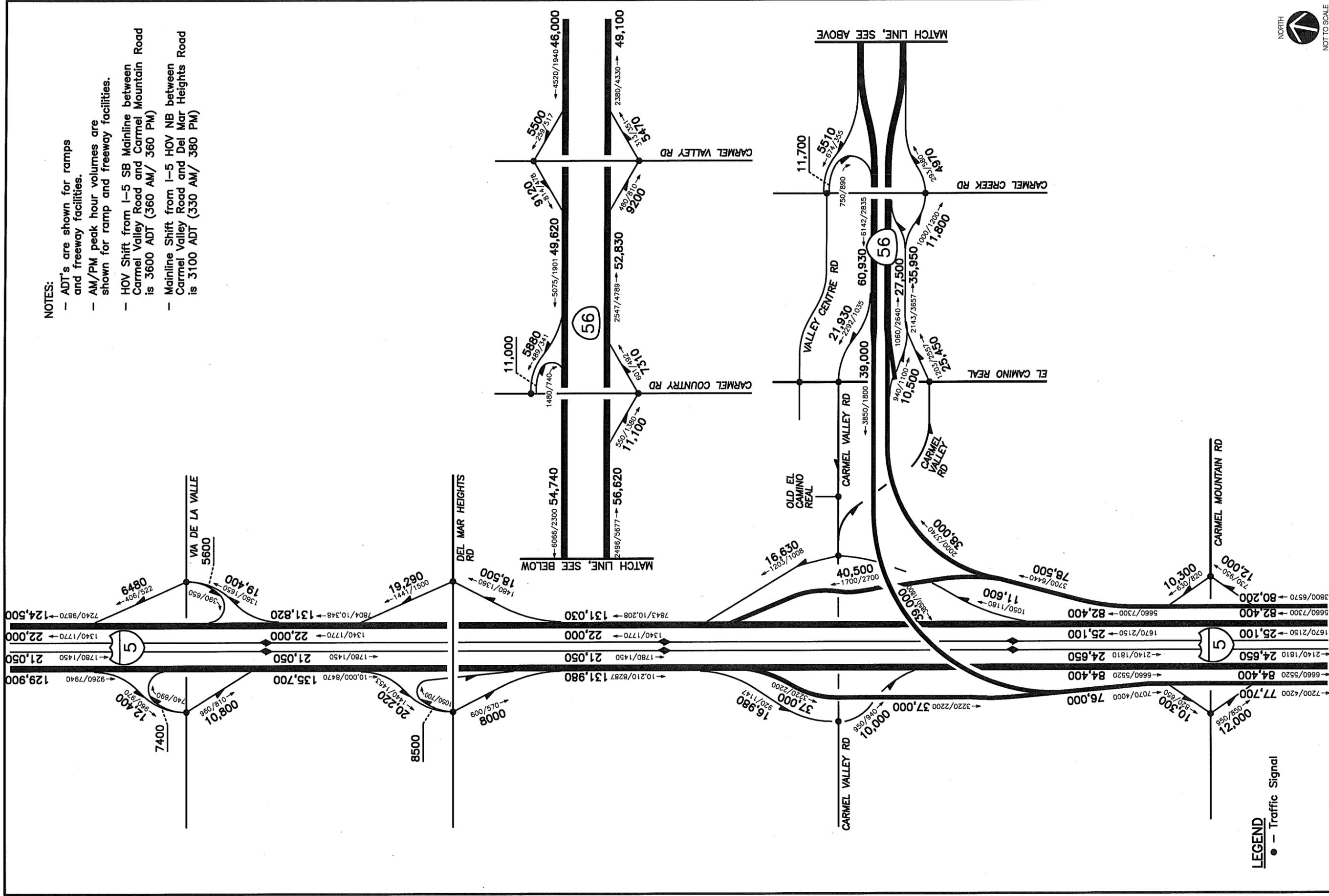
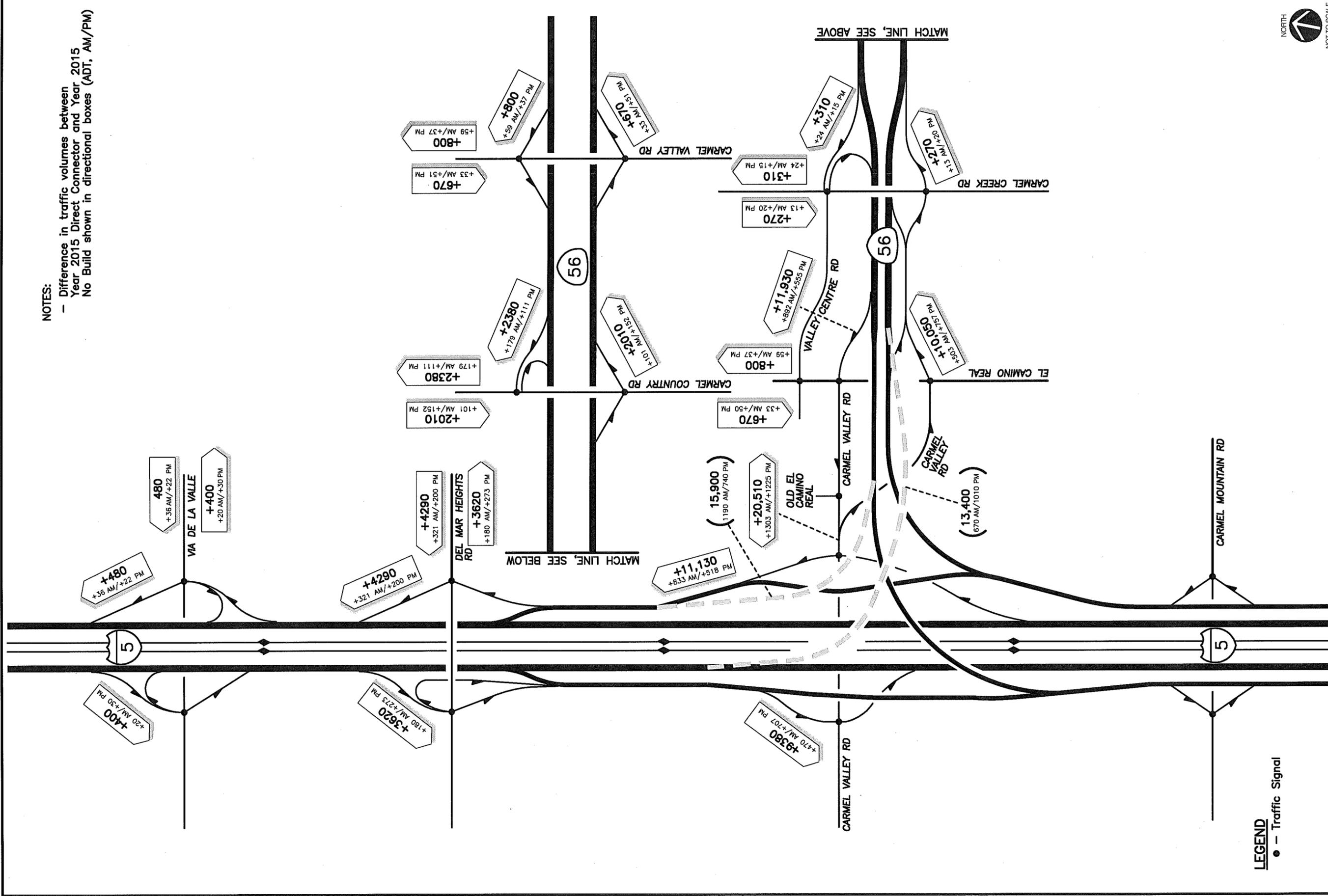


Figure 4-1f
Year 2015 No Build (Model Run A) Traffic Volumes
Freeways and Ramps

NOTES:
 - Difference in traffic volumes between Year 2015 Direct Connector and Year 2015 No Build shown in directional boxes (ADT, AM/PM)



LEGEND
 ● - Traffic Signal



REV. 02/20/2009
 N:\1500-14\FIGURES\YEAR 2015 NO BUILD\FIG 4-1G.DWG

Figure 4-1g
 Year 2015 (Model Run A vs. Model Run C) Traffic Volumes
 Freeways and Ramps

4.1.2 Year 2015 “Auxiliary Lane Alternative” (Model Run B)

The Year 2015 “Auxiliary Lane” Alternative is based on the following assumptions:

- **I-5** freeway configuration is planned to include 10 general-purpose lanes (5 lanes in each direction) with 4 managed/ HOV lanes (two lanes in each direction) with direct access ramps (DAR’s) connections to HOV/managed lanes (10 + 4). As per I-5 North Coast Project, the direct access ramps are planned at Voigt Drive, Manchester Avenue, Cannon Road and Oceanside Boulevard at I-5.
- **SR-56** freeway configuration in the interim Year 2015 is assumed to be the same as existing (4 general-purpose lanes and no HOV lanes). This alternative **does not include** the construction of direct connectors (southbound I-5 to eastbound SR 56 and from westbound SR 56 to northbound I-5 connectors).

PROPOSED IMPROVEMENTS

The following is a list of freeway and local street improvements that are proposed with the Auxiliary Lane Alternative:

- Addition of an auxiliary lane on SB I-5 between Del Mar Heights Road and Carmel Valley Road (*freeway improvement*).
- Addition of an auxiliary lane on WB SR-56 between Carmel Country Road and Carmel Creek Road (*freeway improvement*).
- Addition of a freeway mainline on WB SR-56 between Carmel Creek Road and El Camino Real (*freeway improvement*).
- Reconstruction of Del Mar Heights Road overcrossing (*freeway improvement*).
- Addition of a fourth lane at the SB approach of I-5 SB ramps/Carmel Valley Road and re-striping the SB approach to show dual left-turn lanes, a shared thru-right and an exclusive right-turn lane (*intersection improvement*).
- Addition of a westbound right-turn lane at I-5 Northbound ramps/Carmel Valley Road intersection (*intersection improvement*).
- Widening of the NB I-5 on-ramp at Carmel Valley Road to add a second single occupancy vehicle lane (SOV) (*ramp widening*).
- Widening of the NB I-5 off-ramp at Carmel Valley Road to add a second dedicated NB right-turn lane (*intersection improvement*).
- Addition of a WB thru lane at Old El Camino/ Carmel Valley Road intersection (*intersection improvement*).
- Addition of a third EB through lane at the intersection of El Camino Real/SR-56 EB on-ramp and re-striping the EB approach to show dual left-turn lanes, two through lanes, one shared through right lane and an exclusive right-turn lane and thereby addition of a third lane on the SR-56 EB on-ramp at El Camino Real (*intersection improvement*).
- Addition of a fourth WB through lane at the intersection of El Camino Real/ SR-56 WB off-ramp and re-striping the approach to show an

exclusive left-turn lane, a shared left through lane, three exclusive through lanes and a right-turn lane (*intersection improvement*).

Linscott, Law & Greenspan, Engineers compared the model volumes for the No Build (Run A) and Auxiliary Lane (Run B) alternatives. **Table 4–2** shows the model volumes for both these alternatives and the percent changes along I-5 and SR-56 freeway segments.

**TABLE 4–2
MODEL TRAFFIC VOLUMES – FREEWAY SEGMENTS (RUN A VS. RUN C)**

Freeway Segment	Model Average Daily Traffic (ADT)		Difference (δ)	Percent Change (Increase/Decrease)
	Year 2015 No Build (Run A)	Year 2015 Aux.Lane (Run C)		
I-5 NB Mainline				
Carmel Valley Road to Del Mar Heights Road	177,711	174,591	3,120	-1.8%
Del Mar Heights Road to Via de la Valle	174,256	177,939	3,683	2.1%
I-5 SB Mainline				
Via de la Valle to Del Mar Heights Road	181,601	181,574	27	0.0%
Del Mar Heights Road to Carmel Valley Road	181,973	181,329	-44	-0.4%
SR-56 EB				
El Camino Real to Carmel Creek Road	48,466	48,468	2	0.0%
Carmel Creek Road to Carmel Country Road	50,724	50,726	2	0.0%
SR-56 WB				
Carmel Country Road to Carmel Creek Road	51,443	53,129	1,686	3.3%
Carmel Creek Road to El Camino Real	55,993	57,360	1,367	2.4%

General Notes:

- a. Average Daily Traffic Volumes taken from Series 10 Tranplan Model Runs.
- b. All ADT’s are Adjusted volumes from Series 10 Year 2015 No Build and Auxiliary Lane models (AVOL).
- c. These volumes include mainline and HOV lanes.

The results show minor increases in traffic volumes in the Auxiliary Lane (Run B) scenario. This is due to the additional capacity of the auxiliary lanes, which attracts slightly more traffic to the project area. The Auxiliary Lane Alternative (Run B) can be analyzed with the same traffic volumes as No Build (Run A) and the operational analyses of Run B is expected to show improved operations along certain intersections and freeway segments when compared to the No Build scenario. **Figure 4–2a, Figure 4–2b and Figure 4–2c** illustrate intersection, street segment and freeway geometric conditions. **Figure 4–2d, Figure 4–2e and Figure 4–2f** illustrate the Year 2015 traffic volumes for the intersections, street segment and freeway facilities.

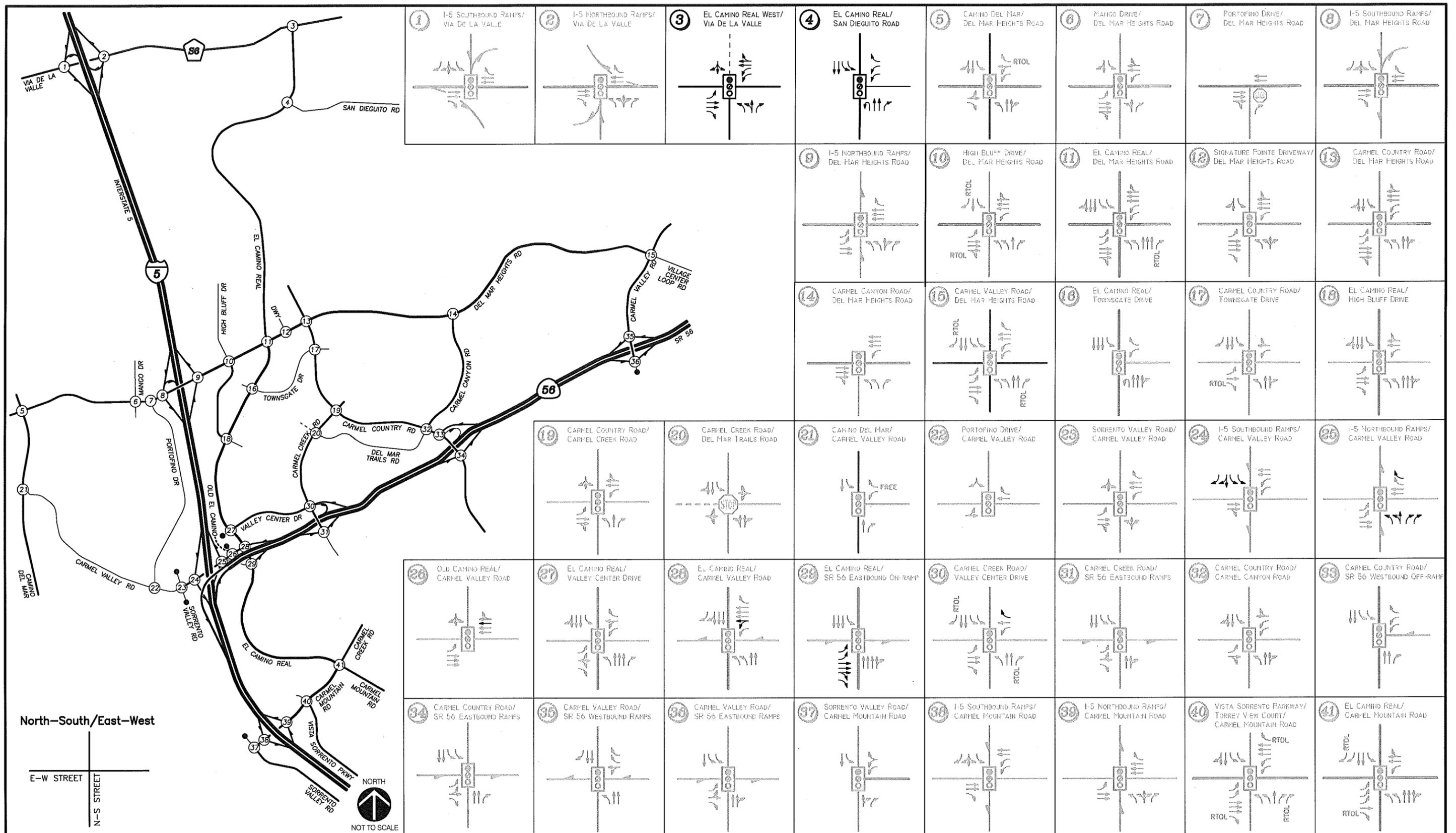


Figure 4-2a

Year 2015 Auxilliary Lane (Model Run B) Network Conditions Intersections

LEGEND

- Ramp Meter Signal
- Bike Lane
- No Parking
- Two-Way Left-Turn Lane
- High Occupancy Vehicle
- Single Occupancy Vehicle
- Two lane undivided roadway
- Four lane divided roadway

- BL NP
- NP
- TWLT
- HOV
- SOV
- 2U
- 4D

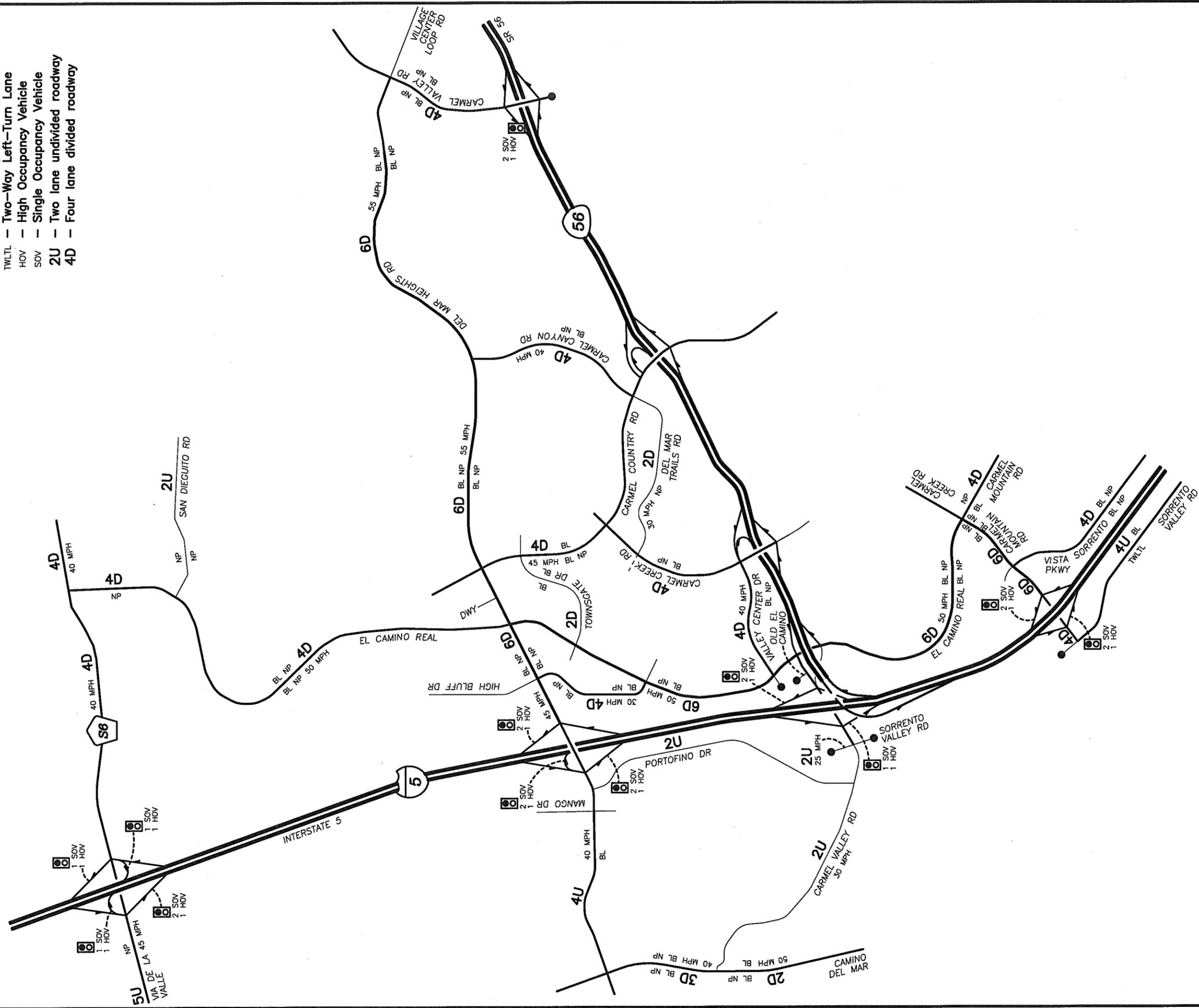
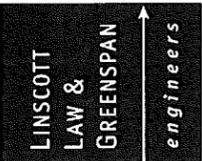
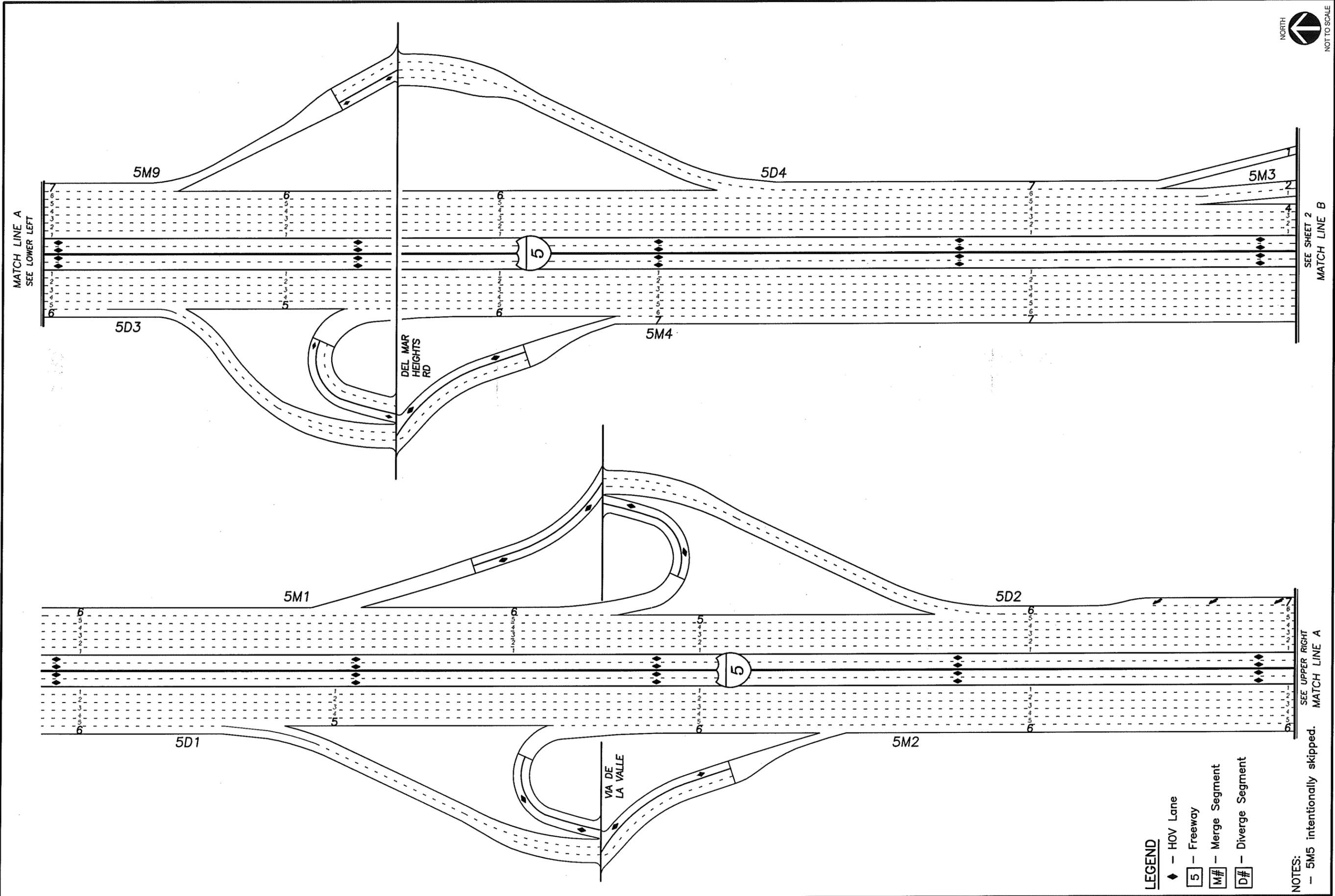


Figure 4-2b
Year 2015 Auxiliary Lane (Model Run B) Network Conditions
Street Segments

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LEGEND

- ◆ - HOV Lane
- - Freeway
- M# - Merge Segment
- D# - Diverge Segment

NOTES:

- 5M5 intentionally skipped.

REV. 08/28/2009

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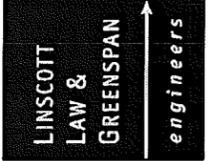
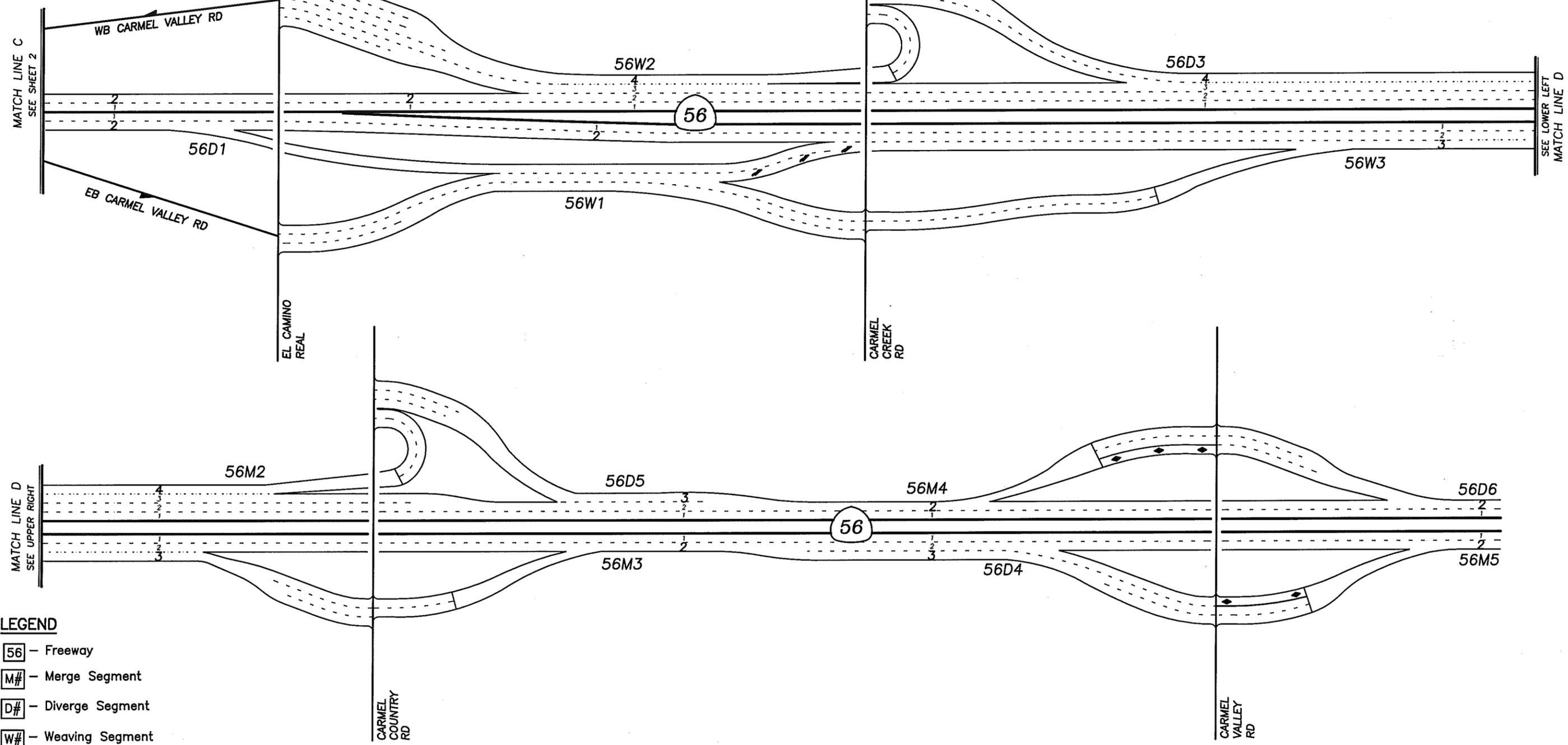


Figure 4-2C
(SHEET 1 OF 3)

Year 2015 Auxiliary Lane (Model Run B) Network Conditions Freeway Facilities

NOTES:
 - 56M1 and 56D2 intentionally skipped



- LEGEND**
- 56 - Freeway
 - M# - Merge Segment
 - D# - Diverge Segment
 - W# - Weaving Segment



Figure 4-2c
 (SHEET 3 OF 3)
 Year 2015 Auxiliary Lane (Model Run B) Network Conditions
 Freeway Facilities

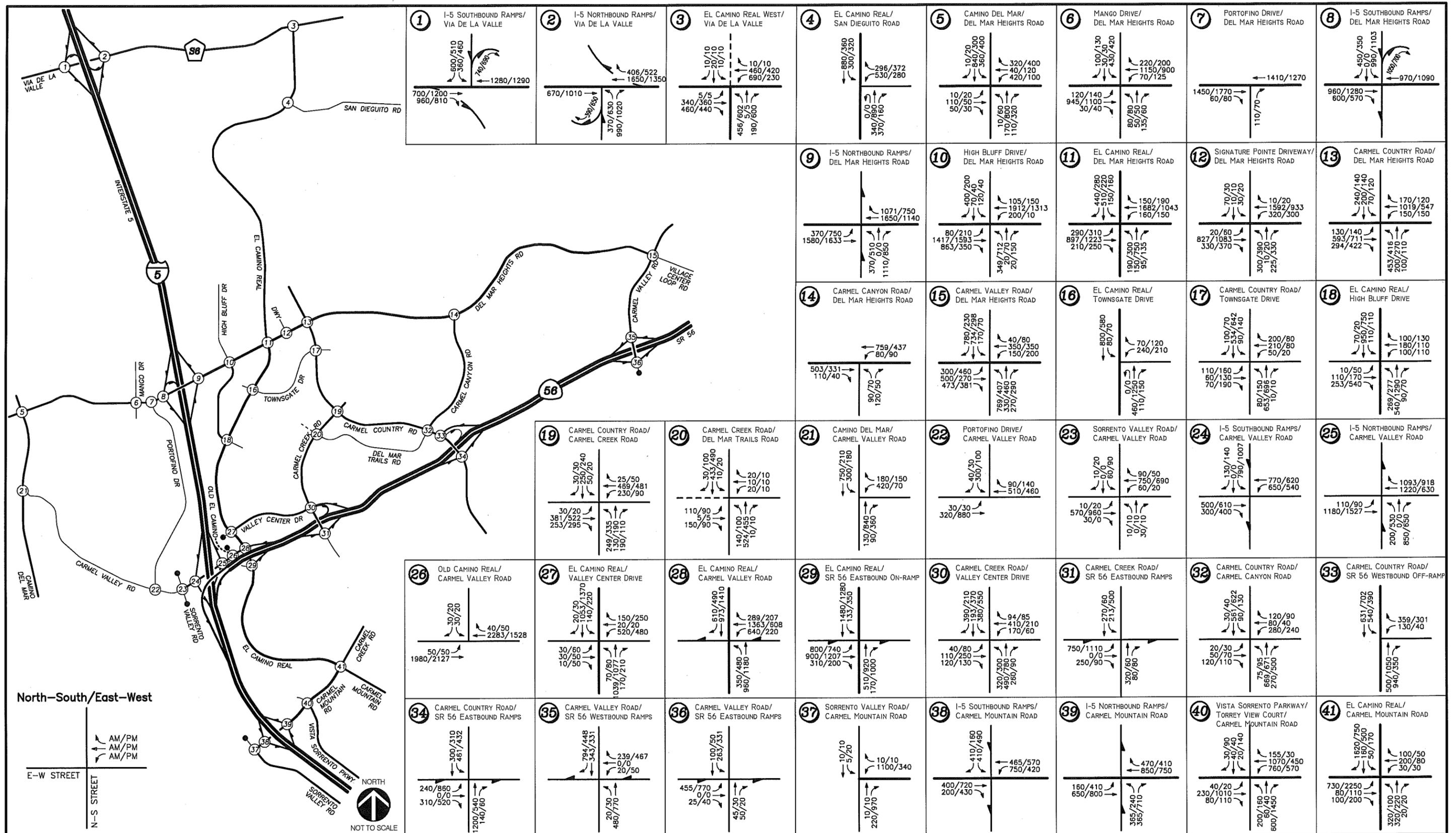


Figure 4-2d

Year 2015 Auxiliary Lane (Model Run B) Traffic Volumes Intersections

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NOTES:
- AM/PM peak hour volumes are shown at the intersections

LEGEND
⊗ - Indicates "study" intersection

NOTES:
 - ADT (Average Daily Traffic)
 shown midblock

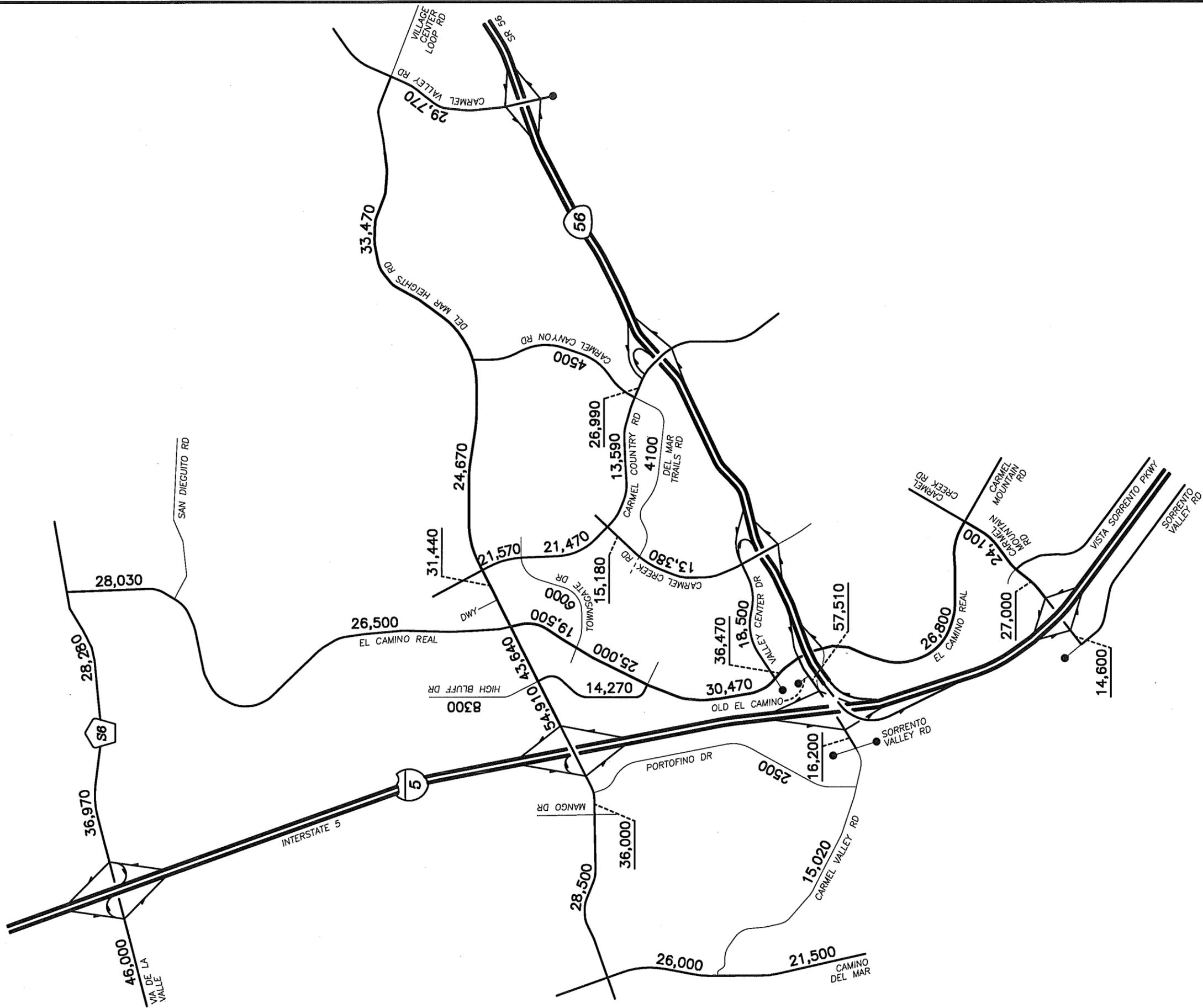
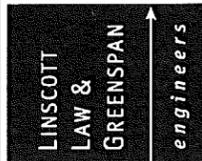


Figure 4-2e
 Year 2015 Auxiliary Lane (Model Run B) Traffic Volumes
 Street Segments

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Year 2015 Auxiliary Lane (Run B) Improvement Alternatives

Traffic volumes and an initial operational analysis were completed for the Year 2015 Auxiliary Lane scenario. Section 7.0 of this report discusses the operational analyses for the Year 2015 scenarios. The operational analyses identified the following deficient weaving facilities:

- SR-56 EB – Weaving segment between El Camino Real and Carmel Creek Road (on frontage road)

Based on the above findings, the following improvement alternatives were developed and analyzed to determine if they corrected the deficiencies:

AUXILIARY LANE ALTERNATIVE — NO EB SLIP OFF-RAMP TO CARMEL CREEK ROAD (MODEL RUN B2)

Alternative: The weaving analyses for this segment shows failing operations in all the Year 2015 scenarios. The speed and densities along this weaving section are calculated to operate poorly (LOS F). Because of this failing weaving segment between El Camino Real and Carmel Creek, this alternative is analyzed based on the elimination of the EB Slip off-ramp to Carmel Creek Road from the I-5 NB connector.

LLG in conjunction with the City of San Diego and Caltrans, developed a re-routing traffic pattern that would likely occur with a “no slip off-ramp” situation. LLG believes that the slip off-ramp mainly serves trips intending to travel north on Carmel Creek Road and Carmel Country Road past the SR-56/Carmel Creek interchange. Based on these destinations, the percentages have been determined based on a number of factors including land use, traffic signals, length of route, ramp meter, etc.

- Route A: I-5 NB exit at Carmel Valley Road and eastbound on Carmel Valley Road to Carmel Creek Road – 75%
- Route B: I-5 NB connector to SR-56 EB to Carmel Country Road. Left at SR-56 EB ramps/ Carmel Country interchange to travel north on Carmel Country Road – 15%
- Route C: I-5 NB connector to SR-56 EB to Carmel Country Road. Left at SR-56 EB ramps/ Carmel Country interchange, right turn at the loop ramp to WB SR-56 exiting at Carmel Creek Road and turn right to head north on Carmel Creek Road – 10%.

Figures 4-2h, Figure 4-2i and Figure 4-2j illustrate the Auxiliary Lane traffic volumes for the intersections, street and freeway facilities with the slip-off ramp to Carmel Creek Road eliminated. The operational analyses tables discussed in Section 7.0 of this report have been labeled as **B2** for the No EB slip-off ramp scenario.

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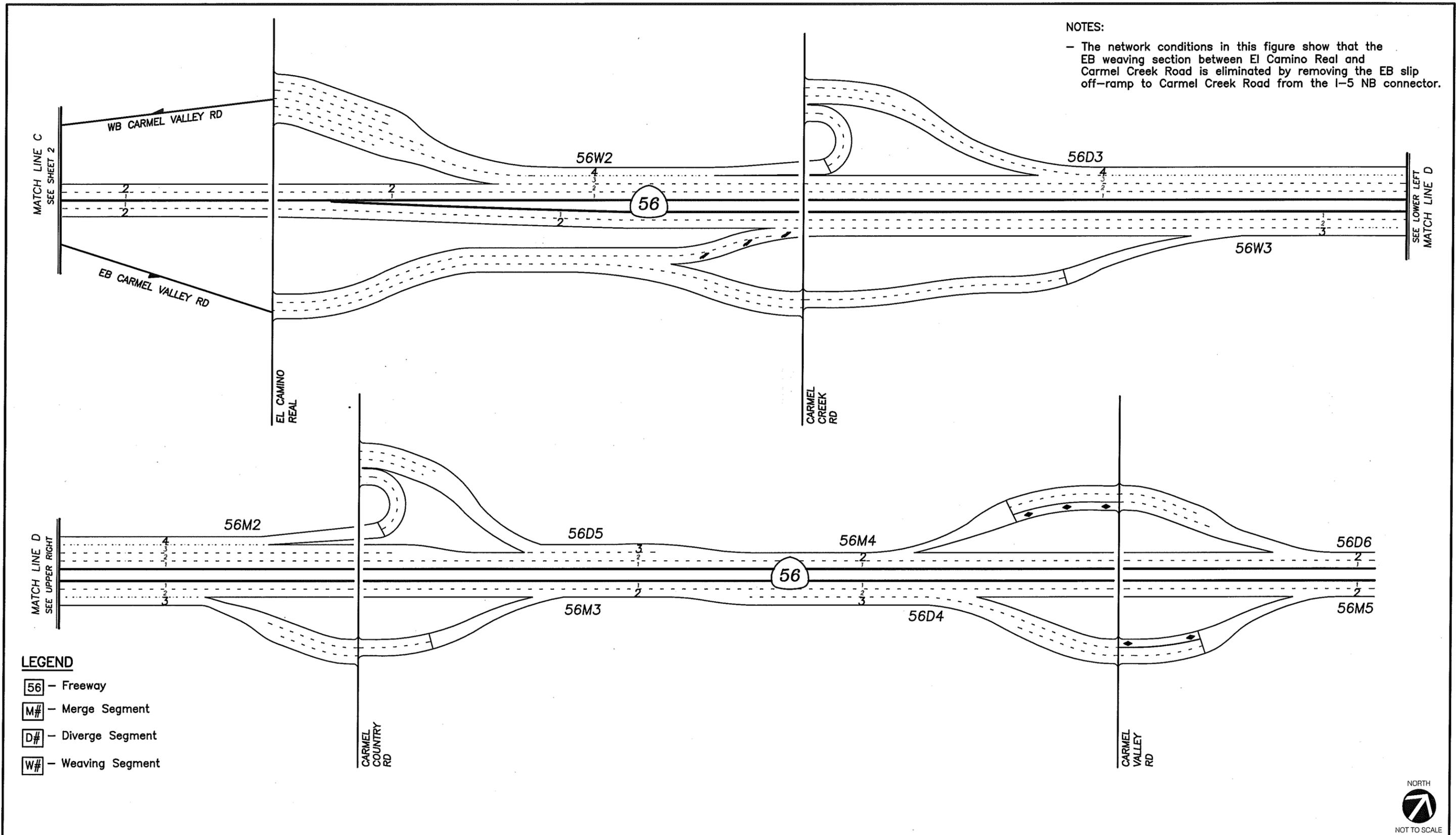


Figure 4-2g
 Year 2015 Auxiliary Lane (Model Run B - No EB Slip Off-ramp) Network Conditions
 Freeway Facilities

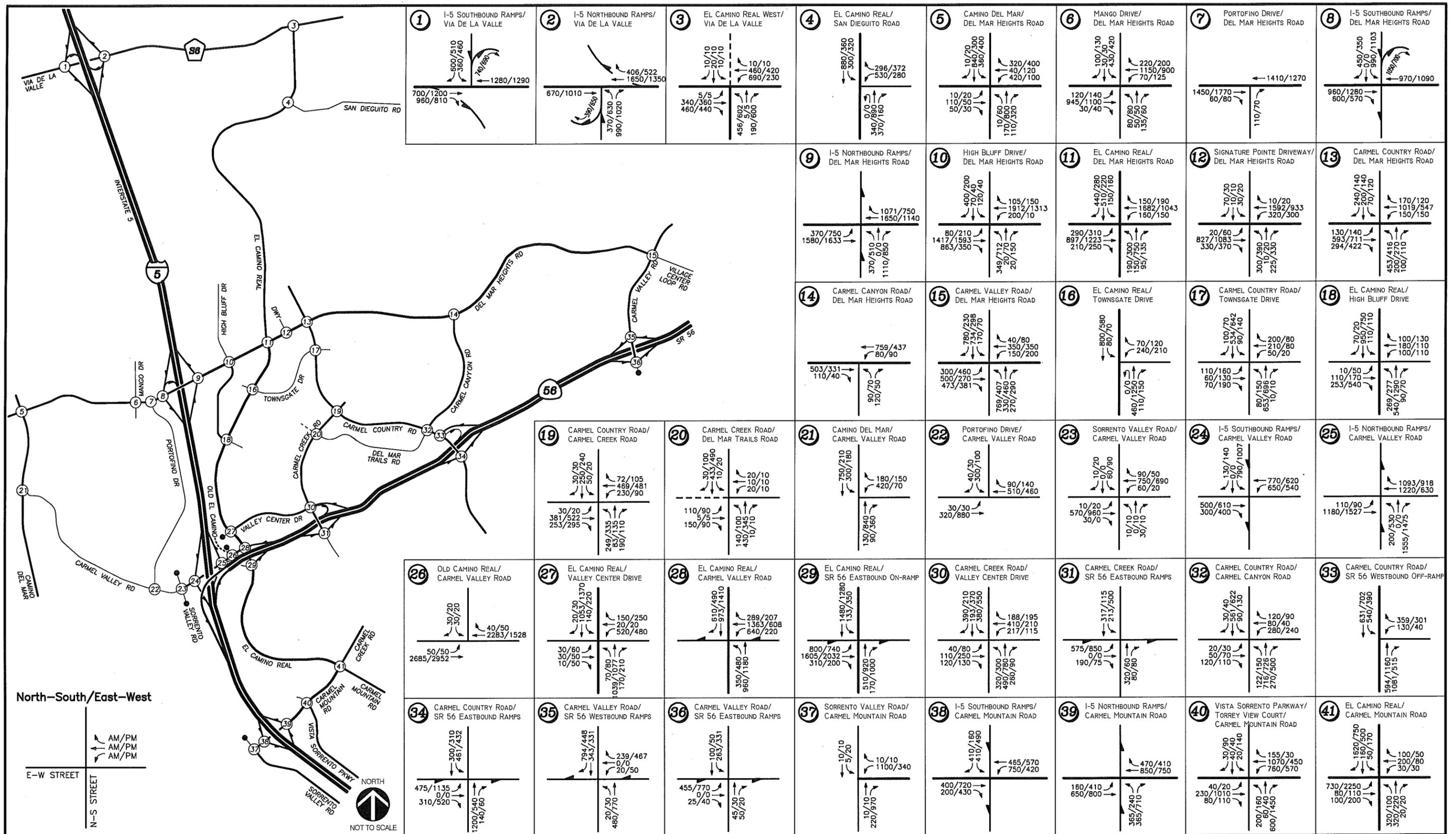


Figure 4-2h

REV. 02/25/09
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NOTES:
- AM/PM peak hour volumes are shown at the intersections
- The volumes shown in this figure assume that the EB slip off ramp from the I-5 NB connector to Carmel Creek Road is eliminated.

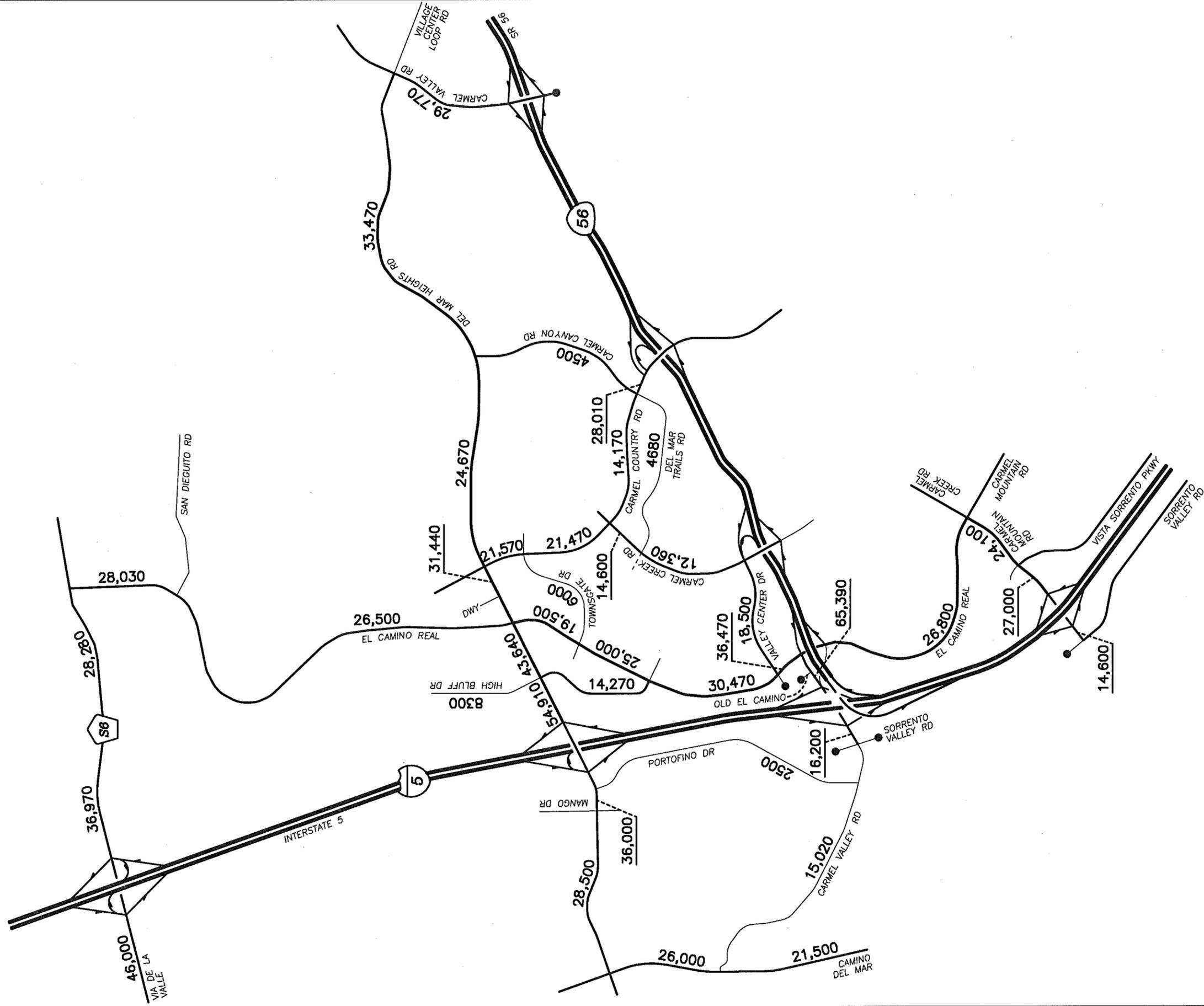
LEGEND
XX - Indicates "study" intersection

Year 2015 Auxiliary Lane (Model Run B - No EB Slip Off-ramp) Traffic Volumes Intersections

NOTES:

- ADT (Average Daily Traffic)
- shown midblock

- The volumes shown in this figure assume that the EB slip off ramp from the I-5 NB connector to Carmel Creek Road is eliminated.



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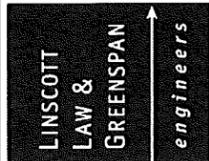
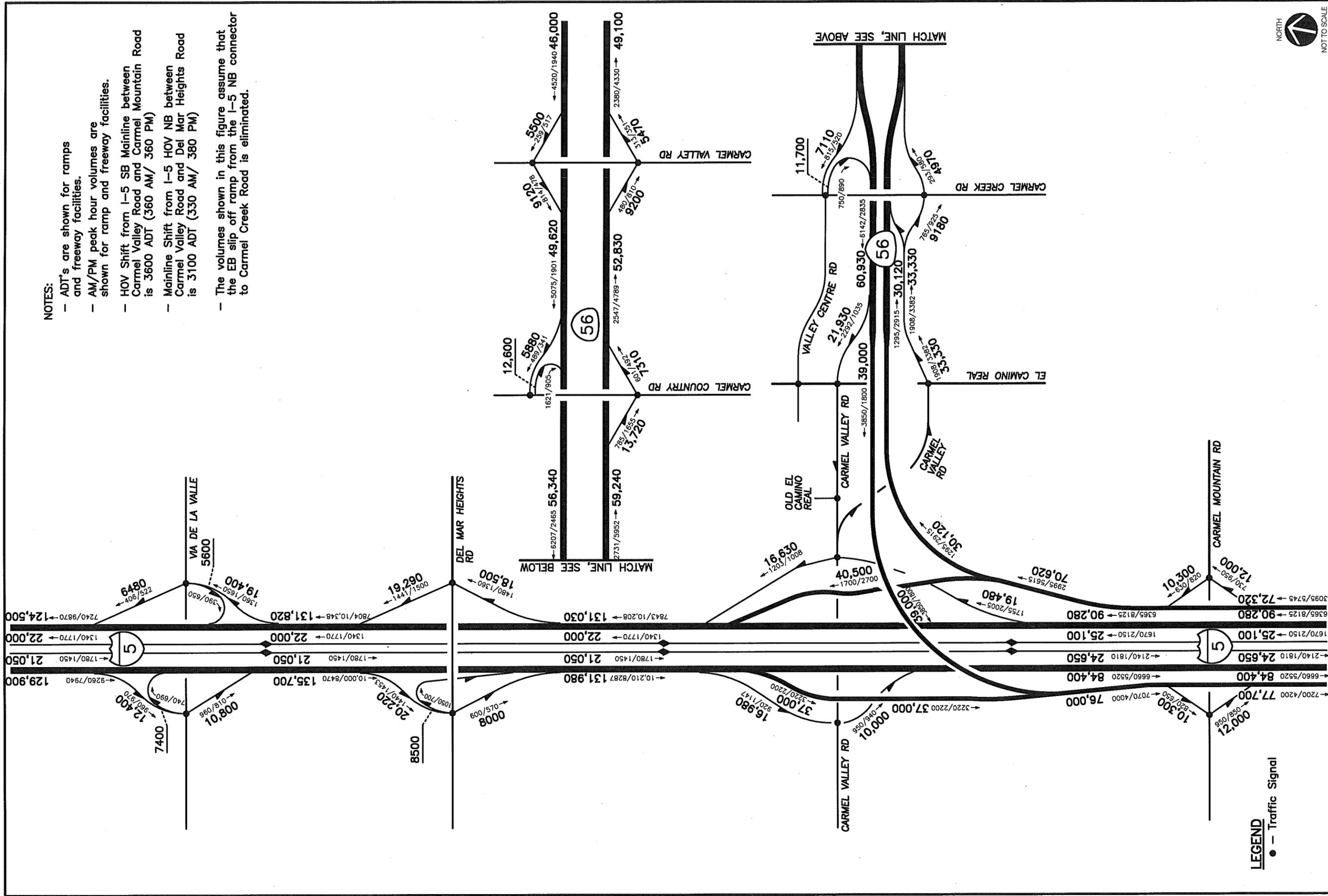


Figure 4-2i
Year 2015 Auxiliary Lane (Model Run B - No EB Slip Off-ramp) Traffic Volumes
Street Segments

NOTES:

- ADT's are shown for ramps and freeway facilities.
- AM/PM peak hour volumes are shown for ramp and freeway facilities.
- HOV Shift from I-5 SB Mainline between Carmel Valley Road and Carmel Mountain Road is 3600 ADT (360 AM/ 360 PM)
- Mainline Shift from I-5 HOV NB between Carmel Valley Road and Del Mar Heights Road is 3100 ADT (330 AM/ 380 PM)
- The volumes shown in this figure assume that the EB slip off ramp from the I-5 NB connector to Carmel Creek Road is eliminated.



LEGEND
● - Traffic Signal



Figure 4-2j

Year 2015 Auxiliary Lane (Model Run B - No EB Slip Off-ramp) Traffic Volumes Freeways and Ramps

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4.1.3 Year 2015 “Direct Connector Alternative” (Model Run C)

The Year 2015 “Direct Connector” Alternative is based on the following assumptions:

- **I-5** freeway configuration is planned to include 10 general-purpose lanes (5 lanes in each direction) with 4 managed/ HOV lanes (two lanes in each direction) with direct access ramps (DAR’s) connections to HOV/managed lanes (10 + 4). As per I-5 North Coast Project, the direct access ramps are planned at Voigt Drive, Manchester Avenue, Cannon Road and Oceanside Boulevard at I-5.
- **SR-56** freeway configuration in the interim Year 2015 is assumed to be the same as existing (4 general-purpose lanes and no HOV lanes) with the construction of direct connectors from southbound I-5 to eastbound SR-56 and from westbound SR-56 to northbound I-5. This alternative does not include the HOV lanes on SR 56 mainlines and on the proposed Direct Connectors.

PROPOSED IMPROVEMENTS

The following list of proposed intersection improvements are assumed for the Direct Connector (Run C) scenario:

- Addition of a fourth lane at the SB approach of I-5 SB ramps/Carmel Valley Road and re-striping the SB approach to show dual left-turn lanes, a shared thru-right and an exclusive right-turn lane (*intersection improvement*).
- Addition of a westbound right-turn lane at I-5 Northbound ramps/Carmel Valley Road intersection (*intersection improvement*).
- Widening of the NB I-5 off-ramp at Carmel Valley Road to add a second dedicated NB right-turn lane (*intersection improvement*).
- Addition of a WB thru lane at Old El Camino/ Carmel Valley Road intersection (*intersection improvement*).
- Addition of a third EB through lane at the intersection of El Camino Real/SR-56 EB on-ramp and re-striping the EB approach to show dual left-turn lanes, two through lanes, one shared through right lane and an exclusive right-turn lane and thereby addition of a third lane on the SR-56 EB on-ramp at El Camino Real (*intersection improvement*).
- Addition of a fourth WB through lane at the intersection of El Camino Real/SR-56 WB off-ramp and re-striping the approach to show an exclusive left-turn lane, a shared left through lane, three exclusive through lanes and a right-turn lane (*intersection improvement*).

LLG coordinated with Caltrans Traffic Forecasting Branch regarding the Year 2015 Direct Connector (Run C: 10+4 and 4+0) traffic volumes. A model run was implemented based on the freeway assumptions discussed above. The model included all the land-use assumptions in the Cities/County 2030 Transportation Forecast.

LLG compared the Year 2015 Direct Connector model to existing traffic volumes and Year 2030 Direct Connector (Run G) model to analyze the change in traffic volumes due to Direct Connectors. **Table 4-3** shows the comparison of traffic volumes between existing and Year 2015 Direct Connectors along SR-56 freeway segments.

**TABLE 4-3
MODEL TRAFFIC VOLUMES – FREEWAY SEGMENTS (EXISTING VS. RUN C)**

Freeway Segment	Average Daily Traffic (ADT)		Difference (δ)	Percent Increase per year
	Existing	Year 2015 Direct Connector (Run C)		
SR-56 EB				
El Camino Real to Carmel Creek Road	46,200	66,440	20,240	5.47%
Carmel Creek Road to Carmel Country Road	40,100	62,460	22,360	6.97%
Carmel Country to Carmel Valley Road	34,600	62,470	27,870	10.06%
East of Carmel Valley Road	28,120	48,550	20,430	9.08%
SR-56 WB				
East of Carmel Valley Road	26,520	52,040	25,520	12.02%
Carmel Valley Road to Carmel Country Road	33,100	60,000	26,900	10.15%
Carmel Country Road to Carmel Creek Road	39,500	63,200	23,700	7.50%
Carmel Creek Road to El Camino Real	45,000	68,120	23,120	6.42%
<i>Average Growth = 8%</i>				

General Notes:

- a. Average Daily Traffic Volumes taken from Series 10 Tranplan Model Runs.
- b. All ADT’s are Adjusted volumes from model (AVOL)

Based on a comparison of existing ADT’s and Year 2015 model ADT’s, the model shows an average growth of 8% per year on SR 56 EB and WB.

The peak hour volumes at the ramp intersections and freeways along I-5 corridor were utilized from the *Wilson & Company I-5 North Coast Corridor Study*. The traffic volumes on SR 56 were developed based on the calculated growth factor and comparison to existing and Year 2030 Direct Connector scenario. The forecast volumes were checked to see if Year 2015 volumes were more than existing and less than Year 2030 Direct Connectors. Several other Traffic Engineering principles and factors such as the neighboring land uses, K-factor and the D-factor were also considered in the development of the volumes.

Figure 4-3a, Figure 4-3b and Figure 4-3c illustrate the intersections, street segments and freeway geometric conditions. **Figure 4-3d, Figure 4-3e and Figure 4-3f** illustrate the Year 2015 traffic volumes for the intersections, street segments and freeway facilities.

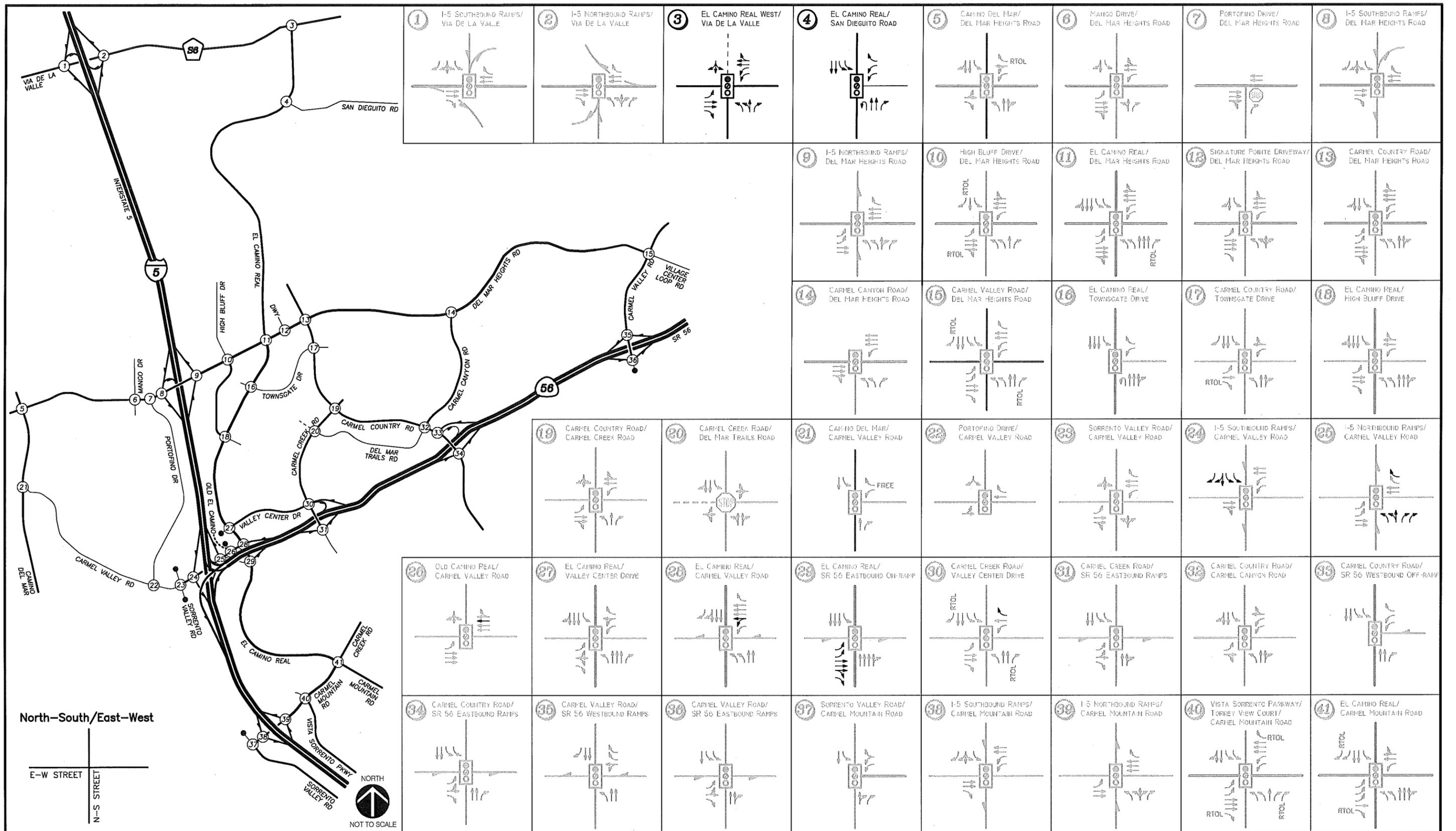


Figure 4-3a

Year 2015 Direct Connector (Model Run C) Network Conditions Intersections

REV. 09/10/2009
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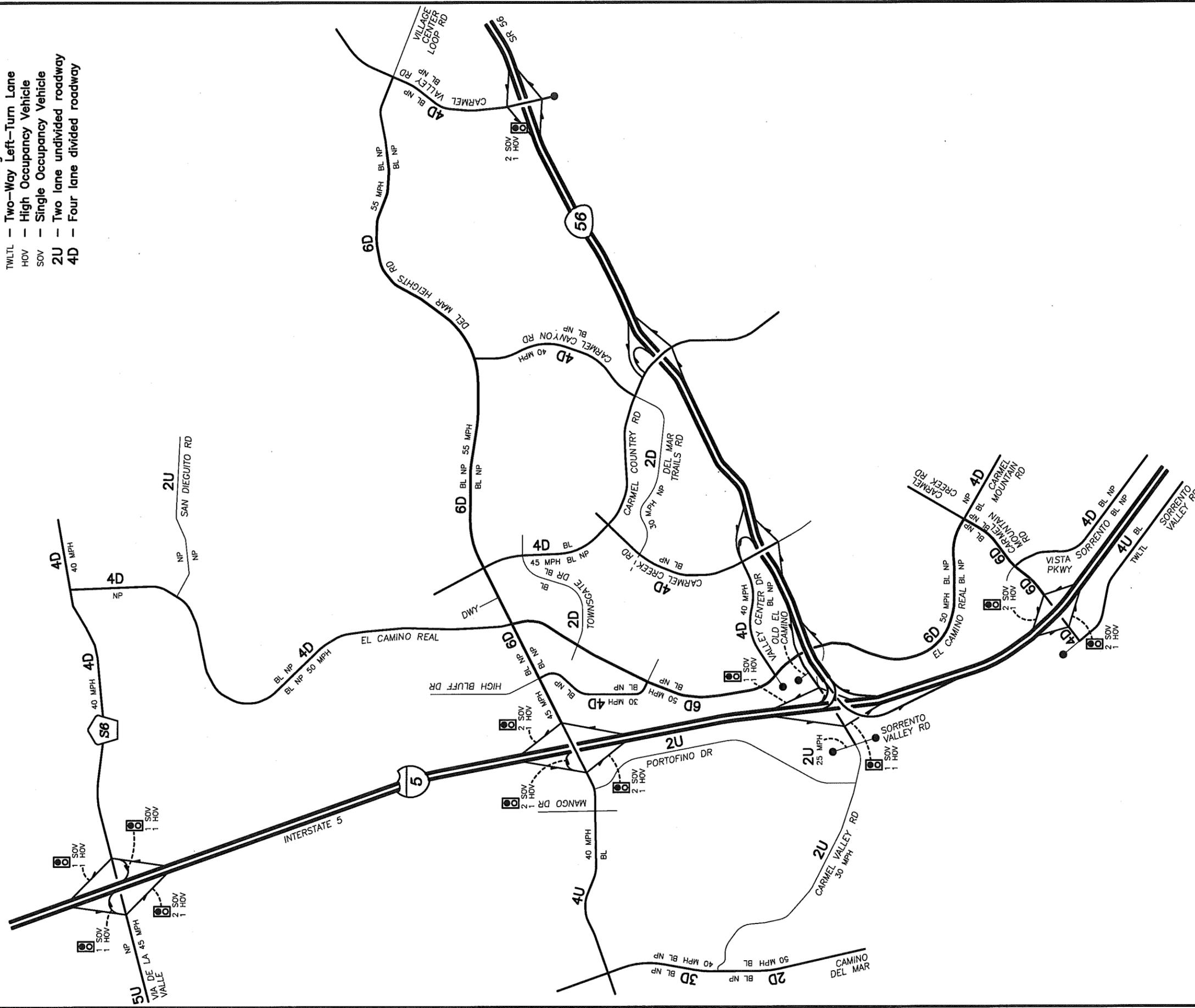
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LEGEND

- Traffic Signal
- All-Way Stop
- Two-Way Stop
- Indicates "study" intersection
- FREE - Free movement
- RTOL - Right Turn Overlap

LEGEND

-  Ramp Meter Signal
-  Bike Lane
-  No Parking
-  Two-Way Left-Turn Lane
-  High Occupancy Vehicle
-  Single Occupancy Vehicle
-  Two lane undivided roadway
-  Four lane divided roadway



REV. 09/10/2009
 N:\1500-14\FIGURES\YEAR 2015 BUILD\1500-14 RUN C FIGURES.DWG

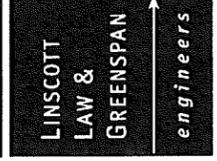


Figure 4-3b
 Year 2015 Direct Connector (Model Run C) Network Conditions
 Street Segments

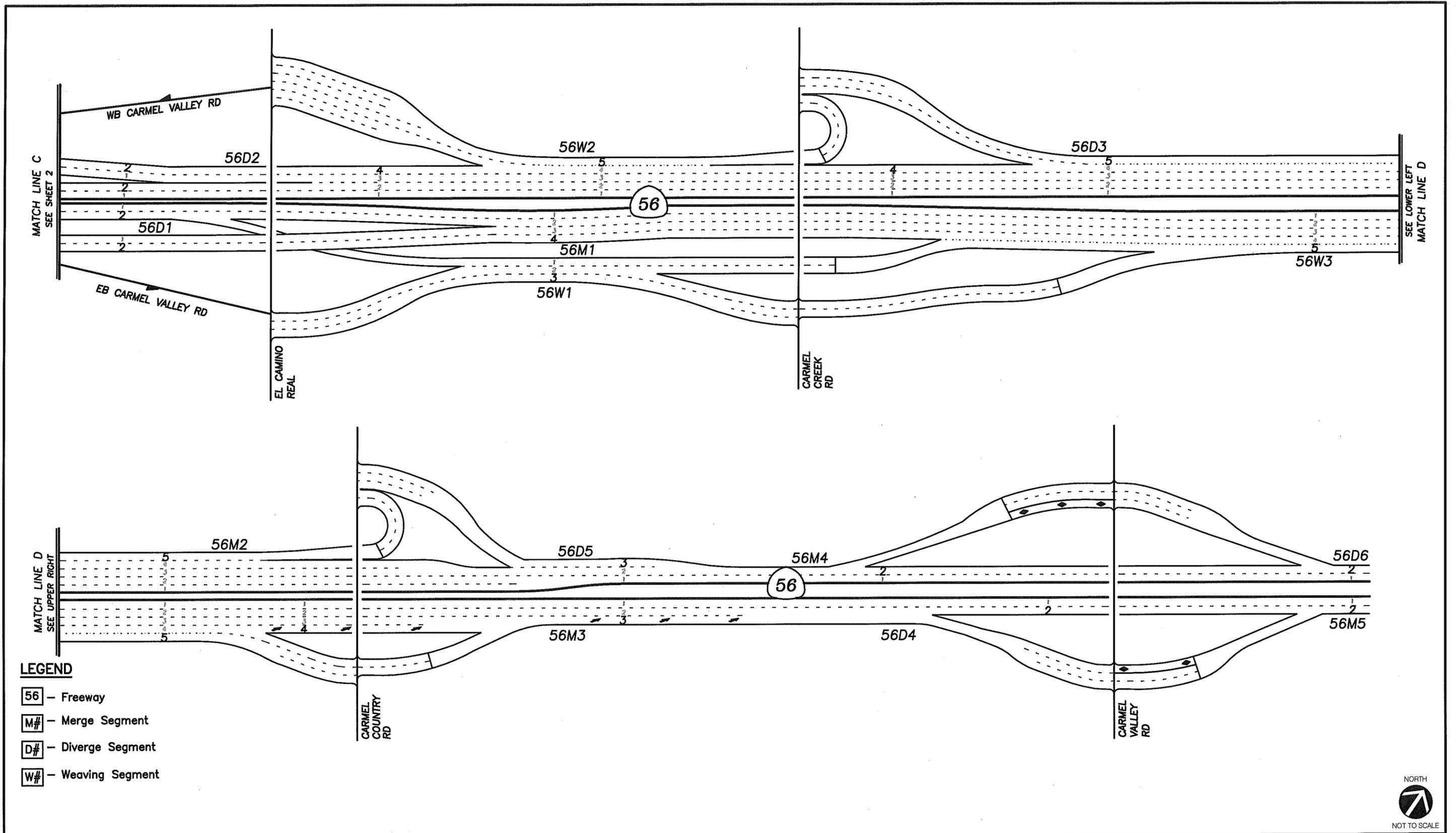


Figure 4-3c
 (SHEET 3 OF 3)
 Year 2015 Direct Connector (Model Run C) Network Conditions
 Freeway Facilities

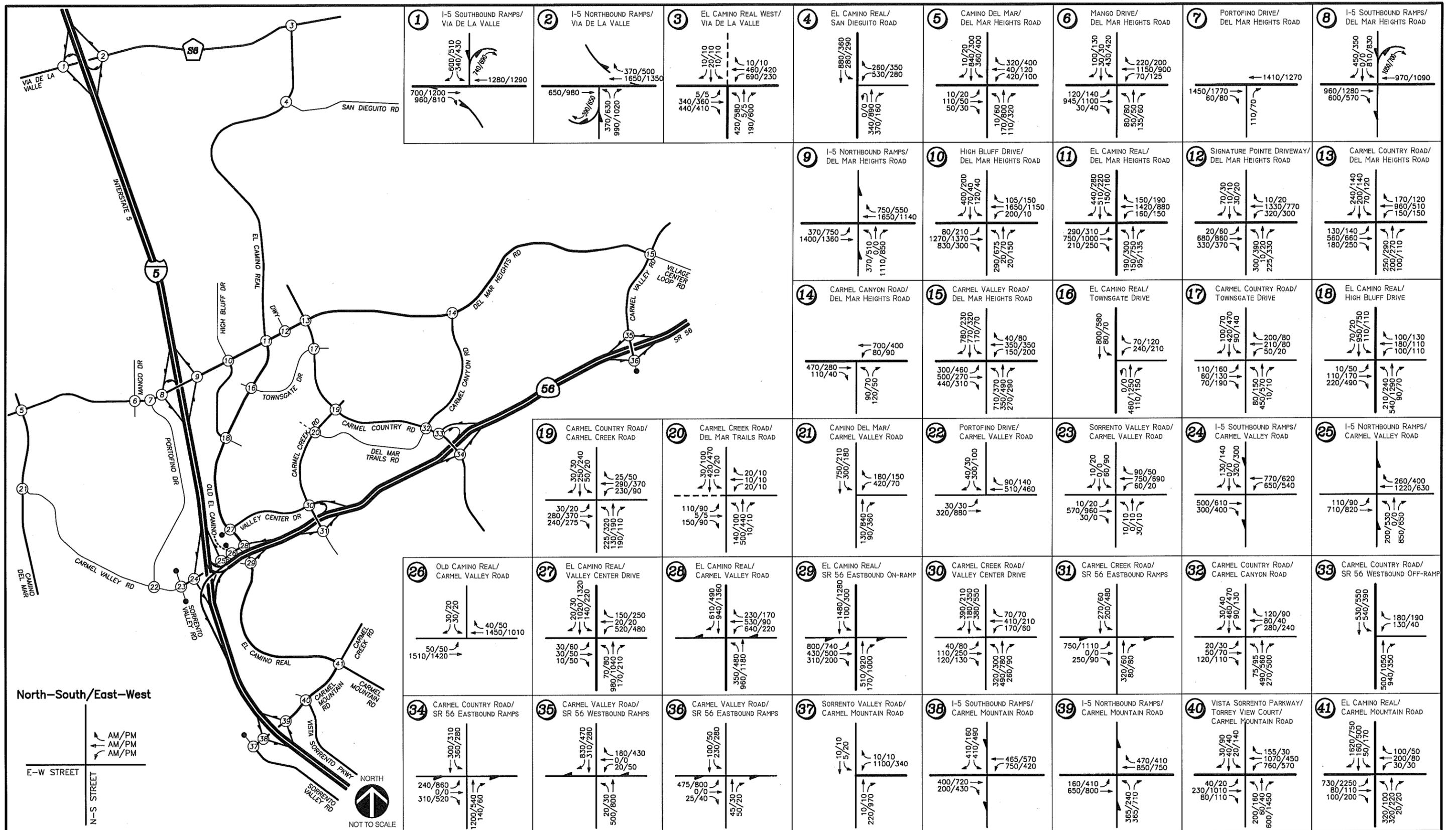


Figure 4-3d
Year 2015 Direct Connector (Model Run C) Traffic Volumes Intersections

REV. 01/27/2009
N:\1500-14\FIGURES\YEAR 2015 BUILD\1500-14 RUN C FIGURES.DWG

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NOTES:
- AM/PM peak hour volumes are shown at the intersections

LEGEND
XX - Indicates "study" intersection

YEAR 2015 DIRECT CONNECTOR ALTERNATIVE — NO EB SLIP OFF-RAMP TO CARMEL CREEK ROAD (MODEL RUN C2)

The same re-routing methodology and percentages discussed in the Year 2015 Auxiliary Lane Alternative (*Run B2 – Elimination of EB slip off-ramp*) were adopted to develop the traffic volumes for the Direct Connector (*Run C2 – Elimination of EB slip off-ramp*) scenario.

Figures 4–3g illustrates the Year 2015 Direct Connector (Run C2) geometric conditions with the slip off-ramp to Carmel Creek Road eliminated. *Figure 4–3h, Figure 4–3i and Figure 4–3j* illustrate the Year 2015 Direct Connectors (Run C) traffic volumes for the intersections, street and freeway facilities with the “no slip off-ramp” situation. The operational analyses tables discussed in Section 7.0 of this report have been labeled as **C2** for the No EB slip-off ramp scenario.

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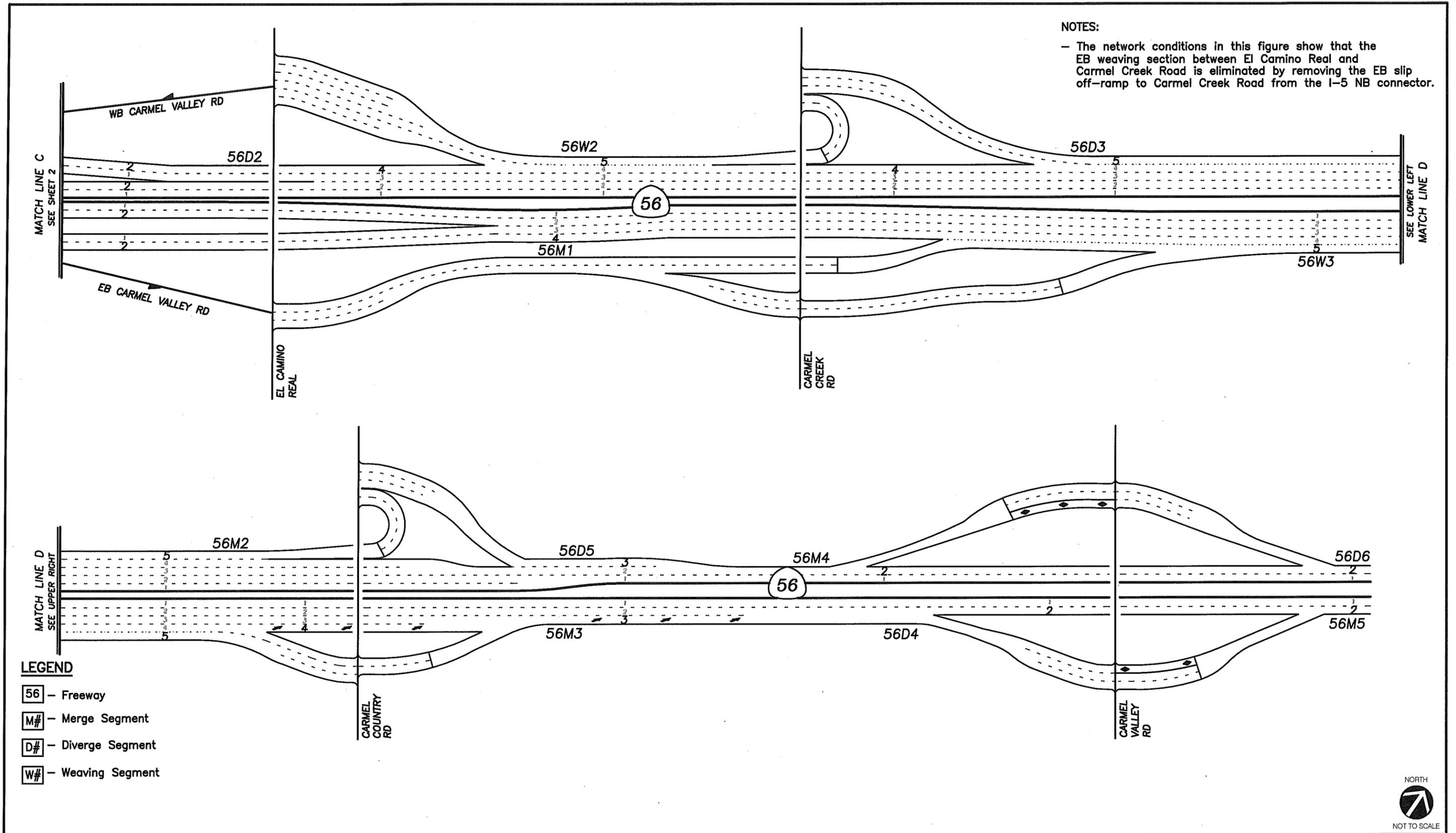


Figure 4-3g
 Year 2015 Direct Connector (Model Run C - No EB Slip Off-ramp) Network Conditions
 Freeway Facilities

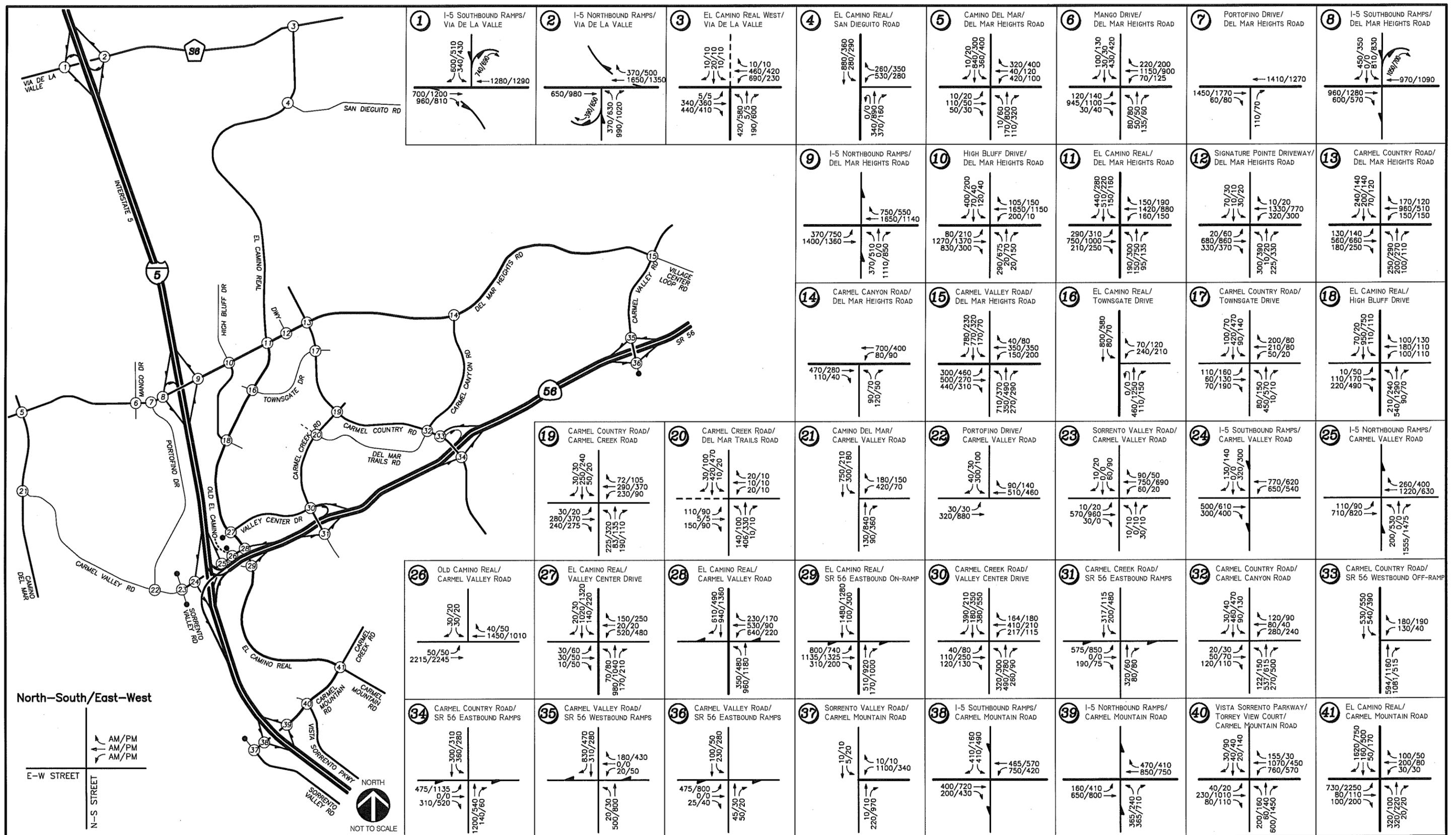


Figure 4-3h

Year 2015 Direct Connector Traffic Volumes (Run C - No EB Slip Off-ramp) Intersections

REV. 02/23/2009
N:\1500-14\FIGURES\YEAR 2015 BUILD\RUN C_NO EB SLIP FIGURES.DWG

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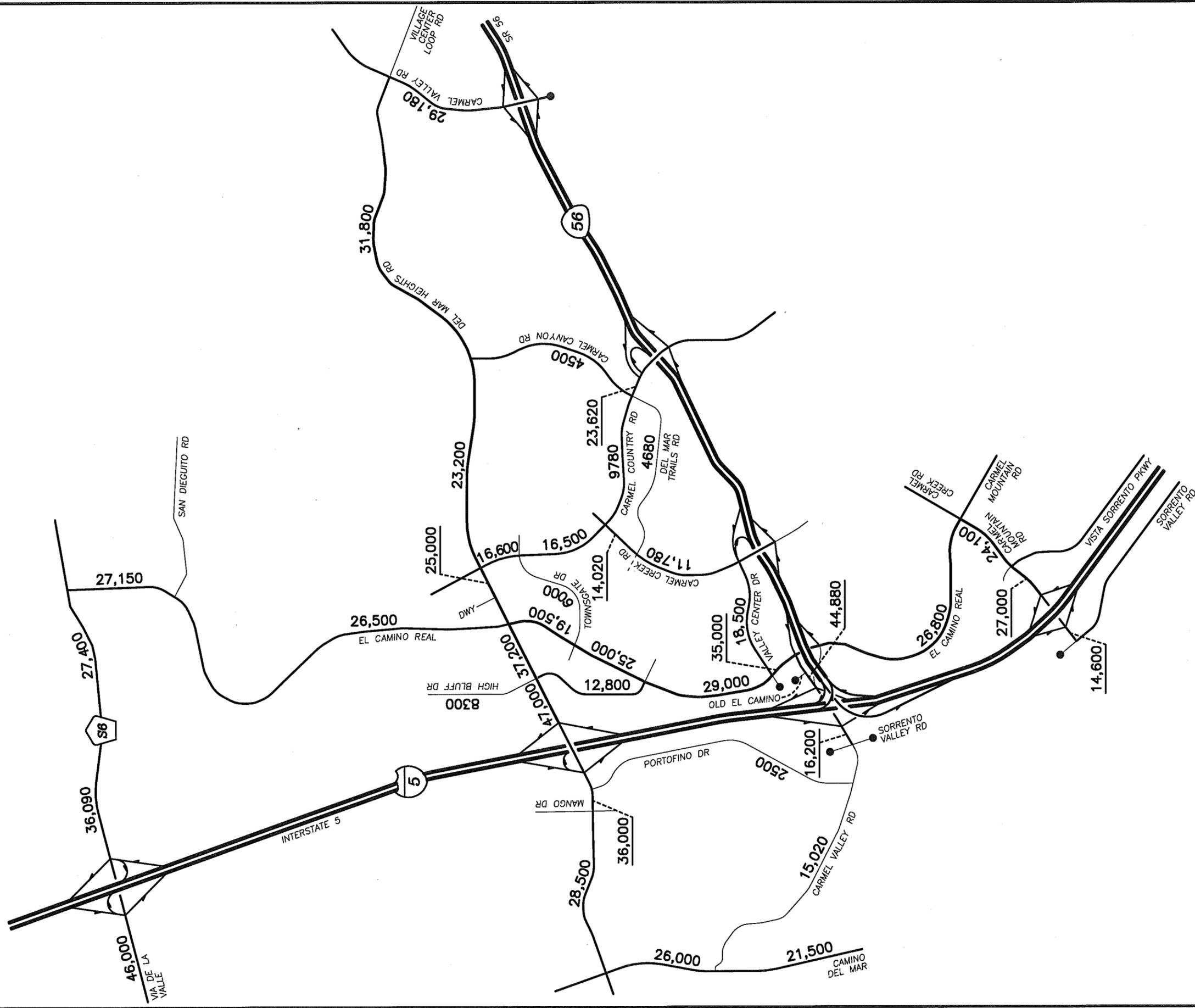
NOTES:
- AM/PM peak hour volumes are shown at the intersections
- The volumes shown in this figure assume that the EB slip off ramp from the I-5 NB connector to Carmel Creek Road is eliminated.

LEGEND
⊗ - Indicates "study" intersection

NOTES:

- ADT (Average Daily Traffic)
shown midblock

- The volumes shown in this figure assume that the EB slip off ramp from the I-5 NB connector to Carmel Creek Road is eliminated.



REV. 02/23/2009
N:\1500-14\FIGURES\YEAR 2015 BUILD\RUN C_NO EB SLIP FIGURES.DWG

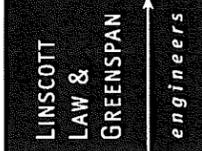


Figure 4-3i
Year 2015 Direct Connector Traffic Volumes (Run C - No EB Slip Off-ramp)
Street Segments

YEAR 2015 DIRECT CONNECTOR ALTERNATIVE — NO EB SLIP OFF RAMP AT CARMEL CREEK ROAD AND WB COLLECTOR- DISTRIBUTOR (C-D) (MODEL RUN C5)

Alternative: This alternative is based on the assumption that the EB Slip off-ramp to Carmel Creek Road from the I-5 NB connector would be eliminated and a collector-distributor alternative on WB SR-56 between Carmel Creek Road and El Camino Real is proposed.

The collector-distributor alternative was developed to eliminate the weaving maneuver of the vehicles entering the loop ramp at Carmel Creek Road onto WB SR-56 to go I-5 SB. This unsafe weaving maneuver would require 3-lane changes in a very short distance and also includes a great speed differential. Hence this collector-distributor system would allow vehicles entering the loop ramp at Carmel Creek Road onto WB SR-56 to go only I-5 NB and restrict them to go I-5 SB.

The collector-distributor alternative would include installation of a barrier separating the I-5 SB traffic from the I-5 NB traffic on WB SR-56. The barrier would start just upstream of the Carmel Creek loop ramp creating a collector-distributor roadway system between Carmel Creek Road and El Camino Real. Vehicles intending to go I-5 NB from WB SR-56 would use the collector-distributor system.

Figures 4-3k illustrates the Year 2015 Direct Connector (Run C5) geometric conditions with the slip off-ramp to Carmel Creek Road eliminated and WB collector-distributor between Carmel Creek Road and El Camino Real. *Figure 4-3l, Figure 4-3m and Figure 4-3n* illustrate the Year 2015 traffic volumes for the intersections, street and freeway facilities. The operational analyses tables discussed in Section 7.0 of this report have been labeled as C5 for the No EB slip-off ramp and WB C-D scenario.

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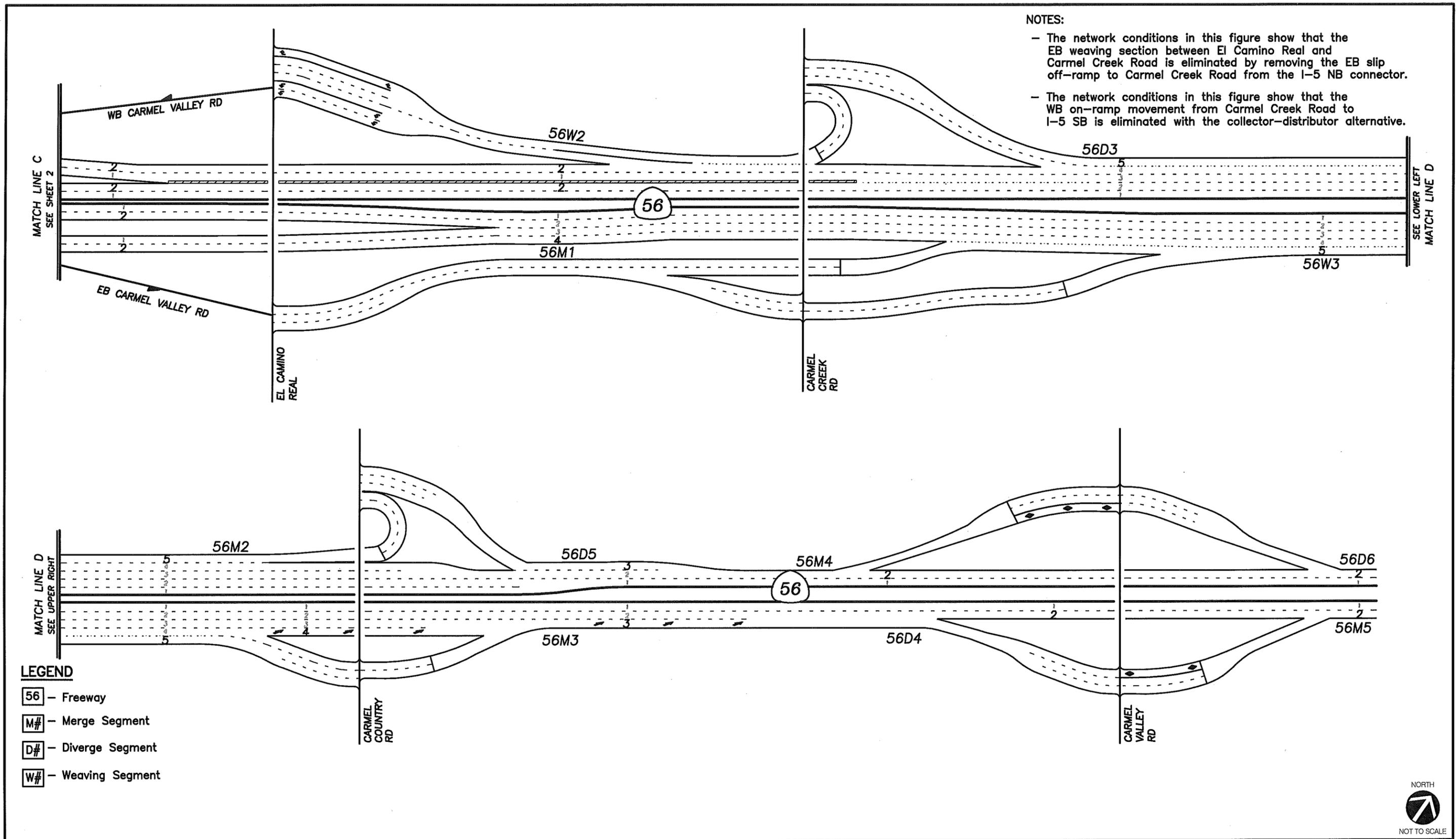


Figure 4-3k

Year 2015 Direct Connector (Model Run C - WB Collector-Distributor Alternative) Network Conditions Freeway Facilities

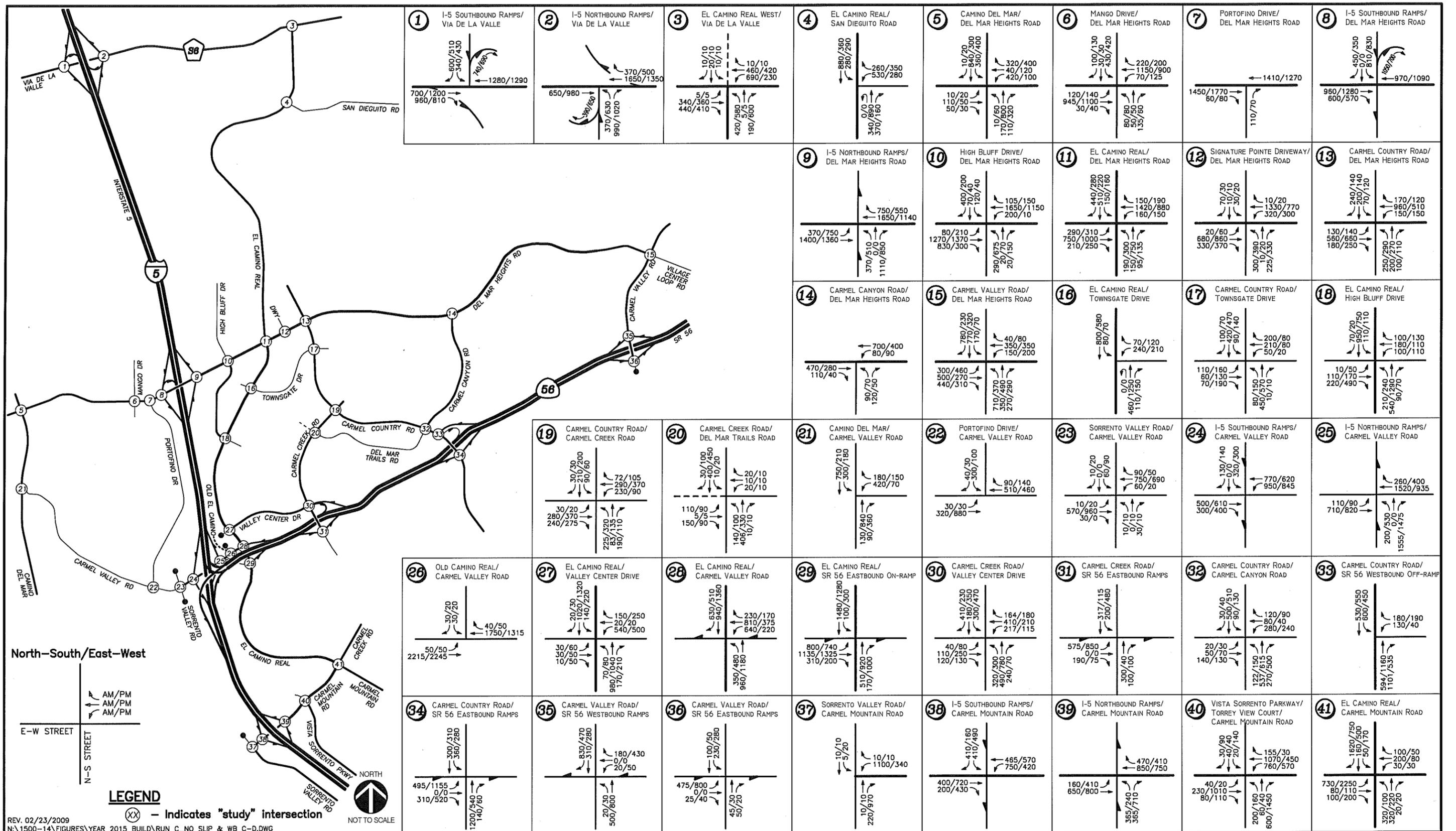


Figure 4-31
Year 2015 Direct Connector Traffic Volumes (Run C - Collector-Distributor Alternative) Intersections

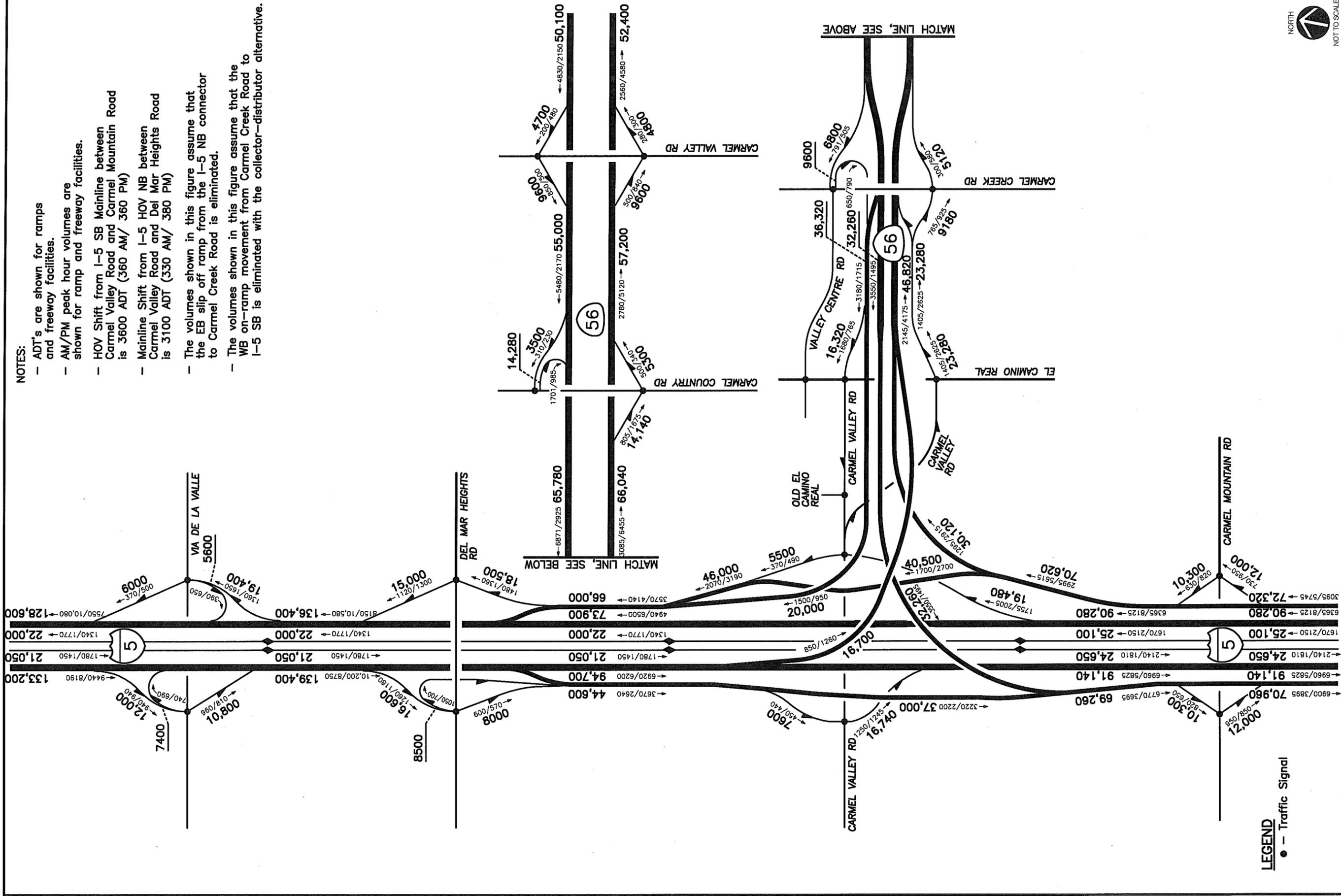
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NOTES:

- The volumes shown in this figure assume that the EB slip off ramp from the I-5 NB connector to Carmel Creek Road is eliminated.
- The volumes shown in this figure assume that the WB on-ramp movement from Carmel Creek Road to I-5 SB is eliminated with the collector-distributor alternative.

NOTES:

- ADT's are shown for ramps and freeway facilities.
- AM/PM peak hour volumes are shown for ramp and freeway facilities.
- HOV Shift from I-5 SB Mainline between Carmel Valley Road and Carmel Mountain Road is 3600 ADT (360 AM/ 360 PM)
- Mainline Shift from I-5 HOV NB between Carmel Valley Road and Del Mar Heights Road is 3100 ADT (330 AM/ 380 PM)
- The volumes shown in this figure assume that the EB slip off ramp from the I-5 NB connector to Carmel Creek Road is eliminated.
- The volumes shown in this figure assume that the WB on-ramp movement from Carmel Creek Road to I-5 SB is eliminated with the collector-distributor alternative.



REV. 02/25/2009
 N:\1500-14\FIGURES\YEAR 2015 BUILD\RUN C_NO SLIP & WB C-D.DWG

Figure 4-3n

**Year 2015 Direct Connector Traffic Volumes (Run C - Collector-Distributor Alternative)
 Freeways and Ramps**

4.1.4 Year 2015 "Hybrid Alternative" (Model Run D)

The Hybrid Alternative is a "blend" of the Auxiliary Lane Alternative in the SB I-5 to EB SR 56 direction and the Direct Connector Alternative in the WB SR 56 to NB I-5 direction. The Hybrid Alternative is based on the following assumptions:

- **I-5** freeway configuration is planned to include 10 general-purpose lanes (5 lanes in each direction) with 4 managed/ HOV lanes (two lanes in each direction) with direct access ramps (DAR's) connections to HOV/managed lanes (10 + 4). As per I-5 North Coast Project, the direct access ramps are planned at Voigt Drive, Manchester Avenue, Cannon Road and Oceanside Boulevard at I-5.
- **SR-56** freeway configuration in the interim Year 2015 is assumed to be the same as existing (4 general-purpose lanes and no HOV lanes) **with the construction of a direct connector from westbound SR-56 to northbound I-5**. This alternative does not include the HOV lanes on SR 56 and on the proposed direct connector.
- The Hybrid Alternative is similar to the Auxiliary lane Alternative (Run B) from SB I-5 to EB SR-56.
- The Hybrid Alternative is similar to the Direct Connector Alternative (Run C) from WB SR 56 to NB I-5.
- The intersection and freeway improvements that were assumed in the Auxiliary Lane (Run B) alternative and Direct Connector (Run C) are assumed for the Hybrid alternative (Run D) as well.
- The Hybrid Alternative assumes elimination of EB slip-off ramp to Carmel Creek Road.
- The Hybrid Alternative assumes collector-distributor (C-D) system on WB SR-56 between Carmel Creek Road and El Camino Real.

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LLG recommends using the same traffic volumes of the Auxiliary Lane (south to east) and Direct Connector (west to north) Alternatives (on a directionality basis) for the Hybrid Alternative to be consistent with previous analyses. This will result in a suitable comparison in the operational analyses. Further the variations of the "No EB slip off-ramp to Carmel Creek Road" and "WB C-D alternative on WB SR 56 between Carmel Creek Road and El Camino Real" are included in the Hybrid alternative.

Figure 4-4a, Figure 4-4b and *Figure 4-4c* illustrate the geometric conditions for the intersections, street segments and freeway facilities. *Figure 4-4d, Figure 4-4e* and *Figure 4-4f* illustrate the Year 2015 traffic volumes for the intersections, street segments and freeway facilities.

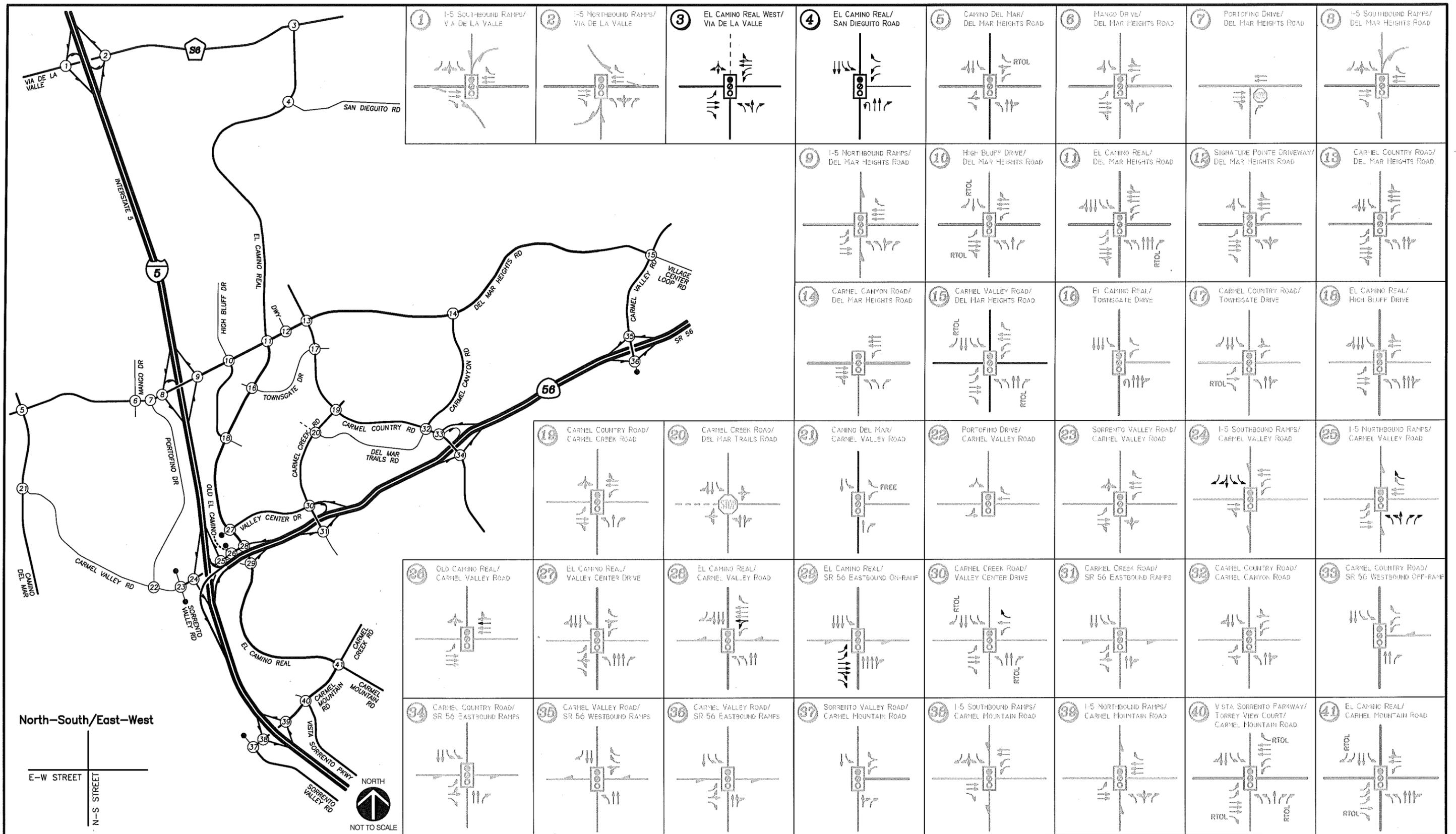
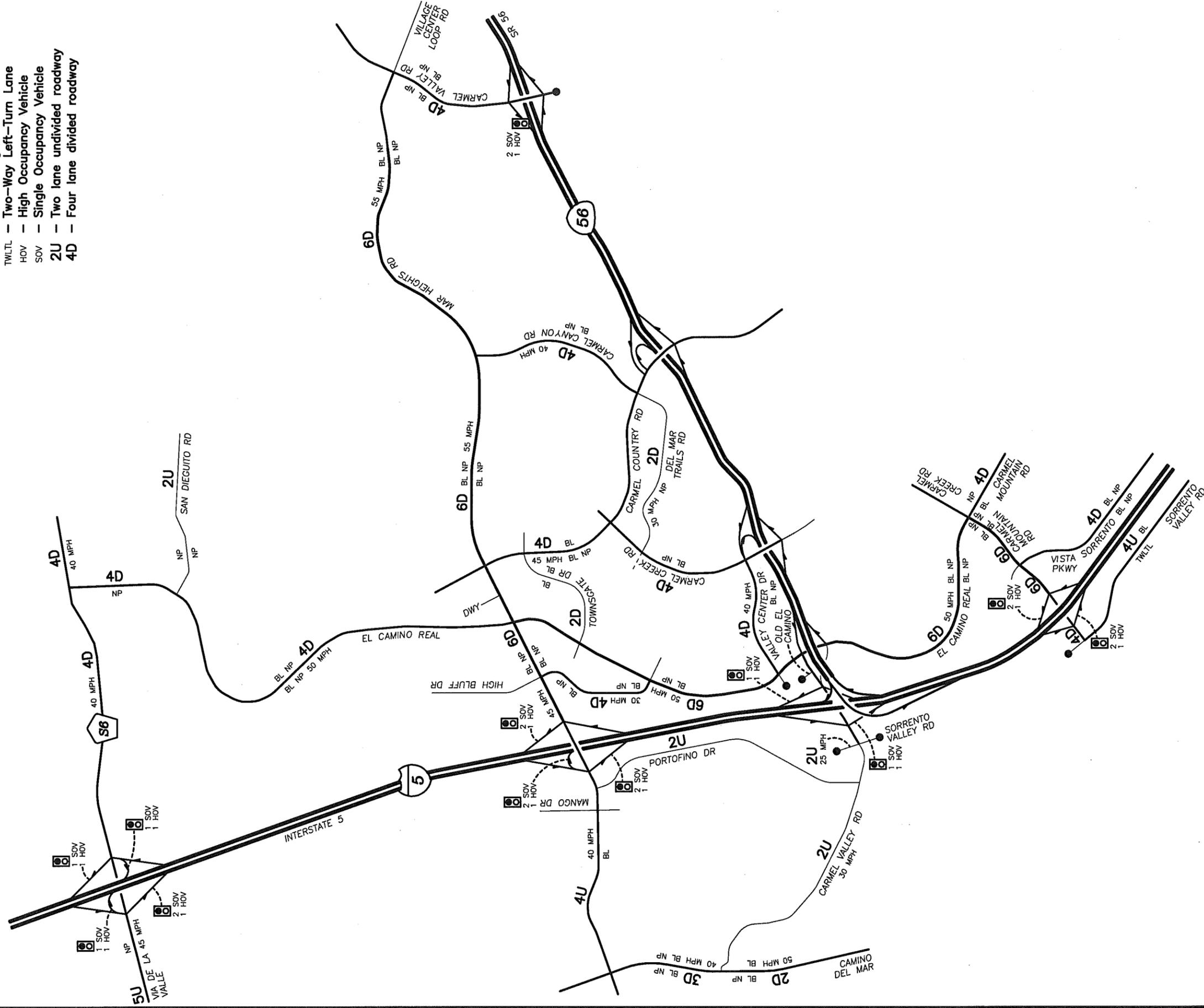


Figure 4-4a

Year 2015 Hybrid Alternative (Model Run D) Network Conditions Intersections

LEGEND

-  Ramp Meter Signal
-  Bike Lane
-  No Parking
-  Two-Way Left-Turn Lane
-  High Occupancy Vehicle
-  Single Occupancy Vehicle
-  Two lane undivided roadway
-  Four lane divided roadway



REV. 02/25/2009
 N:\1500-14\FIGURES\YEAR 2015 HYBRID\RUN D CONDITIONS.DWG

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Figure 4-4b
 Year 2015 Hybrid Alternative (Model Run D) Network Conditions
 Street Segments

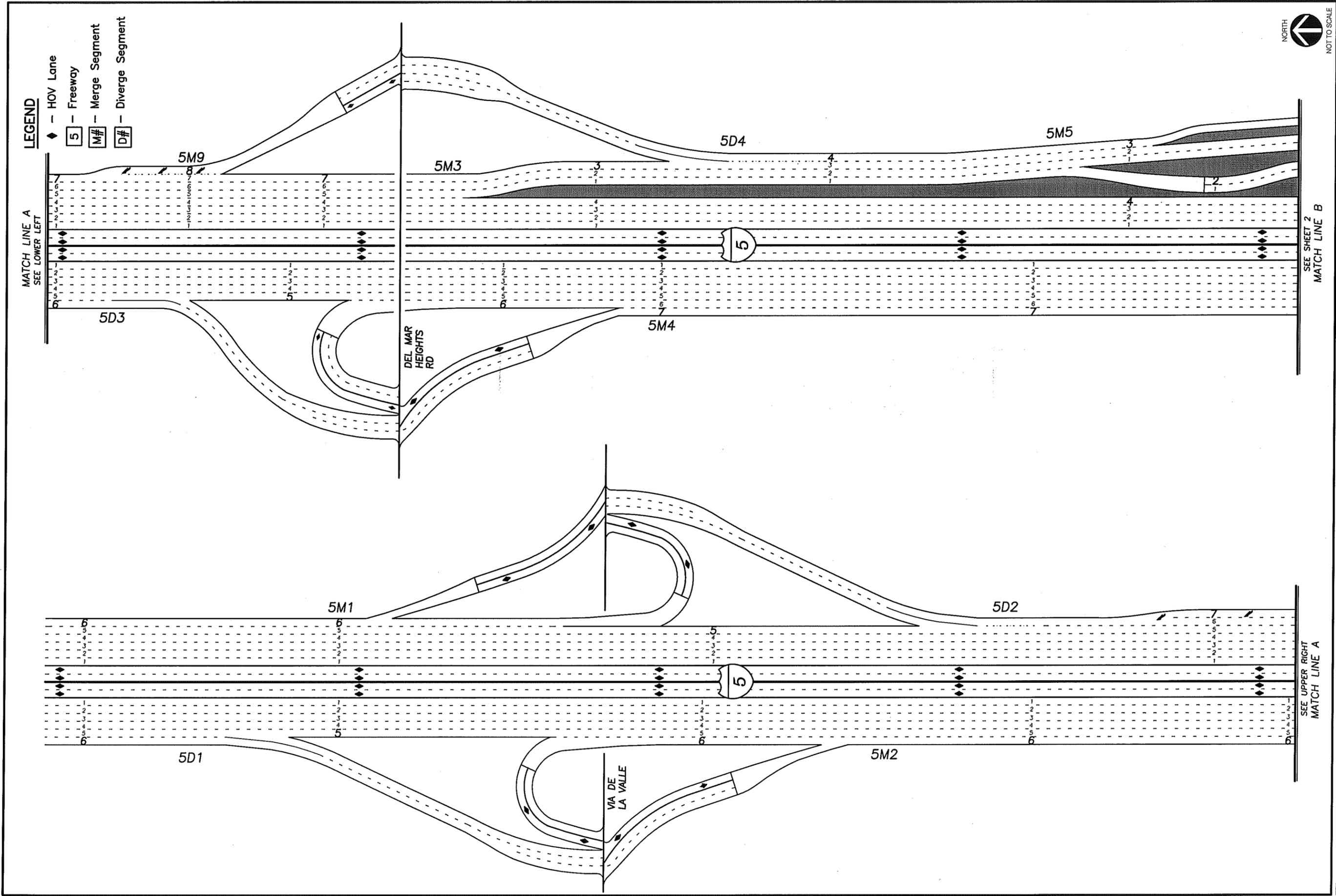


Figure 4-4c
(SHEET 1 OF 3)

**Year 2015 Hybrid (Model Run D) Network Conditions
Freeway Facilities**

REV. 09/02/2009
N:\1500-16\FIGURES\YEAR 2015 HYBRID\1500-16 HYBRID I-5.DWG

LEGEND

- ◆ - HOV Lane
- 5 - Freeway
- M# - Merge Segment
- D# - Diverge Segment

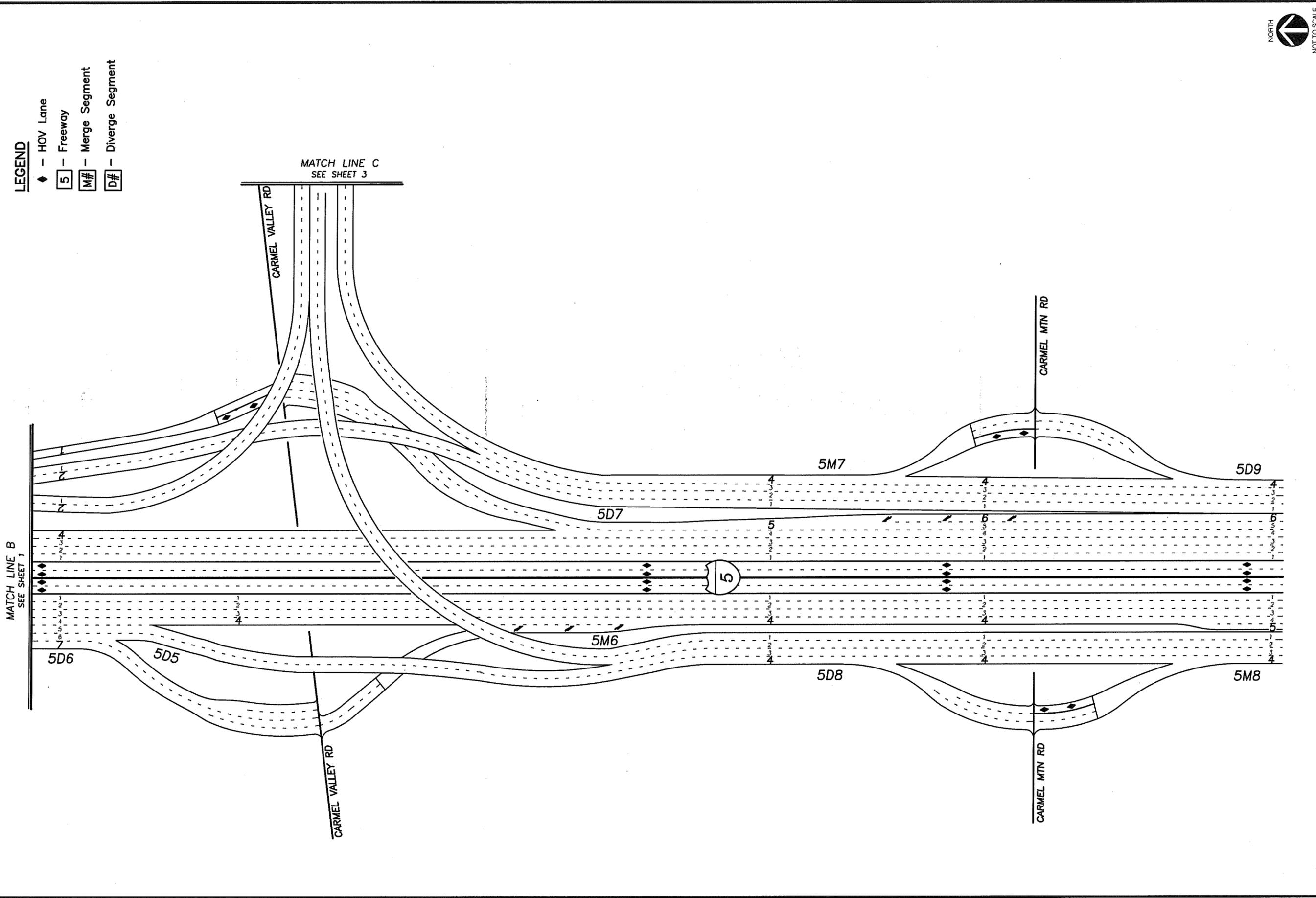
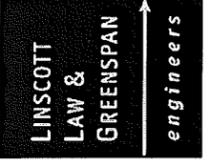


Figure 4-4C
(SHEET 2 OF 3)

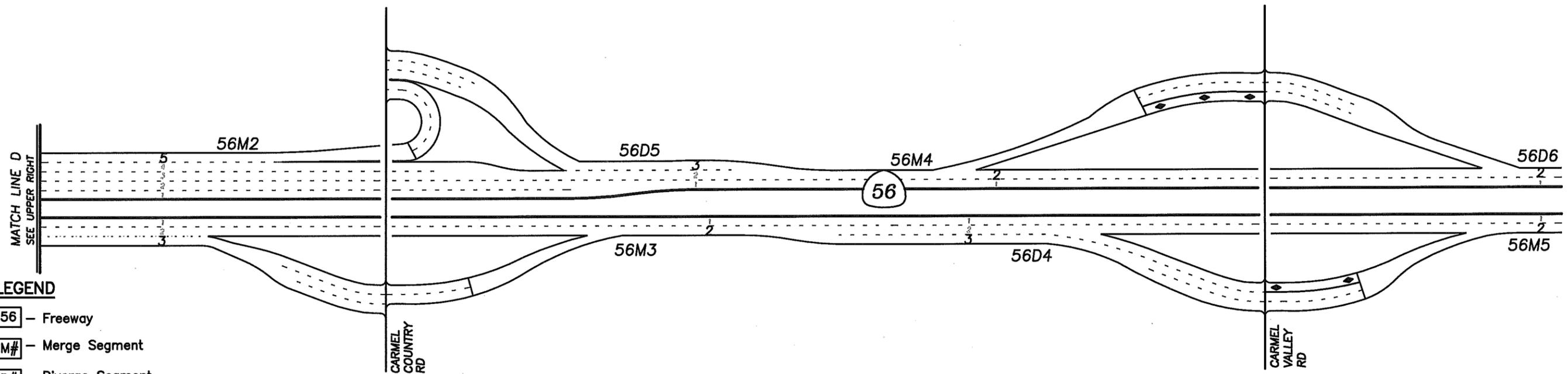
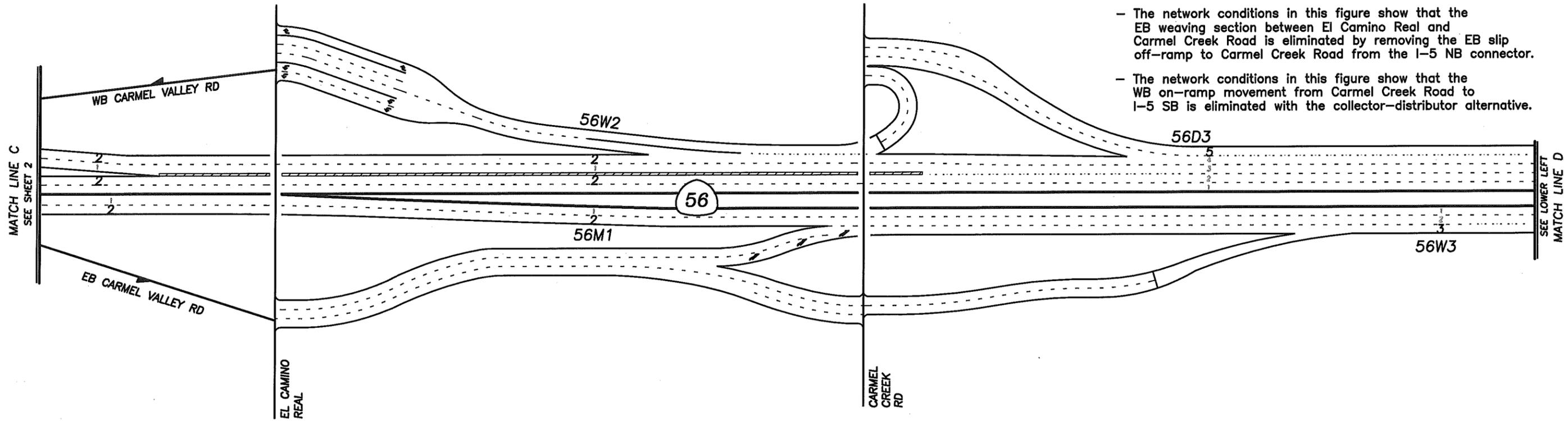
**Year 2015 Hybrid (Model Run D) Network Conditions
Freeway Facilities**

REV. 11/30/2009
N:\1500-16\FIGURES\YEAR 2015 HYBRID\1500-16 HYBRID 1-5.DWG



NOTES:

- The network conditions in this figure show that the EB weaving section between El Camino Real and Carmel Creek Road is eliminated by removing the EB slip off-ramp to Carmel Creek Road from the I-5 NB connector.
- The network conditions in this figure show that the WB on-ramp movement from Carmel Creek Road to I-5 SB is eliminated with the collector-distributor alternative.



LEGEND

- 56 - Freeway
- M# - Merge Segment
- D# - Diverge Segment
- W# - Weaving Segment

NORTH



NOT TO SCALE

Figure 4-4c
(SHEET 3 OF 3)

Year 2015 Hybrid (Model Run D) Network Conditions
Freeway Facilities

REV. 08/28/2009
N:\1500-16\FIGURES\YEAR 2015 HYBRID\1500-16 FIGURES SR 56.DWG

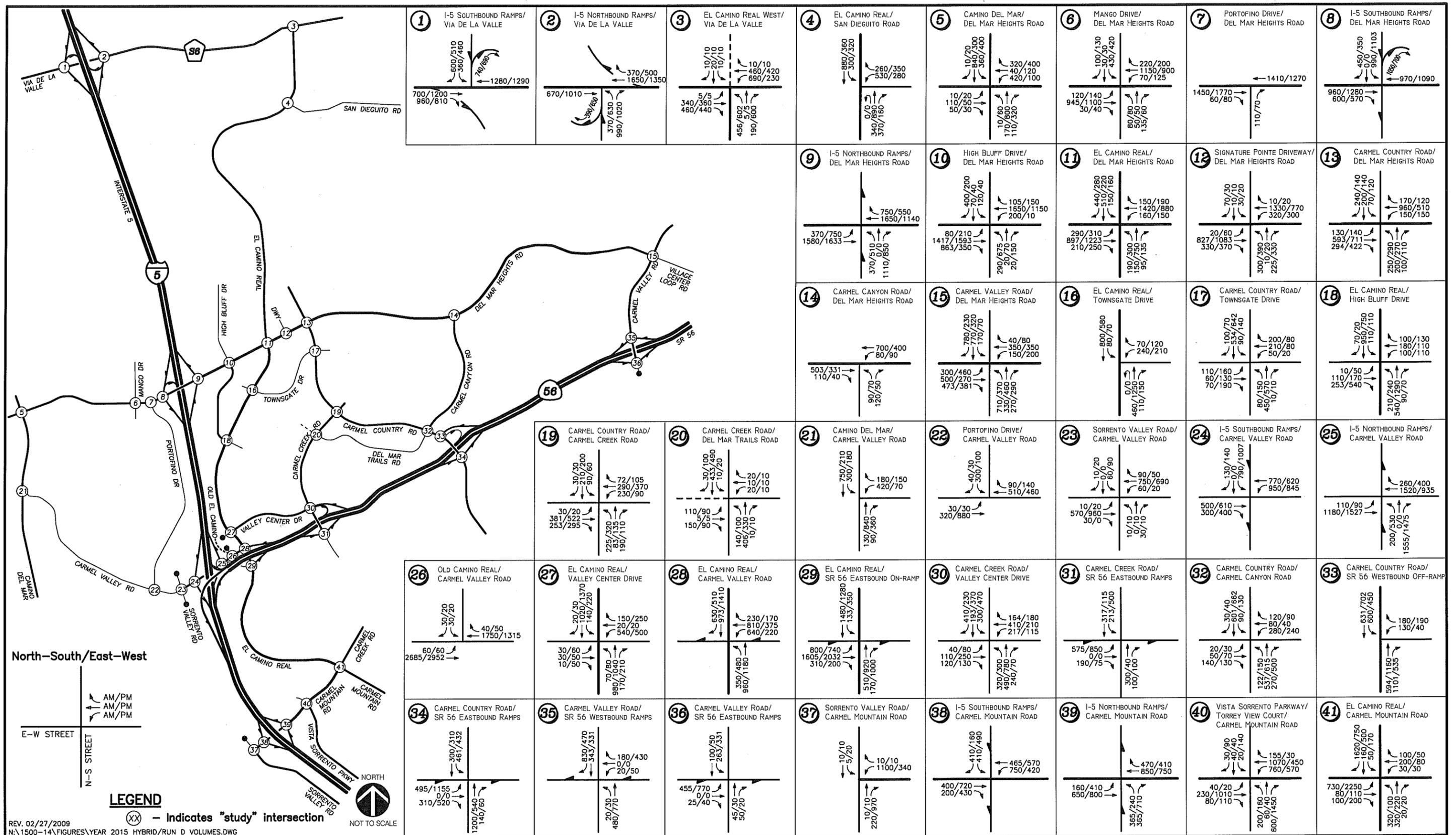


Figure 4-4d
 Year 2015 Hybrid Alternative (Model Run D) Traffic Volumes Intersections

NOTES:

- ADT (Average Daily Traffic) shown midblock
- The volumes shown in this figure assume that the EB slip off ramp from the I-5 NB connector to Carmel Creek Road is eliminated.
- The volumes shown in this figure assume that the WB on-ramp movement from Carmel Creek Road to I-5 SB is eliminated with the collector-distributor alternative.

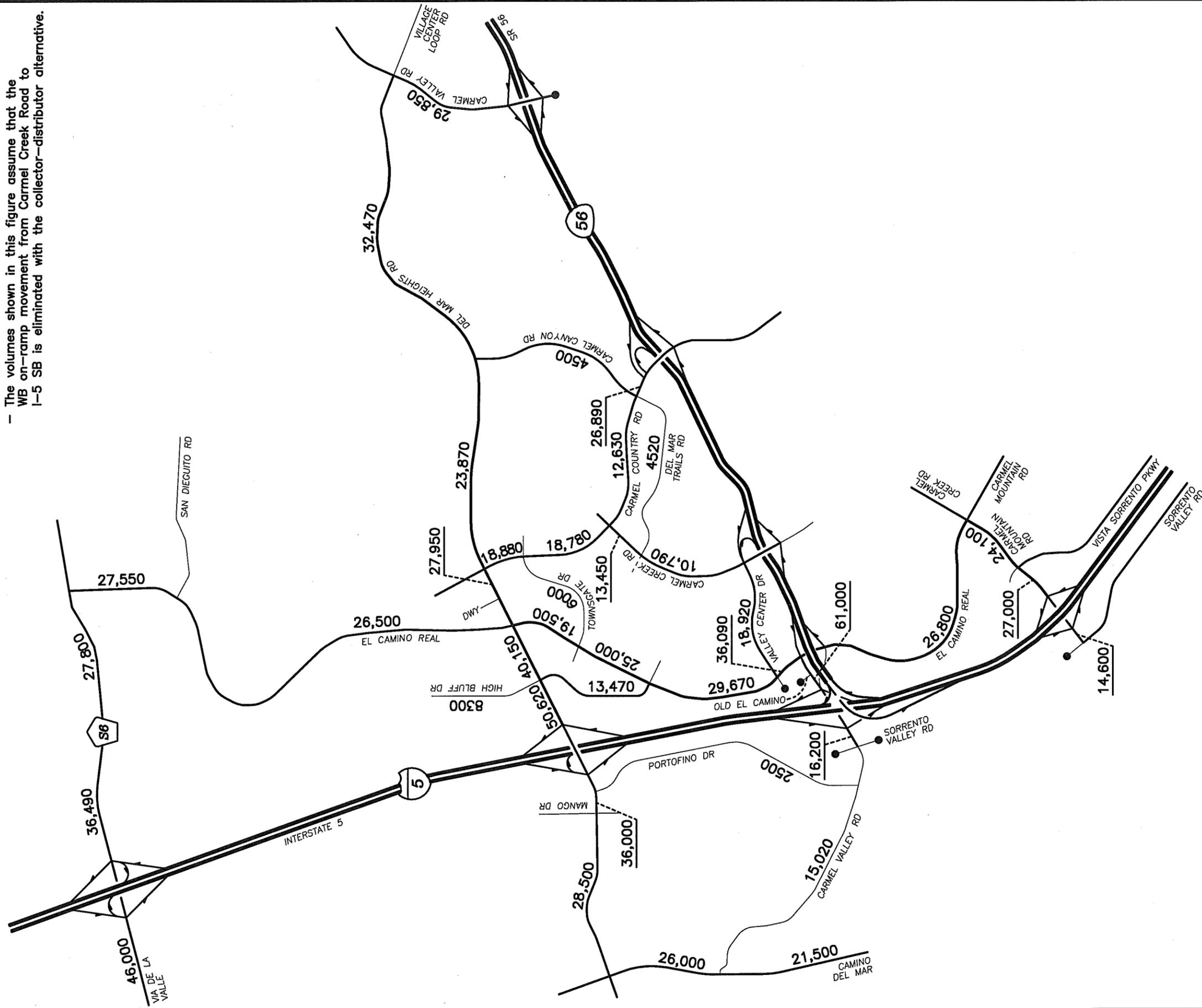
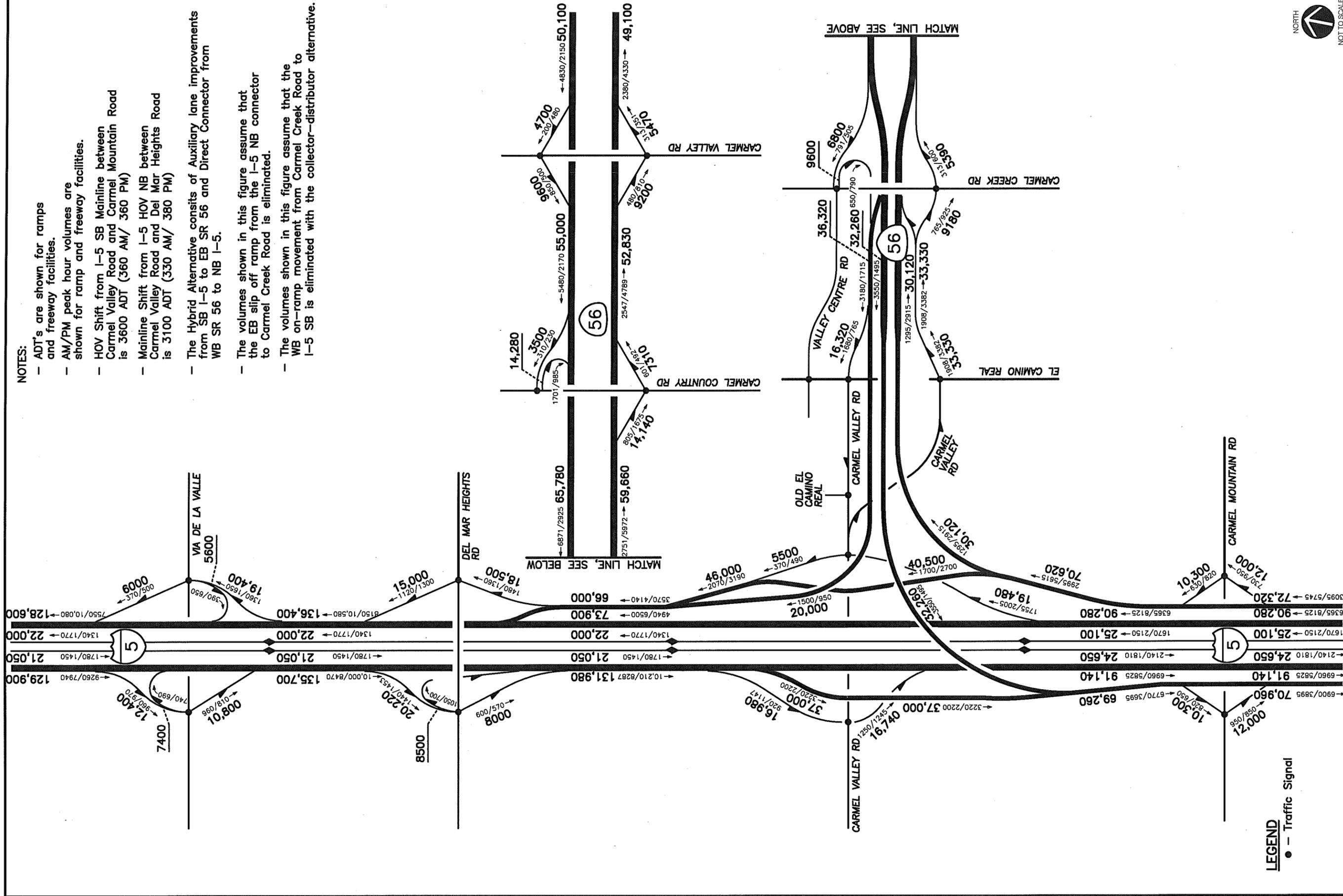


Figure 4-4e
Year 2015 Hybrid Alternative (Model Run D) Traffic Volumes
Street Segments

NOTES:

- ADT's are shown for ramps and freeway facilities.
- AM/PM peak hour volumes are shown for ramp and freeway facilities.
- HOV Shift from I-5 SB Mainline between Carmel Valley Road and Carmel Mountain Road is 3600 ADT (360 AM/ 360 PM)
- Mainline Shift from I-5 HOV NB between Carmel Valley Road and Del Mar Heights Road is 3100 ADT (330 AM/ 380 PM)
- The Hybrid Alternative consists of Auxiliary lane improvements from SB I-5 to EB SR 56 and Direct Connector from WB SR 56 to NB I-5.
- The volumes shown in this figure assume that the EB slip off ramp from the I-5 NB connector to Carmel Creek Road is eliminated.
- The volumes shown in this figure assume that the WB on-ramp movement from Carmel Creek Road to I-5 SB is eliminated with the collector-distributor alternative.



LEGEND
 ● -- Traffic Signal



REV. 02/25/2009
 N:\1500-14\FIGURES\YEAR 2015 HYBRID\RUN D VOLUMES.DWG

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Figure 4-4f
 Year 2015 Hybrid Alternative (Model Run D) Traffic Volumes
 Freeways and Ramps

4.1.5 Year 2015 "Hybrid with Flyover Alternative" (Model Run D1)

This alternative includes a "flyover" in the SB I-5 to EB SR 56 direction and a Direct Connector in the WB SR 56 to NB I-5 direction. The Hybrid with Flyover Alternative involves the construction of a two-lane, one-way EB grade separated structure on Carmel Valley Road between I-5 and El Camino Real serving the SB I-5 to EB SR-56 traffic. This structure would merge into the EB SR-56 mainline between El Camino Real and Carmel Creek interchanges.

Drivers intending to travel from SB I-5 to EB SR 56 would have to exit Carmel Valley Road similar to the No Build and Auxiliary Lane scenarios. Instead of using the El Camino Real on-ramp, SR 56 traffic would use the "flyover" and bypass the El Camino Real intersection. The EB approach at the I-5 NB ramps/ Carmel Valley Road intersection would include three through lanes for this alternative with # 2 EB through lane acting as a shared lane. Drivers intending to travel from Carmel Valley Road to EB SR 56 would have to use the #1 and #2 lanes to access the flyover. #2 and #3 lanes would serve El Camino Real.

LLG coordinated with Caltrans regarding the forecast volumes for the Year 2015 with flyover alternative. The Hybrid with Flyover alternative assumes "no EB slip off-ramp" to Carmel Creek Road and a collector-distributor system on WB SR 56. *Figures 4-4g, Figure 4-4h and Figure 4-4i* illustrate the Year 2015 network conditions for the intersections, street segment and freeway facilities. *Figures 4-4j, Figure 4-4k and Figure 4-4l* illustrate the Year 2015 traffic volumes for the intersections, street segment and freeway facilities for the Hybrid with Flyover Alternative.

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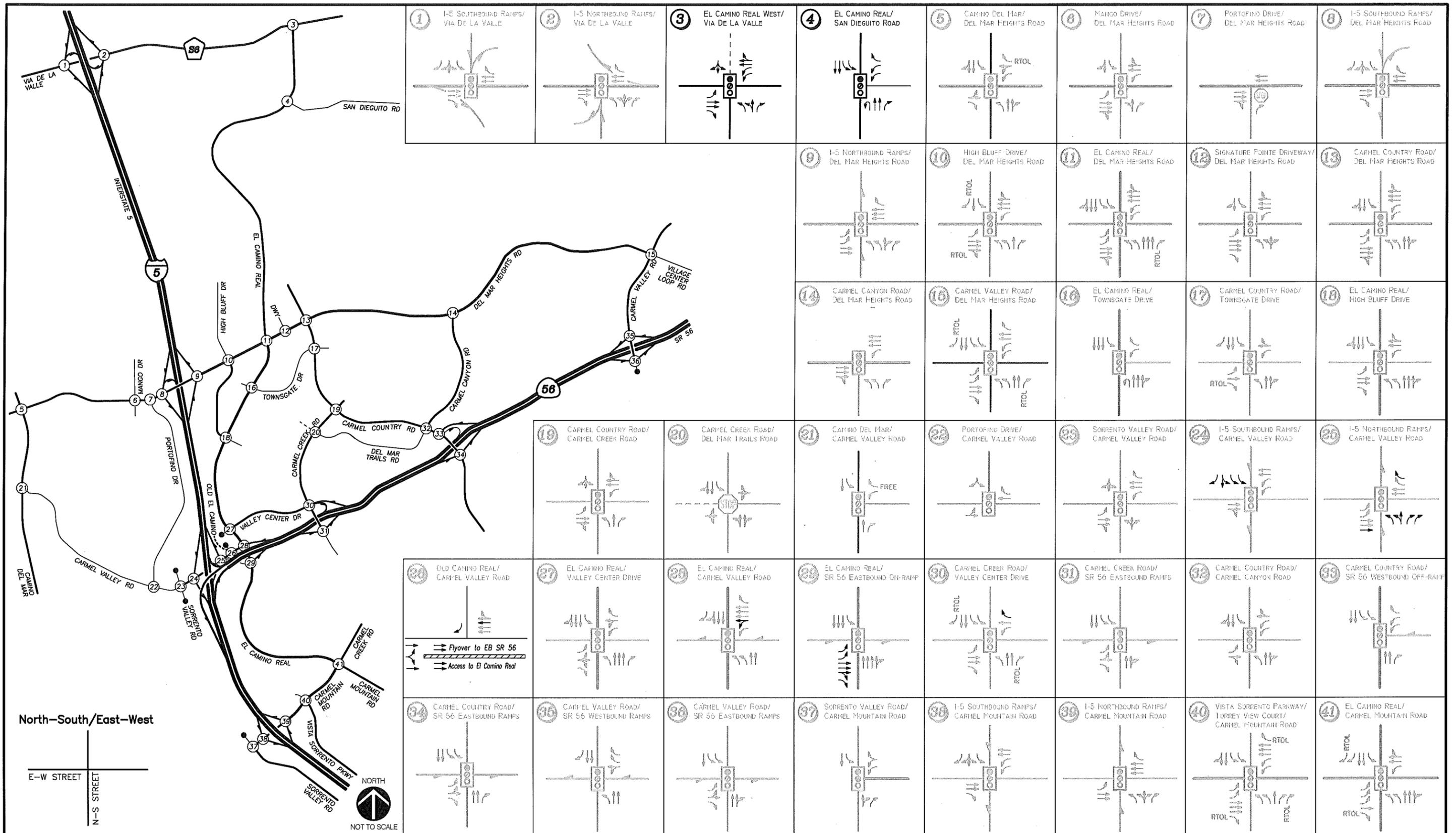
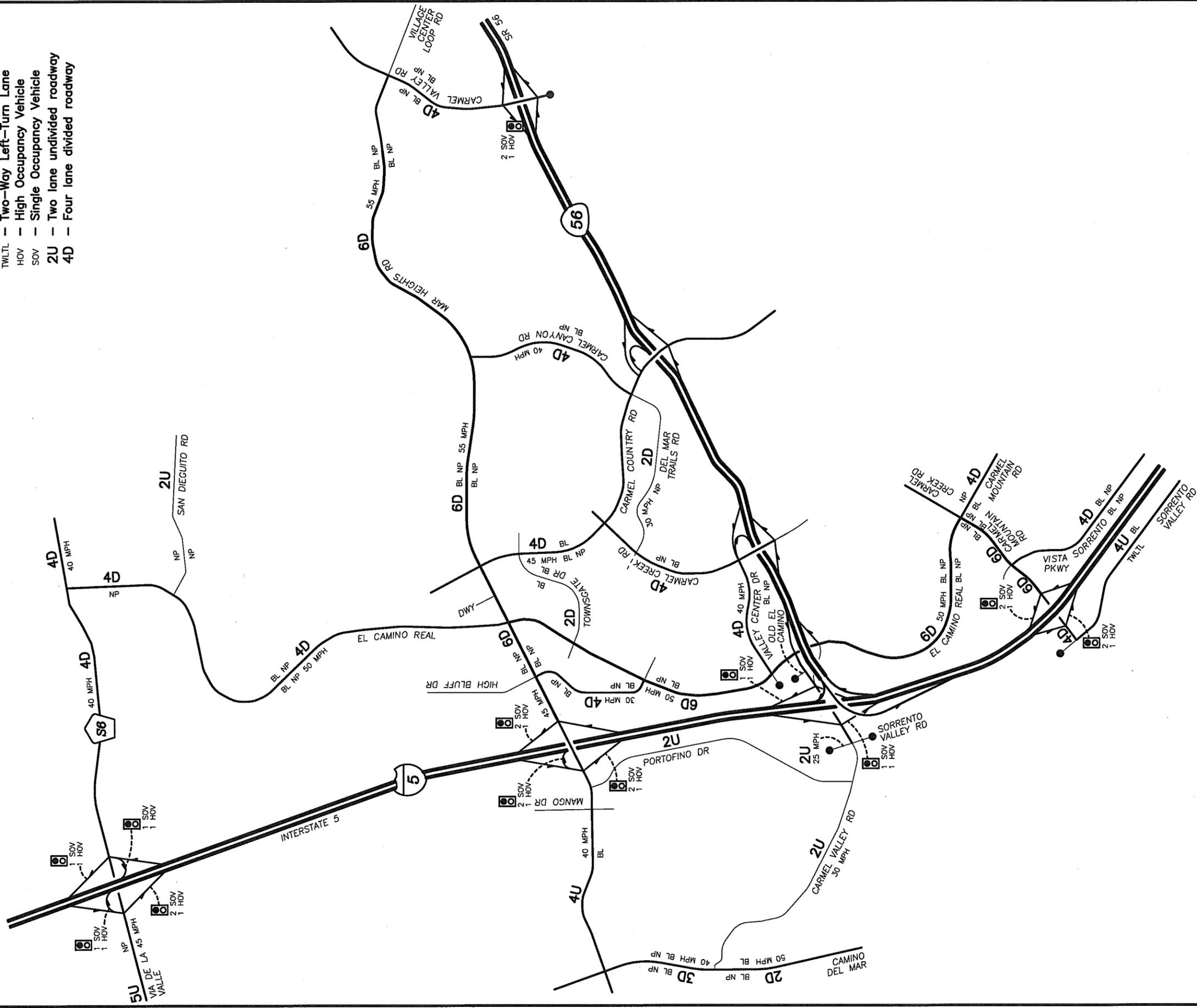


Figure 4-4g

Year 2015 Hybrid with flyover Alternative (Model Run D1) Network Conditions Intersections

LEGEND

- ⊠ Ramp Meter Signal
- BL Bike Lane
- NP No Parking
- TWLTL Two-Way Left-Turn Lane
- HOV High Occupancy Vehicle
- SOV Single Occupancy Vehicle
- 2U Two lane undivided roadway
- 4D Four lane divided roadway



REV. 02/25/2009\YEAR 2015 HYBRID\RUN D CONDITIONS.DWG
 N:\1500-14\FIGURES\YEAR 2015 HYBRID\RUN D CONDITIONS.DWG

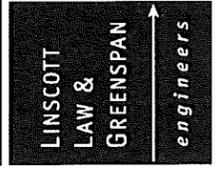


Figure 4-4h
 Year 2015 Hybrid with flyover Alternative (Model Run D1) Network Conditions
 Street Segments

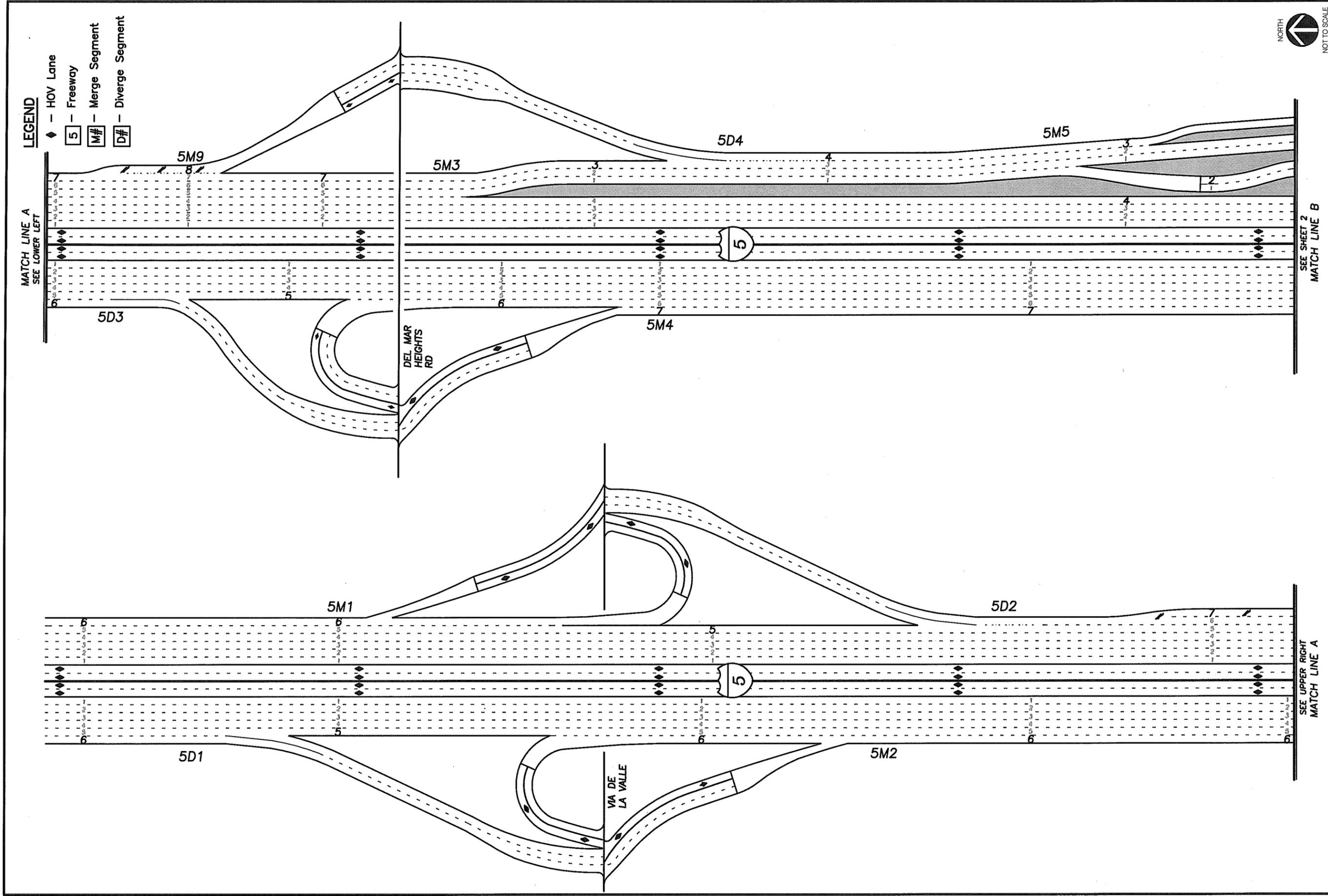


Figure 4-4i
(SHEET 1 OF 3)

**Year 2015 Hybrid with Flyover (Model Run D1) Network Conditions
Freeway Facilities**

REV. 08/11/2009
N:\1500-16\FIGURES\YEAR 2015 HYBRID WITH FLYOVER\1500-16 I-5 WITH FLYOVER.DWG

LEGEND

- ◆ - HOV Lane
- 5 - Freeway
- M# - Merge Segment
- D# - Diverge Segment

MATCH LINE C
SEE SHEET 3

MATCH LINE B
SEE SHEET 1

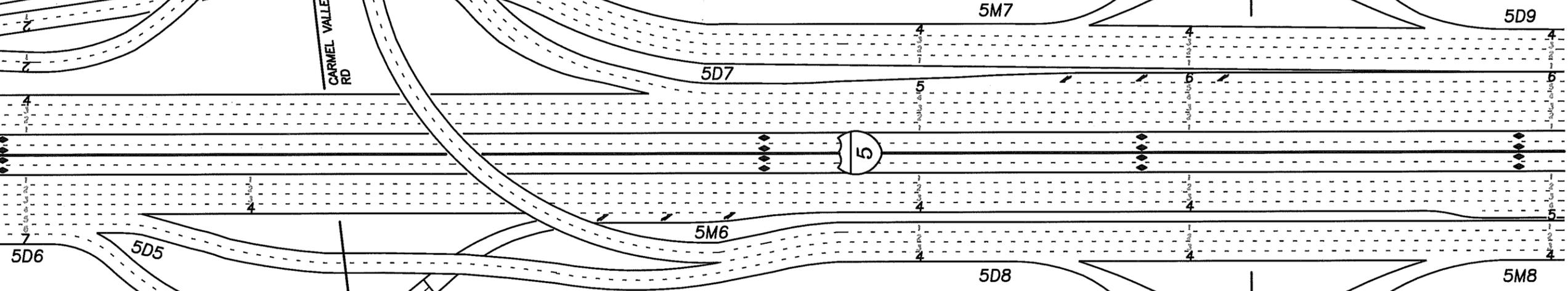
OLD EL CAMINO
REAL

CARMEL VALLEY
RD

CARMEL VALLEY RD

CARMEL MTN RD

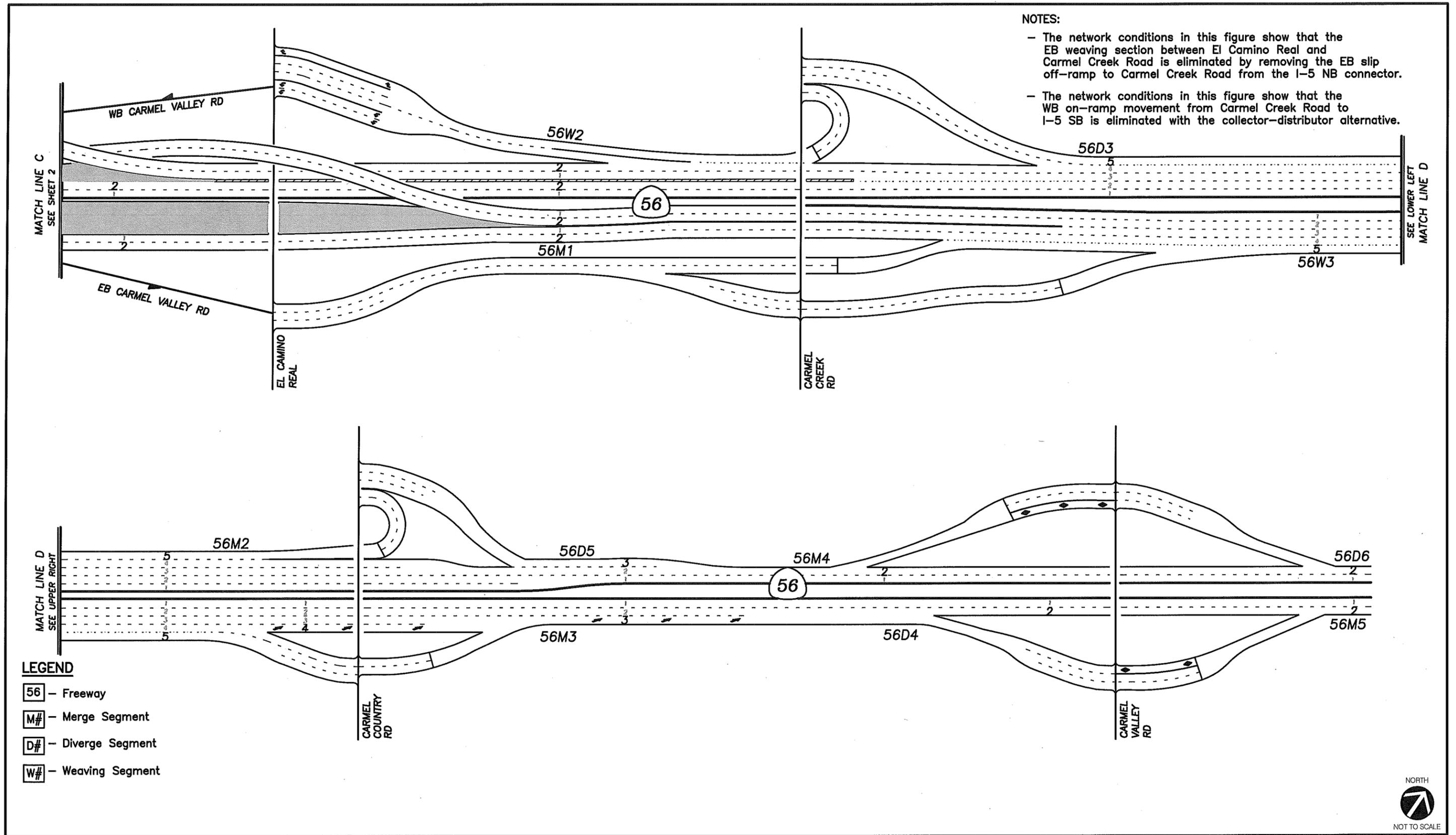
CARMEL MTN RD



REV. 11/30/2009
N:\1500-16\FIGURES\YEAR 2015 HYBRID WITH FLYOVER\1500-16 I-5 WITH FLYOVER.DWG

Figure 4-4i
(SHEET 2 OF 3)

Year 2015 Hybrid with Flyover (Model Run D1) Network Conditions Freeway Facilities



REV. 08/28/2009
 N:\1500-16\FIGURES\YEAR 2015 HYBRID WITH FLYOVER\1500-16 YEAR 2015 SR56 FLYOVER.DWG

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Figure 4-4i
 (SHEET 3 OF 3)

Year 2015 Hybrid with Flyover (Model Run D1) Network Conditions
 Freeway Facilities

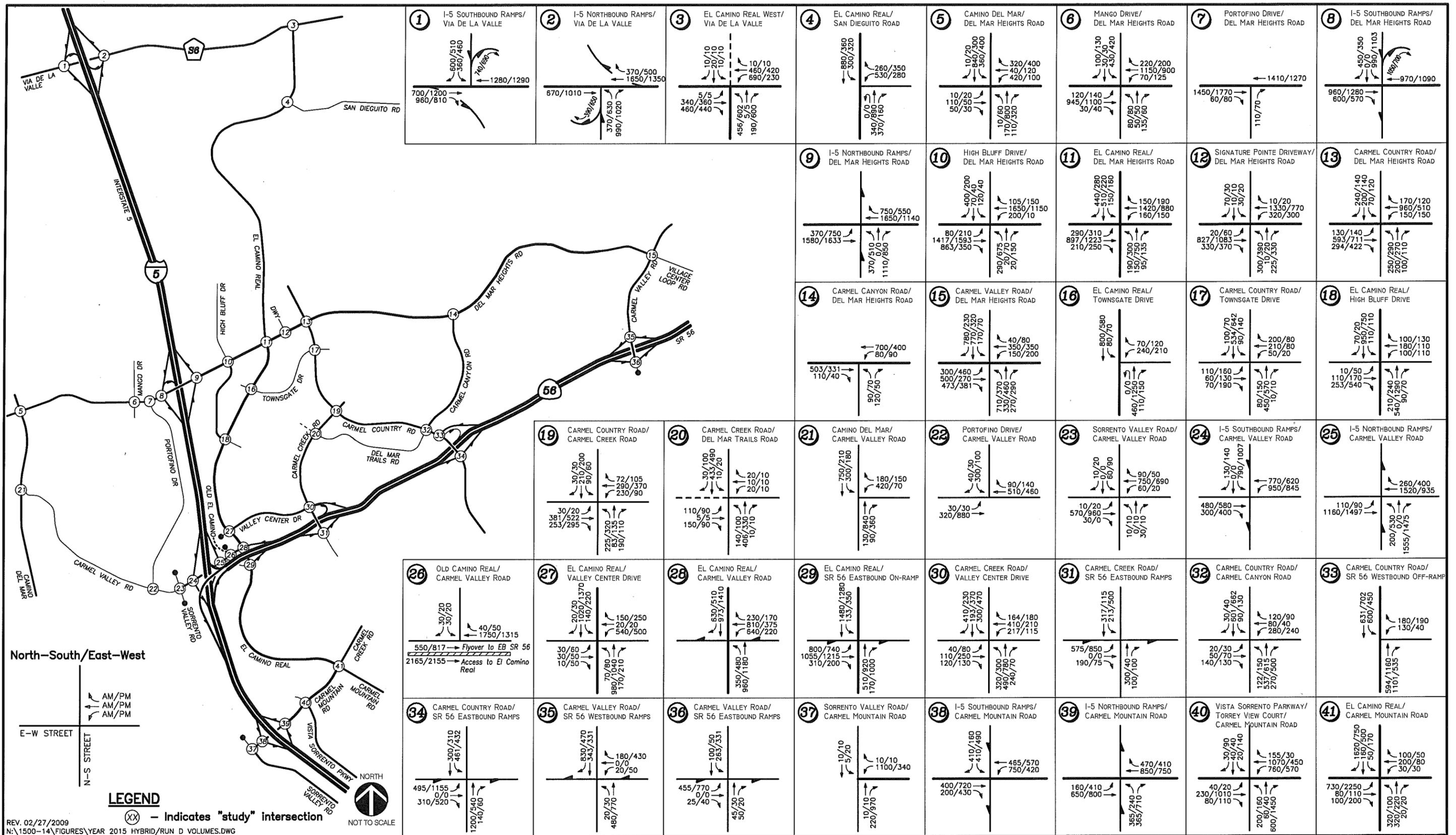
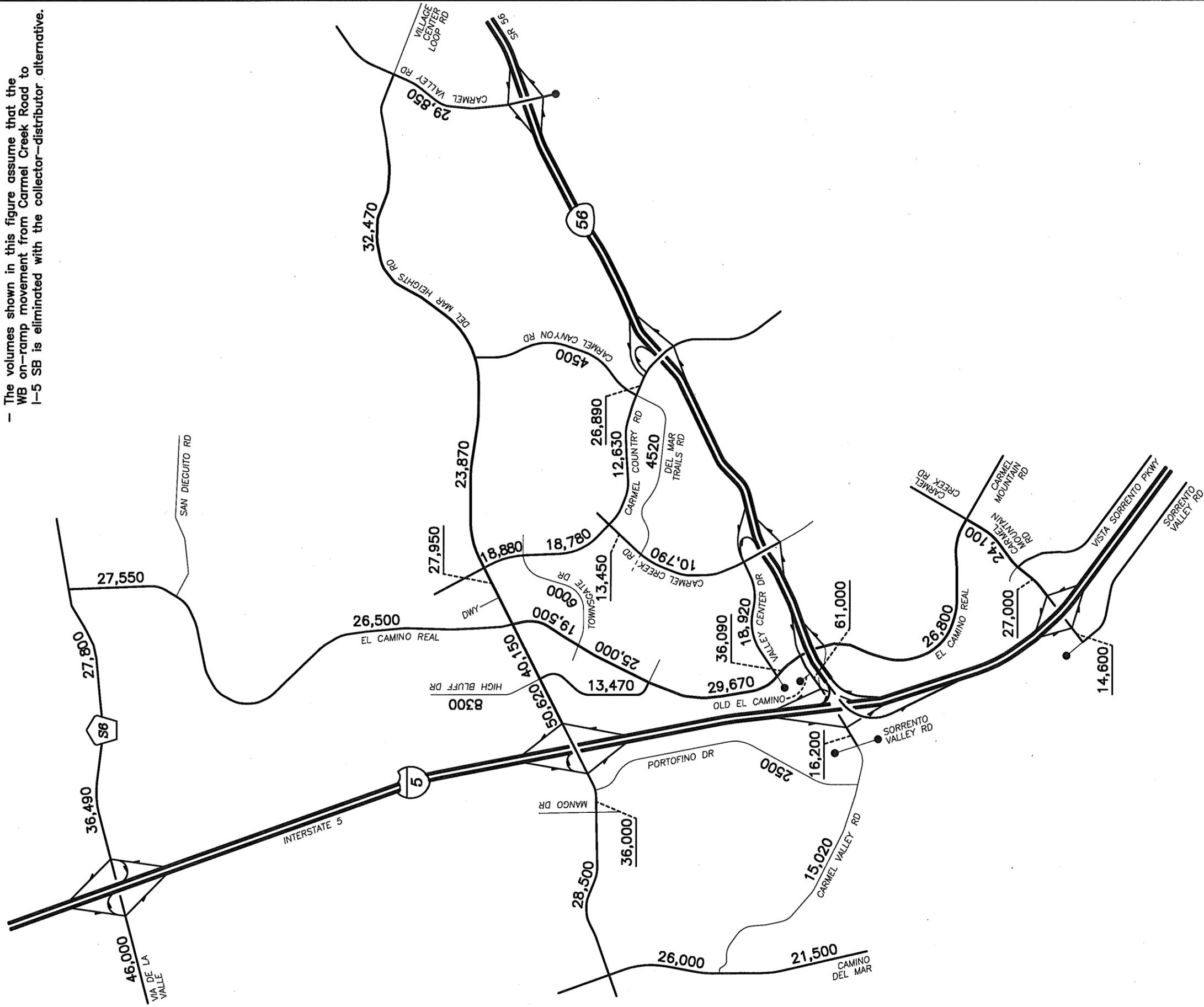


Figure 4-4j

Year 2015 Hybrid with flyover Alternative (Model Run D1) Traffic Volumes Intersections

NOTES:

- ADT (Average Daily Traffic) shown midblock
- The volumes shown in this figure assume that the EB slip off ramp from the I-5 NB connector to Carmel Creek Road is eliminated.
- The volumes shown in this figure assume that the WB on-ramp movement from Carmel Creek Road to I-5 SB is eliminated with the collector-distributor alternative.



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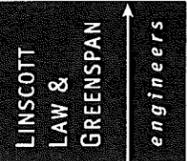
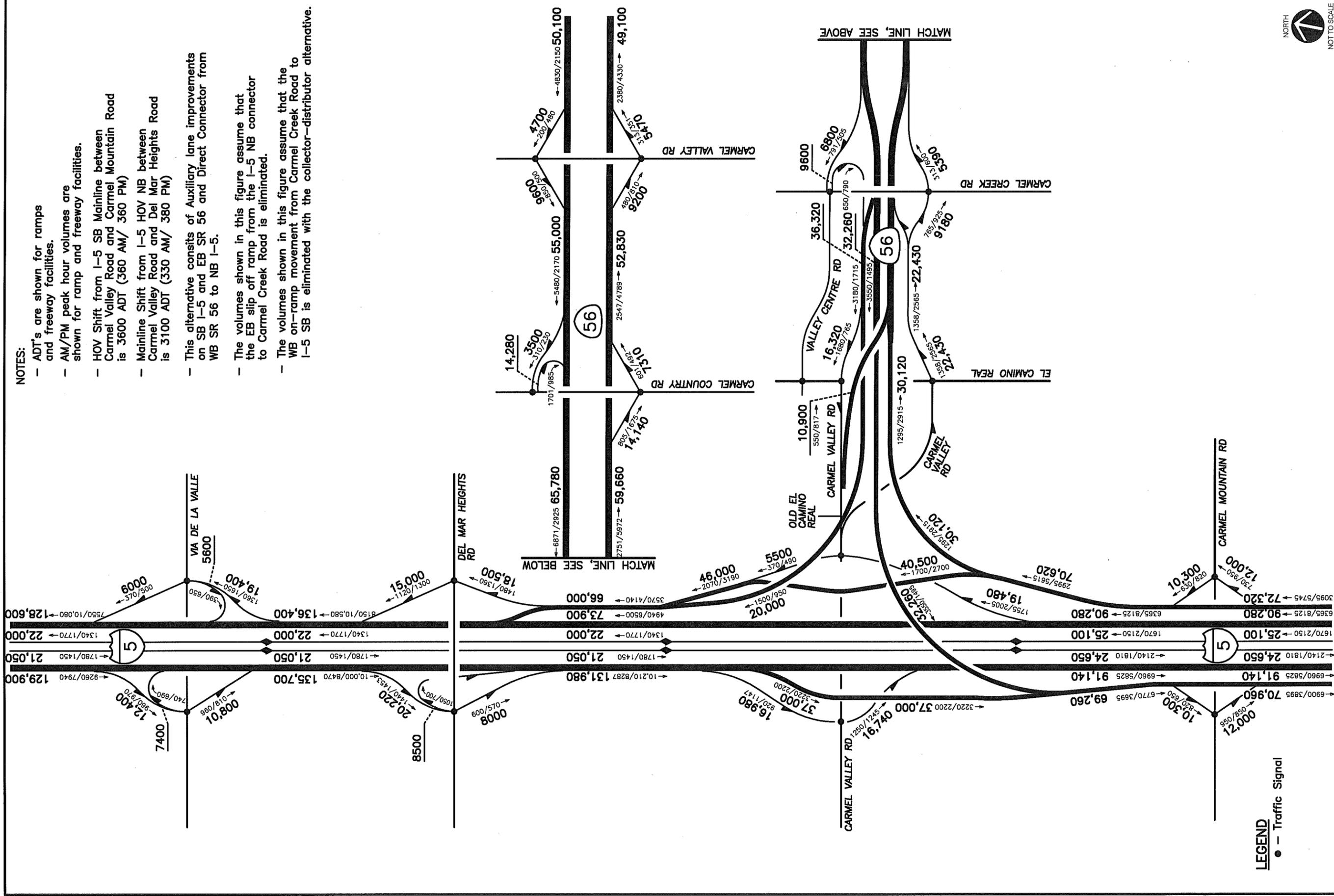


Figure 4-4k
 Year 2015 Hybrid with flyover Alternative (Model Run D1) Traffic Volumes
 Street Segments

NOTES:

- ADT's are shown for ramps and freeway facilities.
- AM/PM peak hour volumes are shown for ramp and freeway facilities.
- HOV Shift from I-5 SB Mainline between Carmel Valley Road and Carmel Mountain Road is 3600 ADT (360 AM/ 360 PM)
- Mainline Shift from I-5 HOV NB between Carmel Valley Road and Del Mar Heights Road is 3100 ADT (330 AM/ 380 PM)
- This alternative consists of Auxiliary lane improvements on SB I-5 and EB SR 56 and Direct Connector from WB SR 56 to NB I-5.
- The volumes shown in this figure assume that the EB slip off ramp from the I-5 NB connector to Carmel Creek Road is eliminated.
- The volumes shown in this figure assume that the WB on-ramp movement from Carmel Creek Road to I-5 SB is eliminated with the collector-distributor alternative.



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 N:\1500-14\FIGURES\YEAR 2015 HYBRID\RUN D VOLUMES.DWG

Figure 4-41
 Year 2015 Hybrid with flyover Alternative (Model Run D1) Traffic Volumes
 Freeways and Ramps

4.2 Year 2030

The following section discusses the horizon year (Year 2030) network assumptions and traffic volumes for the various project scenarios.

4.2.1 Year 2030 “No Build Alternative” (Model Run E)

The Year 2030 “No Build” alternative is based on the following assumptions:

- I-5 freeway configuration is planned to include 10 general-purpose lanes (5 lanes in each direction) with 4 managed/ HOV lanes (two lanes in each direction) with direct access ramps (DAR’s) connections to HOV/managed lanes. As per I-5 North Coast Project, the direct access ramps are planned at Voigt Drive, Manchester Avenue, Cannon Road and Oceanside Boulevard at I-5.
- SR-56 freeway configuration in Year 2030 is planned to include 6 general-purpose lanes (3 lanes in each direction) with 2 managed/ HOV lanes (one lane in each direction). This alternative **does not include** the construction of direct connectors (southbound I-5 to eastbound SR-56 and from westbound SR-56 to northbound I-5 connectors).
- No improvements to the local streets are proposed.

LLG used the Year 2030 Direct Connectors (Model Run G) as a baseline for forecasting the Year 2030 No build scenario (Model Run E). LLG coordinated with Caltrans and City to implement a model run to analyze the traffic patterns and traffic distribution. LLG compared the Year 2030 Direct Connector Model (Model Run G) with the Year 2030 No build (Model Run E). The No build Model (Run E) was understating volumes especially at the area of influence (on I-5/Carmel Valley SB off ramp and NB on-ramp). The Year 2030 ramp volumes at Carmel Valley Road were only slightly higher than existing volumes, which was considered not reasonable. Because of the model’s tendency to assign traffic to parallel routes based on “shortest path” and travel times, LLG adopted the same methodology to re-route traffic, which would have used the connector before but would be traveling through local streets now. The re-routing of traffic volumes through local streets was conducted considering a number of factors that included shortest path, traffic signals, classification of roadway, origin and destination patterns etc.

Based on a comparison of model volumes between Year 2030 Direct Connector (Run G) versus Year 2030 No Build (Run E), the Run G volumes show an increase of approximately 8700 ADT on SR-56 — East of Carmel Valley Road. LLG agrees with the City of San Diego that these are new trips that are attracted due to the presence of the direct connectors and would use different routes like I-15 or SR-78 with a “no connectors” situation. The new volume to be re-routed for the Year 2030 No Build is 42,220 ADT (which is 19,220 ADT from the S-E connector + 23,000 W-N connector) minus the 8700 ADT (trips that were using the new connectors before would be using newer routes), which totals to 33,520 ADT.

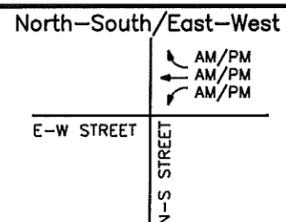
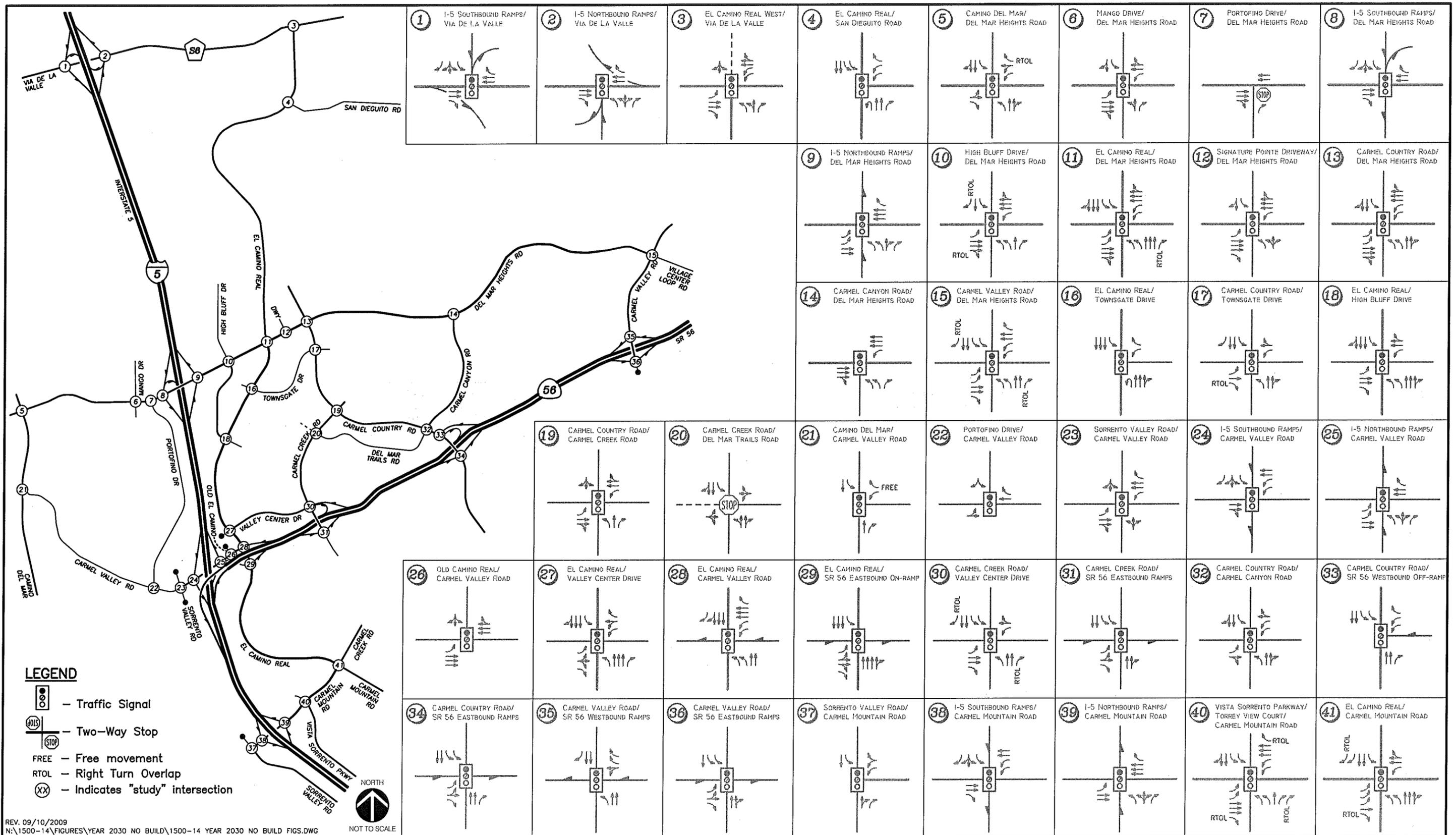
With the cordon stations being Carmel Valley Road on SR-56 and Via de la Valle on I-5, different traffic patterns are anticipated based on distance, travel time, number of signals and congestion on

SR-56. This re-routed 33,520 ADT would use a number of diversions to avoid congestion. LLG in coordination with Caltrans and City of San Diego developed the following traffic route diversions and percentages:

- Route A – Carmel Valley Road NB ramp at I-5 (70%)
- Route B – El Camino Real at SR-56 to Del Mar Heights Road (5%)
- Route C – Carmel Creek Road at SR-56 to Del Mar Heights Road (2%)
- Route D – Carmel Country Road at SR-56 to Del Mar Heights Road (15%)
- Route E – Carmel Valley Road at SR-56 to Del Mar Heights Road (5%)
- Route F – San Dieguito Road to Via de la Valle at I-5 (3%)

LLG coordinated with Caltrans and City of San Diego regarding the forecasting of Year 2030 No Build (Model Run E) intersection peak hour volumes. The Year 2030 Direct Connector (Run G) volumes were used as a baseline and based on the traffic re-routing process described above, the Year 2030 No Build volumes were developed. The forecast volumes were checked for consistency between intersections.

Figure 4-5a, Figure 4-5b and Figure 4-5c illustrate the Year 2030 geometric conditions for the intersections, street segments and freeway facilities. *Figure 4-5d, 4-5e, and 4-5f* illustrate the Year 2030 No build traffic volumes for the intersections, street segments and freeway facilities. *Figure 4-5g* shows the comparison between Year 2030 Direct Connector (Run G) and Year 2030 No Build (Run E) traffic volumes.

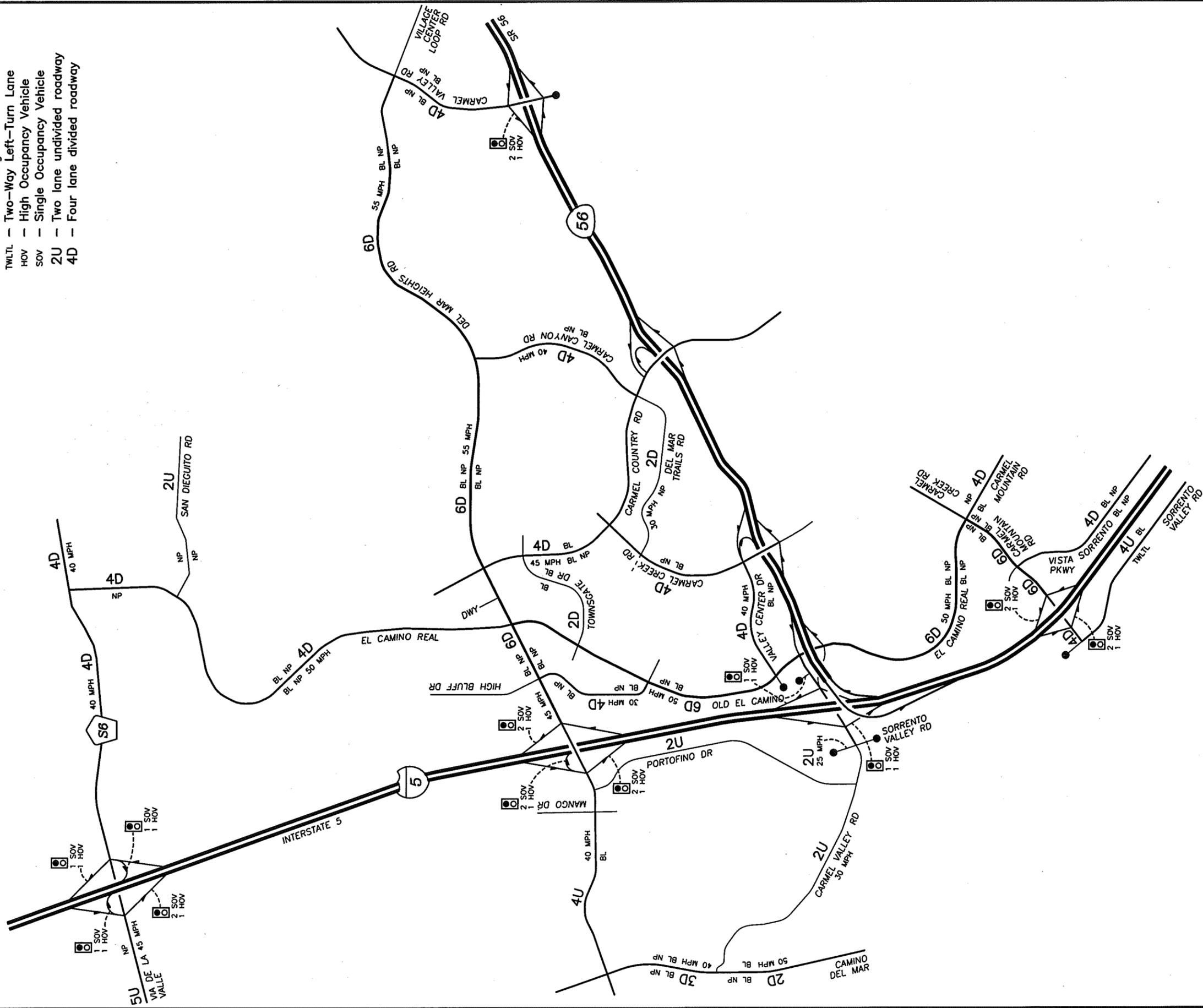


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Figure 4-5a
 Year 2030 "No Build" (Model Run E) Network Conditions
 Intersections

LEGEND

- ◻ Ramp Meter Signal
- BL Bike Lane
- NP No Parking
- TWLT Two-Way Left-Turn Lane
- HOV High Occupancy Vehicle
- SOV Single Occupancy Vehicle
- 2U Two lane undivided roadway
- 4D Four lane divided roadway



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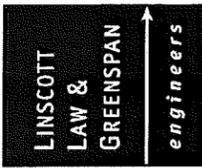
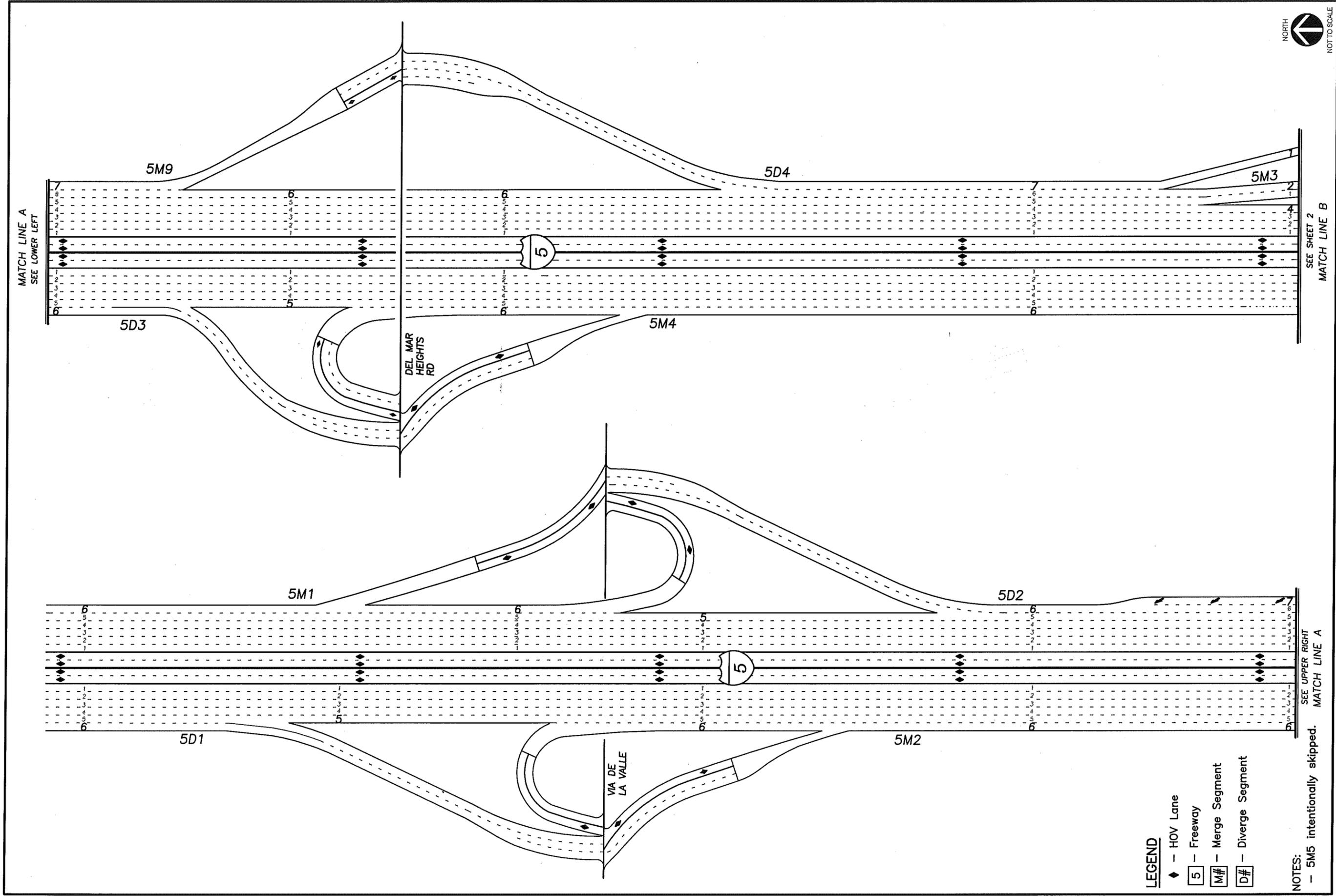


Figure 4-5b
 Year 2030 "No Build" (Model Run E) Network Conditions
 Street Segments



LEGEND

- ◆ - HOV Lane
- ▬ - Freeway
- M# - Merge Segment
- D# - Diverge Segment

NOTES:

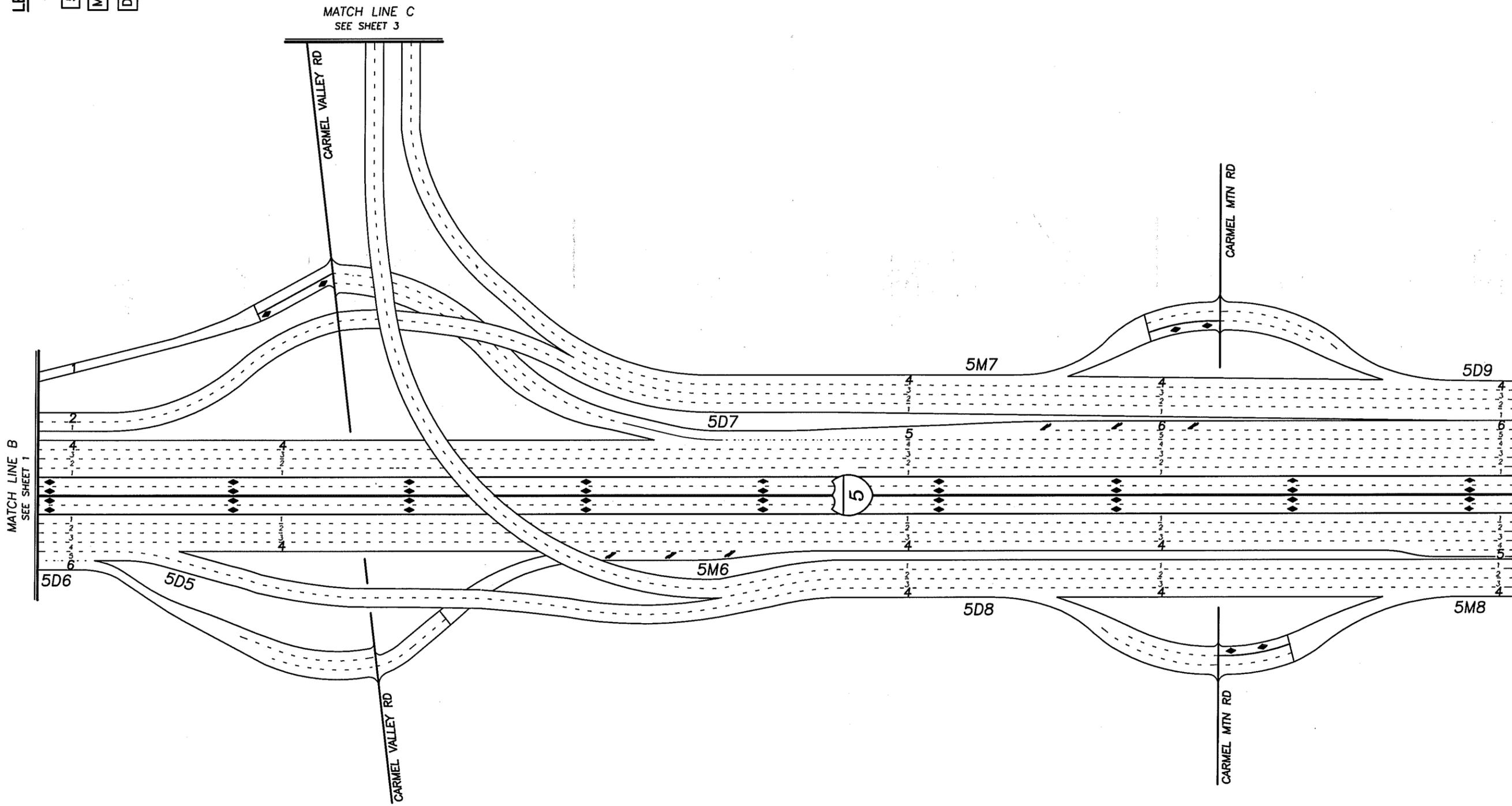
- 5M5 intentionally skipped.

Figure 4-5c
(SHEET 1 OF 3)

**Year 2030 "No Build" (Model Run E) Network Conditions
Freeway Facilities**

LEGEND

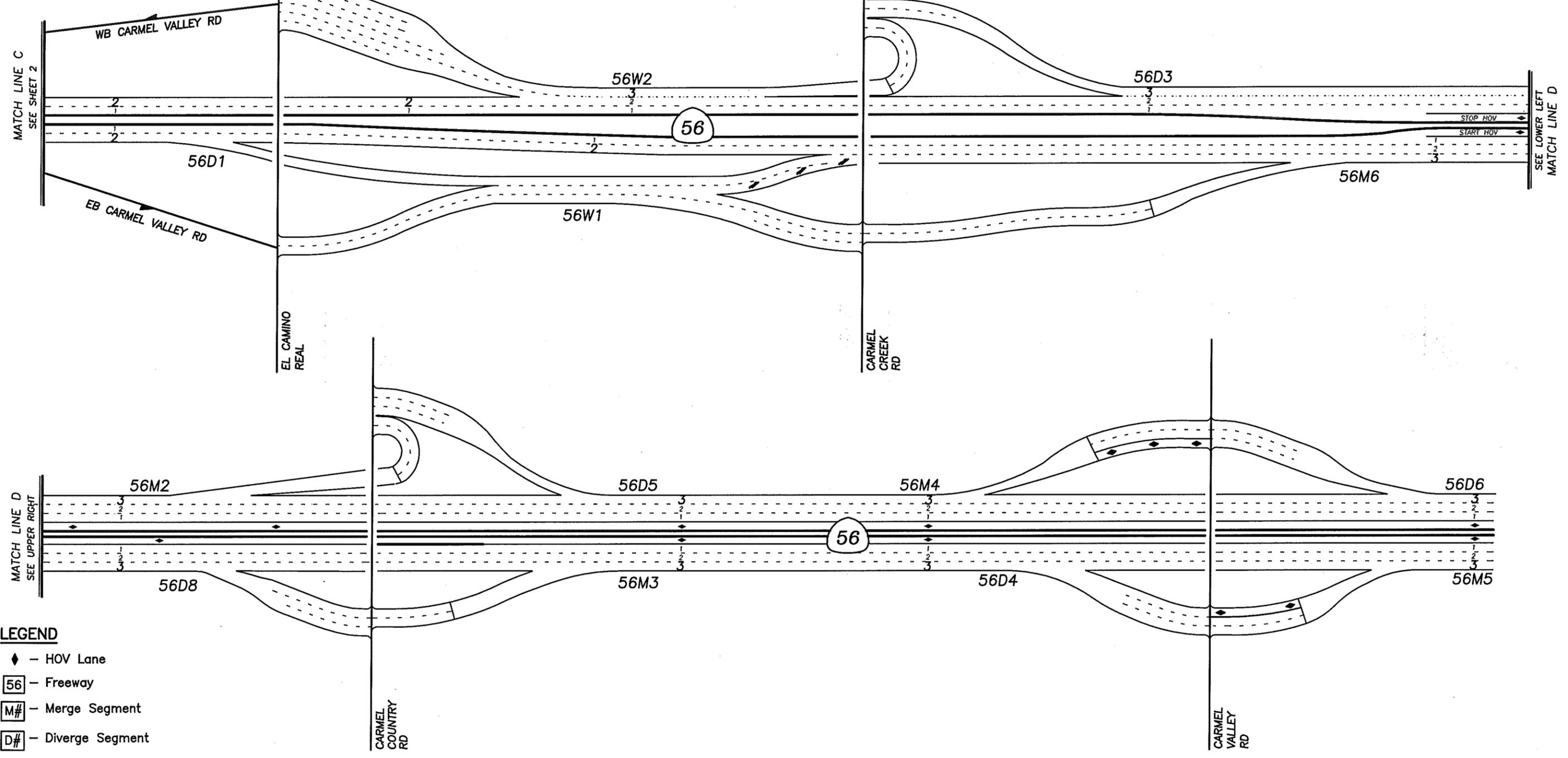
- ◆ - HOV Lane
- 5 - Freeway
- M# - Merge Segment
- D# - Diverge Segment



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Figure 4-5c
(SHEET 2 OF 3)
Year 2030 "No Build" (Model Run E) Network Conditions
Freeway Facilities

NOTES:
 - 56M1 and 56D2 intentionally skipped.

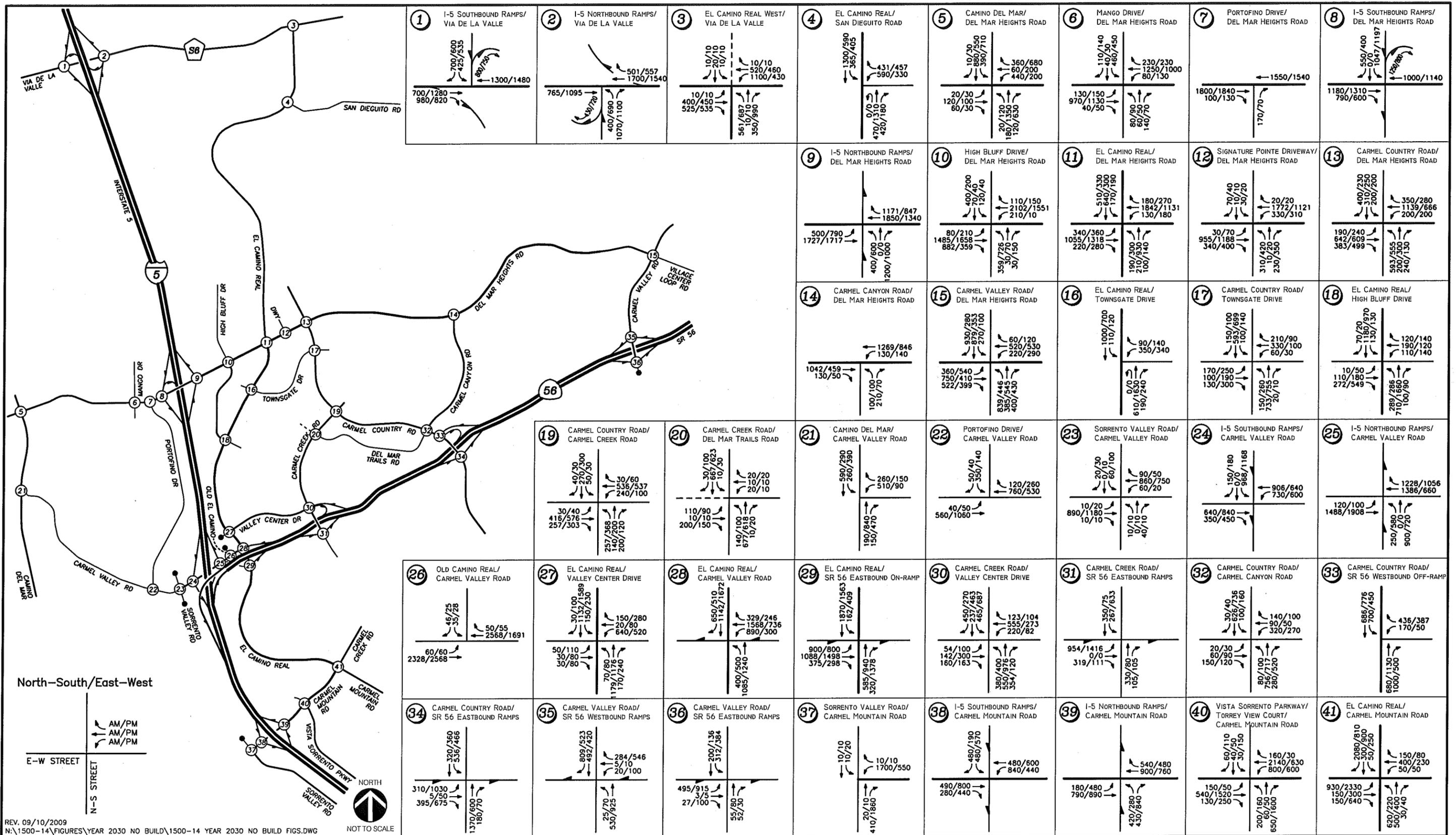


- LEGEND**
- ◆ - HOV Lane
 - 56 - Freeway
 - M# - Merge Segment
 - D# - Diverge Segment
 - W# - Weaving Segment

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Figure 4-5c
 (SHEET 3 OF 3)
 Year 2030 "No Build" (Model Run E) Network Conditions
 Freeway Facilities



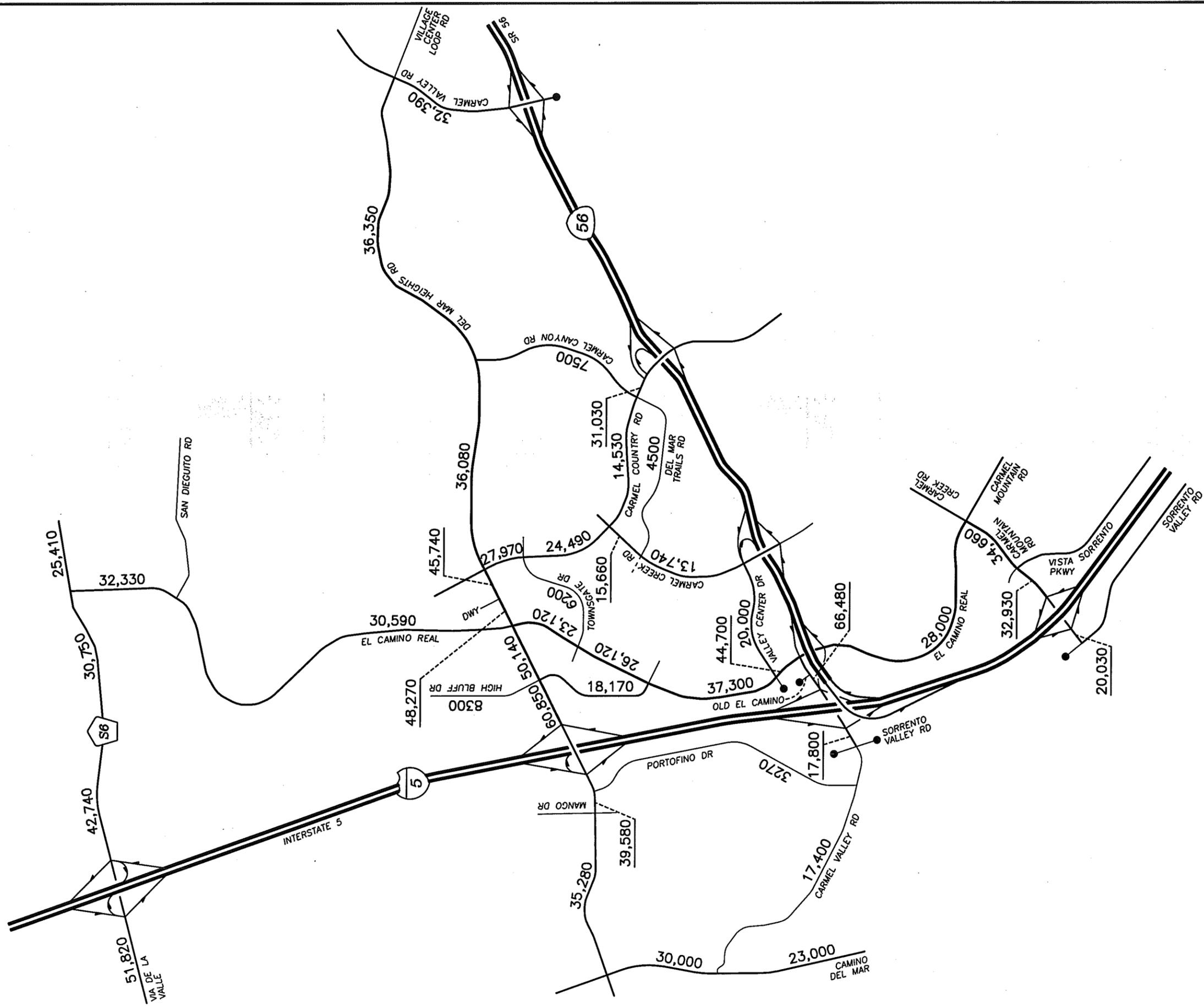
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NOTES:
- AM/PM peak hour volumes are shown at the intersections

LEGEND
ⓧ - Indicates "study" intersection

Figure 4-5d
Year 2030 "No Build" (Model Run E) Traffic Volumes Intersections

NOTES:
 - ADT (Average Daily Traffic)
 shown midblock



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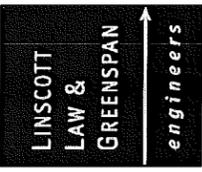
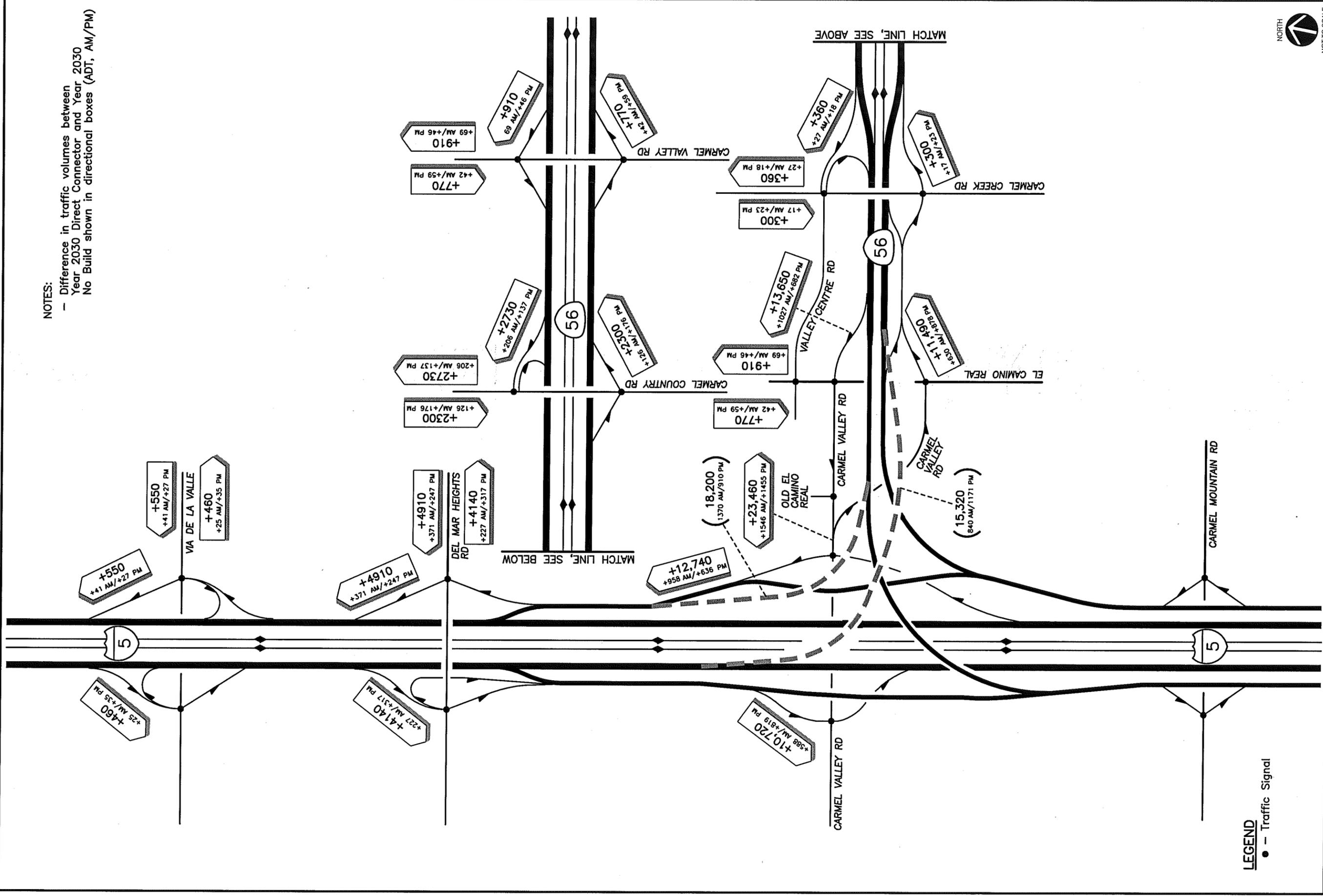


Figure 4-5e
 Year 2030 "No Build" (Model Run E) Traffic Volumes
 Street Segments ADT

NOTES:

- Difference in traffic volumes between Year 2030 Direct Connector and Year 2030 No Build shown in directional boxes (ADT, AM/PM)



LEGEND
● - Traffic Signal



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Figure 4-5g
Year 2030 (Model Run E vs. Model Run G) Traffic Volumes
Freeway and Ramp ADT

4.2.2 Year 2030 “Auxiliary Lane Alternative” (Model Run F)

The Year 2030 “Auxiliary Lane” Alternative scenario is based on the following assumptions:

- I-5 freeway configuration is planned to include 10 general-purpose lanes (5 lanes in each direction) with 4 managed/ HOV lanes (two lanes in each direction) with direct access ramps (DAR’s) connections to HOV/managed lanes. As per I-5 North Coast Project, the direct access ramps are planned at Voigt Drive, Manchester Avenue, Cannon Road and Oceanside Boulevard at I-5.
- SR-56 freeway configuration in Year 2030 is planned to include 6 general-purpose lanes (3 lanes in each direction) with 2 managed/ HOV lanes (one lane in each direction). This alternative **does not include** the construction of direct connectors (southbound I-5 to eastbound SR-56 and from westbound SR-56 to northbound I-5 connectors).

PROPOSED IMPROVEMENTS

The following is a list of freeway and local street improvements that are proposed with the Auxiliary Lane Alternative:

- Addition of an auxiliary lane on SB I-5 between Del Mar Heights Road and Carmel Valley Road (*freeway improvement*).
- Addition of an auxiliary lane on WB SR-56 between Carmel Country Road and Carmel Creek Road (*freeway improvement*).
- Addition of a freeway mainline on WB SR-56 between Carmel Creek Road and El Camino Real (*freeway improvement*).
- Reconstruction of Del Mar Heights Road overcrossing (*freeway improvement*).
- Addition of a fourth lane at the SB approach of I-5 SB ramps/Carmel Valley Road and re-striping the SB approach to show dual left-turn lanes, a shared thru-right and an exclusive right-turn lane (*intersection improvement*).
- Addition of a westbound right-turn lane at I-5 Northbound ramps/Carmel Valley Road intersection (*intersection improvement*).
- Widening of the NB I-5 on-ramp at Carmel Valley Road to add a second single occupancy vehicle lane (SOV) (*ramp widening*).
- Addition of a third NB right-turn lane at I-5 Northbound ramps/Carmel Valley Road intersection (*intersection improvement*).
- Addition of a WB thru lane at Old El Camino/ Carmel Valley Road intersection (*intersection improvement*).
- Addition of a fourth EB lane on EB Carmel Valley Road between I-5 NB ramps and El Camino Real. Reconfiguring the EB approach of El Camino Real/SR-56 EB on-ramp to show an exclusive left-turn lane, a shared left-through lane, two through lanes, and two exclusive right-turn lanes (*segment and intersection improvement*).

- Addition of a fourth WB through lane at the intersection of El Camino Real/ SR-56 WB off-ramp and re-striping the approach to show an exclusive left-turn lane, a shared left through lane, three exclusive through lanes and a right-turn lane (*intersection improvement*).

Linscott, Law & Greenspan, Engineers compared the model volumes for the Year 2030 No Build (Run E) and Year 2030 Auxiliary Lane (Run F) alternatives. **Table 4-4** shows the model volumes for both these alternatives and the percent changes along I-5 and SR-56 freeway segments.

**TABLE 4-4
MODEL TRAFFIC VOLUMES – FREEWAY SEGMENTS
RUN F VS. RUN E**

Freeway Segment	Model Average Daily Traffic (ADT)		Difference (δ)	Percent Change (Increase/Decrease)
	Year 2030 No Build (Run E)	Year 2030 Aux.Lane (Run F)		
I-5 NB Mainline				
Carmel Valley Road to Del Mar Heights Road	174,121	177,105	2,984	+1.7%
Del Mar Heights Road to Via de la Valle	170,106	174,702	4,596	+2.7%
I-5 SB Mainline				
Via de la Valle to Del Mar Heights Road	182,396	184,309	1,913	+1.0%
Del Mar Heights Road to Carmel Valley Road	182,358	185,079	2,721	+1.5%
SR-56 EB				
El Camino Real to Carmel Creek Road	61,174	60,208	966	-1.6%
Carmel Creek Road to Carmel Country Road	58,599	58,543	56	-0.1%
SR-56 WB				
Carmel Country Road to Carmel Creek Road	56,751	59,457	2,706	+4.8%
Carmel Creek Road to El Camino Real	59,715	62,167	2,452	+4.1%

General Notes:

- a. Average Daily Traffic Volumes taken from Series 10 Tranplan Model Runs.
- b. All ADT’s are Adjusted volumes from Series 10 Year 2030 No Build and Auxiliary Lane models (AVOL).
- c. These volumes include mainline and HOV lanes.

The results show minor increases in traffic volumes in the Year 2030 Auxiliary Lane (Run F) scenario. Based on discussions with Caltrans and City of San Diego staff, the Year 2030 Auxiliary Lane Alternative (Run F) has been analyzed with the same traffic volumes as Year 2030 No Build (Run E) to get a suitable comparison.

Figures 4-6a, Figure 4-6b and Figure 4-6c illustrate the Year 2030 auxiliary lane alternative geometric conditions. **Figure 4-6d, Figure 4-6e and Figure 4-6f** illustrate the Year 2030 traffic volumes for the intersections, street segment and freeway facilities.

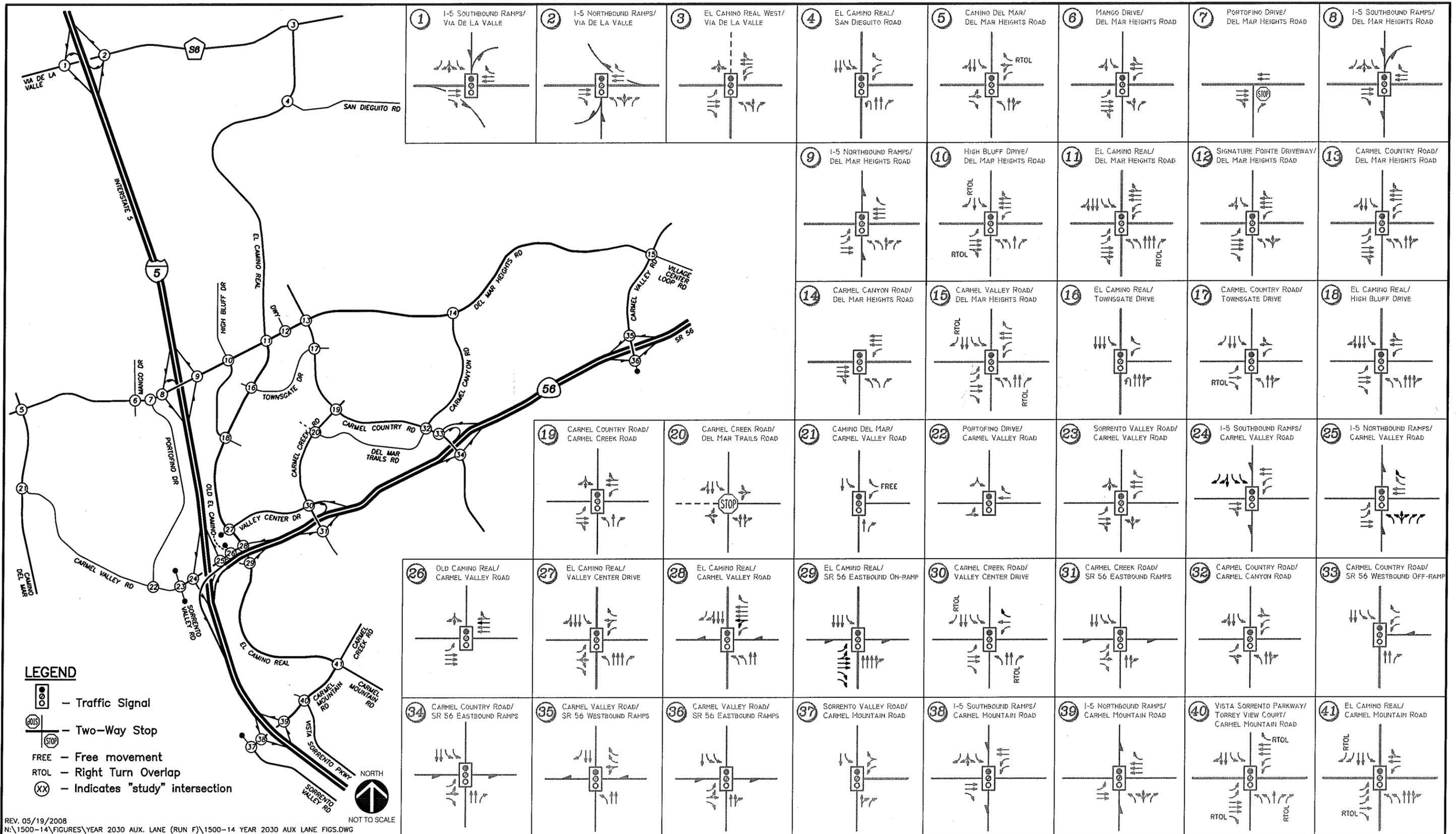
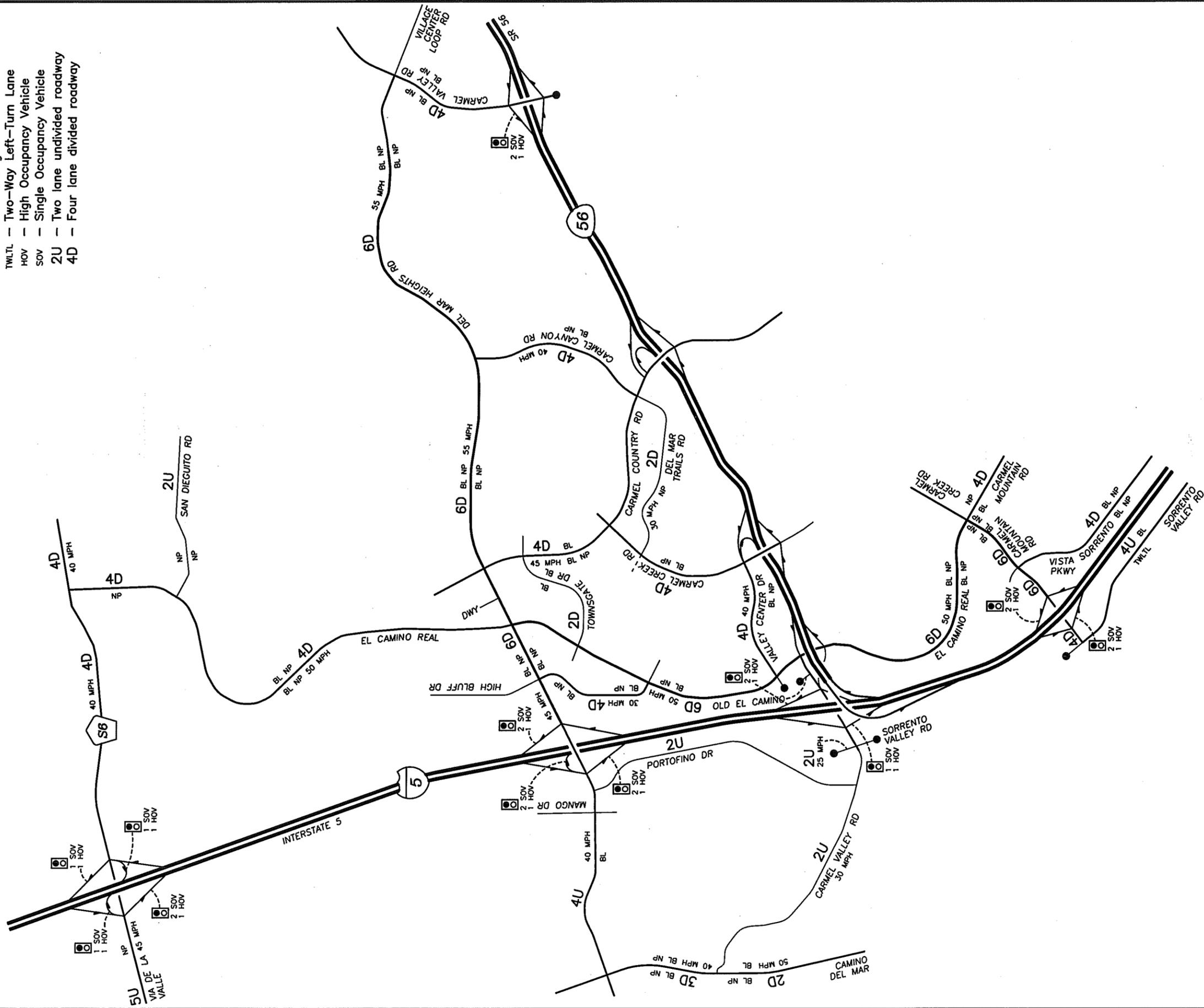


Figure 4-6a
 Year 2030 Auxiliary Lane (Model Run F) Network Conditions
 Intersections

LEGEND

- ◻ Ramp Meter Signal
- BL — Bike Lane
- NP — No Parking
- TWLTL — Two-Way Left-Turn Lane
- HOV — High Occupancy Vehicle
- SOV — Single Occupancy Vehicle
- 2U — Two lane undivided roadway
- 4D — Four lane divided roadway



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Figure 4-6b
 Year 2030 Auxiliary Lane (Model Run F) Network Conditions
 Street Segments

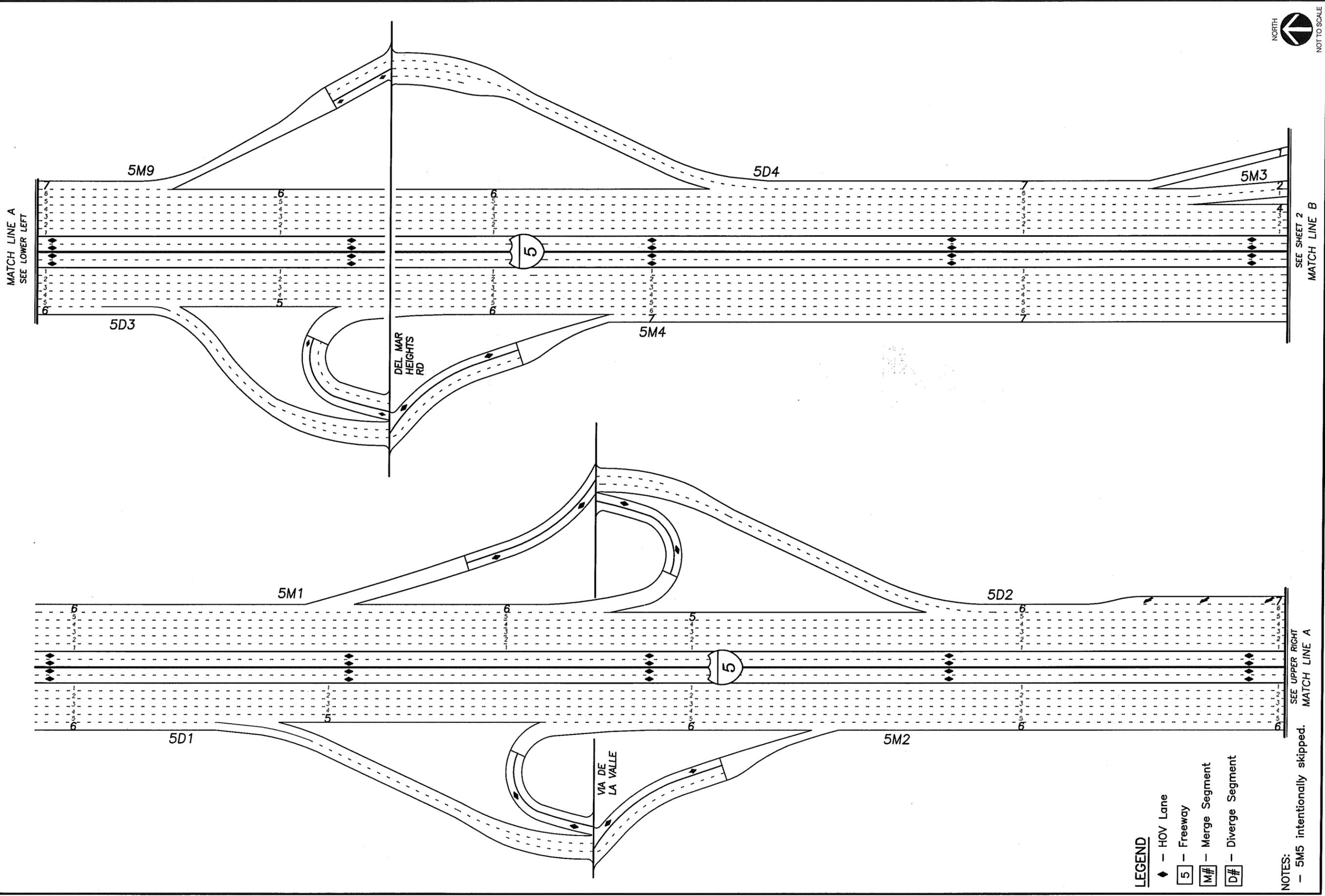


Figure 4-6C
(SHEET 1 OF 3)

Year 2030 Auxiliary Lane (Model Run F) Network Conditions Freeway Facilities

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LEGEND

- ◆ - HOV Lane
- 5 - Freeway
- M# - Merge Segment
- D# - Diverge Segment

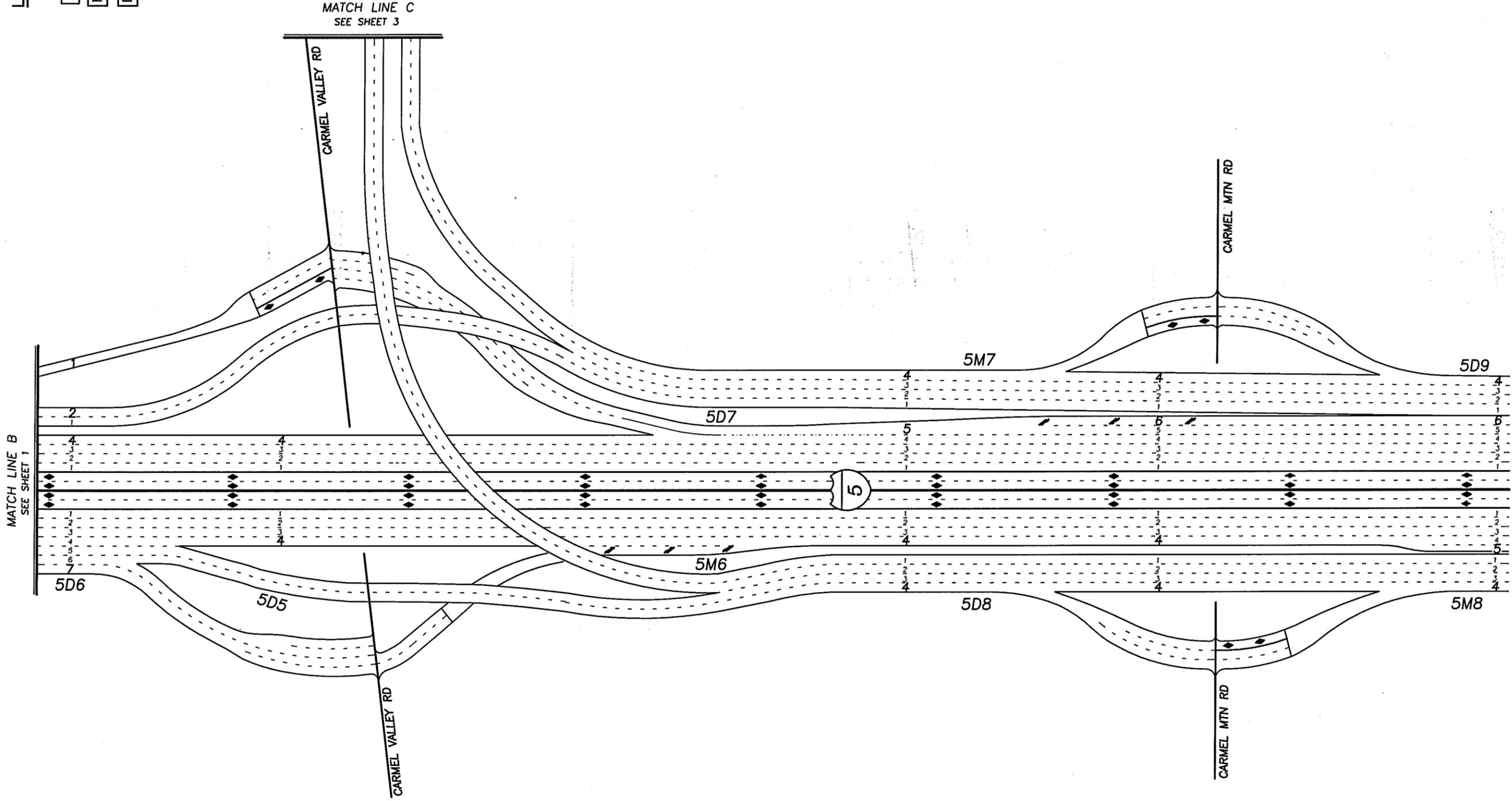
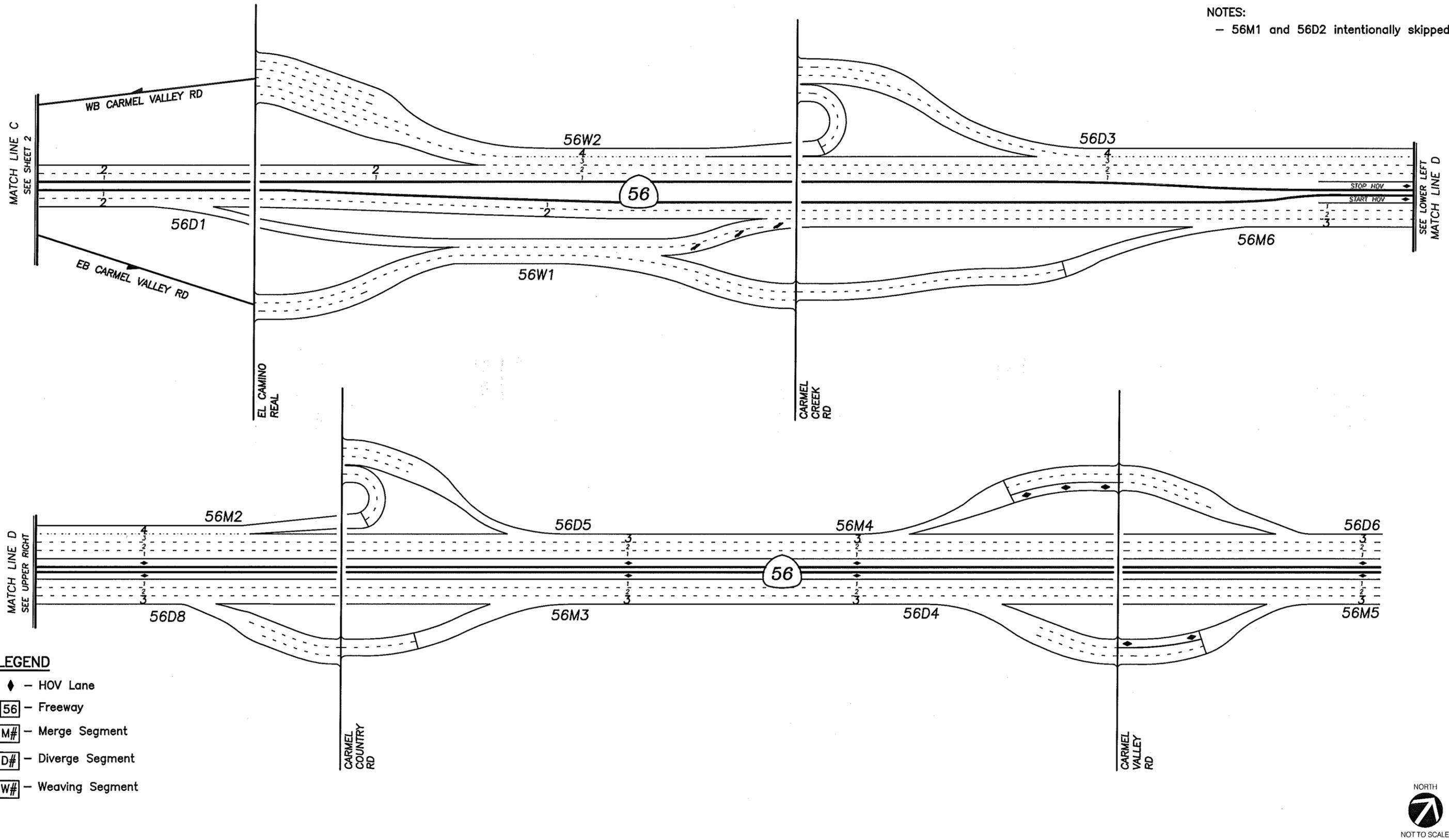


Figure 4-6C
(SHEET 2 OF 3)

**Year 2030 Auxiliary Lane (Model Run F) Network Conditions
Freeway Facilities**

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NOTES:
 - 56M1 and 56D2 intentionally skipped.



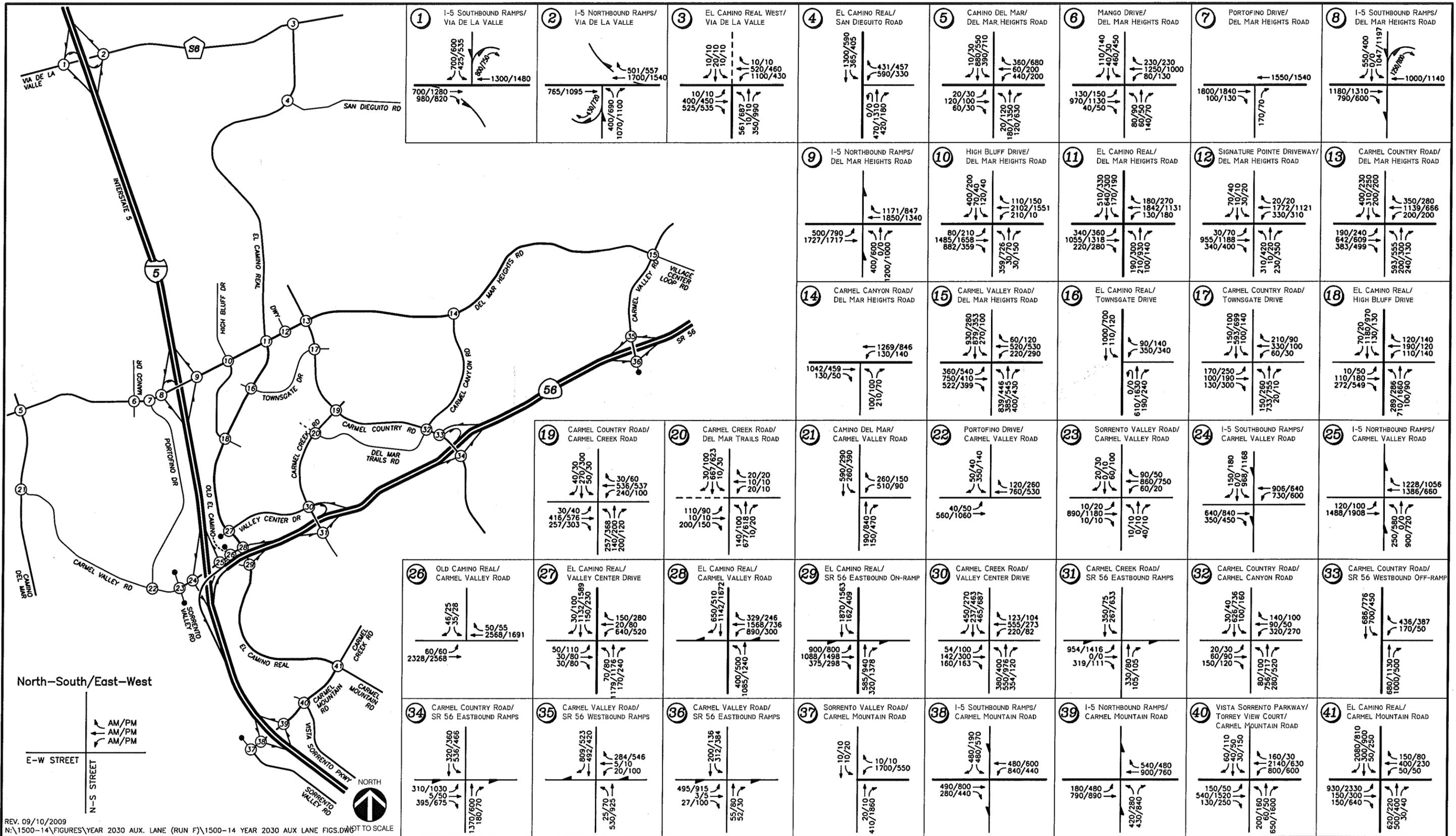
- LEGEND**
- ◆ - HOV Lane
 - 56 - Freeway
 - M# - Merge Segment
 - D# - Diverge Segment
 - W# - Weaving Segment



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Figure 4-6c
 (SHEET 3 OF 3)
 Year 2030 Auxiliary Lane (Model Run F) Network Conditions
 Freeway Facilities



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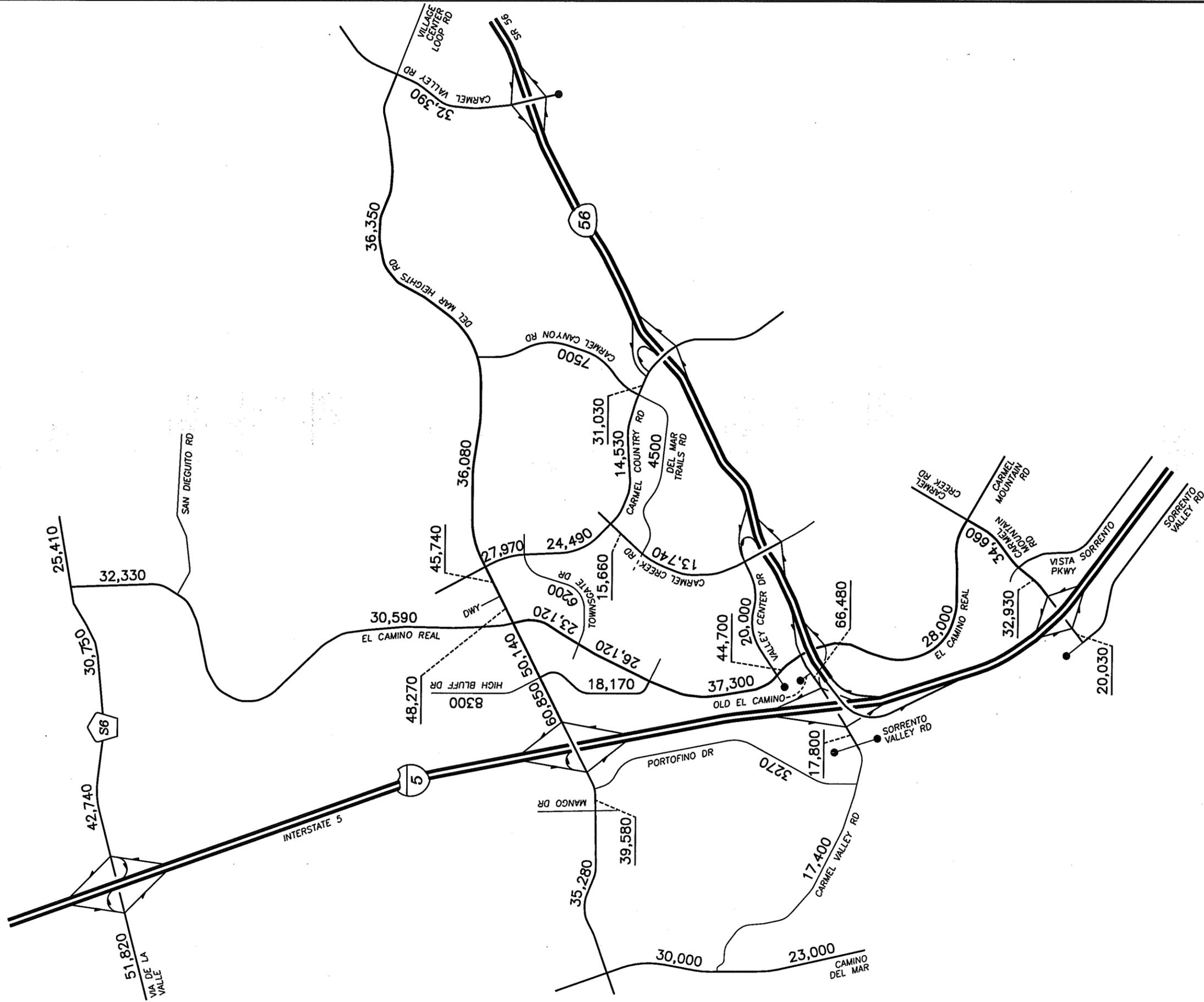
NOTES:
 - AM/PM peak hour volumes are shown at the intersections

LEGEND
 (XX) - Indicates "study" intersection

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Figure 4-6d
 Year 2030 Auxiliary Lane (Model Run F) Traffic Volumes Intersections

NOTES:
 - ADT (Average Daily Traffic)
 shown midblock



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Figure 4-6e
 Year 2030 Auxiliary Lane (Model Run F) Traffic Volumes
 Street Segments ADT

Year 2030 Auxiliary Lane (Run F) Improvement Alternatives

Traffic volumes and an initial operational analysis were completed for the Year 2030 Auxiliary Lane scenario. Section 9.0 of this report discusses the operational analyses for the Year 2030 scenarios. The operational analyses identified the following deficient weaving facilities:

- SR-56 EB – Weaving segment between El Camino Real and Carmel Creek Road (on frontage road)
- SR-56 WB – Weaving segment between Carmel Creek Road and El Camino Real (on mainline).

Based on the above findings, the following improvement alternatives were developed and analyzed to determine if they corrected the deficiencies:

SR-56 EB – WEAVING SEGMENT BETWEEN EL CAMINO REAL AND CARMEL CREEK ROAD (ON FRONTAGE ROAD) – ELIMINATION OF EB SLIP-OFF RAMP TO CARMEL CREEK ROAD (MODEL RUN F2)

Alternative: The weaving analyses for this segment shows failing operations in all the Year 2030 scenarios. The speed and densities along this weaving section are calculated to operate poorly (LOS F) in the Year 2030 Auxiliary Lane alternative. Because of this failing weaving segment between El Camino Real and Carmel Creek, this alternative is analyzed based on the elimination of the EB Slip off-ramp to Carmel Creek Road from the I-5 NB connector.

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LLG in conjunction with the City of San Diego and Caltrans, developed a re-routing traffic pattern that would likely occur with a “no slip off-ramp” situation. LLG believes that the slip off-ramp mainly serves trips intending to travel north on Carmel Creek Road and Carmel Country Road past the SR-56/Carmel Creek interchange. Based on these destinations, the percentages have been determined based on a number of factors including land use, traffic signals, length of route, ramp meter, etc.

- Route A: I-5 NB exit at Carmel Valley Road and eastbound on Carmel Valley Road to Carmel Creek Road – 75%
- Route B: I-5 NB connector to SR-56 EB to Carmel Country Road, left at SR-56 EB ramps/ Carmel Country interchange to travel north on Carmel Country Road – 15%
- Route C: I-5 NB connector to SR-56 EB to Carmel Country Road, left at SR-56 EB ramps/ Carmel Country interchange, right turn at the loop ramp to WB SR-56 exiting at Carmel Creek Road and turn right to head north on Carmel Creek Road – 10%.

Figures 4-6g illustrate the Year 2030 Auxiliary Lane (Run F) SR-56 geometric conditions with the slip off-ramp to Carmel Creek Road eliminated. **Figures 4-6h, Figure 4-6i and Figure 4-6j** illustrate the Year 2030 Auxiliary Lane traffic volumes for the intersections, street and freeway facilities with the slip-off ramp to Carmel Creek Road eliminated. The operational analyses tables discussed in Section 9.0 of this report have been labeled as **F2** for the No EB slip-off ramp scenario.

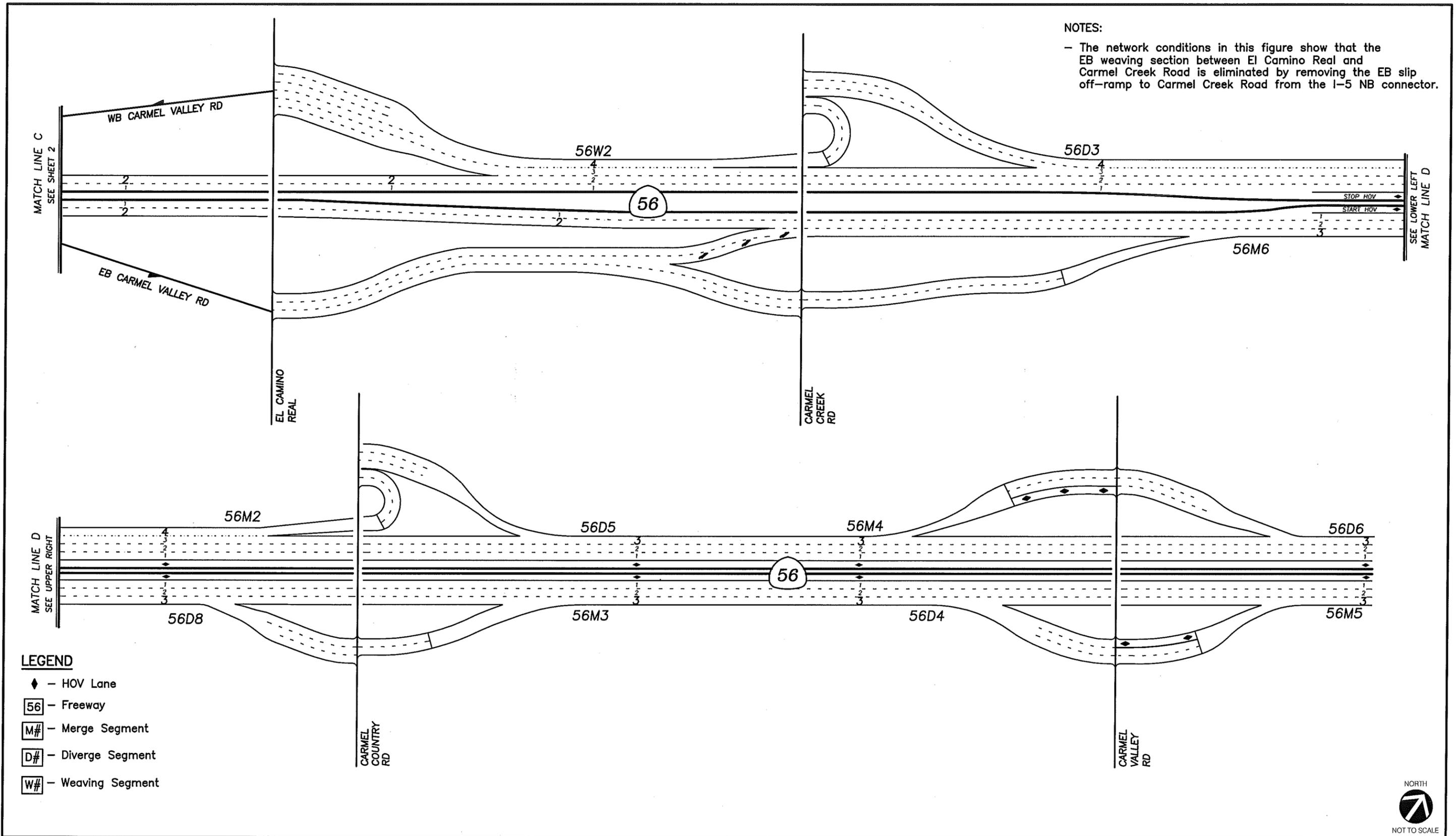


Figure 4-6g
Year 2030 Auxiliary Lane (Model Run F - No EB Slip Off-ramp) Network Conditions
Freeway Facilities

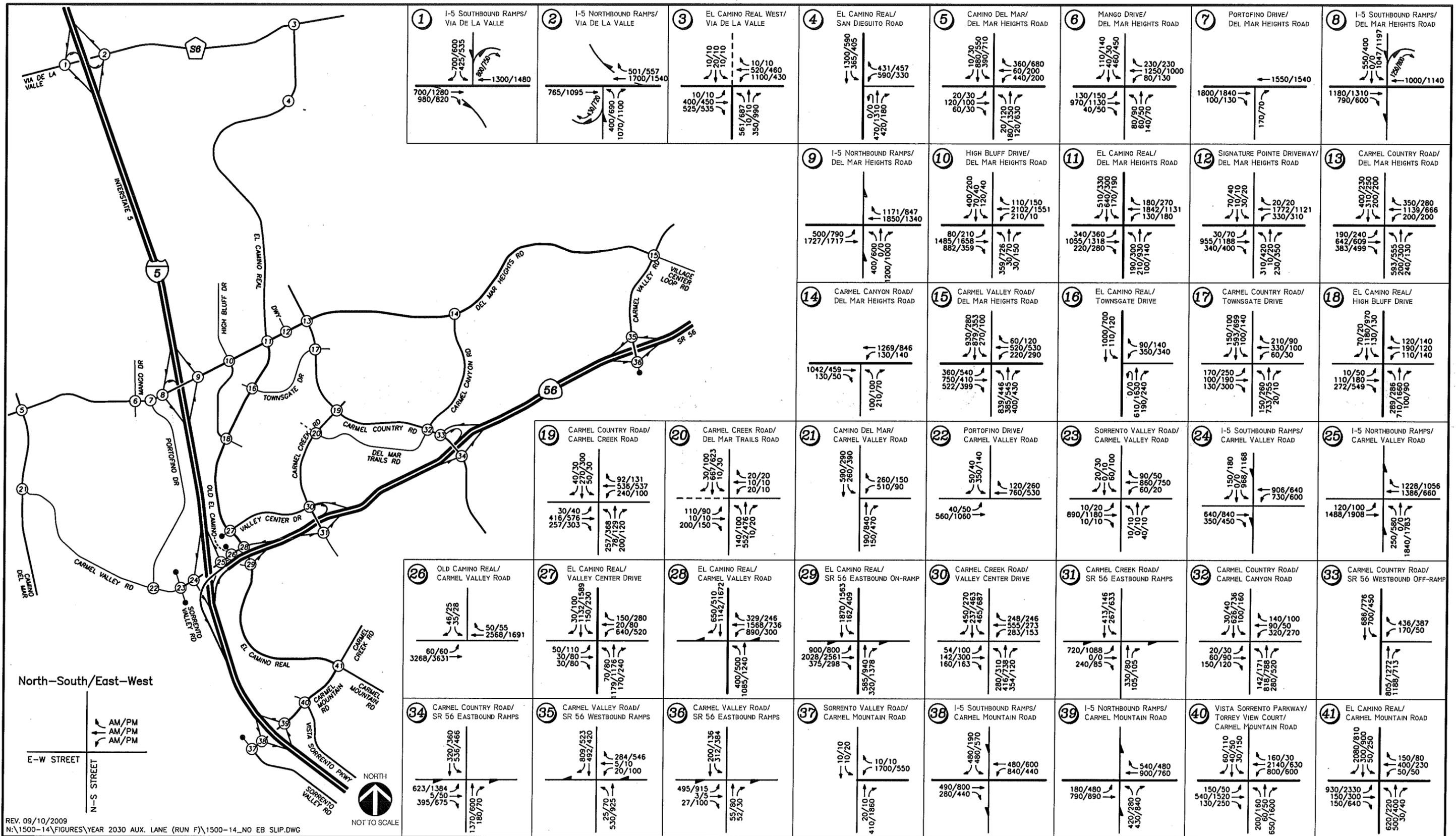
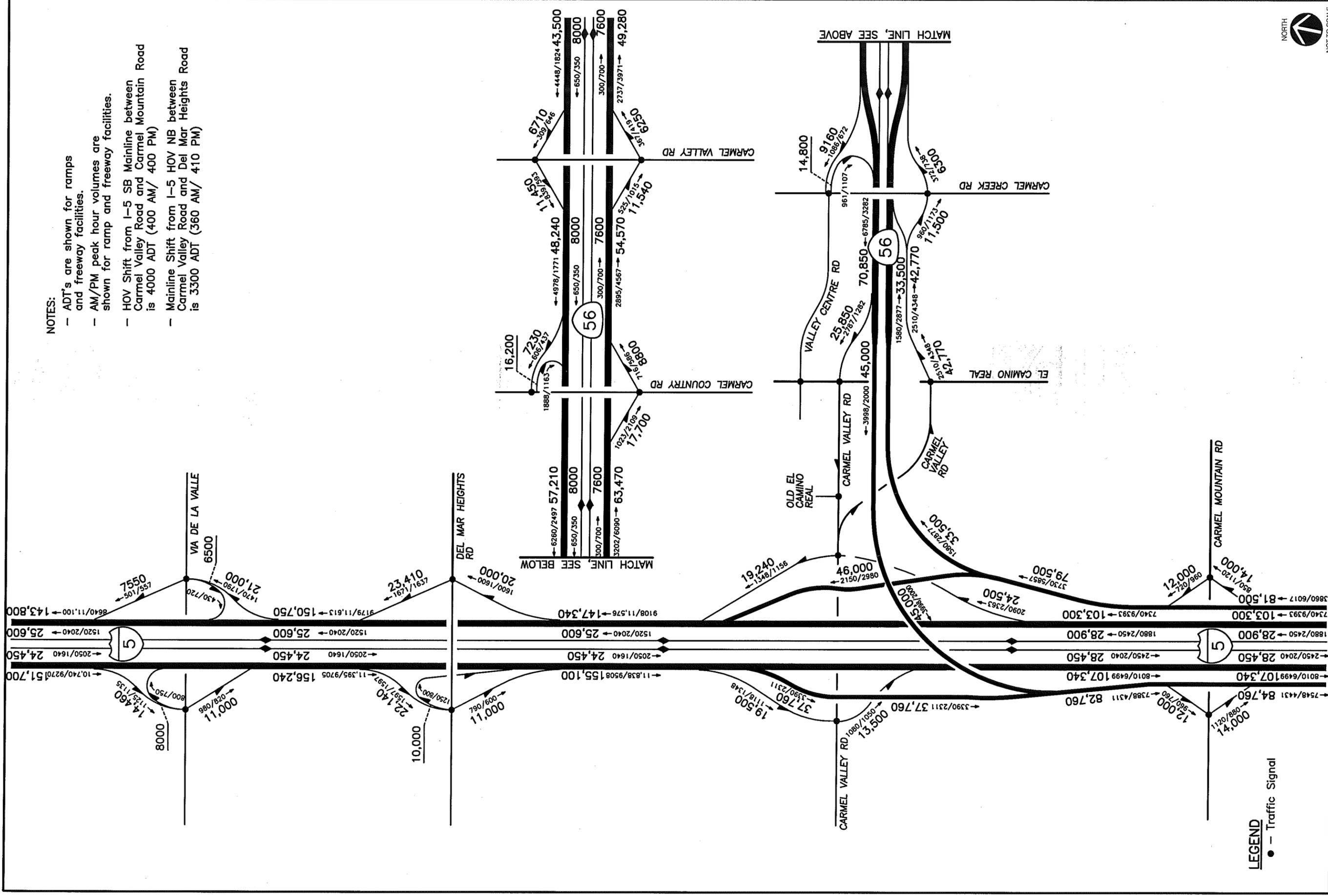


Figure 4-6h
Year 2030 Auxiliary Lane (Model Run F - No EB Slip Off-ramp) Traffic Volumes Intersections

NOTES:

- ADT's are shown for ramps and freeway facilities.
- AM/PM peak hour volumes are shown for ramp and freeway facilities.
- HOV Shift from I-5 SB Mainline between Carmel Valley Road and Carmel Mountain Road is 4000 ADT (400 AM/ 400 PM)
- Mainline Shift from I-5 HOV NB between Carmel Valley Road and Del Mar Heights Road is 3300 ADT (360 AM/ 410 PM)



LEGEND
 • - Traffic Signal



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Figure 4-6j
 Year 2030 Auxiliary Lane (Model Run F - No EB Slip Off-ramp) Traffic Volumes
 Freeway and Ramp ADT

SR-56 WB – WEAVING SEGMENT BETWEEN CARMEL CREEK ROAD AND EL CAMINO REAL – INSTALLATION OF A WB BARRIER (MODEL RUN F3)

Alternative: The weaving analyses for this segment shows failing operations in all the Year 2030 scenarios. The speed and densities along this weaving section are calculated to operate poorly (LOS F) in the Year 2030 Auxiliary Lane alternative. The speed and densities degrade in the Auxiliary lane (Run F) scenario in comparison with the Year 2030 Direct Connector (Run G) scenario. Because of the failing weaving segment between Carmel Creek Road and El Camino Real, this alternative is analyzed based on installing a barrier on SR-56 WB between Carmel Creek Road and El Camino Real, thereby eliminating the weaving problem.

By installing a barrier, vehicles entering the WB loop ramp at Carmel Creek Road would be forced to use exit at El Camino Real and travel through El Camino Real/ Carmel Valley intersection to use I-5 SB. LLG in conjunction with the City and Caltrans, developed a re-routing traffic pattern that would likely occur with a barrier between Carmel Creek Road and El Camino Real. The percentages have been determined based on a number of factors including land use, traffic signals, length of route, ramp meter etc.

- Route A: Carmel Creek loop on-ramp to Carmel Valley Road – 80%
- Route B: Del Mar Trails Road and Carmel Country Road to WB SR-56 – 15%
- Route C: Carmel Creek Road on-ramp to EB SR-56 to exit at Carmel Country Road. Right turn on loop ramp at Carmel Country Road to WB SR-56 (u-turn movement). This would enable the usage of the I-5 NB and SB connectors – 5%.

Figures 4-6k illustrates the Year 2030 Auxiliary Lane (Run F) WB SR-56 geometric conditions with the barrier between Carmel Creek Road and El Camino Real. *Figure 4-6l, Figure 4-6m and Figure 4-6n* illustrate the Year 2030 traffic volumes for the intersections, street and freeway facilities.

The operational analyses tables in Section 8.0 of this report have been labeled as **F3** for the WB barrier scenario.

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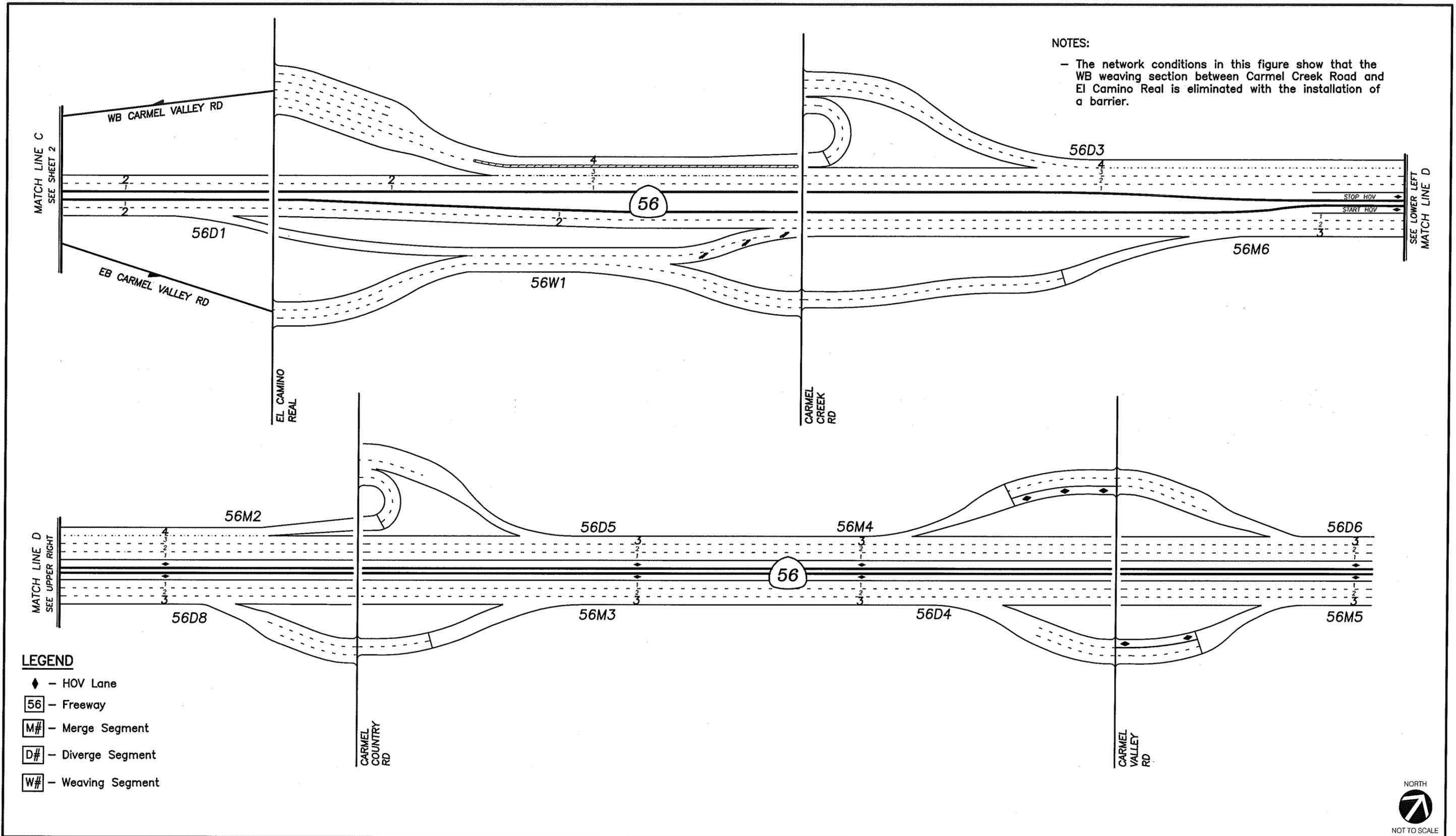
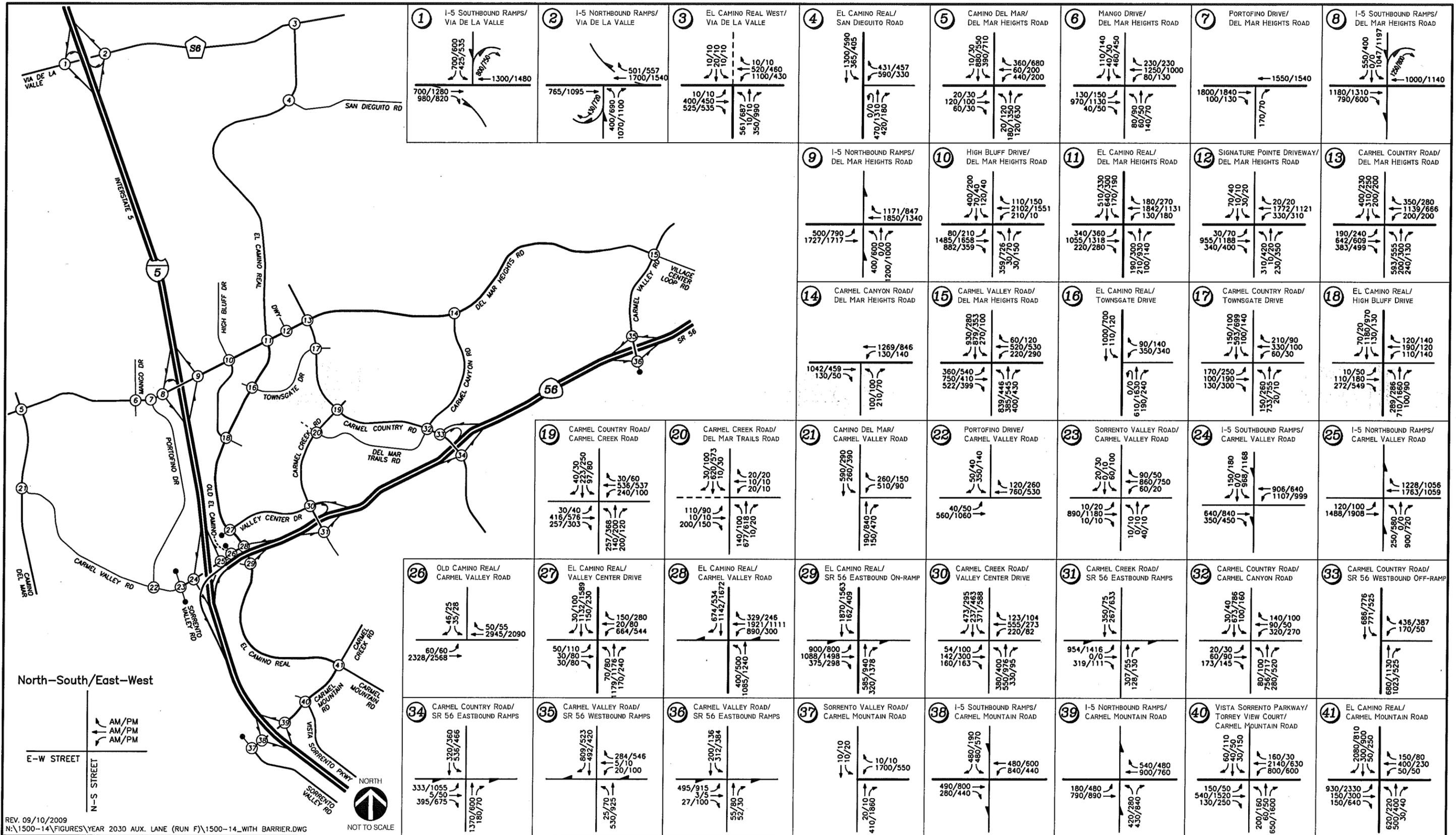


Figure 4-6k
 Year 2030 Auxiliary Lane (Model Run F - With WB Barrier) Network Conditions
 Freeway Facilities



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Figure 4-6I
 Year 2030 Auxilliary Lane (Model Run F - With WB Barrier) Traffic Volumes
 Intersections

COMBINED SCENARIO OF EB SLIP OFF RAMP AT CARMEL CREEK ROAD ELIMINATED AND WB BARRIER BETWEEN CARMEL CREEK ROAD AND EL CAMINO REAL (MODEL RUN F4)

Alternative: This alternative was developed based on the assumption that the EB Slip off-ramp to Carmel Creek Road from the I-5 NB connector would be eliminated and a WB barrier would be installed between Carmel Creek Road and El Camino Real.

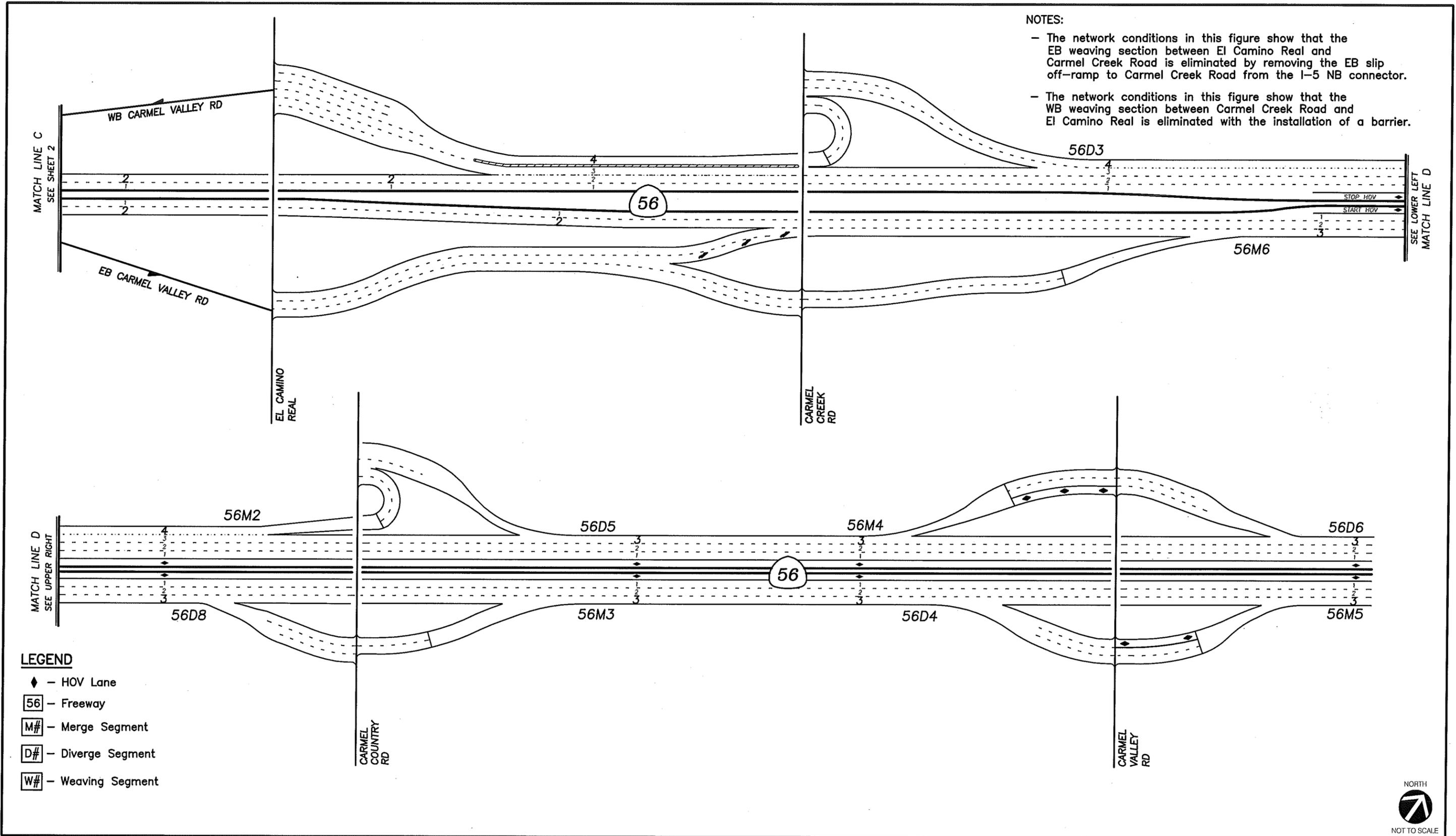
With the elimination of the EB slip-off ramp (thereby eliminating the weaving problem), traffic destined to exit Carmel Creek Road would be forced to use the I-5 NB mainlines, exit Carmel Valley Road and travel through El Camino Real/ Carmel Valley intersection to access Carmel Creek Road off-ramp.

With the installation of a barrier on SR-56 WB between Carmel Creek Road and El Camino Real (thereby eliminating the weaving problem), traffic entering the WB loop ramp at Carmel Creek Road would be forced to exit at El Camino Real and travel through El Camino Real/ Carmel Valley intersection to use I-5 SB.

Figures 4-6p illustrates the Year 2030 SR-56 geometric conditions for the combined scenario. *Figure 4-6q, Figure 4-6r and Figure 4-6s* illustrate the Year 2030 traffic volumes for the intersections, street and freeway facilities.

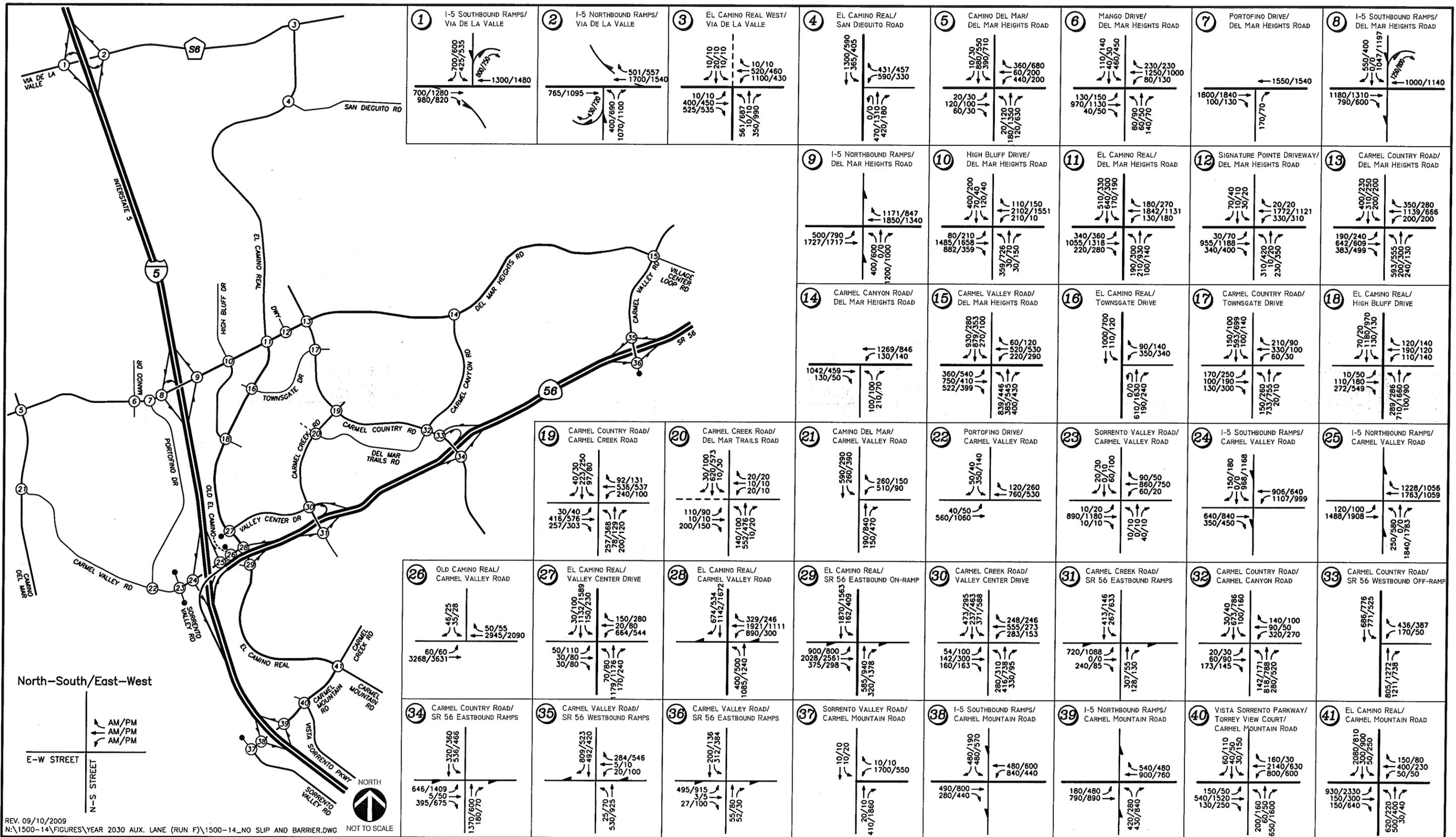
The operational analyses tables in Section 8.0 of this report have been labeled as **F4** for the combined scenario (No EB slip off-ramp + installation of a WB barrier).

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Figure 4-6p
 Year 2030 Auxiliary Lane (Model Run F - No EB Slip Off-ramp with WB Barrier) Network Conditions Freeway Facilities



NOTES:
- AM/PM peak hour volumes are shown at the intersections

LEGEND

(XX) - Indicates "study" intersection

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Figure 4-6q
Year 2030 Auxilliary Lane (Model Run F - No EB Slip Off-Ramp with WB Barrier) Traffic Volumes Intersections

4.2.3 Year 2030 "Direct Connector Alternative" (Model Run G)

The Year 2030 "Direct Connector" Alternative is based on the following assumptions:

- I-5 freeway configuration is planned to include 10 general-purpose lanes (5 lanes in each direction) with 4 managed/ HOV lanes (two lanes in each direction) with direct access ramps (DAR's) connections to HOV/managed lanes. As per I-5 North Coast Project, the direct access ramps are planned at Voigt Drive, Manchester Avenue, Cannon Road and Oceanside Boulevard at I-5.
- SR-56 freeway configuration in Year 2030 is planned to include 6 general-purpose lanes (3 lanes in each direction) with 2 managed/ HOV lanes (one lane in each direction) with the construction of direct connectors from southbound I-5 to eastbound SR-56 and from westbound SR-56 to northbound I-5. This alternative does not include the HOV lanes on these direct connectors.

PROPOSED IMPROVEMENTS

The following is a list of freeway and local street improvements that are proposed with the Direct Connector Alternative:

- Addition of a fourth lane at the SB approach of I-5 SB ramps/Carmel Valley Road and re-striping the SB approach to show dual left-turn lanes, a shared thru-right and an exclusive right-turn lane (*intersection improvement*).
- Addition of a westbound right-turn lane at I-5 Northbound ramps/ Carmel Valley Road intersection (*intersection improvement*).
- Addition of a third NB right-turn lane at I-5 Northbound ramps/Carmel Valley Road intersection (*intersection improvement*).
- Addition of a WB thru lane at Old El Camino/ Carmel Valley Road intersection (*intersection improvement*).
- Addition of a fourth EB lane on EB Carmel Valley Road between I-5 NB ramps and El Camino Real. Reconfiguring the EB approach of El Camino Real/SR-56 EB on-ramp to show an exclusive left-turn lane, a shared left-through lane, two through lanes, and two exclusive right-turn lanes (*segment and intersection improvement*).
- Addition of a fourth WB through lane at the intersection of El Camino Real/ SR-56 WB off-ramp and re-striping the approach to show an exclusive left-turn lane, a shared left through lane, three exclusive through lanes and a right-turn lane (*intersection improvement*).

LLG coordinated with Caltrans and City of San Diego regarding forecasting of Year 2030 (Run G: 10+4) intersection peak hour volumes. The Year 2030 peak hour volumes were developed by the City of San Diego based partially on the existing relationship between ADT and peak hour volumes. The peak hour volumes for the interchanges along I-5 corridor were utilized from the Wilson & Company *I-5 North Coast Corridor Study*. To be consistent, LLG used volumes from these two

sources and forecasted volumes on the remaining roadway segments, intersections, freeway mainline and ramps.

LLG worked with Caltrans to develop Year 2030 "select link assignments". The select link assignments were implemented to find out the traffic pattern and traffic distribution to and from a particular roadway segment or link. The select links were conducted on WB and EB SR-56 between El Camino Real and Carmel Creek, and on NB and SB I-5 bypass between Del Mar Heights Road and Carmel Valley Road. Based on the select link percentages and possible traffic movements in Year 2030, traffic volumes were correspondingly added/ subtracted.

The forecast volumes were checked for consistency between intersections. Several other Traffic Engineering principles and factors such as the neighboring land uses, K-factor and the D-factor were also considered in the development of the volumes.

Figures 4-7a, Figure 4-7b and Figure 4-7c illustrate the Year 2030 geometric conditions for the intersections, street segments and freeway facilities. *Figure 4-7d, Figure 4-7e and Figure 4-7f* illustrate the Year 2030 traffic volumes for the intersections, street segments and freeway facilities.

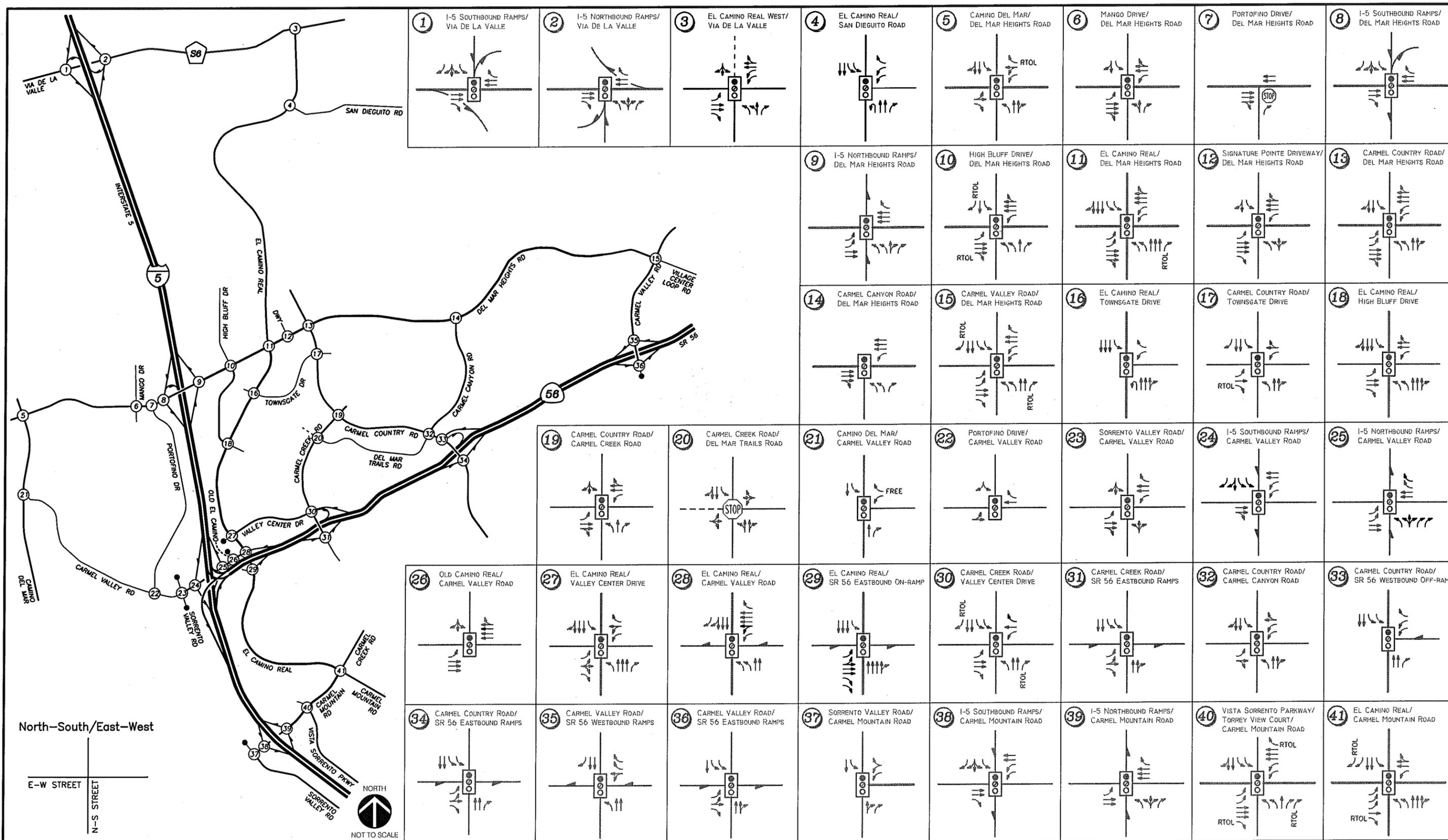


Figure 4-7a

Year 2030 Direct Connector (Model Run G) Network Conditions Intersections

REV. 08/07/2008
 N:\1500-14\FIGURES\EXISTING & YEAR 2030 RUN G (FULL BUILD)\1500-14 EX & RUN G FIGURES.DWG

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LEGEND

- ◻ Ramp Meter Signal
- BL Bike Lane
- NP No Parking
- TWLTL Two-Way Left-Turn Lane
- HOV High Occupancy Vehicle
- SOV Single Occupancy Vehicle
- 2U Two lane undivided roadway
- 4D Four lane divided roadway

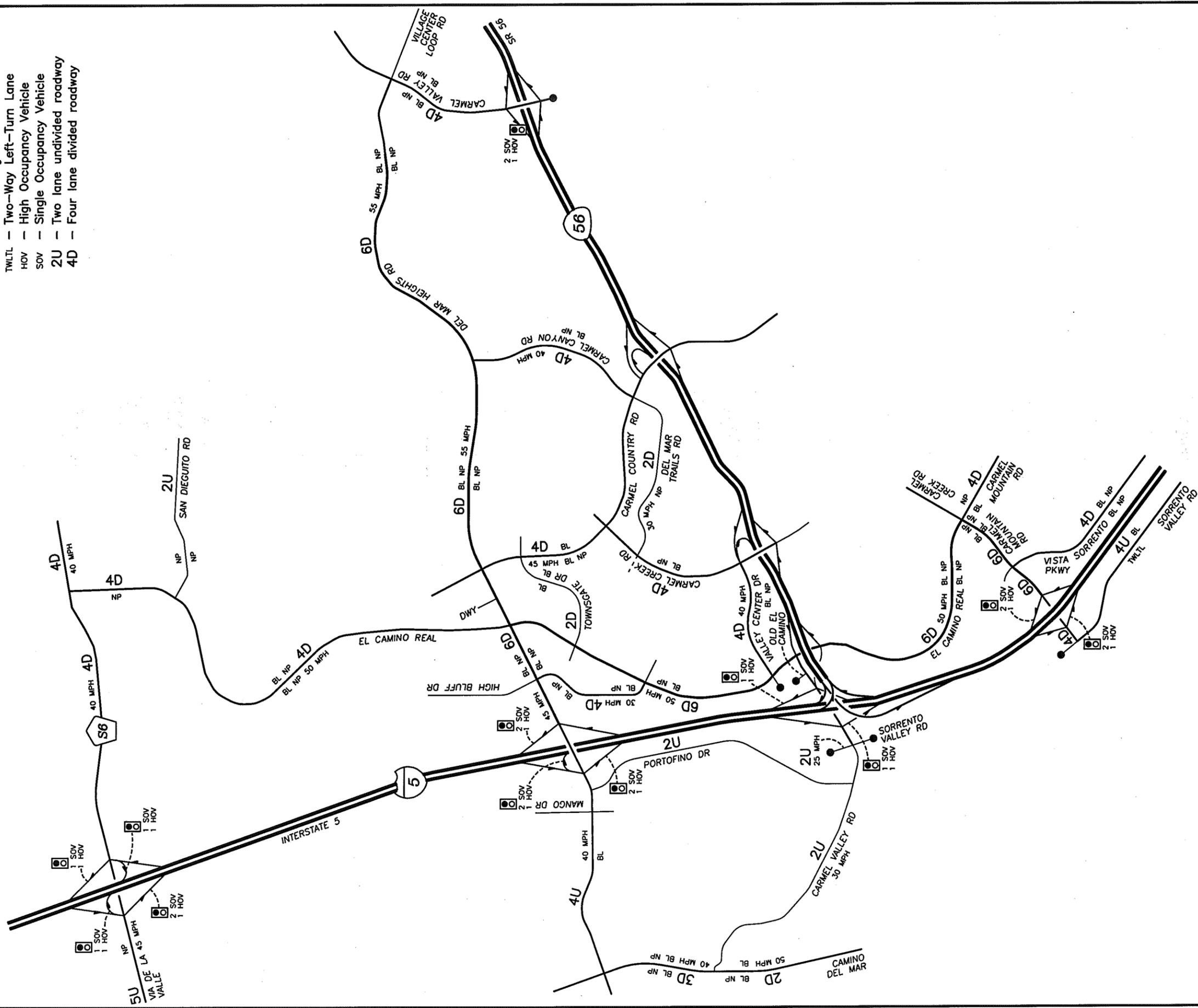
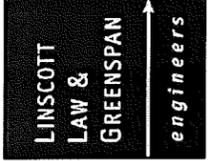


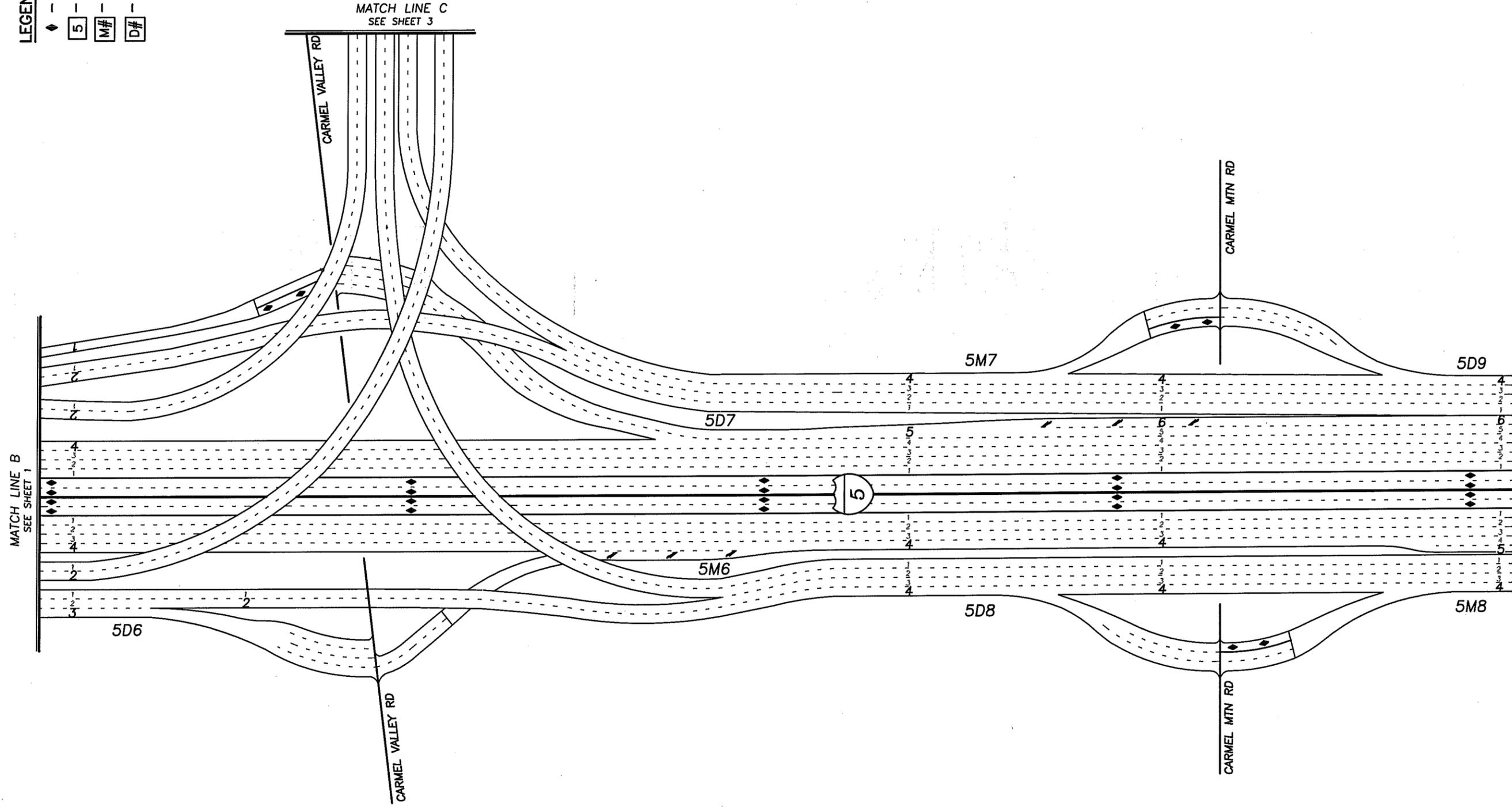
Figure 4-7b
Year 2030 Direct Connector (Model Run G) Network Conditions
Street Segments

REV. 09/10/2009
 N:\1500-14\FIGURES\EXISTING & YEAR 2030 RUN G (FULL BUILD)\1500-14 EX & RUN G FIGURES.DWG



LEGEND

- ◆ - HOV Lane
- 5 - Freeway
- M# - Merge Segment
- D# - Diverge Segment

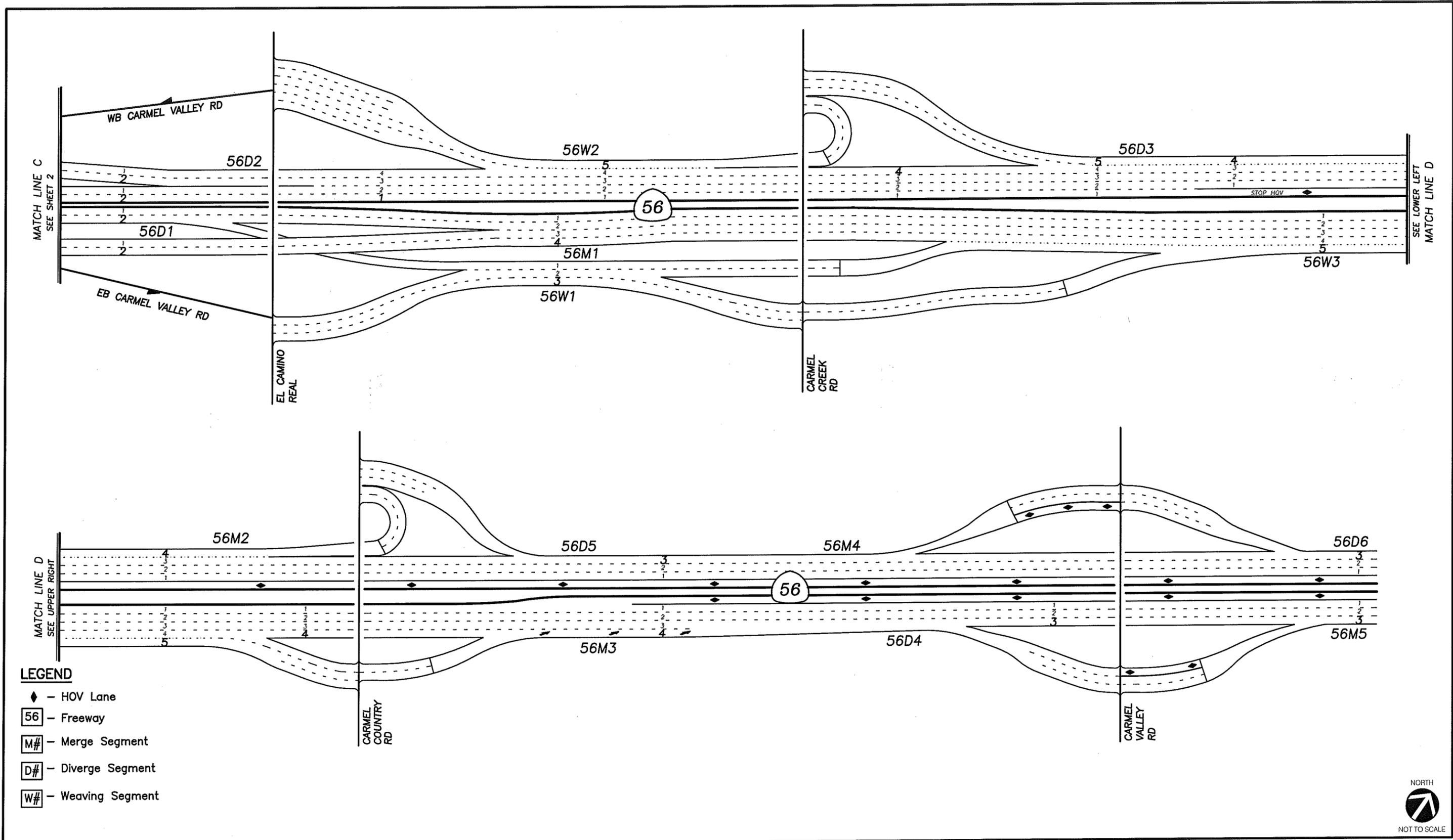


NOT TO SCALE

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 N:\1500-16\FIGURES\YEAR 2030 RUN G\YEAR 2030 RUN G\DECEMBER 2007\1500-16 FIGURES-DEC.DWG

Figure 4-7c
 (SHEET 2 OF 3)

**Year 2030 Direct Connector (Model Run G) Network Conditions
 Freeway Facilities**



- LEGEND**
- ◆ - HOV Lane
 - 56 - Freeway
 - M# - Merge Segment
 - D# - Diverge Segment
 - W# - Weaving Segment

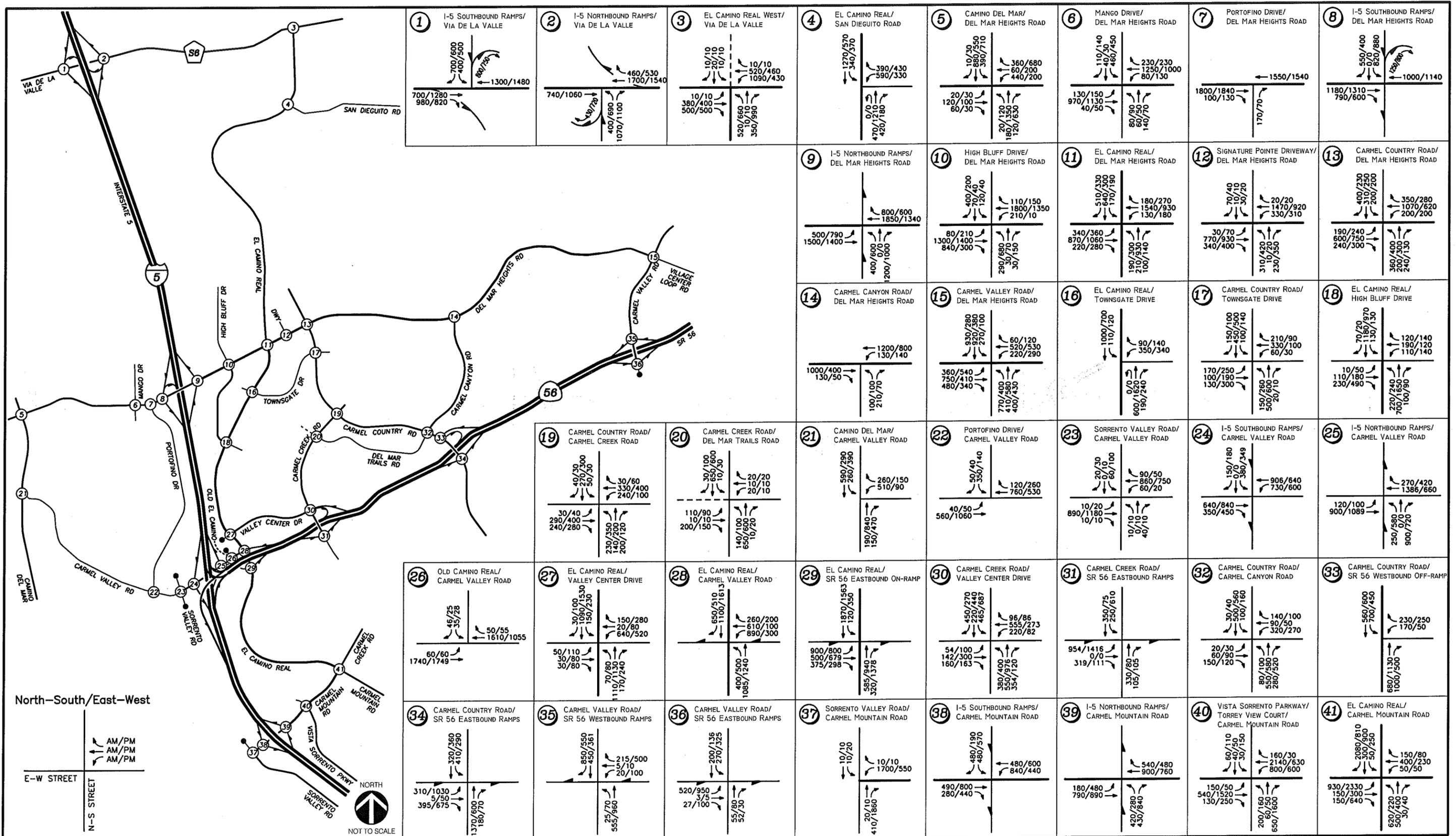


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 N:\1500-16\FIGURES\YEAR 2030 RUN G\YEAR 2030 RUN G\DECEMBER 2007\1500-16 FIGURES-DEC.DWG

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Figure 4-7c
 (SHEET 3 OF 3)

**Year 2030 Direct Connector (Model Run G) Network Conditions
 Freeway Facilities**



REV. 09/10/2009
 N:\1500-14\FIGURES\EXISTING & YEAR 2030 RUN G (FULL BUILD)\1500-14 EX & RUN G FIGURES.DWG

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NOTES:
 - AM/PM peak hour volumes are shown at the intersections

LEGEND
 (XX) - Indicates "study" intersection

Figure 4-7d
 Year 2030 Direct Connector (Model Run G) Traffic Volumes Intersections

NOTES:
 - ADT (Average Daily Traffic)
 shown midblock

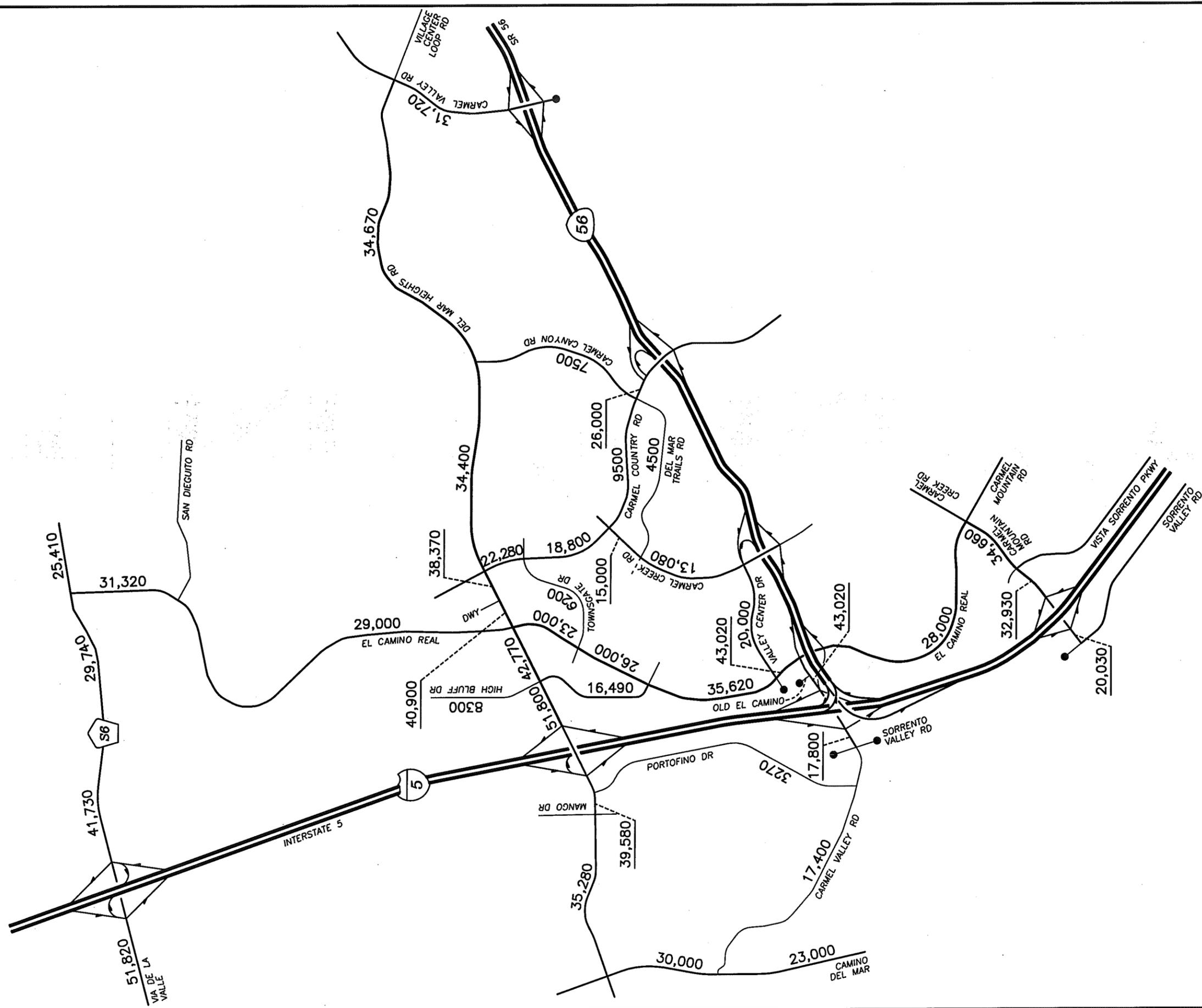
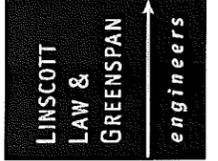


Figure 4-7e
 Year 2030 Direct Connector (Model Run G) Traffic Volumes
 Street Segments ADT

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 N:\1500-14\FIGURES\EXISTING & YEAR 2030 RUN G (FULL BUILD)\1500-14 EX & RUN G FIGURES.DWG



Year 2030 Direct Connector (Run G) Improvement Alternatives

**SR-56 EB – WEAVING SEGMENT BETWEEN EL CAMINO REAL AND CARMEL CREEK ROAD (ON FRONTAGE ROAD) –
ELIMINATION OF EB SLIP OFF-RAMP TO CARMEL CREEK ROAD (MODEL RUN G2)**

Alternative: The weaving section is calculated to operate at LOS F in the Year 2030 Direct Connector (Run G) scenario. Because of this failing weaving segment between El Camino Real and Carmel Creek, this alternative planned to eliminate the EB Slip off-ramp to Carmel Creek Road from the I-5 NB connector. SR-56 EB at the merge of the I-5 NB and SB connectors would be 4 lanes (2 lanes from each connector)

The same re-routing methodology and percentages as discussed in the Year 2030 Auxiliary Lane alternative (Run F2 – Elimination of EB slip off-ramp) were adopted to develop the traffic volumes for the Direct Connectors (Run G2 – Elimination of EB slip off-ramp) scenario.

Figures 4-7g illustrate the Year 2030 Direct Connector (Run G) SR-56 geometric conditions with the slip off-ramp to Carmel Creek Road eliminated. *Figures 4-7h, Figure 4-7i and Figure 4-7j* illustrate the Year 2030 Direct Connector (Run G) traffic volumes for the intersections, street and freeway facilities with “no slip off-ramp” situation.

The operational analyses tables in Section 8.0 of this report have been labeled as **G2** for the “no EB slip-off ramp” scenario.

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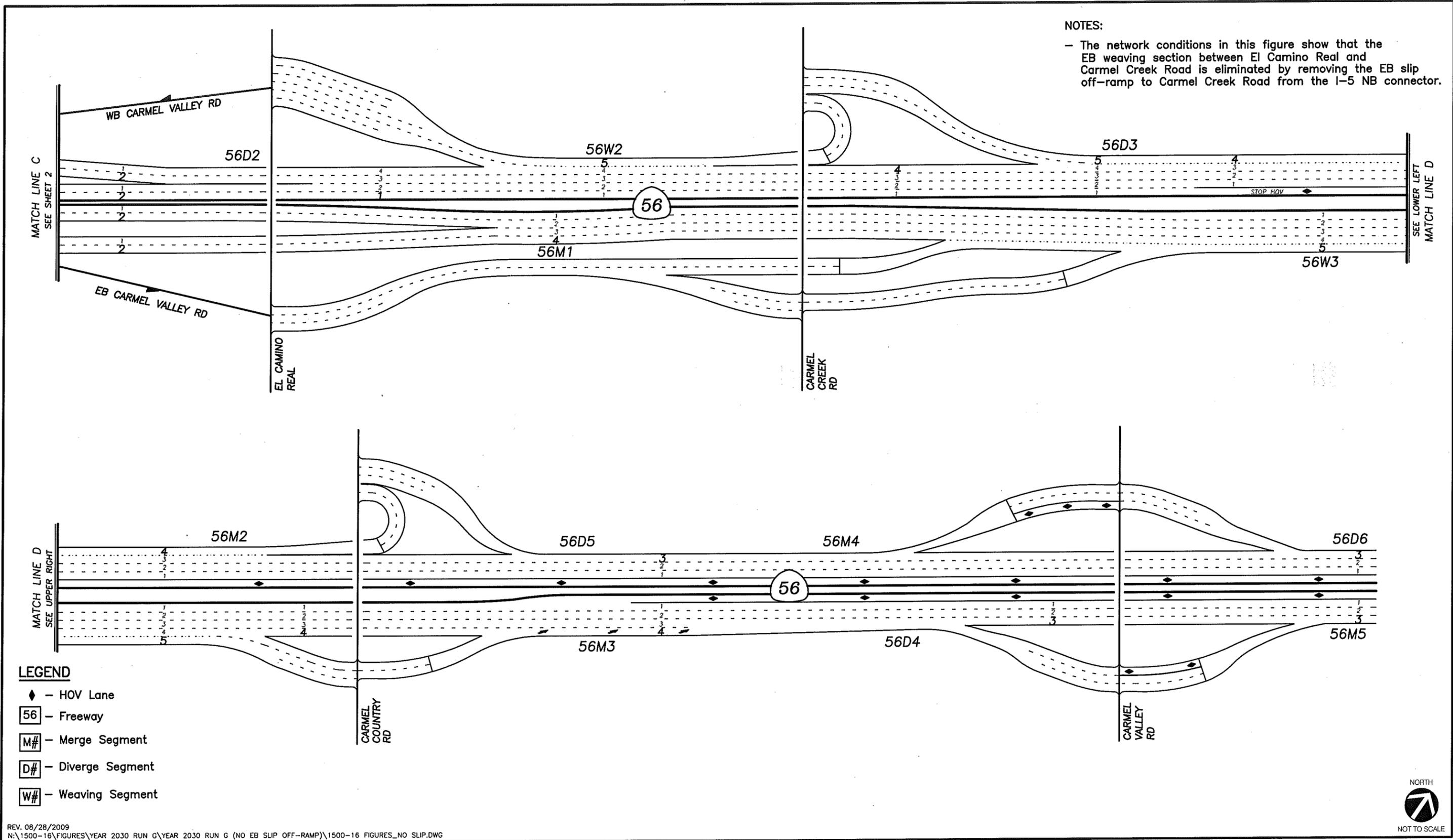
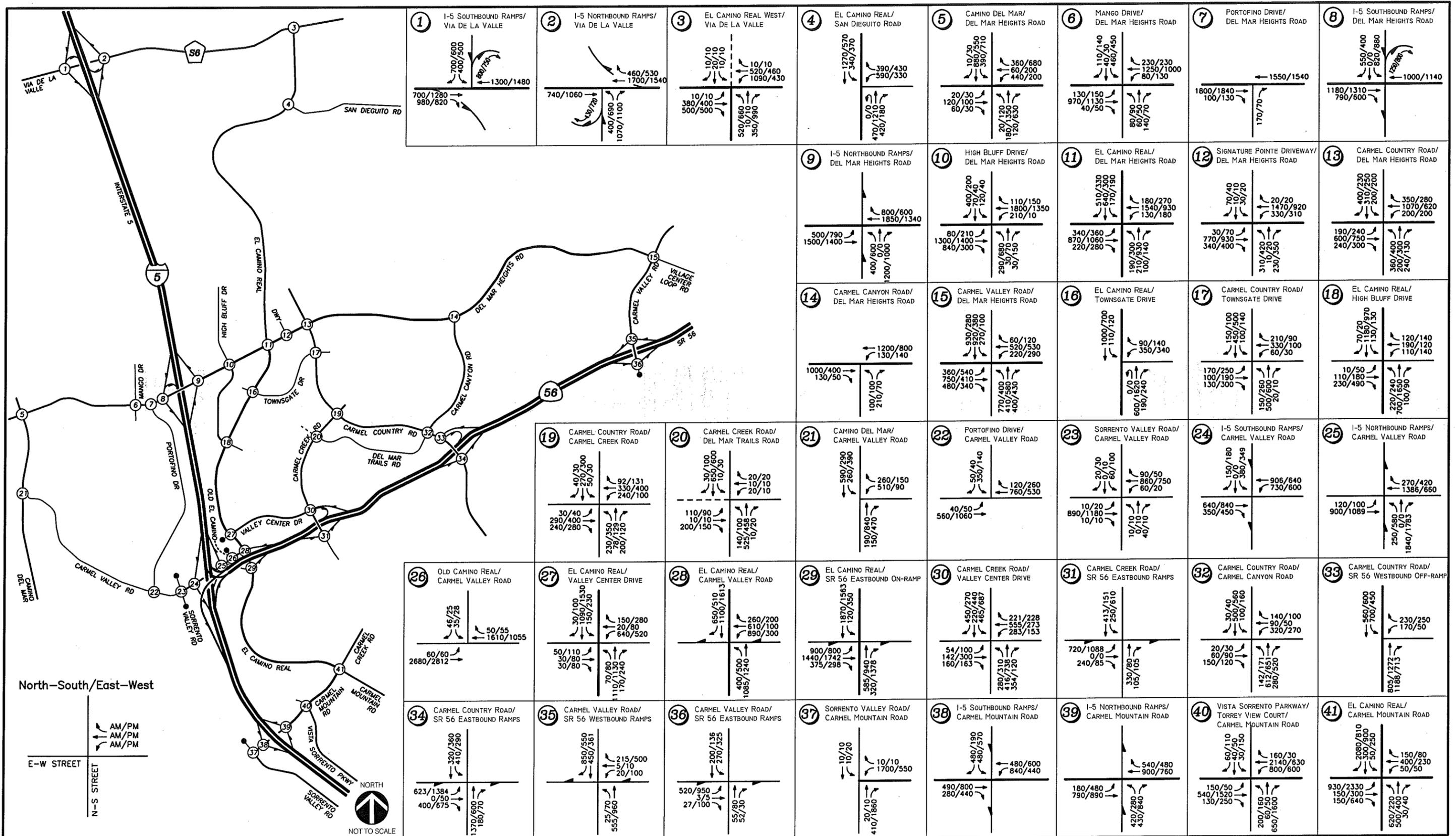


Figure 4-7g
 Year 2030 Direct Connector (Model Run G - No EB Slip Off-Ramp) Network Conditions
 Freeway Facilities



REV. 09/10/2009
 N:\1500-14\FIGURES\EXISTING & YEAR 2030 RUN G (FULL BUILD)\1500-14 RUN G (NO EB SLIP RAMP) FIGURES.DWG

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NOTES:

- AM/PM peak hour volumes are shown at the intersections
- The volumes shown in this figure assume that the EB slip off ramp from the I-5 NB connector to Carmel Creek Road is eliminated.

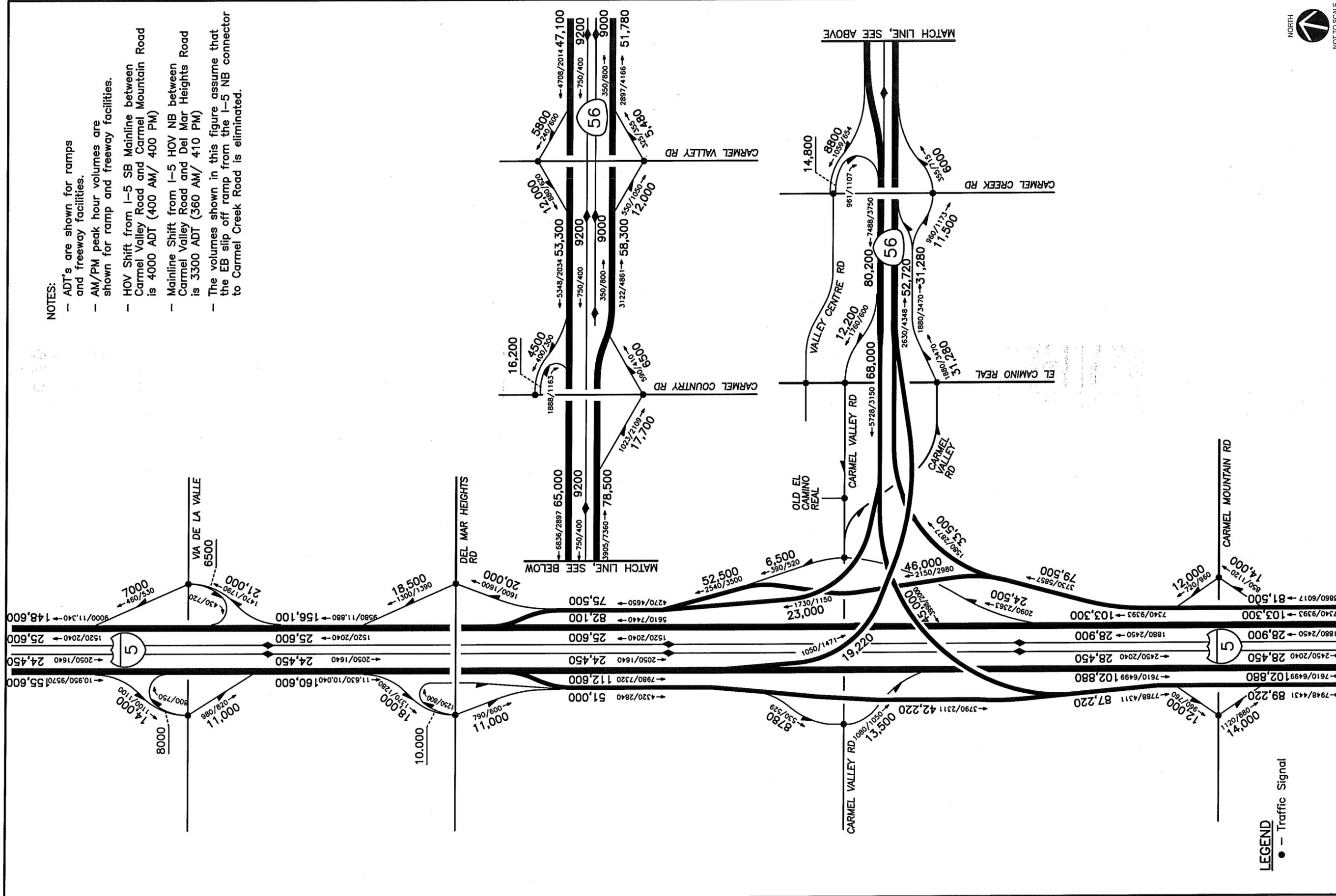
LEGEND

(XX) - Indicates "study" intersection

Figure 4-7h
 Year 2030 Direct Connector Traffic Volumes (Run G - No EB Slip Off-ramp) Intersections

NOTES:

- ADT's are shown for ramps and freeway facilities.
- AM/PM peak hour volumes are shown for ramp and freeway facilities.
- HOV Shift from I-5 SB Mainline between Carmel Valley Road and Carmel Mountain Road is 4000 ADT (400 AM/ 400 PM)
- Mainline Shift from I-5 HOV NB between Carmel Valley Road and Del Mar Heights Road is 3300 ADT (360 AM/ 410 PM)
- The volumes shown in this figure assume that the EB slip off ramp from the I-5 NB connector to Carmel Creek Road is eliminated.



LEGEND
 ● - Traffic Signal



REV. 09/10/2009
 N:\1500-14\FIGURES\EXISTING & YEAR 2030 RUN G (FULL BUILD)\1500-14 RUN G (NO EB SLIP RAMP) FIGURES.DWG

Figure 4-7j

Year 2030 Direct Connector Traffic Volumes (Run G - No EB Slip Off-ramp) Freeway and Ramp ADT

SR-56 WB – WEAVING SEGMENT BETWEEN CARMEL CREEK ROAD AND EL CAMINO REAL – INSTALLATION OF A WB BARRIER (MODEL RUN G3)

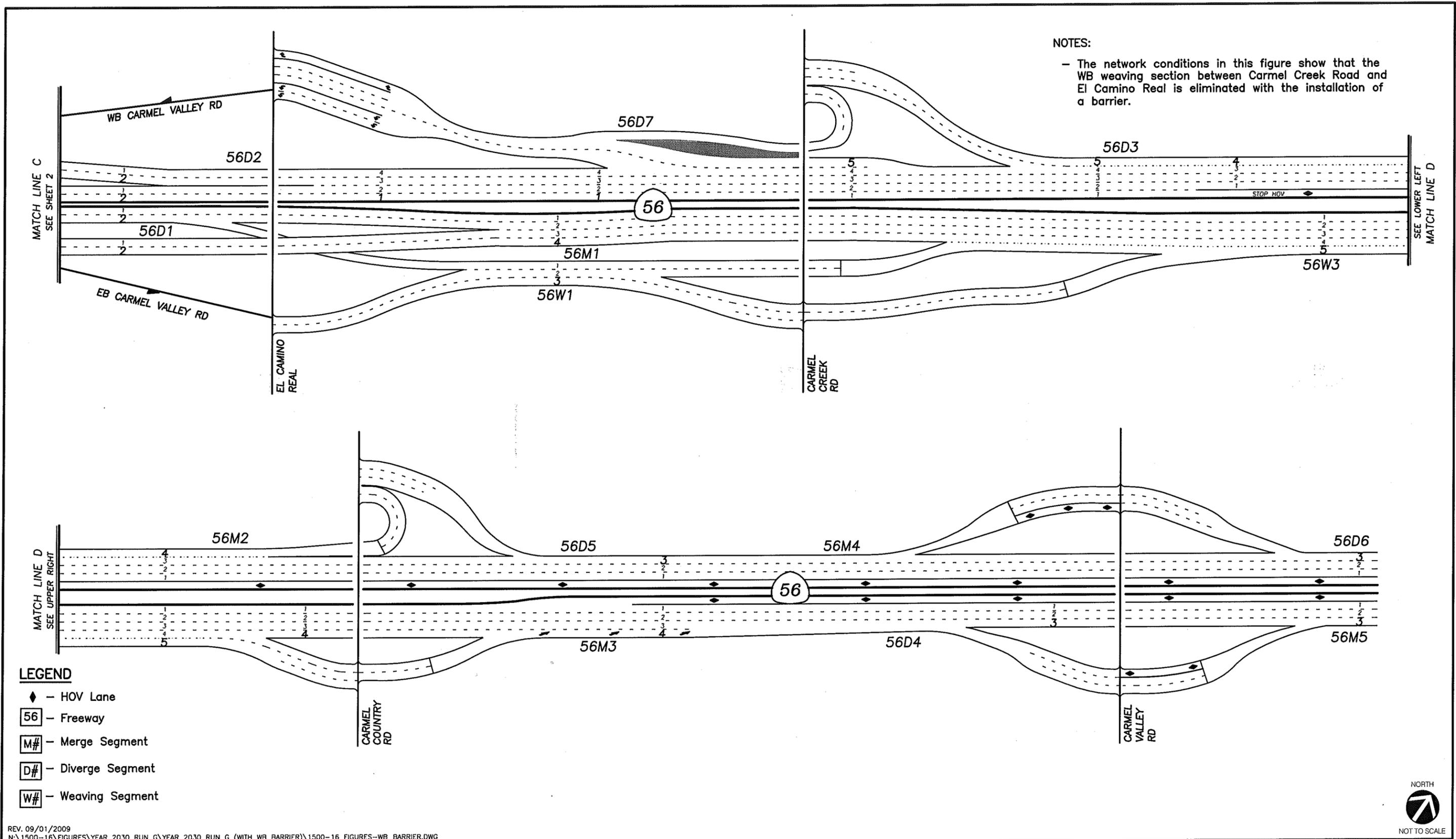
Alternative: The weaving section is calculated to operate at LOS F in the Year 2030 Direct Connector (Run G) scenario. Because of this failing weaving segment between El Camino Real and Carmel Creek, this alternative included a barrier on WB SR-56 between Carmel Creek Road and El Camino Real, thereby eliminating the weaving problem.

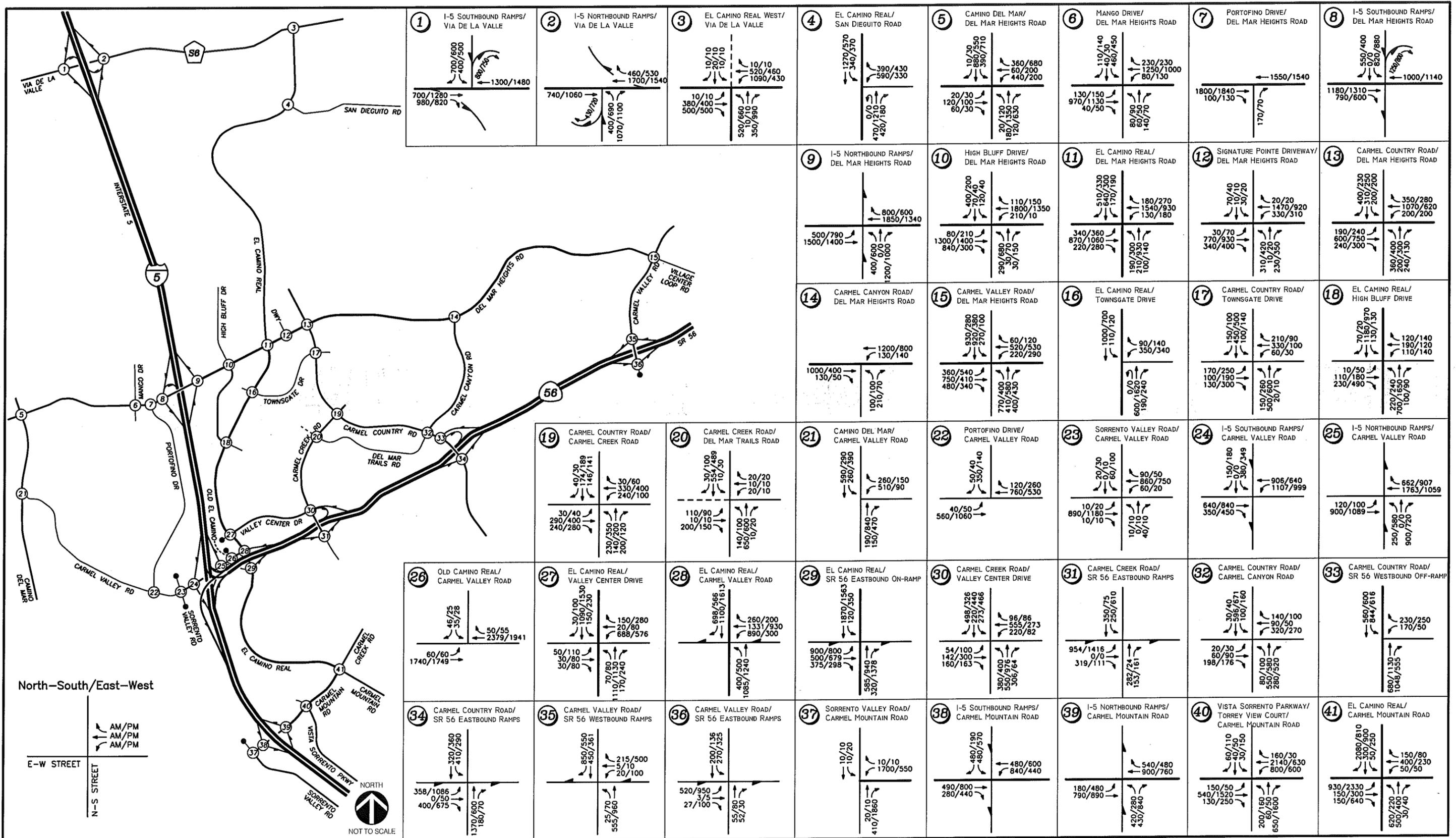
The same re-routing methodology and percentages as discussed in the Year 2030 Auxiliary Lane Alternative (Run F – Installation of WB barrier) were adopted to develop the traffic volumes for the Direct Connector (Run G – Installation of WB barrier) scenario.

Figures 4-7k illustrates the Year 2030 Direct Connectors (Run G) SR-56 geometric conditions with the barrier between Carmel Creek Road and El Camino Real. *Figure 4-7l, Figure 4-7m and Figure 4-7n* illustrate the Year 2030 traffic volumes for the intersections, street and freeway facilities.

The operational analyses tables in Section 8.0 of this report have been labeled as **G3** for the WB barrier scenario.

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 N:\1500-14\FIGURES\EXISTING & YEAR 2030 RUN G (FULL BUILD)\1500-14 RUN G (WB BARRIER) FIGURES.DWG

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NOTES:

- AM/PM peak hour volumes are shown at the intersections
- The volumes shown in this figure assume that the WB weaving section between Carmel Creek Road and El Camino Real is eliminated with a help of a barrier.

LEGEND

(X) - Indicates "study" intersection

Figure 4-71

Year 2030 Direct Connector Traffic Volumes (Run G - With WB Barrier) Intersections

NOTES:
 - ADT (Average Daily Traffic) shown midblock
 - The volumes shown in this figure assume that the WB weaving section between Carmel Creek Road and El Camino Real is eliminated with a help of a barrier.

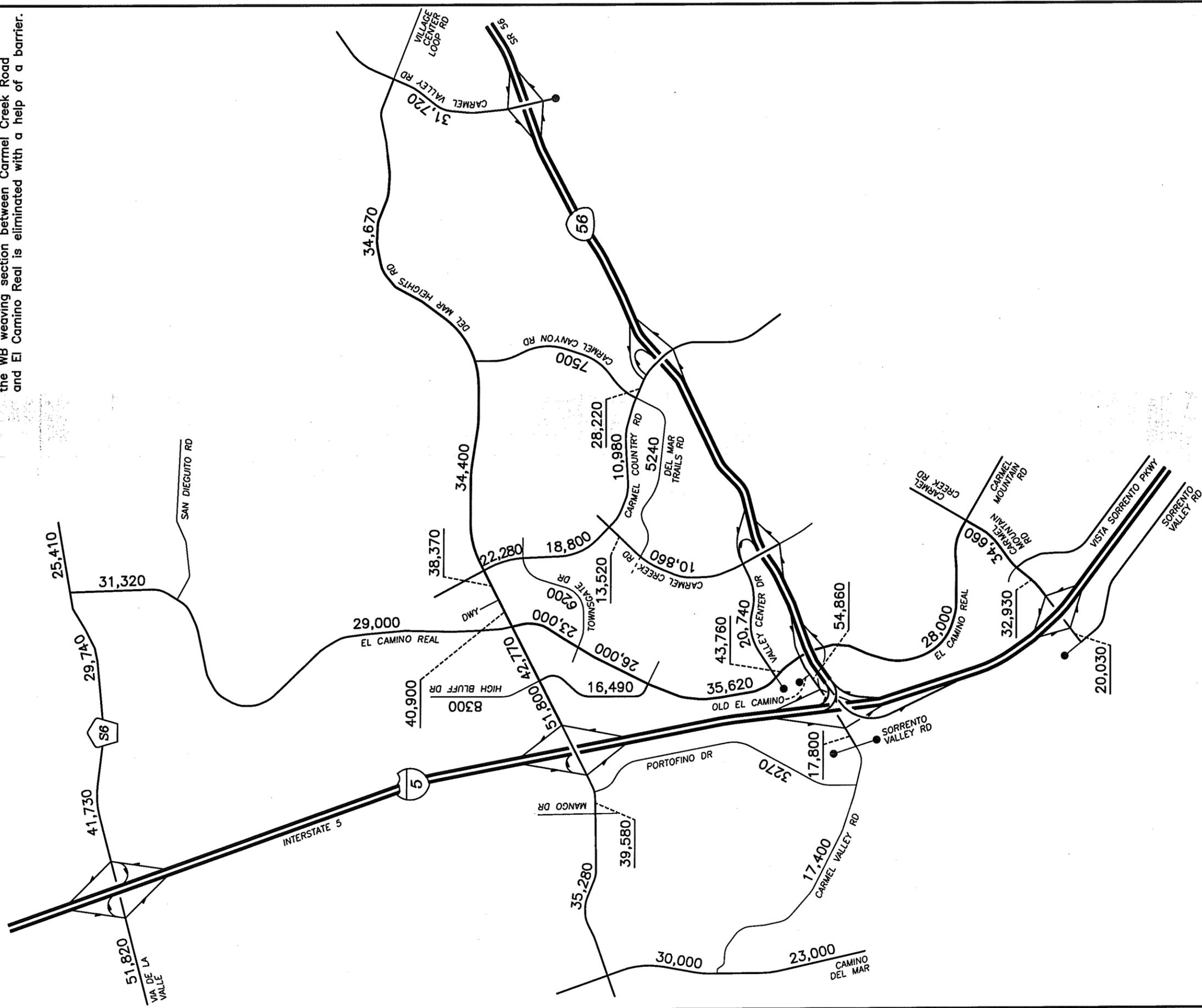
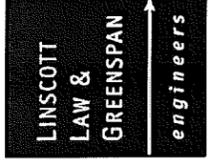


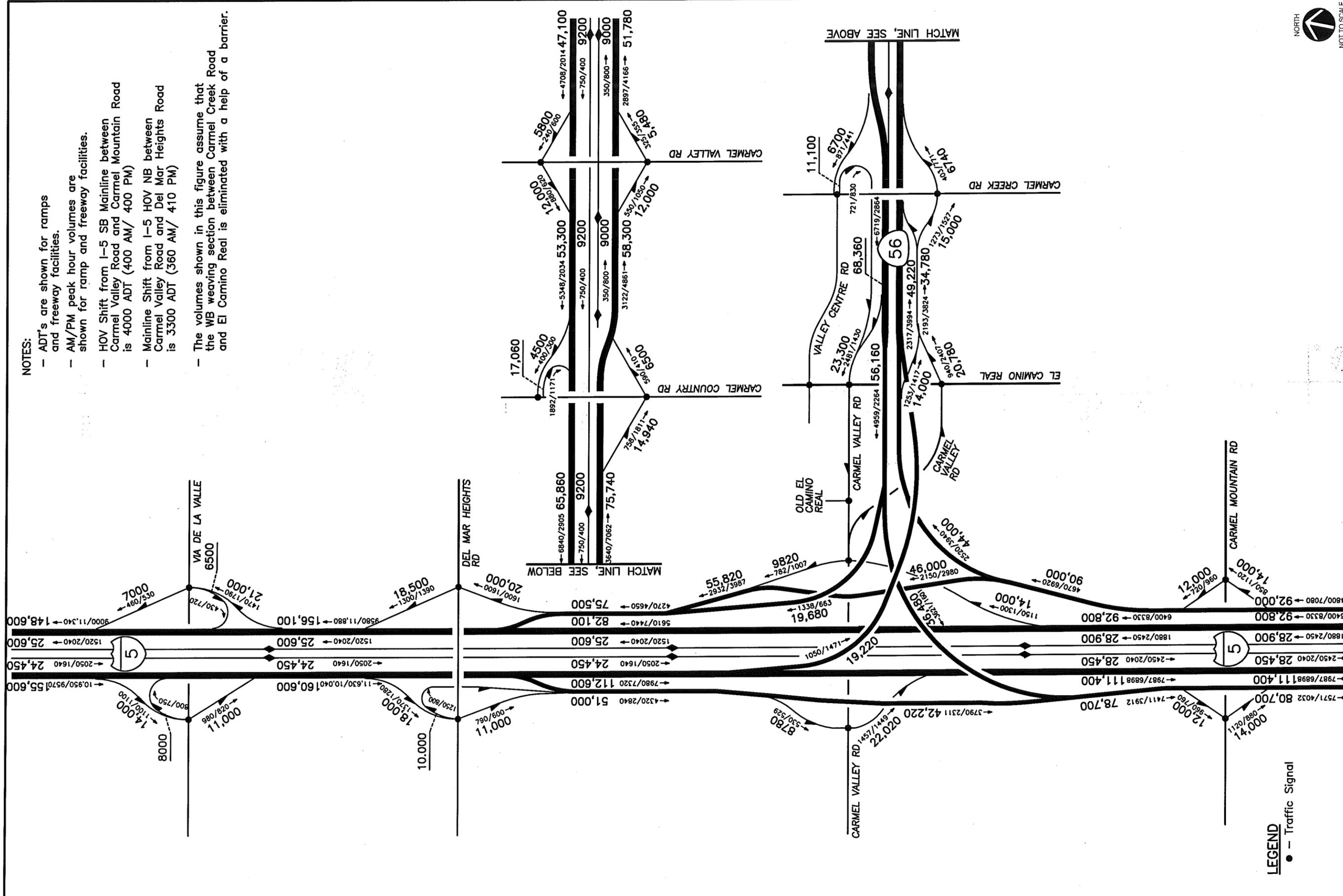
Figure 4-7m
 Year 2030 Direct Connector Traffic Volumes (Run G - With WB Barrier)
 Street Segments ADT

REV. 09/10/2009
 N:\1500-14\FIGURES\EXISTING & YEAR 2030 RUN G (FULL BUILD)\1500-14 RUN G (WB BARRIER) FIGURES.DWG



NOTES:

- ADT's are shown for ramps and freeway facilities.
- AM/PM peak hour volumes are shown for ramp and freeway facilities.
- HOV Shift from I-5 SB Mainline between Carmel Valley Road and Carmel Mountain Road is 4000 ADT (400 AM/ 400 PM)
- Mainline Shift from I-5 HOV NB between Carmel Valley Road and Del Mar Heights Road is 3300 ADT (360 AM/ 410 PM)
- The volumes shown in this figure assume that the WB weaving section between Carmel Creek Road and El Camino Real is eliminated with a help of a barrier.



LEGEND
 ● - Traffic Signal

Figure 4-7n

Year 2030 Direct Connector Traffic Volumes (Run G - With WB Barrier) Freeway and Ramp ADT

REV. 09/10/2009
 N:\1500-14\FIGURES\EXISTING & YEAR 2030 RUN G (FULL BUILD)\1500-14 RUN G (WB BARRIER) FIGURES.DWG

COMBINED SCENARIO OF EB SLIP OFF RAMP AT CARMEL CREEK ROAD ELIMINATED AND WB BARRIER BETWEEN CARMEL CREEK ROAD AND EL CAMINO REAL (MODEL RUN G4)

Alternative: This alternative is based on the assumption that the EB Slip off-ramp to Carmel Creek Road from the I-5 NB connector would be eliminated and a WB barrier would be installed between Carmel Creek Road and El Camino Real.

Figures 4-7p illustrates the Year 2030 SR-56 geometric conditions for the above scenario. *Figure 4-7q, Figure 4-7r and Figure 4-7s* illustrate the Year 2030 traffic volumes for the intersections, street and freeway facilities.

The operational analyses tables in Section 8.0 of this report have been labeled as **G4** for the combined scenario (No EB slip off-ramp + installation of a WB barrier).

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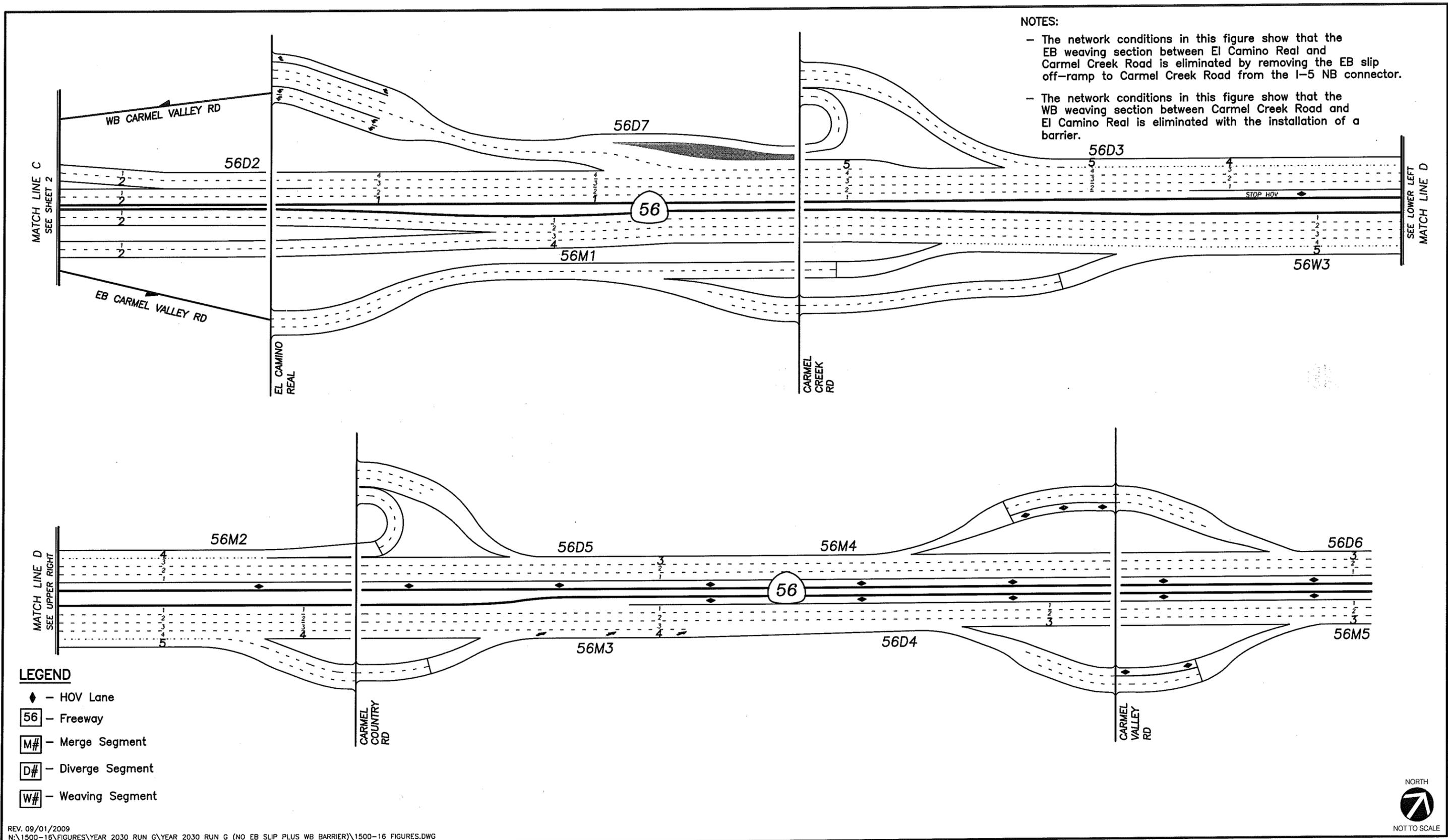


Figure 4-7p

Year 2030 Direct Connector (Model Run G - No EB Slip Off-Ramp with WB Barrier) Network Conditions Freeway Facilities

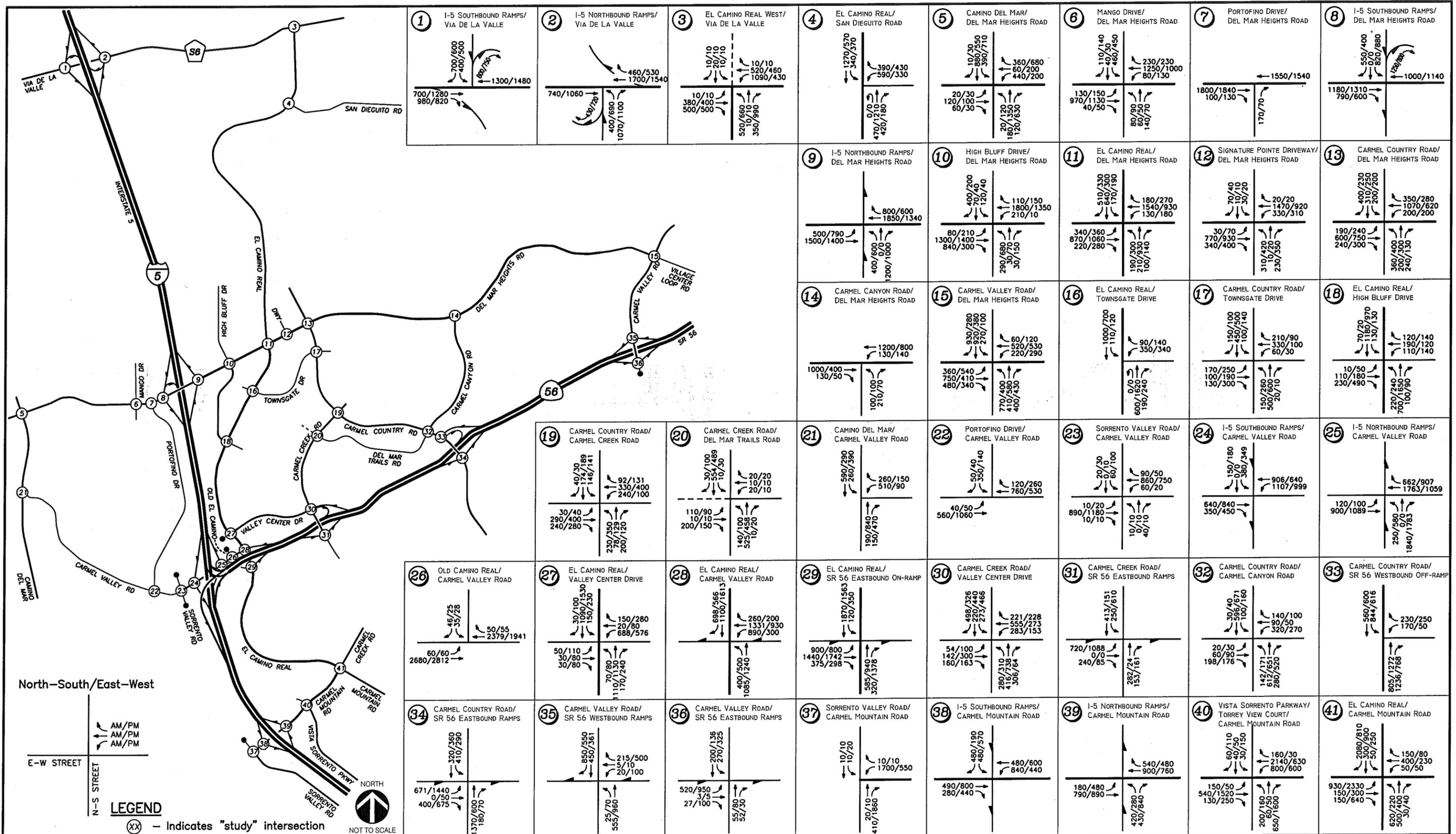


Figure 4-7a

Year 2030 Direct Connector (Run G - No EB Slip Off-Ramp with WB Barrier)
Traffic Volumes - Intersections

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N:\1500-14\FIGURES\EXISTING & YEAR 2030 RUN G (FULL BUILD)\1500-14 RUN G (WITH BARRIER AND NO SLIP) FIGURES.DWG

NOTES:

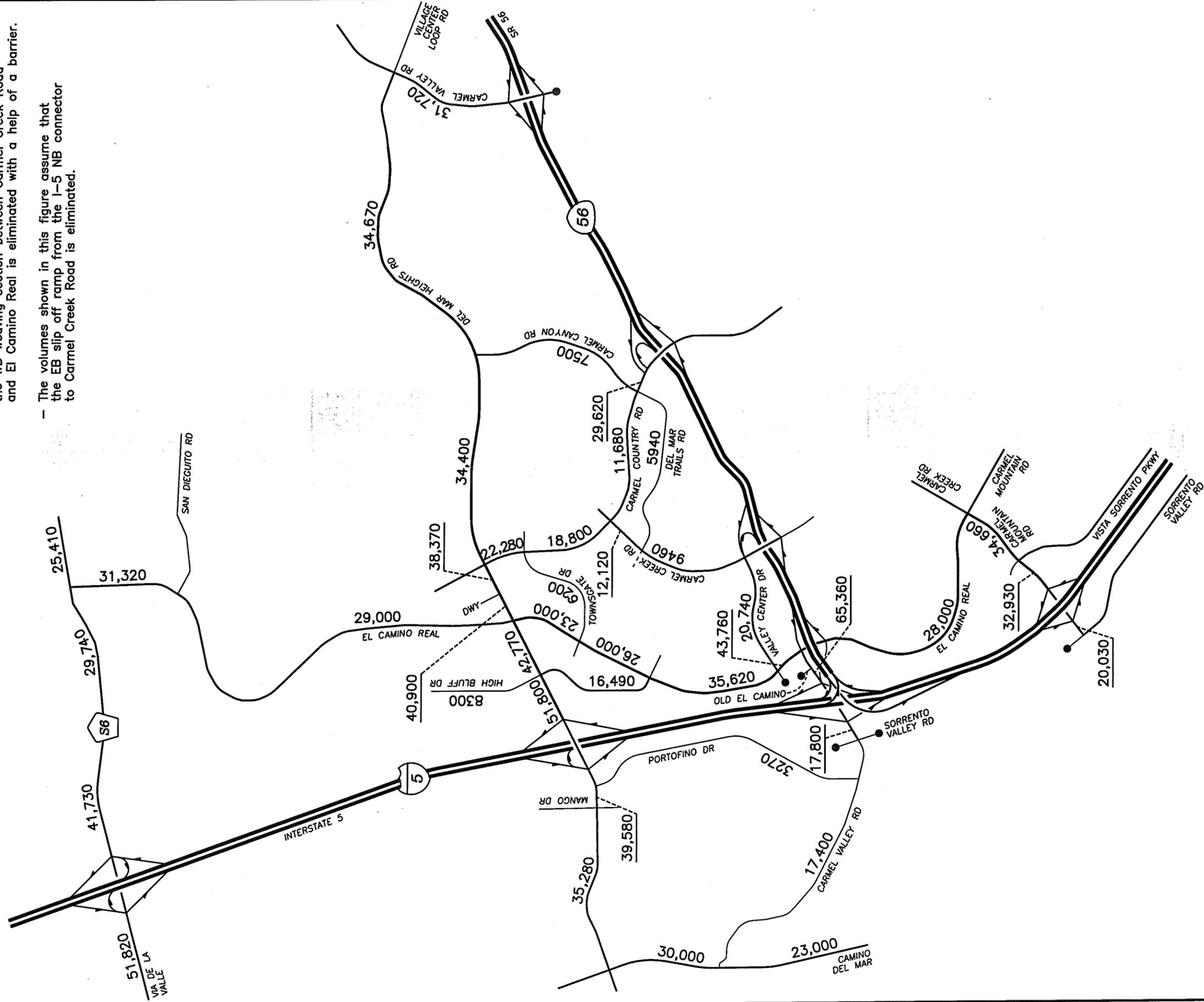
- AM/PM peak hour volumes are shown at the intersections

- The volumes shown in this figure assume that the WB weaving section between Carmel Creek Road and El Camino Real is eliminated with a help of a barrier.

- The volumes shown in this figure assume that the EB slip off ramp from the I-5 NB connector to Carmel Creek Road is eliminated.

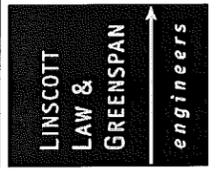
NOTES:

- ADT (Average Daily Traffic) shown midblock
- The volumes shown in this figure assume that the WB weaving section between Carmel Creek Road and El Camino Real is eliminated with a help of a barrier.
- The volumes shown in this figure assume that the EB slip off ramp from the I-5 NB connector to Carmel Creek Road is eliminated.



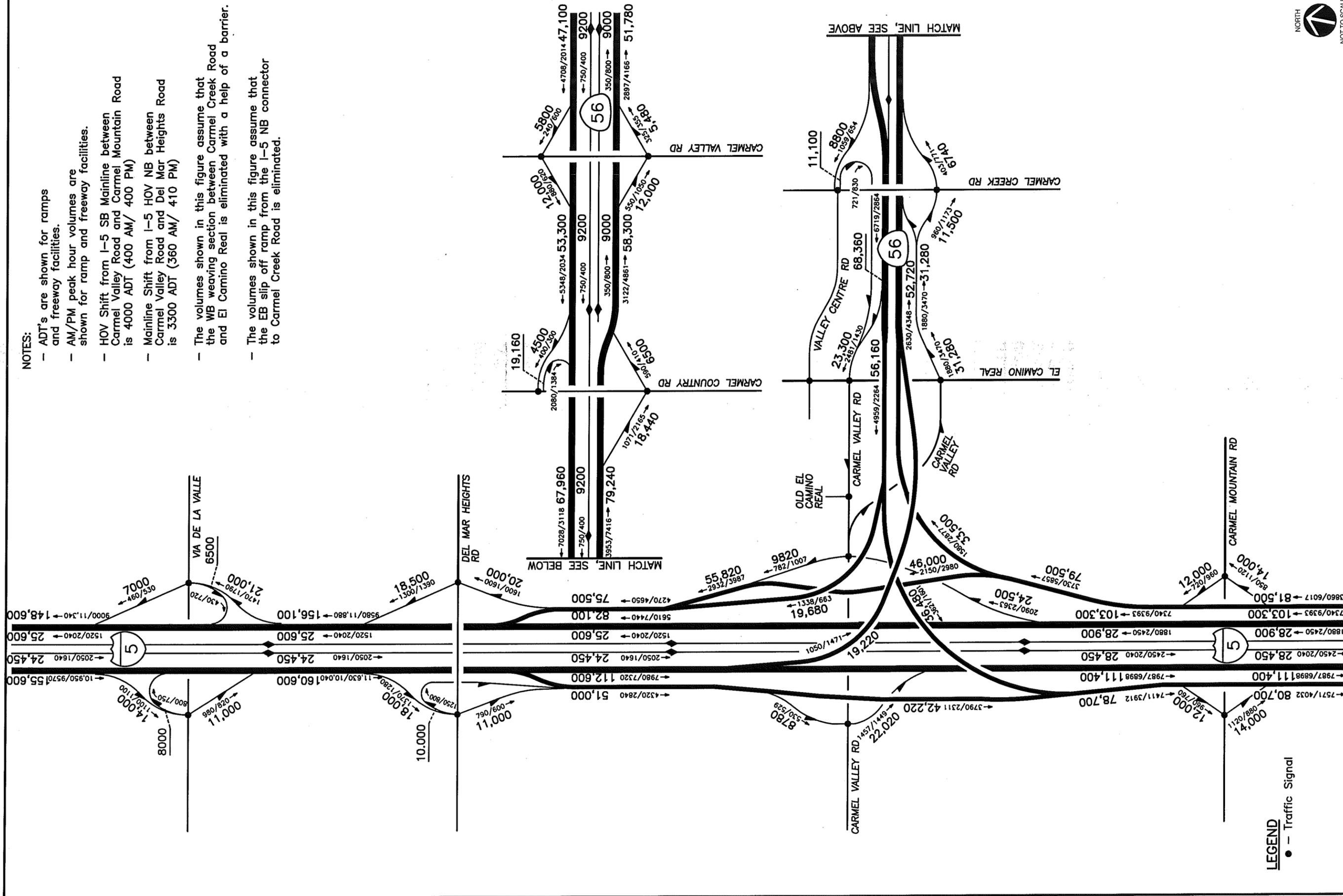
REV. 09/10/2009 N:\1500-14\FIGURES\EXISTING & YEAR 2030 RUN G (FULL BUILD)\1500-14 RUN G (WITH BARRIER AND NO SLIP) FIGURES.DWG

Figure 4-7r
Year 2030 Direct Connector (Run G - No EB Slip Off-Ramp with WB Barrier)
Traffic Volumes - Street Segments ADT



NOTES:

- ADT's are shown for ramps and freeway facilities.
- AM/PM peak hour volumes are shown for ramp and freeway facilities.
- HOV Shift from I-5 SB Mainline between Carmel Valley Road and Carmel Mountain Road is 4000 ADT (400 AM/ 400 PM)
- Mainline Shift from I-5 HOV NB between Carmel Valley Road and Del Mar Heights Road is 3300 ADT (360 AM/ 410 PM)
- The volumes shown in this figure assume that the WB weaving section between Carmel Creek Road and El Camino Real is eliminated with a help of a barrier.
- The volumes shown in this figure assume that the EB slip off ramp from the I-5 NB connector to Carmel Creek Road is eliminated.



LEGEND
● - Traffic Signal



Figure 4-7s

Year 2030 Direct Connector (Run G - No EB Slip Off-Ramp with WB Barrier) Traffic Volumes - Freeway and Ramp ADT

REV. 09/10/2009

N:\1500-14\FIGURES\EXISTING & YEAR 2030 RUN G (FULL BUILD)\1500-14 RUN G (WITH BARRIER AND NO SLIP) FIGURES.DWG

EB SLIP OFF RAMP AT CARMEL CREEK ROAD ELIMINATED AND COLLECTOR-DISTRIBUTOR (C-D) ALTERNATIVE ON WB SR-56 BETWEEN CARMEL CREEK ROAD AND EL CAMINO REAL (MODEL RUN G5)

Alternative: This alternative is based on the assumption that the EB Slip off-ramp to Carmel Creek Road from the I-5 NB connector would be eliminated and a collector-distributor alternative on WB SR-56 between Carmel Creek Road and El Camino Real is proposed.

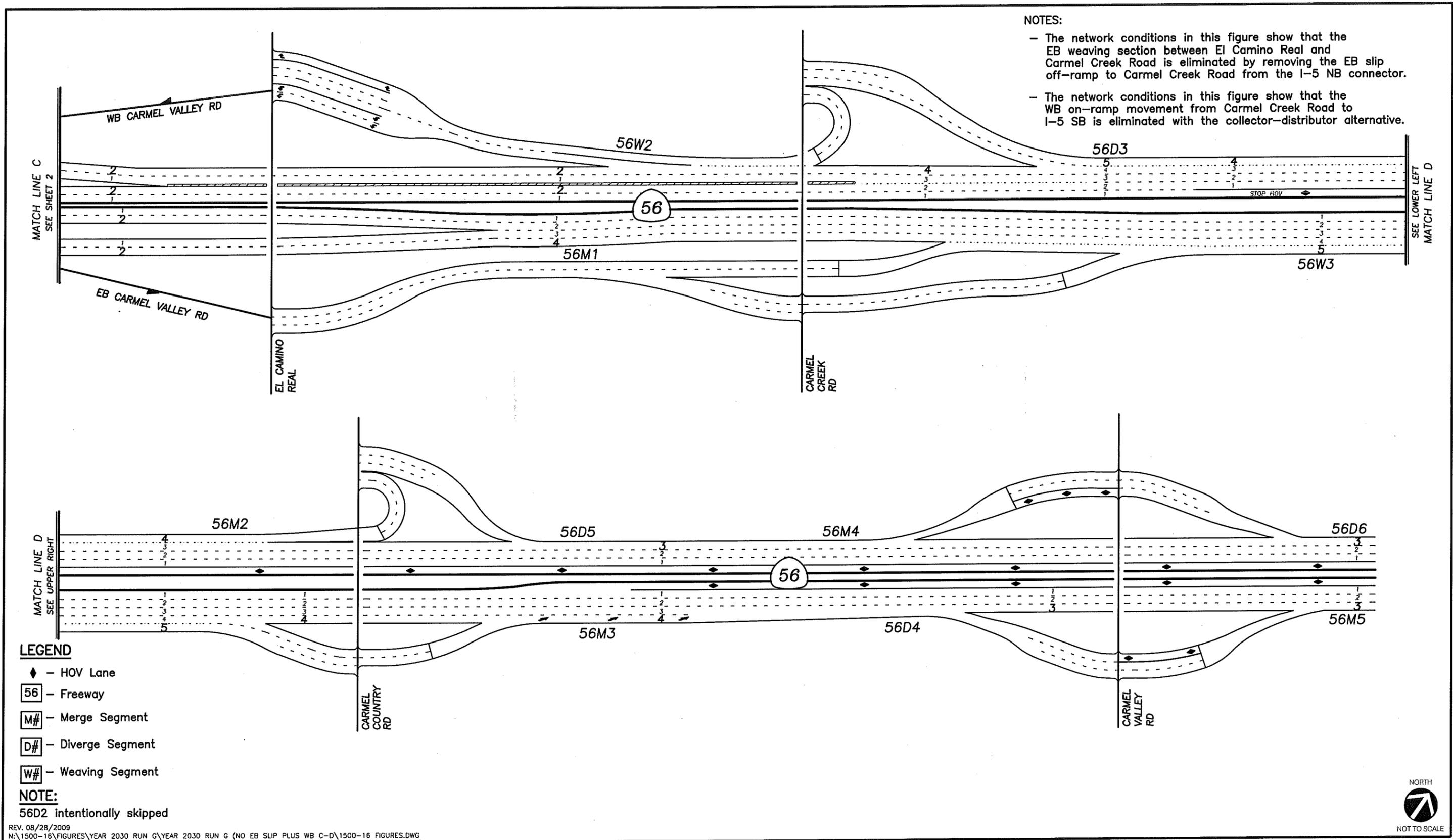
The collector-distributor alternative was developed to eliminate the weaving maneuver of the vehicles entering the loop ramp at Carmel Creek Road onto WB SR-56 to go I-5 SB. This weaving maneuver would require 3-lane changes in a very short distance and also includes a great speed differential. Hence this collector-distributor system would allow vehicles entering the loop ramp at Carmel Creek Road onto WB SR-56 to travel NB on I-5 and restrict them from traveling on SB I-5. Vehicles intending to go I-5 SB from Carmel Creek loop on-ramp would use the I-5/Carmel Valley interchange.

The collector-distributor alternative would include installation of a barrier separating the I-5 SB traffic from the I-5 NB traffic on WB SR-56. The barrier would start just upstream of the Carmel Creek loop ramp creating a collector-distributor roadway system between Carmel Creek Road and El Camino Real. Vehicles intending to go I-5 NB from WB SR-56 would use the collector-distributor system.

Figures 4-7t illustrates the Year 2030 SR-56 geometric conditions for the above scenario. *Figure 4-7u, Figure 4-7v and Figure 4-7w* illustrate the Year 2030 traffic volumes for the intersections, street and freeway facilities.

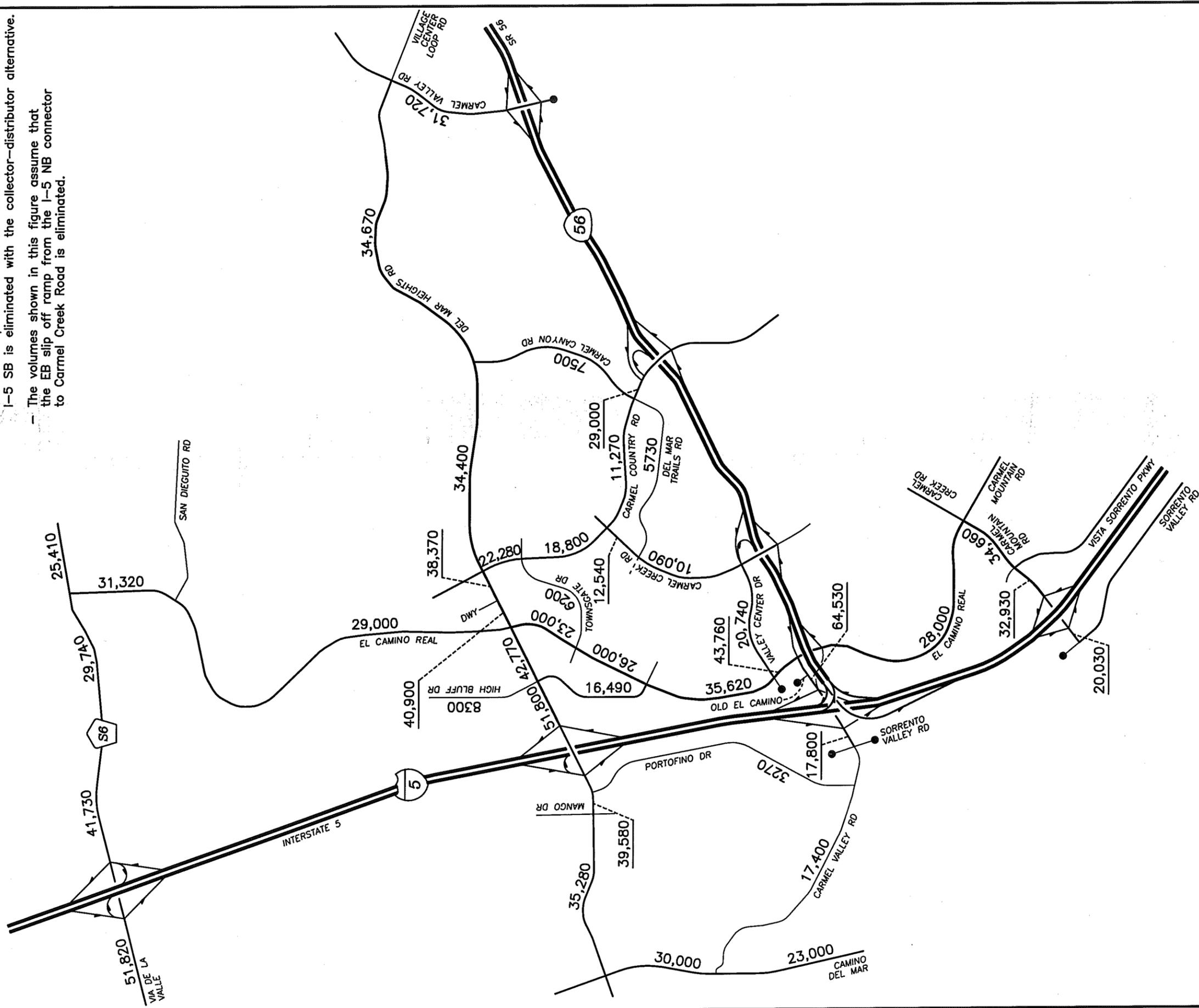
The operational analyses tables in Section 8.0 of this report have been labeled as **G5** for the above scenario (No EB slip off-ramp + WB collector-distributor alternative between Carmel Creek Road and El Camino Real).

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NOTES:

- ADT (Average Daily Traffic) shown midblock
- The volumes shown in this figure assume that the WB on-ramp movement from Carmel Creek Road to I-5 SB is eliminated with the collector-distributor alternative.
- The volumes shown in this figure assume that the EB slip off ramp from the I-5 NB connector to Carmel Creek Road is eliminated.



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 N:\1500-14\FIGURES\EXISTING & YEAR 2030 RUN G (FULL BUILD)\1500-14 RUN G (COLLECTOR-DISTRIBUTOR) FIGURES.DWG

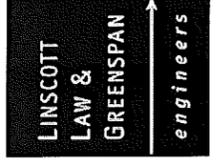
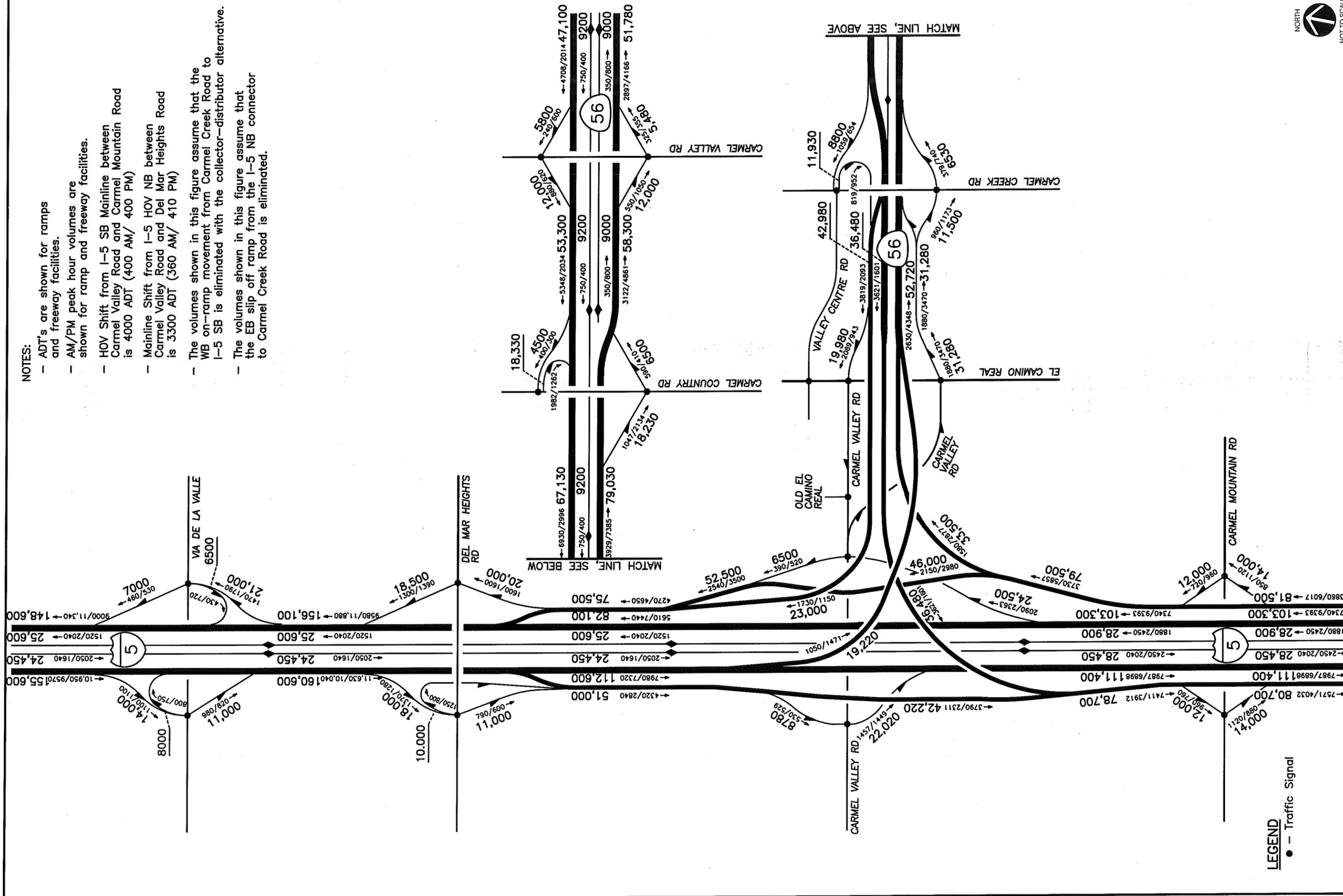


Figure 4-7v
Year 2030 Direct Connector (Run G - Collector-Distributor Alternative)
Traffic Volumes - Street Segments ADT

NOTES:

- ADT's are shown for ramps and freeway facilities.
- AM/PM peak hour volumes are shown for ramp and freeway facilities.
- HOV Shift from I-5 SB Mainline between Carmel Valley Road and Carmel Mountain Road is 4000 ADT (400 AM/ 400 PM)
- Mainline Shift from I-5 HOV NB between Carmel Valley Road and Del Mar Heights Road is 3300 ADT (360 AM/ 410 PM)
- The volumes shown in this figure assume that the WB on-ramp movement from Carmel Creek Road to I-5 SB is eliminated with the collector-distributor alternative.
- The volumes shown in this figure assume that the EB slip off ramp from the I-5 NB connector to Carmel Creek Road is eliminated.



LEGEND
 ● - Traffic Signal



REV. 09/10/2009
 N:\1500-14\FIGURES\EXISTING & YEAR 2030 RUN G (FULL BUILD)\1500-14 RUN G (COLLECTOR-DISTRIBUTOR) FIGURES.DWG

Figure 4-7w
 Year 2030 Direct Connector (Run G - Collector-Distributor Alternative)
 Traffic Volumes - Freeway and Ramp ADT

4.2.4 Year 2030 "Hybrid" Alternative (Run H)

The Hybrid Alternative is a "blend" of the Auxiliary Lane Alternative in the SB I-5 to EB SR 56 direction and the Direct Connector Alternative in the WB SR 56 to NB I-5 direction. The Hybrid alternative is based on the following assumptions:

- I-5 freeway configuration is planned to include 10 general-purpose lanes (5 lanes in each direction) with 4 managed/ HOV lanes (two lanes in each direction) with direct access ramps (DAR's) connections to HOV/managed lanes. As per I-5 North Coast Project, the direct access ramps are planned at Voigt Drive, Manchester Avenue, Cannon Road and Oceanside Boulevard at I-5.
- SR-56 freeway configuration in Year 2030 is planned to include 6 general-purpose lanes (3 lanes in each direction) with 2 managed/ HOV lanes (one lane in each direction) with the construction of a **direct connector from westbound SR-56 to northbound I-5**. This alternative does not include the HOV lanes on the direct connector.
- The Hybrid Alternative is similar to the Auxiliary lane Alternative (Run F) from SB I-5 to EB SR-56.
- The Hybrid Alternative is similar to the Direct Connectors Alternative (Run G) from WB SR 56 to NB I-5.
- The intersection and freeway improvements that were assumed in the Auxiliary Lane (Run F) alternative and Direct Connectors (Run G) are assumed for the Hybrid alternative (Run H) as well.
- The Hybrid Alternative assumes elimination of EB slip-off ramp to Carmel Creek Road.
- The Hybrid Alternative assumes collector-distributor (C-D) system on WB SR-56 between Carmel Creek Road and El Camino Real.

LLG coordinated with Caltrans regarding the forecasting of Year 2030 Hybrid (Run H) model run. A separate Year 2030 model run was conducted for the Hybrid Alternative based on the network assumptions discussed above. The model volumes for the Hybrid Alternative were compared to the Auxiliary Lane and Direct Connector Alternatives, in the appropriate directions.

Table 4-5 shows the difference in model volumes between the Auxiliary Lane Alternative and Hybrid Alternative in the SB I-5 to EB SR 56 direction. **Table 4-6** shows the difference in model volumes between the Direct Connector Alternative and Hybrid Alternative in the WB SR 56 to NB I-5 direction.

**TABLE 4-5
MODEL TRAFFIC VOLUMES
AUXILIARY LANE (RUN F) VS. HYBRID ALTERNATIVE (RUN H)
SB I-5 to EB SR-56 (Freeway Segments)**

Freeway Segment	Model Average Daily Traffic (ADT)		Difference (δ)	Percent Change (Increase/Decrease)
	Year 2030 Aux.Lane (Run F)	Year 2030 Hybrid (Run H)		
I-5 SB Mainline				
Via de la Valle to Del Mar Heights Road	184,309	187,197	2,888	+1.57%
Del Mar Heights Road to Carmel Valley Road	185,079	183,619	1,460	-0.79%
SR-56 EB				
El Camino Real to Carmel Creek Road	60,208	63,053	2,845	+4.73%
Carmel Creek Road to Carmel Country Road	58,543	60,288	1,745	+2.98%

General Notes:

- a. Average Daily Traffic Volumes taken from Series 10 Tranplan Model Runs.
- b. All ADT's are Adjusted volumes from Series 10 Year 2030 Auxiliary Lane and Hybrid models (AVOL).
- c. These volumes include mainline and HOV lanes.

**TABLE 4-6
MODEL TRAFFIC VOLUMES
DIRECT CONNECTORS (RUN G) VS. HYBRID ALTERNATIVE (RUN H)
WB SR 56 to NB I-5 (Freeway Segments)**

Freeway Segment	Model Average Daily Traffic (ADT)		Difference (δ)	Percent Change (Increase/Decrease)
	Year 2030 Direct Connector (Run G)	Year 2030 Hybrid (Run H)		
I-5 NB Mainline				
Carmel Valley Road to Del Mar Heights Road	183,954	181,270	-2,684	-1.46%
Del Mar Heights Road to Via de la Valle	176,689	173,940	-2,749	-1.56%
SR-56 WB				
Carmel Country Road to Carmel Creek Road	65,763	62,455	-3,308	-5.03%
Carmel Creek Road to El Camino Real	69,557	66,063	-3,494	-5.02%

General Notes:

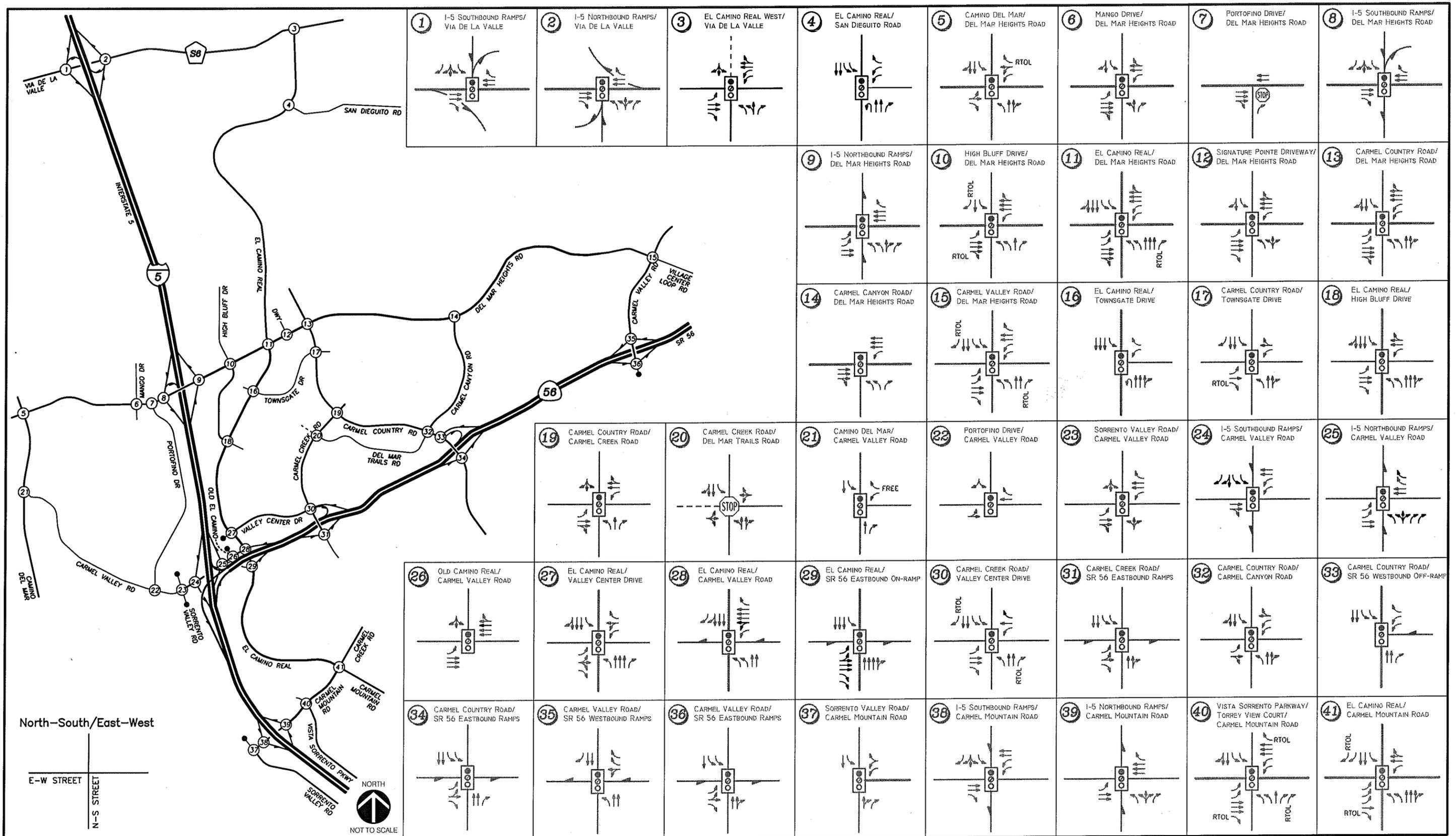
- a. Average Daily Traffic Volumes taken from Series 10 Tranplan Model Runs.
- b. All ADT's are Adjusted volumes from Series 10 Year 2030 Direct Connector and Hybrid models (AVOL).
- c. These volumes include mainline and HOV lanes.

The results show minor differences in traffic volumes in the Hybrid Alternative in comparison to the Auxiliary Lane Alternative in south to east direction and Direct Connector Alternative in the west to north direction.

LLG recommends using the same traffic volumes of the Auxiliary Lane (south to east) and Direct Connector (west to north) Alternatives (on a directionality basis) for the Hybrid Alternative to be consistent with previous analyses. This will also result in a suitable comparison in the operational analyses. Further the variations of the “No EB slip off-ramp to Carmel Creek Road” and “WB C-D alternative on WB SR 56 between Carmel Creek Road and El Camino Real” area also incorporated into the Hybrid alternative.

Figures 4-8a, Figure 4-8b and Figure 4-8c illustrate the Year 2030 geometric conditions for the intersections, street segments and freeway facilities. *Figure 4-8d, Figure 4-8e and Figure 4-8f* illustrate the Year 2030 traffic volumes for the intersections, street segments and freeway facilities.

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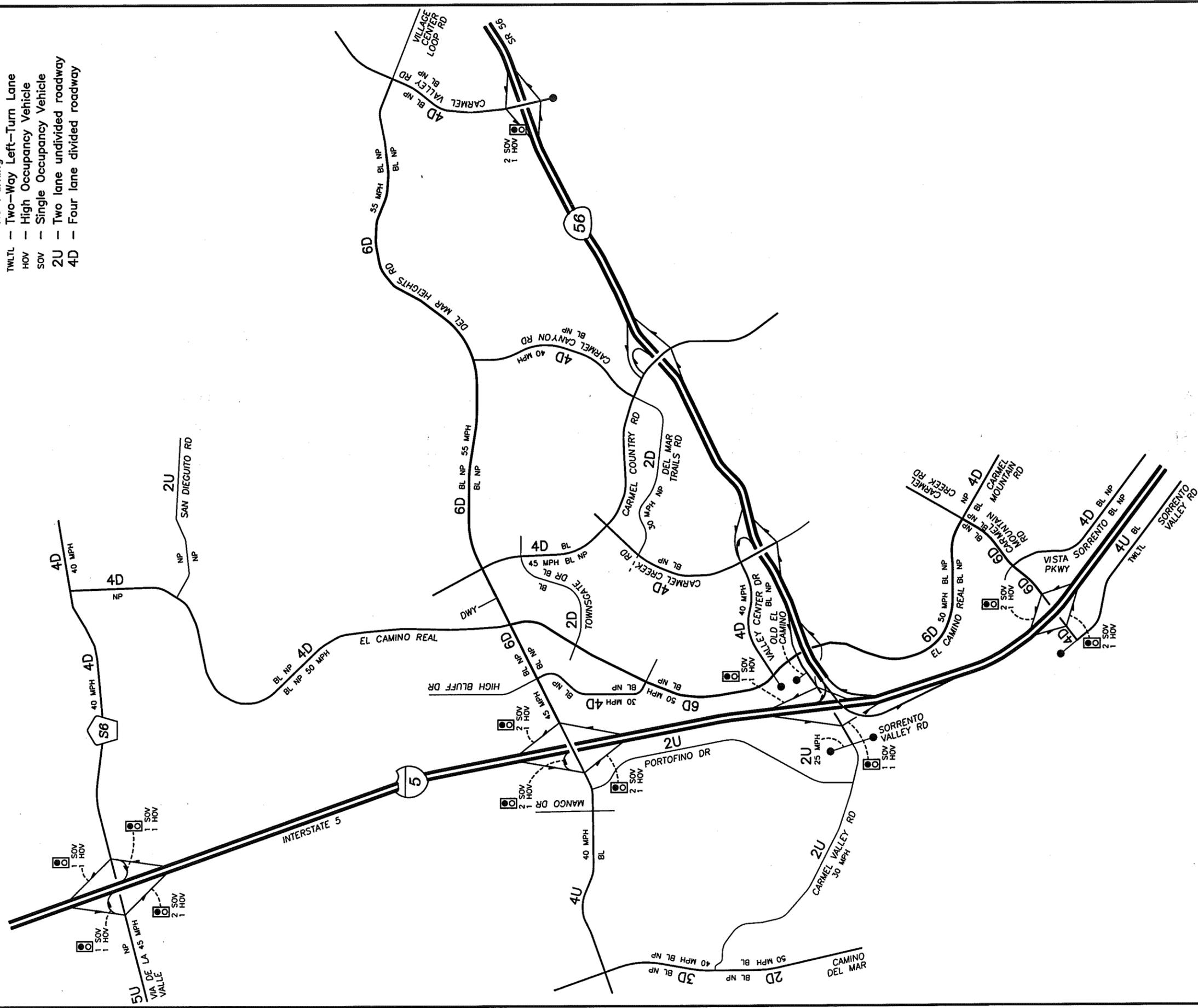
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Figure 4-8a
 Year 2030 Hybrid (Model Run H) Network Conditions
 Intersections

LEGEND

- Ramp Meter Signal
- Bike Lane
- No Parking
- Two-Way Left-Turn Lane
- High Occupancy Vehicle
- Single Occupancy Vehicle
- Two lane undivided roadway
- Four lane divided roadway

- BL —
- NP —
- TWLT —
- HOV —
- SOV —
- 2U —
- 4D —



REV. 09/10/2009
 N:\1500-14\FIGURES\YEAR 2030 HYBRID\1500-14 HYBRID CONDITIONS.DWG

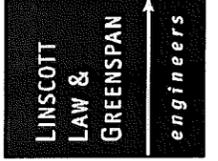


Figure 4-8b
 Year 2030 Hybrid (Model Run H) Network Conditions
 Street Segments

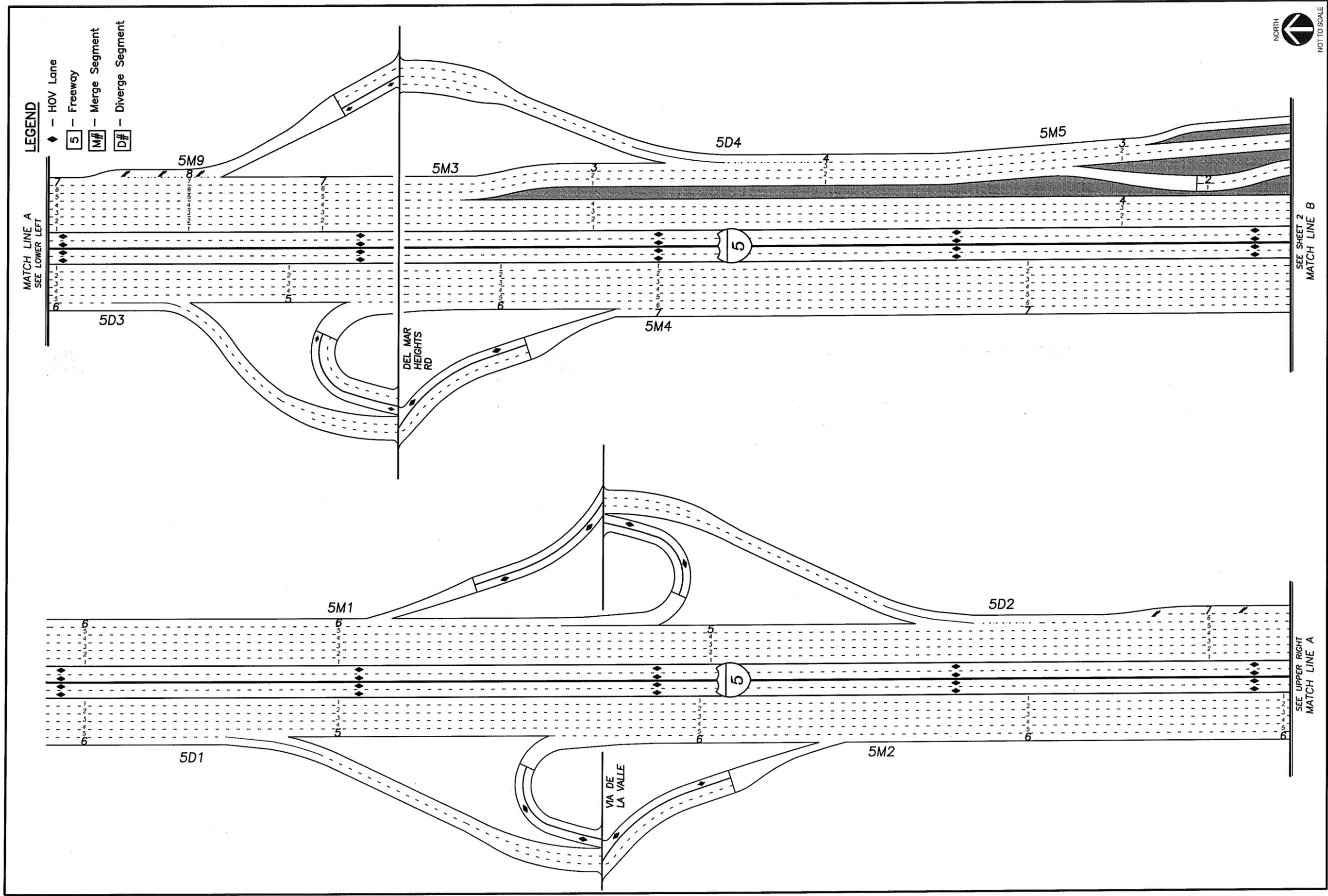


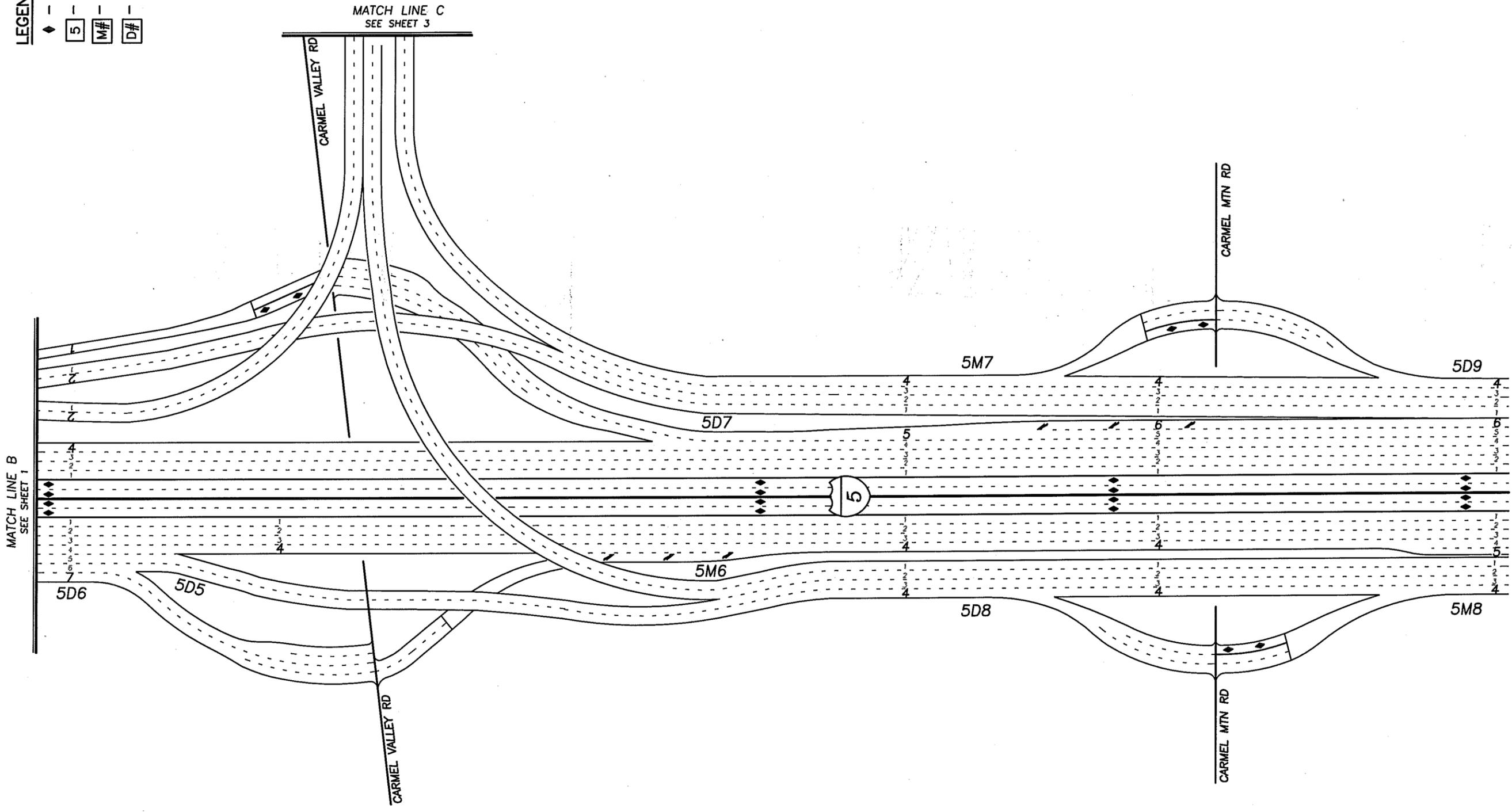
Figure 4-8c
(SHEET 1 OF 3)

**Year 2030 Hybrid (Model Run H) Network Conditions
Freeway Facilities**

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LEGEND

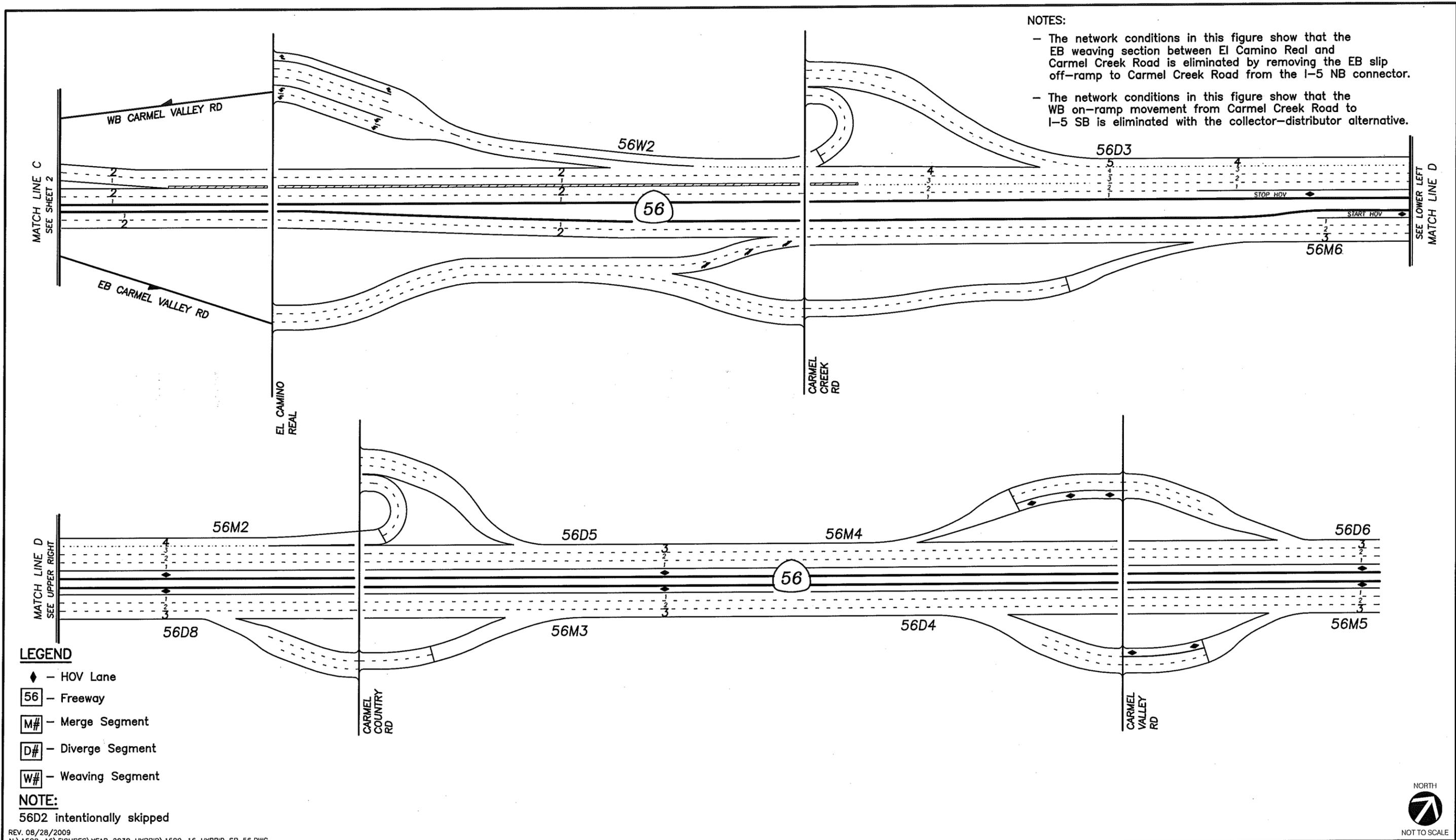
- ◆ - HOV Lane
- 5 - Freeway
- M# - Merge Segment
- D# - Diverge Segment



REV. 11/30/2009
 N:\1500-16\FIGURES\YEAR 2030 HYBRID\1500-16 HYBRID I-5.DWG

Figure 4-8C
 (SHEET 2 OF 5)

**Year 2030 Hybrid (Model Run H) Network Conditions
 Freeway Facilities**



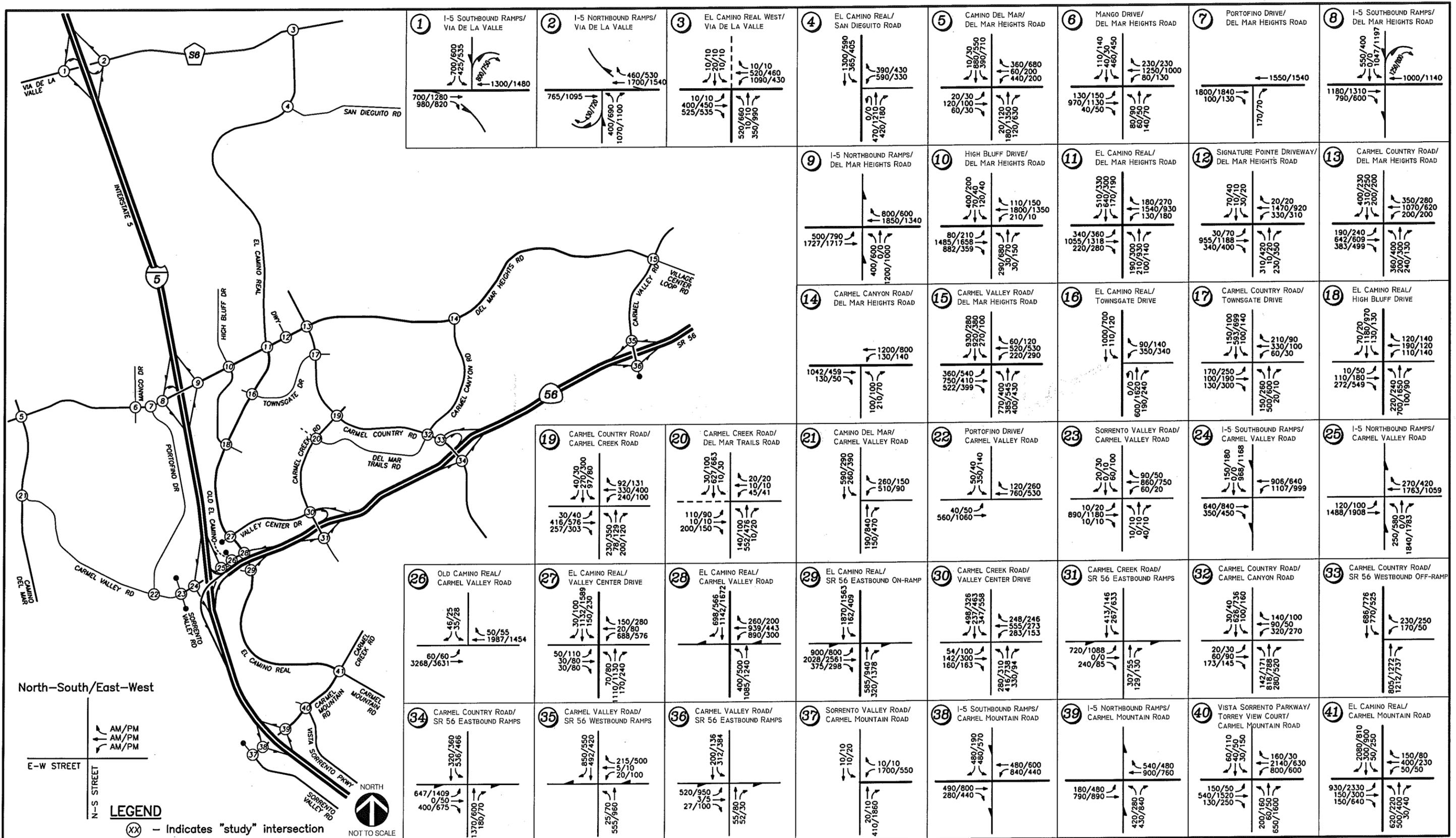


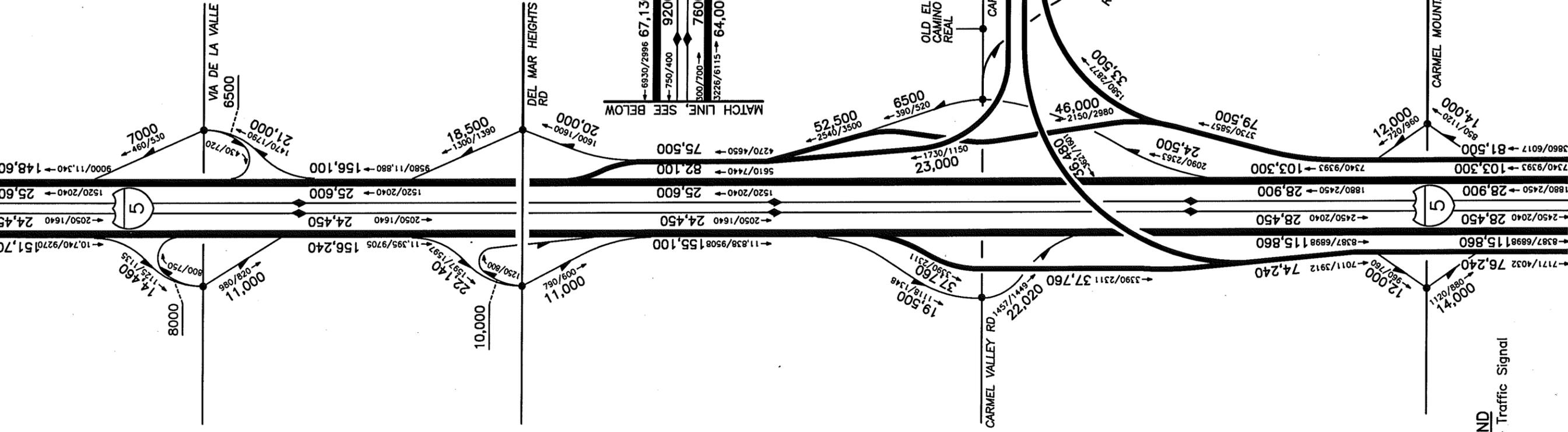
Figure 4-8d
 Year 2030 Hybrid (Model Run H) Traffic Volumes
 Intersections

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NOTES:

- AM/PM peak hour volumes are shown at the intersections
- The volumes shown in this figure assume that the EB slip off ramp from the I-5 NB connector to Carmel Creek Road is eliminated.
- The volumes shown in this figure assume that the WB on-ramp movement from Carmel Creek Road to I-5 SB is eliminated with the collector-distributor alternative.



NOTES:

- ADT's are shown for ramps and freeway facilities.
- AM/PM peak hour volumes are shown for ramp and freeway facilities.
- HOV Shift from I-5 SB Mainline between Carmel Valley Road and Carmel Mountain Road is 4000 ADT (400 AM/ 400 PM)
- Mainline Shift from I-5 HOV NB between Carmel Valley Road and Del Mar Heights Road is 3300 ADT (360 AM/ 410 PM)
- The Hybrid Alternative consists of Auxiliary lane improvements from SB I-5 to EB SR 56 and Direct Connector from WB SR 56 to NB I-5.
- The volumes shown in this figure assume that the WB on-ramp movement from Carmel Creek Road to I-5 SB is eliminated with the collector-distributor alternative.
- The volumes shown in this figure assume that the EB slip off ramp from the I-5 NB connector to Carmel Creek Road is eliminated.

LEGEND
 ● - Traffic Signal



REV. 09/10/2009
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Figure 4-8f
Year 2030 Hybrid (Model Run H) Traffic Volumes
Freeway and Ramp ADT

4.2.5 Year 2030 "Hybrid with Flyover" Alternative (Model Run H1)

This alternative includes a "flyover" in the SB I-5 to EB SR 56 direction and a Direct Connector in the WB SR 56 to NB I-5 direction. The Hybrid with Flyover Alternative involves the construction of a two-lane, one-way EB grade separated structure on Carmel Valley Road between I-5 and El Camino Real serving the SB I-5 to EB SR-56 traffic. This structure would merge into the EB SR-56 mainline between El Camino Real and Carmel Creek interchanges.

Drivers intending to travel from SB I-5 to EB SR 56 would have to exit Carmel Valley Road similar to the No Build and Auxiliary Lane scenarios. Instead of using the El Camino Real on-ramp, SR 56 traffic would use the "flyover" and bypass the El Camino Real intersection. The EB approach at the I-5 NB ramps/ Carmel Valley Road intersection would include three through lanes for this alternative with # 2 EB through lane acting as a shared lane. Drivers intending to travel from Carmel Valley Road to EB SR 56 would have to use the #1 and #2 lanes to access the flyover. #2 and #3 lanes would serve El Camino Real.

LLG coordinated with Caltrans regarding the forecast volumes for the Year 2030 with flyover alternative. The Hybrid with Flyover alternative assumes "no EB slip off-ramp" to Carmel Creek Road and a collector-distributor system on WB SR 56. *Figure 4-9a, Figure 4-9b* and *Figure 4-9c* illustrate the geometric conditions for the intersections, street segments and freeway facilities. *Figure 4-9d, Figure 4-9e* and *Figure 4-9f* illustrate the Year 2030 traffic volumes for the intersections, street segments and freeway facilities.

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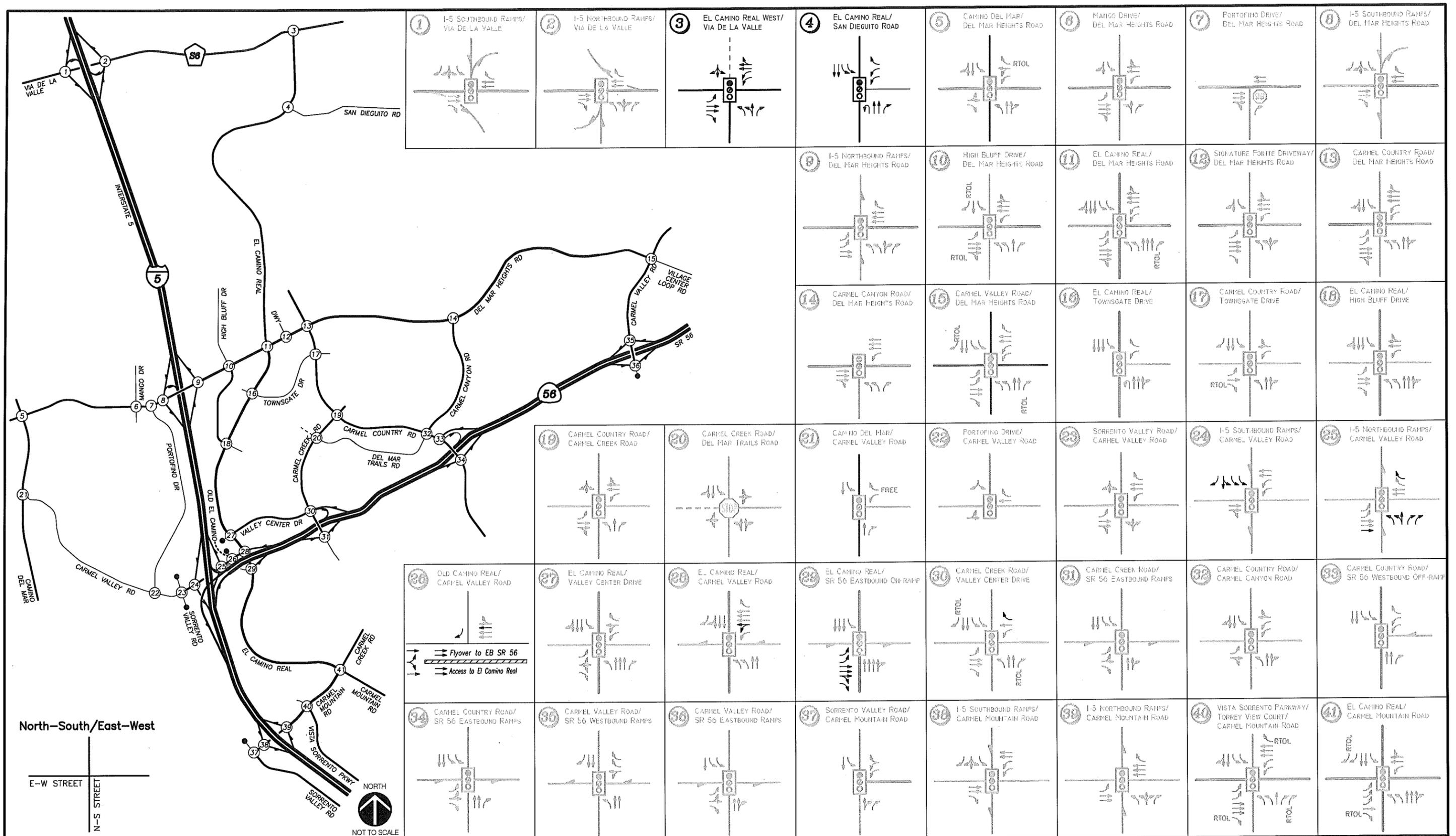


Figure 4-9a
Year 2030 Hybrid with flyover (Model Run H1) Network Conditions Intersections

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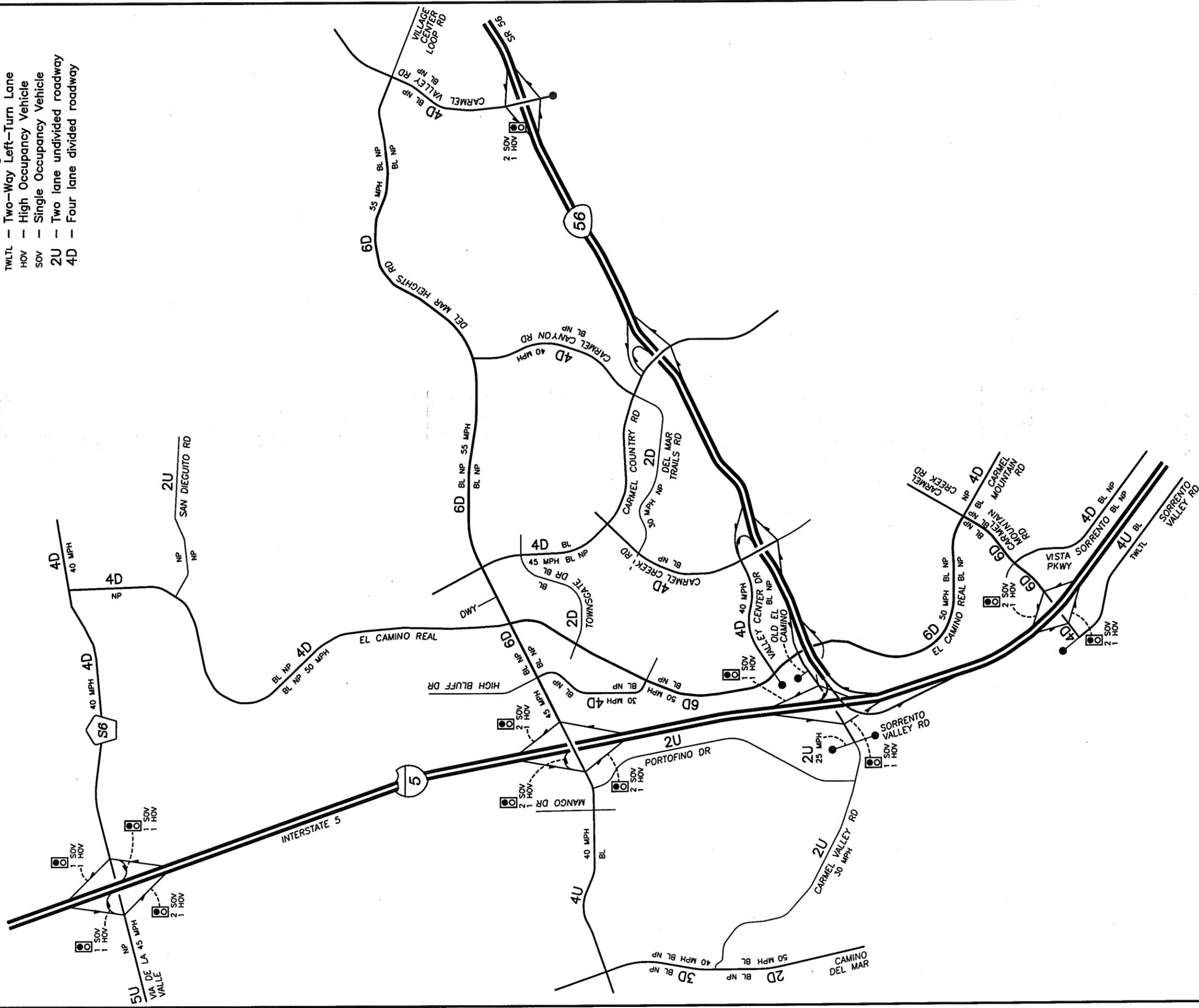
LEGEND

- Traffic Signal
 - All-Way Stop
 - Two-Way Stop
 - Indicates "study" intersection
 - Flyover

FREE - Free movement
 RTOL - Right Turn Overlap

LEGEND

- ◻ Ramp Meter Signal
- BL Bike Lane
- NP No Parking
- TWLT Two-Way Left-Turn Lane
- HOV High Occupancy Vehicle
- SOV Single Occupancy Vehicle
- 2U Two lane undivided roadway
- 4D Four lane divided roadway



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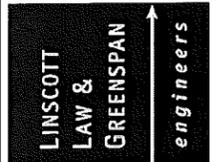
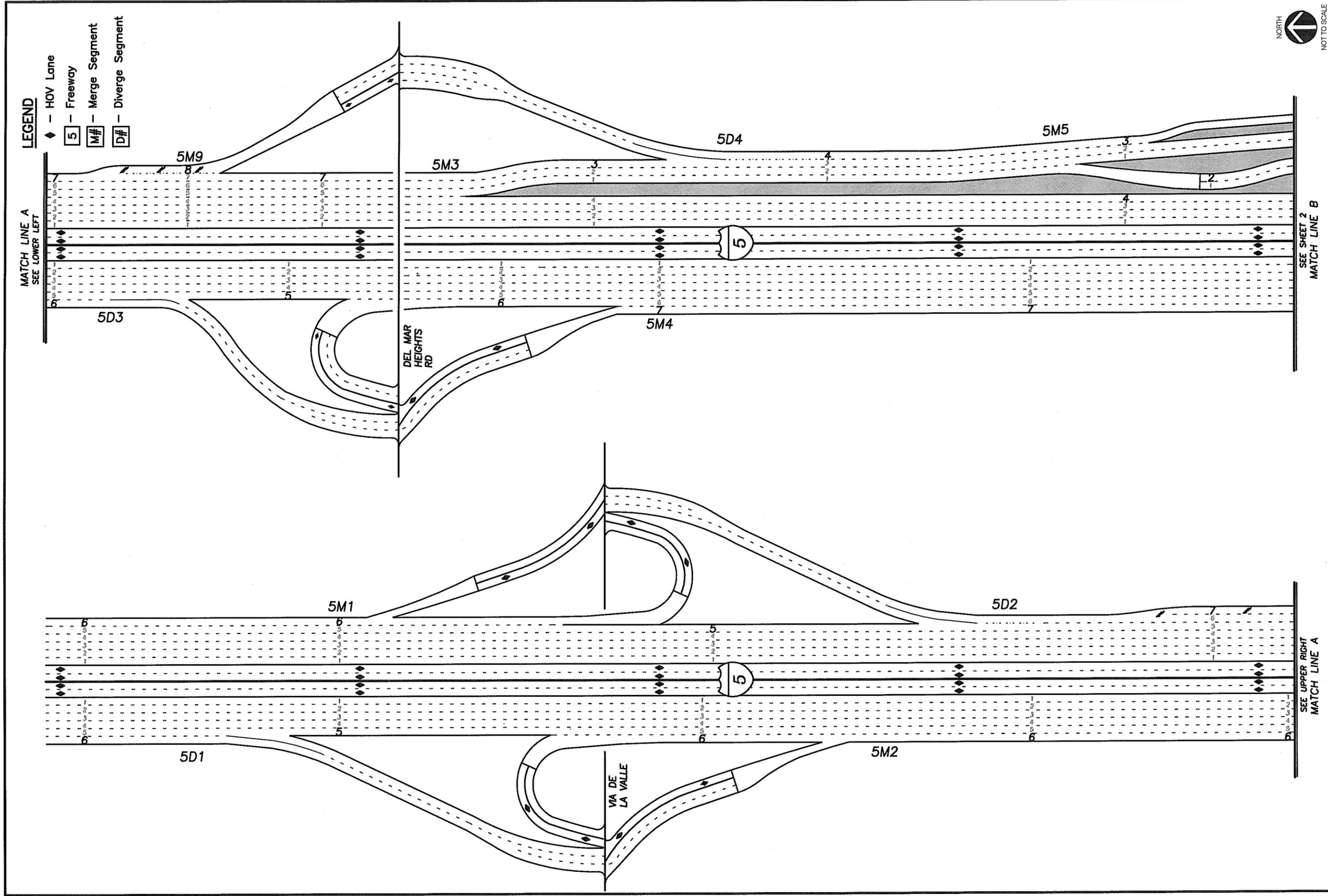


Figure 4-9b

Year 2030 Hybrid with flyover (Model Run H1) Network Conditions Street Segments



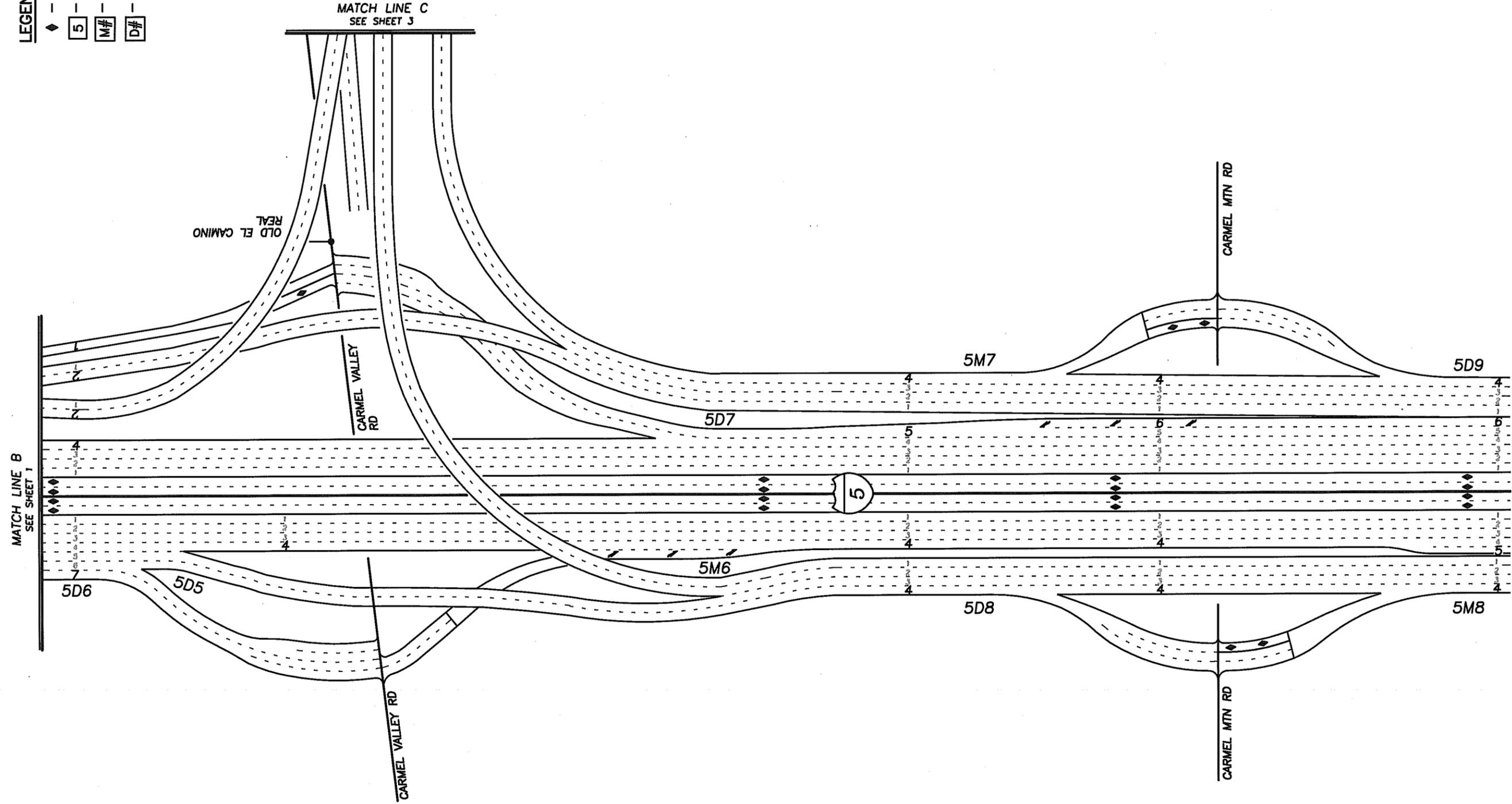
REV. 08/11/2009
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Figure 4-9C
(SHEET 1 OF 3)

**Year 2030 Hybrid with Flyover (Model Run H1) Network Conditions
Freeway Facilities**

LEGEND

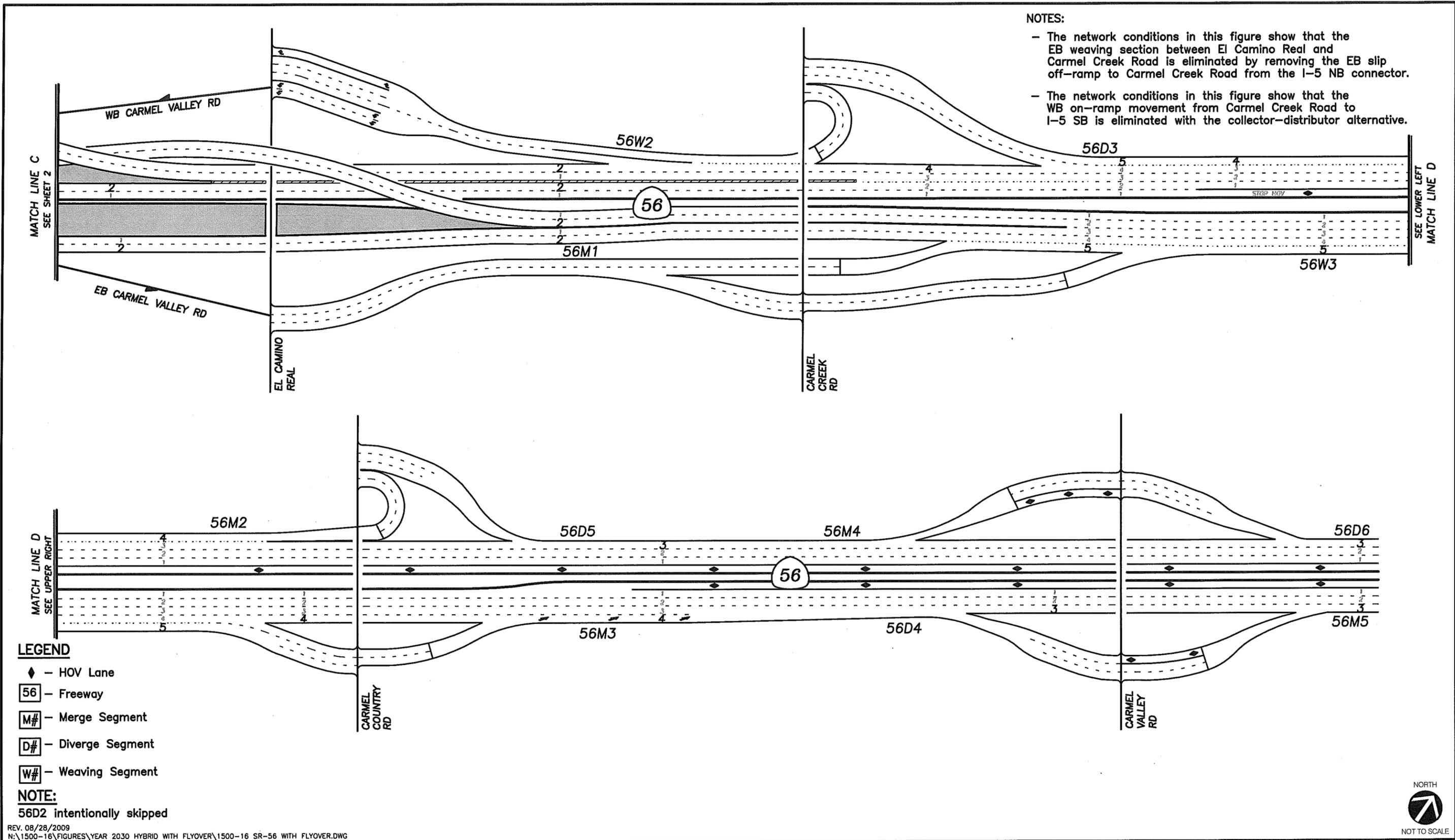
- ◆ - HOV Lane
- 5 - Freeway
- M# - Merge Segment
- D# - Diverge Segment



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Figure 4-9c
 (SHEET 2 OF 3)

Year 2030 Hybrid with Flyover (Model Run H1) Network Conditions Freeway Facilities



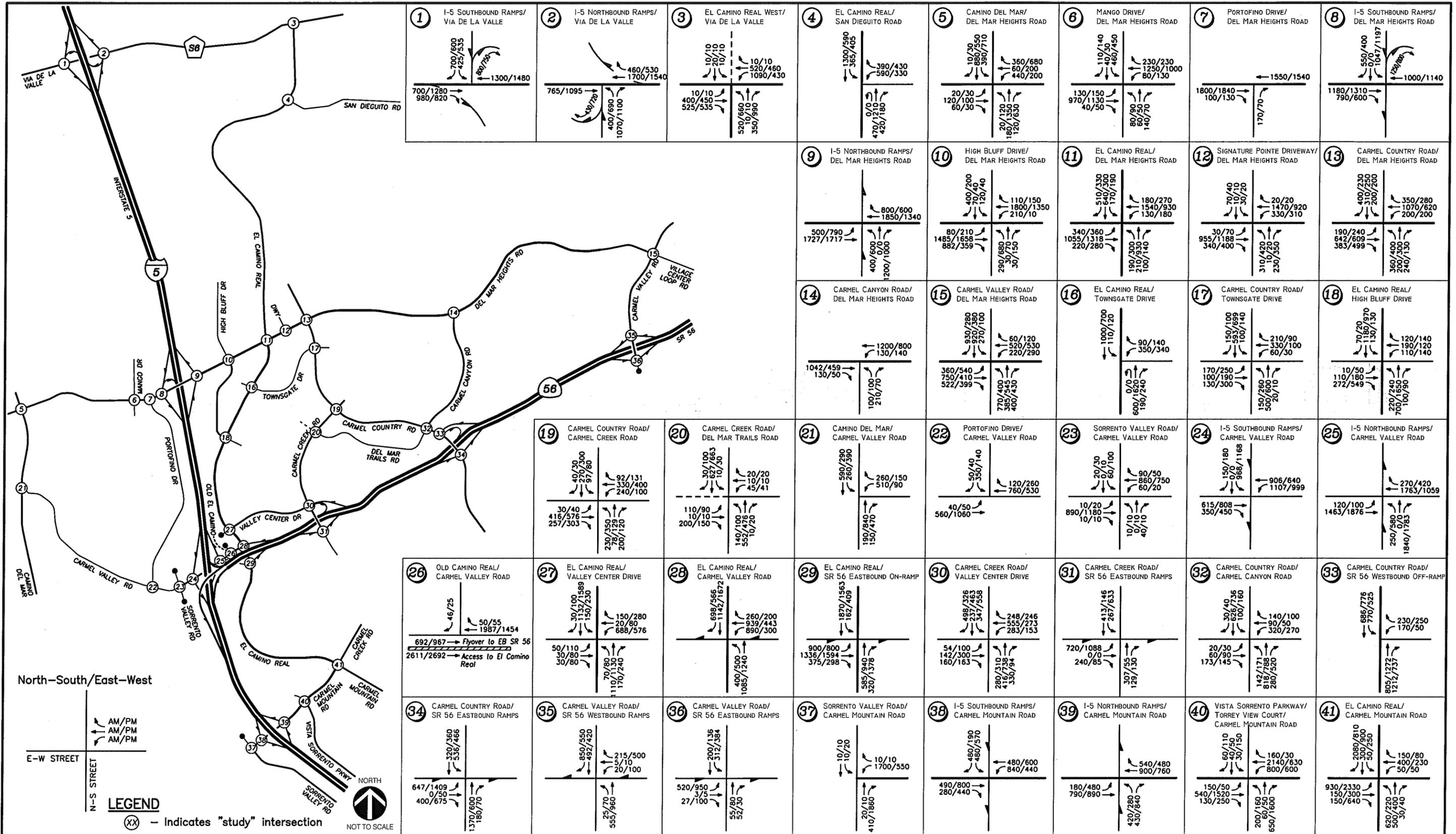


Figure 4-9d
Year 2030 Hybrid with flyover (Model Run H1) Traffic Volumes
Intersections

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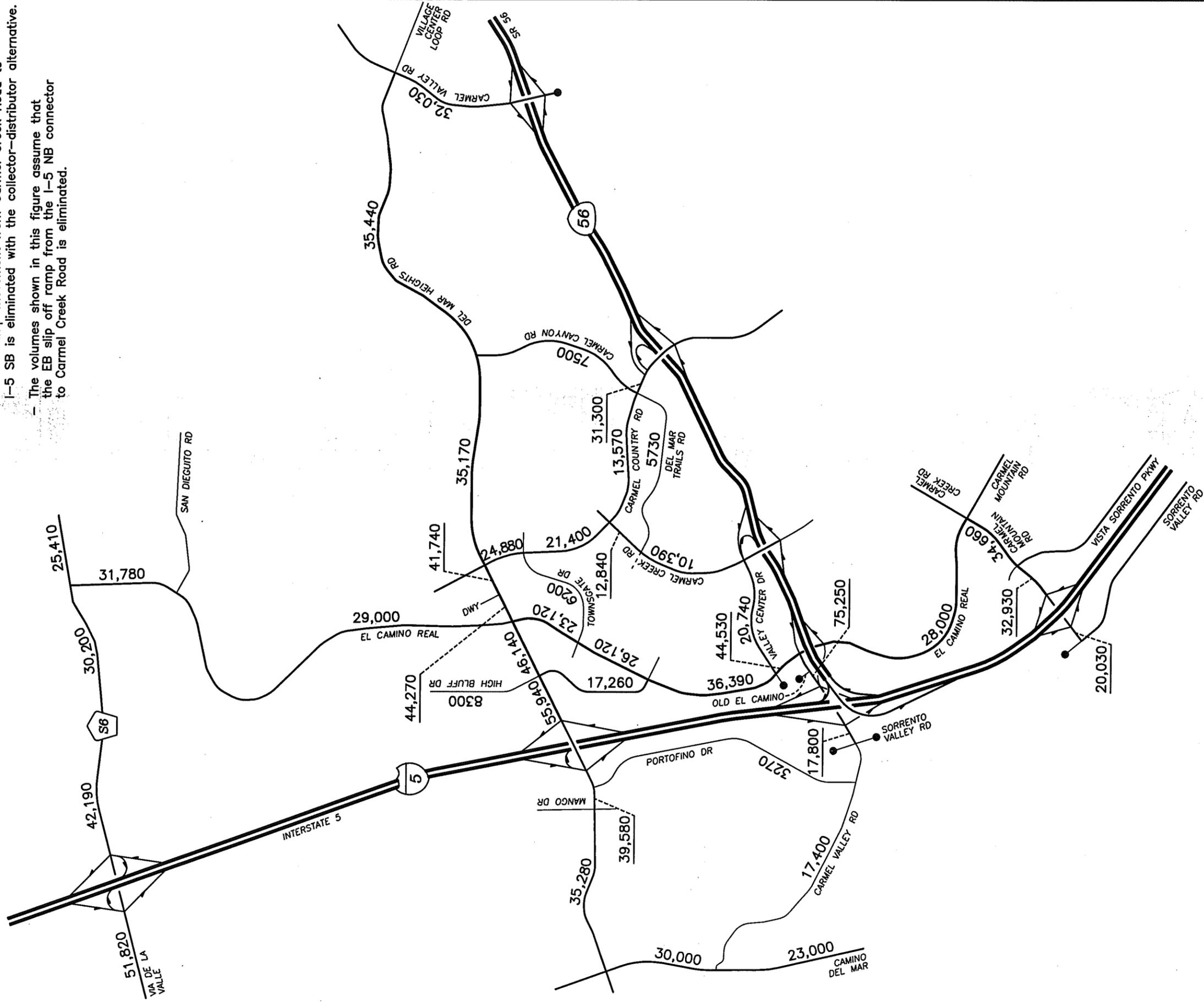
NOTES:

- AM/PM peak hour volumes are shown at the intersections
- The volumes shown in this figure assume that the EB slip off ramp from the I-5 NB connector to Carmel Creek Road is eliminated.
- The volumes shown in this figure assume that the WB on-ramp movement from Carmel Creek Road to I-5 SB is eliminated with the collector-distributor alternative.

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NOTES:

- ADT (Average Daily Traffic) shown midblock
- The volumes shown in this figure assume that the WB on-ramp movement from Carmel Creek Road to I-5 SB is eliminated with the collector-distributor alternative.
- The volumes shown in this figure assume that the EB slip off ramp from the I-5 NB connector to Carmel Creek Road is eliminated.

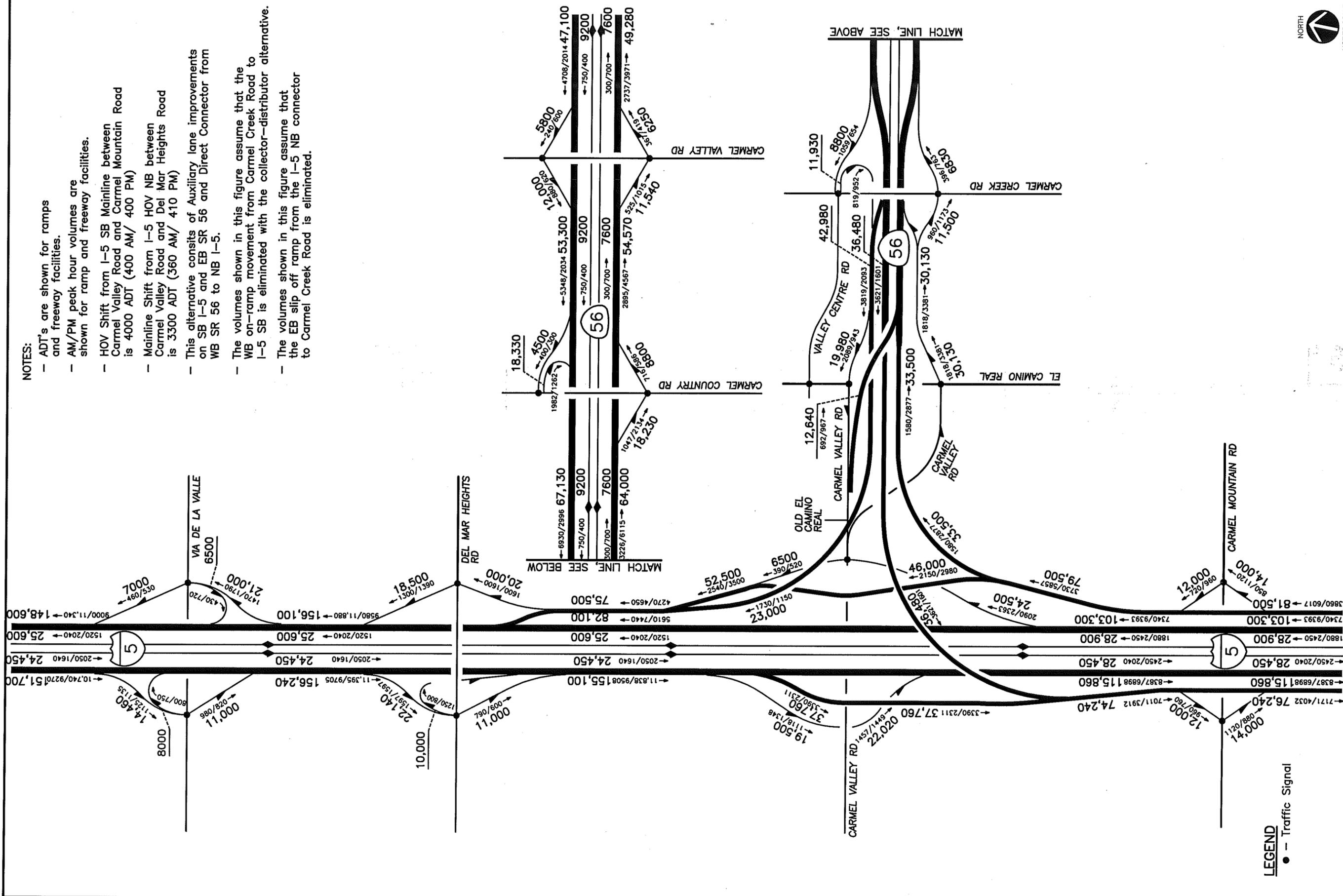


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Figure 4-9e
Year 2030 Hybrid with flyover (Model Run H1) Traffic Volumes
Street Segments ADT

NOTES:

- ADT's are shown for ramps and freeway facilities.
- AM/PM peak hour volumes are shown for ramp and freeway facilities.
- HOV Shift from I-5 SB Mainline between Carmel Valley Road and Carmel Mountain Road is 4000 ADT (400 AM/ 400 PM)
- Mainline Shift from I-5 HOV NB between Carmel Valley Road and Del Mar Heights Road is 3300 ADT (360 AM/ 410 PM)
- This alternative consists of Auxiliary lane improvements on SB I-5 and EB SR 56 and Direct Connector from WB SR 56 to NB I-5.
- The volumes shown in this figure assume that the WB on-ramp movement from Carmel Creek Road to I-5 SB is eliminated with the collector-distributor alternative.
- The volumes shown in this figure assume that the EB slip off ramp from the I-5 NB connector to Carmel Creek Road is eliminated.



LEGEND
 ● - Traffic Signal



Figure 4-9f

Year 2030 Hybrid with flyover (Model Run H1) Traffic Volumes Freeway and Ramp ADT

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 N:\1500-14\FIGURES\YEAR 2030 HYBRID WITH FLYOVER\1500-14_HYB W FLYOVER FIGURES.DWG

