

Corridor System Management Plan – Santa Barbara/Ventura US-101 Corridor Phase I

Final Preliminary Performance Assessment Report



State of California
Department of Transportation

By

DKS Associates

TRANSPORTATION SOLUTIONS

1000 Broadway, Suite 450
Oakland, CA 94607
(510) 763-2061

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Table of Contents

1	INTRODUCTION.....	1
1.1	PURPOSE OF THE REPORT	1
1.2	DATA SOURCES	1
1.3	STUDY CONTEXT	2
2	CORRIDOR DESCRIPTION.....	3
2.1	NETWORK DESCRIPTION	3
2.1.1	Description of Freeway.....	6
2.1.2	Description of Parallel Facilities.....	6
2.2	KEY PHYSICAL FEATURES	7
2.2.1	Northbound	7
2.2.2	Southbound	9
2.3	EXISTING MANAGEMENT STRATEGIES	10
2.4	LAND USE CHARACTERISTICS	10
2.5	PARK-AND-RIDE AND OTHER SUPPORT FACILITIES	11
2.6	CONSTRUCTION ACTIVITIES	14
2.6.1	US-101 Operational Improvements	14
2.6.2	Mission Street / US-101 SB Ramp	15
2.6.3	Carrillo Street / US-101 NB Ramp.....	15
3	CORRIDOR TRAVEL PATTERNS.....	16
3.1	FREEWAY TRAVEL PATTERNS.....	16
3.2	FREEWAY VOLUMES	16
3.2.1	Time-of-Day and Day-of-Week.....	17
3.3	VEHICLE OCCUPANCY	30
3.4	VEHICLE CLASSIFICATION/TRUCKS.....	30
4	FREEWAY PERFORMANCE.....	31
4.1	MOBILITY.....	31
4.2	RELIABILITY	38
4.3	SAFETY	38
4.3.1	Non-Recurring Congestion.....	38
4.3.2	TASAS Records, Collision-Risk Profile.....	38
4.4	PRODUCTIVITY.....	42
4.5	BOTTLENECK ANALYSIS	42
4.6	PRESERVATION	42
4.7	PAVEMENT CONDITION DATA	42
4.8	GAPS IN UNDERSTANDING.....	43
5	ARTERIAL PERFORMANCE	44
5.1	LEVEL OF SERVICE.....	44
5.2	GAPS IN UNDERSTANDING.....	47

6 TRANSIT PERFORMANCE..... 48

SERVICES AND 48

6.1 ROUTES..... 48

6.2 USE OF THE FREEWAY 49

6.3 RIDERSHIP..... 49

6.4 GAPS IN UNDERSTANDING..... 49

Appendices

APPENDIX A KEY PHYSICAL FEATURES

APPENDIX B FREEWAY VOLUMES

APPENDIX C BOTTLENECK ANALYSIS IN SANTA BARBARA COUNTY

APPENDIX D DATA COLLECTION PLAN

List of Figures

Figure 2 Locations of Airports, Park and Ride Lots, Amtrak/Bus13

Figure 3 Current Improvement between Milpas Street and Hot Springs Road15

Figure 4 Day-of-Week Freeway Volumes (Cont.)19

Figure 4 Day-of-Week Freeway Volumes (Cont.)20

Figure 4 Day-of-Week Freeway Volumes (Cont.)21

Figure 4 Day-of-Week Freeway Volumes (Cont.)22

Figure 4 Day-of-Week Freeway Volumes (Cont.)23

Figure 5 Time-of-Day Freeway Volumes.....24

Figure 5 Time-of-Day Freeway Volumes (cont.)25

Figure 5 Time-of-Day Freeway Volumes (cont.)26

Figure 5 Time-of-Day Freeway Volumes (cont.)27

Figure 5 Time-of-Day Freeway Volumes (cont.)28

Figure 5 Time-of-Day Freeway Volumes (cont.)29

Figure 6 Freeway Travel Time Route from PeMS in Ventura County.....32

Figure 7 Variation in Delay by Month for Observed Route32

Figure 8 Variation in Delay by Day of the Week for Observed Route.....33

Figure 9 Variation in Delay by Hour for Observed Route.....33

Figure 10 Travel Time Variability by Hour for Observed Route34

Figure 11 Variation in Buffer Time Index by Hour for Observed Route34

Figure 12 HICOMP Congestion in Santa Barbara County35

Figure 14 US-101N Collision-Risk Profile39

Figure 16 Level of Service at Regionally-Significant Intersections in the Goleta Area44

Figure 17 Level of Service at Regionally-Significant Intersections in the Santa Barbara and
Carpinteria Intersections45

List of Tables

Table 1 Data Sources1

Table 2 Parallel Arterials6

Table 3 Park-and-Ride Lots11

Table 4 Amtrak and Greyhound Stations.....11

Table 5 Annual Average Daily Traffic in 200716

Table 6 Vehicle Occupancy on US-101.....30

Table 7 Operational Deficiency for US-101 Mainline from PM 0.00 to PM 27.537

Table 8 CRP Analysis Statistics41

Table 9 Summary of US-101 Bottlenecks in Santa Barbara County42

Table 10 Summary of US-101 Bottlenecks in Santa Barbara County.....42

Table 11 Operational Deficiency for Ramp and Adjacent Intersections along US-101 between
SB-PM 0 and SB-PM 2745

1 INTRODUCTION

1.1 Purpose of the Report

The purpose of this report is to provide a preliminary assessment of the operation of the corridor, based on existing available data and limited field reviews and to identify critical data gaps and needs. This will provide a basis for determining the analysis that will be required for the detailed performance assessment at a later time and also help determine the data that will be required for that detailed assessment.

This document satisfies Item 4.0 Development Preliminary Performance Assessment of the Corridor System Management Plan (CSMP) Guidelines.

1.2 Data Sources

Table 1 Data Sources lists existing data and studies being used as data sources for this preliminary performance assessment.

Table 1 Data Sources

Data Sources	Date
State Highway Congestion Monitoring Program (HICOMP) Annual Data Compilation Reports	2006-2007
Freeway Performance Measurement System (PeMS) Database	Current
Traffic Accident Surveillance and Analysis System (TASAS) Database	Current
Aerial Photographs (Google Earth, Microsoft Virtual Earth, etc.)	Current
Caltrans Photolog	Current
CMIA Nomination SB/VEN 101 HOV (VEN-101-PM 39.8 to SB-101-PM 2.2) (6 Miles)	2006
Santa Barbara/Ventura Route 101 Corridor Management Overview (VEN-101-PM39.8 to SB-101-PM12.5) (by Caltrans)	2006
Santa Barbara/Ventura 101 HOV Project (Traffic Analysis Report by Fehr and Peers)	2008
Highway 101 Widening Project (EA-0N7000) (Draft of Existing Conditions Operations Analysis by Dowling)	2008
Multiple Tach Runs in District 5	2006-2008
Caltrans Traffic Volumes	2007-2008
Traffic Counts from Various Projects	2007-2008

1.3 Study Context

Funded through the proposition 1B Corridor Mobility Improvement Account (CMIA), the proposed project will be used to construct improvements on US-101 between Mobil Pier Road in Ventura County (PM R39.8) to south of Casitas Pass Road in Santa Barbara County (PM 2.2). This 6.0 mile project will add 12 HOV lane-miles, Intelligent Transportation Systems (ITS) infrastructure, and pedestrian access improvements. The project will significantly reduce delay, improve safety, and facilitate both goods movement and regional and interregional travel.

Caltrans is required to prepare a CSMP for US-101 in Santa Barbara and Ventura counties to assess current performance, identify causal factors for congestion, and propose the best mix of improvements for preserving the performance of the corridor for the next twenty years. The CSMP will study US-101 from Rice Avenue interchange (VEN PM 20.7) to Hollister Avenue interchange (SB PM 27.2); including major local parallel arterials, local road intersections, ramps, signal controls, transit, park and ride lots, pedestrian and bike lanes, and rail.

2 CORRIDOR DESCRIPTION

2.1 Network Description

US-101 runs almost the entire length of the State of California and is a major interregional route connecting San Francisco and Los Angeles. The study area is located in the southern part of the State, in southern Santa Barbara County and western Ventura County. The corridor study limit is illustrated in **Figure 1**. This corridor is the most congested corridor in Caltrans District 5 and one of the most congested four-lane freeway segments in California. Regionally, it is the only viable alternative route for commuters and freights between Santa Barbara and Ventura counties.

US-101 is on the Interregional Road System (IRRS) as a designated Focus Route¹. The United States Department of Defense has identified US-101 as a Strategic Highway Network (STRAHNET) route². It is part of a network of linked highways deemed essential to national defense for facilitating the movement of troops and equipment to airports, ports, rail lines, and military bases. The highway is also a State Highway Extra Legal Load (SHELL) roadway and is designated for use by larger trucks³. It is also listed on the National Highway System which means that it connects rural areas to growing urban centers and is critical for moving people, goods, services, and technology.

The Pacific Ocean and the steep coastal mountains physically constrain travel options and make US-101 vulnerable to travelers. It is the only viable alternative for travel between the cities of Santa Barbara and Ventura. US-101 also plays a larger role in the state economy by serving as a secondary route to Interstate 5 connecting the Los Angeles Basin to Northern California. This role is exacerbated when an accident, a forest fire or snowfall closes I-5.

¹ <http://www.leginfo.ca.gov/cgi-bin/displaycode?section=shc&group=00001-01000&file=163-164.56>

² <http://www.globalsecurity.org/military/facility/strahnet.htm>

³ Corridor Mobility Improvement Account Nomination SB/VEN 101 HOV, December 29, 2006

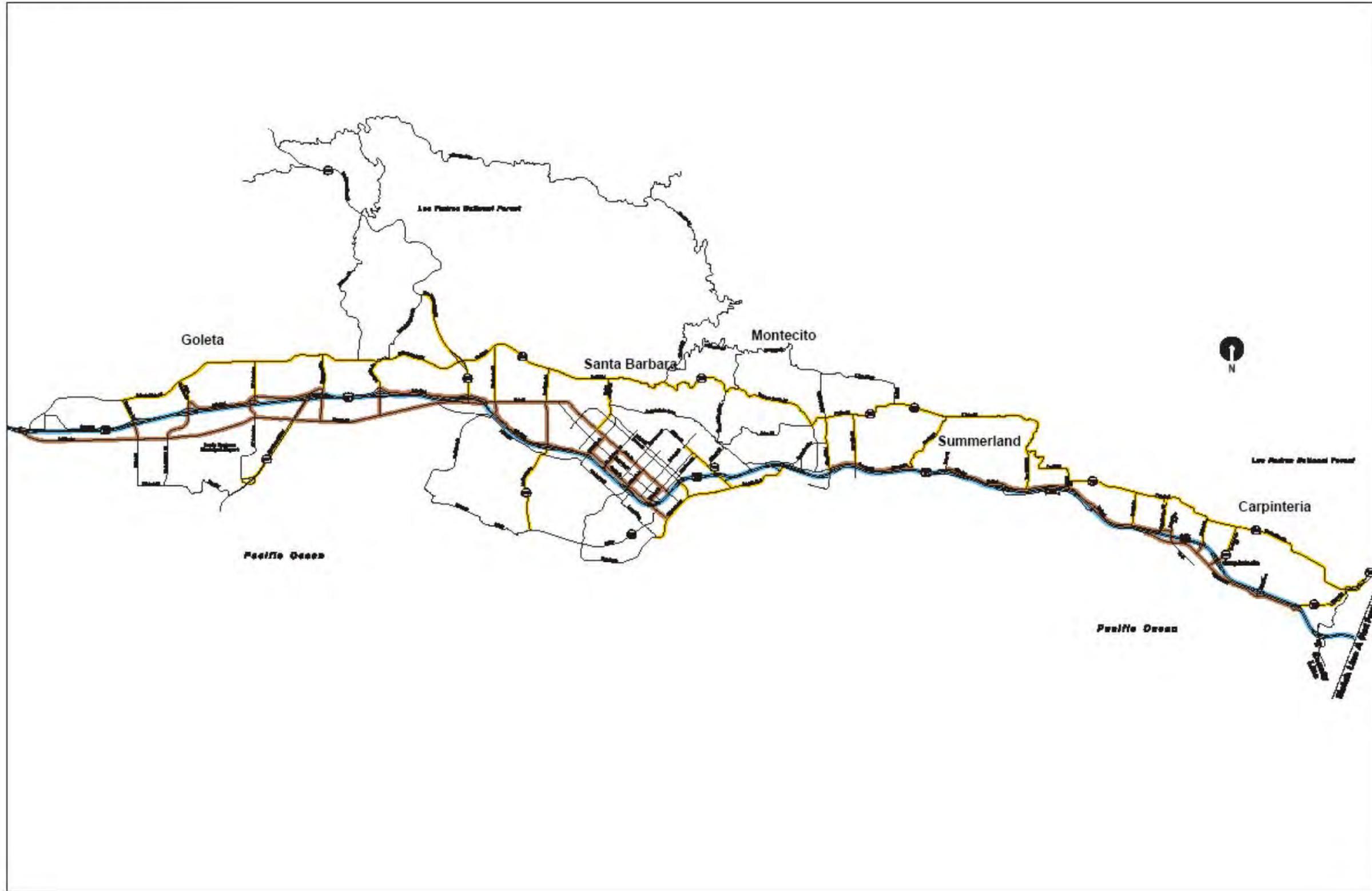


Figure 1 Corridor Study Limit

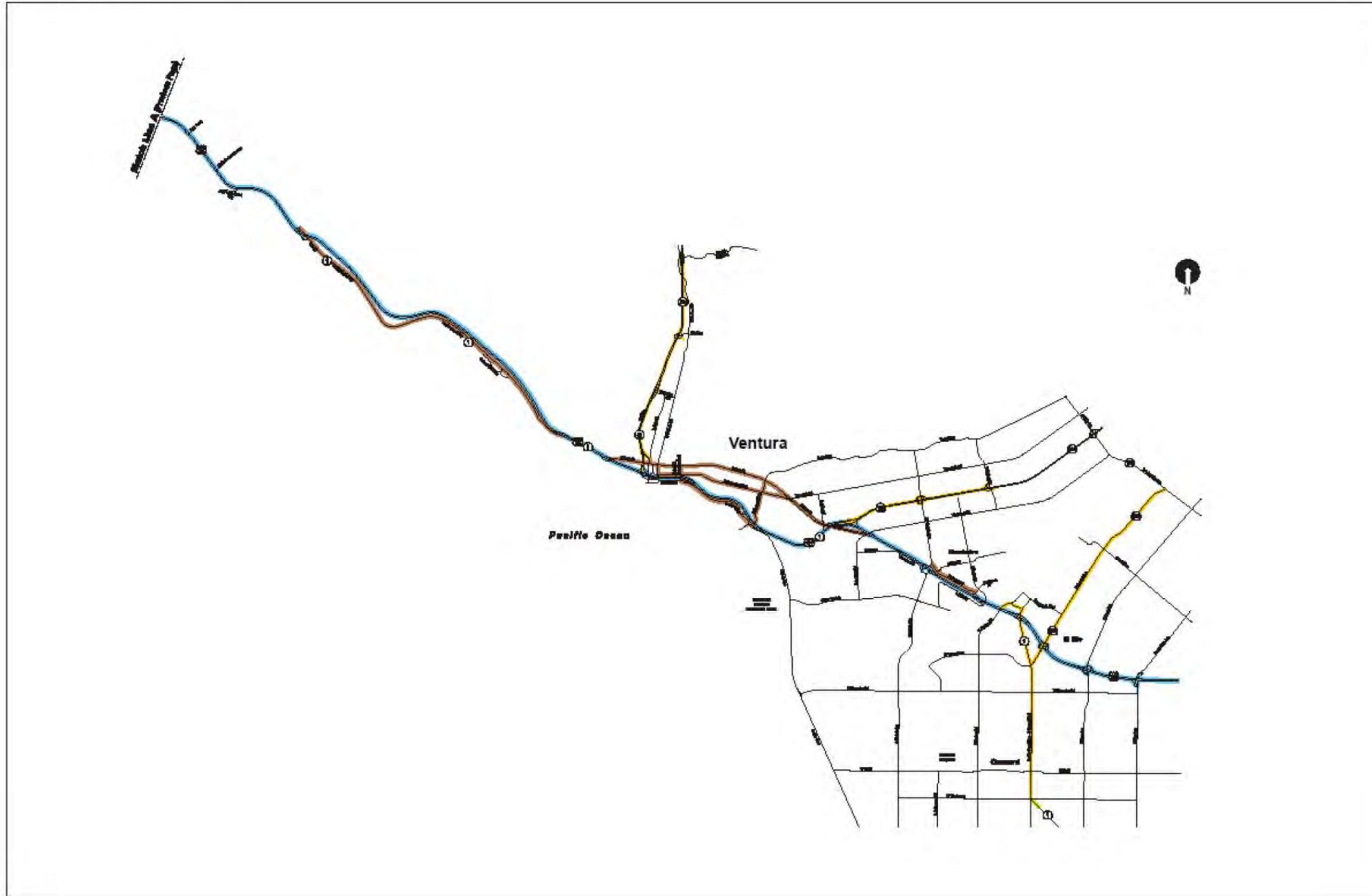


Figure 1 Corridor Study Limit (continued)

2.1.1 Description of Freeway

While most of US-101 in the corridor study limit is a six-lane freeway, about 16 miles between Mussel Shoals and Milpas Street is a four-lane freeway. Within this four-lane section, there is a portion where there are three median openings to provide access to the communities of Mussel Shoals and La Conchita and to the industrial site known as Tank Farm. If this section was improved to six-lanes and the access points were removed, the entire US-101 would be a continuous six-lane freeway facility for almost 70 miles from Thousand Oaks to Goleta carrying major traffic between the two counties. The 2006 (Annual Average Daily Traffic) AADT ranges from 65,000-106,000 vehicles with projected 2030 AADT ranging from 85,000-145,000 vehicles.

2.1.2 Description of Parallel Facilities

Parallel facilities include arterials and a single track rail line. There are several parallel arterials in this corridor, as illustrated in **Figure 1** and listed in Table 2, but none of them serves as a major alternative route between or within the two counties during normal operations. Once there is a significant congestion or an incident or accident blocks lanes of the freeway, some traffic can divert to these parallel arterials to bypass the congested segments of US-101. The parallel arterials are listed as follows.

Table 2 Parallel Arterials

Parallel Arterials	From	To
Hollister Avenue	The Northern End	State Street
Calle Real	Los Carneros Road	Patterson Avenue
	Turnpike Road	State Street
	Lacumbre Road	Mission Street
State Street	La Cumbre Road	Gutierrez Street
Castillo Street	Mission Street	SR-225
Jameson Line	Olive Mill Road	Sheffield Drive
Via Real	Evan Street	Santa Ynez Avenue
Carpinteria Avenue	US-101S Exit	SR-150
SR-1 (Pacific Coast)	Seacliff	Solimar
Main Street	SR-33	Telephone Road
Thompson Boulevard	Ventura Avenue	E Main Street
Harbor Boulevard	California Street	Seaward Avenue
Frontage Road	Victoria Avenue	Northbank Drive
Cathedral Oaks Road	Storke Road	SR-154
SR-192	SR-154	SR-150

The corridor contains a single track rail line, which intercity passenger trains and freight use daily. While potential conflicts exist, commuter passenger service has been analyzed and has been found to fit within existing train schedules with the implementation of capital improvements. Furthermore, additional commuter service would not interfere with freight service. Currently, Amtrak runs 6 roundtrips of the Pacific Surfliner between Santa Barbara and Los Angeles, with two of these trips extending north to San Luis Obispo. One daily roundtrip is made by the Coast Starlight long distance passenger train. None of the existing trains are particularly well suited to accommodate an 8 to 5 workday in Santa Barbara with a trip originating in Ventura/Oxnard.

2.2 Key Physical Features

The US-101 corridor includes approximately 50 miles of sections between Santa Barbara and Ventura areas, which is located within Caltrans District 5 and District 7 jurisdictions. The study sections begin to the east of the Rice Avenue interchange in Ventura County (VEN, PM 20.1) and end to the west of the Hollister interchange in Santa Barbara County (SB, PM 26.9).

2.2.1 Northbound

In the northbound direction, US-101 maintains 2 or 3 travel lanes for the entire study corridor. Sections with 3 lanes include:

- NB from Rice Avenue / Auto Center Drive interchange (VEN, PM 20.1) to E Main Street / S Mills Road off-ramp (VEN, PM 26.7);
- NB from SR-126 on-ramp (VEN, PM 26.7) to SR-33 off-ramp (VEN, PM 30.9);
- NB from SR-33 on-ramp (VEN, PM 30.9) to an area between Seacliff interchange (VEN, PM 39.0) and Old Pacific Coast Highway intersection (VEN, PM 40.9); and
- NB from Milpas Street on-ramp (SB, PM 12.9) to Fairview Avenue on-ramp (SB, PM 22.5).

Sections with 2 lanes include:

- NB from E Main Street / S Mills Road off-ramp (VEN, PM 26.7) to SR-126 on-ramp (VEN, PM 26.7);
- NB from SR-33 off-ramp (VEN, PM 30.9) to SR-33 on-ramp (VEN, PM 30.9);
- NB from between Seacliff interchange (VEN, PM 39.0) and Old Pacific Coast Highway intersection (VEN, PM 40.9) to Milpas Street on-ramp (SB, PM 12.9); and
- NB from N Fairview Avenue on-ramp (SB, PM 22.5) to Hollister Avenue interchange (SB, PM 27.0).

Lane Drop Feature

A location with a lane drop of a travel lane is typically identified as a potential bottleneck when excessive volume exists. In the northbound direction of the study area, there are lane drops on mainline US-101 from 3 lanes to 2 lanes at following locations:

- NB at E Main Street / S Mills Road off-ramp (VEN, PM 26.7);

- NB at SR-33 off-ramp (VEN, PM 30.9);
- NB between the Seacliff interchange (VEN, PM 39.0) and Old Pacific Coast Highway intersection (VEN, PM 40.9); and
- NB at N Fairview Avenue on-ramp (SB, PM 22.5).

Weaving Feature

The northbound sections consist of all freeway segment types including basic, merging, diverging, and weaving. Most of the weaving sections less than 2,000 feet do not have an auxiliary lane travelling between on-ramp and off-ramp. These sections are identified as potential deficiency areas based on the California Highway Design Manual (CA HDM). These potential sections are:

- NB from S Oak Street on-ramp (VEN, PM 30.0) to SR-33 off-ramp (VEN, PM 30.9);
- NB from Bates Road on-ramp (SB, PM 0.1) to Rincon Road off-ramp (SB, PM 0.5);
- NB from Ortega Hill Road / Evan Street on-ramp (SB, PM 8.4) to N Jameson Ln / Sheffield Drive off-ramp (SB, PM 8.9);
- NB from San Ysidro Road on-ramp (SB, PM 10.2) and Olive Mill Road off-ramp (SB, PM 10.4);
- NB from Salinas Street on-ramp (SB, PM 12.1) to S Milpas Street off-ramp (SB, PM 12.6);
- NB from S Milpas Street on-ramp (SB, PM 12.9) to Laguna Street / Garden Street off-ramp (SB, PM 13.4);
- NB from Garden Street on-ramp (SB, PM 13.6) to Bath Street off-ramp (SB, PM 14.0);
- NB from Castillo Street on-ramp (SB, PM 14.3) to W Carrillo Street off-ramp (SB, PM 14.6);
- NB from W Carrillo Street on-ramp (SB, PM 14.9) to W Arrellaga Street off-ramp (SB, PM 15.3);
- NB from W Arrellaga Street on-ramp (SB, PM 15.4) to W Mission Street off-ramp (SB, PM 15.7); and
- NB from Los Carneros Road on-ramp (SB, PM 23.9) to Storke Road off-ramp (SB, PM 24.7).

At-Grade Intersection Feature

There are three at-grade intersections in this direction. These intersections are:

- Intersection of US-101 and Tank Farm (VEN, PM 42.2);
- Intersection of US-101 and W Santa Barbara Avenue (VEN, PM 41.5); and
- Intersection of US-101 and Old Pacific Coast Highway (VEN, PM 40.9).

Other Key Physical Features

It is common for the access to the mainline to be provided at the right-hand side of a travel lane. Access to E Cabrillo Boulevard from US-101 is provided via a left-hand off-ramp in the

northbound direction. However, this will be changing with the Milpas to Hot Springs Improvements project scheduled to be completed in the year 2012.

There are freeway-to-freeway interchanges merging to the northbound direction at SR-126 and SR-33 in Ventura County. These merging areas are considered a potential feature that may affect Level of Service.

2.2.2 Southbound

In the southbound direction, US-101 also maintains 2-3 travel lanes for the entire study corridor. The sections with 3 travel lanes include:

- SB from Fairview Avenue on-ramp (SB, PM 22.4) to Milpas Street off-ramp (SB, PM 12.9);
- SB from an area between Old Pacific Coast Highway intersection (VEN, PM 40.9) and Seacliff interchange (VEN, PM 39.0) to SR-33 off-ramp (VEN, PM 30.9);
- SB from SR-33 on-ramp (VEN, 30.9) to SR-126 off-ramp (VEN, PM 26.7); and
- SB from Telephone Road (VEN, PM 26.0) to Rice Avenue (VEN, PM 20.1)

And sections with 2 lanes include:

- SB from Hollister Avenue interchange (SB, PM 26.7) to N Fairview Avenue on-ramp (SB, PM 22.4);
- SB from Milpas Street off-ramp (SB, PM 12.9) to an area between Old Pacific Coast Highway intersection (VEN, PM 40.9) and Seacliff interchange (VEN, PM 39.0) (changing with Milpas to Hot Springs Improvements Project);
- SB from SR-33 off-ramp (VEN, PM 30.9) to SR-33 on-ramp (VEN, PM 30.9); and
- SB from SR-126 off-ramp (VEN, PM 26.7) to Telephone Road on-ramp (VEN, PM 26.0).

Lane Drop Feature

A lane drop from 3 lanes to 2 lanes in the southbound direction occurs at the following locations:

- SB at S Milpas Street off-ramp (SB, PM 12.9);
- SB at SR-33 off-ramp (VEN, PM 30.9); and
- SB at SR-126 off-ramp (VEN, PM 26.7).

Weaving Feature

Similar to the northbound sections, the southbound sections also consist of basic, merging, diverging, and weaving segment types. The following locations meet the CA HDM criteria for auxiliary lanes:

- SB from Reynolds to Linden (SB, PM 3.3) (changing with Milpas to Hot Springs Improvement Project) ;
- SB from Santa Claus to Carpinteria (SB, PM 4.5);
- SB from Sheffield to Evans (SB, PM 8.6); and

- SB from Olive Mill to San Ysidro (SB, PM 10.3).

At-Grade Intersection Feature

There are three at-grade intersections at following locations:

- Intersection of US-101 and Tank Farm (VEN, PM 42.2);
- Intersection of US-101 and W Santa Barbara Avenue (VEN, PM 41.5); and
- Intersection of US-101 and Old Pacific Coast Highway (VEN, PM 40.9).

Other Key Physical Features

Mainline access in the southbound direction is located on the left-hand side of the travel lanes at several locations. The interchanges of E Cabrillo Boulevard and N Jameson Ln connect to the mainline on the left side of US-101 (changing with Milpas to Hot Springs Improvements project).

Major merging areas for this direction are freeway-to-freeway interchanges connecting to the southbound US-101 at SR-217, SR-33, and SR-126.

2.3 Existing Management Strategies

Incident management on the District 5 US-101 segment is provided primarily by the Freeway Service Patrol (FSP), which is jointly managed by SBCAG and the California Highway Patrol (CHP) with assistance from Caltrans. During commute periods (6:30 to 9:30 AM and 4:30 to 7:30 PM), tow trucks cover the US-101 corridor from Patterson Avenue to the Ventura County line. The trucks are dispatched by CHP to accidents and vehicle breakdowns for emergency assistance and removal of vehicles to a safe place. The program began in March 2006 and is well received by the public as it acts to reduce non-recurring congestion as well as chances of further accidents.

Travel information system is under development on the District 7 US-101 segment. VCTC installed a wireless solar-powered traffic speed monitoring system along US-101 in Ventura County under VCTC's Congestion Management Program. Speed data generated from this system will be used for the posting of real-time travel speeds along the corridor for public viewing on the Internet as well as helping pinpoint traffic hazards for improving emergency response to traffic incidents.

Closed circuit television cameras have been installed along US-101 at Trunpike, Patterson, Fairview, Los Carneros, and Storke/Glenn Annie interchanges. The Traffic Operation Centers in Los Angeles and San Luis Obispo monitor all US-101 segments in Districts 7 and 5, respectively, and feed information to the media about accidents and incidents that will affect traffic flow.

2.4 Land Use Characteristics

Detailed analysis of land use characteristics will be done once the travel demand models are obtained to understand the socio economic data such as population, households, number of autos per household, income, employment, etc.

2.5 Park-and-Ride and Other Support Facilities

There are several facilities along the US 101 CSMP study corridor that support higher vehicle occupancies and non-auto modes, such as park and ride lots, Amtrak, Greyhound. **Figure 2** illustrates the locations of these facilities. There are several park and ride lots in Santa Barbara and Ventura Counties. Only a few of those lots in Ventura County are in proximity with the study corridor. These park-and-ride lots are located in the city of Ventura, Montalvo, Oxnard, Camarillo and Santa Paula, as shown in Table 3.

Table 3 Park-and-Ride Lots

City	Address
Ventura	National Guard Armory, 1270 Arundell Ave. adjacent to Routes 101 & 126
Montalvo	6175 Ventura Blvd., at the Metrolink Station
Oxnard	Oxnard Factory Outlet Center, Lockwood and Outlet Center Drive
Oxnard	Oxnard Transportation Center, 201 East 4 th St.
Camarillo	690 Ventura Blvd. at Los Posas, adjacent to Route 101
Camarillo	30 N. Lewis Rd, at the Metrolink Station
Camarillo	Pleasant Valley Road & Route 101
Santa Paula	K-Mart, 895 Faulkner Road, adjacent to Route 126

In addition, there are a few Amtrak and Greyhound stations along the study corridor as listed in Table 4.

Table 4 Amtrak and Greyhound Stations

City	Address
Amtrak Stations	
Goleta	North End of La Patera Lane, Goleta, CA 93117
Santa Barbara	209 State St, Santa Barbara, CA 93101
Carpinteria	5th Street at Linden Avenue, Carpinteria, CA 93013
Ventura	Harbor Blvd. & Figueroa St., Ventura, CA 93013
Oxnard	201 East 4th St., Oxnard, CA 93030
Carmarillo	30 Lewis Road, Camarillo, CA 93010
Greyhound Stations	
Santa Barbara	34 West Carrillo St., Santa Barbara, CA 93101
Oxnard	201 East 4th St. STE C, Oxnard, CA 93030

Several airports are within or nearby the study area. The Santa Barbara Airport (SBA) is located in the north portion of the study corridor, which is owned and operated by the City of Santa Barbara. SBA is a small hub airport with 180,000 annual aircraft operations of commercial and general aviation flights. Five commercial airlines serve nine major non-stop cities and over 200 one-stop destinations. 194 Santa Barbara based private aircraft are served by two fixed-base operators and thirty aviation service companies.

The Oxnard Airport (OXR) is located in the southern portion of the study corridor. It is classified as a non-hub commercial service airport, with commuter flights currently serving numerous destinations through Los Angeles International Airport by SkyWest Airlines only (a commuter division of United Airlines). The airport has a contract air traffic control tower handling approximately 100,000 arrivals and/or departures a year, and is home to over 180 individual aircraft. As of February 2007, two full service Fixed Base Operators (FBO) and two Flight Schools are headquartered at the airfield.

The Camarillo Airport is located adjacent to US-101, about 3 miles to the south end of the study corridor. It is a general aviation reliever airport for the Los Angeles area, supporting a wide range of general aviation activity. The airport exclusively serves privately-operated general aviation and executive aircraft with no scheduled commercial service. In addition, it is home to nearly 20 aviation related businesses, and also plays host to some 15 non-aviation businesses providing a varying range of services.

The Santa Paula Airport (SZP) is located about 12 miles northeast to the south portion of the study corridor. SZP is a privately-owned public-use airport, which handles approximately 97,000 arrivals and/or departures a year, and is home to over 259 individual aircraft. The airport primarily serves the local community and provides hangar space for pilots of nearby communities. As of February 2007, SZP is a non-towered airport, with no FBO headquartered at the airfield.

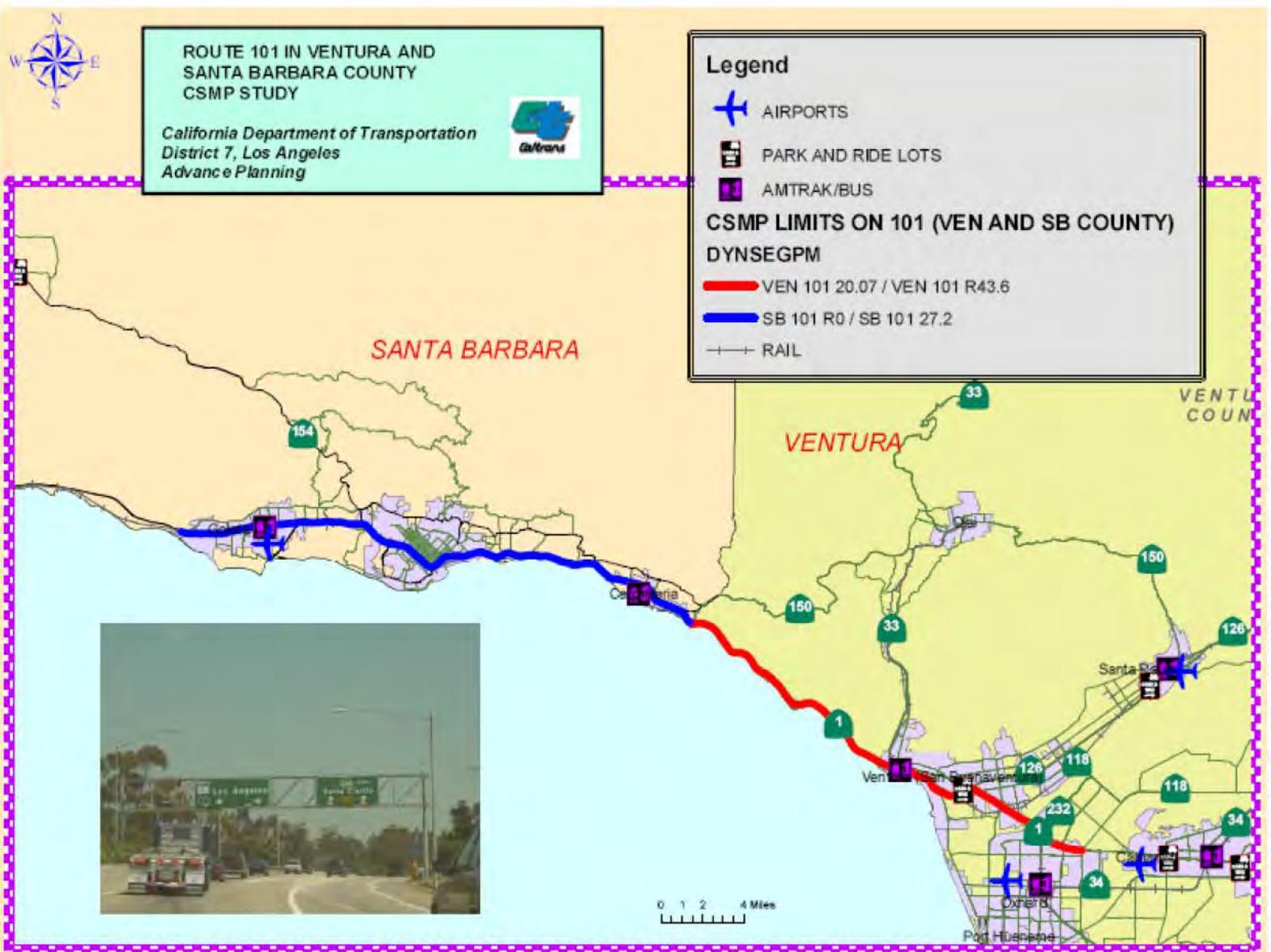


Figure 2 Locations of Airports, Park and Ride Lots, Amtrak/Bus

In addition to park-and-ride and other support facilities described above, there are bicycle programs implemented in this corridor to support non-auto and auto alternative improvements. Most of the cities within Santa Barbara and Ventura Counties, and the counties themselves, have adopted bicycle master plans covering a comprehensive bikeway network of existing and planned routes. VCTC provides bike racks and bicycle storage compartments on all of the VISTA buses. Bike racks are also available on the Pacific Surfliner train. There are Class II bicycle lanes on US-101 between Mobil Pier under crossing and the Santa Barbara Ventura County line. These bike lanes are planned to be incorporated into any widening project along this segment.

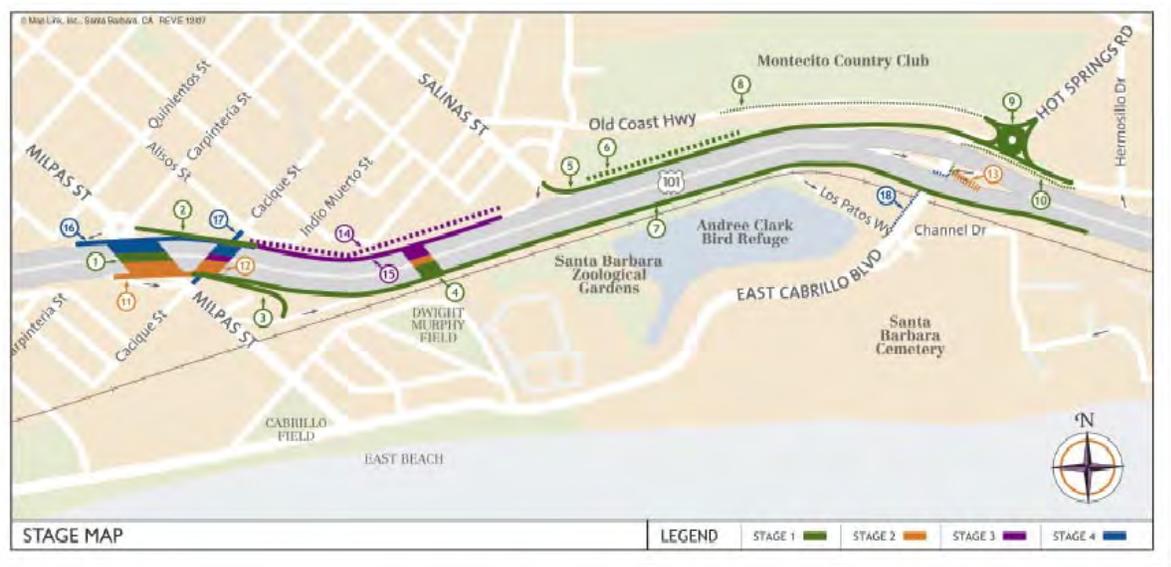
2.6 Construction Activities

2.6.1 US-101 Operational Improvements

Within the study area, construction has been undertaken between Milpas Street and Hot Springs Road / Cabrillo Boulevard to improve traffic congestion, ramp access, and safety. The main construction related to US-101 mainline includes improvements as follows:

- Adding a travel lane to southbound between Milpas Street and Hot Springs Road / Cabrillo Boulevard
- Adding an auxiliary lane to northbound between Salinas Street and Milpas Street
- Replacing a bridge at Milpas Street
- Adding an auxiliary lane, in the northbound direction, between Cabrillo Boulevard on-ramp and Salinas Street off-ramp
- Adding vehicle, pedestrian, and bike connection under US-101 at Cacique Street
- Adding a roundabout at Cacrillo Boulevard/Hot Springs Road/Coast Village Road/Old Coast Highway
- Improving pedestrian and bicycle access under US-101 and along Old Coast Highway

Construction has started in the summer of 2008 and is planned to be completed in four years. Each construction stage will take approximately one year for the completion. These improvements between Mipas Street and Hot Springs Road are graphically shown in **Figure 3**.



STAGE 1 (2008 -2009)

- 1. REPLACE MILPAS BRIDGES
- 2. MILPAS OFF-RAMP IMPROVEMENTS
- 3. SOUTHBOUND MILPAS HOOK OFF-RAMP
- 4. REPLACE SYCAMORE CREEK BRIDGE
- 5. CABRILLO TO SALINAS MERGE LANE
- 6. TENNIS STADIUM SOUND WALL

- 7. THIRD SOUTHBOUND LANE
- 8. OLD COAST HWY SIDEWALK
- 9. MONTECITO ROUNDABOUT
- 10. MULTIPURPOSE PATH

STAGE 2 (2009 -2010)

- 11. THIRD SOUTHBOUND LANE OVER MILPAS
- 12. CACIQUE UNDERCROSSING
- 13. CLOSE SOUTHBOUND ON-RAMP

STAGE 3 (2010 -2011)

- 14. SALINAS TO ALISOS SOUND WALL
- 15. THIRD NORTHBOUND LANE FROM SALINAS TO MILPAS

STAGE 4 (2011 -2012)

- 16. THIRD NORTHBOUND LANE OVER MILPAS
- 17. CONNECT CACIQUE ST.
- 18. MULTIPURPOSE PATH

Source: www.sbroads.com

Figure 3 Current Improvement between Milpas Street and Hot Springs Road

2.6.2 Mission Street / US-101 SB Ramp

The Mission Street Bike Lanes Project improves safety by enhancing bicycle and pedestrian facilities on Mission Street under Highway 101. Construction for this project began at the end of April 2008 and will continue through Fall 2008.

2.6.3 Carrillo Street / US-101 NB Ramp

This project includes adding a lane to the ramp intersection, widening the on-ramp, and metering the on-ramp at Carrillo Street interchange. The construction is scheduled to be completed in Fall 2008.

3 CORRIDOR TRAVEL PATTERNS

3.1 Freeway Travel Patterns

An imbalance of housing and jobs exists between western Ventura and Santa Barbara Counties which results in long distance commutes and the inevitable impact on quality of life. Results from a 2002 survey indicated that more than 15,000 vehicles a day commute along US-101 from homes in Ventura County to jobs in Santa Barbara County. This commuting pattern generates significant traffic on US-101 northbound during the AM peak period and on US-101 southbound during the PM peak period.

3.2 Freeway Volumes

Unlike other major freeways in California, the study corridor has only four PeMS detectors and all of them are in Ventura County. The Annual Average Daily Traffic (AADT) data for the study corridor is available through Caltrans count stations. Table 5 illustrates 2007 AADT volumes for the study corridor.

Table 5 Annual Average Daily Traffic in 2007

Segment	Segment Description	AADT	Peak Month	Peak Hour
VEN PM 20.077-21.01	Oxnard, Santa Clara/Rice Avenues to Rose Avenue Interchange	131,000	137,000	10,400
VEN PM 21.01-22.006	Oxnard, Rose Avenue Interchange	141,000	147,000	11,100
VEN PM 22.006-22.729	Oxnard, Jct. Rte. 232, Vineyard Avenue	131,000	137,000	10,400
VEN PM 22.729-23.45	Oxnard, Jct. Rte. 1 South, Pacific Coast Highway	153,000	161,000	12,200
VEN PM 23.45-24.645	Ventura, Johnson Drive Interchange	136,000	143,000	10,900
VEN PM 24.645-25.966	Ventura, Victoria Avenue Interchange	119,000	127,000	9,600
VEN PM 25.966-26.39	Ventura, Telephone Road Interchange	90,000	95,000	7,300
VEN PM 26.39-28.452	Ventura, Jct. Rte. 126, Santa Paula Freeway Interchange	122,000	133,000	10,100
VEN PM 28.452-29.45	Ventura, Seaward Avenue Interchange	119,000	129,000	10,100
VEN PM 29.45-30.147	Ventura, Vista Del Mar Drive Interchange	116,000	126,000	10,100
VEN PM 30.147-30.906	Ventura, California Street Interchange	96,000	104,000	8,600
VEN PM 30.906-32.7	Ventura, Jct. Rte. 33, Ojai Freeway Interchange	71,000	78,000	5,800
VEN PM 32.7-38.976	Solimar Beach, South Jct. Rte. 1, Pacific Coast Highway Interchange	67,000	73,000	5,600
VEN PM 38.976-43.622	Seacliff, North Jct. Rte. 1, Pacific Coast Highway Interchange	65,000	71,000	5,500
SB PM 0-0.634	Ventura/Santa Barbara County Line	66,000	72,000	7,700
SB PM 0.634-1.622	Jct. Rte. 150 East	66,000	74,000	5,600
SB PM 1.622-2.64	El Rincon Interchange	70,000	83,000	7,800
SB PM 2.64-3.059	Carpinteria, Casitas Pass Road	70,000	84,000	7,700
SB PM 3.059-3.773	Carpinteria, Linden Avenue Interchange	75,000	91,000	8,800
SB PM 3.773-5.283	Carpinteria, Santa Monica Road Interchange	75,000	90,000	8,500
SB PM 5.283-7.138	South Padaro Lane Interchange	78,000	95,000	8,600
SB PM 7.138-8.264	Padaro Lane Interchange	79,000	95,000	8,500
SB PM 8.264-9.003	Evans Avenue Interchange	83,000	100,000	9,000
SB PM 9.003-10.023	Montecito, Sheffield Drive	86,000	103,000	8,900
SB PM 10.023-10.536	San Ysidro Road Interchange	91,000	110,000	9,500

Segment	Segment Description	AADT	Peak Month	Peak Hour
SB PM 10.536-11.407	Olive Mill Road Interchange	86,000	102,000	8,600
SB PM 11.407-12.754	Santa Barbara, Jct. Rte. 225 West	94,000	109,000	9,500
SB PM 12.754-13.485	Santa Barbara, Jct. Rte. 144	105,000	121,000	10,500
SB PM 13.485-14.187	Santa Barbara, Garden Street	98,000	109,000	9,800
SB PM 14.187-14.758	Santa Barbara, Castillo Street Interchange	111,000	122,000	11,100
SB PM 14.758-15.733	Santa Barbara, Carrillo Street Interchange	126,000	137,000	12,900
SB PM 15.733-16.552	Santa Barbara, Mission Street Interchange	138,000	143,000	12,200
SB PM 16.552-17.784	Santa Barbara, Jct. Rte. 225 Southeast	137,000	142,000	12,100
SB PM 17.784-18.364	La Cumbre Road Interchange	132,000	140,000	11,400
SB PM 18.364-18.924	Jct. Rte. 154	120,000	127,000	11,700
SB PM 18.924-20.062	El Sueno Road	120,000	127,000	11,700
SB PM 20.062-21.414	Turnpike Road Interchange	113,000	120,000	11,000
SB PM 21.414-22.533	Jct. Rte. 217 South	90,000	97,000	8,800
SB PM 22.533-23.711	Fairview Avenue Interchange	77,000	81,000	7,500
SB PM 23.711-24.786	Los Carneros Road	63,000	68,000	5,500
SB PM 24.786-26.907	Storke Road to Hollister Avenue	33,000	35,000	3,450

Source: <http://traffic-counts.dot.ca.gov/2007all/r101i.htm>

3.2.1 Time-of-Day and Day-of-Week

Various available data sources were used to compile the traffic data to assess time of day and day of week patterns. **Figures 4 and 5** indicate day-of-week and time-of-day volumes at some strategic mainline locations. The day-of-week traffic profile indicates that the traffic volumes are slightly higher on Fridays and weekends compared to the week days. This can be attributed to the recreational significance of the study area. The time-of-day traffic profiles indicate that the southern and northern termini of the study corridor have similar traffic patterns during the AM and PM peak periods. The corridor connecting the two counties is uni-directional. Northbound is the peak direction during the AM peak period and southbound is the peak direction during the PM peak period. This pattern indicates job commutes from Ventura County to Santa Barbara County.

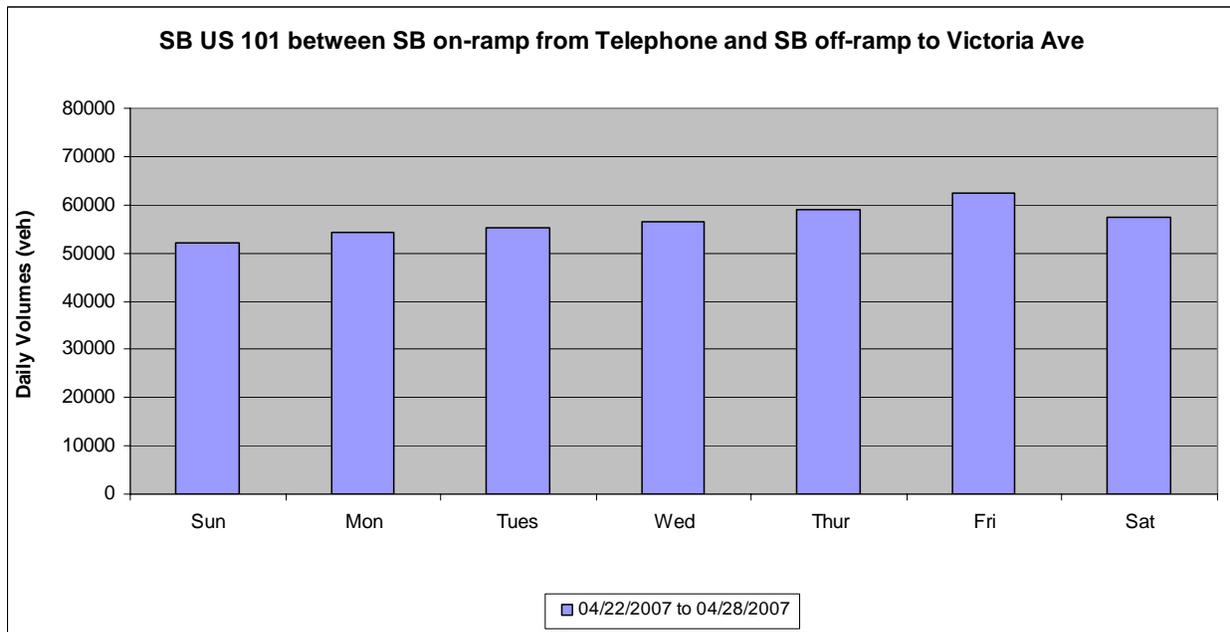
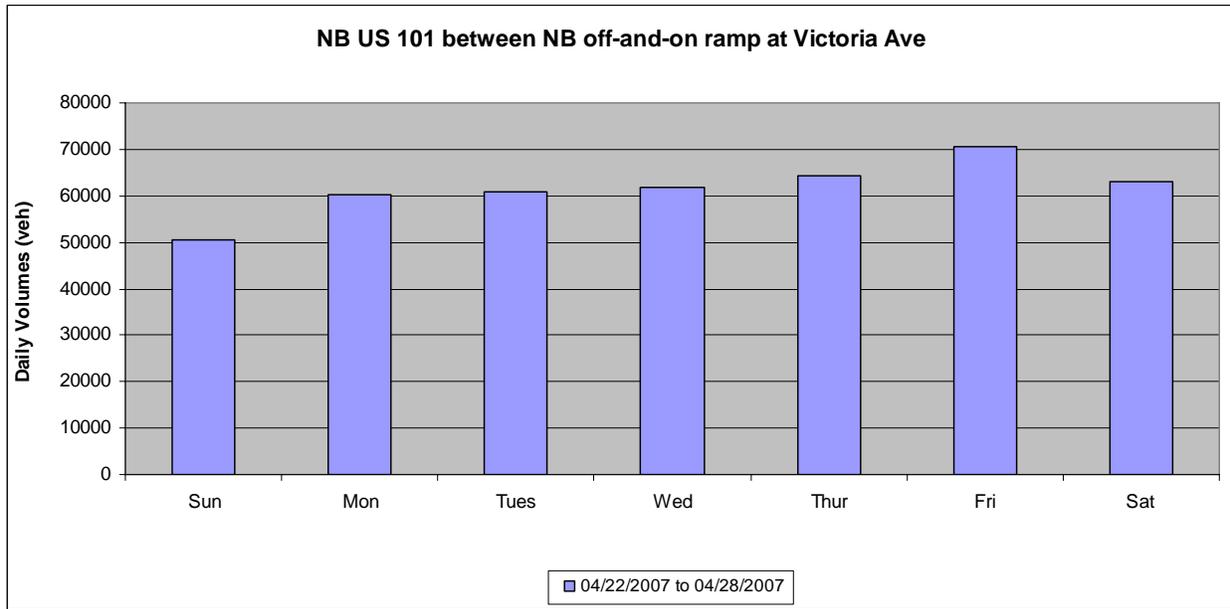


Figure 4 Day-of-Week Freeway Volumes

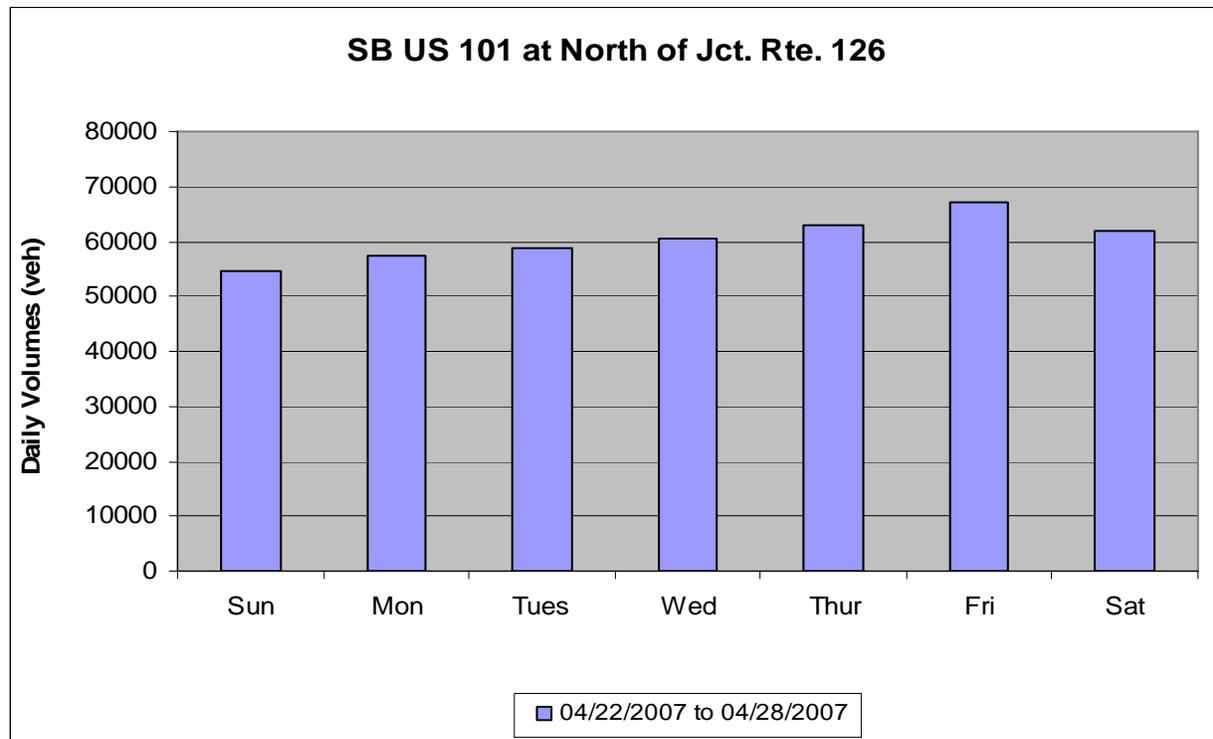
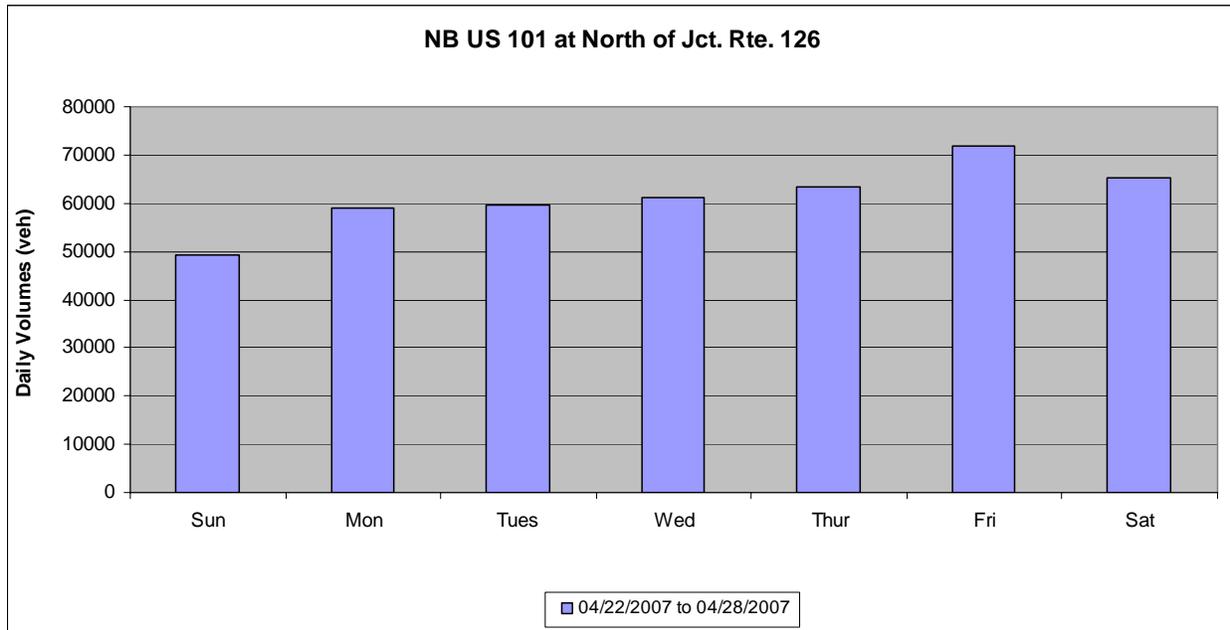


Figure 4 Day-of-Week Freeway Volumes (Cont.)

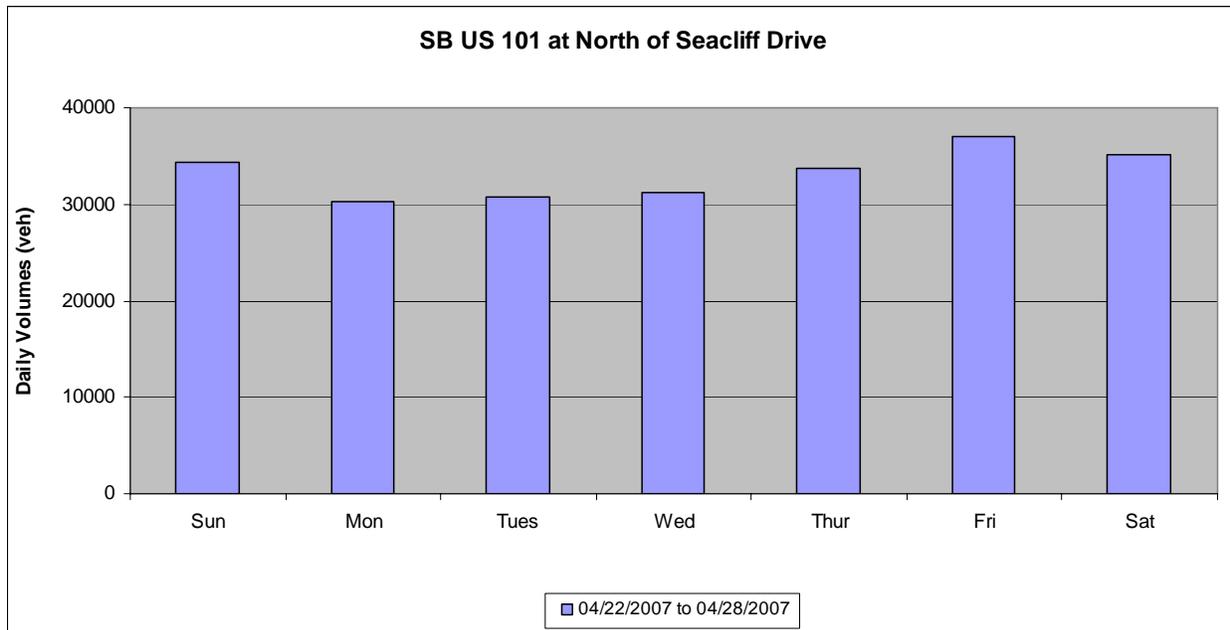
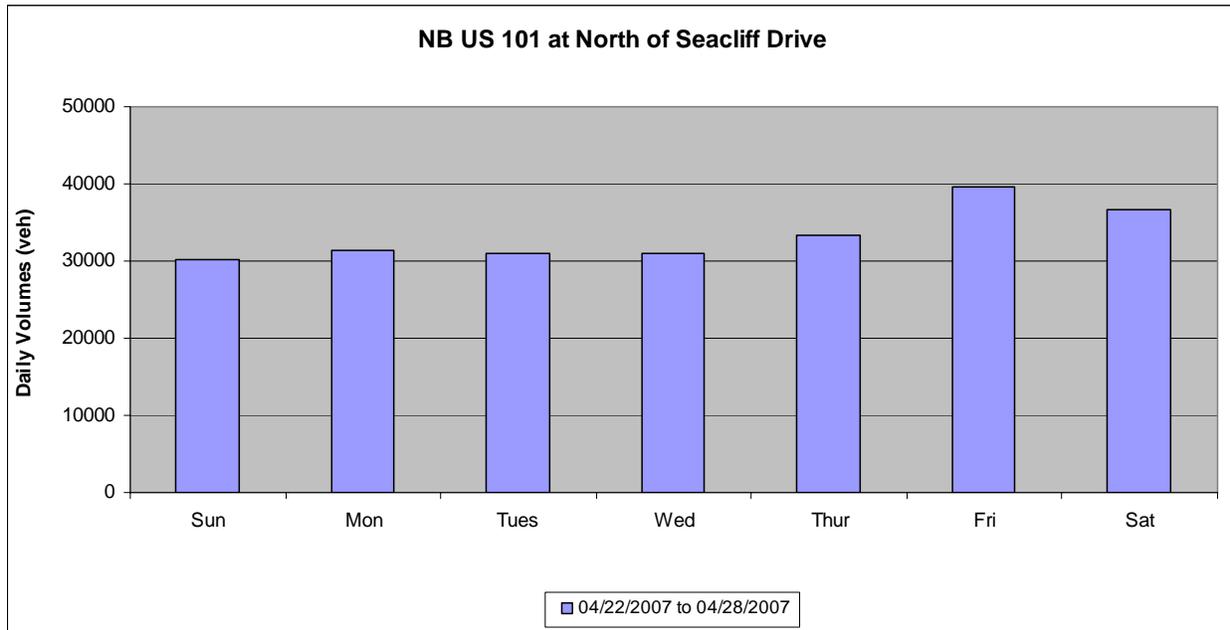


Figure 4 Day-of-Week Freeway Volumes (Cont.)

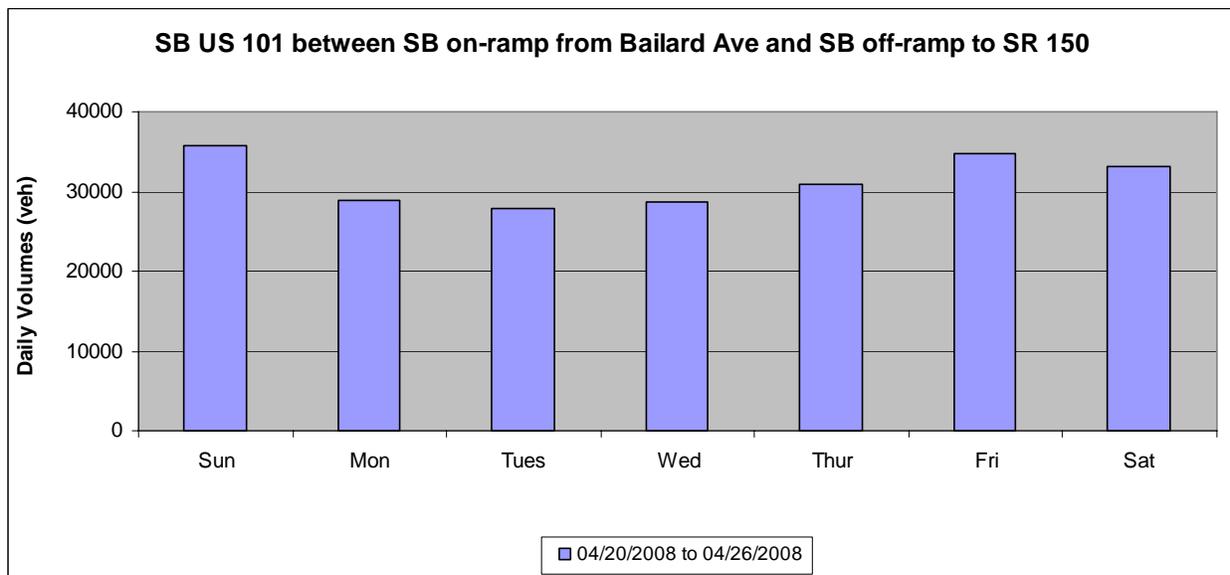
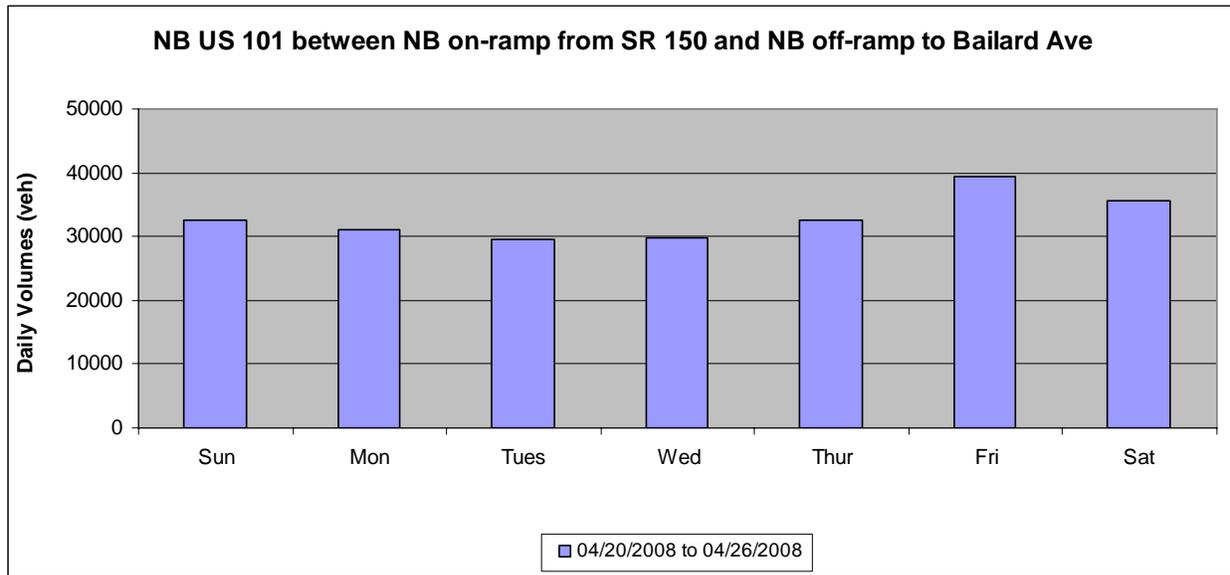


Figure 4 Day-of-Week Freeway Volumes (Cont.)

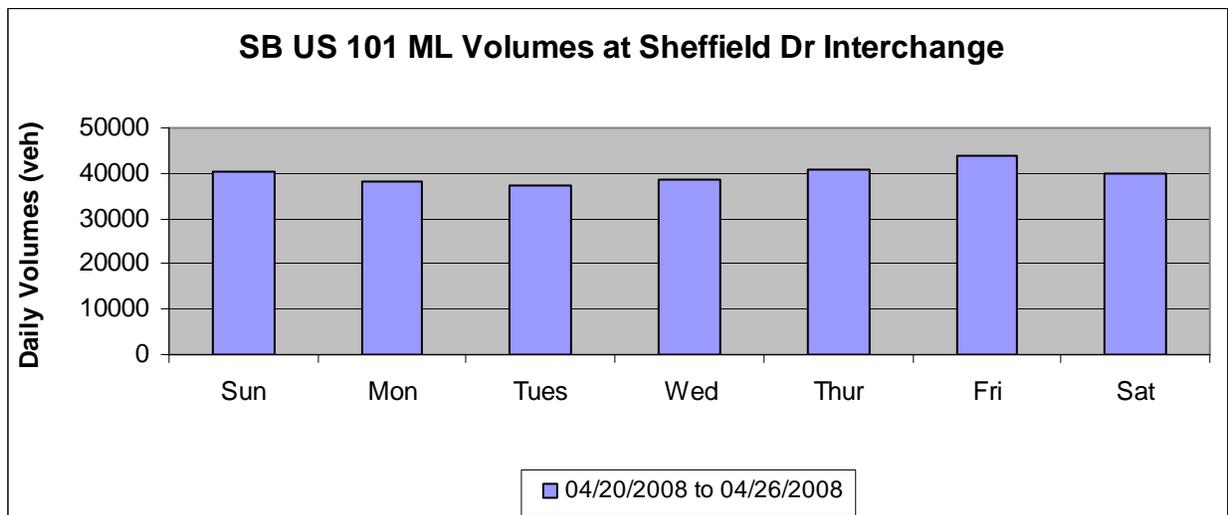
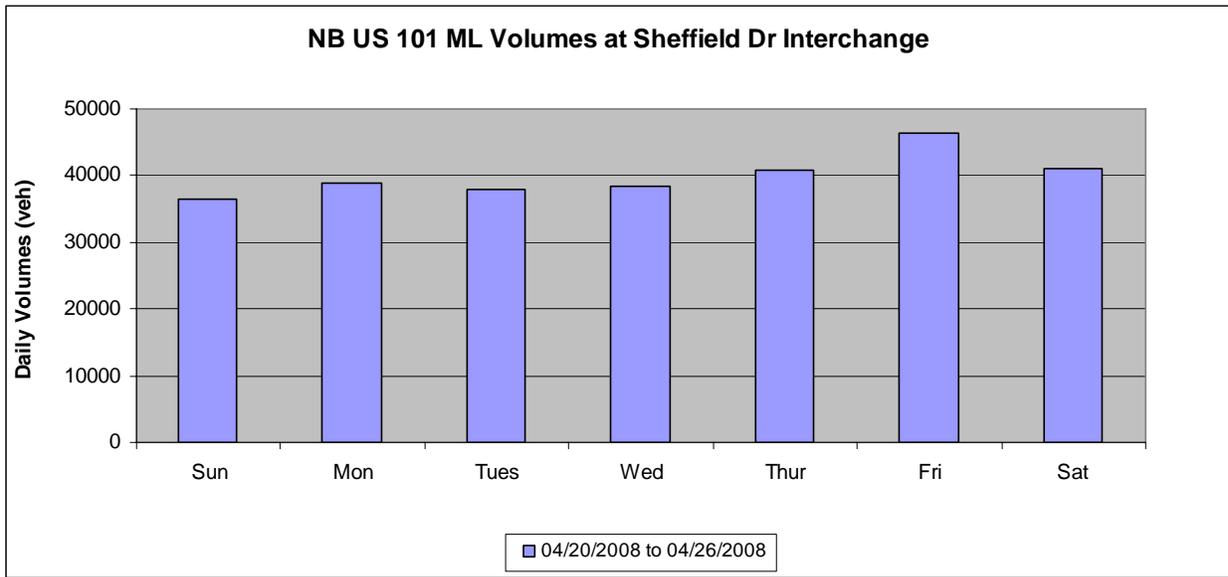


Figure 4 Day-of-Week Freeway Volumes (Cont.)

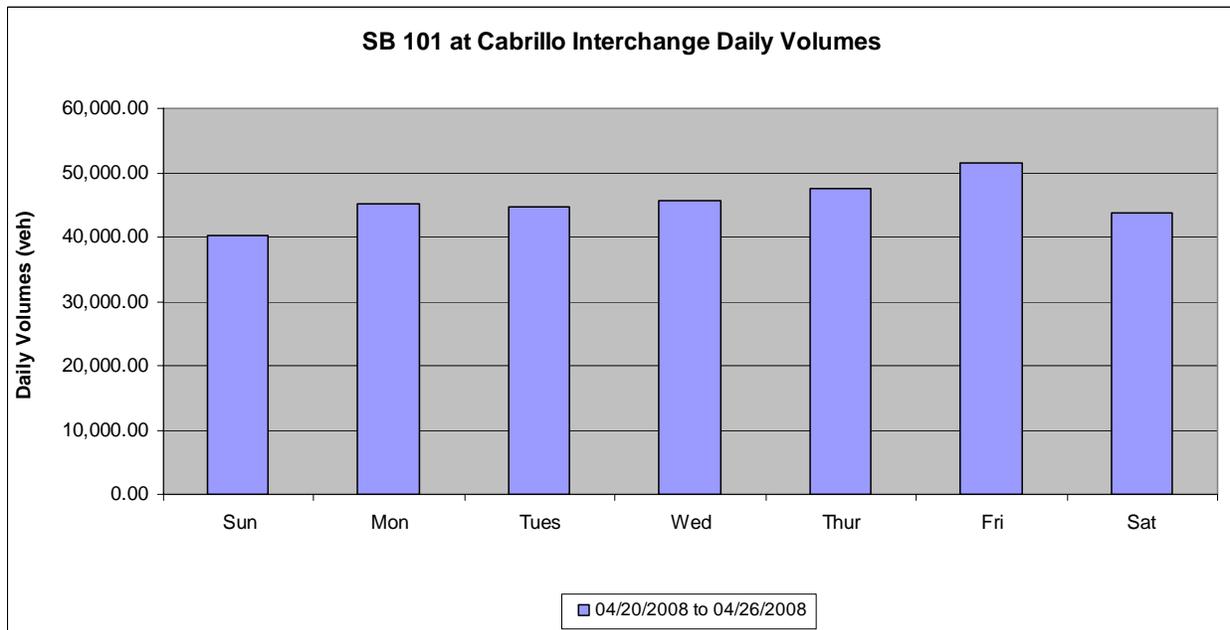
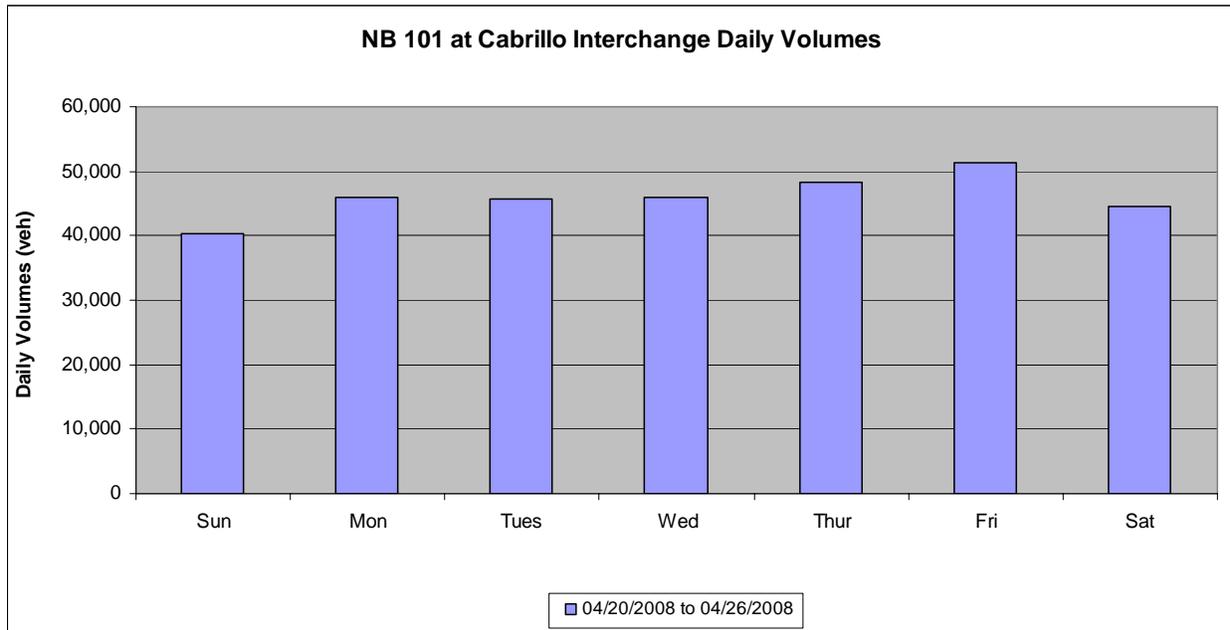


Figure 4 Day-of-Week Freeway Volumes (Cont.)

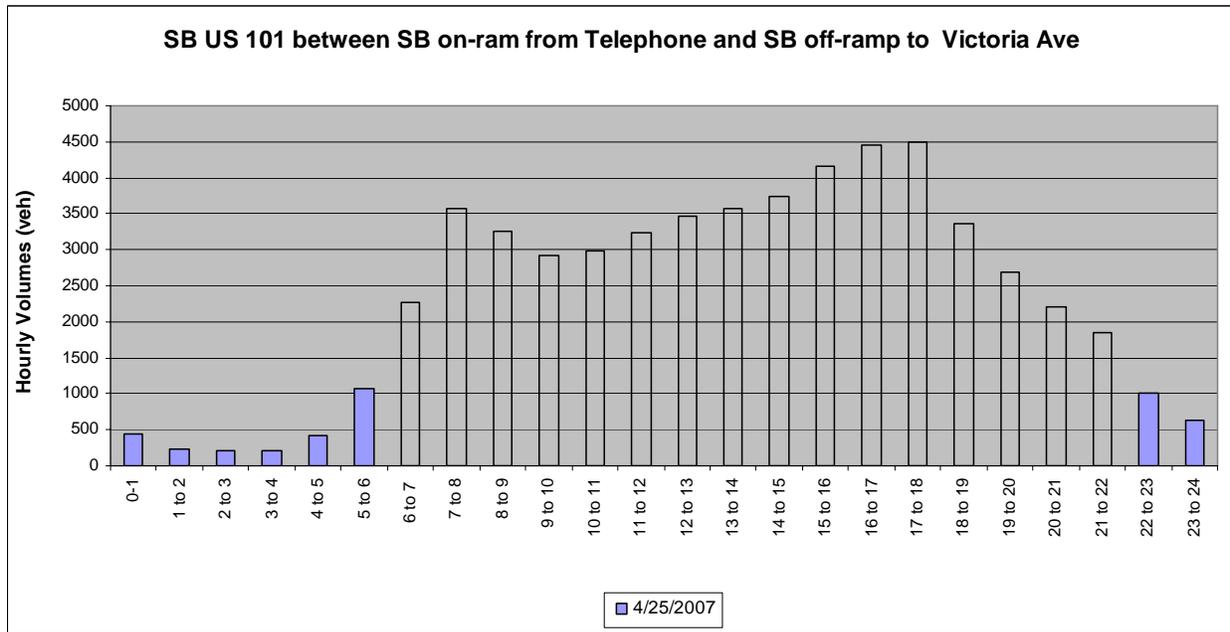
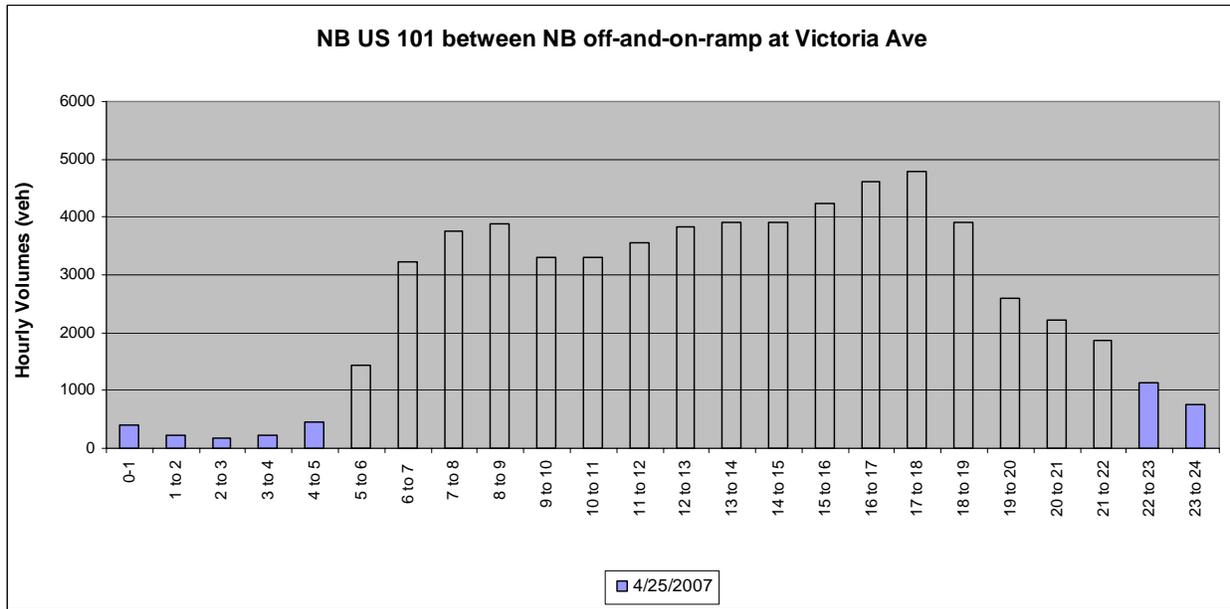


Figure 5 Time-of-Day Freeway Volumes

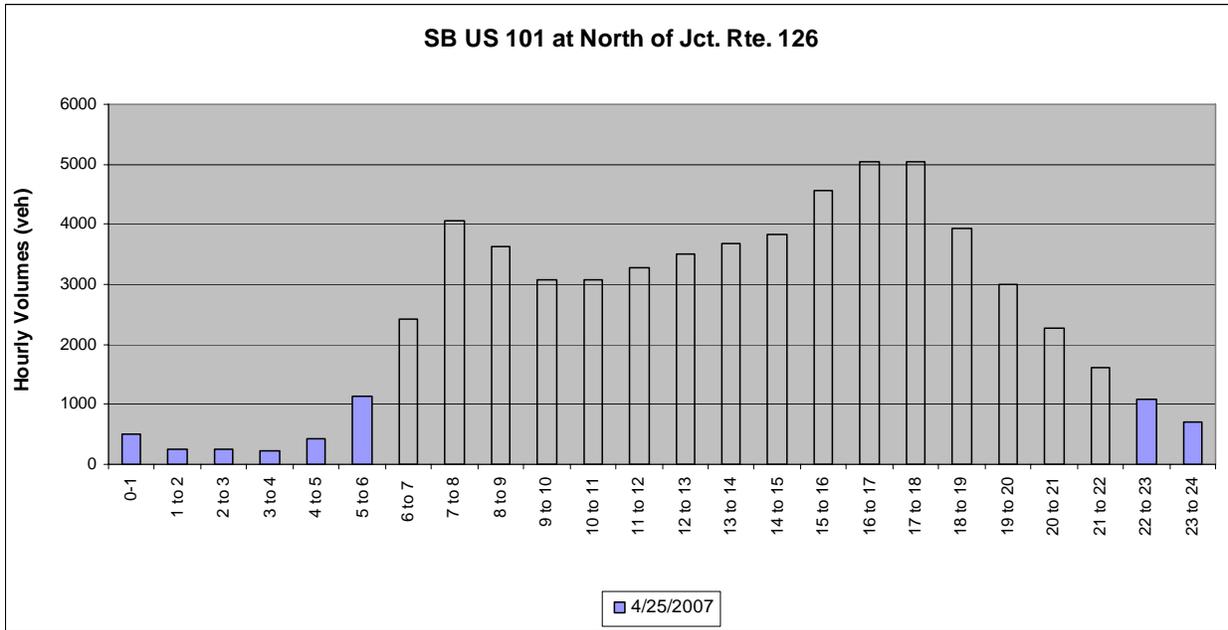
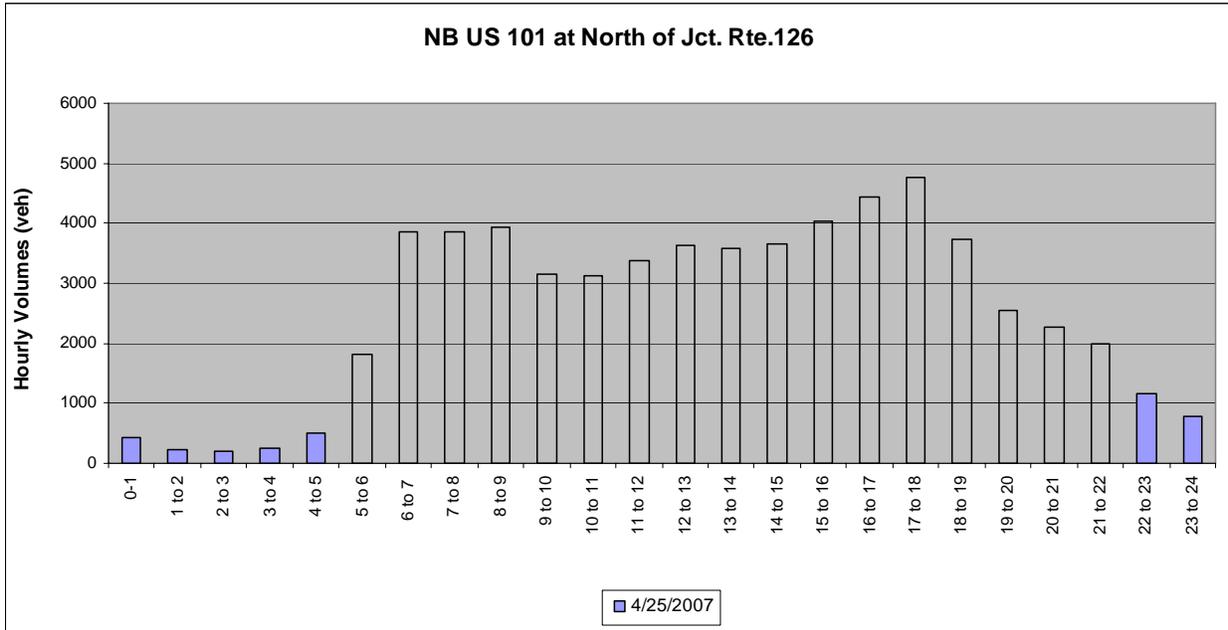


Figure 5 Time-of-Day Freeway Volumes (cont.)

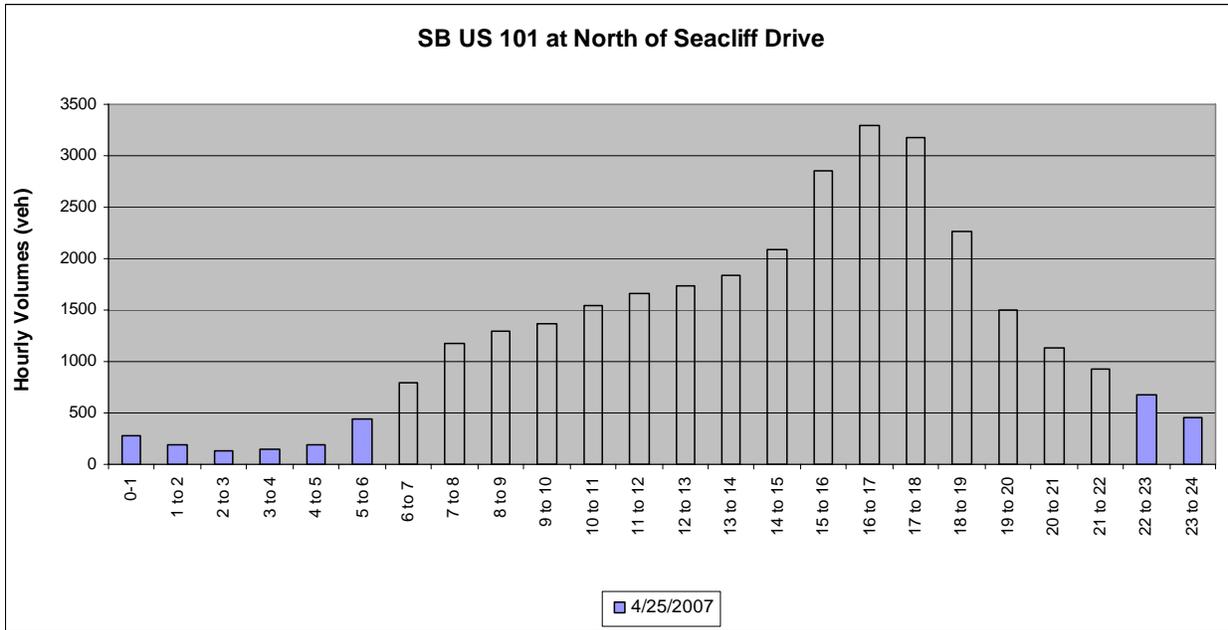
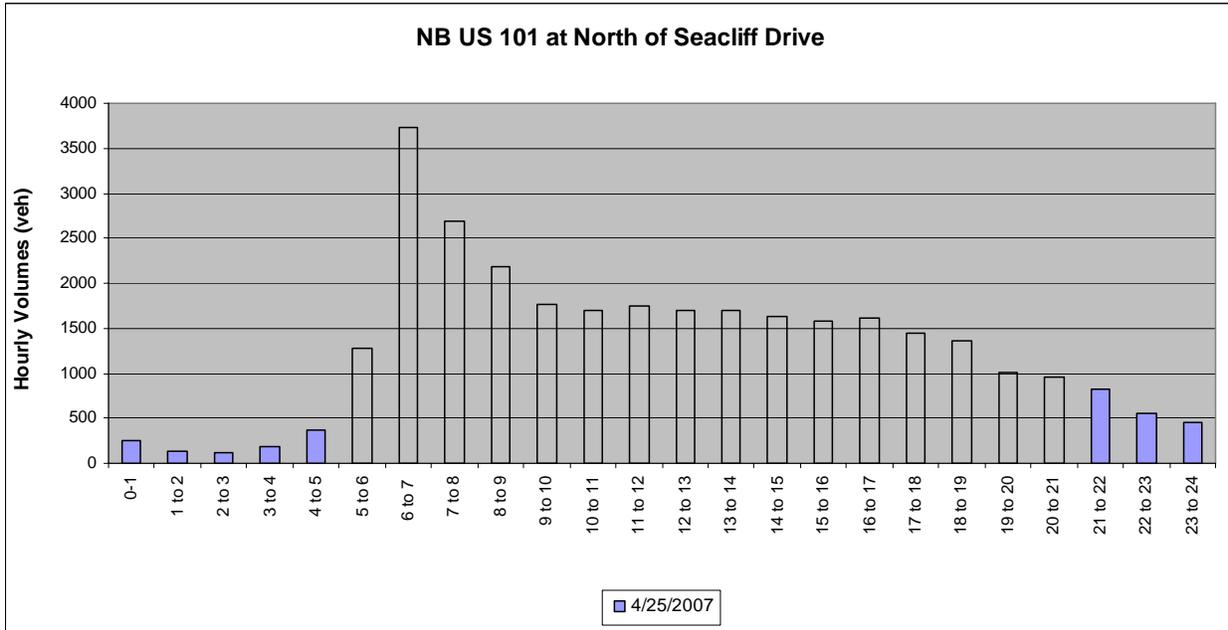


Figure 5 Time-of-Day Freeway Volumes (cont.)

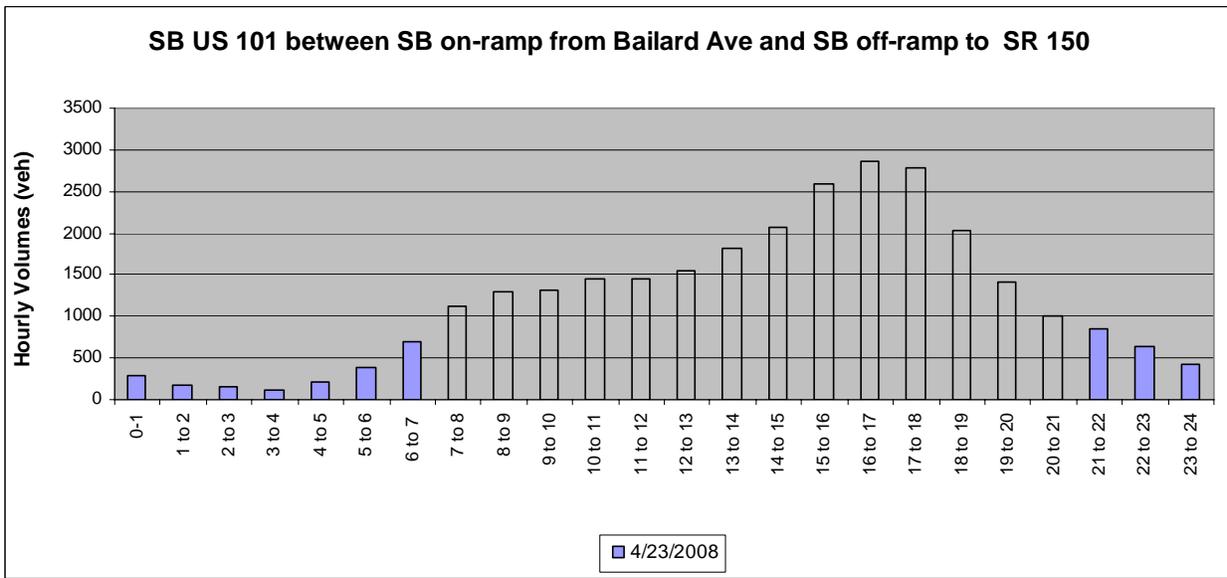
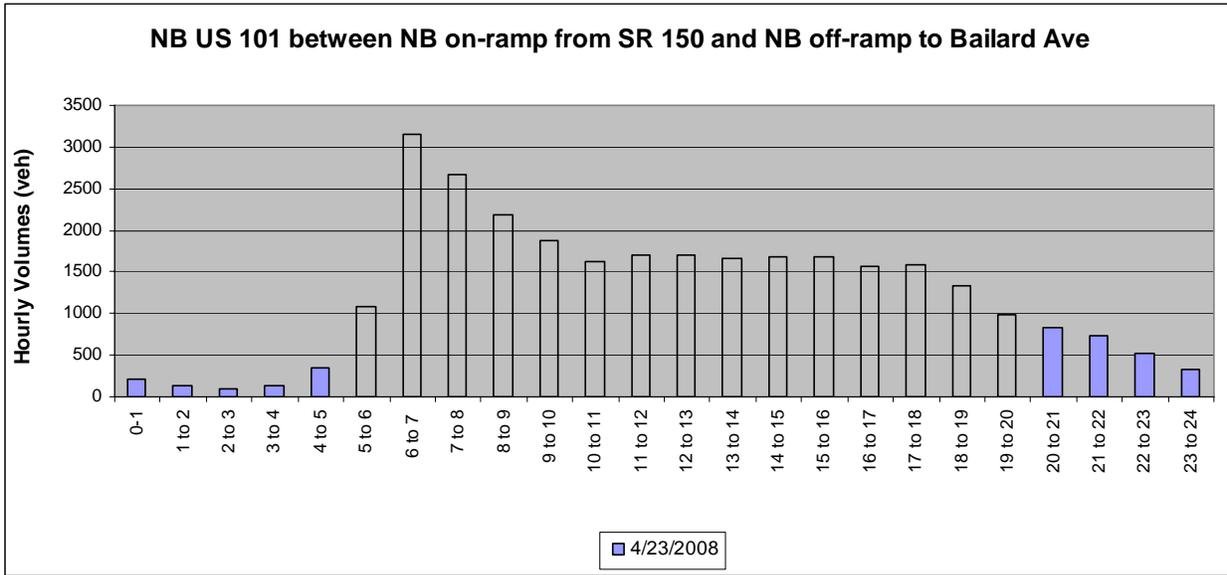


Figure 5 Time-of-Day Freeway Volumes (cont.)

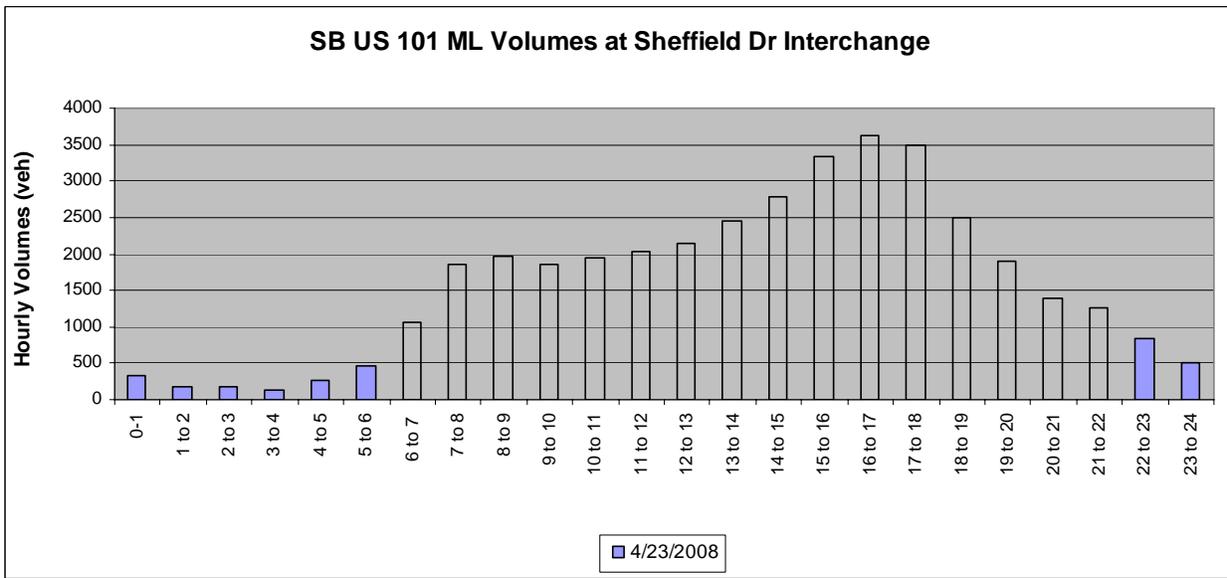
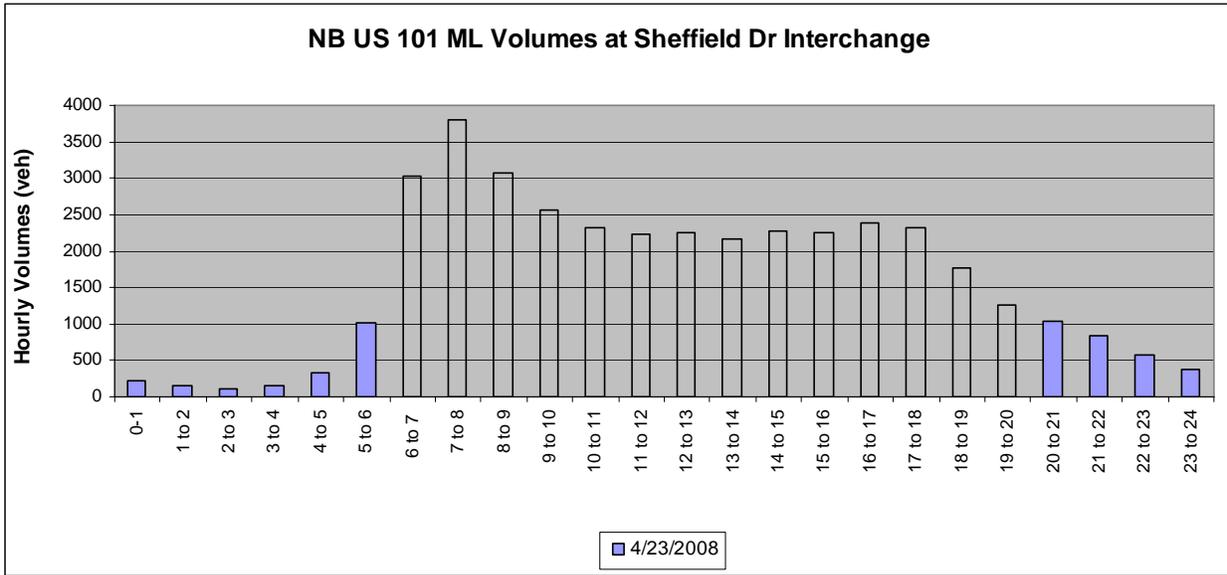


Figure 5 Time-of-Day Freeway Volumes (cont.)

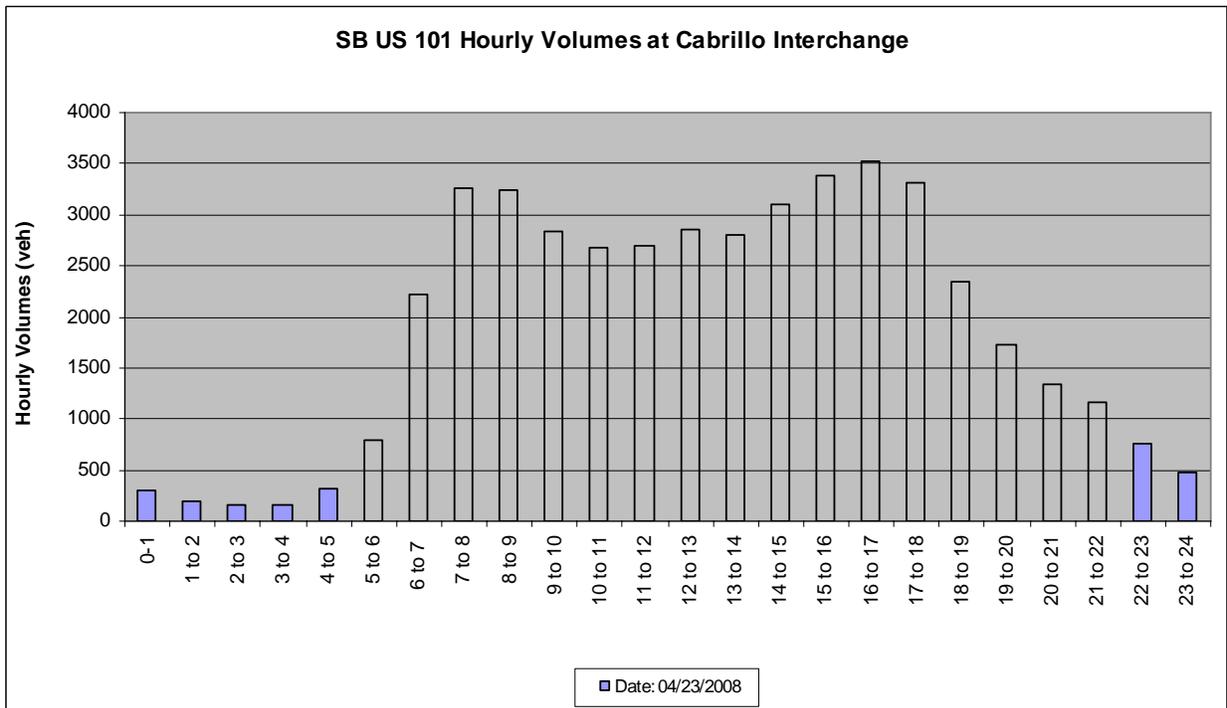
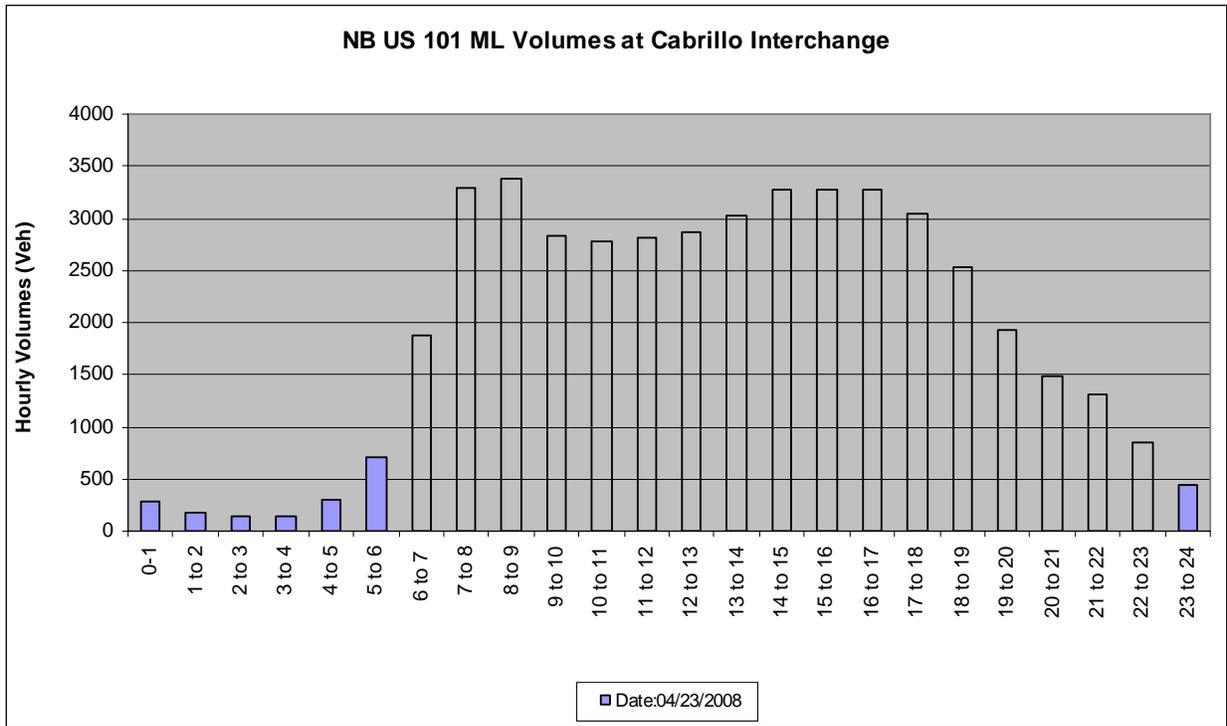


Figure 5 Time-of-Day Freeway Volumes (cont.)

3.3 Vehicle Occupancy

The average vehicle occupancy varies from 7% to 26% with two or more occupants. There are no HOV lanes within the study corridor at present. The observed vehicle occupancy values at various locations are shown in Table 6.

Table 6 Vehicle Occupancy on US-101

Location	Observation Period	1 Person	2 People	3+ People
US-101N at SR-150	7-9 AM	84.3%	13.2%	2.6%
US-101N at Carrillo St	7-9 AM	92.2%	6.8%	1.0%
US-101N at Turnpike Rd	7-9 AM	87.8%	10.0%	2.2%
US-101N at Storke Rd	7-9 AM	74.3%	18.1%	7.6%
US-101 S at Storke Rd	4-6 PM	76.4%	19.7%	3.9%
US-101 S at Turnpike Rd	4-6 PM	74.0%	21.2%	4.8%
US-101 S at Carrillo St	4-6 PM	69.3%	26.1%	4.7%
US-101 S at SR-150	4-6 PM	83.4%	15.5%	1.0%

Source: Dowling (2008), Highway 101 Widening Project (EA-0N7000)

3.4 Vehicle Classification/Trucks

Approximately 6.7% of the traffic along this corridor is attributable to trucks. This information is extracted from the detailed vehicle classification information from the Highway 101 widening project for the Santa Barbara County. This information will be augmented with the additional vehicle classification data that will be collected for the CSMP study to use in the micro-simulation.

4 FREEWAY PERFORMANCE

4.1 Mobility

Mobility of the US 101 Corridor can be assessed through the travel time and delay information available through various sources such as Freeway Performance Measurement System (PeMS), The State Highway Congestion Monitoring Program (HICOMP) reports and previous studies.

The PeMS system automatically computes travel times using speed data from freeway detectors. There are two travel time routes in the PeMS database:

1. Route “CMIA D5 101N Santa Barbara Co.” on 23.0 miles of US-101N in Santa Barbara County, from Postmile R0.25 to 23.42
2. Route “SOTS 101N Los Angeles – SR23 to SR1 PCH” on 35.8 miles of US-101N in Ventura County, from Postmile 3.25 to R39.00

The first route does not have observed data, so PeMS reports free flow travel time of 21.23 minutes. PeMS database should be improved to capture this route in Santa Barbara County. The second route indicates congestion during 4:00 to 6:00 PM on weekdays (Tuesday to Thursday), as shown in **Figure 6**. **Figures 7** through **11** illustrate variations in delay and travel time. The median travel times vary between 33 to 38 minutes for this 35.8-mile route, which covers 18.35 miles of the study corridor and 17.45 miles outside the study corridor. Buffer Time Index (BTI) is used to represent reliability of travel time.

California > SOTS 101N Los Angeles - SR23 to SR1 PCH > Route Configuration

Route 'SOTS 101N Los Angeles - SR23 to SR1 PCH'

Route Information

District	7
Created	07/11/2006 11:00
Activation Date	01/01/2006 00:00
Starting Location	101-N/Rancho Rd
Ending Location	101-N/State Hwy 1
Number of Segments	1
Total Fwy Length	35.8 Miles
Ramp Length	0.0 Miles
Avg Ramp Speed	0.0 mph

Map of Segments



Route Segments

Seg#	Fwy	Dir	Length (mi)	Num VDS		Name	Start		Name	End	
				ML	HOV		Abs PM	CA PM		Abs PM	CA PM
1	101	N	35.8	11		Rancho Rd	42.8	3.25	State Hwy 1	78.5	R39.001

Figure 6 Freeway Travel Time Route from PeMS in Ventura County

Average Daily Delay (V_{t=35}) (Veh-Hours)
 1,542,240 Lane Points (58% Observed)
 Segment Type: Route, Segment Name: SOTS 101N Los Angeles - SR23 to SR1 PCH
 09/01/2007 00:00:00 to 08/31/2008 23:59:59 (Days=Tu,We,Th)

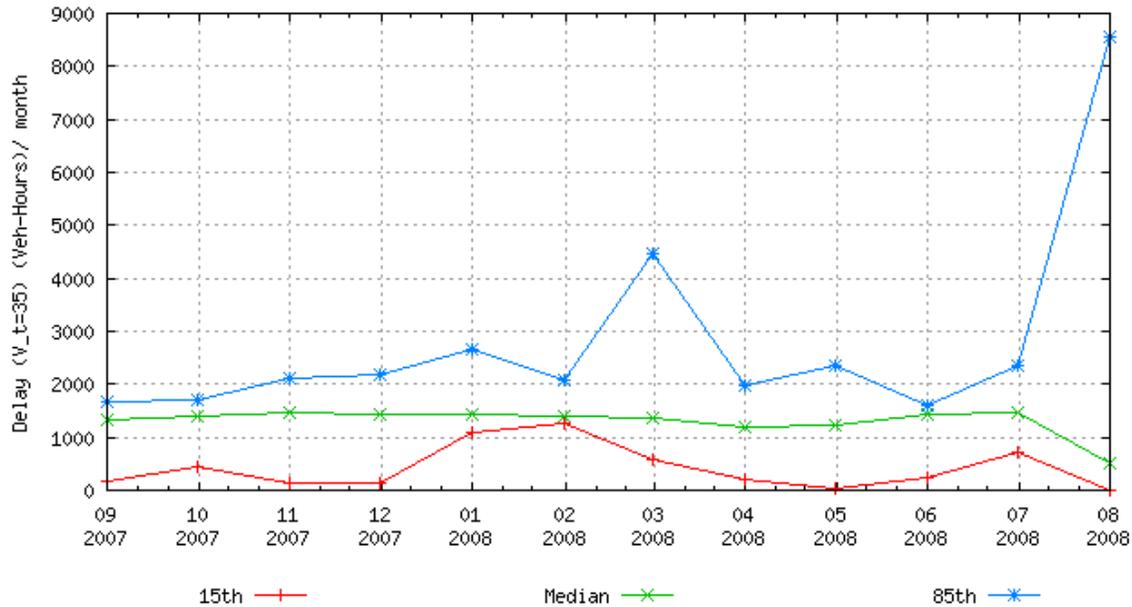


Figure 7 Variation in Delay by Month for Observed Route

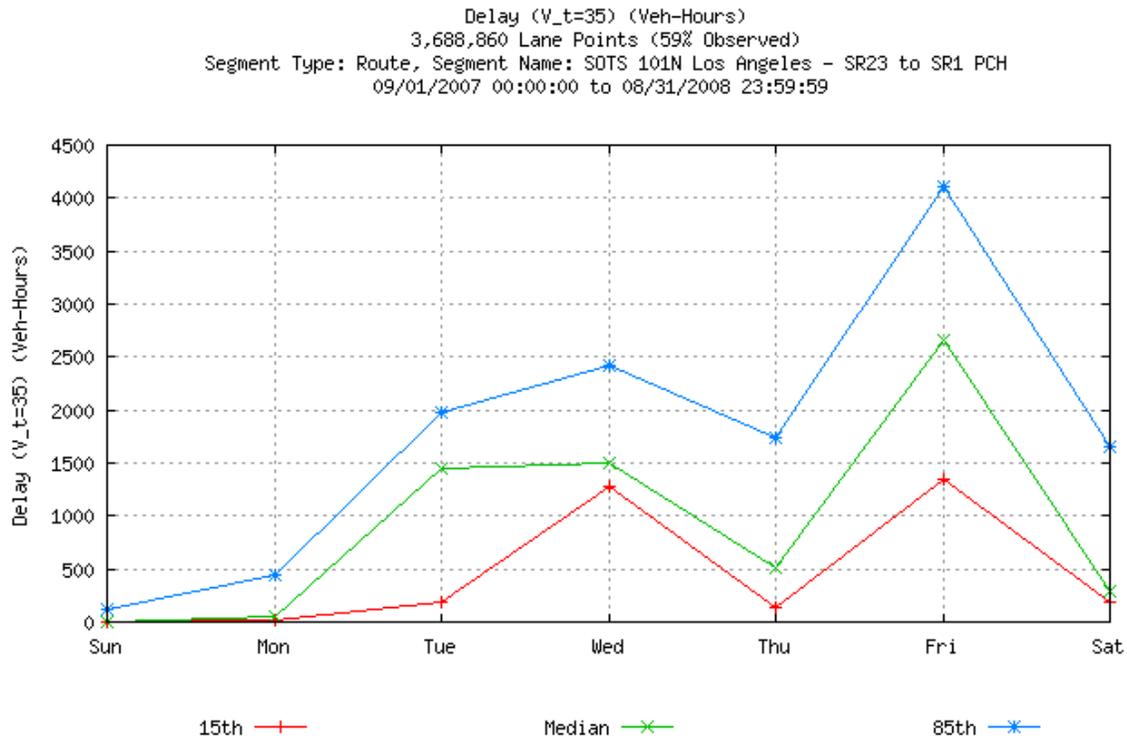


Figure 8 Variation in Delay by Day of the Week for Observed Route

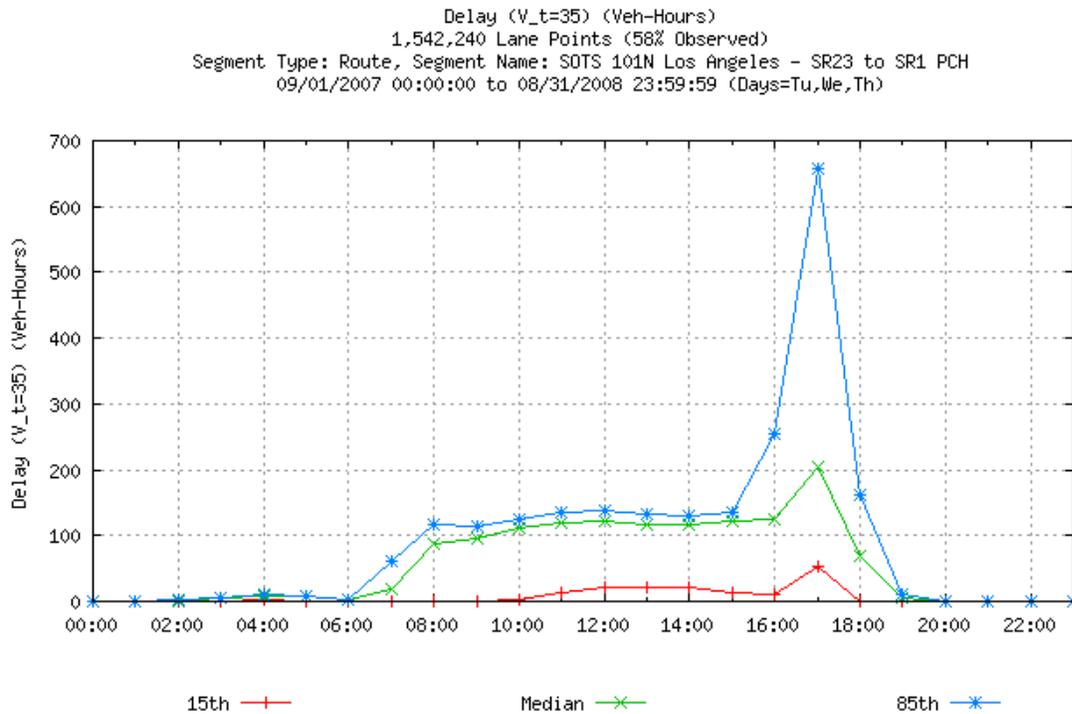


Figure 9 Variation in Delay by Hour for Observed Route

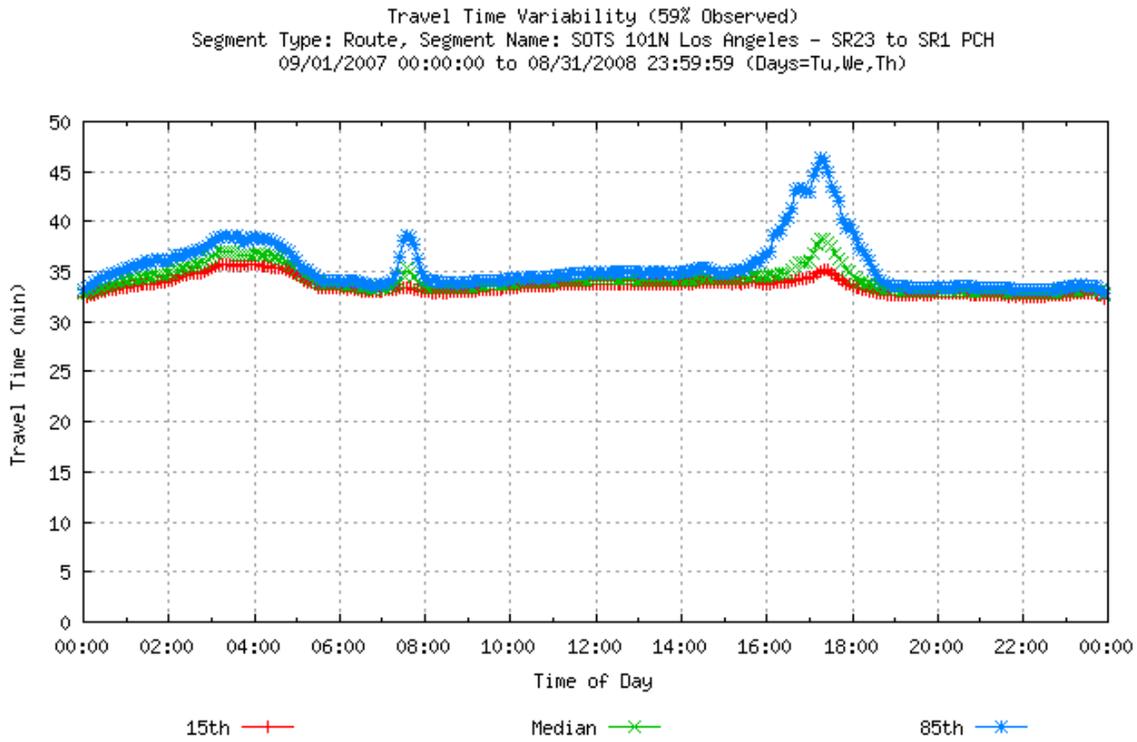


Figure 10 Travel Time Variability by Hour for Observed Route

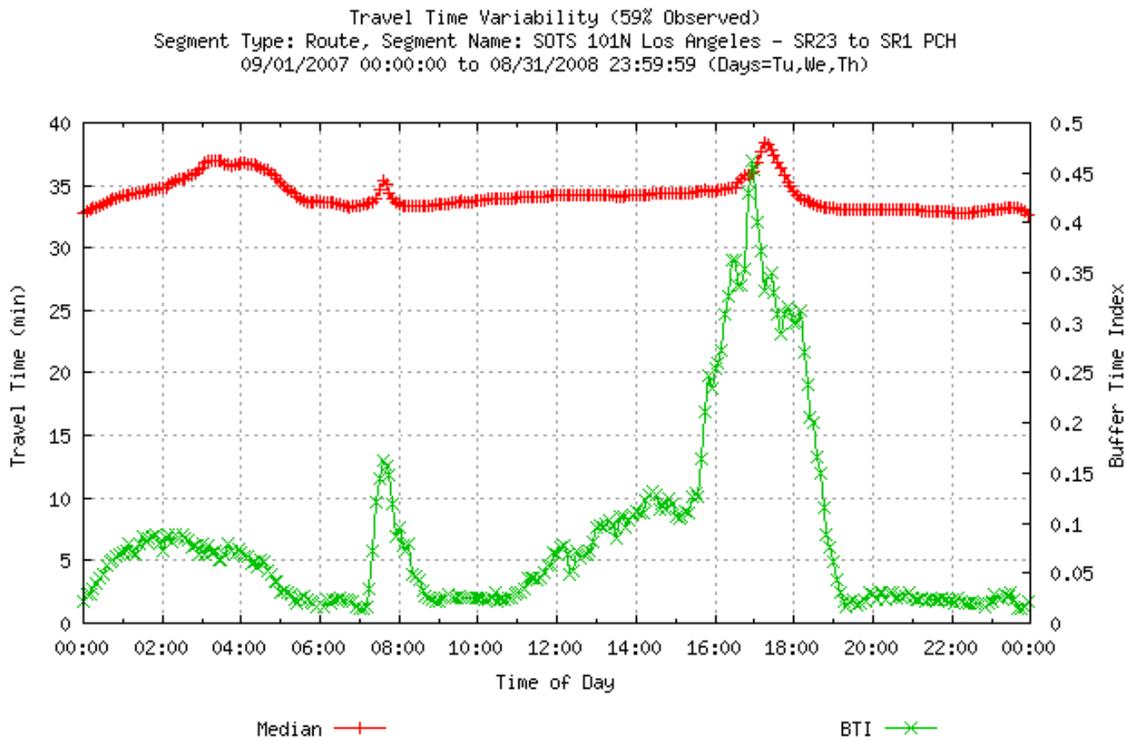


Figure 11 Variation in Buffer Time Index by Hour for Observed Route

HICOMP measures the congestion occurring on urban area freeways in California and presents the data in a report. **Figures 12 and 13** illustrate congestion information from 2006 HICOMP reports in Santa Barbara and Ventura Counties respectively.



Source: HICOMP (2006) (AM)



Source: HICOMP (2007) (AM)



Source: HICOMP (2006) (PM)



Source: HICOMP (2007) (PM)

Figure 12 HICOMP Congestion in Santa Barbara County



Source: HICOMP (2006) (AM)



Source: HICOMP (2007) (AM)



Source: HICOMP (2006) (PM)



Source: HICOMP (2007) (PM)

Figure 13 HICOMP Congestion in Ventura County

Mainline traffic operations on US 101 reflect local commuting patterns with reduced LOS during the AM peak in the northbound direction; this pattern is mirrored in the PM peak with higher congestion levels in the southbound direction. Between Seacliff and Bailard Avenue, northbound US 101 generally operate at LOS C during the AM peak. During the PM peak, southbound US 101 operate at LOS C between Bailard Avenue at Bates Road, and at LOS D between Bates Road and Seacliff (Fehr and Peers, 2008).

The Santa Barbara/Ventura 101 HOV Project indicates three junctions with poor level of service.

- Mussel Shoals Access/US 101 – The eastbound approach currently operates at LOS D during the AM peak hour and LOS F during the PM peak hour.
- Santa Barbara Avenue/US 101 – The westbound approach currently operates at LOS F during the AM peak hour and LOS D during the PM peak hour.
- SR-150/US 101 Southbound Ramps – The southbound (off-ramp) approach currently operates at LOS E during the PM peak hour.

Table 7 lists the segments of freeway in Santa Barbara County where the speed falls below 55 mph. This information is based on the travel time runs conducted as part of the Highway 101 Widening Project. The analysis was based on Caltrans District-5 LOS deficiency criteria as represented by the cusp of LOS C/D. This numerically equates to:

- 31 pcplpm (passenger cars per lane per mile) for freeway segments;

Table 7 Operational Deficiency for US-101 Mainline from PM 0.00 to PM 27.5

Data Source	Direction	Start Location	End Location	Avg. Speed ¹ (mph)	Lanes	Period	Start Time	End Time	% of Time below 35 mph	% of Time below 55 mph	Comment
Test Car	NB	Rincon Rd (Rte 150) On-Ramp	Bailard Ave On-Ramp	51	2	AM	7:30	8:30	42.03%	49.64%	Speed below 55 mph
Test Car	NB	Bailard Ave On-Ramp	SR-224 On-Ramp	47	2	AM	7:30	8:30	73.31%	77.89%	Speed below 55 mph
Test Car	NB	SR-224 On-Ramp	Linden Ave On-Ramp	41	2	AM	7:30	8:30	86.44%	86.44%	Speed below 55 mph
Test Car	NB	Linden Ave On-Ramp	Santa Monica Rd On-Ramp	51	2	AM	7:30	8:30	37.79%	69.57%	Speed below 55 mph
Test Car	NB	Santa Monica Rd On-Ramp	S Padero Ln On-Ramp	53	2	AM	7:30	8:30	28.63%	60.09%	Speed below 55 mph
Test Car	NB	S Padero Ln On-Ramp	N Padero Ln On-Ramp	48	2	AM	7:30	8:30	31.24%	63.18%	Speed below 55 mph
Test Car	NB	N Padero Ln On-Ramp	Evans Ave On-Ramp	50	2	AM	7:30	8:30	20.92%	67.12%	Speed below 55 mph
Test Car	NB	Evans Ave On-Ramp	Jameson Ln On-Ramp	34	2	AM	7:30	8:30	67.96%	86.08%	Speed below 55 mph
Test Car	NB	Jameson Ln On-Ramp	San Ysidro Rd On-Ramp	37	2	AM	7:30	8:30	41.38%	99.01%	Speed below 55 mph
Test Car	NB	San Ysidro Rd On-Ramp	Cabrillo Blvd On-Ramp	29	2	AM	7:30	8:30	70.83%	93.83%	Speed below 55 mph
Test Car	NB	Cabrillo Blvd On-Ramp	Salinas St On-Ramp	30	2	AM	7:30	8:30	76.37%	98.97%	Speed below 55 mph
Test Car	NB	Arregalla St On-Ramp	Mission St On-Ramp	54	3	PM	4:30	5:30	25.19%	38.52%	Speed below 55 mph
Test Car	NB	Las Positas Rd On-Ramp	Hope Ave On-Ramp	54	3	PM	4:30	5:30	14.35%	40.19%	Speed below 55 mph
Test Car	SB	Castillo St On-Ramp	Garden St On-Ramp	52	3->2	PM	4:30	5:30	24.11%	39.29%	Speed below 55 mph
Test Car	SB	Garden St On-Ramp	Milpas St On-Ramp	26	2	PM	4:30	5:30	88.12%	100.00%	Speed below 55 mph
Test Car	SB	Milpas St On-Ramp	Cabrillo Blvd On-Ramp	45	2	PM	4:30	5:30	26.58%	70.00%	Speed below 55 mph

Source: Dowling (2008), Highway 101 Widening Project (EA-0N7000)

Note 1: Speed Data are based on following number of runs:

- NB AM - 10 runs
- NB PM - 7 runs
- SB AM - 9 runs
- SB PM - 7 runs

4.2 Reliability

The US-101 in motion report indicates that both Ventura and Santa Barbara counties are highly desirable recreational destinations on weekends, holidays and during the summer months. For that reason, traffic often deteriorates to LOS “F” conditions during those times as well, particularly Sunday evening.

4.3 Safety

4.3.1 Non-Recurring Congestion

There is no useful data currently available from PeMS on non-recurrent congestion.

4.3.2 TASAS Records, Collision-Risk Profile

Continuous risk profile analysis (CRP) is an alternative way of assessing the accident data for the corridor. It represents the number of accidents recorded in a moving window of the freeway, compared to a reference base rate. Locations that have a high incidence are highlighted, and the “noise” related to inaccuracies in coding exact location are filtered. The results of CRP for US-101 are illustrated in **Figures 14** and **15**. Table 8 illustrates the statistics of CRP analysis for the study corridor.

Route From - - To -

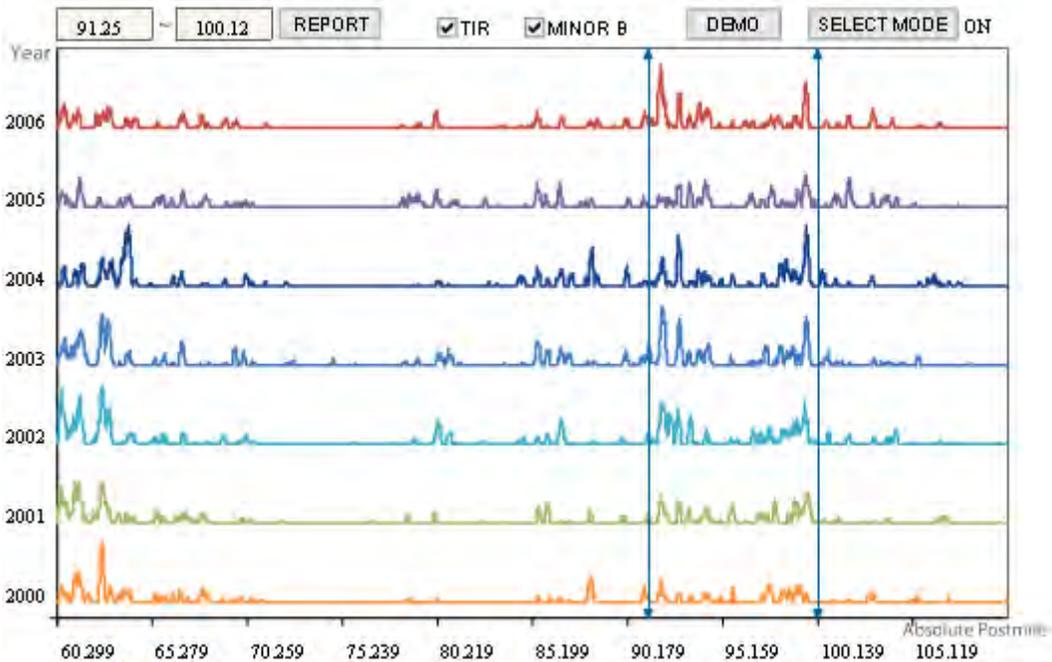
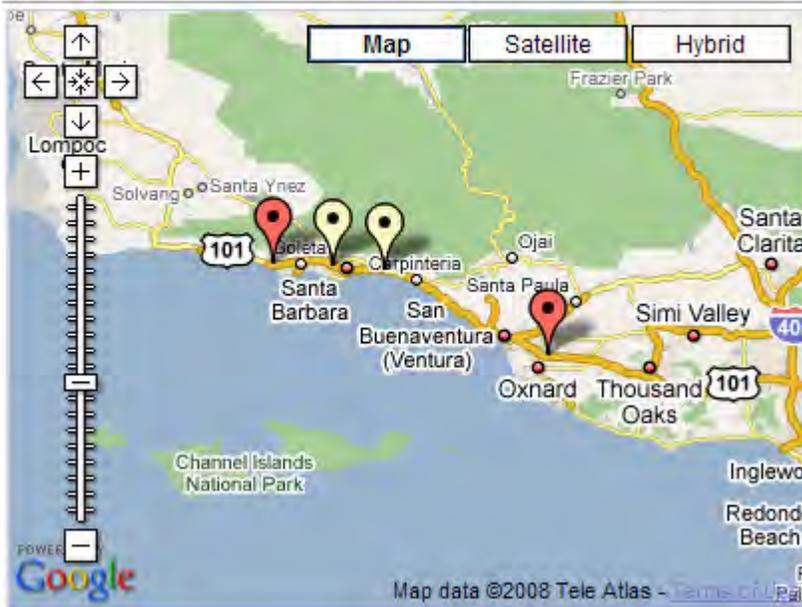


Figure 14 US-101N Collision-Risk Profile

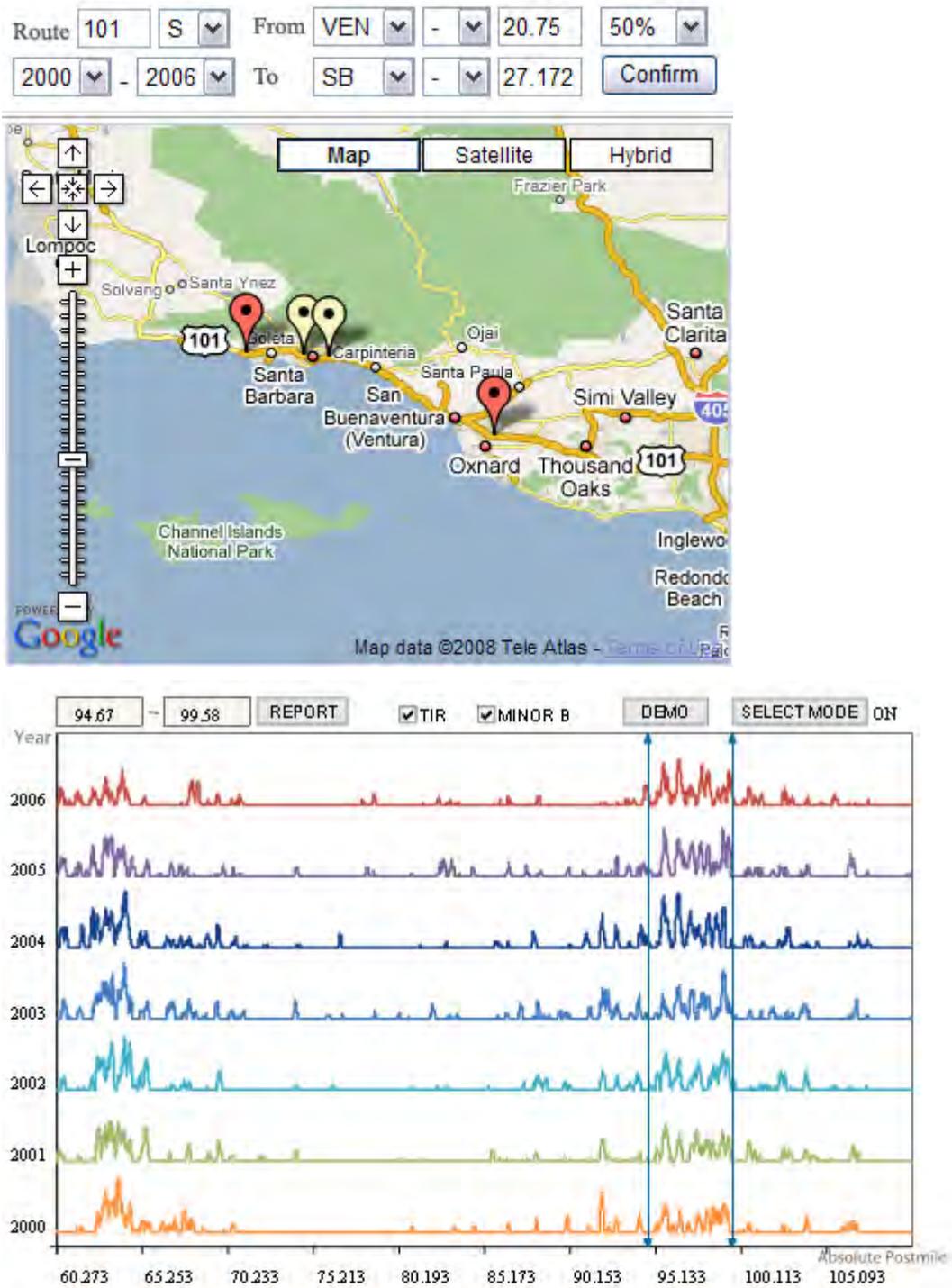


Figure 15 US-101S Collision-Risk Profile

Table 8 Collision-Risk Profile Analysis Statistics

Measurements	US-101N				US-101S			
	PM91.25 ~ 100.12		Rest		PM94.67 ~ 99.58		Rest	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Collision Distribution								
A: Beyond Median or Stripe	2	0%	5	0%	1	0%	10	0%
B: Beyond Shoulder Drivers Left	135	9%	651	13%	65	5%	664	13%
C: Left Shoulder Area	3	0%	12	0%	1	0%	15	0%
D: Left Lane	623	41%	1,583	31%	414	35%	1,698	34%
E: Interior Lanes	144	9%	542	11%	138	12%	572	11%
F: Right Lane	349	23%	1,100	22%	387	32%	946	19%
G: Right Shoulder Area	12	1%	60	1%	15	1%	64	1%
H: Beyond Shoulder Drivers Right	143	9%	713	14%	91	8%	640	13%
I: Gore Area	2	0%	10	0%	1	0%	19	0%
J: Other	8	1%	27	1%	8	1%	21	0%
V: HOV	0	0%	1	0%	0	0%	0	0%
W: HOV Buffer Area	0	0%	0	0%	0	0%	0	0%
<<: Not Stated	0	0%	0	0%	0	0%	0	0%
---: Does Not Apply	113	7%	359	7%	79	7%	357	7%
Others	1	0%	1	0%	0	0%	0	0%
TOTAL	1,535	100%	5,064	100%	1,200	100%	5,006	100%
Primary Collision Factor								
1: Influence of Alcohol	67	4%	250	5%	43	4%	275	5%
2: Following Too Close	36	2%	83	2%	30	3%	70	1%
3: Failure to Yield	1	0%	9	0%	1	0%	3	0%
4: Improper Turn	150	10%	929	18%	79	7%	915	18%
5: Speeding	933	61%	2,591	51%	810	68%	2,582	52%
6: Other Violations	266	17%	908	18%	198	17%	895	18%
B: Improper Driving	0	0%	3	0%	1	0%	3	0%
C: Other than Driver	36	2%	137	3%	15	1%	135	3%
D: Unknown	10	1%	47	1%	6	1%	42	1%
E: Fell Asleep	4	0%	24	0%	6	1%	23	0%
<: Not Stated	5	0%	9	0%	2	0%	11	0%
Others	27	2%	74	1%	9	1%	52	1%
TOTAL	1,535	100%	5,064	100%	1,200	100%	5,006	100%
Type of Collision								
A: Head-On	8	1%	28	1%	3	0%	27	1%
B: Sideswipe	192	13%	674	13%	150	13%	720	14%
C: Rear End	931	61%	2,490	49%	816	68%	2,488	50%
D: Broadside	30	2%	117	2%	14	1%	70	1%
E: Hit Object	322	21%	1,467	29%	175	15%	1,423	28%
F: Overturn	24	2%	191	4%	20	2%	167	3%
G: Auto-Pedestrian	3	0%	7	0%	8	1%	15	0%
H: Other	23	1%	85	2%	12	1%	80	2%
<: Not Stated	2	0%	5	0%	2	0%	16	0%
Others	0	0%	0	0%	0	0%	0	0%
TOTAL	1,535	100%	5,064	100%	1,200	100%	5,006	100%
Severity								
PDO	1,074	70%	3,529	70%	885	74%	3,577	71%
Injury	452	29%	1,505	30%	313	26%	1,404	28%
Fatality	9	1%	30	1%	2	0%	25	0%
TOTAL	1,535	100%	5,064	100%	1,200	100%	5,006	100%

4.4 Productivity

This information will be provided in the Comprehensive Freeway Performance Report.

4.5 Bottleneck Analysis

The bottleneck analysis for the Santa Barbara County was done based on the data available from various data sources. The bottleneck analysis for Ventura County was based on the data collected in December 2008. The detailed bottleneck analysis is included in Appendix C.

Table 9 Summary of US-101 Bottlenecks in Santa Barbara County

ID	Direction	Period	Start Location	End Location	Start PM	End PM	Lanes	Start Time	End Time	Severity
1	US-101N	AM	Santa Monica Rd	Bailard Ave	4.0	1.0	2	6:30	7:45	Major
2	US-101N	AM	N Parado Ln	Santa Monica Rd	7.0	4.0	2	7:15	7:45	Minor
3	US-101N	AM	Jameson Ln	N Parado Ln	9.3	7.0	2	7:45	8:15	Major
4	US-101N	AM	Salinas St	Jameson Ln	11.8	9.3	2	7:30	8:15	Major
5	US-101N	AM	Hope Ave	Mission St	17.2	15.5	3.06	7:30	8:00	Minor
6	US-101N	PM	Hope Ave	Carrillo St	17.4	14.5	3	5:00	5:45	Major
7	US-101S	PM	Jameson Ln	Cabrillo St	8.5	11.2	2	4:45	5:30	Minor
8	US-101S	PM	Milpas St	Mission St	12.2	15.0	3	4:00	6:00	Major
9	US-101S	PM	La Cumbre Ln	State St	16.9	18.2	3.18	4:15	6:00	Minor
10	US-101S	PM	Faireview Ave	La Carneros Rd	22.0	23.5	3	4:30	5:15	Minor

Table 10 Summary of US-101 Bottlenecks in Ventura County

ID	Direction	Period	Start Location	End Location	Start PM	End PM	Start Time	End Time	Severity
1	US 101N	AM	N Oxnard Ave	Victoria Ave	21.6	20.7	7:45	8:15	Major
2	US 101N	AM	Sea Cliff	Bates Road	39.4	43.5	6:00	6:45	Major
3	US 101N	PM	N Rice Avenue	E Vineyard Avenue	20.7	22.0	4:15	5:00	Minor
4	US 101N	PM	N Rice Avenue	E Vineyard Avenue	20.7	22.0	5:00	5:15	Major
5	US 101S	AM	N Rice Avenue	E Vineyard Avenue	20.7	22.0	7:15	7:30	Minor
6	US 101S	PM	Bates Rd	Sea Cliff	43.5	39.4	3:45	4:00	Minor
7	US 101S	PM	Seaward Avenue	SR-126	28.5	26.39	4:00	4:30	Minor
8	US 101S	PM	Seaward Avenue	SR-126	28.5	26.39	4:30	4:45	Major
9	US 101S	PM	Ventura Ave	SR 126	30.1	26.39	3:45	4:00	Minor
10	US 101S	PM	Telephone Rd	N Oxnard Ave	25.97	21.6	4:30	5:00	Major
11	US 101S	PM	Victoria Ave	Rice Ave	24.65	20.7	3:30	4:00	Minor
12	US 101S	PM	SR 126	Rice Ave	26.39	20.7	4:30	4:45	Minor

4.6 Preservation

This information will be provided in the Comprehensive Freeway Performance Report.

4.7 Pavement Condition Data

This information will be provided in the Comprehensive Freeway Performance Report.

4.8 Gaps in Understanding

Most of the available data to assess the Freeway Performance of the study corridor is in Santa Barbara County. Data available through previous studies in Ventura County is outdated and there is need for more recent data for the use in CSMP micro-simulation analysis. Additional data required to complete the Comprehensive Freeway Performance Assessment and to calibrate the CSMP micro-simulation analysis is presented in Appendix D “Data Collection Plan”.

5 ARTERIAL PERFORMANCE

Various studies done under Congestion Management programs in the corridor provides information about the arterial performance in the study corridor.

5.1 Level of Service

The 2007 Traffic Trends Report for Santa Barbara County illustrates P.M. peak hour level of service at Congestion Management Program (CMP) network intersections in Goleta, Santa Barbara, and Carpinteria areas. The information is illustrated in **Figures 16 and 17**.



Figure 16 Level of Service at Regionally-Significant Intersections in the Goleta Area

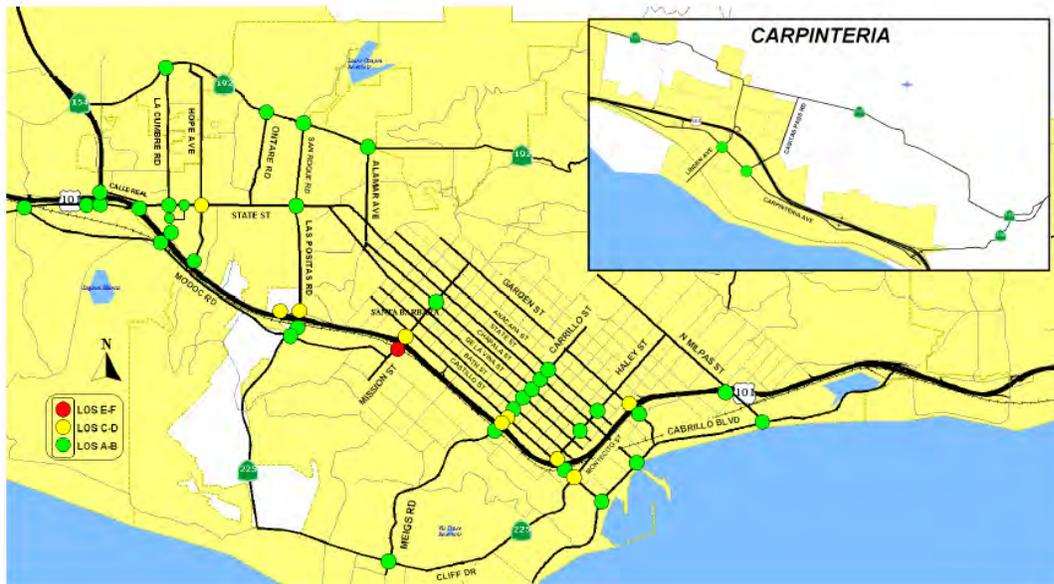


Figure 17 Level of Service at Regionally-Significant Intersections in the Santa Barbara and Carpinteria Intersections

For the US-101 Widening Project, the US-101 ramp intersections and adjacent intersections in Santa Barbara County were analyzed in Synchro-7 using HCM 2000 methodology. Table 11 lists the intersections with Level of Service D or below. The analysis was based on Caltrans District-5 LOS deficiency criteria as represented by the cusp of LOS C/D. This numerically equates to:

- 45 seconds of control delay per vehicle for intersections;

Table 11 Operational Deficiency for Ramp and Adjacent Intersections along US-101 between SB-PM 0 and SB-PM 27

Intersection	Delay ¹ (seconds)	LOS ¹
NB off ramp & Casitas Pass Rd	<i>AM Peak</i> 32.5	D
SB On/Off Ramp and Casitas Pass Road	<i>PM Peak</i> 25.6	D
Santa Ynez Avenue/7th Street and Carpinteria Ave	<i>PM Peak</i> 37.1	D
NB on/off ramp & Via Real	<i>AM Peak</i> 46.1	E
San Ysidro Rd & N. Jameson Ln	<i>AM Peak</i> 36.3	E
N. Jameson Ln & Olive Mill Rd	<i>AM Peak</i> 31.3	D
SB on/off ramp & NB off ramp & Cabrillo Blvd	<i>AM Peak</i> 50.4 <i>PM Peak</i> 49.2	F E

Intersection		Delay ¹ (seconds)	LOS ¹
SB on/off ramp & Garden St	<i>PM Peak</i>	53.2	D
Garden St & E/ Yanonali St	<i>PM Peak</i>	67.1	E
NB on ramp & Castillo St	<i>AM Peak</i>	38.0	D
	<i>PM Peak</i>	72.7	E
NB on/off ramp & Cabrillo St	<i>AM Peak</i>	124.4	F
NB on/off ramp & Castillo St	<i>AM Peak</i>	44.7	E
	<i>PM Peak</i>	90.3	F
SB on/off ramp & Mission St	<i>AM Peak</i>	35.2	D
NB off ramp & Pueblo St & Calle Real	<i>PM Peak</i>	44.5	E
Calle Real & Las Pasitas Rd	<i>AM Peak</i>	35.7	D
	<i>PM Peak</i>	41.9	D
SB on/off ramp & Las Pasitas Rd	<i>PM Peak</i>	42.9	D
Las Pasitas Rd & Modoc Rd	<i>AM Peak</i>	150.8	F
	<i>PM Peak</i>	66.0	E
SB on ramp & State St & Rt 154	<i>AM Peak</i>	28.8	D
Turnpike Rd & Calle Real	<i>PM Peak</i>	241.1	F
SB on/off ramp & Patterson Ave	<i>PM Peak</i>	73.5	E
Patterson Ave & Calle Real	<i>PM Peak</i>	45.9	D
NB on/off ramp & Fairview Ave	<i>AM Peak</i>	43.4	D
NB on/off ramp & Los Carneros Rd	<i>AM Peak</i>	36.7	D
NB on/off ramp & Glen Annie Rd & Calle Real	<i>AM Peak</i>	347.7	F
	<i>PM Peak</i>	371.1	F
SB on/off ramp & Glen Annie Rd	<i>AM Peak</i>	113.6	F
NB off ramp/Calle Real & Winchester Canyon	<i>AM Peak</i>	77.6	F
	<i>PM Peak</i>	44.4	E

Source: Dowling (2008), Highway 101 Widening Project (EA-0N7000)

Note 1: The analysis was based on HCM 2000, Chapter 16 Signalized Intersections; Chapter 17 Unsignalized Intersections methodology

5.2 Gaps in Understanding

As is the case in freeway data, most of the arterial traffic data available is in the Santa Barbara County. The data collection effort that will be undertaken for the CSMP study includes the arterial data needed in Ventura County and Santa Barbara County in the detail required for the micro-simulation analysis.

6 TRANSIT PERFORMANCE

6.1 Services and Routes

The transit options within the study area include the services provided by the Santa Barbara Metropolitan Transit District (MTD) and the services governed by the Ventura County Transportation Commission (VCTC).

The Santa Barbara MTD, a public transit agency, provides bus service in the southern portion of Santa Barbara County. The Line 14 Montecito provides services for the passengers between the City of Santa Barbara and the City of Montecito, in a 60-75-minute headway from Monday to Saturday and with limited service on Sunday. The Line 20/21x Carpinteria Express operates between the City of Santa Barbara and Carpinteria, in a 60-75-minute headway, seven days a week.

VCTC, a governing board, is responsible for the transportation operation in Ventura County. Within all the services that VCTC is responsible for, the Ventura Intercity Service Transit Authority (VISTA) operates seven regular bus routes and two general public dial-a-ride services. The VISTA Coastal Express serves commuters between Ventura, Carpinteria, Santa Barbara, and Goleta, seven days a week. The service extends to University of California in Santa Barbara (UCSB) for the northbound direction during the morning peak period and for the southbound direction during the afternoon peak period. The Vista Highway 101/Conejo Connection serves commuters in the western Ventura County along US-101, including the City of Ventura and the City of Oxnard, seven days a week.

Within all the local bus system in Ventura County, Gold Coast Transit (GCT) operates 17 scheduled, fixed bus routes and ACCESS Paratransit Service in 91 square miles of western Ventura County, including the service between the City of Ventura and Oxnard and the service between the major public transportation user centers within each city.

Other than these regular public transportation services; the VCTC implemented ITS-transit improvements such as Nextbus and GO Ventura Smart Card. Also, VCTC and Santa Barbara County Association of Governments (SBCAG), a regional planning agency, continue to work with Caltrans to improve rail service along the corridor reflecting a multimodal approach to congestion relief. Both agencies participate in LOSSAN, a rail corridor agency promoting enhancements to the UP Coast Rail line paralleling US-101.

The Greyhound Bus is the largest provider of intercity bus transportation in the U.S. Within the study corridor, the Greyhound provides bus service between the City of Santa Barbara and the City of Oxnard. Five buses operate everyday seven days a week for both directions.

Amtrak Rail is a national rail system, which provides intercity passenger train service. Within the study corridor, the Pacific Surfliner route provides services going through the City of Santa Barbara and the City of Oxnard five times a day, seven days a week for each direction; the Coast Starlight route provides similar service within the study corridor once a day for each direction. In addition, the Thruway Motor Coach provides bus service from the City of Santa Barbara to the City of Oxnard once a day in the southbound direction.

MetroLink Commuter Rail is a premier regional rail system serving Southern California. MetroLink provides commuter and other passenger services, linking communities to employment and activity centers. Within the corridor, the Ventura County Line provides service to the City of Oxnard and Ventura.

In addition, some other regional or local private bus companies also provide intercity services along the study corridor. For example, Central Coast Shuttle Service provides 5 buses everyday going through the City of Santa Barbara and Ventura.

6.2 Use of the Freeway

Most intercity buses going through/between the City of Santa Barbara and Oxnard use at least one section of US-101. Other bus services passing by either the City of Santa Barbara or Oxnard use the US-101 corridor also. The Santa Barbara Air Bus provides services which pass through the City of Santa Barbara and the Silverado Coast Flyer provides bus services to cities north of Santa Barbara. Routes used by these transit services include US-101.

6.3 Ridership

The Santa Barbara Metropolitan Transit District provides rides to over 7 million passengers, mostly within Santa Barbara City limits. These bus riders make up 97% of all transit usage in the US-101 CMIA project study area.

The VISTA Coastal Express serves commuters between Ventura, Carpinteria, Santa Barbara, and Goleta, seven days a week. Service began in 2001 and is jointly funded and administered by SBCAG and VCTC. Annual boardings in 2005/2006 were 147,629 a 30% increase from 2004/2005. Farebox recovery ratio is 72%. Similar gains in ridership have occurred each year since the service was initiated.

6.4 Gaps in Understanding

The lack of available detailed ridership information leads to the gap in understanding of the transit operations. The detailed ridership information could be available from respective transit agencies. The data needs to be collected and compiled to have a complete understanding of the transit operations in the study corridor.

Appendix A

Key Physical Features

Freeway	Segment	Segment Type	Lanes	Type	Length	Auxiliary Lane	Potential Deficiency
US-101N	Mainline [Start]	Mainline	3				
US-101N	NB OFF TO RICE AVE/ AUTO CENTER DR	Offramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB ON FROM RICE AVE/ AUTO CENTER DR	Onramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB OFF TO ROSE AVE	Offramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB ON FROM NB ROSE AVE	Onramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB ON FROM SB ROSE AVE	Onramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB OFF TO VINEYARD AVE	Offramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB ON FROM NB VINEYARD AVE	Onramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB ON FROM SB VINEYARD AVE	Onramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB OFF TO OXNARD BLVD	Offramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB ON FROM OXNARD BLVD	Onramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB OFF TO JOHNSON DR / NORTH BANK DR	Offramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB ON FROM JOHNSON DR / NORTH BANK DR	Onramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB OFF TO VICTORIA AVE	Offramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB ON FROM VICTORIA AVE	Onramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB OFF TO TELEPHONE RD	Offramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB OFF TO SR-126E	Offramp	1				
US-101N	Mainline	Mainline	3	Diverge	1500		Lane drop (3 to 2)
US-101N	NB OFF TO E MAIN ST/S MILLS RD	Offramp	1				

Freeway	Segment	Segment Type	Lanes	Type	Length	Auxiliary Lane	Potential Deficiency
US-101N	Mainline	Mainline	2				
US-101N	NB ON FROM SR-126W	Onramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB ON FROM E MAIN ST	Onramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB OFF TO SEAWARD AVE	Offramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB ON FROM SEAWARD AVE	Onramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB OFF TO VISTA DEL MAR DR	Offramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB OFF TO CALIFORNIA ST	Offramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB ON FROM S OAK ST	Onramp	1				
US-101N	Mainline	Mainline	3	Weave	<2000	No	Lane drop (3 to 2) and Not comply with CA HDM for an auxiliary lane requirement for a weaving section less than 2,000 feet
US-101N	NB OFF TO SR-33N	Offramp	2				
US-101N	Mainline	Mainline	2				
US-101N	NB ON FROM SR-33S	Onramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB ON FROM W MAIN ST	Onramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB OFF TO SOLIMAR (SR-1)	Offramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB OFF TO SEACLIFF (SR-1)	Offramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB ON FROM SEACLIFF (SR-1)	Onramp	1				
US-101N	Mainline	Mainline	3->2	Basic	7400		Lane drop (3 to 2)
US-101S	NB OFF/ON TO/FROM OLD PACIFIC COAST HWY	At-Grade	1	Intersection		-	Interrupted flow on highway
US-101S	Mainline	Mainline	2				
US-101S	NB OFF/ON TO/FROM W SANTA BARBARA AVE	At-Grade	1	Intersection -	-	-	Interrupted flow on highway
US-101S	Mainline	Mainline	2				

Freeway	Segment	Segment Type	Lanes	Type	Length	Auxiliary Lane	Potential Deficiency
US-101S	NB OFF/ON TO/FROM TANK FARM	At-Grade	1	Intersection		-	Interrupted flow on highway
US-101S	Mainline	Mainline	2				
US-101N	NB OFF TO BATES RD	Offramp	1		-		
US-101N	Mainline	Mainline	3				
US-101N	NB ON FROM BATES RD	Onramp	1				
US-101N	Mainline	Mainline	3	Weave	<2000	No	Not comply with CA HDM for an auxiliary lane requirement for a weaving section less than 2,000 feet
US-101N	NB OFF TO RINCON RD	Offramp	1				
US-101N	Mainline	Mainline	3->2				
US-101N	NB ON FROM RINCON RD (Rte 150)	Onramp	1				
US-101N	Mainline	Mainline	2				
US-101N	NB OFF TO BAILARD AVE	Offramp	1				
US-101N	Mainline	Mainline	2				
US-101N	NB ON FROM BAILARD AVE	Onramp	1				
US-101N	Mainline	Mainline	2				
US-101N	NB OFF TO SR-224	Offramp	1				
US-101N	Mainline	Mainline	2				
US-101N	NB ON FROM SR-224	Onramp	1				
US-101N	Mainline	Mainline	2				
US-101N	NB ON FROM LINDEN AVE/ OGAN RD	Onramp	1				
US-101N	Mainline	Mainline	2				
US-101N	NB OFF TO SANTA MONICA RD	Offramp	1				
US-101N	Mainline	Mainline	2				
US-101N	NB ON FROM SANTA MONICA RD	Onramp	1				
US-101N	Mainline	Mainline	2				
US-101N	NB OFF TO S PADARO LN	Offramp	1				
US-101N	Mainline	Mainline	2				
US-101N	NB ON FROM S PADARO LN	Onramp	1				
US-101N	Mainline	Mainline	2				
US-101N	NB OFF TO N PADARO LN	Offramp	1				
US-101N	Mainline	Mainline	2				
US-101N	NB ON FROM N PADARO LN	Onramp	1				

Freeway	Segment	Segment Type	Lanes	Type	Length	Auxiliary Lane	Potential Deficiency
US-101N	Mainline	Mainline	2				
US-101N	NB OFF TO LILLIE AVE/ EVANS ST	Offramp	1				
US-101N	Mainline	Mainline	2				
US-101N	NB ON FROM ORTEGA HILL RD/ EVANS ST	Onramp	1				
US-101N	Mainline	Mainline	2	Weave	<2000	No	Not comply with CA HDM for an auxiliary lane requirement for a weaving section less than 2,000 feet
US-101N	NB OFF TO N JAMESON LN/ SHEFFIELD DR	Offramp	1				
US-101N	Mainline	Mainline	2				
US-101N	NB ON FROM N JAMESON LN/ SHEFFIELD DR	Onramp	1				
US-101N	Mainline	Mainline	2				
US-101N	NB OFF TO SAN YSIDRO RD	Offramp	1				
US-101N	Mainline	Mainline	2				
US-101N	NB ON FROM SAN YSIDRO RD	Onramp	1				
US-101N	Mainline	Mainline	2	Weave	<2000	No	Not comply with CA HDM for an auxiliary lane requirement for a weaving section less than 2,000 feet
US-101N	NB OFF TO OLIVE MILL RD	Offramp	1				
US-101N	Mainline	Mainline	2				
US-101N	NB OFF TO COAST VILLAGE RD/ HERMOSILO RD	Offramp	1				
US-101N	Mainline	Mainline	2	Diverge	1200		
US-101N	NB OFF TO E CABRILLO BLVD (LEFT RAMP)	Offramp	1				
US-101N	Mainline	Mainline	2	Basic	1700		
US-101N	NB ON FROM COAST VILLAGE RD/ E CABRILLO BLVD	Onramp	1		-		
US-101N	Mainline	Mainline	2				
US-101N	NB OFF TO S SALINAS ST	Offramp	1		-		
US-101N	Mainline	Mainline	2				
US-101N	NB ON FROM S SALINAS ST	Onramp	1				
US-101N	Mainline	Mainline	2	Weave	<2000	No	
US-101N	NB OFF TO S MILPAS ST	Offramp	1				
US-101N	Mainline	Mainline	2				
US-101N	NB ON FROM S MILPAS ST	Onramp	1				

Cabrillo Hot Springs Operational Improvement Project - currently under construction

Freeway	Segment	Segment Type	Lanes	Type	Length	Auxiliary Lane	Potential Deficiency
US-101N	Mainline	Mainline	2->3	Weave	<2000	No	Not comply with CA HDM for an auxiliary lane requirement for a weaving section less than 2,000 feet
US-101N	NB OFF TO LAGUNA ST/ GARDEN ST	Offramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB ON FROM GARDEN ST	Onramp	1				
US-101N	Mainline	Mainline	3	Weave	<2000	No	Not comply with CA HDM for an auxiliary lane requirement for a weaving section less than 2,000 feet
US-101N	NB OFF TO BATH ST	Offramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB ON FROM CASTILLO ST (SR-225)	Onramp	1				
US-101N	Mainline	Mainline	3	Weave	<2000	No	Not comply with CA HDM for an auxiliary lane requirement for a weaving section less than 2,000 feet
US-101N	NB OFF TO W CARRILLO ST	Offramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB ON FROM W CARRILLO ST	Onramp	1				
US-101N	Mainline	Mainline	3	Weave	<2000	No	Not comply with CA HDM for an auxiliary lane requirement for a weaving section less than 2,000 feet
US-101N	NB OFF TO W ARRELLAGA ST	Offramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB ON FROM W ARRELLAGA ST	Onramp	1				
US-101N	Mainline	Mainline	3	Weave	<2000	No	Not comply with CA HDM for an auxiliary lane requirement for a weaving section less than 2,000 feet
US-101N	NB OFF TO W MISSION ST	Offramp	1				
US-101N	Mainline	Mainline	3				

Freeway	Segment	Segment Type	Lanes	Type	Length	Auxiliary Lane	Potential Deficiency
US-101N	NB ON FROM W MISSION ST	Onramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB OFF TO CALLE REAL/ W PUEBLO ST	Offramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB OFF TO CALLE REAL/ LAS POSITAS RD	Offramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB ON FROM CALLE REAL/ LAS POSITAS RD	Onramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB OFF TO S HOPE AVE	Offramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB ON FROM S HOPE AVE	Onramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB OFF TO STATE ST (SR-154)	Offramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB ON FROM STATE ST (SR-154)	Onramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB OFF TO EL SUENO RD	Offramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB ON FROM EL SUENO RD	Onramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB OFF TO TURNPIKE RD	Offramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB ON FROM TURNPIKE RD	Onramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB OFF TO PATTERSON AVE	Offramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB OFF TO SR-217	Offramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB ON FROM PATTERSON AVE	Onramp	1				
US-101N	Mainline	Mainline	3				
US-101N	NB OFF TO FAIRVIEW AVE	Offramp	1				
US-101N	Mainline	Mainline	3->2	Basic	1600		Lane drop (3 to 2) before merging area
US-101N	NB ON FROM FAIRVIEW AVE	Onramp	1				

Freeway	Segment	Segment Type	Lanes	Type	Length	Auxiliary Lane	Potential Deficiency
US-101N	Mainline	Mainline	2				
US-101N	NB OFF TO LOS CARNEROS RD	Offramp	1				
US-101N	Mainline	Mainline	2				
US-101N	NB ON FROM LOS CARNEROS RD	Onramp	1				
US-101N	Mainline	Mainline	2	Weave	<2000	No	Not comply with CA HDM for an auxiliary lane requirement for a weaving section less than 2,000 feet
US-101N	NB OFF TO STORKE RD	Offramp	1				
US-101N	Mainline	Mainline	2				
US-101N	NB ON FROM STORKE RD	Onramp	1				
US-101N	Mainline	Mainline	2				
US-101N	NB OFF TO CALLE REAL/ WINCHESTER CANYON RD	Offramp	1				
US-101N	Mainline	Mainline	2				
US-101N	NB ON FROM CALLE REAL/ HOLLISTER AVE	Onramp	1				
US-101N	Mainline [End]	Mainline	2				
x	x	x	x				
US-101S	Mainline [Start]	Mainline	2				
US-101S	SB OFF TO HOLLISTER AVE	Offramp	1				
US-101S	Mainline	Mainline	2				
US-101S	SB ON FROM HOLLISTER AVE	Onramp	1				
US-101S	Mainline	Mainline	2				
US-101S	SB OFF TO STORKE RD	Offramp	1				
US-101S	Mainline	Mainline	2				
US-101S	SB ON FROM STORKE RD	Onramp	1				
US-101S	Mainline	Mainline	2				
US-101S	SB OFF TO LOS CARNEROS RD	Offramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB ON FROM LOS CARNEROS RD	Onramp	1				
US-101S	Mainline	Mainline	2				
US-101S	SB OFF TO FAIRVIEW AVE	Offramp	1				
US-101S	Mainline	Mainline	2->3				
US-101S	SB ON FROM FAIRVIEW AVE	Onramp	1				
US-101S	Mainline	Mainline	3				

Freeway	Segment	Segment Type	Lanes	Type	Length	Auxiliary Lane	Potential Deficiency
US-101S	SB OFF TO PATTERSON AVE	Offramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB ON FROM SR-217	Onramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB ON FROM PATTERSON AVE	Onramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB OFF TO TURNPIKE RD	Offramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB ON FROM TURN PIKE RD	Onramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB OFF TO STATE ST	Offramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB ON FROM SAN MARCOS PASS RD	Onramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB OFF TO LAS PALMAS DR	Offramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB ON FROM LAS PALMAS DR	Onramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB OFF TO LAS POSITAS RD	Offramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB ON FROM LAS POSITAS RD	Onramp	1				
US-101S	Mainline	Mainline	3	Weave	<2000	No	Not comply with CA HDM for an auxiliary lane requirement for a weaving section less than 2,000 feet
US-101S	SB OFF TO W MISSION ST	Offramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB ON FROM W MISSION ST	Onramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB OFF TO W CARRILLO ST	Offramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB ON FROM W CARRILLO ST	Onramp	1				

Freeway	Segment	Segment Type	Lanes	Type	Length	Auxiliary Lane	Potential Deficiency
US-101S	Mainline	Mainline	3	Weave	<2000	No	Not comply with CA HDM for an auxiliary lane requirement for a weaving section less than 2,000 feet
US-101S	SB OFF TO CASTILLO ST	Offramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB ON FROM CASTILLO ST	Onramp	1				
US-101S	Mainline	Mainline	3	Weave	<2000	No	Not comply with CA HDM for an auxiliary lane requirement for a weaving section less than 2,000 feet
US-101S	SB OFF TO GARDEN ST	Offramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB ON FROM GARDEN ST	Onramp	1				
US-101S	Mainline	Mainline	3->2	Weave	<2000	No	
US-101S	SB OFF TO S MILPAS ST	Offramp	1				
US-101S	Mainline	Mainline	2				
US-101S	SB ON FROM S MILPAS ST	Onramp	1				
US-101S	Mainline	Mainline	2				
US-101S	SB OFF TO LOS PATOS WAY	Offramp	1				
US-101S	Mainline	Mainline	2	Diverge	550		
US-101S	SB OFF TO E CABRILLO BLVD (LEFT RAMP)	Offramp	1				
US-101S	Mainline	Mainline	2				
US-101S	SB ON FROM E CABRILLO BLVD (LEFT RAMP)	Onramp	1				
US-101S	Mainline	Mainline	2				
US-101S	SB OFF TO SPRING RD	Offramp	1				
US-101S	Mainline	Mainline	2				
US-101S	SB ON FROM OLIVE MILL RD	Onramp	1				
US-101S	Mainline	Mainline	2	Weave	<2000	No	Not comply with CA HDM for an auxiliary lane requirement for a weaving section less than 2,000 feet
US-101S	SB OFF TO EUCALYPTUS LN/San Ysido Rd	Offramp	1				
US-101S	Mainline	Mainline	2				

Cabrillo Hot Springs Operational Improvement Project - currently under construction

Freeway	Segment	Segment Type	Lanes	Type	Length	Auxiliary Lane	Potential Deficiency
US-101S	SB ON FROM S JAMESON LN	Onramp	1				
US-101S	Mainline	Mainline	2				
US-101S	SB OFF TO SHEFFIELD DR (LEFT RAMP)	Offramp	1				
US-101S	Mainline	Mainline	2				
US-101S	SB ON FROM SHEFFIELD DR (LEFT RAMP)	Onramp	1				
US-101S	Mainline	Mainline	2	Weave	<2000	No	Not comply with CA HDM for an auxiliary lane requirement for a weaving section less than 2,000 feet
US-101S	SB OFF TO EVANS ST	Offramp	1				
US-101S	Mainline	Mainline	2				
US-101S	SB ON FROM WALLACE AVE/ Evans St	Onramp	1				
US-101S	Mainline	Mainline	2				
US-101S	SB OFF TO N PADARO LN	Offramp	1				
US-101S	Mainline	Mainline	2				
US-101S	SB ON FROM N PADARO LN	Onramp	1				
US-101S	Mainline	Mainline	2				
US-101S	SB OFF TO S. PADARO LN	Offramp	1				
US-101S	Mainline	Mainline	2				
US-101S	SB ON FROM SANTA CLAUS LN/S.Padaro Ln	Onramp	1				
US-101S	Mainline	Mainline	2				
US-101S	SB OFF TO CARPINTERIA AVE	Offramp	1				
US-101S	Mainline	Mainline	2				
US-101S	SB OFF TO REYNOLDS AVE	Offramp	1				
US-101S	Mainline	Mainline	2				
US-101S	SB ON FROM REYNOLDS AVE	Onramp	1				
US-101S	Mainline	Mainline	2	Weave	<2000	No	Not comply with CA HDM for an auxiliary lane requirement for a weaving section less than 2,000 feet
US-101S	SB OFF TO LINDEN AVE	Offramp	1				
US-101S	Mainline	Mainline	2				
US-101S	SB OFF TO SR-224	Offramp	1				
US-101S	Mainline	Mainline	2				

Freeway	Segment	Segment Type	Lanes	Type	Length	Auxiliary Lane	Potential Deficiency
US-101S	SB ON FROM SR-224	Onramp	1				
US-101S	Mainline	Mainline	2				
US-101S	SB OFF TO BAILARD AVE	Offramp	1				
US-101S	Mainline	Mainline	2				
US-101S	SB ON FROM BAILARD AVE	Onramp	1				
US-101S	Mainline	Mainline	2				
US-101S	SB OFF TO SR-150	Offramp	1				
US-101S	Mainline	Mainline	2				
US-101S	SB ON FROM SR-150	Onramp	1				
US-101S	Mainline	Mainline	2				
US-101S	SB OFF TO BATES RD	Offramp	1				
US-101S	Mainline	Mainline	2				
US-101S	SB ON FROM BATES RD	Onramp	1				
US-101S	Mainline	Mainline	2				
US-101S	NB OFF/ON TO/FROM TANK FARM	At-Grade	1	Intersection		-	Interrupted flow on highway
US-101S	Mainline	Mainline	2				
US-101S	NB OFF/ON TO/FROM W SANTA BARBARA AVE	At-Grade	1	Intersection -		-	Interrupted flow on highway
US-101S	Mainline	Mainline	2				
US-101S	NB OFF/ON TO/FROM OLD PACIFIC COAST HWY	At-Grade	1	Intersection -		-	Interrupted flow on highway
US-101S	Mainline	Mainline	2->3				
US-101S	SB OFF TO SEACLIFF (SR-1)	Offramp	1			-	
US-101S	Mainline	Mainline	3				
US-101S	SB ON FROM SEACLIFF (SR-1)	Onramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB ON FROM SOLIMAR (SR-1)	Onramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB OFF TO W MAIN ST	Offramp	1				
US-101S	Mainline	Mainline	3->2	Basic	4000		Lane drop (3 to 2)
US-101S	SB OFF TO SR-33N	Offramp	1				
US-101S	Mainline	Mainline	2				
US-101S	SB OFF TO VENTURA AVE	Offramp	1			-	
US-101S	Mainline	Mainline	2				
US-101S	SB ON FROM SR-33S	Onramp	1				
US-101S	Mainline	Mainline	2->3				

Freeway	Segment	Segment Type	Lanes	Type	Length	Auxiliary Lane	Potential Deficiency
US-101S	SEG SB ON FROM E THOMPSON BLVD	Onramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SEG SB ON FROM HARBOR BLVD/Chesnut St	Onramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB ON FROM E THOMPSON BLVD/ HARBOR BLVD/Front St	Onramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB OFF TO MONMOUTH WAY	Offramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB ON FROM MONMOUNTH WAY	Onramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB ON FROM SEAWARD AVE	Onramp	1				
US-101S	Mainline	Mainline	3->2	Basic	7300		Lane drop (3 to 2)
US-101S	SB OFF TO SR-126E	Offramp	2				
US-101S	Mainline	Mainline	2				
US-101S	SB OFF TO DONLON ST/E MAIN ST	Offramp	1		-		
US-101S	Mainline	Mainline	2				
US-101S	SB ON FROM TELEPHONE RD	Onramp	1				
US-101S	Mainline	Mainline	2->3				
US-101S	SB OFF TO VICTORIA AVE	Offramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB ON FROM SB VICTORIA AVE	Onramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB ON FROM NB VICTORIA AVE	Onramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB OFF TO JOHNSON DR	Offramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB ON FROM JOHNSON DR	Onramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB OFF TO WAGON WHEEL RD	Offramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB OFF TO OXNARD BLVD	Offramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB ON FROM OXNARD BLVD	Onramp	1				
US-101S	Mainline	Mainline	3				

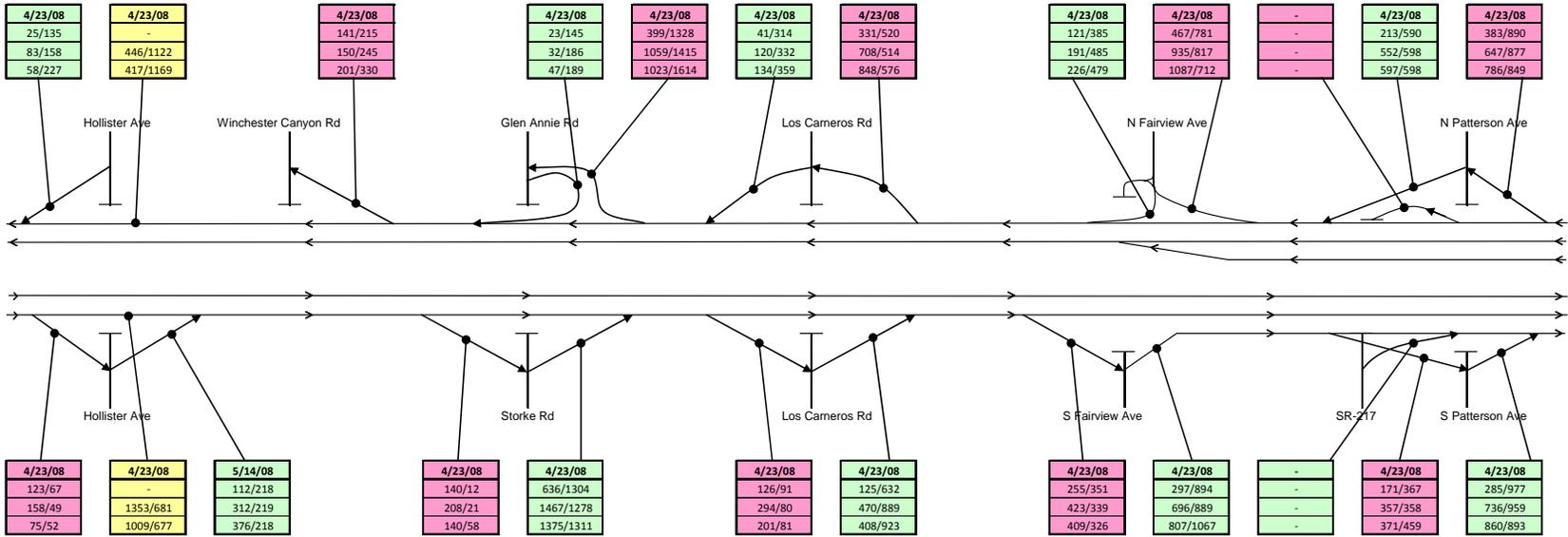
Freeway	Segment	Segment Type	Lanes	Type	Length	Auxiliary Lane	Potential Deficiency
US-101S	SB OFF TO VINEYARD AVE	Offramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB ON FROM SB VINEYARD AVE	Onramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB ON FROM NB VINEYARD AVE	Onramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB OFF TO ROSE AVE	Offramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB ON FROM SB ROSE AVENUE	Onramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB ON FROM NB ROSE AVE	Onramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB OFF TO RICE AVE	Offramp	1				
US-101S	Mainline	Mainline	3				
US-101S	SB ON FROM RICE AVE	Onramp	1				
US-101S	Mainline [End]	Mainline	3				

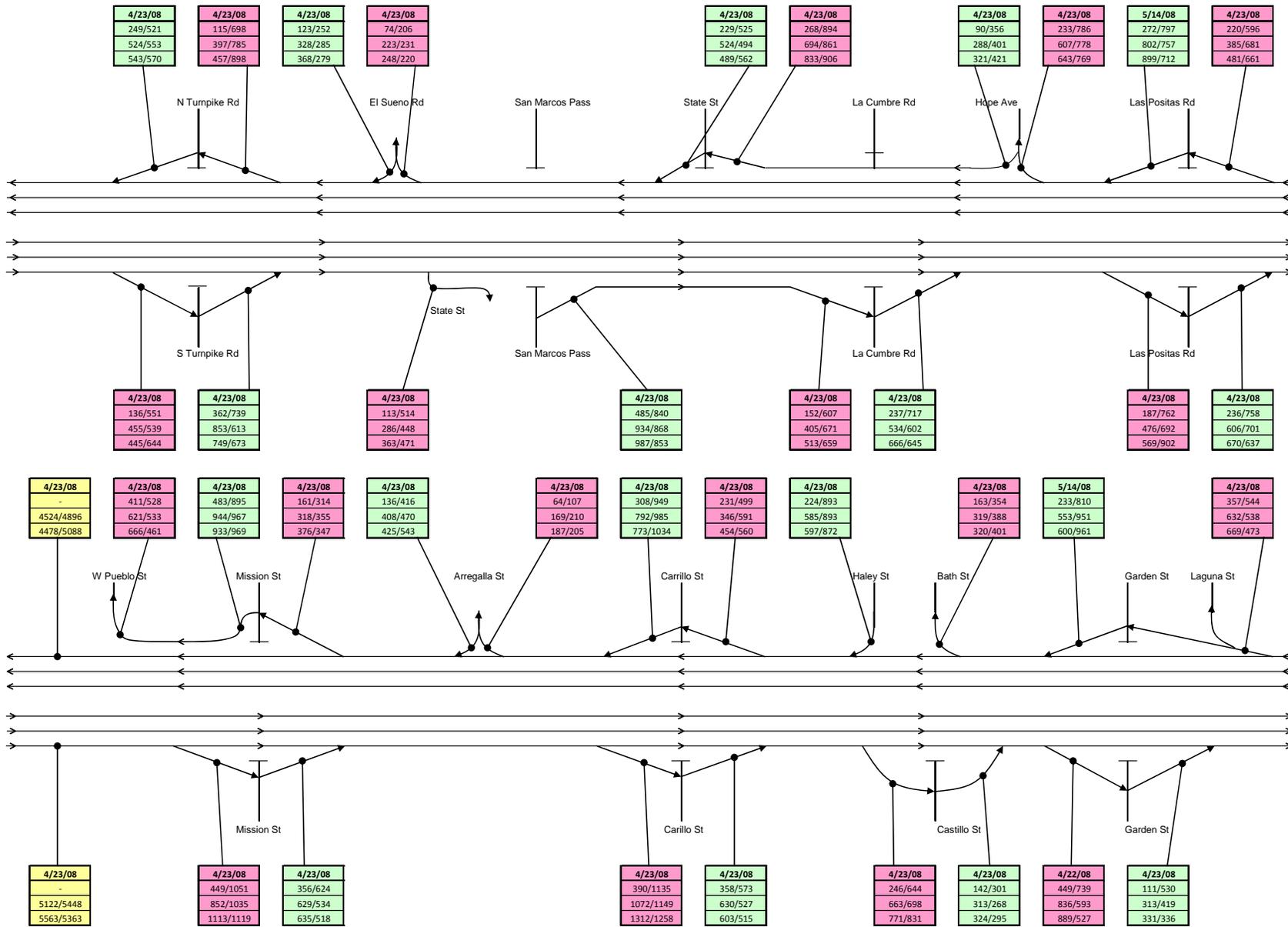
Appendix B

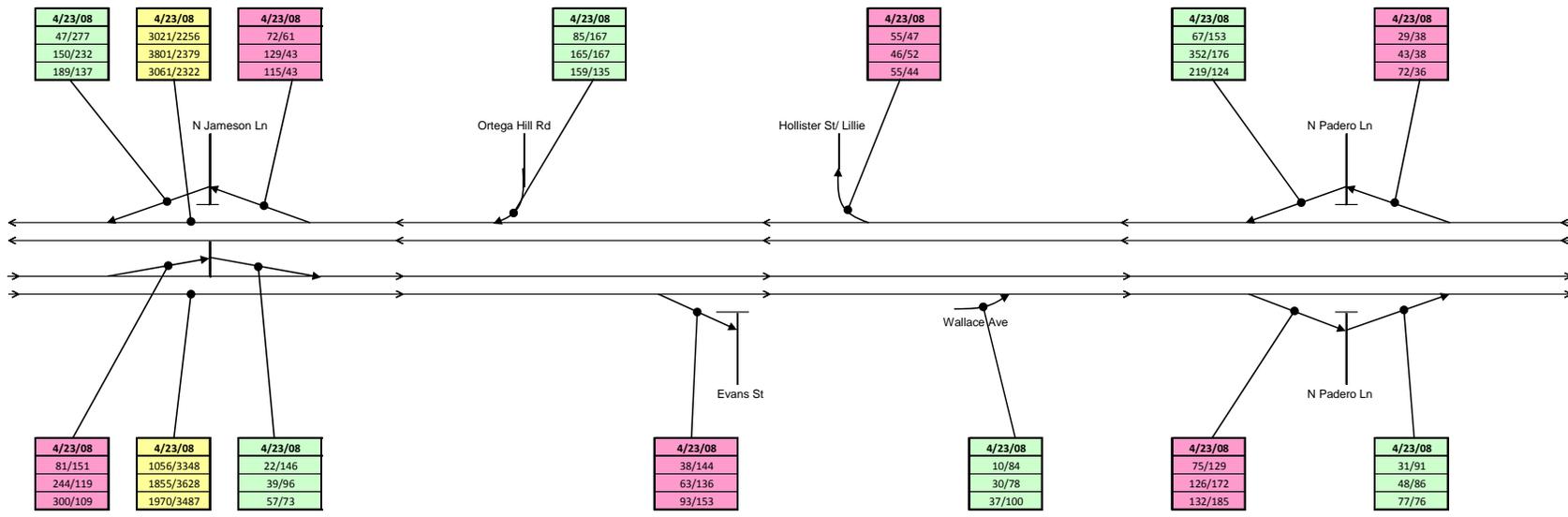
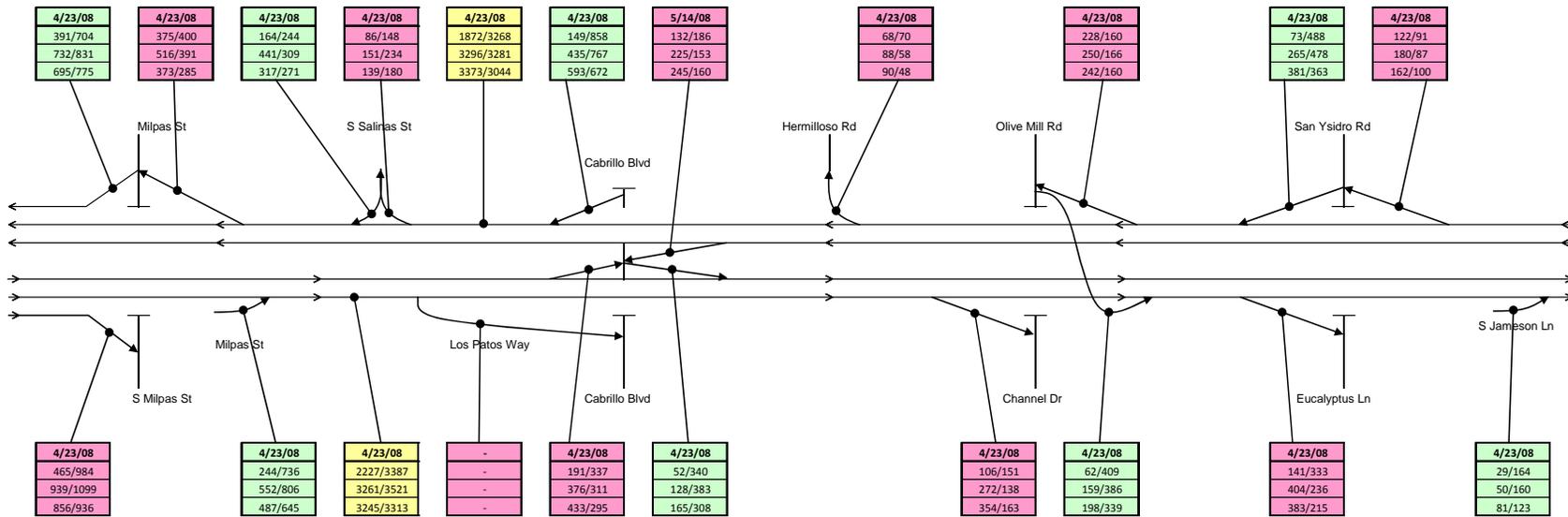
Freeway Volumes

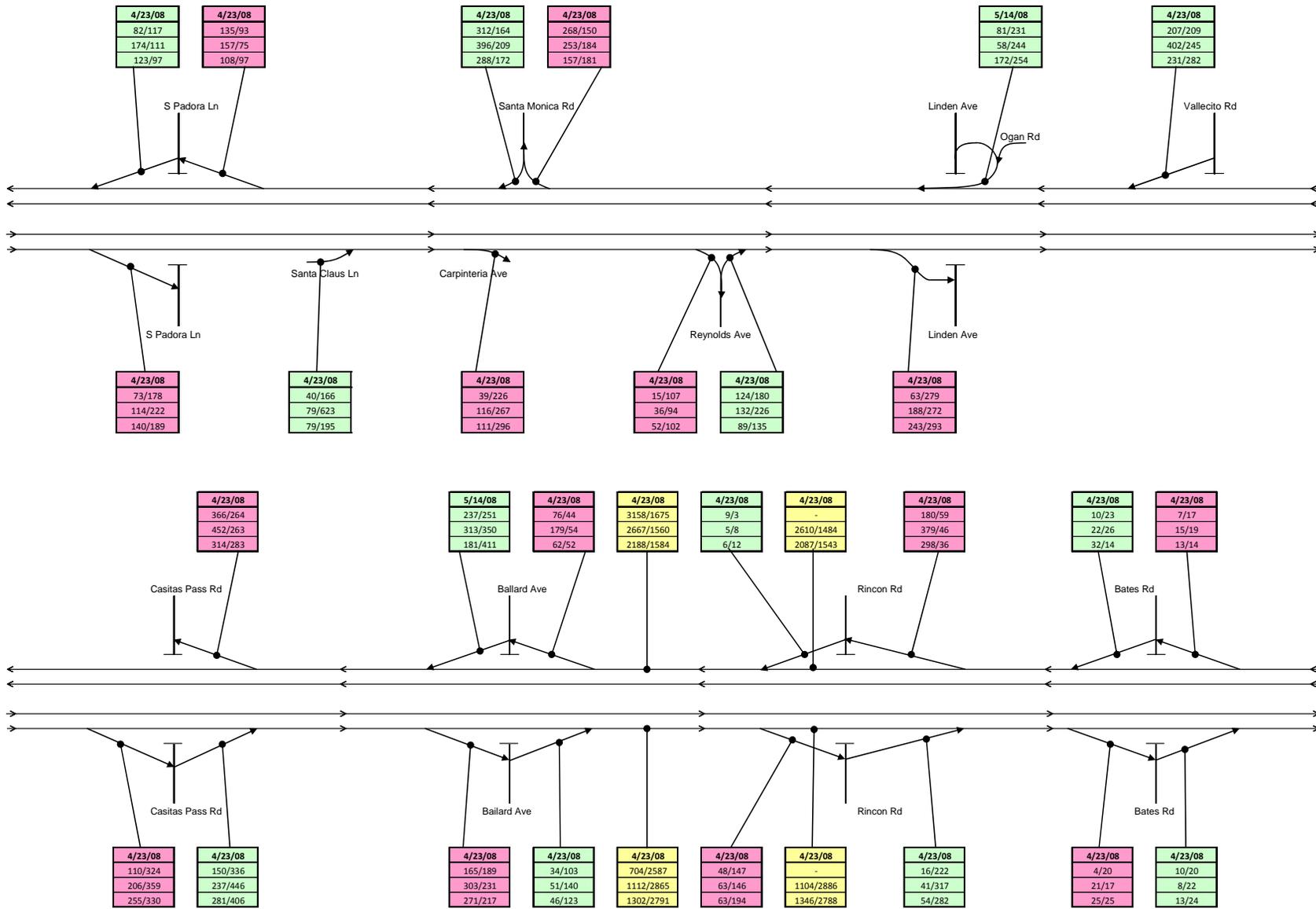
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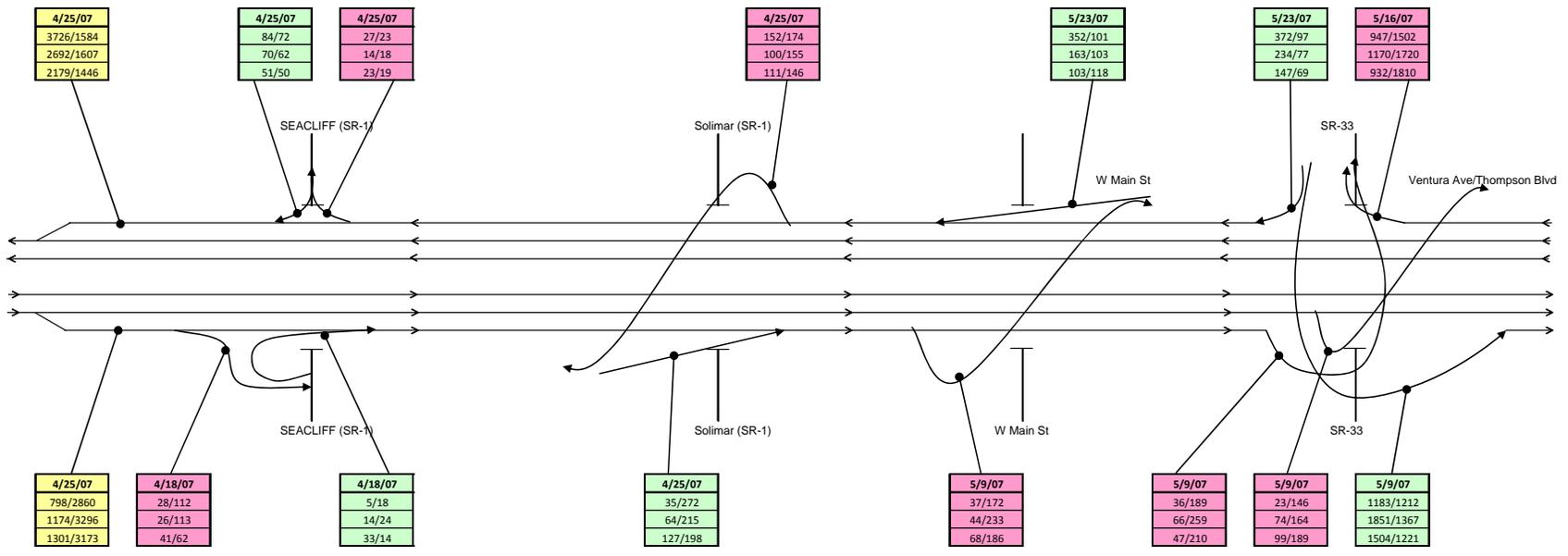
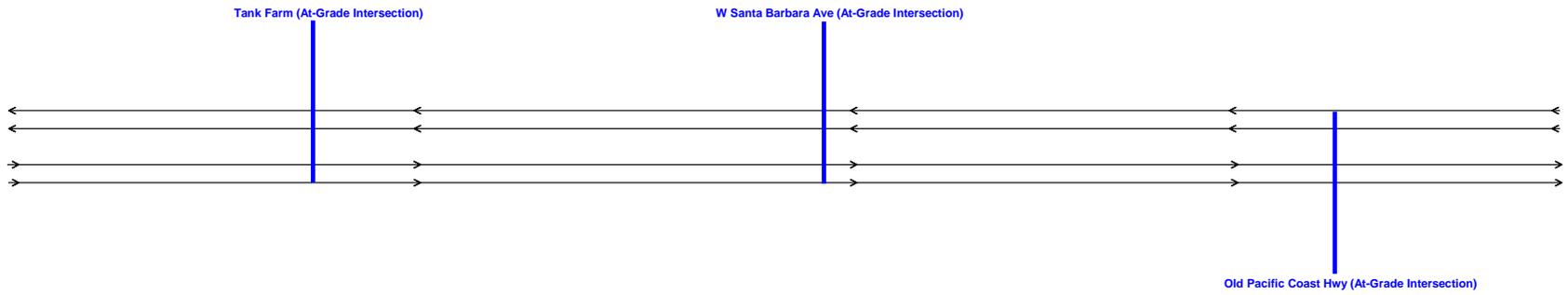
Obs Date
Volumes 6-7AM/3-4PM
Volumes 7-8AM/4-5PM
Volumes 8-9AM/5-6PM

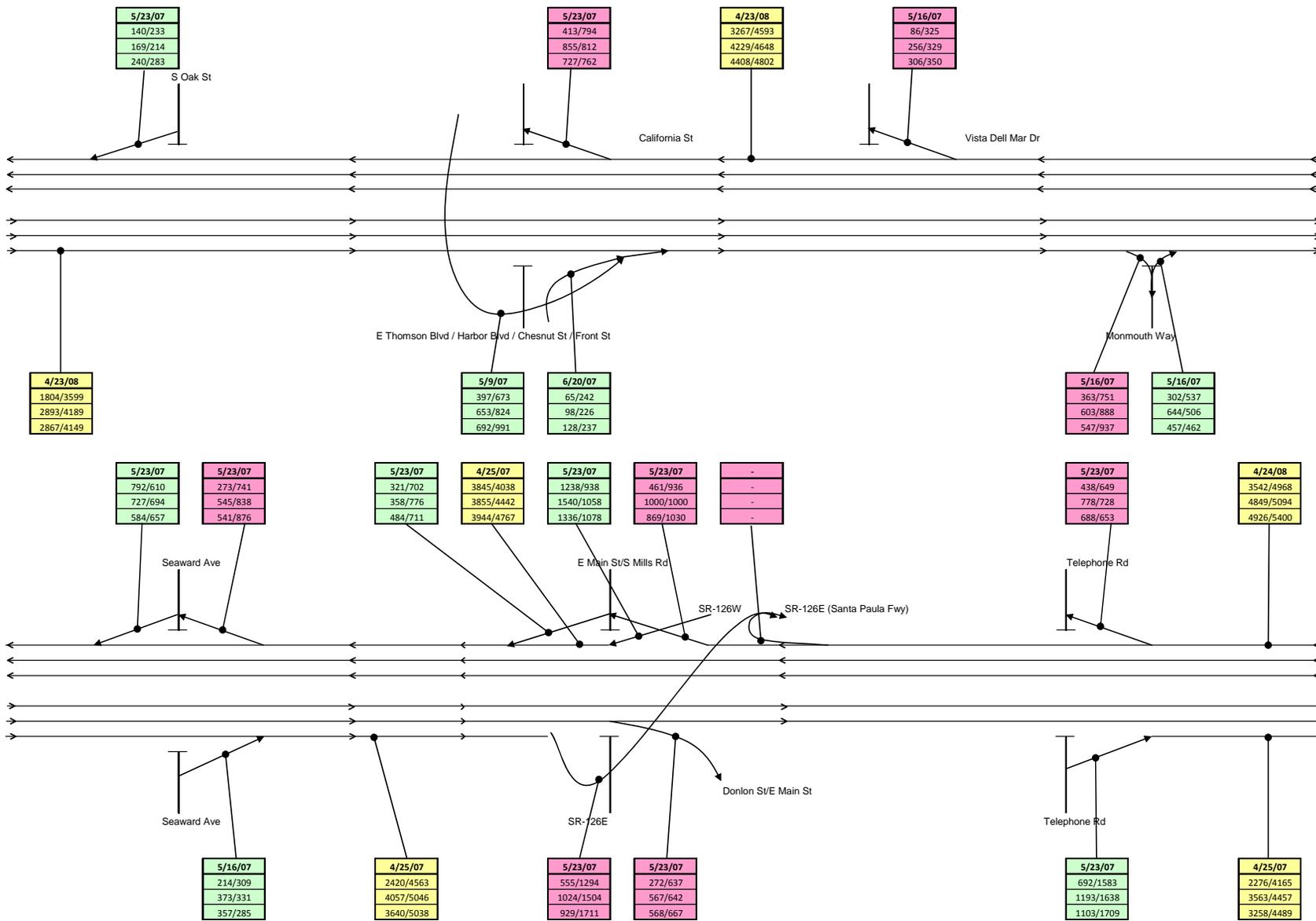


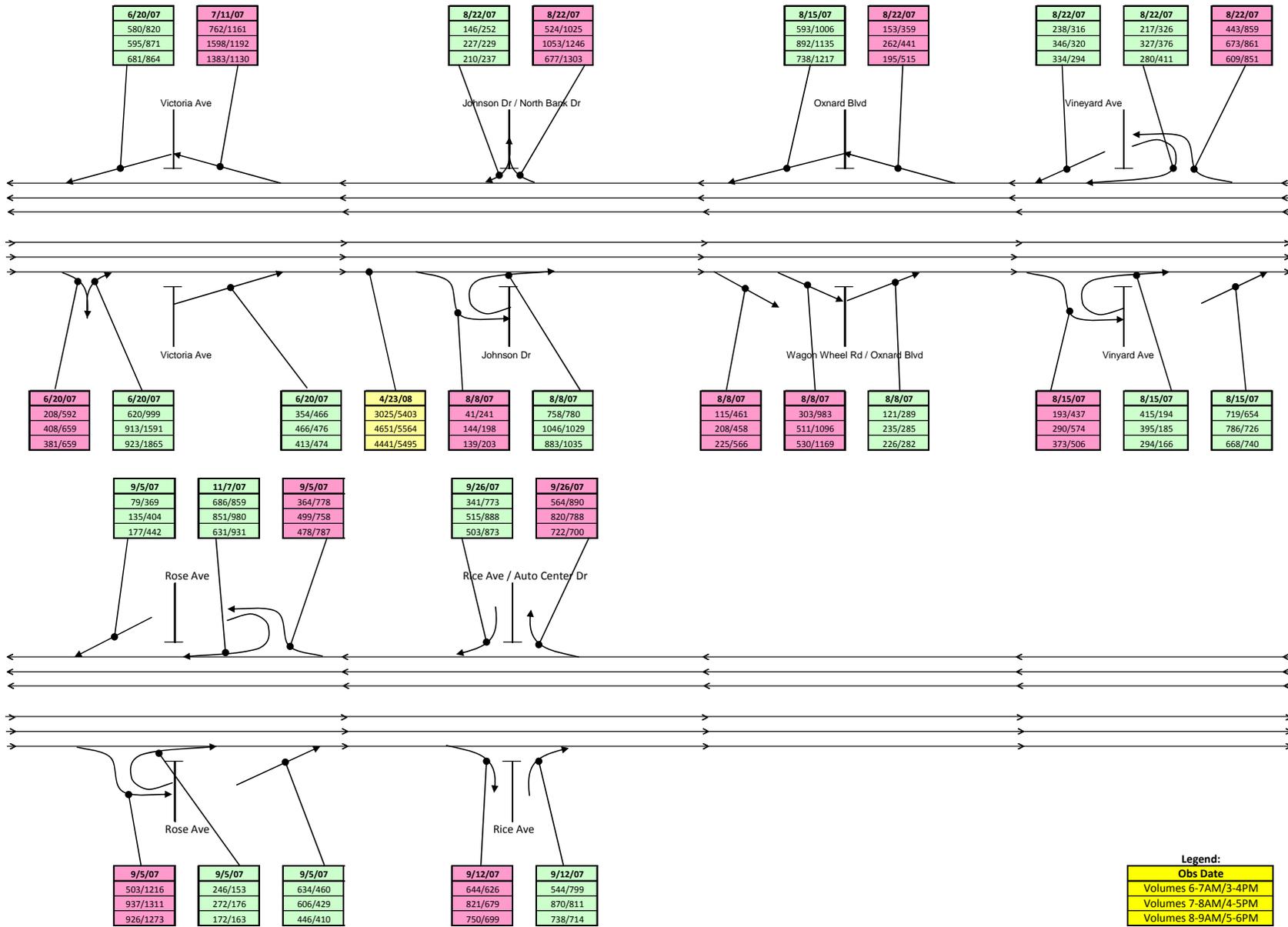












Appendix C
Bottleneck Analysis in Santa Barbara
County

US 101 Congestion Segments

***Santa Barbara County**

Data Source	Direction	Start Location	End Location	Start PM	End PM	Period	Start Time	End Time	Severity	Comment	Observation Date
AM Peak Period NB											
Probe 08	NB	Santa Monica Rd	Bailard Ave	4.0	1.0	AM	6:30	7:45	Major		4.22.08/4.23.08
Probe 08	NB	N Parado Ln	Santa Monica Rd	7.0	4.0	AM	7:15	7:45	Minor	35~50 mph	4.22.08
Probe 08	NB	Jameson Ln	N Parado Ln	9.3	7.0	AM	7:45	8:15	Major		4.22.08
Probe 08	NB	Salinas St	Jameson Ln	11.8	9.3	AM	7:30	8:15	Major		4.22.08
Probe 08	NB	Hope Ave	Mission St	17.2	15.5	AM	7:30	8:00	Minor	35~55 mph	4.22.08
HICOMP 07	NB	S Parado Ln	SR 150	4.8	0.4	AM	6:45	8:15	Major		
HICOMP 07	NB	Garden St	S Parado Ln	13.0	5.5	AM	6:00	9:30	Major		
HICOMP 07	NB	Calle Real	Castillo St	16.4	14.0	AM	7:45	8:45	Major		
Caltrans 06	NB	Linden Ave	SR 150	3.0	0.5	AM	7:00	7:45	Major		10.12.06/11.15.06
Caltrans 06	NB	N Parado Ln	Bailard Ave	7.0	1.4	AM	6:45	8:00	Major		1.18.06
Caltrans 06	NB	Jameson Ln	S Parado Ln	9.0	5.0	AM	7:45	8:00	Major		10.12.06/11.15.06
Caltrans 06	NB	Salinas St	N Parado Ln	11.8	7.0	AM	8:00	8:45	Major		1.18.06
Caltrans 06	NB	Salinas St	San Ysidro Rd	11.8	10.0	AM	7:45	8:30	Major		10.12.06/11.15.06
Caltrans 06	NB	Mission St	Garden St	15.7	13.2	AM	7:45	8:00	Major		11.15.06

AM Peak Period SB											
HICOMP 07	SB	Mission St	Las Positas Ln	15.7	16.0	AM	7:45	8:15	Major		

PM Peak Period NB											
Probe 08	NB	Hope Ave	Carrillo St	17.4	14.5	PM	5:00	5:45	Major	Weaving btw SR 154 and Hope & Big off traffic, 2 hidden bottlenecks are from Mission on and Calle Real on because of weaving & Big on traffic	4.22.08
HICOMP 07	NB	Calle Real	Castillo St	16.4	14.0	PM	3:45	6:15	Major		
Caltrans 06	NB	Salinas St	Olive Mill Rd	11.5	10.5	PM	3:45	5:15	Major		11.14.06
Caltrans 06	NB	Carrilo St	Garden St	14.8	13.4	PM	5:15	5:30	Major		11.14.06
Caltrans 06	NB	Calle Real	Mission St	16.4	15.5	PM	5:15	5:30	Major		11.14.06

PM Peak Period SB											
Probe 08	SB	Jameson Ln	Cabrillo St	8.5	11.2	PM	4:45	5:30	Minor	40~65 mph, but consistent speed drop	4.22.08
Probe 08	SB	Milpas St	Mission St	12.2	15.0	AM	4:00	6:00	Major		4.22.08
Probe 08	SB	La Cumbre Ln	State St	16.9	18.2	AM	4:15	6:00	Minor	50~65 mph, but consistent speed drop	4.22.08
Probe 08	SB	Faireview Ave	La Carneros Rd	22.0	23.5	AM	4:30	5:15	Minor	45~65 mph, but consistent speed drop	4.22.08
HICOMP 07	SB	Olive Mill Rd	Castillo St	10.0	14.0	PM	3:00	6:00	Major		
HICOMP 07	SB	Las Palmas Dr	SR 217	17.4	21.0	PM	5:00	6:15	Major		
Caltrans 06	SB	Bates Rd	Bailard Ave	0.0	3.0	PM	4:30	4:45	Minor	35~60 mph	11.14.06
Caltrans 06	SB	Jameson Ln	San Ysidro Rd	8.6	9.5	PM	3:00	3:15	Minor	35~60 mph	11.14.06
Caltrans 06	SB	Milpas St	Garden St	12.0	13.0	PM	4:30	4:45	Major		11.14.06

Appendix D

Data Collection Plan

ATTACHMENT B: DATA COLLECTION PLAN

October 24, 2008

Some of the traffic data needed for the traffic operational analysis for US-101 Corridor System Management Plan (CSMP) corridor in Santa Barbara and Ventura Counties are obtained from previous studies and various sources, although some additional data will be needed for the current analysis. This data collection plan identifies the data to be collected in the fall of 2008 to support the project.

The following sections are broken down according to the different types of traffic data needed to support the operational analysis. For each type, the data necessary for the conduct of the analysis are identified along with whether or not this information is available from previous studies. New data needs and gaps in the data already compiled are highlighted. The available data information is based on the discussions with Caltrans District 5 and District 7 during the kick-off meeting on May 27, 2008 and subsequent phone calls to the Districts. The pricing for the proposed data collection efforts is also included in this data collection plan.

Freeway Mainline Traffic Volumes

There are four continuously counting PeMS vehicle detection stations (767802, 767810, 767811, 767801) and ten Caltrans trend stations on US-101. In addition to those automatic counts, there are six locations where manual counts are available for three days during the peak periods (6:00 to 9:00 AM and 3:00 to 6:00 PM). It is anticipated that new data collection on the freeway mainline will be collected at **8 locations to fill gaps on US-101** and **4 locations** where the following state routes: SR-217, SR-154, SR-33, and SR-126 join US-101. These data will be collected using manual count method on 1 weekday (Tuesday or Wednesday) from 6:00 to 9:00 AM and 3:00 to 6:00 PM.

Ramp Traffic Volumes

Ramp traffic volumes are available from other studies for almost all of the US-101 freeway. It is anticipated that additional ramp traffic volumes will be collected at **8 additional locations on the US-101** freeway to cover gaps and at the **41 freeway ramp locations on the other state routes within the corridor**. These data will be collected using vehicle classification machine counts to obtain 15-minute interval/48-hour period (Tuesday and Wednesday) volumes.

Intersection Traffic Volumes

Figure 1 illustrates the corridor limits and the major roadways within the corridor. The roadways in the corridor are classified into three categories: (1) the core area, (2) the inner area, and (3) the outer area to designate their relative priority for arterial intersection turning-movement counts.

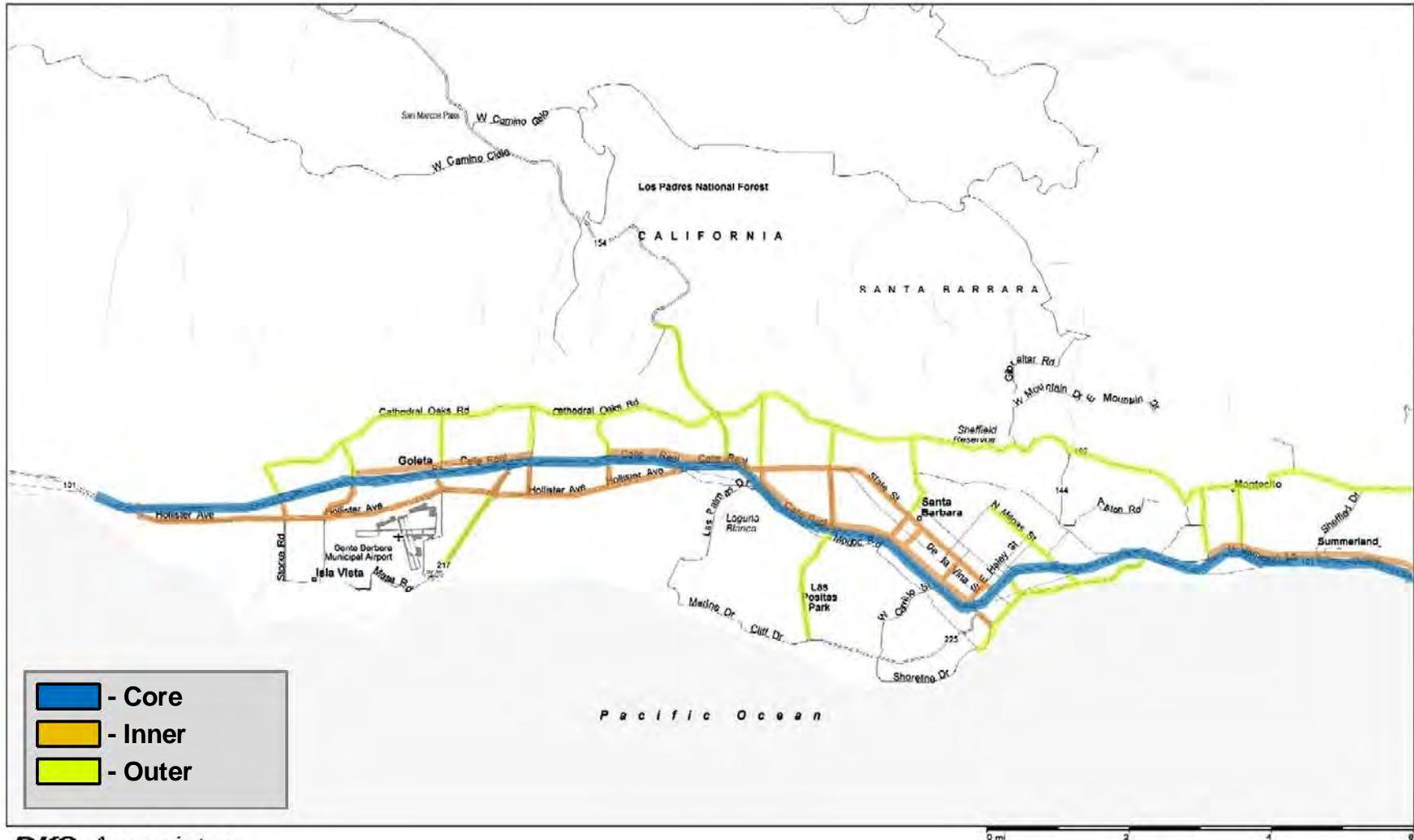


Figure 1 Corridor Limit (Northern Part)

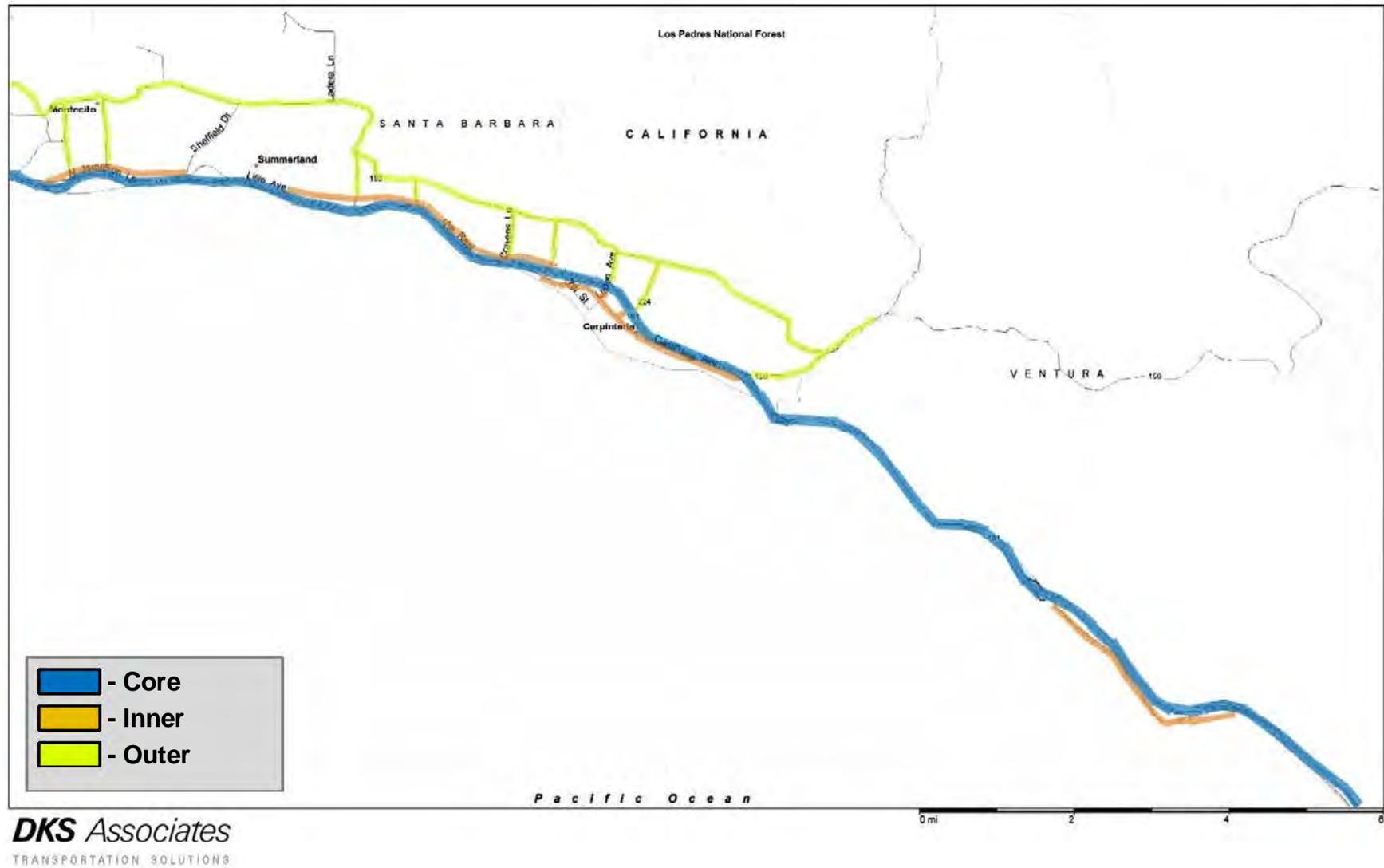


Figure 1 Corridor Limit (continued) (Middle Part)



Figure 1 Corridor Limit (continued) (Southern Part)

The **core area** includes all of the US-101 ramp intersections and one intersection next to the US-101 ramp intersections.

The **inner area** includes parallel arterials and frontage roads, which are:

- Hollister Avenue
 - from the northern end to State Street
- Calle Real
 - from Los Carneros Road to Patterson Avenue
 - from Turnpike Road to State Street
 - from Lacumbre Road to Mission Street
- State Street
 - from La Cumbre Road to Gutierrez Street
- Castillo Street
 - from Mission Street to SR-225
- Jameson Line
 - from Olive Mill Road to Sheffield Drive
- Via Real
 - from Evan Street to Santa Ynez Avenue
- Carpinteria Avenue
 - from US-101S Exit to SR-150
- SR-1 (Pacific Coast)
 - from Seacliff to Solimar
- Main Street
 - from SR-33 to Telephone Road
- Thompson Boulevard
 - from Ventura Avenue to E Main Street
- Harbor Boulevard
 - from California Street to Seaward Avenue
- Frontage Road
 - from Victoria Avenue to Northbank Drive
- Connectors between the above roadways and US-101

The **outer area** includes the following roadways:

- Cathedral Oaks Road
 - from Storke Road to SR-154
- SR-192
 - from SR-154 to SR-150
- SR-217
 - from US-101 to Fairview Avenue
- SR-154
 - from US-101 to San Antonio Creek Road
- SR-225
 - from US-101 to Cliff Drive
 - from Loma Alta Drive to US-101 (Hot Springs Road)
- SR-144

- from SR-225 to E Ortega Street
- SR-224
 - from Carpinteria Avenue to SR-192
- SR-150
 - from US-101 to SR-192
- SR-33
 - from US-101 to Canada Larga Road
- SR-126
 - from US-101 to Kimball Road
- SR-1
 - from US-101 to Wooley Road
- SR-232
 - from SR-1 to SR-118
- Connectors between the above roadways and the inner area or US-101.

It is anticipated that **intersection traffic volumes will be collected at 145 locations**. The selection is based on three levels of detail.

- High: the core area (37 locations)
- Medium: the inner area (56 locations)
- Low: the outer area (52 locations)

All intersections within the **core area** will be counted, but only select intersections that are critical to the simulation modeling will be counted in the **inner** and **outer areas**. More coverage is planned for the **inner area** than for the **outer area**. These data will be manually collected as turning movement counts on 1 weekday (Tuesday or Wednesday) during 7:00 to 9:00 AM and 4:00 to 6:00 PM.

Arterial Traffic Volumes

Arterial traffic volumes are available at three locations in the study area. It is anticipated that new arterial counts will be conducted at **15 additional locations on parallel streets and state routes**. For each location, arterial traffic volumes will be counted by direction. These data will be collected using the standard ADT machine counts to obtain 15-minute interval/48-hour period (Tuesday and Wednesday) volumes.

Signal Timing Data

Signal timing data for all the signalized ramp intersections, and intersections on any parallel routes will be collected from Caltrans, County, and Cities as appropriate. These data are needed to estimate current and future LOS and delay and also potential diversion impacts.

Vehicle Occupancy Data

As part of the 2008 Santa Barbara/Ventura 101 HOV Project, traffic counts were collected at three locations on US-101 mainline in Santa Barbara County. Vehicle occupancy data were collected at the same time for these three locations and at three ramp locations. There are no vehicle occupancy data available in the Ventura County. **Vehicle Occupancy Data will be collected at the same 16 locations where new freeway mainline traffic volumes will be collected.**

Travel Time/Speed Data

Travel time and speed data are available covering the entire US-101 Corridor in Santa Barbara County collected as part of the 101 HOV study. There are some travel time runs available from District 7 that cover the freeway segment from Seacliff I/C to Casitas Pass I/C. However, the accuracy and consistency of travel time/speed data are crucial for corridor assessment, bottleneck identification, and modeling, especially without automatic detection such as PeMS. It is anticipated that freeway travel time/speed data will be collected from new tach runs using **8 probe vehicles to create a GPS speed profile on 2 weekdays** (Tuesday and Wednesday) during the periods from 6:00 to 9:00 AM and 3:00 to 6:00 PM. Four probe vehicles will start from the southern end to the northern end with 15-minute headways, and the other four probe vehicles will start from the northern end to the southern end with 15-minute headways.

Field Observations

In addition to the data described in the prior sections, understanding and analysis of the study area will rely on comprehensive field observations. Field observations will be performed as part of this study to conduct detailed observations of the physical conditions and congestions on all sections of freeway and surface roads, and at all intersections, that will be included in the analysis. **The cost for field observation is not included in this Data Collection Plan.**

Accident Data

For this study, the TASAS accident data for the most recent three year period (2005 to 2008) will be obtained from Caltrans to cover the freeway segments of US-101 within the study network. Accident data on parallel arterials will be requested for the same period from Counties and Cities as appropriate.

Vehicle Classification Data

2006 Annual Average Daily Truck Traffic on the California State Highway System compiled by the Traffic Operations division reports the annual average daily truck traffic at some locations within the US-101 CSMP Corridor limits. In addition, vehicle classification data are available on all the ramps in Santa Barbara County from the 2008 Santa Barbara/Ventura 101 HOV Project. **The new vehicle classification data will be collected at the same 16 locations where the mainline manual counts will be collected and on all ramps in Ventura County.**

Bottleneck Locations

To identify causes of congestion, it is anticipated that the **videotaping of the bottleneck locations will be collected** along the entire corridor.

License Plate Surveys

There have been no license plate surveys conducted along the corridor with which to perform an origin destination assessment. **It is anticipated that the license plate surveys will be conducted at both ends of the study corridor and the two ends of the CMIA project.**

Lane Density Data

To determine congestion levels, it is anticipated that the **lane density data will be collected during the AM and PM peak periods** by the means of flying the corridor and collecting aerial photographs.

Data Collection Pricing

Data Type	Unit Price	Amount	Total
Mainline Manual Counts (volumes + occupancy + classification) – Per person per hour	\$70	432	\$30,240
Ramp Tube Counts (48 hours, classification)	\$180	49	\$8,820
Intersection TMC (2-hour AM and 2-hour PM)	\$280	145	\$40,600
Arterial Tube Counts (48 hours, ADT)	\$135	15	\$2,025
Tach Runs (per probe vehicle per hour)	\$120	96	\$11,520
Video Logs –See Note 1	-	-	\$15,000
License Plate Surveys –See Note 1	-	-	\$15,000
Lane Density-Aerial Photographs–See Note 1	-	-	\$25,000
Total:			148,205

Note 1: Require pre approval from Contract Manager before proceeding with this activity.

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