METROPOLITAN TRANSPORTATION COMMISSION

US101/SR 92 INTERCHANGE AREA STUDY

San Mateo County, California

June 2013

KITTELSON & ASSOCIATES, INC.

TRANSPORTATION ENGINEERING/PLANNING

US101/SR92 Interchange Area Study

San Mateo County, California

June 2013

US101/SR92 Interchange Area Study

San Mateo County, California

Prepared For:
Metropolitan Transportation Commission
101 8th Street
Oakland, CA 94607
(510) 817-5700

Prepared By:
Kittelson & Associates, Inc.
155 Grand Avenue, Suite 900
Oakland, California 94612
(510) 839-1742

Project Manager: Mark Bowman, PE
Project Principal: Richard Dowling, PE

Project No. 12473

June 2013

CONTENTS

1. Executive Summary 2
Study Process 2
Capital Projects 2
Cost Estimates 5
Findings 5
Recommendations 6
2. Introduction 9
Study Purpose 9
Study Area 9
Study Approach 9
3. Analysis Methods 12
VISSIM Model Development 12
FREQ Model Development 13
Synchro Model Development 13
Coordination Between Overlapping Models 13
4. Baseline Conditions 15
Northbound US101 15
AM Peak Period *15*
PM Peak Period *16*
Southbound US101 16
AM Peak Period *16*
Westbound SR92 16
PM Peak Period *16*
5. Capital Projects Development 20
Scenario Definitions 20
Scenario A *20*
Scenario B *20*
Scenario C *25*
Scenarios E, F, and G *25*
Effectiveness of Project Scenarios 26
Project Packages 28
6. Capital Projects Operations Analysis 30

Capital Projects Description 30
Package 1 – US101 Auxiliary Lane Connectors *30*
Package 2 – New SR92 Auxiliary Lanes *30*
Package 3 – US101/SR92-Hillsdale Boulevard Braided Ramps *33*
Analysis Methodology 33
Traffic Operations Analysis 36
Package 1 – US101 Auxiliary Lane Connectors *36*
Package 2 – New SR92 Auxiliary Lanes *36*
Package 3 – US101/SR92-Hillsdale Boulevard Braided Ramps *37*
Traffic Operations Analysis Results 38
Package 1 – US101 Auxiliary Lane Connectors *38*
Package 2 – New SR92 Auxiliary Lanes *44*
Package 3 – US101/SR92-Hillsdale Boulevard Braided Ramps *47*
Findings 51
7. Capital Projects Costs and Prioritization 53
Project Refinements 53
Project Costs 53
Project Priorities Based on Cost-Effectiveness 55
Conclusions 57
8. 2020 Analysis of Higher-priority Projects 60
Higher-priority Project Package Description 60
Future Traffic Volumes 60
Summary of Key Traffic Issues in 2020 61
AM Peak Period *61*
PM Peak Period *61*
Effectiveness of Projects Over Time 64
AM Peak Period *64*
PM Peak Period *64*
Other Operational Effects *65*
Travel Times *65*
Conclusions 68
9. Conclusions and Next Steps 70

LIST OF EXHIBITS

Exhibit 1: Study Area 3
Exhibit 2: Capital Projects Estimated Costs 5
Exhibit 3: Summary of Capital Projects and Recommendations 7
Exhibit 4: Baseline AM Peak Period Congestion 17
Exhibit 5: Baseline PM Peak Period Congestion 18
Exhibit 6: Lane Diagram for Scenario A (3rd Ave.) 21
Exhibit 7: Lane Diagram for Scenario A (Hillsdale) 22
Exhibit 8: Lane Restriping Options for Eastbound SR92, East of US101 23
Exhibit 9: Lane Restriping Options for Westbound SR92, West of US101 24
Exhibit 10: Qualitative Assessment Summary 27
Exhibit 11: Lane Diagram for Capital Projects Package 1 31
Exhibit 12: Existing and Package 2 Configurations 32
Exhibit 13: Schematic Diagram of Package 3 From SR92 Southward 34
Exhibit 14: Throughput Volume Comparison, Packages 1, 2, and 3 versus Baseline Westbound SR92, West of El Camino Real 35
Exhibit 15: Volumes for Capital Projects Package 2 Analysis 39
Exhibit 16: Capital Projects Package 2 Analysis Volumes AM and PM Peak Hour 40
Exhibit 17: Capital Projects Package 1 AM Peak Period Congestion 42
Exhibit 18: Capital Projects Package 1 PM Peak Period Congestion 43
Exhibit 19: Capital Projects Package 2 AM Peak Period Congestion 45
Exhibit 20: Capital Projects Package 2 PM Peak Period Congestion 46
Exhibit 21 Key Travel Time Results Comparison – Package 3 vs. Package 1 47
Exhibit 22: Capital Projects Package 3 AM Peak Period Congestion 49
Exhibit 23: Capital Projects Package 3 PM Peak Period Congestion 50
Exhibit 24: Capital Project Travel Times 51
Exhibit 25: Capital Projects Estimated Costs 54
Exhibit 26: Capital Projects Estimated Cost-Effectiveness 56
Exhibit 27: Capital Projects 2020 Baseline AM Peak Period Congestion 62
Exhibit 28 Capital Projects 2020 Baseline PM Peak Period Congestion 63

Exhibit 29: Capital Projects Package 4 AM Peak Period Congestion 66

Exhibit 30 Capital Projects Package 4 PM Peak Period Congestion..... 67

Exhibit 31: Capital Project Travel Times..... 68

APPENDICES

Appendix A: Baseline Operational Projects

Appendix B: Concept Drawings by TYLin – The "TYLin Concept"

Appendix C: Traffic Volume Re-Routing for Package 2

Appendix D: 2010 Speed Contours

Appendix E: Travel Time Comparisons

Appendix F: Performance Measure Comparisons

Appendix G: Synchro Reports

Appendix H: Cost Estimates

Appendix I: Traffic Forecasts

Appendix J: 2020 Speed Contours

Chapter 1
Executive Summary

1. EXECUTIVE SUMMARY

The overall purpose of this study is to address existing and future mobility problems on both freeways in the vicinity of the US101/SR92 interchange. The study was conducted by the Metropolitan Transportation Commission (MTC) with the participation of a stakeholder group that included representatives of:

- California Department of Transportation (Caltrans)
- City of Foster City
- City of San Mateo
- City/County Association of Governments of San Mateo County (C/CAG)
- San Mateo County Transportation Authority (SMCTA)

STUDY PROCESS

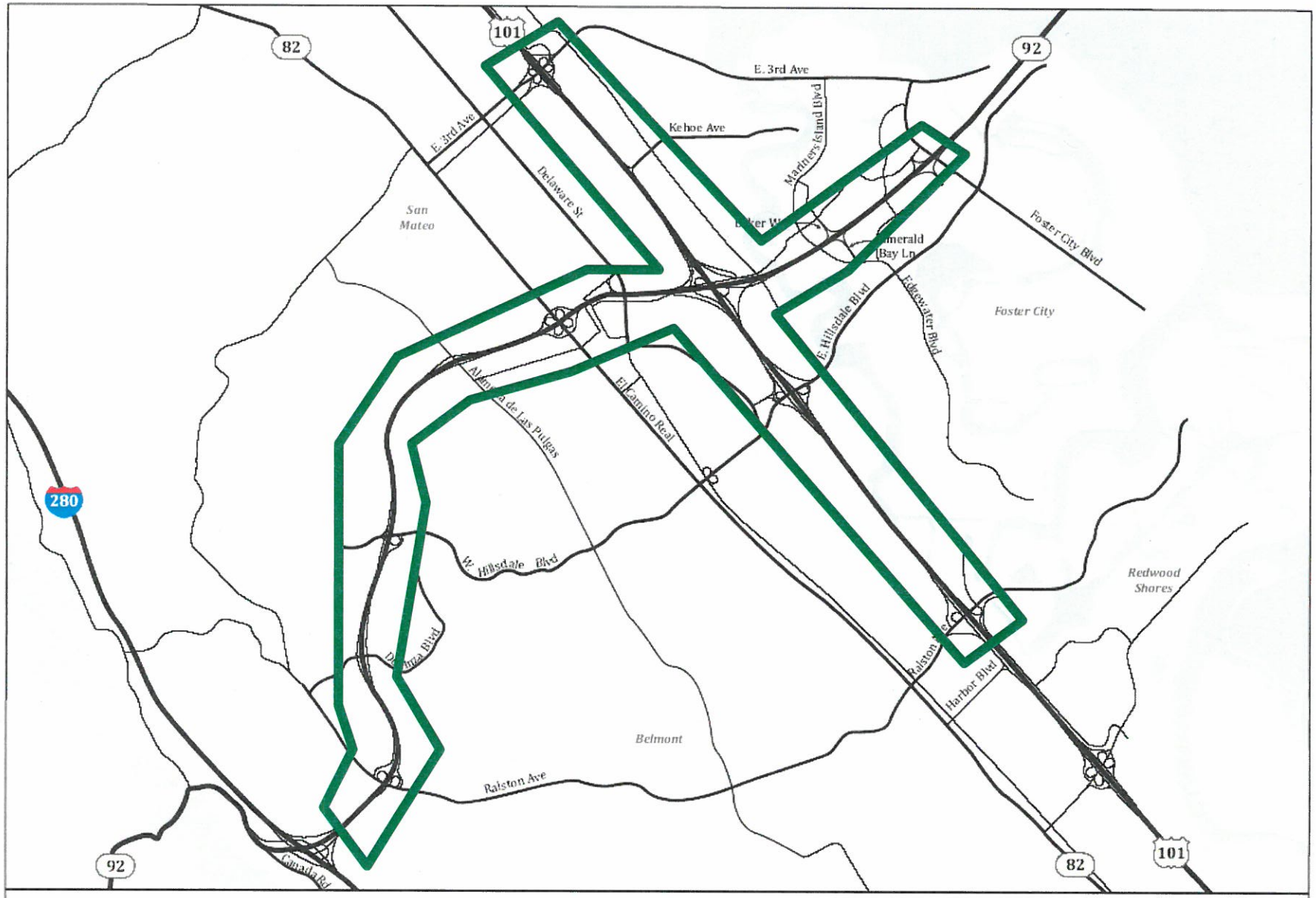
An extensive data collection effort was conducted in May of 2010 to define existing traffic operating conditions in the study area shown in Exhibit 1. Based on the data, operational analysis models were built and calibrated to represent existing operating conditions. After the models were calibrated, projects expected to be in place in the near term were added to the traffic operations models to create a Baseline condition. Baseline projects included projects that were fully-funded or under construction and projects that were included in local plans and policies.

A number of relatively large-scale "Capital Projects" were suggested by stakeholders to address the operational needs identified for the US101/SR92 interchange and provide a starting point for comparative evaluation of effectiveness and costs. These initial Capital Projects were developed as scenarios and qualitatively screened for feasibility and effectiveness in addressing the traffic operations issues. The most promising projects were retained for more detailed evaluation. Three project packages, comprised of components from the project scenarios, were evaluated and compared to the Baseline.

CAPITAL PROJECTS

The following capital project packages were developed as options to be considered individually or in combination as a means for potentially improving traffic operations at the US101/SR92 interchange.

Package 1 would increase the number of lanes on US101 from four to five underneath the overcrossings at 3rd Avenue (northbound) and at Hillsdale Boulevard (southbound). It would extend the northbound US101 auxiliary lane that currently exits at 3rd Avenue through the interchange to connect with the auxiliary lane that begins at the 3rd Avenue on-ramp. It would also include a similar modification for southbound US101 at Hillsdale Boulevard.



LEGEND

Not to Scale

Exhibit 1: Study Area

Package 2 would add an auxiliary lane to eastbound SR92 between the US101 connector on-ramp and the Edgewater off-ramp and extend the westbound auxiliary lane between the US101 connectors and the Delaware off-ramp to the El Camino Real off-ramp. It would also eliminate the westbound on-ramp from Delaware and the eastbound off-ramp to Delaware, as well as convert the SR92/El Camino Real interchange to a partial cloverleaf configuration by eliminating the westbound-to-southbound and eastbound-to-northbound loop ramps. This package assumes that new railroad crossings would be constructed along 17th Avenue and 20th Avenue and the streets would be extended to Delaware Street to serve local traffic.

Package 3 would start with the Package 1 modifications. It would then add a westbound-to-southbound flyover ramp at US101/SR92, and provide braided ramp configurations for northbound and southbound US101 between SR92 and Hillsdale Boulevard.

An additional capital project to provide an auxiliary lane on northbound US101 between the westbound SR92 and Fashion Island Boulevard on-ramps and the Kehoe Avenue off-ramp was identified to potentially remove or reduce the effect of a controlling bottleneck that would remain after implementation of Package 1 improvements.

The operational benefits of some of the capital project packages were found to be substantially greater in one direction of travel and were considered for further evaluation. The higher-priority portions of the capital project packages were evaluated for future conditions to determine if the value of those projects would have longer-term benefits. The elements of the capital projects identified as higher-priority were combined into a hybrid **Package 4**, which includes the following items in order of priority:

1. Package 1 plus auxiliary lane at Kehoe Avenue
    a. All of Package 1 (connect northbound auxiliary lanes north and south of 3rd Avenue to create a fifth lane underneath the overcrossing; connect southbound auxiliary lanes north and south of Hillsdale Boulevard to create a fifth lane underneath the overcrossing)
    b. A new auxiliary lane on northbound US101 between the westbound SR92 and Fashion Island Boulevard on-ramps and the Kehoe Avenue off-ramp
2. The northbound components of Package 3 (ramp braiding to eliminate the northbound weaving section)
3. The westbound components of Package 2 (eliminate westbound on-ramp from Delaware Street; extend westbound auxiliary lane from the Delaware Street off-ramp to El Camino Real off-ramp; convert westbound half of SR92/El Camino Real interchange to partial cloverleaf; construct two new grade-separated railroad crossings.

Package 4 was evaluated using 2020 forecasts to determine the effectiveness of these higher-priority projects through the near-term.

COST ESTIMATES

Planning level cost estimates were prepared for the capital projects, and are prioritized in Exhibit 2 based on expected operational benefits.

Exhibit 2: Capital Projects Estimated Costs

Capital Project	Estimated Cost
Implement Package 1 in the northbound and southbound directions plus auxiliary lane on northbound US101 south of the Kehoe Avenue off-ramp	$ 21,300,000
Implement Package 3 in the northbound direction	$ 40,000,000
Implement Package 2 in the westbound direction with street connections at 17th Avenue and 20th Avenue	$ 96,000,000
Implement Package 2 in the eastbound direction if further analysis of future traffic volumes indicates it would be cost-effective	$ 18,000,000
Implement Package 3 in the southbound direction if further analysis of future traffic volumes indicates it would be cost-effective	$ 180,000,000

FINDINGS

1. Package 1 was found to be, by far, the most cost-effective project due to its ability to eliminate controlling bottlenecks on US101 and would require the least amount of property acquisition (1 residential property).
2. After implementation of Package 1, a bottleneck would remain on northbound US101 south of the Kehoe Avenue off-ramp and would be present during both the AM and PM peak periods.
3. A new auxiliary lane on northbound US101 between the westbound SR92 and Fashion Island Boulevard on-ramps and the Kehoe Avenue off-ramp would eliminate the bottleneck during both the AM and PM peak periods, would have a relatively low cost, and would require no property acquisition.
4. Package 2 Westbound would provide slightly more than twice the operational improvement provided by Package 3 Northbound by eliminating the PM bottleneck on westbound SR92 between US101 and El Camino Real. However, Package 2 Westbound would cost more than twice as much to build and require significantly more property acquisition (affecting 11 businesses and 11 residential properties) compared to Package 3 Northbound (which would affect no businesses and 11 residential properties).
5. The US101/SR92 interchange area is expected to experience significant increases in congestion by 2020 as indicated by increases in travel time.
6. Package 4 would eliminate practically all queuing during the 2020 AM peak period except for queuing resulting from a bottleneck on eastbound SR92 east of the US101 connector ramps.
7. Package 4 did not include improvements to eastbound SR92 that may eliminate the bottleneck near the US101 connector ramps.

8. The effectiveness of Package 4 in 2020 is expected to be approximately double the effect it would have had on travel times in 2010. So, the effectiveness of Package 4 appears to be substantially greater in the future than today.

RECOMMENDATIONS

The following recommendations are based on the study findings:

1. Implement Capital Project Package 1 to eliminate controlling bottlenecks on US101 with the least amount of property impacts.
2. Implement an additional capital project to provide an auxiliary lane on northbound US101 from the westbound SR92 and Fashion Island Boulevard on-ramps to the Kehoe Avenue off-ramp. This additional project would remove the effect of a bottleneck that would remain on northbound US101 after implementation of Package 1 at a relatively low cost with no need for property acquisition.
3. Implement elements of Package 2 westbound that would not require the development of local roadway extensions that would be expensive to construct and would require significant property acquisition.
4. Develop and evaluate measures to address a new controlling bottleneck expected to develop by 2020 between the merge of the northbound and southbound US101 connector ramps to eastbound SR92 and the Edgewater Boulevard off-ramp.
5. Implement at least the improvements to US101 as soon as possible to provide benefits that will increase over time as traffic demand increases.

At the final stakeholders meeting the stakeholders agreed with the suggested recommendations and agreed that implementation of Package 1 plus the auxiliary lane south of Kehoe Avenue should be the first priority. The stakeholders set the next priority to be implementation of the following auxiliary lanes on SR92:

- Westbound between Delaware Street and El Camino Real
- Eastbound between the US101 on-ramps and the Edgewater Boulevard off-ramp

A summary of the packages and recommendations is provided in Exhibit 3.

Exhibit 3: Summary of Capital Projects and Recommendations

Capital Project	Description	Cost	Cost-Effectiveness Score[1]	Recommendations
Package 1	Connect northbound auxiliary lanes north and south of 3rd Avenue to create a fifth lane underneath the overcrossing. Connect southbound auxiliary lanes north and south of Hillsdale Boulevard to create a fifth lane underneath the overcrossing.	$19 million	70	Implement all of Package 1. Add a new auxiliary lane on northbound US101 between the westbound SR92 and Fashion Island Boulevard on-ramps and the Kehoe Avenue off-ramp at an additional cost of $2.3 million.
Package 2	Add an auxiliary lane on eastbound SR92 from US101 to the Edgewater Boulevard off-ramp. Add an auxiliary lane on westbound SR92 from the Delaware Street off-ramp to the El Camino Real off-ramp. Eliminate the westbound SR92 on-ramp from Delaware Street and the eastbound SR92 off-ramp to Delaware Street. Construct two new grade-separated railroad crossings along 17th and 20th Avenues between El Camino Real and Delaware Street. Convert the SR92/El Camino Real interchange to a partial cloverleaf by eliminating the westbound-to-southbound and eastbound-to-northbound loop ramps.	$114 million	13	Implement only the auxiliary lanes on SR92: • Eastbound from the US101 on-ramps to the Edgewater Boulevard off-ramp • Westbound from the Delaware Street off-ramp to the El Camino Real off-ramp Continue with current plans to convert the SR92/El Camino Real interchange to a partial cloverleaf by eliminating the westbound-to-southbound loop ramp. Do not implement other elements of Package 2 at this time.
Package 3	Braided ramps along US101 between SR92 and Hillsdale Boulevard to eliminate weaving on US101.	$220 million	2.9	Do not implement Package 3 at this time.

[1] Cost-effectiveness is measured as the effectiveness in reducing the hours of travel time during the average weekday peak periods per million dollars of investment.

Chapter 2
Introduction

2. INTRODUCTION

In 2009, a technical traffic analysis was conducted in support of the San Mateo US101 Corridor System Management Plan (CSMP) being developed by Caltrans District 4. The US101 corridor throughout the length of San Mateo County was studied for the CSMP analysis, but the details of operations at specific interchanges of freeways were not. This report documents the mobility problems on both freeways in the vicinity of the US101/SR92 interchange and the recommended improvements to mitigate them.

STUDY PURPOSE

The purpose of the US101/SR92 Interchange Area Traffic Analysis is to:

- Document the acquisition of data and other information to support the assessment of existing conditions.
- Develop a better understanding of how SR92 and US101 interact.
- Examine existing and future operating conditions at this key interchange in the City of San Mateo and to identify and evaluate potential solutions to congestion.
- Recommend freeway, ramp, and surface street improvements (Capital Projects) to address existing and future mobility problems at the interchange.
- Develop estimated costs for delivery of the various Capital Projects and determine which elements of those projects are most cost-effective for improving traffic operations in the US101/SR92 interchange area.

STUDY AREA

The study area, shown in Exhibit 1, includes US101 from Ralston Avenue to 3rd Avenue and SR92 from I-280 to Foster City Boulevard, as well as El Camino Real near SR92.

STUDY APPROACH

In order to define the existing conditions, an extensive data collection effort was conducted in May of 2010. Based on the data, operational analysis models were built and calibrated to represent existing operating conditions. An evaluation of existing traffic operations was documented in a previous Existing Conditions report[1] and serves as the basis for the development of projects that would alleviate congestion in the study area.

[1] US 101/State Route 92 Interchange Area Traffic Analysis – Existing Conditions, April 6, 2012 (Dowling Associates, Inc.)

Once the existing conditions were accurately represented by the analysis models, projects expected to be in place in the near term were added to the traffic operations models to create a Baseline condition.

These projects include:

- A new auxiliary lane on northbound US101 between the 3rd Avenue on-ramp and the Peninsula Avenue off-ramp
- New ramp metering for the Fashion Island Boulevard, Kehoe Avenue, and 3rd Avenue on-ramps to US101
- New ramp metering on southbound US101, north of the study limits
- More restrictive ramp metering at US101/Hillsdale Boulevard and US101/Ralston Avenue
- New freeway-to-freeway connector ramp metering on the southbound US101 to eastbound SR92 ramp during the AM peak period
- New freeway-to-freeway connector ramp metering on the westbound SR92 to northbound US101 ramp during the PM peak period
- New freeway-to-freeway connector ramp metering on the southbound US101 to westbound SR92 ramp during both peak periods
- New ramp metering on all local street on-ramps serving SR92 within the study area

The next step was to identify and then test the operational benefits and impacts of “Capital Projects” to resolve Baseline traffic issues. These types of projects tend to involve major construction, such as interchange modifications and freeway widening, and several such projects were bundled into “packages” for evaluation.

Chapter 3
Analysis Methods

3. ANALYSIS METHODS

The methods used to develop and analyze strategies to improve traffic operations in the US101/SR92 interchange area involved the use of traffic operations models to represent conditions that would occur after implementation of those strategies. The traffic operations models used to develop and analyze improvement strategies include:

- VISSIM (for the US101/SR92 interchange and its nearby facilities)
- FREQ (for SR92 west of El Camino Real)
- Synchro (for the surface street intersections along El Camino Real near SR92)

Three different models were used because of different characteristics of the facilities and the capabilities of the models. Microsimulation modeling using VISSIM software was used to evaluate the most complex freeway and ramp facilities because of its ability to model lane changing and weaving. For the less complex freeway and ramp facilities, macrosimulation modeling was performed using FREQ. Finally, at-grade intersections were evaluated using Highway Capacity Manual methodology as implemented within Synchro software.

Most of the Capital Projects operations analysis was conducted using the VISSIM microsimulation model because the proposed modifications and their impacts on congestion are located within the limits of that model. All models were calibrated based on field data, observations, and aerial photos collected during the first week of May, 2010, plus intersection/ramp traffic data provided by Caltrans and the City of San Mateo. A summary of the model development is provided below. Additional details regarding calibration of the traffic operations models are provided in the Existing Conditions report.

VISSIM MODEL DEVELOPMENT

VISSIM models were calibrated for the US101/SR92 interchange, from 3rd Avenue to Hillsdale Boulevard on US101 and from El Camino Real to Foster City Boulevard on SR92. Models were developed for a four-hour AM peak period and a five-hour PM peak period from 6:00 AM to 10:00 AM and from 2:30 PM to 7:30 PM. The existing data used for the inputs included geometric data, traffic data, aerial photographs, and the origin-destination survey conducted at the same time most of the other data were collected (May of 2010).

Microsimulation modeling is a technique in which various characteristics are assigned to individual simulation vehicles, and those “vehicles” are sent through a modeled roadway network to attempt to replicate actual conditions as closely as possible. VISSIM software was selected for this project because, while many different software packages can provide reasonable results, VISSIM represents some of the lane-changing movements that occur in the field in this specific study area slightly better than other software.

Microsimulation modeling does not provide the same kind of reproducible results as more static analysis methodologies, such as with *Highway Capacity Manual* or macrosimulation (FREQ) techniques. For example, with FREQ modeling, a given combination of capacity and volume will result in the model identifying the exact same bottleneck location, queue length, and duration of congestion for every application of the model. With microsimulation modeling, the reported results are usually the average of several simulation runs, each with unique outputs.

FREQ MODEL DEVELOPMENT

FREQ models were calibrated for SR92, west of El Camino Real (SR82). The FREQ modeling software, developed by the Institute for Transportation Studies at the University of California at Berkeley, is a macrosopic simulation modeling software package. This type of model is different from microsimulation modeling in several ways, with the most distinct being that it simulates the behavior of collections of vehicles rather than individual vehicles.

The geometric data required by FREQ consists of number of lanes, lengths of freeway mainline sections between ramps and lane/grade changes, percent grades, and number of lanes on each ramp. The physical data was initially obtained from aerial photographs, and then confirmed during field visits. The input free flow speed was determined through a combination of PeMS speed measurements, 511.org travel time data, and field observations.

SYNCHRO MODEL DEVELOPMENT

Synchro software was selected to evaluate at-grade intersections along El Camino Real at SR92. The Synchro network was created using aerial photographs of the SR92/El Camino interchange and of El Camino Real from north of Barneson Avenue to south of 25th Avenue.

Caltrans and City of San Mateo staff provided current signal timing information for the four signalized intersections along El Camino Real. This information included timing for pedestrian phases, minimum green signal phase times, and coordination settings. Aerial photographs of the intersections closest to SR92 were taken during peak periods, and are shown in the Existing Conditions report. These photographs were compared to the overall level of service letter grade results as well as the queuing observed in the photographs and in the field.

COORDINATION BETWEEN OVERLAPPING MODELS

With three different models – FREQ, VISSIM, and Synchro – covering the study area, one challenge of this study was to ensure that the analyses were consistent. In this study area, the two freeway models were built to overlap, so that the part of each model extending into the other's study limits would provide consistent conditions and manipulation of either model at the boundary would be minimized.

Chapter 4
Baseline Conditions

4. BASELINE CONDITIONS

A Baseline was established that includes projects that are expected to be implemented with a high degree of certainty prior to implementation of additional capital improvements. These projects fall into two categories:

1. Fully-funded or under construction
2. Included in local plans/policies

Fully-funded Category 1 projects include:

- A new auxiliary lane on northbound US101 between the 3rd Avenue on-ramp and the Peninsula Avenue off-ramp
- New ramp metering for the Fashion Island Boulevard, Kehoe Avenue, and 3rd Avenue on-ramps to US101
- New ramp metering on southbound US101, north of the study limits

Planned Category 2 projects were developed through an analysis process that investigated the ramp metering scenarios listed below (and described in a *Draft Operational Scenarios Report* [September 20, 2012] in Appendix A):

- More restrictive ramp metering at US101/Hillsdale Boulevard and US101/Ralston Avenue
- New freeway-to-freeway connector ramp metering on the southbound US101 to eastbound SR92 ramp during the AM peak period
- New freeway-to-freeway connector ramp metering on the westbound SR92 to northbound US101 ramp during the PM peak period
- New freeway-to-freeway connector ramp metering on the southbound US101 to westbound SR92 ramp during both peak periods
- New ramp metering on all local street on-ramps serving SR92 within the study area

Several key traffic congestion issues were identified through the Baseline conditions analysis. Those issues are listed below, along with brief discussions of each. Exhibit 4 and Exhibit 5 show the locations of these key issues on a study area map.

NORTHBOUND US101

AM Peak Period

3rd Avenue – A bottleneck develops in the four-lane section between the off-ramp and on-ramp. Queuing extends south of the Hillsdale Boulevard interchange, and also causes traffic on the loop ramp from eastbound SR92 to back up onto eastbound SR92. Traffic on the connector ramp from westbound SR92 trying to enter northbound US101 queues back along the ramp a short distance, but does not reach nor affect westbound SR92 traffic.

Between the Westbound SR92 / Fashion Island On-ramp and the Kehoe Off-ramp (92/F.I./Kehoe) – There is a bottleneck at this location that is hidden in queues extending south from 3rd Avenue.

PM Peak Period

Between the Westbound SR92 / Fashion Island On-ramp and the Kehoe Off-ramp (92/F.I./Kehoe) – This bottleneck is the result of high volumes entering northbound US101 from westbound SR92 and subsequent lane drops on northbound US101. Queuing on northbound US101 extends to just north of the Hillsdale Boulevard-SR92 weaving section, and slowing extends beyond the southern study limits.

SOUTHBOUND US101

AM Peak Period

Hillsdale Boulevard – This AM peak period bottleneck is located between the loop and diagonal on-ramps from Hillsdale Boulevard, with queuing extending north of the off-ramp to SR92. The queued traffic limits the ability of the eastbound and westbound SR92 ramp traffic to enter southbound US101, which, in turn, causes queuing back onto eastbound and westbound SR92.

WESTBOUND SR92

PM Peak Period

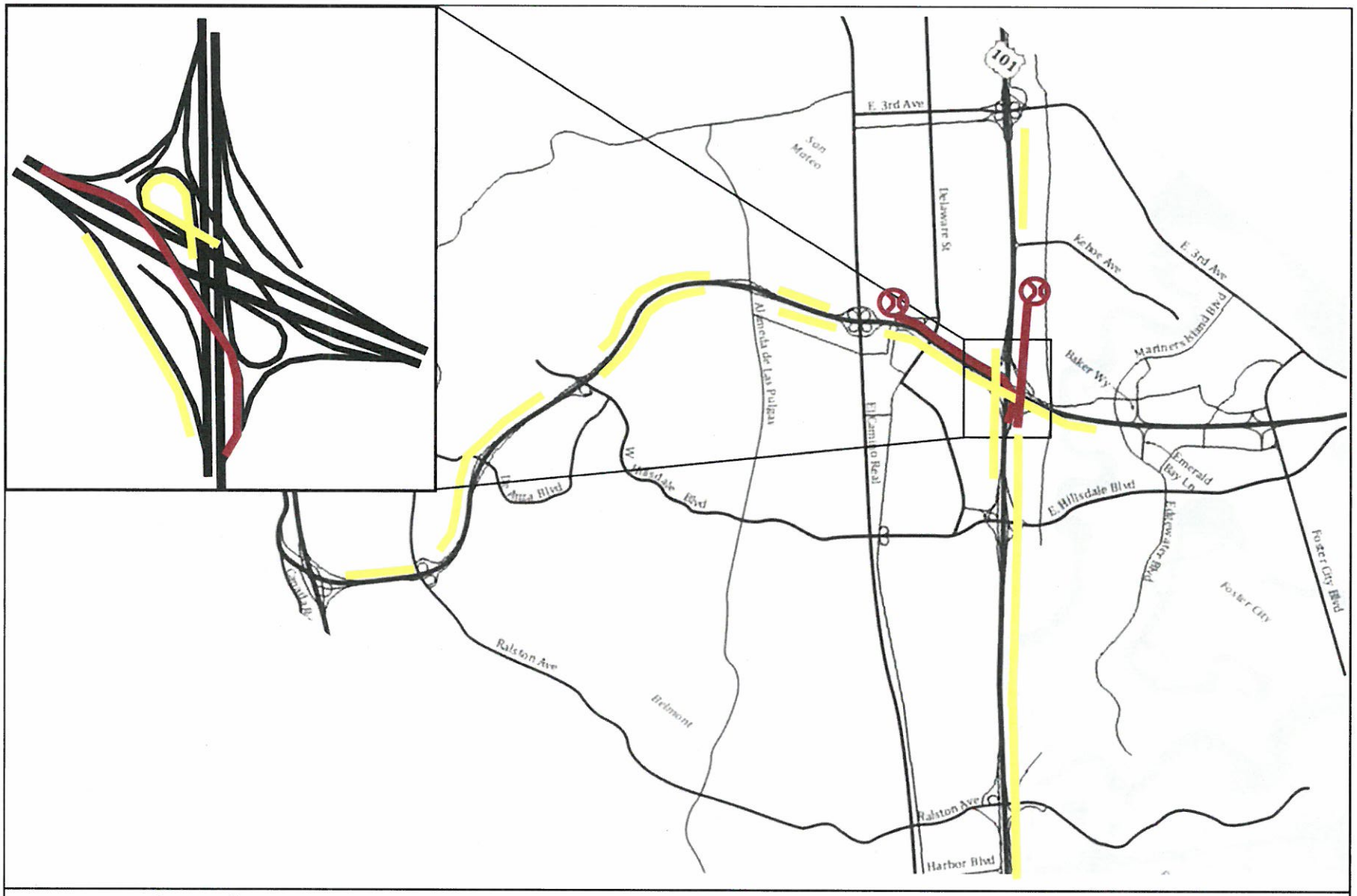
US101/El Camino Real – The location of the controlling PM bottleneck in this area shifts depending on traffic conditions during the peak period. During parts of the peak, the bottleneck develops between the Delaware Street on-ramp and the off-ramp to northbound El Camino Real. At other times during the PM peak period, the bottleneck develops between the US101 on-ramp and the off-ramp to Delaware Street. Queues from this bottleneck extend east on SR92 and onto the northbound US101-to-westbound SR92 connector ramp.

Legend

- Primary Bottleneck
- Probable Secondary Bottleneck
- Slowing
- Queuing

Not to Scale

Exhibit 4:
Baseline AM Peak Period Congestion



Legend

- Primary Bottleneck
- Secondary Bottleneck
- Slowing
- Queuing

Not to Scale

Exhibit 5:
Baseline PM Peak Period Congestion

Chapter 5
Capital Projects Development

5. CAPITAL PROJECTS DEVELOPMENT

A number of relatively large-scale "Capital Projects" were suggested by stakeholders to address the operational needs identified for the US101/SR92 interchange and provide a starting point for comparative evaluation of effectiveness and costs. These initial Capital Projects were developed as scenarios and qualitatively screened for feasibility and effectiveness in addressing the traffic issues. The most promising projects were retained for more detailed evaluation.

SCENARIO DEFINITIONS

The capital projects identified for initial screening are listed below:

Scenario A: Auxiliary lane connectors at US101/3rd Avenue (northbound) and at US101/Hillsdale Boulevard (southbound)

Scenario B: Lane restriping at two locations on SR92 and US101 connectors

Scenario C: Additional SR92 auxiliary lanes between US101 and I-280

Scenario D: El Camino Real / Delaware Street / RR crossing modifications

Scenario E: A westbound SR92-to-southbound US101 flyover connector

Scenario F: Northbound and southbound US101 ramp braiding between Hillsdale Boulevard and SR92

Scenario G: Remainder of "TY Lin concept" package (See Appendix B) not already included in Scenario E and Scenario F

Scenario A

This project concept involves extending the existing auxiliary lane that approaches an interchange through to the other side of the interchange, effectively converting the two nearby auxiliary lanes into one through lane. This concept would be applied to northbound US101 at 3rd Avenue and southbound US101 at Hillsdale Boulevard. Exhibit 6 and Exhibit 7 show, schematically, what this concept would look like at the two locations.

Scenario B

Two locations were identified where restriping lanes to benefit traffic operations might be possible. Both locations are on SR92 – one is just east of US101 and one is just west of US101. At each of these locations, multiple ramps merge together, creating turbulence in the traffic flow. Exhibit 8 and Exhibit 9 show the re-striping concepts.

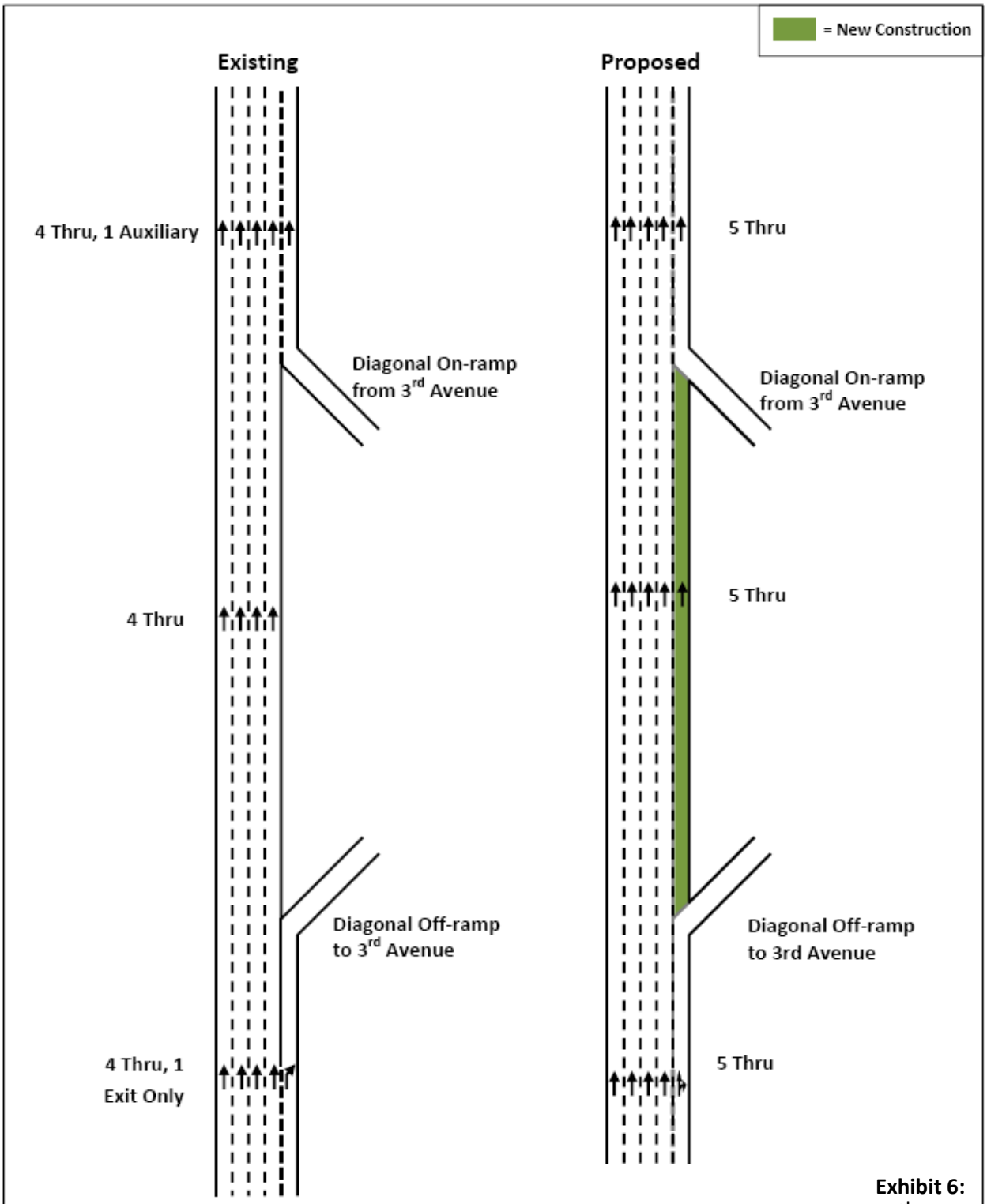


Exhibit 6:
Lane Diagram for Scenario A (3rd Ave.)

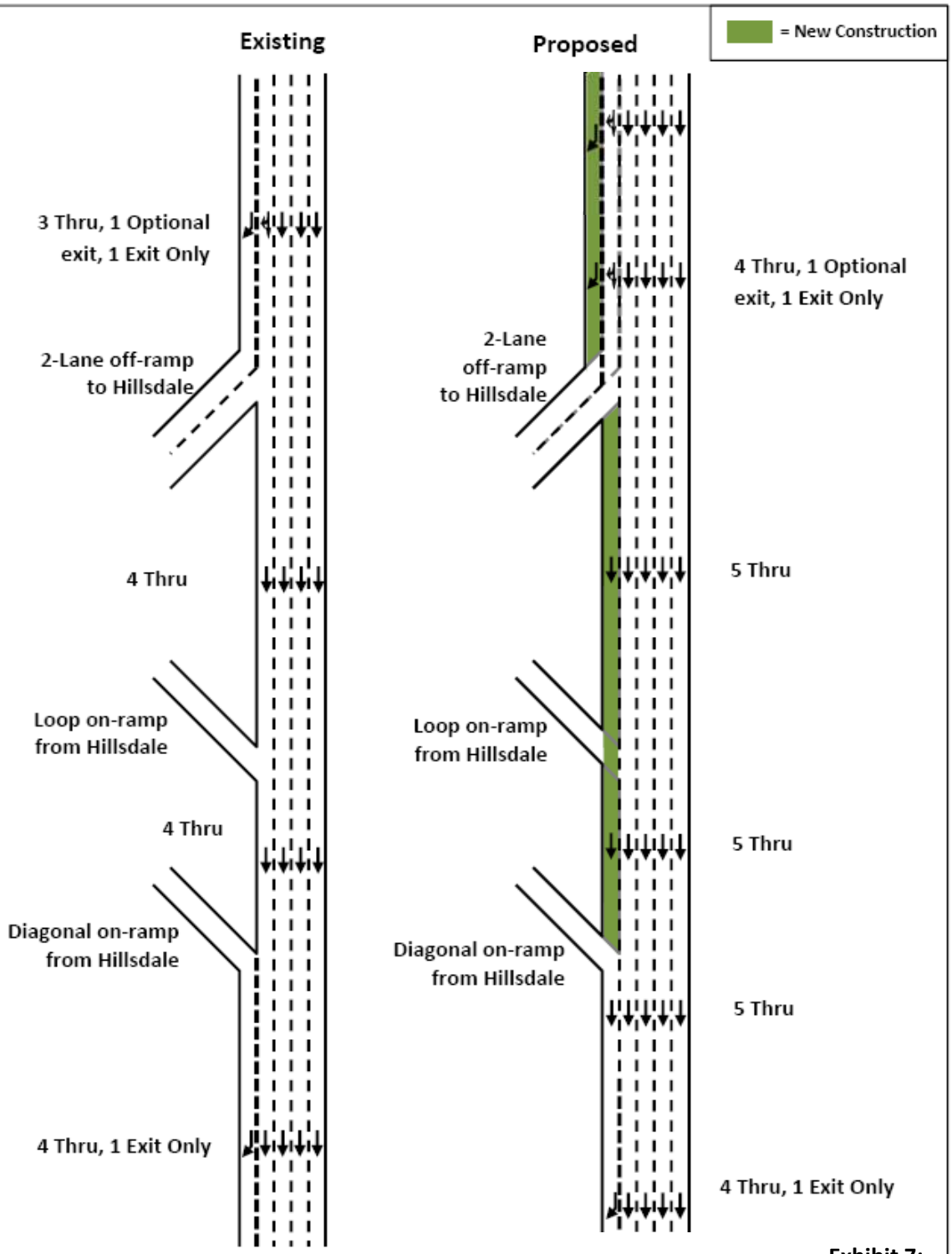


Exhibit 7:
Lane Diagram for Scenario A (Hillsdale)

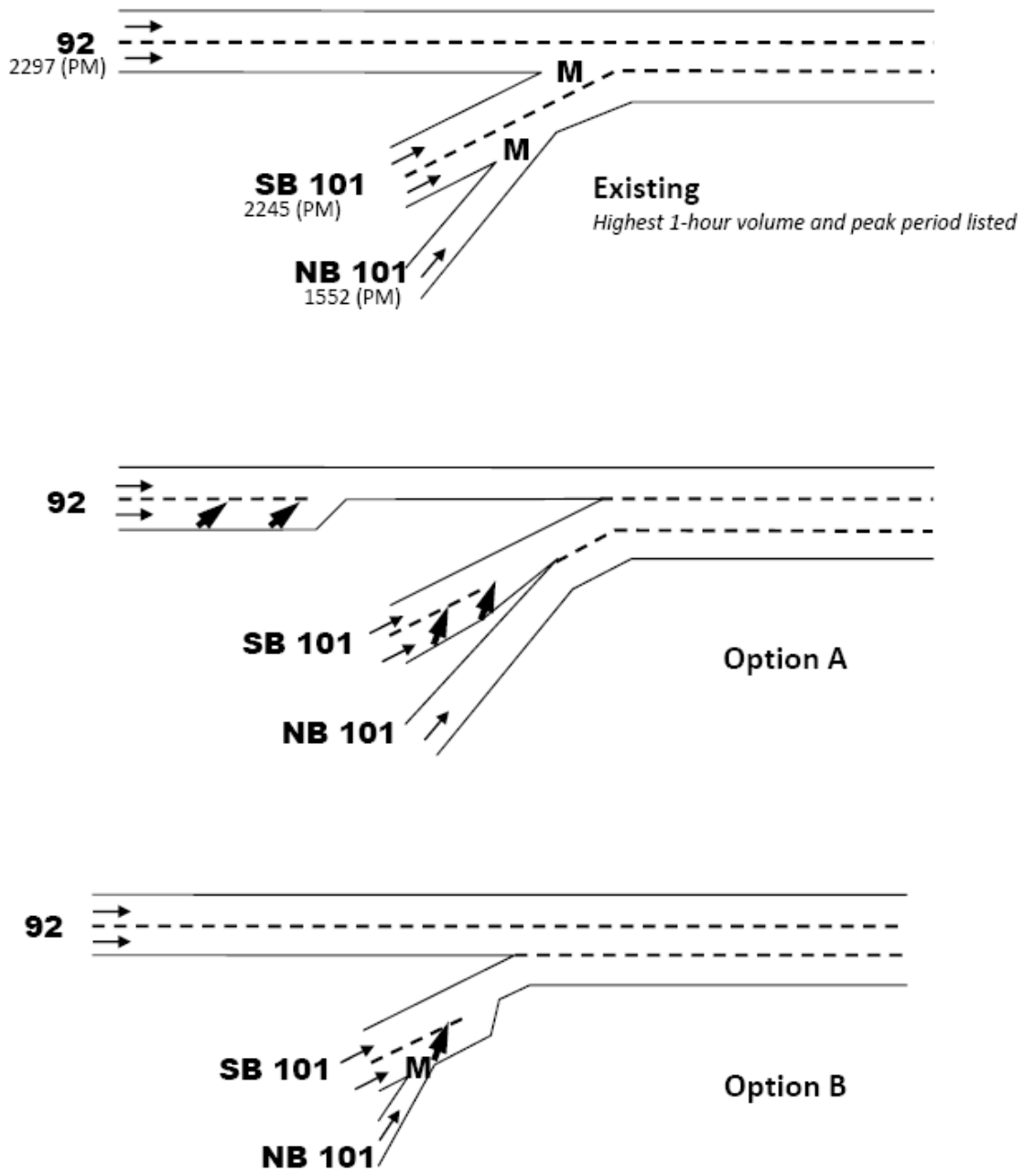
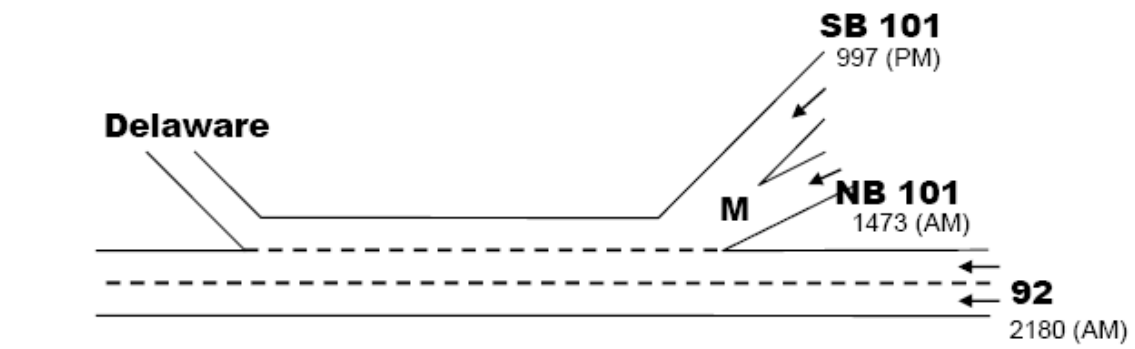
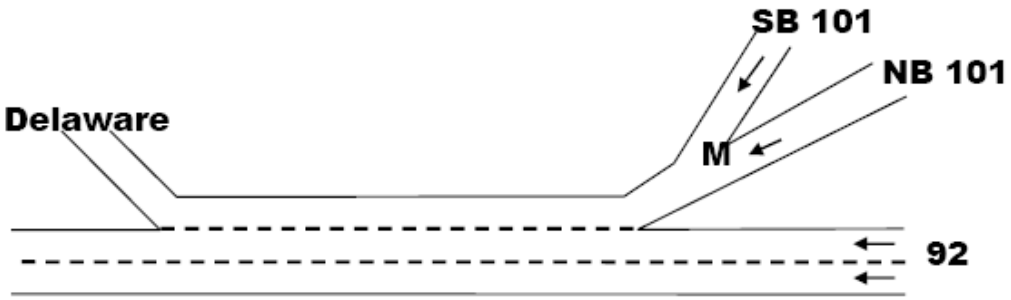


Exhibit 8:
Lane Restriping Options for Eastbound SR92, East of US101

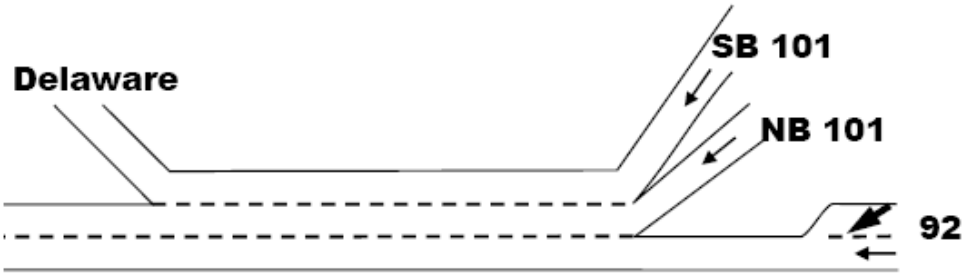


Existing

Highest 1-hour volume and peak period listed



Option A



Option B

Exhibit 9:
Lane Restriping Options for Westbound SR92, West of US101

For the location on eastbound SR92, the AM peak period volumes for each incoming roadway are all below approximately 1,650 vehicles per hour. This level of demand is generally accommodated within a single lane. The PM peak period volumes are higher. The southbound-to-eastbound connector ramp, which is currently two lanes, has a peak 1-hour demand volume of nearly 2,250 vehicles per hour, while the eastbound through volume on SR92 is nearly 2,300 vehicles per hour.

For the location on westbound SR92, the freeway-to-freeway connector ramps are both already only single-lane ramps, and the demand on them seems to be comfortably within single lane ramp capacities, with a maximum 1-hour demand of slightly less than 1,500 vehicles per hour. The westbound through traffic demand on SR92 is highest during the AM peak period, when it reaches a 1-hour maximum of slightly over 2,100 vehicles per hour.

Scenario C

The initial concept for Scenario C was to add a third through lane to the entire length of SR92 between US101 and I-280, a concept that was part of a 2001 PSR. However, opportunities to provide auxiliary lanes in strategic locations in lieu of an entire through lane were explored for this scenario instead. The six locations where auxiliary lanes were considered along SR92 are:

- Eastbound Direction
    - West Hillsdale Boulevard to Alameda de las Pulgas
    - Alameda de las Pulgas to El Camino Real
- Westbound Direction
    - Delaware Street to El Camino Real
    - El Camino Real to Alameda de las Pulgas
    - Alameda de las Pulgas to West Hillsdale Boulevard
    - West Hillsdale Boulevard to DeAnza

Scenario D

This concept involves constructing new and modified railroad crossings to reduce the traffic demand on SR92, along with closure of the westbound SR92 on-ramp from Delaware Street and the eastbound SR92 off-ramp to Delaware Street. Additionally, this scenario includes the conversion of the SR92/El Camino Real interchange to a partial cloverleaf interchange.

Scenarios E, F, and G

These concepts were identified as part of what has been referred to as the “TY Lin Concept.” That concept includes several major modifications to the US101/SR92 and US101/Hillsdale Boulevard interchanges – conceptual drawings of those modifications are included in Appendix B.

- Scenario E includes the westbound-to-southbound flyover ramp, as well as the relocation of the on-ramp from Fashion Island Boulevard (See “Sheet A” of the drawings)
- Scenario F includes the ramp-braiding-like modifications at the Hillsdale Boulevard interchange that are designed to reduce the amount of weaving traffic. (See “Sheet C” of the drawings)

- Scenario G includes the remainder of the elements in the TY Lin Concept. These include an eastbound SR92 to northbound US101 flyover connector ramp (Sheet A); widening on eastbound SR92, just east of US101, to accommodate an auxiliary lane (Sheet B); and additional ramp braiding of the eastbound SR92 to southbound US101 connection beyond what is needed to accommodate the Scenario E flyover (Sheets A and C).

EFFECTIVENESS OF PROJECT SCENARIOS

Exhibit 10 shows a visual representation of the qualitative assessment of the project scenarios. Green circles represent a favorable assessment, yellow circles a neutral or moderate assessment, and red circles an "unfavorable" assessment. An empty circle indicates that an assessment is not applicable. In some cases, there are two dots in a single square – this indicates a mixed result, such as for Scenario F which has two potentially independent components.

The upper half of the exhibit provides a (qualitative) assessment of 1) the operational feasibility of the project (i.e., is it feasible to operate the roadway system as defined by the scenario); and 2) the anticipated effectiveness of the scenario to address the traffic issue at hand. The lower half of the exhibit addresses characteristics of the project that are unrelated to the project's operational effectiveness – items such as cost, environmental impact, etc.

The reason for the dual-purpose exhibit is to recognize that a project could be relatively low-cost and/or low-impact (a favorable assessment), but perhaps not address the traffic issue for which it was identified. However, it is important to recognize that these assessments are qualitative in nature, and quantitative operations and cost analyses will provide additional information to aid in prioritizing improvements.

Scenario A has mostly favorable assessments for both the cost/environmental categories and for the feasibility/effectiveness categories. The reason for the neutral results in the effectiveness boxes of the exhibit is that releasing the applicable bottlenecks will likely move those bottlenecks elsewhere, perhaps even outside of this study area.

Scenario B appears very favorable in terms of environmental impacts and costs, but only neutral in its operational effectiveness. The reason for the neutral feasibility/effectiveness is that it is not clear if managing the number of lanes is a practical solution. If not practical, the effectiveness of reducing lanes at certain locations may be reduced. If it is decided to reduce lanes at certain locations and times, such reductions may cause queuing that does not exist under the Baseline scenario.

Scenario C has neutral results for impacts and costs, but does addresses a key traffic issue.

Scenario D has a split result (neutral and unfavorable) because it is not yet clear the extent to which neighborhoods might be impacted. The concept was designed to minimize such impacts by providing multiple new and improved crossings so that traffic would not be focused at one location. Further studies may help in identifying such impacts. This scenario also has significant construction and right-of-

way costs because of new bridges to be built and connected (to existing local surface streets). Preliminary analysis shows that there would be improvements to traffic flow on SR92, but that it might not be significant.

Exhibit 10: Qualitative Assessment Summary

Category			Scenario						
			A: Auxiliary Lane Connectors	B: Lane Restriping	C: SR 92 Auxiliary Lanes	D: Railroad Crossings	E: WB to SB Flyover	F: Ramp Braiding	G: Remainder of "TY Lin Concept"
Traffic Issue		**Does it Address the Issue?**							
Most Severe	NB 101, 3rd	Traffic Ops Feasibility	🟢	○	○	○	○	○	○
		Traffic Ops Effectiveness	🟡	○	○	○	○	○	○
↑	NB 101, Hillsdale Boulevard-92	Traffic Ops Feasibility	🟢	🟡	○	🟢	○	🟢	○
		Traffic Ops Effectiveness	🟡	🟡	○	🟢	○	🟢	○
	SB 101, Hillsdale Boulevard	Traffic Ops Feasibility	🟢	○	○	○	🟡	🟢	○
		Traffic Ops Effectiveness	🟢	○	○	○	🔴	🟢	○
	NB 101, 92-Kehoe	Traffic Ops Feasibility	○	○	○	○	○	○	🟡
↓		Traffic Ops Effectiveness	○	○	○	○	○	○	🔴
Least Severe	WB 92, Delaware-El Camino Real	Traffic Ops Feasibility	○	🟡	🟢	🟢	○	○	○
		Traffic Ops Effectiveness	○	🟡	🟢	🟡	○	○	○
Environmental Impacts (overall)			🟢	🟢	🟡	🟡 🔴	🟡	🟡 🔴	🔴
Cost (overall)			🟡	🟢	🟡	🔴	🔴	🔴	🔴
R/W (enviro., i.e., impact to residents, businesses)			🟢	🟢	🟡	🔴	🔴	🔴	🔴
R/W (cost)			🟢	🟢	🟡	🔴	🔴	🟡 🔴	🔴
Engineering (design exceptions, etc.)			🟡	🟡 🔴	🟡	🟢	🟢	🟢	🟢
Engineering Compatibility (with other projects)			🟢	🟢	🟢	🟢	🟡	🟢	🟢

Scenario E would have both high costs and impacts, and neutral or unfavorable effectiveness assessments. The reason for the unfavorable assessment for operational effectiveness is that addition of this flyover connector would increase traffic on southbound US101, which would increase congestion there. The high costs are related to both the construction of a large flyover ramp and that existing residences would likely have to be purchased.

Scenario F would have favorable impacts on traffic flow. However, for the southbound direction, construction would require removal of existing development, which would be very costly. It appears

that the northbound direction modifications could be constructed with minimal impact to residences, thus the mixed assessment in Exhibit 10. Either half of the scenario would involve relatively high construction costs.

Scenario G would involve high construction and right-of-way costs and would not provide favorable impacts to traffic operations at the key traffic issue locations.

PROJECT PACKAGES

Based on the qualitative screening assessment described above, it did not appear to be constructive to include Scenarios E, or G in the quantitative operations and cost analyses. As noted above, Scenarios E and G would require large costs and cause large impacts for, at best, neutral operational effectiveness. Likewise, Scenario B did not show favorable effectiveness in addressing the identified traffic issues. Ultimately stakeholders agreed to drop Scenarios B, E, and G from further consideration, and elements of the other scenarios were combined into “packages” and evaluated quantitatively. The operations analysis of these packages is documented in the next chapter.

Chapter 6
Capital Projects Operations Analysis

6. CAPITAL PROJECTS OPERATIONS ANALYSIS

CAPITAL PROJECTS DESCRIPTION

Three project packages, comprised of components from the project scenarios described in the previous chapter, were evaluated in order to compare conditions to the Baseline. The elements of Package 1 and Package 2 were each built upon the Baseline network. Package 3 was built onto the Package 1 network.

Package 1 – US101 Auxiliary Lane Connectors

This package would consist of extending existing auxiliary lanes on US101 through two of the interchanges, creating an additional through lane. Specifically, this would be done for northbound US101 at 3rd Avenue and for southbound US101 at Hillsdale Boulevard, creating a 5-lane cross-section under the overcrossing at each location. Exhibit 11 shows a schematic diagram of both locations. At one point during the phase of this study when these projects were being defined, the modifications at each location were to include conversion of the left-most mainline lane into an HOV lane. However, once more detailed project definitions began, it was noted that additional auxiliary lane connectors would have to be included at each interchange to accommodate the HOV lane. Since the primary purpose of this project alternative was to test the concept of removing the bottleneck at each location, it was agreed among the project stakeholders to leave the left-most lane as a mixed flow lane.

Package 2 – New SR92 Auxiliary Lanes

This package includes three components. First, there would be new auxiliary lanes on both eastbound and westbound SR92. The new eastbound auxiliary lane would be located between the merge of the connector ramps coming from US101 to the exit to Edgewater Boulevard. The new westbound auxiliary lane would be an extension of the existing auxiliary lane from the off-ramp to Delaware Street to the off-ramp to El Camino Real. Second, the westbound SR92 on-ramp from Delaware Street and the eastbound SR92 off-ramp to Delaware Street would be eliminated. Exhibit 12 shows the lane configurations for this project alternative in the immediate vicinity of US101. Third, the SR92/El Camino Real interchange would be converted to a standard partial-cloverleaf interchange, eliminating the loop off-ramps from SR92 and adding signalized intersections at the diagonal off-ramp terminals.

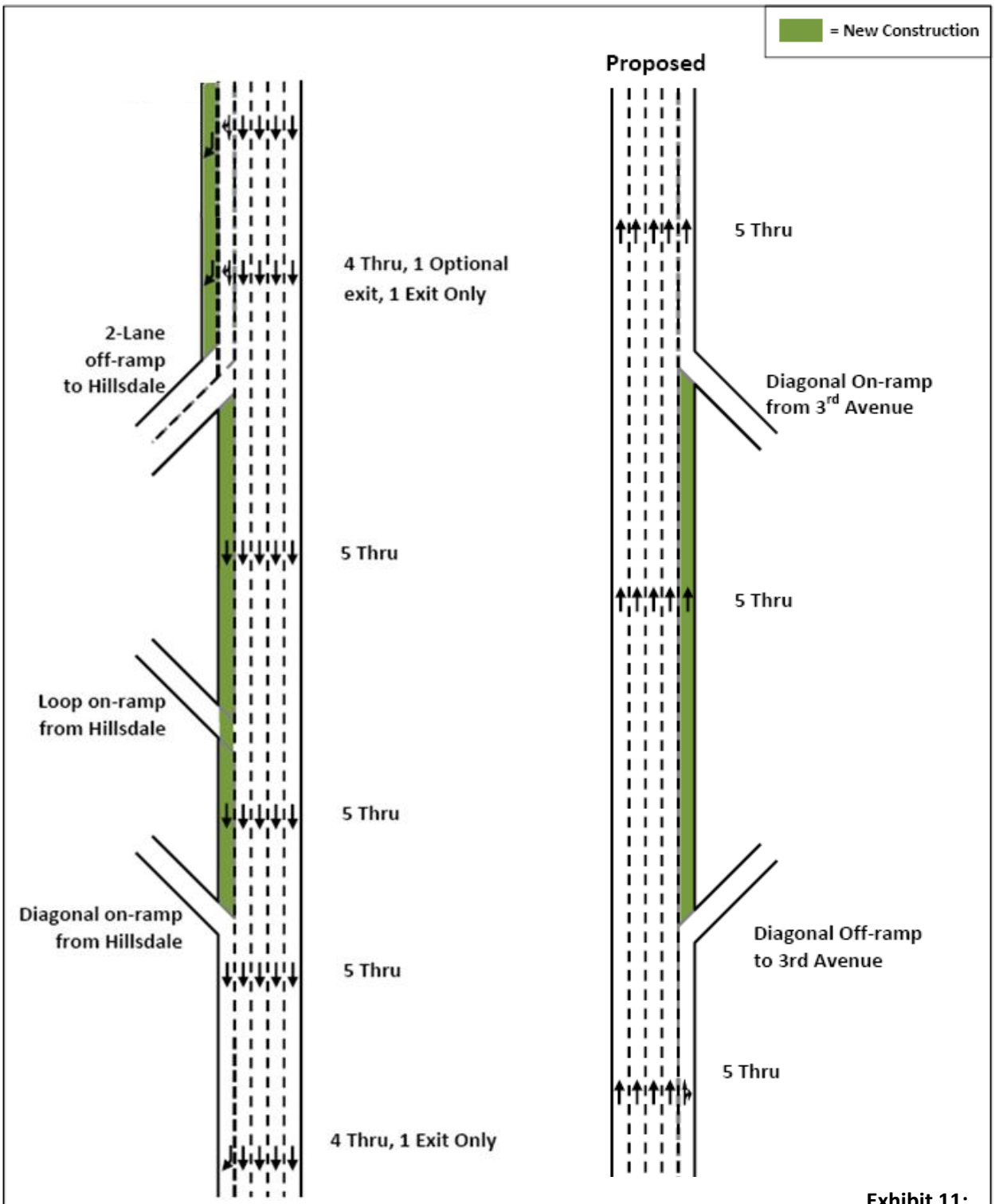


Exhibit 11:
Lane Diagram for Capital Projects Package 1

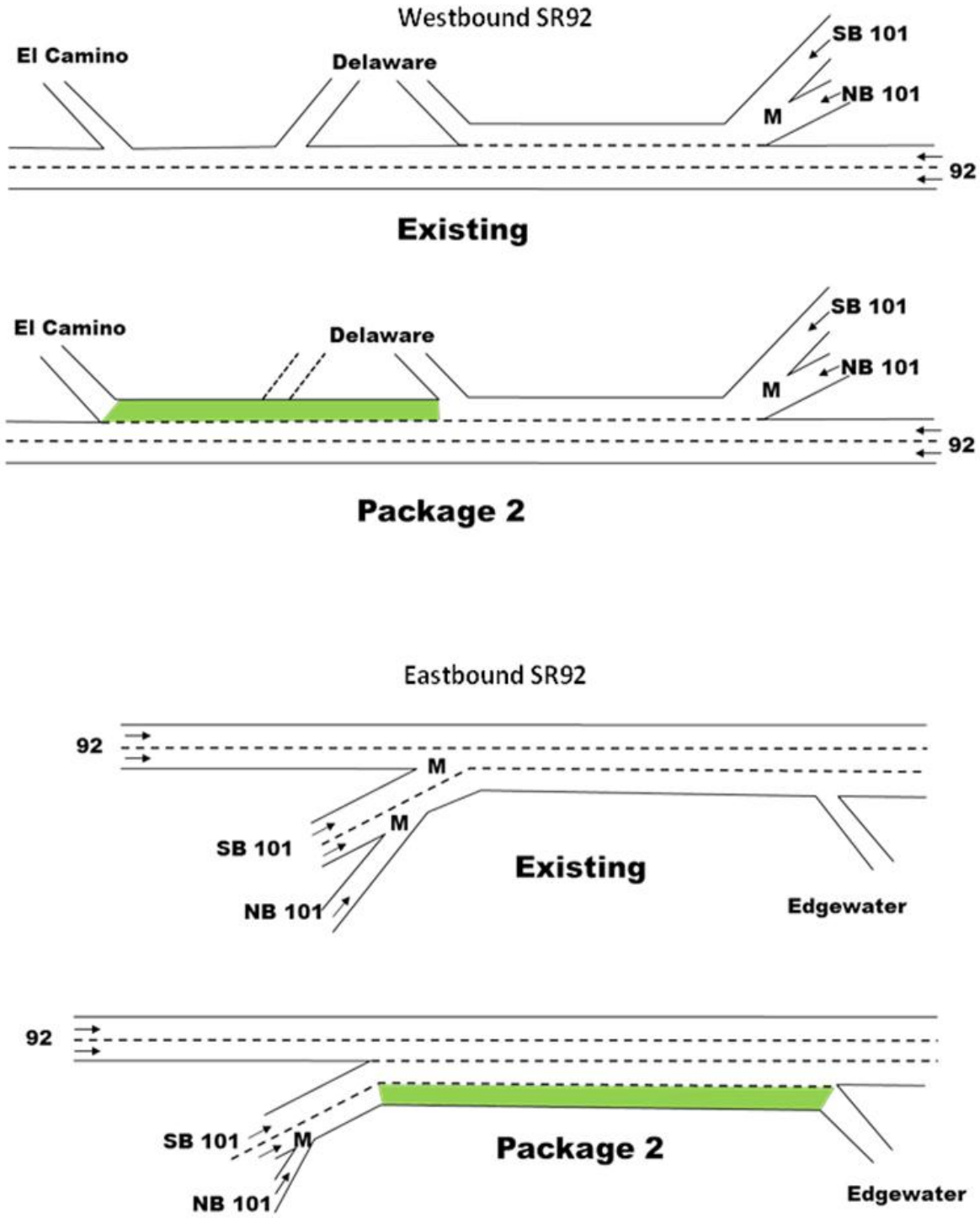


Exhibit 12:
Existing and Package 2 Configurations

Package 3 – US101/SR92-Hillsdale Boulevard Braided Ramps

This package would include construction of braided ramp systems along US101 between SR92 and Hillsdale Boulevard consistent with past studies that created basic geometry known as the "TYLin Concept." Exhibit 13 shows a schematic diagram of the part of this concept that comprises Package 3. Package 3 was developed as an additional enhancement to Package 1 and includes all the Package 1 elements. The elements of Package 3 not described under Package 1 are listed below.

Modifications related to southbound US101

- New flyover ramp serving westbound SR92 to southbound US101
- Relocation of on-ramp from Fashion Island Boulevard to existing location of westbound-to-southbound loop ramp
- Relocation of off-ramp to Hillsdale Boulevard to location just south (downstream) of new Fashion Island Boulevard on-ramp and new collector-distributor roadway from there to Hillsdale Boulevard
- Slip ramp connecting new westbound-to-southbound flyover to new collector-distributor roadway
- Slip ramp connecting eastbound-to-southbound diagonal connector ramp to new collector-distributor roadway
- Conversion of Hillsdale Boulevard interchange to diamond configuration (so elimination of loop ramp)

Modifications related to northbound US101

- Relocation of exit leading to SR92 connector ramps to same location as existing Hillsdale Boulevard off-ramp
- New collector-distributor roadway from combined off-ramp to SR92 connector ramps
- Conversion of Hillsdale Boulevard interchange to diamond configuration (so elimination of loop ramp)
- Relocation and elevation of diagonal on-ramp from Hillsdale Boulevard (to pass above new collector-distributor roadway)
- Slip ramp connecting Hillsdale Boulevard on-ramp to collector-distributor roadway

ANALYSIS METHODOLOGY

Most of the analysis was conducted using the VISSIM microsimulation model because the proposed modifications and their impacts on congestion are located within the limits of that model. For each analysis package and for each peak period, the model was run ten times with a different random number seed, and the output results were averaged.

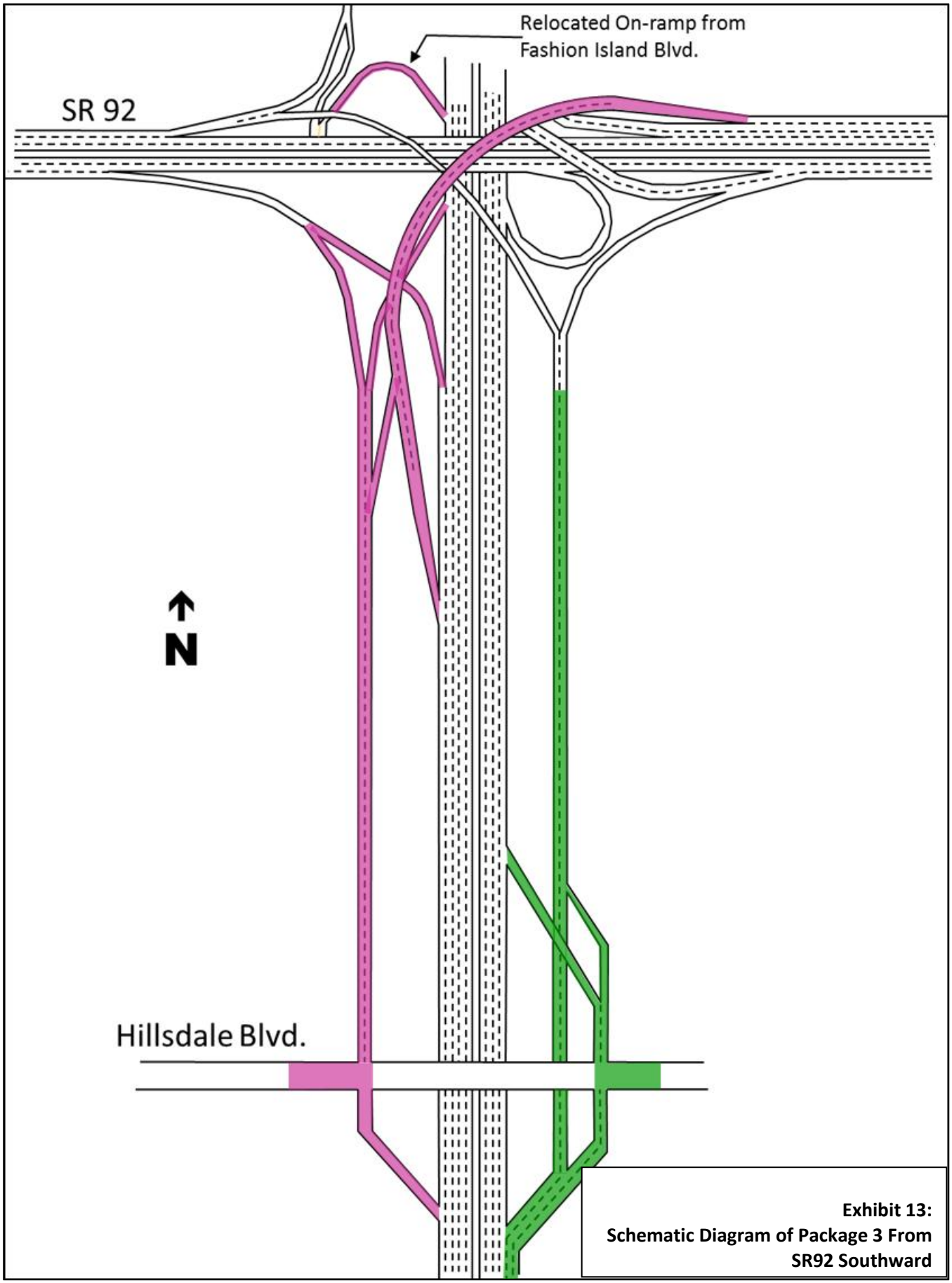


Exhibit 13:
Schematic Diagram of Package 3 From SR92 Southward

The FREQ model developed for this study covers eastbound and westbound SR92 west of El Camino Real, where no modifications were proposed. This model was to be used if significant changes in volumes occurred at the boundary between the VISSIM model area and the FREQ model area as a result of releasing traffic at upstream bottlenecks. However, when the simulated volumes from the VISSIM model were checked at this location, it was found that the throughput volumes were very close to the Baseline case, so no new FREQ analysis was conducted. Exhibit 14 shows a comparison of volumes on westbound SR92, west of El Camino Real. The small variation in traffic volumes shown in the table demonstrates that running the FREQ model for the Capital Projects packages was not necessary.

Exhibit 14:
Throughput Volume Comparison, Packages 1, 2, and 3 versus Baseline
Westbound SR92, West of El Camino Real

	AM Peak Period Time Slices				AM	PM Peak Period Time Slices					PM
	1	2	3	4	Total	1	2	3	4	5	Total
Baseline	1488	3284	3614	2934	11,320	2811	3397	3963	3719	2603	16,493
Package 1	1496	3302	3618	2923	11,339	2829	3401	3970	3734	2582	16,515
Package 2	1495	3271	3679	2879	11,324	2797	3410	4012	3602	2584	16,405
Package 3	1490	3280	3624	2886	11,280	2825	3397	3981	3713	2575	16,491
Largest Difference	+0.5%	-0.5%	+1.8%	-1.5%	-0.3%	+0.6%	+0.4%	+1.2%	-3.1%	-1.1%	-0.5%

The Synchro model developed to evaluate operations along El Camino Real was also used in the evaluation of Package 2 because that package includes elimination of two of the ramps at the Delaware interchange. That modification would require traffic to reroute through the El Camino Real interchange in order to travel between SR92 and the surface streets near Delaware. Additionally, Synchro was used to determine what lane configurations would be minimally acceptable (Level of Service D or better) for the conversion of the Hillsdale interchange to a diamond configuration under Package 3.

The primary quantitative outputs for evaluating components of the freeway system are speeds and travel time. From the VISSIM speed outputs, speed contour diagrams were created for the major traffic movements. Travel times are documented in tables that include comparisons to the applicable baseline. Twelve travel patterns are included in each table – northbound-to-westbound, northbound through, northbound-to-eastbound, etc. In addition to these strictly quantitative outputs, diagrams showing bottlenecks, queuing, and “slowing” are also presented.

The primary outputs for evaluating surface street intersections are delay and Level of Service. The goal for intersection operations was to find configurations that led to Level of Service D or better. At some specific locations (particularly approaches to intersections from off-ramps), queuing outputs were reviewed to determine if queues would back up onto the freeway mainline.

Other performance measures more related to overall network performance, such as person-throughput and air quality, are also collected from the VISSIM model.

Once the performance measures were extracted from the analysis models, Package 1 and Package 2 were each compared to the Baseline. Each of these packages could conceivably be constructed independently because of their physical locations on US101 and SR92, respectively. Also, it was believed (prior to starting the analysis) that neither package would have significant effects on the other freeway (e.g., Package 1 would not have a significant effect on SR92). Package 3 was compared to both Package 1 and to the Baseline because it could either be constructed as a single project or after Package 1 was already in place.

TRAFFIC OPERATIONS ANALYSIS

Specific key model inputs for each analysis package are listed below, as applicable.

Package 1 – US101 Auxiliary Lane Connectors

Geometry

This analysis package would extend the northbound US101 auxiliary lane that currently exits at 3rd Avenue through the interchange to connect with the auxiliary lane that begins at the 3rd Avenue on-ramp. It would include a similar modification for southbound US101 at Hillsdale Boulevard.

Controls

There would be no changes to intersection or ramp meter controls compared to the Baseline.

Volumes

There would be no changes to volumes from the Baseline.

Package 2 – New SR92 Auxiliary Lanes

Geometry

This package would increase the number of lanes from three to four in the eastbound direction of SR92 between US101 and the off-ramp to Edgewater Boulevard. The connector ramps from northbound and southbound US101 would merge into two lanes prior to joining eastbound SR92. Instead of the left lane of the connector ramps merging with the right lane of SR92, however, there would no longer be a merge. This would create additional weaving movements, as vehicles from eastbound SR92 wishing to exit at Edgewater would have to make two lane changes (instead of one) in order to do so. The weaving length for eastbound SR92 between the US101 connector ramps and the Edgewater off-ramp would remain approximately the same as existing (1,600 feet). Readers can refer back to Exhibit 12 for a schematic diagram of the proposed lane configuration.

Package 2 would also increase the number of lanes from two to three in the westbound direction of SR92 between the off-ramp to Delaware Street to the off-ramp to El Camino Real. Two ramps would be

eliminated under this package: the westbound SR92 on-ramp from Delaware Street and the eastbound SR92 off-ramp to Delaware Street. This package also assumes that new railroad crossings would be constructed to serve local traffic that needs to cross the tracks. The SR92/El Camino Real interchange would be converted to a partial cloverleaf interchange, with the westbound-to-southbound and eastbound-to-northbound loop ramps eliminated.

Controls

New traffic signals would be included at the ramp terminal intersections at the SR92/El Camino Real interchange. There would be no changes to ramp meter controls compared to the Baseline, except that the ramp meter for the westbound SR92 on-ramp from Delaware Street would be eliminated along with the ramp itself.

Volumes

As documented in a previous memorandum for a version of this package, traffic volumes would have to be re-routed to account for the two ramps that would be eliminated under this package. Exhibit 15 and Exhibit 16 show the volumes used for this analysis, while details of the volume re-routing are included in Appendix C.

Package 3 – US101/SR92-Hillsdale Boulevard Braided Ramps

Geometry

The westbound-to-southbound flyover ramp would depart westbound SR92 as a single lane, but would immediately widen to two lanes until just prior to joining southbound US101. All other ramps would be single-lane ramps. The collector-distributor roadways would both be two lanes.

The relocated southbound on-ramp from Fashion Island Boulevard would be located at the same place as the existing loop ramp. The off-ramp to Hillsdale Boulevard would be located approximately 1,000 feet to the south. The on-ramp from eastbound SR92 would remain in the same location, and the on-ramp from the new flyover ramp would be located approximately 1,000 feet south of that.

The northbound ramps are as described above under the Package Descriptions section and Exhibit 13 – there are no critical geometric dimensions that need to be included in this section.

Controls

The ramp terminal intersections at the US101/Hillsdale Boulevard interchange would be modified to accommodate a diamond interchange. The most significant change would be the addition of signalized left-turns onto the diagonal on-ramps because of the elimination of the loop ramps.

Ramp metering would remain the same as for the Baseline except for elimination of the meters on the Hillsdale Boulevard loop ramps being eliminated under this package.

Volumes

No changes to volumes were made for this package, except to relocate them to appropriate intersection turning movements or ramps.

TRAFFIC OPERATIONS ANALYSIS RESULTS

Package 1 – US101 Auxiliary Lane Connectors

This package would eliminate the existing controlling bottlenecks on northbound US101 (at 3rd Avenue) and on southbound US101 (at Hillsdale Boulevard), which occur during the AM peak period. Traffic speeds would increase, as the queuing and slowing approaching those bottleneck locations would almost completely disappear. However, after implementation of Package 1, a formerly hidden bottleneck on northbound US101 would be revealed during the AM peak period between the westbound SR92 and Fashion Island Boulevard on-ramp and the Kehoe Avenue off-ramp. This bottleneck would cause queuing during the AM peak period that would extend to the same location as under Baseline conditions – to the section between Ralston Avenue and Hillsdale Boulevard.

The bottleneck (noted above) that becomes the controlling bottleneck on northbound US101 during the AM peak period is already the controlling bottleneck during the PM peak period. Package 1 would improve operating speeds on northbound US101 during the PM peak period, but would not eliminate the controlling bottleneck.

The northbound (i.e., northbound US101 from Ralston Avenue to 3rd Avenue) travel time during the worst 1-hour time period (8AM-9AM) would decrease by approximately one minute (from 9½ to 8½ minutes, or about 10%). Similarly, the southbound travel time would decrease during the same time period by 4 minutes (from 8½ to 4½ minutes, or about 50%). While the southbound bottleneck would be eliminated, slowing would remain during the AM peak period where the connector ramp leading to eastbound and westbound SR92 diverges from US101, due to weaving maneuvers.

Congestion and slowing on SR92 is nearly the same as without the modifications included in this package in most locations, as expected – that is, there is still a PM peak period bottleneck in the westbound direction. Travel times are all within 3% of the Baseline condition.

Exhibit 17 and Exhibit 18 show the locations of bottlenecks, queuing, and slowing under Package 1 conditions. The speed contour diagrams and travel time comparison exhibits are included in Appendix D and Appendix E, while a detailed interpretation of the speed contour diagrams for this analysis package is also provided within Appendix D. Comparison exhibits (for AM and PM peak periods) showing all of the performance measures collected for the analysis of this package are included in Appendix F.

US101/SR92 Interchange Area Study

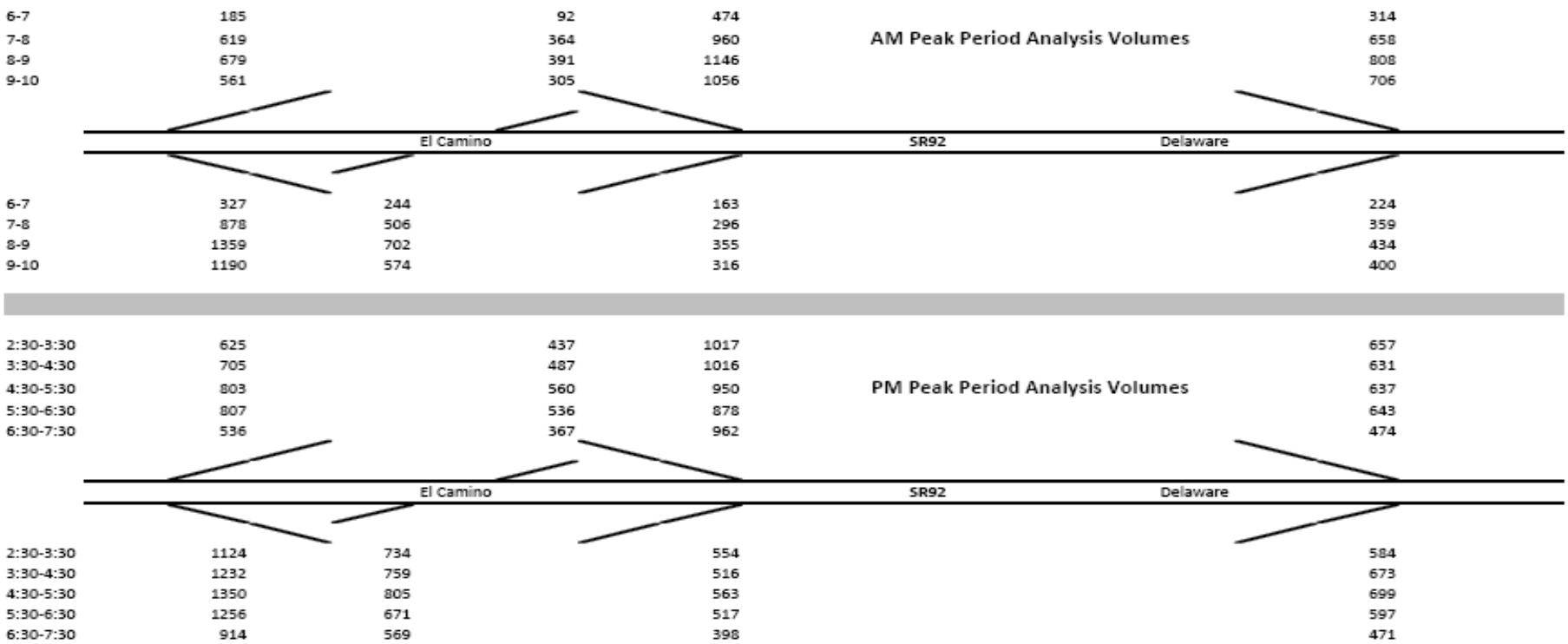
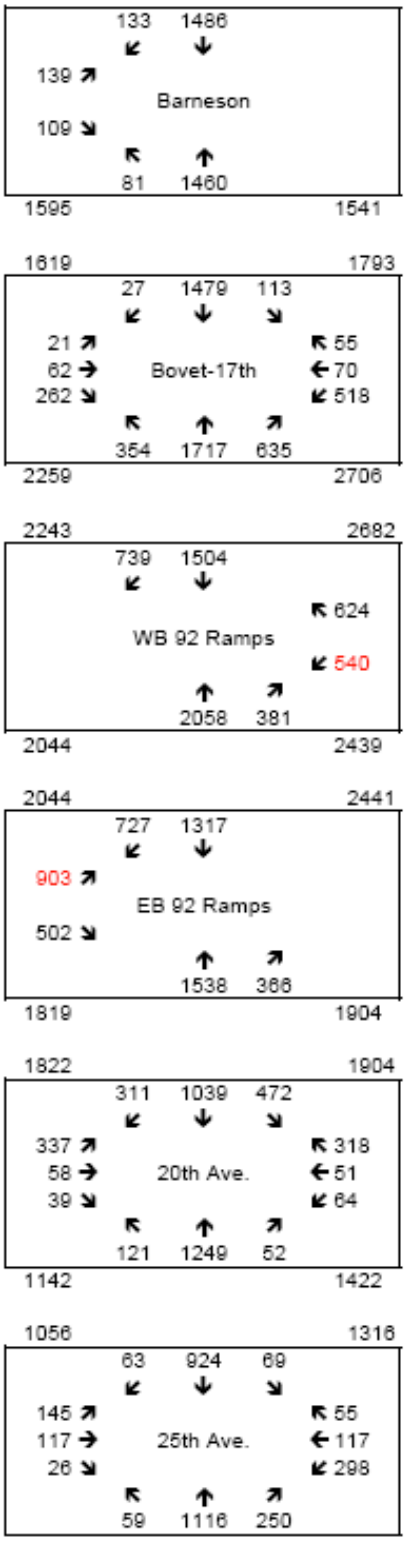


Exhibit 15:
Volumes for Capital Projects Package 2 Analysis

US101/SR92 Interchange Area Study

AM Peak Hour



PM Peak Hour

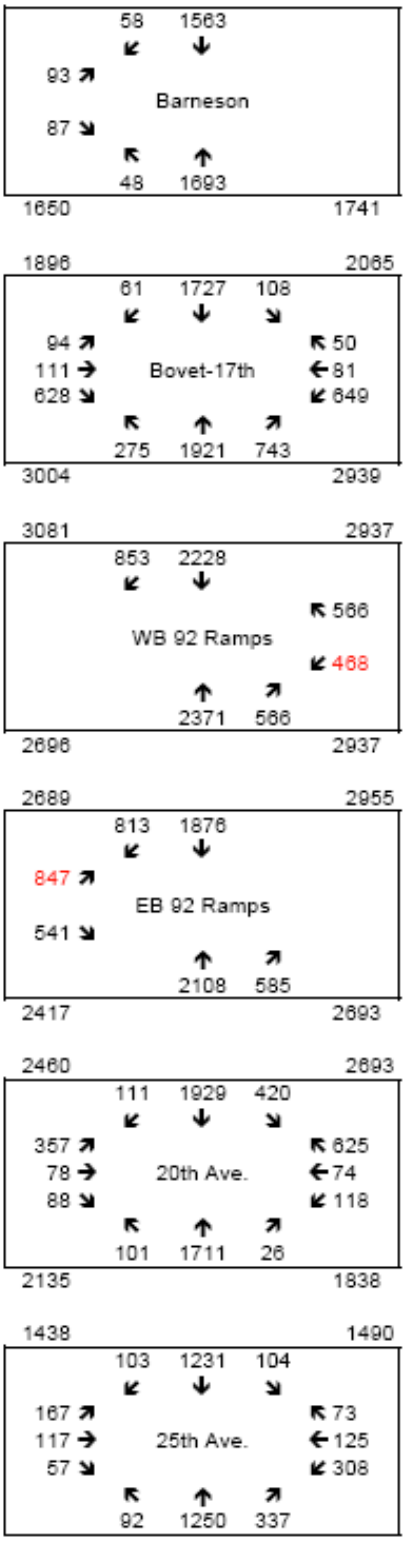


Exhibit 16:
Capital Projects Package 2 Analysis Volumes
AM and PM Peak Hour

Additional Discussion

One of the most important assumptions when defining this analysis package was that the left-most lanes on both northbound and southbound US101 would remain as mixed flow lanes. However, there are currently studies underway that would convert that lane to HOV usage, as long as auxiliary lanes such as those in Package 1 are added at interchanges on US101 to retain the same number of mixed flow lanes that exist today. Therefore, the success of Package 1 in reducing congestion in the study area must be viewed with the understanding that this conversion to HOV may eventually be recommended. This does not necessarily mean that evaluating Package 1 without converting the lanes to HOV is without merit – it is possible that other studies will conclude that the HOV demand is similar to a single lane of mixed flow demand. The reader should recognize that the purpose of this analysis was to determine if relieving these key bottlenecks on US101 would improve traffic or not. Other studies can be undertaken to determine if similar improvements plus conversion of the lane to HOV would have similar results.

It should be noted that this analysis does not analyze conditions beyond the study limits, and it is likely that bottlenecks may develop beyond these limits, perhaps even immediately beyond the limits. For example, the throughput for southbound US101 beyond Ralston Avenue may exceed the capacity of the mainline there (four lanes plus an auxiliary lane). The peak hour throughput volume under this package, however, is approximately 7,500 vehicles. On northbound US101, north of 3rd Avenue, the peak hour throughput volume is approximately 8,800 vehicles under this package. Both of these volume levels appear to be within the capacity of the mainline at those locations – the southbound capacity should be over 7,600 (4 lanes x 1,900 vphpl, plus an auxiliary lane), and the northbound capacity should be approximately 9,500 (5 x 1,900). Somewhere further beyond the study limits there is likely some location for which the demand would exceed the capacity. This would be the case for any study in which bottlenecks are eliminated – excess demand is then released downstream, and new bottlenecks will likely appear somewhere. However, overall corridor congestion would be reduced.

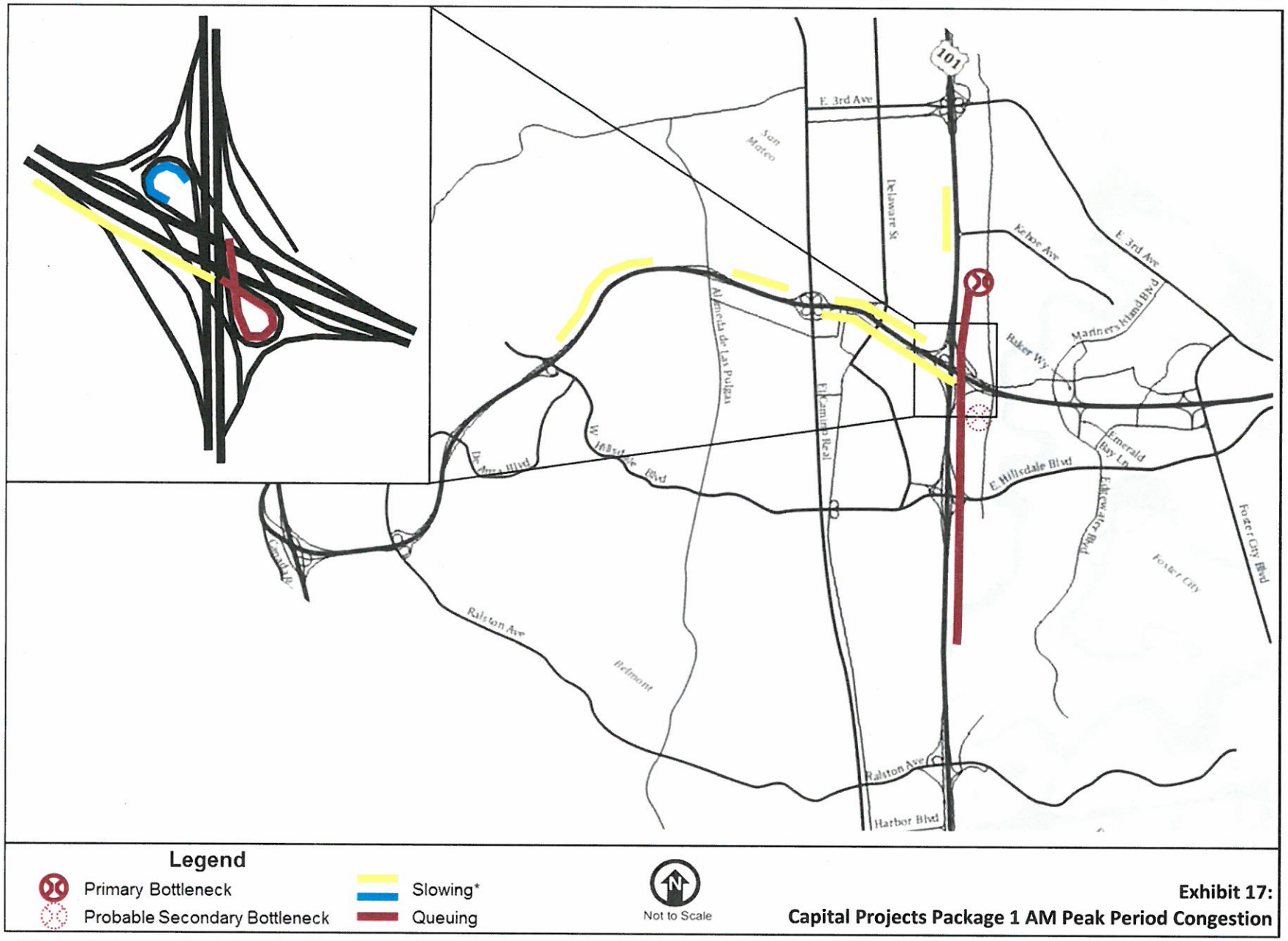
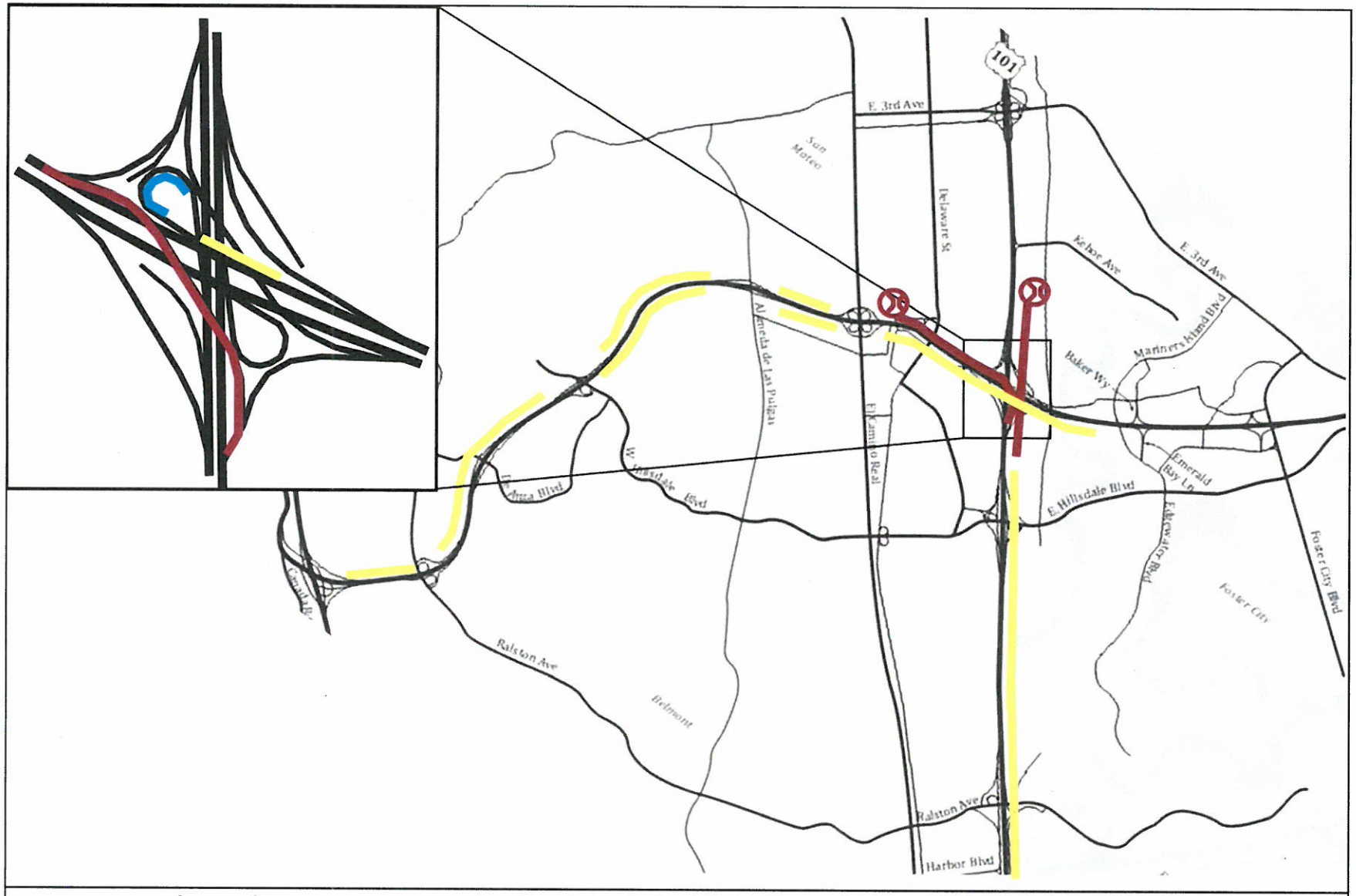


Exhibit 17:
Capital Projects Package 1 AM Peak Period Congestion

*Slowing due to congestion is shown in yellow; slowing due to geometry (e.g., a loop ramp) is shown in blue.



Legend

- Primary Bottleneck
- Secondary Bottleneck
- Slowing*
- Queuing

Not to Scale

Exhibit 18:
Capital Projects Package 1 PM Peak Period Congestion

*Slowing due to congestion is shown in yellow; slowing due to geometry (e.g., a loop ramp) is shown in blue.

Package 2 – New SR92 Auxiliary Lanes

The key result from Package 2 is that the PM peak period bottleneck on westbound SR92 at Delaware Street/El Camino Real (which shifts between two adjacent segments) would be eliminated. Speeds would be consistently in the mid-to-high 50s through the Delaware Street-El Camino Real area. Travel times would improve in the 5:30-6:30PM time period for both westbound through traffic and for southbound-to-westbound traffic by 14% (both travel patterns improve from about 5½ minutes to about 4½ minutes). Additionally, the changes in this package would improve the northbound-to-eastbound and northbound-to-westbound travel times by 30% and 44%, respectively, during the same hour (8 minutes to 5½ minutes and 12 minutes to 6½ minutes).

Package 2 would also reduce the eastbound slowing that occurs in the study area by improving traffic operating speeds from approximately the low to mid-40s to the mid-50s. The northbound and southbound congestion during the AM and PM peak periods would remain approximately the same as the Baseline – travel times are all within 7% of that scenario.

Exhibit 19 and Exhibit 20 show the bottlenecks and slowing for Package 2. The speed contour diagrams and travel time comparison exhibits are included in Appendix D and Appendix E, and a detailed interpretation of the speed contour diagrams for this analysis package is also provided within Appendix D. Comparison exhibits (for AM and PM peak periods) showing all of the performance measures collected for the analysis of this package are included in Appendix E.

Additional Discussion

Because of the traffic re-routing needed with the elimination of the two ramps (westbound on-ramp from Delaware Street, eastbound off-ramp to Delaware Street), two of the El Camino Real intersections would require significant modifications in order to function adequately. The El Camino Real/Bovet/17th Avenue intersection would require a second westbound left-turn lane, two separate northbound right-turn lanes, and sufficient lanes on El Camino Real and on 17th Avenue to receive the multiple turn lanes. The El Camino Real/20th Avenue intersection would require two westbound right-turn lanes, two southbound left-turn lanes, and sufficient receiving lanes on El Camino Real and on 20th Avenue to accommodate the multiple turn lanes. Synchro outputs are included in Appendix G.

There is one anomaly in the results that does not appear to be significant. The travel time for one travel path – Foster City Boulevard to 3rd Avenue (i.e., westbound-to-northbound) – would increase by 13% for one hour of the PM peak period. This increase is higher than the 10% threshold for the color coding on the travel time exhibits in Appendix E. However, in reviewing the model animation, there is no significant slowing resulting from implementation of Package 2.

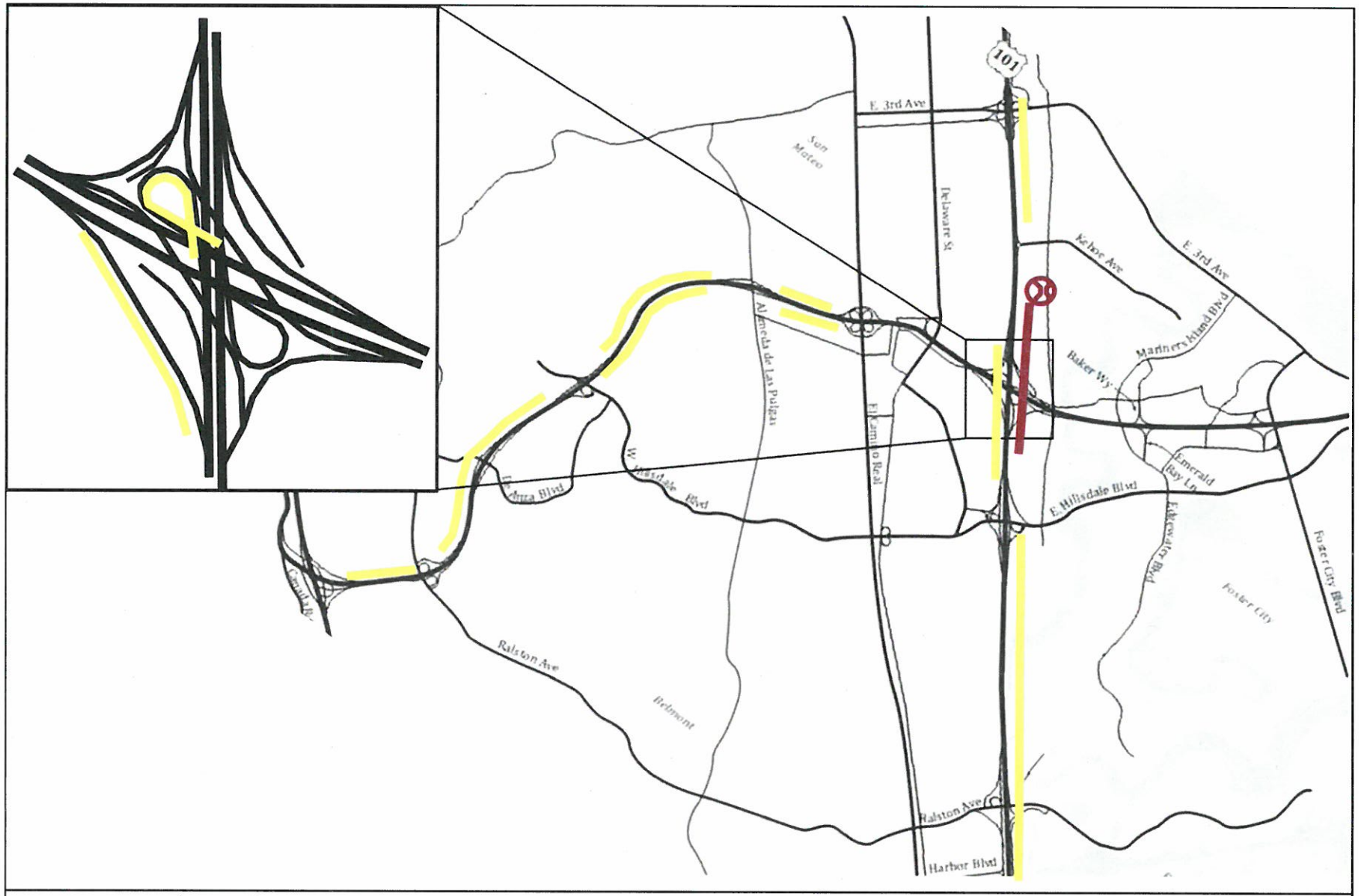
Legend

- Primary Bottleneck
- Probable Secondary Bottleneck
- Slowing*
- Queuing

Not to Scale

Exhibit 19:
Capital Projects Package 2 AM Peak Period Congestion

*Slowing due to congestion is shown in yellow; slowing due to geometry (e.g., a loop ramp) is shown in blue.



Legend

- Primary Bottleneck
- Secondary Bottleneck
- Slowing*
- Queuing

Not to Scale

Exhibit 20:
Capital Projects Package 2 PM Peak Period Congestion

*Slowing due to congestion is shown in yellow; slowing due to geometry (e.g., a loop ramp) is shown in blue.

Package 3 – US101/SR92-Hillsdale Boulevard Braided Ramps

Package 3 would provide some significant additional improvements compared to Package 1 alone. The incremental improvements of Package 3 (over Package 1) include the following:

- During the AM peak period, Package 3 would reduce queuing on northbound US101 south of SR92 caused by the bottleneck on northbound US101 between the westbound SR92 and Fashion Island Boulevard on-ramp and the Kehoe Avenue off-ramp that would remain if Package 1 were implemented alone.
- During the AM peak period, Package 3 would improve travel for the westbound-to-southbound travel pattern because of the new flyover connector ramp.
- There would be additional improvements for traffic originating on northbound US101 during the second half of the AM peak period due to the elimination of weaving movements.
- The PM peak period slowing between Hillsdale Boulevard and SR92 on northbound US101 would be eliminated by this package.

During the PM peak period, there would be moderate travel time improvements (12-18%) over the Package 1 travel times for the northbound-to-eastbound and northbound-to-westbound travel patterns during the most congested hours (4:30-6:30 PM). There would also be improvements (11-13%) for the eastbound through and eastbound-to-southbound travel patterns. There would be one travel time increase greater than 10% during the 4:30-5:30 PM hour – the westbound-to-northbound travel pattern would have a travel time 13% higher than for Package 1. Exhibit 21 highlights the key travel time differences between Package 3 and Package 1.

Exhibit 21
Key Travel Time Results Comparison – Package 3 vs. Package 1

Peak Period	Travel Pattern	Package 3 Lower	Package 3 Higher
AM	WB-to-SB	16-20% (5 to 4 minutes), 6-10AM	
	NB thru	27% (8½ to 6 minutes), 8-9AM	
		19% (5 to 4 minutes), 9-10AM	
	NB-to-EB	40% (7 to 4 minutes), 8-10AM	
	NB-to-WB	20-31% (7-8½ to 6 minutes), 8-10AM	
PM	NB-to-EB	17-18% (6½-5½ to 5½-4½ minutes), 4:30-6:30PM	
	NB-to-WB	12% (7½ to 6½ minutes), 4:30-5:30PM	
	EB thru	12-13% (5½ to 5 minutes), 3:30-5:30PM	
	EB-to-SB	11% (6½ to 5½ minutes), 4:30-5:30PM	
	WB-to-NB		13% (4 to 4½ minutes), 4:30-5:30PM

The speed contour diagrams and travel time exhibits are included in Appendix D and Appendix E, and a detailed interpretation of the speed contour diagrams for this analysis package is also provided within Appendix D. Exhibit 22 and Exhibit 23 show the bottlenecks and congestion for this package.

Comparison exhibits (for AM and PM peak periods) showing all of the performance measures collected for the analysis of this package are included in Appendix F.

Because the Hillsdale Boulevard interchange would be reconfigured to a diamond interchange, Synchro analysis was conducted to determine the minimum number of lanes to operate acceptably using level of service results only (LOS D or better) – that is, queuing needs may require some changes to these minimum lanes. The Synchro output sheets are included in Appendix G. The following lane configurations would be needed under this package:

Northbound ramps

- Eastbound – 2 Through, 2 Left-turn
- Westbound – 3 Through, 1 Right-turn
- Northbound – 2 Left-turn, 2 Right-turn

Southbound ramps

- Eastbound – 3 Through, 2 Right-turn
- Westbound – 2 Through, 2 Left-turn
- Southbound – 1 Left-turn, 1 Right-turn

Additional Discussion

One of the features of the Package 3 design is that northbound traffic bound for either Hillsdale Boulevard or SR92 would all exit at the approximate location where Hillsdale Boulevard traffic currently exits. Because of the high volume of traffic for these two destinations, there would have to be a 3-lane exit with one additional new auxiliary lane leading to the off-ramp. The left-most three lanes on the mainline would be through lanes, the next lane would be a shared through-exit lane, and the two auxiliary lanes would both exit. The analysis was conducted using this configuration.

Package 3 was also reviewed in comparison to the Baseline and the results are provided in Appendix F. This comparison was conducted as another means of isolating the effects of Package 3, although Package 3 would not be implemented without implementation of Package 1. The findings of this comparison were not considered particularly informative and are not included here.

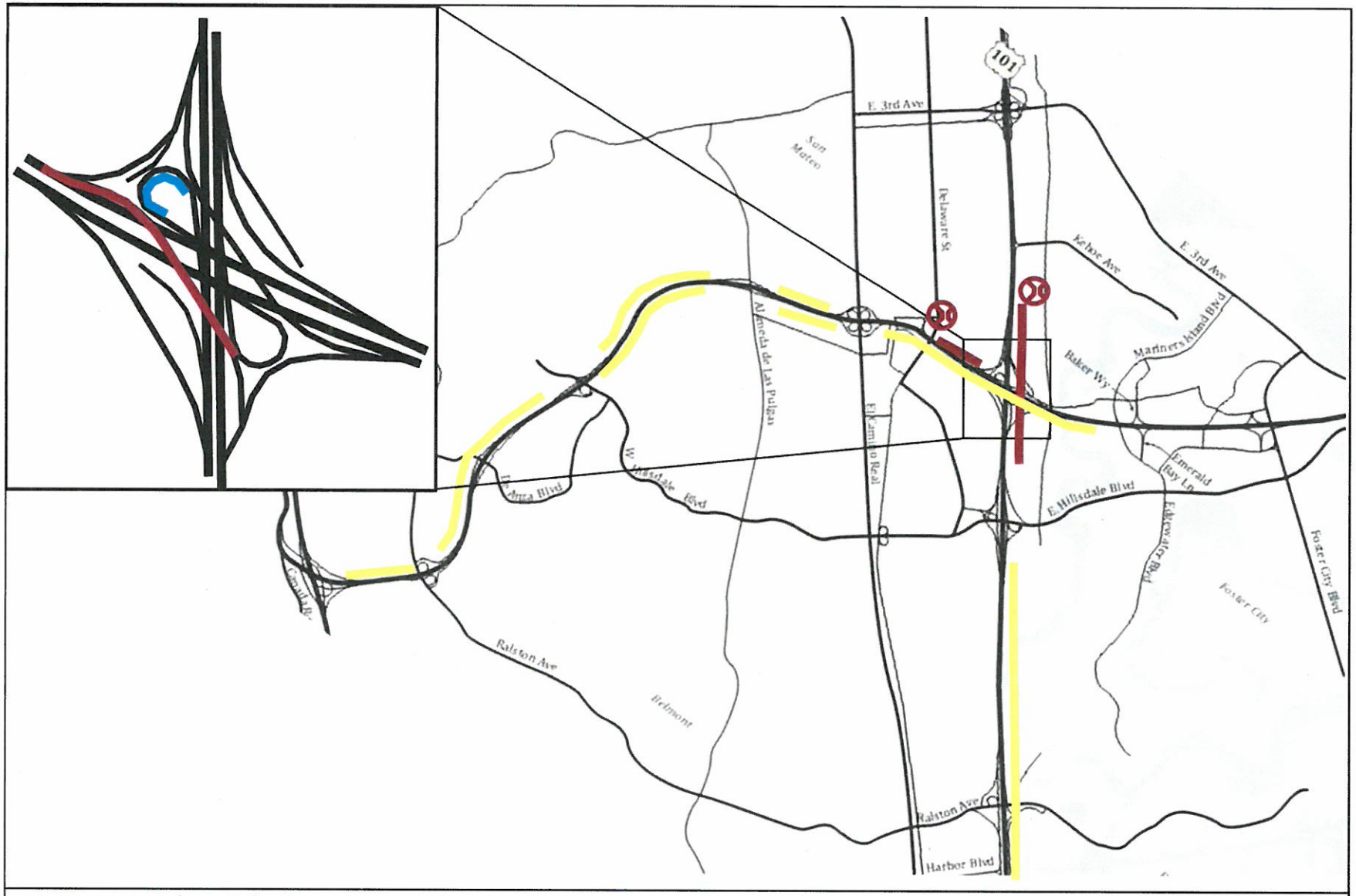
Legend

- Primary Bottleneck
- Probable Secondary Bottleneck
- Slowing*
- Queuing

Not to Scale

Exhibit 22:
Capital Projects Package 3 AM Peak Period Congestion

*Slowing due to congestion is shown in yellow; slowing due to geometry (e.g., a loop ramp) is shown in blue.



Legend

- Primary Bottleneck
- Secondary Bottleneck
- Slowing*
- Queuing

Not to Scale

Exhibit 23: Capital Projects Package 3 PM Peak Period Congestion

*Slowing due to congestion is shown in yellow; slowing due to geometry (e.g., a loop ramp) is shown in blue.

FINDINGS

The operational analysis for the capital project packages produced the following findings:

1. Package 1 would be very effective in eliminating the controlling AM peak period bottlenecks on northbound US101 (at 3rd Avenue) and on southbound US101 (at Hillsdale Boulevard).
2. After implementation of Package 1, a hidden bottleneck on northbound US101 between the westbound SR92 and Fashion Island Boulevard on-ramps and the Kehoe Avenue off-ramp would become the controlling bottleneck during the AM peak period.
3. The PM peak period controlling bottleneck on northbound US101 (between the westbound SR92 and Fashion Island Boulevard on-ramps and the Kehoe Avenue off-ramp) would remain under all three packages.
4. Package 2 would be effective in eliminating the PM peak period bottlenecks on westbound SR92 between US101 and El Camino Real.
5. Package 2 would improve traffic operating speeds on eastbound SR92.
6. Package 3 would be effective in reducing AM peak period queuing on northbound US101 south of SR92 caused by the northbound bottleneck between the westbound SR92 and Fashion Island Boulevard on-ramp and the Kehoe Avenue off-ramp.
7. None of the packages would completely remove the controlling bottlenecks on northbound US101 during the AM and PM peak periods.

Total system-wide travel times for the study area and are shown in Exhibit 24.

Exhibit 24: Capital Project Travel Times

Capital Project	Travel Time Hours[1]		Travel Time Change[2]	
	AM Peak Period	PM Peak Period	AM Peak Period	PM Peak Period
Baseline	10,879	14,003		
Package 1 - US101 Auxiliary Lane Connectors	10,014	13,538	-865	-465
Package 2 - SR92 Modifications	10,505	12,941	-373	-1,062
Package 3 - US101/SR92-Hillsdale Boulevard	9,864	13,040	-150	-498

[1] Travel time hours represents the sum of all time spent by all vehicles within the study area during the specified time period.

[2] Travel times for Package 1 and Package 2 are compared to the Baseline. Travel times for Package 3 are compared to Package 1.

Chapter 7
Capital Projects Costs and Prioritization

7. CAPITAL PROJECTS COSTS AND PRIORITIZATION

This chapter documents the cost-effectiveness of the proposed capital projects in mitigating congestion problems in the interchange area.

PROJECT REFINEMENTS

After implementation of all of the capital project packages, a controlling bottleneck would remain on northbound US101 between the westbound SR92 and Fashion Island Boulevard on-ramps and the Kehoe Avenue off-ramp. An additional capital project was identified to potentially remove or reduce the effect of the bottleneck south of Kehoe Avenue. The additional capital project would provide an auxiliary lane from the Fashion Island Boulevard on-ramp to the Kehoe Avenue off-ramp.

A refinement was made to the concept for extending the southbound US101 auxiliary lane north of the exit ramp to Hillsdale Boulevard to provide better compliance with Caltrans design standards. The refinement would extend the existing auxiliary lane on southbound US101 to the westbound SR92 loop on-ramp. A second auxiliary lane would be added on southbound US101 from the eastbound SR92 on-ramp to the Hillsdale Boulevard off-ramp.

PROJECT COSTS

Planning level cost estimates were prepared for the capital project packages. The estimated costs include all items understood to be required for project delivery; however, the level of detail is not as refined as typically required for a Caltrans Project Study Report. A summary of capital project estimated costs and the number of properties that would need to be acquired is provided in Exhibit 25. The items included in the cost estimates are provided in Appendix H along with assumptions and potential design exceptions required for project approval.

The highest priority capital project package for improving traffic operations, Package 1, also has the lowest cost. At a cost of $19 million, the cost would be less than half the cost of any of the other capital project packages. If the auxiliary lane south of Kehoe Avenue is added to address the controlling bottleneck at that location, the cost of Package 1 would be increased by 12 percent to $21.3 million. One residential property would likely need to be acquired to implement Package 1. Design exceptions would be needed for the 3rd Avenue northbound and southbound off-ramp design features, the SR92 on-ramp spacing, non-standard shoulder widths, and some 11-foot lane widths.

Exhibit 25: Capital Projects Estimated Costs

Capital Project	Estimated Cost	Property Acquisition
Package 1 – US101 Auxiliary Lane Connectors	$ 19,000,000	1 SFR
Auxiliary Lane at Kehoe	$ 2,300,000	None
Subtotal: Package 1 plus Aux Lane at Kehoe	***$ 21,300,000***	
Package 3 NB - US101/SR92-Hillsdale Boulevard	***$ 40,000,000***	10 SFRs; 1 partial SFR
Package 2 - Westbound with no RR Overheads	$ 12,000,000	None
Package 2 - RR Crossing at 17th Ave	$ 46,000,000	9 Bus.; 1 SFR ; 6 partial SFRs
Package 2 - RR Crossing at 20th Ave	$ 38,000,000	1 Bus.; 4 SFRs ; 1 partial Bus.
Subtotal: Package 2 WB with RR Crossings	***$ 96,000,000***	
Total: Higher-priority Projects	***$ 157,300,000***	
Package 2 - Eastbound with no RR Overheads	$ 18,000,000	None
Package 3 SB - US101/SR92-Hillsdale Boulevard	$ 180,000,000	19 SFR; 42 condos; 64 KSF office
Total: Lower-Priority Projects	***$ 198,000,000***	
Total: All Projects	***$ 355,300,000***	

Key:
SFR = single family residence
Bus. = business

The second priority capital project package for improving traffic operations, Package 3 Northbound, would cost approximately $40 million. To implement Package 3 Northbound, approximately 10 residential properties would likely need to be acquired and right-of-way is expected to be needed from several residential properties adjacent to the existing SR92 connector ramps. The estimate assumes that more than $9 million would be required for property acquisition. An existing non-standard inside shoulder width on northbound US101 would remain and would likely require a Caltrans design exception.

The third priority capital project package for improving traffic operations, Package 2 Westbound, would cost approximately $96 million primarily because of the high estimated costs of completing local street connections north and south of SR92 across the rail tracks between El Camino Real and Delaware Street. Without the local street connections, Package 2 Westbound would cost approximately $12 million, assuming several Caltrans design exceptions (shown in Appendix H) would be approved. No property acquisition is expected as a result of constructing the freeway portion of Package 2 Westbound. Design exceptions would be needed for the SR92/El Camino Real ramp design features, interchange spacing on SR92 west of El Camino Real, and median width along El Camino Real.

The local street extension at 17th Street is estimated to cost approximately $46 million, almost half of which would be property acquisition. Nine business properties and one residential property would likely need to be acquired and right-of-way is expected to be needed from six other residential properties adjacent to 17th Street. A design exception would be required on El Camino Real because of narrow lanes and no shoulders.

The local street extension at 20th Street is estimated to cost approximately $38 million, about a third of which would be property acquisition. One business property and four residential properties would likely need to be acquired and right-of-way is expected to be needed from the Taco Bell property. A design exception would be required on El Camino Real because of narrow lanes and no shoulders.

Although Package 2 Eastbound was not found to be a higher-priority project for improving traffic operations, costs were estimated to be approximately $18 million after construction of the westbound Package 2 components including the local street connections north and south of SR92 across the rail tracks. The cost estimate assumes that several Caltrans design exceptions would be approved. Similar to westbound SR92, design exceptions would be needed for the eastbound SR92/El Camino Real ramp design features, interchange spacing on SR92 west of El Camino Real, and median width along El Camino Real.

Package 3 Southbound was also not considered to be higher-priority and is expected to have a high cost, estimated to be approximately $180 million. Almost half of the cost of the southbound portion of Package 3 would be for property acquisition. Nineteen residential homes, 42 condominiums and one 64,000 SF office building would likely need to be acquired. The cost estimate also assumes that an existing non-standard inside shoulder width on southbound US101 would remain and would likely require a Caltrans design exception.

As previously described, an additional capital project would provide an auxiliary lane on northbound US101 from the westbound SR92 and Fashion Island Boulevard on-ramps to the Kehoe Avenue off-ramp. This auxiliary lane project was developed to potentially remove or reduce the effect of the bottleneck south of Kehoe Avenue. No property acquisition would be required to construct the auxiliary lane; however, design exceptions would be needed due to nonstandard deceleration length and inside shoulder width.

PROJECT PRIORITIES BASED ON COST-EFFECTIVENESS

An assessment of cost-effectiveness of each of the capital projects was prepared to assist with the development of project priorities. The cost of the capital projects was compared against the effectiveness of the project in reducing the hours of total travel time for the study area. A summary of improvements in travel time and the cost-effectiveness of the capital projects in providing the improvements are provided in Exhibit 26.

The cost-effectiveness assessment provides a score for ranking the capital projects relative to each other. Cost-effectiveness is measured as the total hours of travel time reduced during the average weekday peak periods per million dollars of investment. The highest cost-effectiveness score (70) was for Package 1, which would provide significant travel time reductions at a relatively low cost of $19 million. The addition of the northbound auxiliary lane just south of Kehoe Avenue was not calculated because an analysis of travel time savings for that late addition was not performed.

Exhibit 26: Capital Projects Estimated Cost-Effectiveness

Capital Project	Travel Time Change		Cost-Effectiveness[a]
Package 1 – US101 Auxiliary Lane Connectors	-8% AM; -3.3% PM		70
Auxiliary Lane at Kehoe	Unknown		[b]
Package 3 NB - US101/SR92-Hillsdale Boulevard	-1.5% AM; -3.7% PM	Total NB & SB	8 to 16[c,d]
Package 2 - Westbound with no RR Overheads Package 2 - RR Crossing at 17th Ave Package 2 - RR Crossing at 20th Ave	-3.4% AM; -7.6% PM		7 to 15[e,f]
Package 2 - Eastbound with no RR Overheads			0 to 7[g,f]
Package 3 SB - US101/SR92-Hillsdale Boulevard			0 to 1.8[h,d]

[a] Cost-effectiveness (CE) is measured as the effectiveness in reducing the hours of travel time during the average weekday peak periods per million dollars of investment.
[b] The CE for Package 1 does not include the cost for the auxiliary lane at Kehoe Avenue as the effectiveness of the auxiliary lane has not been assessed.
[c] The effectiveness of Package 3 Northbound is assumed to be between 50 and 100 percent of the effectiveness of total Package 3 effectiveness.
[d] The CE for Package 3 total is 2.9.
[e] The effectiveness of Package 2 Westbound is assumed to be between 50 and 100 percent of the effectiveness of total Package 2 effectiveness. The cost includes the total cost of providing the railroad crossings to allow for independent implementation of only the westbound portion of Package 2.
[f] The CE for Package 2 total is 13.
[g] The effectiveness of Package 2 Eastbound is assumed to be between 0 and 50 percent of the effectiveness of total Package 2 effectiveness. The cost includes the total cost of providing the railroad crossings to allow for independent implementation of only the eastbound portion of Package 2.
[h] The effectiveness of Package 3 Southbound is assumed to be between 0 and 50 percent of the effectiveness of total Package 3 effectiveness.

The second and third priority projects from the traffic operations study appear to be roughly equivalent in terms of cost-effectiveness. Traffic operations priorities were developed for Packages 2 and 3 on a directional basis as the traffic operations evaluation determined that the greater improvement would occur predominantly for one direction for each of those packages. Travel times were evaluated for each total package but were not available for the various components of the packages. Due to this limitation, a range of potential effectiveness in reducing travel time was established for the packages with significant differences in directional effectiveness in reducing bottlenecks and queues.

Package 3 Northbound, which ranked higher than Package 2 Westbound in the traffic operations study, was also found to be slightly more cost-effective. The ranges of potential cost-effectiveness of Package 3 Northbound and Package 2 Westbound overlap substantially, so it is not certain that Package 3 Northbound would be more cost-effective than Package 2 Westbound.

Package 2 Westbound would provide slightly more than twice the improvement provided by Package 3 Northbound but would cost more than twice as much to build. The cost alone of implementing Package 2 Westbound may be a significant impediment to implementing the entire package. It may be more cost-effective to implement elements of Package 2 Westbound rather than to implement the entire

package. It was not possible to determine the effectiveness of specific elements of any of the packages in this study. The assessment of cost-effectiveness was limited to consideration of eastbound and westbound differentiation.

Further study might identify specific elements of Package 2 Westbound that might increase the desirability of implementing them based on their cost-effectiveness. The City of San Mateo is currently pursuing modifications to the El Camino Real interchange that are consistent with Package 2 Westbound and those modifications may be cost-effective to implement on a stand-alone basis. It may also be possible to provide traffic operational benefits by implementing other elements of Package 2 Westbound. Construction of the westbound auxiliary lane from the Delaware Street off-ramp to the El Camino Real off-ramp could be completed at a relatively low cost without removing the Delaware Street on-ramp. Additional study would be needed to address the effectiveness of each element to improve traffic operations, the extent to which implementation of portions of the package would perpetuate some of the existing non-standard design elements of the existing design, and whether design exceptions would likely be approved by Caltrans.

Package 2 Eastbound and Package 3 Southbound were identified as low-priority projects in the traffic operations analysis and would remain lower-priority based on the cost-effectiveness assessment. At most, Package 2 Eastbound would be less than 10 percent as cost-effective as Package 1 in reducing system-wide travel time. Package 3 Southbound would be the least cost-effective of all modifications considered in this study.

CONCLUSIONS

The assessment of cost-effectiveness generally supported the earlier conclusion that the higher-priority projects would remain as determined from the study of traffic operations improvements. The findings from the assessment are as follows:

1. Package 1 was found to be, by far, the most cost-effective project due to its ability to eliminate controlling bottlenecks on US101 and would require the least amount of property acquisition of all the packages. However, after implementation of Package 1, a bottleneck would remain on northbound US101 south of the Kehoe Avenue off-ramp during the AM and PM peak periods.
2. An additional capital project that would provide an auxiliary lane on northbound US101 from the westbound SR92 and Fashion Island Boulevard on-ramps and the Kehoe Avenue off-ramp was developed to potentially remove or reduce the effect of the bottleneck on northbound US101 south of Kehoe Avenue. This supplemental modification to Package 1 would have a relatively low cost and would require no property acquisition.
3. Package 3 Northbound could be constructed for approximately half the cost of Package 2 Westbound, with impacts to 11 residential properties and no impacts to businesses. Implementing Package 3 may be more cost-effective than implementing all the components of Package 2 Westbound, which would require local street connections.
4. Package 2 Westbound would provide slightly more than twice the improvement provided by Package 3 Northbound but would cost more than twice as much to build.

5. Construction of the local street connections required for full implementation of Package 2 Westbound is estimated to cost more than $80 million and would require significant acquisition of property, affecting 11 businesses and 11 residential properties.
6. It may be more cost-effective to implement elements of Package 2 Westbound rather than to implement the entire package; however, it was not possible to determine the effectiveness of specific elements of any of the packages in this study.
7. Package 2 Eastbound and Package 3 Southbound were identified as lower-priority projects in the traffic operations analysis and would remain lower-priority based on the cost-effectiveness assessment. Package 2 Eastbound would not require property acquisitions but Package 3 Southbound would require the most property acquisition of all the packages.

Chapter 8
2020 Analysis of Higher-priority Projects

8. 2020 ANALYSIS OF HIGHER-PRIORITY PROJECTS

The higher-priority portions of the capital project packages were evaluated for future conditions to determine if the value of those projects identified by an evaluation of existing (2010) traffic volume levels would have longer-term benefits. The year 2020 was selected for analysis of future conditions as it is likely to be close to the opening year for a project that would be developed from the findings of this study.

Forecasts of 2020 traffic volumes were developed using the C/CAG travel model and key traffic operations issues were identified for 2020 conditions if no capital improvements are made. The elements of the capital projects identified as higher-priority were combined into a hybrid Package 4 and an analysis was conducted to determine how well Package 4 would perform in 2020 with a focus on freeway traffic operations. Travel times were used as a measure of effectiveness of the higher-priority portions of the capital project packages. The findings from the long-term effectiveness evaluation were used to develop suggestions for possible additional study and suggestions for further refinements to the project(s).

HIGHER-PRIORITY PROJECT PACKAGE DESCRIPTION

The elements of the capital projects identified as higher-priority in the previous analysis were combined into a hybrid Package 4, which includes the following items:

1. Package 1 plus auxiliary lane at Kehoe Avenue
    a. All of Package 1 (connect northbound auxiliary lanes north and south of 3rd Avenue to create a fifth lane underneath the overcrossing; connect southbound auxiliary lanes north and south of Hillsdale Boulevard to create a fifth lane underneath the overcrossing)
    b. A new auxiliary lane on northbound US101 between the westbound SR92 and Fashion Island Boulevard on-ramps and the Kehoe Avenue off-ramp
2. The northbound components of Package 3 (ramp braiding to eliminate the northbound weaving section)
3. The westbound components of Package 2 (eliminate westbound on-ramp from Delaware Street; extend westbound auxiliary lane from the Delaware Street off-ramp to El Camino Real off-ramp; convert westbound half of SR92/El Camino Real interchange to partial cloverleaf; construct two new grade-separated railroad crossings.

FUTURE TRAFFIC VOLUMES

Forecasts of 2020 traffic volumes were developed using the C/CAG travel model because, of the models available in the area, it shows the most reasonable growth on the key roadway links in the study area. A comparison of the various models and details on model assumptions and processes are included in Appendix I.

SUMMARY OF KEY TRAFFIC ISSUES IN 2020

An analysis was conducted to determine how well Package 4 would perform in 2020 with a focus on freeway traffic operations.

Exhibit 27 and Exhibit 28 show the key traffic operations issues that were identified by the traffic operations model in 2020 if no capital improvements are made. The speed contour diagrams shown in Appendix J also provide information that illustrates some of the traffic operations issues expected in 2020.

AM Peak Period

Higher year 2020 traffic demand would result in more congestion on northbound US101 approaching the 3rd Avenue bottleneck as well as create new congestion on westbound SR92 approaching US101. Congestion on northbound US101 and westbound SR92 would extend south and east of the study limits, respectively.

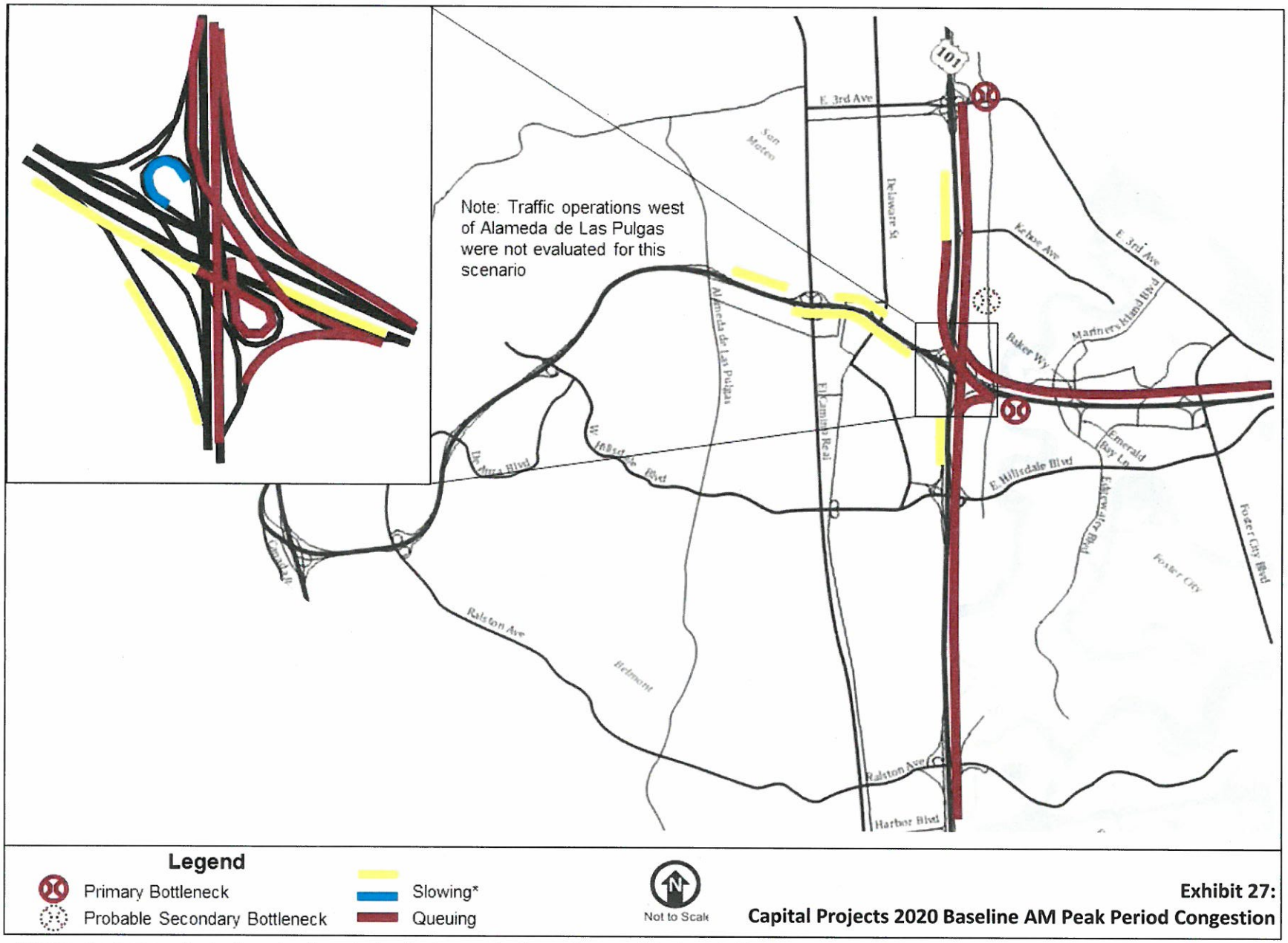
A new controlling bottleneck is also expected to develop between the merge of the northbound and southbound US101 connector ramps to eastbound SR92 and the Edgewater Boulevard off-ramp. This bottleneck would cause queuing that would contribute to the congestion on northbound US101 and would create new congestion for the southbound US101 to eastbound SR92 connector ramp.

The bottleneck that was shown for existing conditions on southbound US101 at Hillsdale Boulevard is not expected to develop during the AM peak period in 2020 due to the traffic flow constraining effect of the queues expected to develop on westbound SR92. Similarly, the existing congestion shown on the westbound SR92 to southbound US101 loop ramp and eastbound SR92 to northbound US101 diagonal ramp would no longer develop due to the queuing on westbound SR92 limiting traffic flows onto southbound US101.

PM Peak Period

The existing PM peak period bottleneck on northbound US101 south of Kehoe Avenue would not develop in 2020 due to congestion at two other bottlenecks that would constrain traffic from getting to that section of freeway. A new bottleneck is expected to develop intermittently on northbound US101 at the Hillsdale Boulevard interchange during the PM peak period.

The previously identified bottleneck on westbound SR92 near El Camino Real would remain in 2020 and approaching congestion would increase due to the growth in traffic demand. Similar to the AM peak period, a new controlling bottleneck would develop during the PM peak period on eastbound SR92 east of the US101 connector ramps. The combination of these two bottlenecks would cause traffic to queue on northbound US101 beyond the southern limits of the study area.



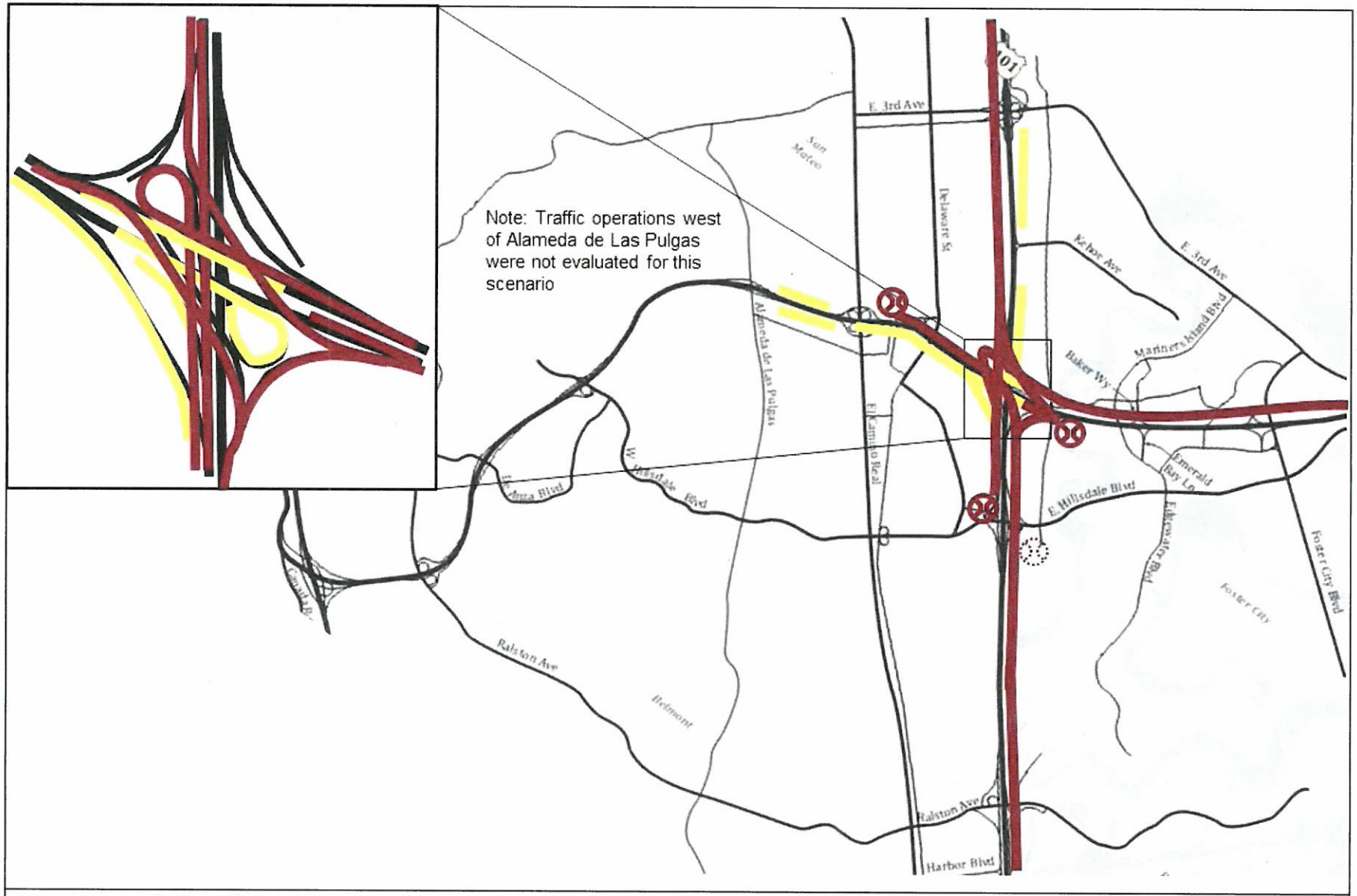
Legend

- Primary Bottleneck
- Probable Secondary Bottleneck
- Slowing*
- Queuing

Not to Scale

Exhibit 27:
Capital Projects 2020 Baseline AM Peak Period Congestion

Slowing due to congestion is shown in yellow; slowing due to geometry (e.g., a loop ramp) is shown in blue.



Legend

- Primary Bottleneck
- Secondary Bottleneck
- Slowing
- Queuing

Not to Scale

Exhibit 28:
Capital Projects 2020 Baseline PM Peak Period Congestion

In 2020, the bottleneck on eastbound SR92 east of the US101 connector ramps would cause queues that would extend back into the US101/SR92 interchange on SR92 and through the interchange on the northbound and southbound US101 connector ramps to eastbound SR92.

Another new controlling bottleneck would occur during the 2020 PM peak hour on southbound US101 at the Hillsdale Boulevard interchange, similar to the bottleneck identified during the 2010 AM peak period. Queues from this new bottleneck would extend through the US101/SR92 interchange and along westbound SR92 beyond the eastern limits of the study area. The combination of bottlenecks on southbound US101 at Hillsdale Boulevard and on eastbound SR92 east of the US101 connector ramps would cause queues on southbound US101 that would extend beyond the northern limits of the study area.

EFFECTIVENESS OF PROJECTS OVER TIME

Package 4 was found to be reasonably effective in improving traffic operations through at least 2020. The effectiveness of Package 4 to alleviate congestion in 2020 by adding capacity at critical bottlenecks is shown in Exhibit 29 and Exhibit 30. The speed contour diagrams in Appendix J also provide information that is useful in determining the effectiveness of the Package 4.

AM Peak Period

As shown in Exhibit 29, Package 4 would add capacity and eliminate practically all queuing during the 2020 AM peak period except for congestion resulting from the bottleneck on eastbound SR92 east of the US101 connector ramps. Package 4 would also significantly reduce the queues for northbound US101 and transfer some of that queuing to the collector-distributor (CD) road between Hillsdale Boulevard and the US101/SR92 interchange. The queue on northbound US101 south of Hillsdale Boulevard would be reduced in length.

The construction of a CD road from Hillsdale Boulevard to SR92 would create a new bottleneck at the off-ramp from northbound US101 serving the CD road. This new bottleneck would be hidden in queues extending south from the bottleneck on eastbound SR92 east of the US101 connector ramps during some of the AM peak period. At other times during the period, the bottleneck at the CD road would constrain traffic flow entering eastbound SR92 from northbound US101 and reduce the queue for the southbound US101 to eastbound SR92 connector ramp by allowing more traffic to enter eastbound SR92 from southbound US101.

PM Peak Period

The effectiveness of Package 4 to provide improvements in traffic operations during the 2020 PM peak period is shown in Exhibit 30. Package 4 would eliminate practically all bottlenecks except for the bottleneck on eastbound SR92 near the US101 connector ramps. The remaining bottleneck would cause queuing that would extend back into the US101/SR92 interchange on SR92 and through the interchange on the northbound and southbound US101 connector ramps to eastbound SR92. Queuing

on southbound US101 would be effectively eliminated although the queue on northbound US101 would remain beyond the southern limits of the study area.

Other Operational Effects

The hidden bottleneck identified near Kehoe Avenue for the 2010 AM peak period is expected to be eliminated by the addition of a new auxiliary lane between the westbound SR92 and Fashion Island Boulevard on-ramps and the Kehoe Avenue off-ramp.

Travel Times

Total system-wide travel times for the study area are shown in Exhibit 31. Travel times are expected to increase substantially by 2020 with an increase of 39 percent in the AM peak period and 76% in the PM peak period. Package 4 is expected to restore travel times in 2020 to near the travel times of 2010 during the AM peak period. During the PM peak period, Package 4 is expected to negate 57 percent of the increase in travel time.

An assessment was made to determine the effectiveness of Package 4 in 2020 relative to the effect it would have had on travel times in 2010. Package 4 was not evaluated in 2010, so an approximation of the effect of the package in 2010 was made by summing the travel time reductions for all of the earlier Capital Project packages. This approximation should provide a conservative assessment of the effectiveness of Package 4 in 2010 because Package 4 did not include all the capacity improvements included in Package 1, 2, and 3.

The effectiveness of Package 4 in 2020 is expected to be approximately double the effect it would have had on travel times in 2010. In 2010, the sum of travel time reductions for Packages 1, 2, and 3 would be 13% and 14% during the AM and PM peak periods, respectively. In 2020, Package 4 would reduce travel times by 27% and 25% during the AM and PM peak periods, respectively.

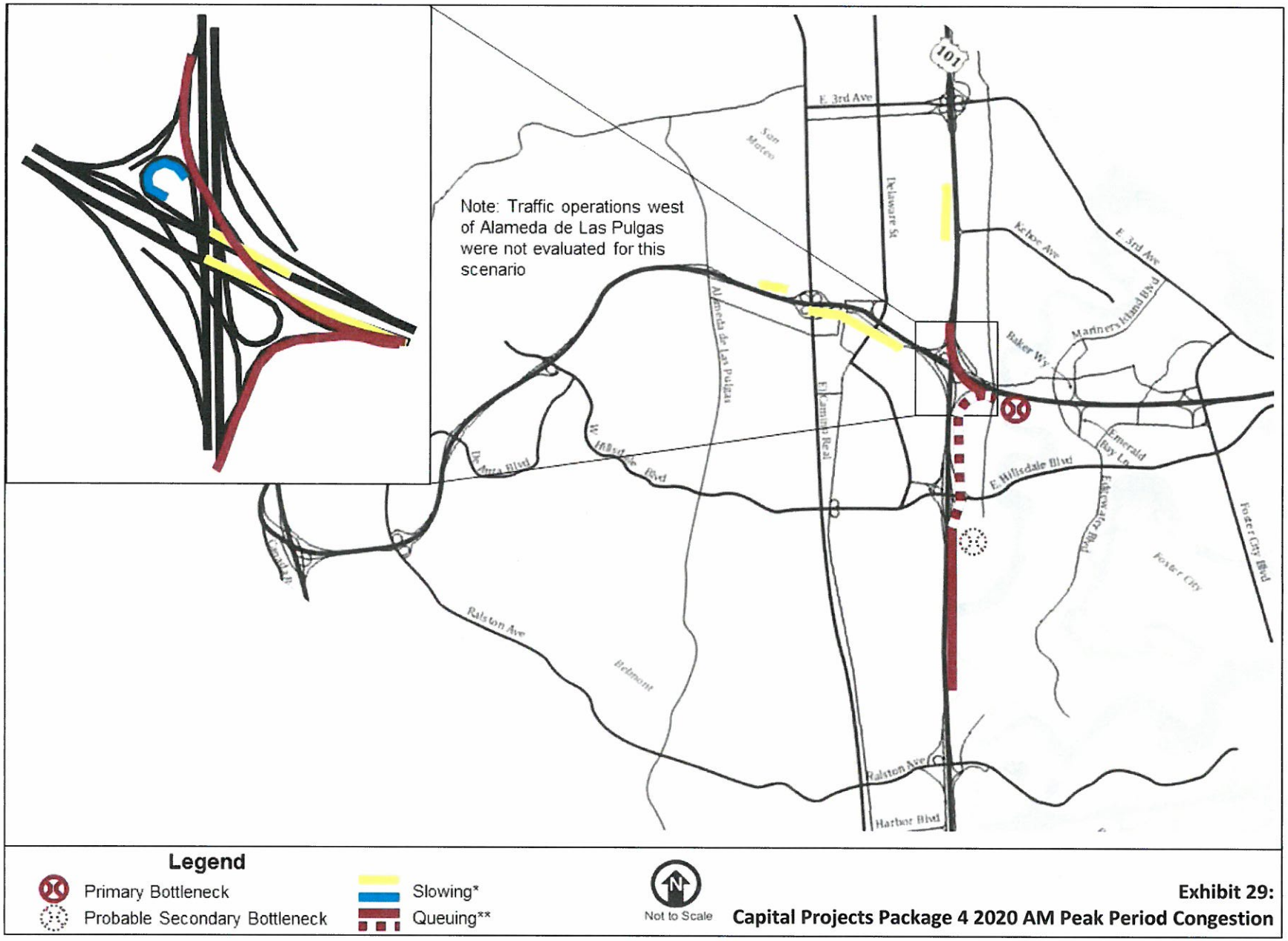
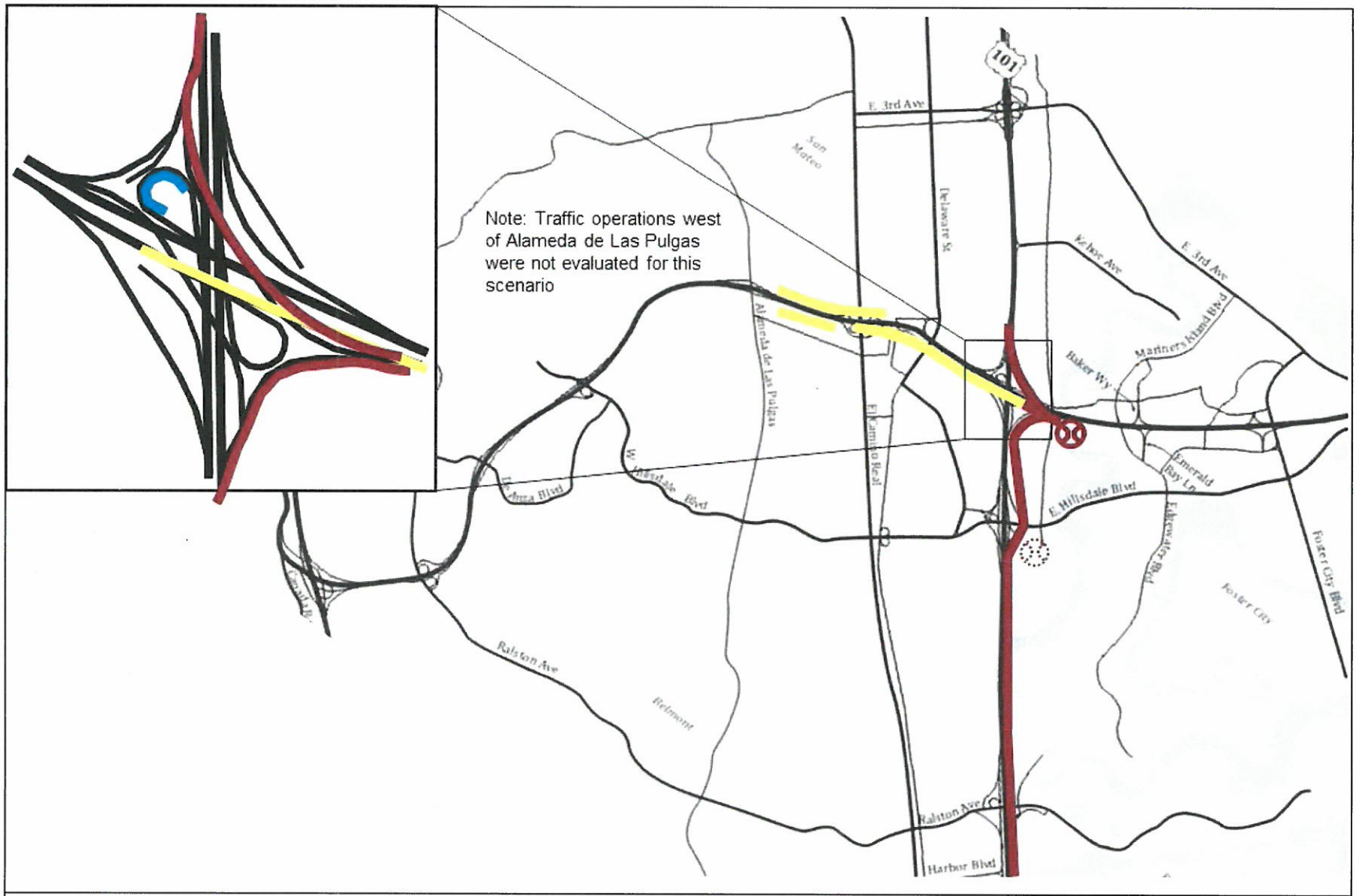


Exhibit 29: Capital Projects Package 4 2020 AM Peak Period Congestion

*Slowing due to congestion is shown in yellow; slowing due to geometry (e.g., a loop ramp) is shown in blue. **Dashed line shows queues sometimes prevented by upstream bottleneck.



Legend

- Primary Bottleneck
- Secondary Bottleneck
- Slowing*
- Queuing

Not to Scale

Exhibit 30:
Capital Projects Package 4 2020 PM Peak Period Congestion

*Slowing due to congestion is shown in yellow; slowing due to geometry (e.g., a loop ramp) is shown in blue.

Exhibit 31: Capital Project Travel Times

Capital Project	Travel Time Hours		Travel Time Change[1]		Percent Change	
	AM Peak Period	PM Peak Period	AM Peak Period	PM Peak Period	AM Peak Period	PM Peak Period
2010 Baseline	10,879	14,003				
Package 1 - US101 Auxiliary Lane Connectors	10,014	13,538	-865	-465	-8%	-3%
Package 2 - SR92 Modifications	10,505	12,941	-373	-1,062	-3%	-8%
Package 3 - US101/SR92-Hillsdale Boulevard	9,864	13,040	-150	-498	-1%	-4%
Total of Packages 1, 2 and 3 in 2010[2]			-1,388	-2,025	-13%	-14%
2020 Baseline	15,094	24,700	4,215	10,698	39%	76%
Package 4 - Higher Priority Elements	11,052	18,622	-4,041	-6,078	-27%	-25%

[1] Travel times for Package 1 and Package 2 are compared to the 2010 Baseline. Travel times for Package 3 are compared to Package 1. Travel times for the 2020 Baseline are compared to the 2010 Baseline. Travel times for Package 4 are compared to the 2020 Baseline.

[2] Package 2 was evaluated independently from Package 1 and Package 3 (which were evaluated together); therefore, the sum of Package 1, 2, and 3 may not represent the travel time change that would result from evaluation of all the packages together.

CONCLUSIONS

1. The US101/SR92 interchange area is expected to experience significant increases in congestion by 2020 as indicated by increases in travel time.

2. A new bottleneck is expected to develop near the merge of the northbound and southbound US101 connector ramps to eastbound SR92 and would be present during both the AM and PM peak periods.

3. Package 4 would eliminate practically all queuing during the 2020 AM peak period except for queuing resulting from the bottleneck on eastbound SR92 near the US101 connector ramps.

4. Package 4 did not include improvements to eastbound SR92 that may eliminate the bottleneck near the US101 connector ramps.

5. A new auxiliary lane on northbound US101 between the westbound SR92 and Fashion Island Boulevard on-ramps and the Kehoe Avenue off-ramp appears to eliminate the hidden bottleneck expected to develop during the PM peak period.

6. The effectiveness of Package 4 in 2020 is expected to be approximately double the effect it would have had on travel times in 2010. So, the effectiveness of Package 4 appears to be substantially greater in the future than today.

Chapter 9
Conclusions and Next Steps

9. CONCLUSIONS AND NEXT STEPS

A final meeting of the project stakeholders was held on June 4, 2013. The findings of the study were presented and the following recommendations were presented to the stakeholders:

1. Implement Capital Project Package 1 to eliminate controlling bottlenecks on US101 with the least amount of property impacts.
2. Implement an additional capital project to provide an auxiliary lane on northbound US101 from the westbound SR92 and Fashion Island Boulevard on-ramps to the Kehoe Avenue off-ramp. This additional project would remove the effect of a bottleneck that would remain on northbound US101 after implementation of Package 1 at a relatively low cost with no need for property acquisition.
3. Implement elements of Package 2 westbound that would not require the development of local roadway extensions that would be expensive to construct and would require significant property acquisition.
4. Develop and evaluate measures to address a new controlling bottleneck expected to develop by 2020 between the merge of the northbound and southbound US101 connector ramps to eastbound SR92 and the Edgewater Boulevard off-ramp.
5. Implement at least the improvements to US101 as soon as possible to provide benefits that will increase over time as traffic demand increases.

At the final stakeholders meeting the stakeholders agreed with the suggested recommendations and agreed that implementation of Package 1 plus the auxiliary lane south of Kehoe Avenue should be the first priority. The next priority should be to implement the following auxiliary lanes on SR92:

- Westbound between Delaware Street and El Camino Real
- Eastbound between the US101 on-ramps and the Edgewater Boulevard off-ramp

Appendix A:
Baseline Operational Projects

Introduction

The purpose of the US101 / SR92 Interchange Area Traffic Analysis is to examine existing and future operating conditions at this key interchange in the City of San Mateo and to identify and evaluate potential solutions to congestion. In 2009, the US101 corridor throughout the length of San Mateo County was studied, but the details of operations at specific interchanges of freeways were not. In order to define the existing conditions, an extensive data collection effort was conducted in May of 2010. Based on the data, operational analysis models were built and calibrated to represent existing operating conditions. Once the existing conditions were accurately represented by the analysis models, projects expected to be in place in the near term were added to the models to create a Baseline condition, against which the alternative scenarios were compared.

The initial step of developing alternatives was to find projects that are oriented toward demand management strategies. These kinds of projects were described by the project stakeholder group as "operational" projects. This memo documents the operational analyses of these strategies and recommends those that should be pursued in the next step of the study.

The next step will be to test the operational benefits and impacts of what the stakeholder group calls "capital" projects. These types of projects tend to involve major construction, such as reconfiguring interchange ramps, freeway widening etc.

Study Limits

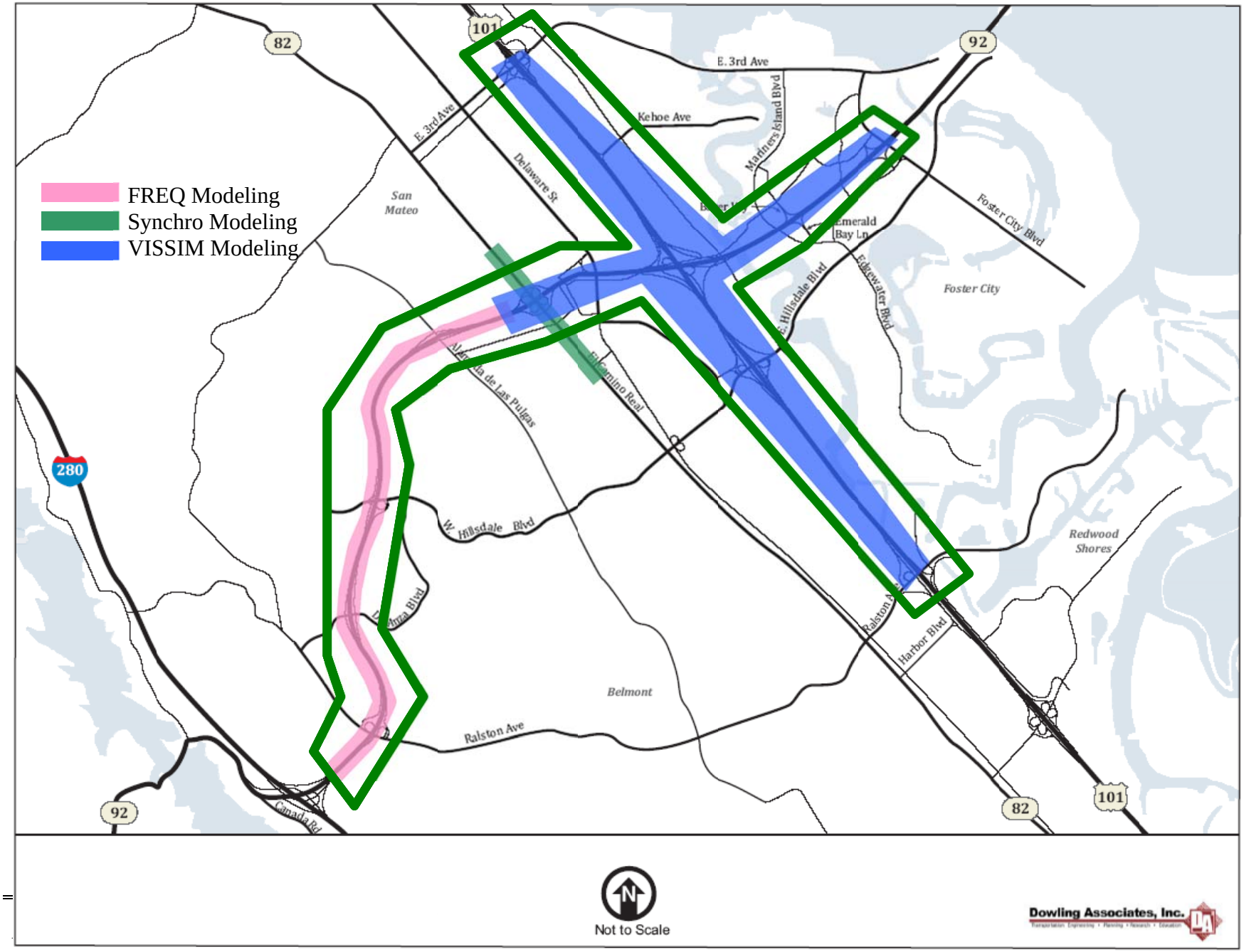
The limits of the overall study are US101 from Ralston/Marine to 3rd Avenue, and SR92 from I-280 to Foster City Blvd. Exhibit 1 shows the overall map of the study area, with general locations that are covered by the different operational models. Three different models were used to evaluate operating conditions because of different characteristics of the facilities. Microsimulation modeling using VISSIM software was used to evaluate the most complex freeway and ramp facilities because of its ability to model lane changing and weaving. For the less complex freeway and ramp facilities, macrosimulation modeling was performed using FREQ. Finally, at-grade intersections were evaluated using *Highway Capacity Manual* methodology as implemented within Synchro software.

Analysis Format

The format of the analysis of operational projects was to establish a Baseline scenario that includes projects that are already under development and are expected to be implemented with high degree of certainty. Detailed results from the Baseline scenario analysis were discussed at a stakeholder meeting on June 15, 2012, documented in a memorandum dated June 22, 2012, and included as Appendix A. The next step was to implement the projects in logical progression considering the cost and ease of implementation. Project scenario components that were found to

be beneficial would be retained in the operational modeling network(s) for the subsequent scenario analyses. Projects retained through this part of the study will form an operational improvement package against which the capital projects will be evaluated. For this study, the operational scenarios analyzed were as follows:

- **Scenario 1** – Modify (slow down) existing ramp metering rates for on-ramps at the US101/ Hillsdale and US101/Ralston interchanges.
- **Scenario 2 –** Implement metering for all non-loop freeway to freeway connectors at the US 101/SR 92 Interchange
- **Scenario 3** – Implement ramp metering on all of the local interchange on-ramps along SR92 within the study area.
- **Scenario 4** – Implement toll plaza metering at the San Mateo Bridge.


FREQ Modeling
Synchro Modeling
VISSIM Modeling
82
101
92
280
E. 3rd Ave
Kehoe Ave
Marines Island Blvd
Delaware St
San Mateo
Emerald Bay Ln
Foster City Blvd
Foster City
Hillsdale Blvd
Edgewater Blvd
Alameda de Las Pulgas
El Camino Real
W. Hillsdale Blvd
Redwood Shores
Ralston Ave
Harbor Blvd
Belmont
Ralston Ave
Canada Rd
Not to Scale
Dowling Associates, Inc.

Study Area

Baseline Conditions

Exhibits 2 and 3 show the key locations for congestion in the study area that were observed and modeled for Baseline conditions, which are very similar to Existing conditions.

As shown in Exhibits 2 & 3, bottlenecks at Third Avenue, north of SR92, and at Hillsdale Blvd. control operations on northbound and southbound US101, and there are less severe bottlenecks on SR92 during the PM peak period. A summary of the bottlenecks is provided below – details of the operations analysis of the Baseline scenario are included in the June 22, 2012 memorandum, which is included in Appendix A.

Summary of Bottlenecks

<u>Northbound US101</u>

- AM Peak Period
  - Bottleneck between 3rd Avenue off-ramp and on-ramp – queuing extends south of Hillsdale
- PM Peak Period
  - Bottleneck in the 5 lane section approaching the Kehoe off-ramp – queuing extends almost to SR92
  - Bottleneck between Hillsdale and SR92 – queuing extends south of Hillsdale; slowing extends beyond study limits

<u>Southbound US101</u>

- AM Peak Period
  - Bottleneck between Hillsdale loop on and diagonal on – queuing extends to between SR92 diverge and 3rd Avenue

<u>Westbound SR92</u>

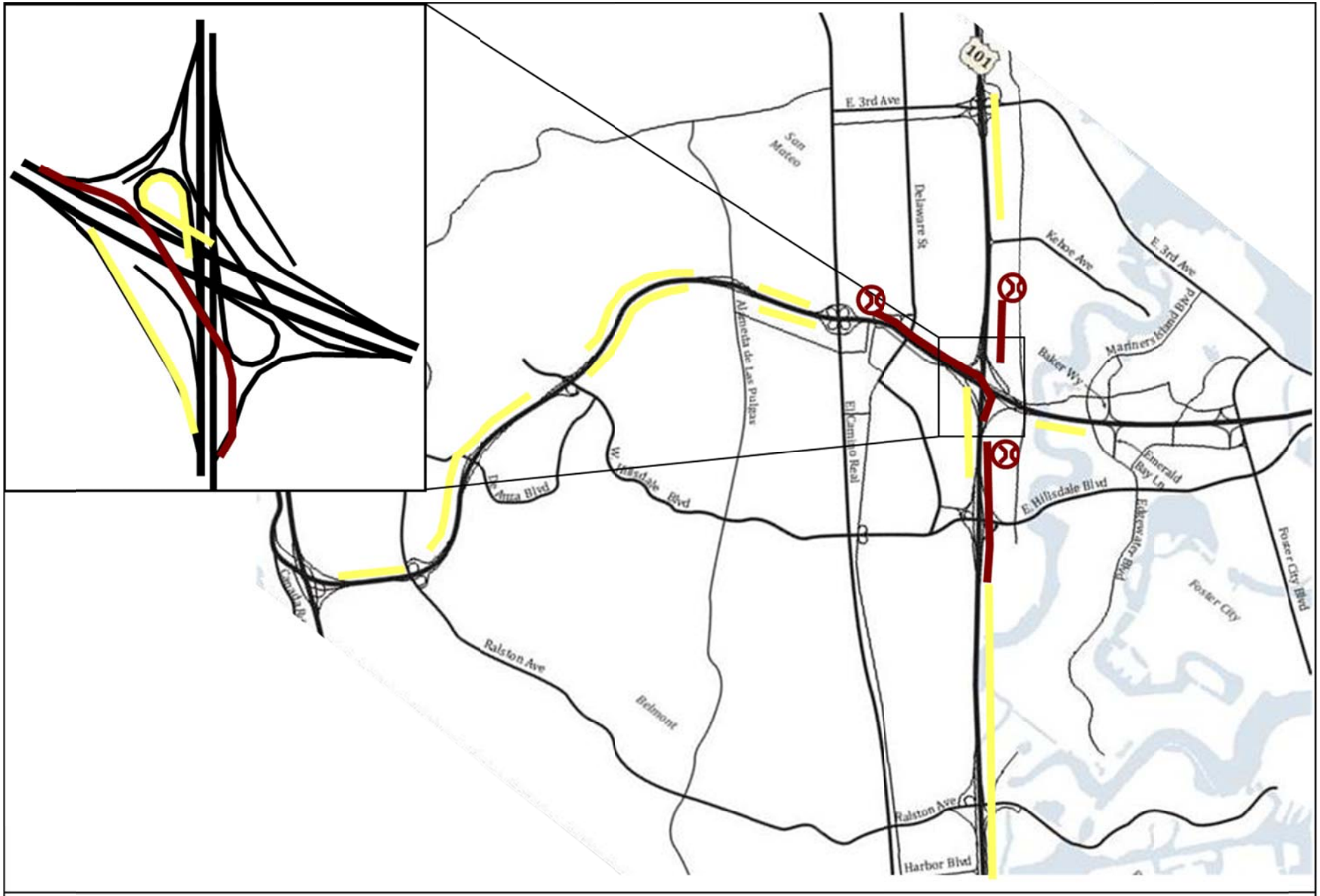
- PM Peak Period
  - Bottleneck between Delaware on and El Camino Diagonal off – queuing primarily contained on northbound-to-westbound freeway-to-freeway connector ramp

Legend

- Primary Bottleneck
- Probable Secondary Bottleneck
- Slowing
- Queuing

Not to Scale

Exhibit 2
Baseline AM Peak Period Congestion



Legend

- Primary Bottleneck
- Secondary Bottleneck
- Slowing
- Queuing

Not to Scale

Exhibit 3
Baseline PM Peak Period Congestion

Operational Scenario Analyses

Model outputs are included in Appendices B, C, and D. Appendix B includes speed contour diagrams, and is organized by direction/location and time – each scenario for a given direction/location and time is presented together for ease of comparing one scenario to another. Appendix C includes comparisons of travel time on selected travel patterns from each scenario to the previous one (e.g., Scenario 2 vs. Scenario 1). Appendix D includes FREQ outputs for Scenario 3.

Scenario 1

This scenario analyzed more restrictive metering rates at US101/Hillsdale and US101/ Ralston to evaluate whether it would provide any benefit to the mainline traffic operations. A key consideration for this analysis was that queuing would not be permitted to consistently extend onto the local arterials. Scenario 1 was analyzed using only the VISSIM model because the resulting impacts were contained within the area coded in the VISSIM model.

Modeling Inputs

Tables 1 and 2 present the applicable volume and metering inputs for the northbound and southbound on-ramps, respectively, at the Hillsdale and Ralston interchanges.

Table 1
Northbound On-Ramps from Hillsdale and Ralston
Existing Metered Throughput and Metering Rates

AM Peak Period Beginning	Hillsdale						Ralston					
	Diagonal (1 lane)			Loop (1 + HOV)			Diagonal (2 + HOV)			Loop (1 + HOV)		
	Volume	B Rate	S1 Rate	Volume	B Rate	S1 Rate	Volume	B Rate	S1 Rate	Volume	B Rate	S1 Rate
6:00	337	400	360	250	277	240	107	900	240	164	900	240
7:00	598	720	720	416	514	400	263	900	257	154	900	240
8:00	633	900	720	372	450	360	300	900	360	148	900	240
9:00	547	720	600	315	360	300	225	900	300	207	900	240
PM Peak Period Beginning												
3:00	444	514	450	405	514	400	265	900	300	674	900	720
4:00	394	450	400	388	450	400	351	900	720	698	900	720
5:00	424	514	450	397	450	400	681	900	900	682	900	720
6:00	428	514	514	337	400	360	627	900	720	570	900	600

Notes:
"B Rate" = Metering rate (vehicles per hour per lane – vphpl) coded in Baseline scenario.
"S1 Rate" = Metering rate (vphpl) coded in Scenario 1.
"Volume" means the metered throughput (vphpl) based on existing metering rates as measured during the May, 2010 data collection effort, documented in the June 23, 2010 data collection memo.

In the northbound direction, during the AM peak period, the ramp metering rates at the Ralston interchange were initially assumed to be 900 vphpl, but it was found that the rate could be as low as 240 vphpl without causing impact to the local arterials. Consequently, a metering rate of 240 vphpl was used for the analysis.

Table 2
Southbound On-Ramps from Hillsdale and Ralston
Existing Metered Throughput and Metering Rates

AM Peak Period Beginning	Hillsdale						Ralston	
	Loop (2 lanes)			Diagonal (1 lane)			Loop + Diagonal (2 + HOV)	
	Volume	B Rate	S1 Rate	Volume	B Rate	S1 Rate	Volume	Rates
6:00	116	240	240	278	300	300	284	Not coded because at study limits
7:00	237	240	240	457	480	480	666	
8:00	283	300	300	524	600	600	746	
9:00	229	240	240	781	900	900	617	
PM Peak Period Beginning								
3:00	236	240	240	523	540	540	699	Not coded because at study limits
4:00	212	240	240	550	600	600	995	
5:00	229	240	240	704	720	720	1177	
6:00	212	240	240	643	660	660	991	

Notes:
"B Rate" = Metering rate (vehicles per hour per lane – vphpl) coded in Baseline scenario.
"S1 Rate" = Metering rate (vphpl) coded in Scenario 1.
"Volume" means the metered throughput (vphpl) based on existing metering rates as measured during the May, 2010 data collection effort, documented in the June 23, 2010 data collection memo.

At the Hillsdale on-ramps in the southbound direction there is no additional storage available to accommodate more restrictive metering rates. Therefore, restrictive metering rates were not evaluated during either peak period. For the Ralston interchange, ramp metering was not coded because the resulting impacts would be experienced outside the study limits.

Operations Analysis Results

As shown in Tables 4 and 5, the operations analysis results for Scenario 1 showed very little change in the modeled outputs compared to Baseline results. As expected, changing metering rates at two interchanges to amounts close to the ramp volumes would not significantly mitigate the magnitude of congestion that currently occurs.

One other factor in this result is that there was little margin to reduce the existing metering rates because of the relatively high ramp volumes during peak hours. Queues already exist when the meters operate, and the ramps are of average length. Since the constraint was that queues could not consistently extend onto local streets, the rates could only be reduced by a small amount in most cases.

However, recognizing that making occasional adjustments to ramp meters is usually beneficial to some degree, and the associated cost is usually small – this often results in a favorable cost/benefit ratio. For this reason, it was recommended, and subsequently agreed, that these changes would continue into the next step of the analysis.

Tables 3 and 4 presents a comparison of performance measures for the AM and PM peak periods, respectively.

Table 3 – Performance Measure Summary, Scenario 1 vs. Baseline, AM Peak Period

		Baseline	Scenario 1	Difference
Bottleneck Locations		• NB 101: 3rd Ave. off/on ramps • SB 101: Hillsdale loop/diagonal on-ramps		No change
Queue Lengths		• NB 101: South of Hillsdale • SB 101: North of SR92 Off		No change
Travel Time (sec)		Peak hour range: 243 (SB to EB) to 569 (NB thru)	Peak hour range: 241 (SB to EB) to 568 (NB thru)	Minor changes, mostly decreases: -7 sec (NB to EB) at most
Conflicting movements		• NB 101 between Hillsdale and 92 • SB 101 between EB92 on-ramp and Hillsdale off-ramp.		No change
Emissions and fuel consumption	CO	755,123	759,301	+0.6% Not Significant
	NOx	146,920	147,733	
	VOC	175,007	175,976	
	FuelCons	10,803	10,863	
Person-throughput		136,735	136,713	<-0.1% Not significant
Total Person Miles Traveled (PMT)		538,157	538,114	<-0.1% Not significant
Total Distance Traveled (VMT)		444,758	444,722	<-0.1% Not significant
Duration of congestion		• NB 101: 7:30-9:30 • SB 101: 7:15-10:00		No change

Table 4 – Performance Measure Summary, Scenario 1 vs. Baseline, PM Peak Period

		Baseline	Scenario 1	Difference
Bottleneck Locations		• NB 101: Fashion Island/WB 92 on to Kehoe off • NB 101: Hillsdale on to 92 off • WB 92: Delaware on to El Camino off		No change
Queue Lengths		• NB 101: South of Hillsdale • WB 92: NB-WB connector ramp back to 101		No change
Travel Time (sec)		Peak hour range: 228 (SB to EB) to 890 (NB to WB)	Peak hour range: 229 (SB to EB) to 915 (NB to WB)	About same number of increases and decreases Increases: up to 38 (NB to EB) Decreases: up to 25 (NB to EB)
Conflicting movements		• NB101 between Hillsdale and 101 • NB101 between Fashion Island/WB92 on-ramps and Kehoe • EB92 between 101 and Edgewater • WB92 between 101 and Delaware		No change
Emissions and fuel consumption	CO	1,007,288	1,012,212	Slight increase, not significant (under 1%)
	NOx	195,982	196,940	
	VOC	233,449	234,590	
	FuelCons	14,411	14,481	
Person-throughput		184,778	184,564	<-0.1% Not significant
Total Person Miles Traveled (PMT)		700,028	699,015	<-0.2% Not significant
Total Distance Traveled (VMT)		578,536	577,699	<-0.2% Not significant
Duration of congestion		• NB 101: 5:00-6:30 • WB 92: 5:15-5:45		No change

In addition to the tables above that provide overall summaries of the performance measures, some additional observations are worth noting. First, the speed contour diagrams (Appendix B) for Scenario 1 and Baseline conditions are nearly identical. Second, the travel times (Appendix C) for the 12 origin-destination routes were tracked (e.g., northbound from

Ralston to Third, northbound to eastbound, northbound to westbound, etc.). As with the speed contour diagrams, the travel time results between baseline and scenario 1 were very similar. Most of the routes that include northbound US101 have slight improvements in this performance measure.
In the 4th time slice of the PM (5:30-6:30 PM) model, there are some exceptions to the close similarities, as there are slight travel time increases (38 and 25 seconds) along the northbound US101 to eastbound and westbound SR92 travel patterns. The reason was due to holding some of the on-ramp demand from the 2nd and 3rd time slices, and then releasing those vehicles during the 5:30-6:30 hour with a faster metering rate.

There was virtually no change for the southbound direction of US101 for this scenario because it turned out that there were no practical opportunities to restrict metering rates beyond the existing rates.

Scenario 2

This scenario would implement some limited freeway-to-freeway connector ramp metering. The initial concept for this scenario was broken down into two sub-scenarios that included, first, metering the SR92 diagonal connector ramps leading onto US101, and second, metering the connector ramps leading onto SR92 from US101. When it was noted that demand on certain ramps during certain peak periods was too high for metering without causing significant queuing impacts[1] (see Appendix E, which includes volume graphs and metering thresholds), Scenario 2 was redefined to be implementation of metering on the following ramps at the following times:

- Westbound SR92 to northbound US101 – PM peak period
- Southbound US101 to eastbound SR92 – AM peak period
- Southbound US101 to westbound SR92 – both peak periods

Modeling Inputs

The metering rate inputs were set to accommodate the full hourly traffic demand for each ramp. The rates were set at demand levels, rather than more restricted levels, for one of two reasons: either because the mainline sections onto which the ramps lead were not congested for the applicable peak periods; or because the periodic demand surges resulted in queues back to the originating mainline, even at demand level metering rates.

[1] An assumption of two-cars-per-green operations was used. With two-cars-per-green, the maximum practical output increases, but only from about 900 vehicles per hour per lane to 1,100. If more cars per green were used, the increase above the 1,100 threshold would not likely be enough to change the conclusions.

Operations Analysis Results

Tables 6 and 7 show a summary of the performance measures for this scenario, as compared to Scenario 1. Results are similar to the comparison of Scenario 1 to the Baseline showing very minor operational improvements.

Table 6 – Performance Measure Summary, Scenario 2 vs. 1, AM Peak Period

		Scenario 1	Scenario 2	Difference
Bottleneck Locations		• NB 101: 3rd Ave. off/on ramps • SB 101: Hillsdale loop/diagonal on-ramps		No change
Queue Lengths		• NB 101: South of Hillsdale • SB 101: North of SR92 Off		No change
Travel Time (sec)		Peak hour range: 241 (SB to EB) to 568 (NB thru)	Peak hour range: 249 (SB to EB) to 563 (NB thru)	Minor changes, mostly decreases: -14 (SB thru) at most; increases up to 28 on metered connectors
Conflicting movements		• NB 101 between Hillsdale and 92 • SB 101 between EB92 on-ramp and Hillsdale off-ramp.		No change
Emissions and fuel consumption	CO	759,301	757,100	Minor decreases (0.3%), not significant
	NOx	147,733	147,304	
	VOC	175,976	175,465	
	FuelCons	10,863	10,831	
Person-throughput		136,713	136,694	Negligible
Total Person Miles Traveled (PMT, miles)		538,114	534,881	Minor decreases (0.6%), not significant
Total Distance Traveled (VMT, miles)		444,722	442,050	
Duration of congestion		• NB 101: 7:30-9:30 • SB 101: 7:15-10:00		No change

Table 7 – Performance Measure Summary, Scenario 2 vs. 1, PM Peak Period

		Scenario 1	Scenario 2	Difference
Bottleneck Locations		• NB 101: Fashion Island/WB 92 on to Kehoe off • NB 101: Hillsdale on to 92 off • WB 92: Delaware on to El Camino off		No change
Queue Lengths		• NB 101: South of Hillsdale • WB 92: NB-WB connector ramp back to 101		No change
Travel Time (sec)		Peak hour range: 229 (SB to EB) to 915 (NB to WB)	Peak hour range: 229 (SB to EB) to 869 (NB to WB)	Mostly minor changes, mostly decreases; max decrease -104 (SB thru); increases up to 29 on metered connectors
Conflicting movements		• NB101 between Hillsdale and 101 • NB101 between Fashion Island/WB92 on-ramps and Kehoe • EB92 between 101 and Edgewater • WB92 between 101 and Delaware		No change
Emissions and fuel consumption	CO	1,012,212	1,008,355	Minor decreases (0.4%), not significant
	NOx	196,940	196,189	
	VOC	234,590	233,696	
	FuelCons	14,481	14,426	
Person-throughput		184,564	183,823	Minor decrease (0.4%), not significant
Total Person Miles of Traveled (PMT, miles)		699,015	697,889	Minor decreases (0.2%), not significant
Total Distance Traveled (VMT, miles)		577,699	576,768	
Duration of congestion		• NB 101: 5:00-6:30 • WB 92: 5:15-5:45	• NB 101: 5:15-6:30 • WB 92: 5:15-5:45	Slight change NB 101

Scenario 3

Scenario 3 analyzed the addition of metering all of the on-ramps along SR92 between the San Mateo Bridge and I-280 to the recommended metering in Scenario 2 described earlier. Two analysis tools were used to evaluate this scenario because the length of SR92 extends across the limits of both the VISSIM microsimulation modeling tool and the FREQ macrosimulation modeling tool.

Modeling Inputs

Metering rates for each of the ramps within the VISSIM model analysis limits were set to accommodate the full demand of on-ramp traffic. For ramps within the FREQ model analysis limits, the lengths of each on-ramp were entered into the model, and a basic optimization was run so that the ramps could be used as storage behind the meters, but queues would not extend beyond the ramps onto the local streets.

Operations Analysis Results

Tables 8 and 9 show a summary of the results. The analysis found that there would be slight improvements in some of the performance measures, but the overall result is that conditions would be about the same as without the metering. It should be reiterated that this analysis used an assumption that consistent queuing back onto surface streets would be unacceptable. With this assumption, most of the ramps must be metered at “demand rates,” which means that the full demand is able to pass through the meter. With demand rates, there is no change to the traffic volumes, so most of the performance measures are nearly identical to the previous scenario. Some exceptions to the similarity to Scenario 2 are for traffic originating along the western part of SR92 and traveling toward US101 – there were increases in travel time, particularly in the PM peak period (see the Travel Time part of Table 9). This is actually consistent with other scenarios where metering was added, in that traffic that is subjected to metering experiences delays that it would not experience without the meters. There were a few notable decreases in travel time, due to improved traffic flow with the addition of metering. The greatest decreases occurred in the 3rd to the 5th time slices (from 3:30 to 6:30 PM) for the northbound-to-westbound and northbound-to-eastbound travel patterns – travel times decreased between about 15-25% compared to Scenario 2.

Table 8 – Performance Measure Summary, Scenario 3 vs. 2, AM Peak Period

		Scenario 2	Scenario 3	Difference
Bottleneck Locations		• NB 101: 3rd Ave. off/on ramps • SB 101: Hillsdale loop/diagonal on-ramps		No change
Queue Lengths		• NB 101: South of Hillsdale • SB 101: North of SR92 Off		No change
Travel Time (sec)		Peak hour range: 249 (SB to EB) to 563 (NB thru)	Peak hour range: 248 (SB to EB) to 570 (NB thru)	Mostly slight increases
Conflicting movements		• NB 101 between Hillsdale and 92 • SB 101 between EB92 on-ramp and Hillsdale off-ramp.		No change
Emissions and fuel consumption	CO	757,100	768,673	Slight increases (1.5%)
	NOx	147,304	149,556	
	VOC	175,465	178,147	
	FuelCons	10,831	10,997	
Person-throughput		136,694	136,515	-0.1% Not Significant
Total Person Miles Traveled (PMT, miles)		534,881	538,687	+0.7% Not Significant
Total Distance Traveled (VMT, miles)		442,050	445,196	+0.7% Not Significant
Duration of congestion		• NB 101: 7:30-9:30 • SB 101: 7:15-10:00		No change

Table 9 – Performance Measure Summary, Scenario 3 vs. 2, PM Peak Period

		Scenario 2	Scenario 3	Difference
Bottleneck Locations		• NB 101: Fashion Island/WB 92 on to Kehoe off • NB 101: Hillsdale on to 92 off • WB 92: Delaware on to El Camino off		No change
Queue Lengths		• NB 101: South of Hillsdale • WB 92: NB-WB connector ramp back to 101		No change
Travel Time (sec)		Peak hour range: 229 (SB to EB) to 869 (NB to WB)	Peak hour range: 243 (SB to EB) to 717 (NB to WB)	Some notable changes, both increases and decreases (-43 to +45)
Conflicting movements		• NB101 between Hillsdale and 101 • NB101 between Fashion Island/WB92 on-ramps and Kehoe • EB92 between 101 and Edgewater • WB92 between 101 and Delaware		No Change
Emissions and fuel consumption	CO	1,008,355	1,027,617	Slight increases (2.0%)
	NOx	196,189	199,937	
	VOC	233,696	238,160	
	FuelCons	14,426	14,701	
Person-throughput		183,823	185,182	+0.7% Not Significant
Total Person Miles of Traveled (PMT, miles)		697,889	705,200	+1.0% Not Significant
Total Distance Traveled (VMT, miles)		576,768	582,810	+1.0% Not Significant
Duration of congestion		• NB 101: 5:15-6:30 • WB 92: 5:15-5:45		No Change

Scenario 4

Operational Scenario 4 would be to implement metering at the San Mateo Bridge toll plaza, similar to metering that currently exists on the Bay Bridge.

The evaluation of scenario was based on the qualitative analysis of peak hour traffic reduction that may reasonably be achieved by metering the San Mateo Bridge Toll Plaza. Once the evaluation of operational project concepts proceeded to the point at which Scenario 4 was to be considered, the existing demand volumes crossing the San Mateo Bridge were reviewed, and the amount of peak hour traffic reduction was discussed with the stakeholders. The heavier peak period for westbound traffic is the AM peak period. During that peak period, the highest one-hour volume is 5,334. Based on the assumed reduction of 3% of bridge traffic during the peak hour would be reduced by about 160 vehicles.

There were two considerations using the 160 vehicles result. One consideration was how much that number of vehicles might affect operations within the analysis area. Using simple percentage calculations, the largest destination of westbound traffic coming from the bridge is northbound US101 at about 40%. This means that approximately 40% of the 160-vehicle reduction would be applied to that direction, or about 65 vehicles. Given the magnitude of congestion on northbound US101, a maximum reduction of 65 vehicles during the peak hour would have very little effect on that congestion.

The other consideration was the extent to which queuing would be exacerbated at the east end of the bridge – Stakeholders have voiced concern that metering at the toll plaza could cause queuing to extend to I-880 and affect operations on that freeway. The cross section of SR92 leading up to the toll plaza area (not including when the number of lanes increases immediately in advance of the toll booths) is three mixed-flow lanes and one HOV lane. Using a conservative assumption that none of the 160 vehicles that would be withheld by toll plaza metering would qualify for the HOV lane, this would mean adding an average of about 53 vehicles of queue to each lane. With queued headways measuring somewhere between 25 and 50 feet, this would mean adding 1/4-mile to 1/2-mile to the existing queues. The total distance between the toll plaza and I-880 is 3.8 miles. Based on the hourly counts obtained for this study, it does not appear that queues currently extend to within 1/2 mile of I-880, so this level of metering could likely be accommodated without affecting operations on I-880.

In conclusion, despite the likelihood of the SR92 approach to the toll plaza being able to accommodate some additional queuing, the potential impacts of toll plaza metering do not appear to warrant further study.

Conclusions and Recommendations

Based on the results from the operational analyses and comparisons of Scenarios to one another, as well as on the feedback received at the stakeholder meeting of July 24, 2012, it is recommended that Scenario 3 be carried forward into the analysis of the Capital Projects scenarios. Each scenario evaluated in this part of the study had slight quantitative and/or qualitative improvements such that it is reasonable to carry those modifications forward. The clearest improvements (although not always dramatic) were for travel times where through

traffic that was not metered had travel time reductions due to slightly reduced demands elsewhere. Tables 10 and 11 show a comparison of the Scenario 3 quantitative results to the Baseline results. In addition to the quantitative results, ramp and connector metering reduces turbulence at merge areas by maintaining a steady flow of vehicles onto the mainline. This results in a safer and more operationally efficient movement of vehicles, which also helps in reducing congestion. Such benefits are qualitative and are not quantifiable in the performance measure summary tables below.

Table 10 – Performance Measure Summary, Scenario 3 vs. Baseline, AM Peak Period

		Baseline	Scenario 3	Difference
Bottleneck Locations		• NB 101: 3rd Ave. off/on ramps • SB 101: Hillsdale loop/diagonal on-ramps		No change
Queue Lengths		• NB 101: South of Hillsdale • SB 101: North of SR92 Off		No change
Travel Time (sec)		Peak hour range: 241 (SB to EB) to 568 (NB thru)	Peak hour range: 248 (SB to EB) to 570 (NB thru)	Increases from metering; decreases for un-metered traffic
Conflicting movements		• NB 101 between Hillsdale and 92 • SB 101 between EB92 on-ramp and Hillsdale off-ramp.		No change
Emissions and fuel consumption	CO	755,123	768,673	Slight Increases (1.8%)
	NOx	146,920	149,556	
	VOC	175,007	178,147	
	FuelCons	10,803	10,997	
Person-throughput		136,735	136,515	-0.2% Not Significant
Total Person Miles Traveled (PMT, miles)		538,157	538,687	+0.1% Not Significant
Total Distance Traveled (VMT, miles)		444,758	445,196	+0.1% Not Significant
Duration of congestion		• NB 101: 7:30-9:30 • SB 101: 7:15-10:00		No change

Table 11 – Performance Measure Summary, Scenario 3 vs. Baseline, PM Peak Period

		Baseline	Scenario 3	Difference
Bottleneck Locations		• NB 101: Fashion Island/WB 92 on to Kehoe off • NB 101: Hillsdale on to 92 off • WB 92: Delaware on to El Camino off		No change
Queue Lengths		• NB 101: South of Hillsdale • WB 92: NB-WB connector ramp back to 101		No change
Travel Time (sec)		Peak hour range: 229 (SB to EB) to 915 (NB to WB)	Peak hour range: 243 (SB to EB) to 717 (NB to WB)	Increases from metering; decreases for un-metered traffic
Conflicting movements		• NB101 between Hillsdale and 101 • NB101 between Fashion Island/WB92 on-ramps and Kehoe • EB92 between 101 and Edgewater • WB92 between 101 and Delaware		No Change
Emissions and fuel consumption	CO	1,007,288	1,027,617	Slight increases (2.0%)
	NOx	195,982	199,937	
	VOC	233,449	238,160	
	FuelCons	14,411	14,701	
Person-throughput		184,778	185,182	+0.2% Not Significant
Total Person Miles of Traveled (PMT, miles)		700,028	705,200	+0.7% Not Significant
Total Distance Traveled (VMT, miles)		578,536	582,810	+0.7% Not Significant
Duration of congestion		• NB 101: 5:00-6:30 • WB 92: 5:15-5:45	• NB 101: 5:15-6:30 • WB 92: 5:15-5:45	Slight change NB 101

Appendix B:
Concept Drawings by TYLin – The "TYLin Concept"

Sheet A includes the Scenario E elements (identified by red arrows) and the Scenario G elements.
Sheet B includes the connection of the Scenario E flyover to SR92, east of US101.
Sheet C includes the Scenario F elements.

Scenario E Elements

SEE SHEET B

SEE SHEET C

DRAFT EXHIBIT

METROPOLITAN TRANSPORTATION COMMISSION

IN ASSOCIATION WITH

SANTA CLARA Valley Transportation Authority

SAN MATEO COUNTY Transportation Authority

DRAWN	DESIGNED	HORIZONTAL SCALE
EL	FL/EL	1"=200'
CHECKED	DATE CHECKED	VERTICAL SCALE
MW	11/13/07	N/A
APPROVED		CONTRACT NO.
ENGINEER	DATE	

CAMBRIDGE SYSTEMATICS

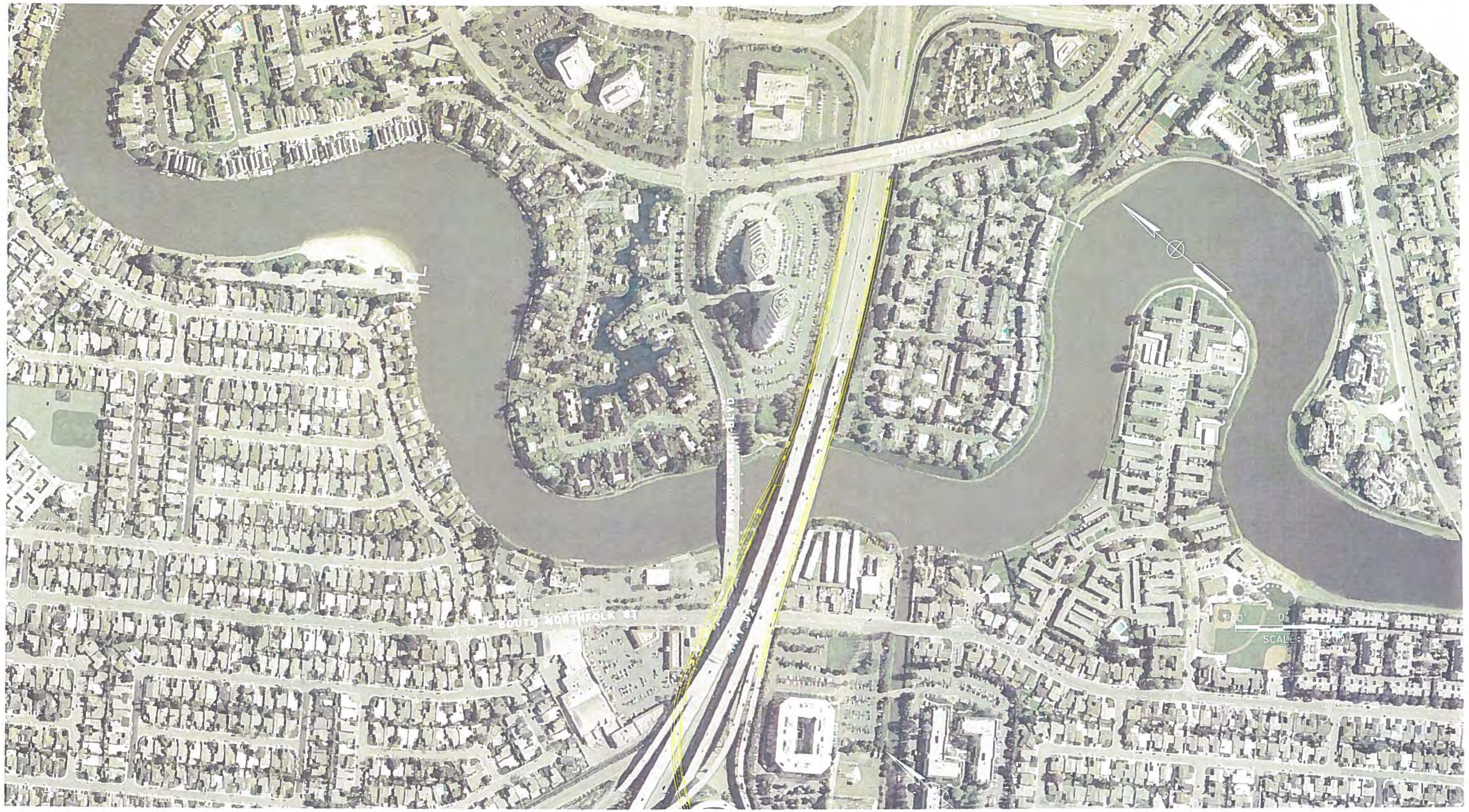
T·Y·LIN INTERNATIONAL

US 101 CORRIDOR STUDY

MODIFICATION CONCEPT AT HWY 92/HILLSDALE BLVD

JOB NO.	SHEET
330172	A
DATE	SHEET NO. / TOTAL SHEETS
11/13/07	

Drawing: P:\330172_CambridgeSystem_#7776_FrwyPerf\CADD\Exhibits\Exh-92-hillsdale.dwg Nov 13, 2007, 6:24pm



SEE SHEET A

DRAFT EXHIBIT

METROPOLITAN TRANSPORTATION COMMISSION

IN ASSOCIATION WITH

SANTA CLARA Valley Transportation Authority

SAN MATEO COUNTY Transportation Authority

DRAWN EL	DESIGNED FL/EL	HORIZONTAL SCALE 1"=200'
CHECKED MW	DATE CHECKED 11/13/07	VERTICAL SCALE N/A
APPROVED		CONTRACT NO.
ENGINEER	DATE	

CAMBRIDGE SYSTEMATICS

T·Y·LIN INTERNATIONAL

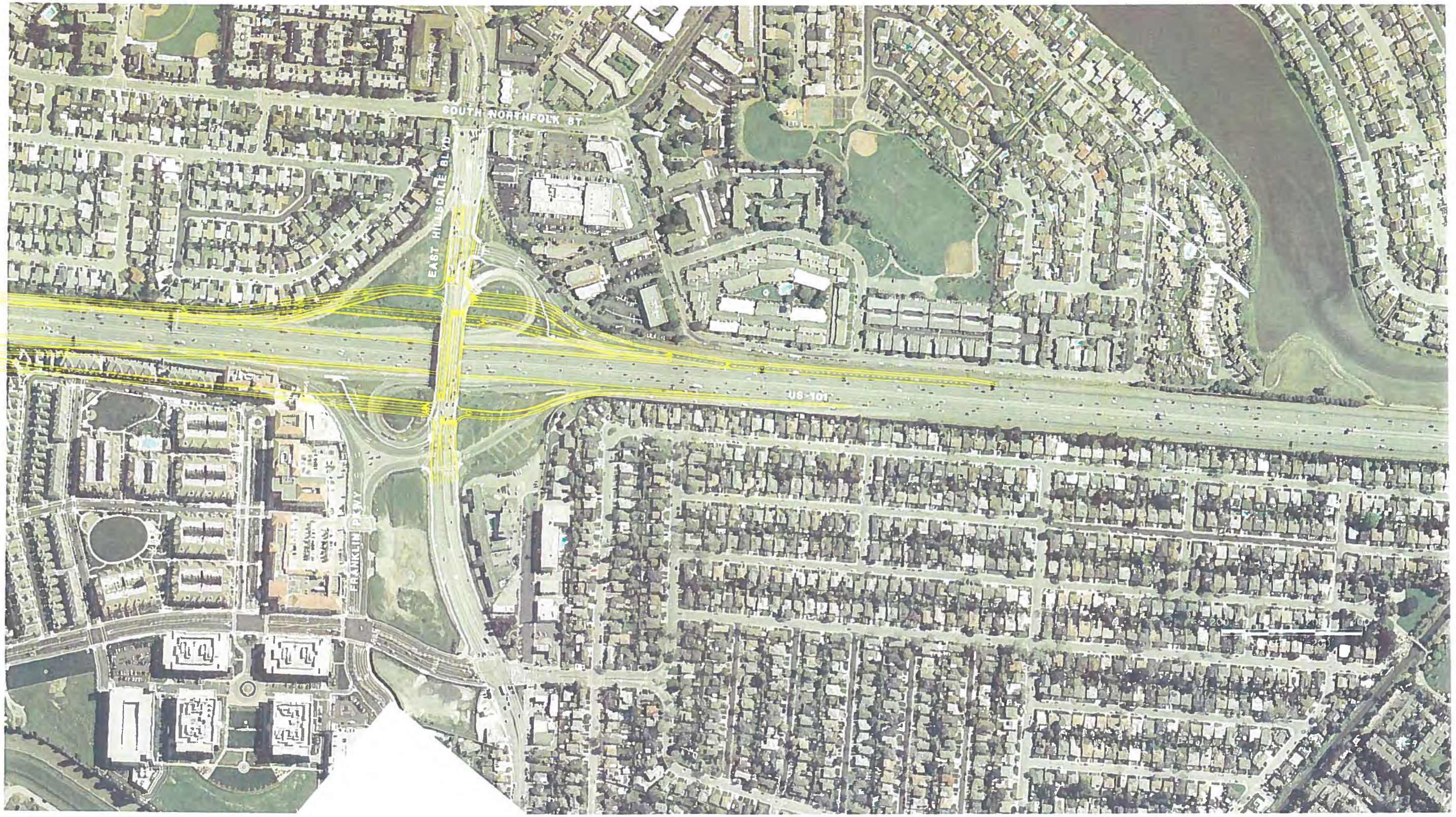
US 101 CORRIDOR STUDY

MODIFICATION CONCEPT AT HWY 92/HILLSDALE BLVD

JOB NO. 330172	SHEET B
DATE 11/13/07	SHEET NO. / TOTAL SHEETS

Drawing: P:\330172_CambridgeSystem_#7776_FrwyPerf\CADD\Exhibits\Exh-92-hillsdale.dwg Nov 13, 2007, 6:30pm

SEE SHEET A



DRAFT EXHIBIT

METROPOLITAN TRANSPORTATION COMMISSION

IN ASSOCIATION WITH

SANTA CLARA Valley Transportation Authority

SAN MATEO COUNTY Transportation Authority

DRAWN	DESIGNED	HORIZONTAL SCALE
EL	FL/EL	1"=200'
CHECKED	DATE CHECKED	VERTICAL SCALE
MW	11/13/07	N/A
APPROVED		CONTRACT NO.
ENGINEER	DATE	

CAMBRIDGE SYSTEMATICS

T·Y·LIN INTERNATIONAL

US 101 CORRIDOR STUDY

MODIFICATION CONCEPT AT HWY 92/HILLSDALE BLVD

JOB NO.	SHEET
330172	C
DATE	SHEET NO. / TOTAL SHEETS
11/13/07	

Drawing: P:\330172_CambridgeSystem_#7776_FrwyPerf\CADD\Exhibits\Exh-92-hillsdale.dwg Nov 13, 2007, 6:36pm

Appendix C:
Traffic Volume Re-Routing for Package 2

Existing Configurations and Volumes

6-7	130	178	30	317	138	314
7-8	405	436	124	604	534	658
8-9	433	538	114	700	616	808
9-10	385	458	107	664	439	706

El Camino — Delaware

6-7	53	263	91	176	215	224
7-8	137	553	320	323	495	359
8-9	157	778	550	394	767	434
9-10	197	633	474	349	610	400

Existing El Camino, 2 Delaware Ramps closed

6-7	185	171	92	304		314
7-8	619	402	364	557		658
8-9	679	498	391	648		808
9-10	561	431	305	625		706

El Camino — Delaware

6-7	139	244	188	163		224
7-8	335	506	543	296		359
8-9	464	702	895	355		434
9-10	441	574	749	316		400

El Camino Par-Clo, 2 Delaware Ramps closed

6-7	185		92	474		314
7-8	619		364	960		658
8-9	679		391	1146		808
9-10	561		305	1056		706

El Camino — Delaware

6-7	327	244		163		224
7-8	878	506		296		359
8-9	1359	702		355		434
9-10	1190	574		316		400

Existing Configurations and Volumes

2:30-3:30	384	496	166	611	602	657
3:30-4:30	439	500	188	616	665	631
4:30-5:30	505	513	224	549	746	637
5:30-6:30	527	406	221	577	701	643
6:30-7:30	356	393	165	636	449	474

El Camino — Delaware

2:30-3:30	197	789	384	595	639	584
3:30-4:30	205	822	425	559	708	673
4:30-5:30	250	870	478	608	732	699
5:30-6:30	239	727	458	560	658	597
6:30-7:30	174	611	335	427	477	471

Existing El Camino, 2 Delaware Ramps closed

2:30-3:30	625	456	437	561		657
3:30-4:30	705	455	487	561		631
4:30-5:30	803	459	560	491		637
5:30-6:30	807	363	536	515		643
6:30-7:30	536	367	367	594		474

El Camino — Delaware

2:30-3:30	453	734	672	554		584
3:30-4:30	488	759	744	516		673
4:30-5:30	543	805	807	563		699
5:30-6:30	502	671	754	517		597
6:30-7:30	365	569	550	398		471

El Camino Par-Clo, 2 Delaware Ramps closed

2:30-3:30	625		437	1017		657
3:30-4:30	705		487	1016		631
4:30-5:30	803		560	950		637
5:30-6:30	807		536	878		643
6:30-7:30	536		367	962		474

El Camino — Delaware

2:30-3:30	1124	734		554		584
3:30-4:30	1232	759		516		673
4:30-5:30	1350	805		563		699
5:30-6:30	1256	671		517		597
6:30-7:30	914	569		398		471

Existing El Camino Configuration, All ramps open

AM Peak Hour

133 1486
139 Barneson 109
81 1460
1595 1541

1619 1793
27 1528 64
21 12
35 Bovet-17th 61
289 272
363 1760 290
2089 2413

2073 2389
493 1580
676
WB 92 Ramps
580
1713 141
2160 1854

2160 1856
803 1357
558
EB 92 Ramps
195
1298 405
1552 1703

1555 1703
320 1070 165
357 78
38 20th Ave. 42
39 33
121 1268 33
1142 1422

1056 1316
63 924 69
145 55
117 25th Ave. 117
26 298
59 1116 250

PM Peak Hour

58 1563
93 Barneson 87
48 1693
1650 1741

1896 2065
61 1759 76
94 13
78 Bovet-17th 76
661 351
280 1958 414
2771 2652

2848 2650
555 2293
608
WB 92 Ramps
522
2042 230
2815 2272

2808 2290
878 1930
518
EB 92 Ramps
248
1772 630
2178 2402

2221 2402
132 1962 127
391 289
44 20th Ave. 53
88 85
101 1722 15
2135 1838

1438 1490
103 1231 104
167 73
117 25th Ave. 125
57 308
92 1250 337

Existing El Camino Configuration, Delaware ramps closed

AM Peak Hour

133 1486
139 ↗ Barneson ↘ 109
81 1460
1595 1541

1619 1793
27 1479 113
21 ↗ ↖ 55
62 → Bovet-17th ← 70
262 ↘ ↙ 518
354 1717 635
2259 2706

2243 2682
739 1504
↖ 624
WB 92 Ramps
540 ↘
2058 381
2044 2439

2044 2441
727 1317
↖ 903
EB 92 Ramps
502 ↘
1538 366
1819 1904

1822 1904
311 1039 472
337 ↗ ↖ 318
58 → 20th Ave. ← 51
39 ↘ ↙ 64
121 1249 52
1142 1422

1056 1316
63 924 69
145 ↗ ↖ 55
117 → 25th Ave. ← 117
26 ↘ ↙ 298
59 1116 250

PM Peak Hour

58 1563
93 ↗ Barneson ↘ 87
48 1693
1650 1741

1896 2065
61 1727 108
94 ↗ ↖ 50
111 → Bovet-17th ← 81
628 ↘ ↙ 649
275 1921 743
3004 2939

3081 2937
853 2228
↖ 566
WB 92 Ramps
468 ↘
2371 566
2696 2937

2689 2955
813 1876
↖ 847
EB 92 Ramps
541 ↘
2108 585
2417 2693

2460 2693
111 1929 420
357 ↗ ↖ 625
78 → 20th Ave. ← 74
88 ↘ ↙ 118
101 1711 26
2135 1838

1438 1490
103 1231 104
167 ↗ ↖ 73
117 → 25th Ave. ← 125
57 ↘ ↙ 308
92 1250 337

Par-Clo El Camino Configuration, Delaware Ramps closed

AM Peak Hour

133 ↙ 1486 ↓
139 ↗ Barneson
109 ↘ ↖ 81 ↑ 1460
1595 1541

1619 1793
27 ↙ 1479 ↓ 113 ↘
21 ↗ ↖ 55
62 → Bovet-17th ← 70
262 ↘ ↙ 518
↖ 354 ↑ 1717 ↗ 635
2259 2706

2243 2682
739 ↙ 1504 ↓
↖ 624
WB 92 Ramps
↙ 540
↑ 2058 ↗ 381
2044 2439

2044 2441
727 ↙ 1317 ↓
903 ↗
EB 92 Ramps
502 ↘
↑ 1538 ↗ 366
1819 1904

1822 1904
311 ↙ 1039 ↓ 472 ↘
337 ↗ ↖ 318
58 → 20th Ave. ← 51
39 ↘ ↙ 64
↖ 121 ↑ 1249 ↗ 52
1142 1422

1056 1316
63 ↙ 924 ↓ 69 ↘
145 ↗ ↖ 55
117 → 25th Ave. ← 117
26 ↘ ↙ 298
↖ 59 ↑ 1116 ↗ 250

PM Peak Hour

58 ↙ 1563 ↓
93 ↗ Barneson
87 ↘ ↖ 48 ↑ 1693
1650 1741

1896 2065
61 ↙ 1727 ↓ 108 ↘
94 ↗ ↖ 50
111 → Bovet-17th ← 81
628 ↘ ↙ 649
↖ 275 ↑ 1921 ↗ 743
3004 2939

3081 2937
853 ↙ 2228 ↓
↖ 566
WB 92 Ramps
↙ 468
↑ 2371 ↗ 566
2696 2937

2689 2955
813 ↙ 1876 ↓
847 ↗
EB 92 Ramps
541 ↘
↑ 2108 ↗ 585
2417 2693

2460 2693
111 ↙ 1929 ↓ 420 ↘
357 ↗ ↖ 625
78 → 20th Ave. ← 74
88 ↘ ↙ 118
↖ 101 ↑ 1711 ↗ 26
2135 1838

1438 1490
103 ↙ 1231 ↓ 104 ↘
167 ↗ ↖ 73
117 → 25th Ave. ← 125
57 ↘ ↙ 308
↖ 92 ↑ 1250 ↗ 337

Appendix D:
2010 Speed Contours

Detailed interpretation of speed contour diagrams

Capital Projects Baseline (CPB)

AM Peak Period

NB101

There is a bottleneck between the off-ramp to 3rd Avenue and the on-ramp from 3rd Avenue. While the speed contour diagram indicates a break in the queue south of the loop on-ramp from EB92 and then a separate block of queuing down into the section between Ralston and Hillsdale, the animation shows that there is a continuous queue with no real break.

SB101

There is a bottleneck between the off-ramp to Hillsdale and the loop on-ramp from WB Hillsdale. The speed contour diagram indicates that there may be two other bottlenecks, one between the loop on-ramp from WB92 and the on-ramp from Fashion Island Blvd., and the other in the section just downstream of the off-ramp to the connector ramp to SR92. Review of the animation indicates that, while the former potential bottleneck may be a hidden one, there is a continuous queue from the Hillsdale bottleneck back to the SR92 off-ramp. The low speeds upstream of the SR92 off-ramp do not appear to be representative of a bottleneck, but instead represent slow speeds caused by vehicles bound for that exit ramp.

EB92

The speed contour diagrams exhibit some speeds slow enough to indicate potential bottlenecks at two locations, west of the loop off-ramp to NB101 and west of the on-ramp from Delaware. Review of the animation, however, indicates that these are not bottlenecks. The slow speeds west of the loop off-ramp are because of traffic backing up on the loop ramp because of congestion on NB101. The slow speeds at the Delaware on-ramp are because of the traffic entering the freeway. While speeds are slow at this location, review of the animation indicates that it is not a bottleneck.

There is general slowing throughout the peak period from west of the loop off-ramp to El Camino to the on-ramps from US101. There is also similar slowing just upstream of the off-ramp to Foster City Blvd. that is caused by vehicles attempting to exit there.

WB92

There are no bottlenecks in this direction during the AM peak period. The speed contour diagram shows some moderate slowing (mostly in the mid-40s mph) in four locations:

- the segment between the El Camino on-ramp from SB El Camino and the off-ramp to Alameda de las Pulgas;
- from the section east of the Delaware on-ramp to the loop on-ramp from NB El Camino;
- from the on-ramps from 101 to the Delaware off-ramp; and
- in the segment east of the off-ramp to NB101.

Review of the VISSIM animation showed that slowing is more-or-less located between El Camino and Alameda de las Pulgas and between 101 and El Camino.

PM Peak Period

NB101

There is a bottleneck in the section between the on-ramp from WB92/F.I. Blvd. and Kehoe Avenue due to a combination of the entering traffic volume and multiple lane drops. The queuing extends into the segment just north of the Hillsdale/92 weaving section. Slow traffic extends from there to the study limits. There is one time slice at the location just at the edge of the study area where the speed dips below the 35 mph "congestion" threshold, but it does not appear to be a bottleneck. There is moderate slowing south of the off-ramp to 3rd Avenue back to the bottleneck location.

SB101

There are no bottlenecks during this peak period, but there is some moderate slowing from the 92/Hillsdale weaving section back to the F.I. Blvd. on-ramp. There is some additional moderate slowing in the section between the off-ramp to SR92 and the loop on-ramp from WB92.

EB92

The speed contour diagram shows slowing through most of the model limits, specifically from the off-ramp to Edgewater back to the weaving section at El Camino. There is one time slice where the speed in the section west of the Delaware on-ramp dips 1 mph into the "congested" realm - this does not constitute a bottleneck. Near the eastern study limits, there is slow traffic just west of the off-ramp to Foster City Blvd., with speeds just dipping below 35 mph for three time slices (i.e., 45 minutes). This slowing is due to turbulence associated with a moderately high number of vehicles exiting at that off-ramp, and is not a bottleneck.

WB92

The speed contour diagram shows a bottleneck with associated queuing between the Delaware on-ramp and the off-ramp to NB El Camino. The queuing extends to where the connector ramps from US101 join SR92. The queuing also extends back along the NB-WB connector ramp nearly to NB101. There is also some moderate slowing between the on-ramp from SB El Camino and the western model limit (east of the off-ramp to Alameda de las Pulgas).

Changes with CP1

AM Peak Period

NB101

The bottleneck near 3rd Avenue would be eliminated. A bottleneck would exist instead in the section between the on-ramp from WB92/F.I. Blvd. and Kehoe Ave. The queuing would extend to the same

location as under CPB conditions, to the section between Ralston and Hillsdale, and the duration of the congestion would remain the same.

SB101

The bottleneck near Hillsdale would be eliminated. The slow traffic just upstream of the off-ramp to SR92 would still be present.

EB92

There would be essentially no change to traffic conditions.

WB92

There would be almost no change to traffic conditions - the speed contour diagram shows a few locations where speeds would increase by 2 or 3 mph to just reach the threshold above "slow" traffic" (i.e. 49/50 mph).

PM Peak Period

NB101

The moderate slowing south of 3rd Avenue would be mostly eliminated, while the remainder of the congested and slow conditions would remain essentially the same.

SB101

The moderate slowing would be eliminated in both locations.

EB92

With the exception of a few grids in the speed contour diagram where speeds would change by 1 or 2 mph and cross the "congested"/"slow" threshold (34/35 mph), traffic conditions would remain essentially the same.

WB92

There would be essentially no change to traffic conditions on WB92, although speeds would be slightly higher on the connector ramp coming from NB101 - the back of queue would not reach as far as under CPB conditions.

Changes with CP2

AM Peak Period

NB101

Traffic conditions would remain essentially the same as CPB conditions.

SB101

Traffic conditions would remain essentially the same as CPB conditions.

EB92

Most of the slowing from the CPB conditions from El Camino to US101 would be eliminated, with speeds rising to the mid-50s. Speeds just upstream of the off-ramp to Foster City Blvd. would also rise above 50 mph - this change is an indirect result of the eastbound auxiliary lane addition upstream. Vehicles bound for Foster City Blvd. would often use the left or middle lane to bypass turbulence from vehicles exiting at Edgewater, but would then have to change lanes once or twice to the right to exit at Foster City Blvd. - this caused some slowing upstream of that off-ramp. With the new auxiliary lane providing a less turbulent environment near Edgewater, fewer Foster City Blvd. vehicles would be compelled to use the left and middle lanes, thus easing their movement toward the off-ramp, resulting in higher speeds.

WB92

Much of the slowing near Delaware is mitigated under this package with the elimination of the Delaware on-ramp. There is some increased slowing near the on-ramps from El Camino because of the additional volumes entering SR92 there (rerouted from Delaware).

PM Peak Period

NB101

Traffic conditions would remain mostly the same as CPB conditions, with some increases in speeds at and behind the Hillsdale/92 weaving section. At this location, with the new eastbound and westbound auxiliary lanes, there is less slowing on the connector ramps, so less turbulence in the weaving section and upstream.

SB101

Traffic conditions would remain essentially the same as CPB conditions.

EB92

There would be similar improvements as in the AM.

WB92

The bottleneck at Delaware/El Camino would be eliminated, and almost all of the slowing from US101 to El Camino would be eliminated. There would be more significant slowing from the El Camino on-ramps because of the rerouted traffic from the closed Delaware on-ramp. Speeds during the half-hour period starting at 5:00 would drop below 35 mph, but review of the animation output does not indicate that this is a bottleneck.

Changes with CP3

AM Peak Period

NB101

The queuing south of the SR92 interchange that remained under CP1 conditions would be eliminated, with only some slight slowing south of the off-ramp to Hillsdale. This slowing is caused by large volumes exiting there - all of the Hillsdale and SR92 traffic would exit there under this project package.

SB101

Traffic conditions would remain essentially the same as for CP1 conditions.

EB92

Traffic conditions would remain nearly the same as for CPB and CP1 conditions. The only change would be a slight increase in speeds near the Delaware on-ramp and off-ramp to SB101, due to less slow traffic on the connector ramp, improving conditions slightly where the ramp connects to SR92 and upstream.

WB92

Traffic conditions would remain essentially the same as for CP1 conditions.

PM Peak Period

NB101

Traffic conditions would remain nearly the same as for CP1 conditions. The slowing at the Hillsdale/92 weaving section and upstream would be mitigated, with only some moderate slowing near the off-ramp to Hillsdale and 92, similar to AM conditions.

SB101

Traffic conditions would remain essentially the same as for CP1 conditions.

EB92

Traffic conditions would remain nearly the same as for CP1 conditions. There would be a slight decrease in speeds near the Delaware on-ramp and the off-ramp to SB101, due to weaving maneuvers.

WB92

Traffic conditions would remain essentially the same as for CP1 conditions.

Northbound US101

AM Peak Period

Capital Packages Baseline

Start	End	US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB SR-92 Off to SR-92 EB On	US-101 NB @ S of EB 92 On-Ramp	US-101 NB SR-92 EB On to SR-92 WB On	US-101 NB @ S of WB92 On-Ramp	US-101 NB Fashion Island On to Kehoe Off	US-101 NB Kehoe On to 3rd Off	US-101 NB @ S of 3rd Off-Ramp	US-101 NB N of 3rd
6:00 AM	6:15 AM	62	62	61	61	61	61	62	60	60	53	58	58	52	60
6:15 AM	6:30 AM	62	62	61	61	61	61	62	60	60	53	57	58	53	59
6:30 AM	6:45 AM	62	62	61	61	61	61	62	60	60	54	58	58	52	59
6:45 AM	7:00 AM	62	62	61	61	61	61	62	60	60	53	58	58	51	59
7:00 AM	7:15 AM	62	62	54	60	59	56	62	60	59	52	52	56	47	58
7:15 AM	7:30 AM	62	62	53	55	45	57	62	60	59	52	51	55	42	58
7:30 AM	7:45 AM	62	62	52	54	45	57	62	60	52	29	26	28	27	57
7:45 AM	8:00 AM	62	62	52	50	28	25	62	47	11	19	26	25	20	57
8:00 AM	8:15 AM	62	37	32	29	28	24	11	36	11	19	27	27	23	57
8:15 AM	8:30 AM	62	28	27	16	28	22	11	36	11	23	27	28	26	57
8:30 AM	8:45 AM	62	28	26	16	27	21	11	38	43	43	46	45	40	57
8:45 AM	9:00 AM	62	28	27	16	27	21	11	39	58	52	50	54	43	58
9:00 AM	9:15 AM	62	28	28	46	42	48	51	54	57	53	47	49	42	58
9:15 AM	9:30 AM	62	27	28	59	57	53	62	60	59	54	55	56	45	58
9:30 AM	9:45 AM	62	55	46	47	56	53	62	60	59	54	53	56	46	58
9:45 AM	10:00 AM	62	62	49	59	58	53	62	60	59	54	55	56	46	58

Capital Package 1

US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB SR-92 Off to SR-92 EB On	US-101 NB @ S of EB 92 On-Ramp	US-101 NB SR-92 EB On to SR-92 WB On	US-101 NB @ S of WB92 On-Ramp	US-101 NB Fashion Island On to Kehoe Off	US-101 NB Kehoe On to 3rd Off	US-101 NB @ S of 3rd Off-Ramp	US-101 NB N of 3rd
62	62	61	61	61	61	62	60	60	53	59	59	59	60
62	62	61	61	61	61	62	60	60	53	58	59	59	59
62	62	61	61	61	61	62	60	60	53	58	59	59	60
62	62	61	61	61	61	62	60	60	53	59	59	59	60
62	62	54	60	59	56	62	59	58	52	54	57	58	59
62	62	53	55	45	57	62	60	58	52	54	56	58	58
62	62	52	54	45	57	62	60	51	29	51	56	58	58
62	62	52	50	28	25	62	45	11	18	51	56	58	58
62	37	32	29	28	24	12	37	11	19	53	57	58	58
62	28	27	16	28	22	11	37	11	23	53	57	58	58
62	28	26	16	27	21	11	42	43	43	51	57	58	58
62	28	27	16	27	21	11	44	57	52	52	57	58	58
62	28	28	46	42	47	50	53	56	52	49	57	57	58
62	27	28	59	57	54	62	59	58	53	55	58	58	59
62	55	46	49	56	53	62	60	58	53	55	58	58	59
62	62	49	59	58	54	62	60	58	53	57	58	58	59

Southbound US101

AM Peak Period

Capital Packages Baseline

Start	End	US-101 SB N of 3rd	US-101 SB 3rd On to SR-92 Off	US-101 SB @ N of 92 Off-Ramps	US-101 SB SR-92 Off to SR-92 WB On	US-101 @ N of WB 92 On-Ramp	US-101 SB SR-92 WB On to Fashion Island On	US-101 SB Fashion Island On to SR-92 EB On	US-101 SB SR-92 EB On to Hillsdale Off	US-101 SB @ N of Hillsdale Loop On-Ramp	US-101 SB Hillsdale On to Ralston Off	US-101 SB Ralston On to Harbor Off	US-101 SB S of Harbor
6:00 AM	6:15 AM	63	62	59	62	56	58	61	59	59	61	60	60
6:15 AM	6:30 AM	63	62	59	62	57	58	61	59	59	60	60	60
6:30 AM	6:45 AM	63	62	59	62	56	58	61	59	59	60	60	60
6:45 AM	7:00 AM	62	62	59	62	56	58	61	59	59	60	60	60
7:00 AM	7:15 AM	62	58	56	58	46	53	57	53	53	56	56	56
7:15 AM	7:30 AM	62	27	26	58	46	52	56	50	52	55	53	53
7:30 AM	7:45 AM	62	26	24	58	45	52	56	49	52	55	53	53
7:45 AM	8:00 AM	62	26	24	38	11	49	57	54	49	56	54	54
8:00 AM	8:15 AM	62	54	48	23	11	39	37	29	36	57	56	56
8:15 AM	8:30 AM	62	57	55	14	11	32	16	29	42	53	52	52
8:30 AM	8:45 AM	62	57	55	11	34	36	17	35	51	54	53	53
8:45 AM	9:00 AM	62	57	54	11	36	28	16	27	52	55	54	54
9:00 AM	9:15 AM	62	61	59	11	35	28	30	27	52	56	55	55
9:15 AM	9:30 AM	62	61	60	49	36	53	31	28	52	58	57	57
9:30 AM	9:45 AM	62	61	60	53	36	54	32	29	53	58	57	57
9:45 AM	10:00 AM	62	61	60	52	36	54	31	29	52	58	58	58

Capital Package 1

US-101 SB N of 3rd	US-101 SB 3rd On to SR-92 Off	US-101 SB @ N of 92 Off-Ramps	US-101 SB SR-92 Off to SR-92 WB On	US-101 @ N of WB 92 On-Ramp	US-101 SB SR-92 WB On to Fashion Island On	US-101 SB Fashion Island On to SR-92 EB On	US-101 SB SR-92 EB On to Hillsdale Off	US-101 SB @ N of Hillsdale Loop On-Ramp	US-101 SB Hillsdale On to Ralston Off	US-101 SB Ralston On to Harbor Off	US-101 SB S of Harbor
63	62	62	62	57	59	61	60	60	60	60	60
63	62	62	62	57	59	61	60	60	59	60	60
63	62	62	62	56	58	61	60	60	60	60	60
62	62	62	62	57	59	61	60	60	59	60	60
62	58	58	58	53	54	57	55	55	54	55	56
62	27	28	58	52	53	57	55	55	53	53	53
62	26	26	58	53	53	57	55	55	52	53	54
62	26	26	58	52	53	57	55	54	52	53	53
62	54	52	57	52	53	56	54	54	52	54	54
62	57	56	57	53	53	57	54	54	52	54	54
62	57	56	57	53	53	56	53	54	52	54	54
62	57	56	57	53	53	56	54	54	52	54	54
62	61	60	60	56	56	59	55	56	55	56	56
62	61	60	61	56	57	60	55	57	56	58	58
62	61	60	61	56	57	60	56	57	56	58	58
62	61	60	61	56	57	60	56	57	56	58	58

Eastbound SR92

AM Peak Period

Capital Packages Baseline

Start	End	SR-92 EB @ W of El Camino Real Off-Ramp	SR-92 EB S El Camino Off to S El Camino On	SR-92 EB @ W of El Camino Real Loop On-Ramp	SR-92 EB @ W of El Camino Real Loop Off-Ramp	SR-92 EB @ W of El Camino Real Direct On-Ramp	SR-92 EB @ W of Delaware Off-Ramp	SR-92 EB Delaware Off to Delaware On	SR-92 EB @ W of Delaware On-Ramp	SR-92 EB @ W of SB 101 Off-Ramp	SR-92 EB @ W of NB 101 Off-Ramp	SR-92 EB US-101 NB Off to US-101 On	SR-92 EB @ W of 101 On-Ramps	SR-92 EB @ W of Egewater Off-Ramp	SR-92 EB Emerald Bay On to Foster City Off	SR-92 EB @ W of Foster City Off-Ramp	SR-92 EB E of Foster City
6:00 AM	6:15 AM	58	57	53	49	50	51	50	46	50	48	52	53	57	60	58	59
6:15 AM	6:30 AM	58	57	53	49	50	51	50	45	50	42	50	51	57	60	58	58
6:30 AM	6:45 AM	58	57	53	49	50	51	50	45	50	42	50	51	56	60	58	58
6:45 AM	7:00 AM	58	57	53	49	50	51	50	46	50	41	49	51	56	60	58	58
7:00 AM	7:15 AM	56	57	54	47	45	47	43	37	44	37	46	47	55	55	49	58
7:15 AM	7:30 AM	56	56	54	47	45	47	43	37	44	38	46	47	55	54	47	58
7:30 AM	7:45 AM	55	56	54	47	45	47	43	38	40	37	46	47	55	54	47	58
7:45 AM	8:00 AM	56	56	54	47	45	47	43	37	39	37	46	47	55	54	46	59
8:00 AM	8:15 AM	55	56	53	44	42	44	39	32	35	28	45	46	52	52	44	59
8:15 AM	8:30 AM	53	55	52	42	41	43	35	29	36	28	43	44	52	51	43	60
8:30 AM	8:45 AM	53	54	51	42	41	43	36	30	39	28	44	44	51	51	41	59
8:45 AM	9:00 AM	54	55	51	43	42	44	38	31	39	28	44	45	52	51	42	60
9:00 AM	9:15 AM	54	55	52	44	44	46	41	32	41	42	46	45	51	55	49	54
9:15 AM	9:30 AM	55	56	52	45	44	46	40	33	41	42	46	45	51	56	50	53
9:30 AM	9:45 AM	54	56	52	45	44	46	41	33	42	42	47	46	50	56	50	53
9:45 AM	10:00 AM	56	56	52	45	44	46	41	33	42	41	46	45	51	56	51	52

Capital Package 1

Start	End	SR-92 EB @ W of El Camino Real Off-Ramp	SR-92 EB S El Camino Off to S El Camino On	SR-92 EB @ W of El Camino Real Loop On-Ramp	SR-92 EB @ W of El Camino Real Loop Off-Ramp	SR-92 EB @ W of El Camino Real Direct On-Ramp	SR-92 EB @ W of Delaware Off-Ramp	SR-92 EB Delaware Off to Delaware On	SR-92 EB @ W of Delaware On-Ramp	SR-92 EB @ W of SB 101 Off-Ramp	SR-92 EB @ W of NB 101 Off-Ramp	SR-92 EB US-101 NB Off to US-101 On	SR-92 EB @ W of 101 On-Ramps	SR-92 EB @ W of Egewater Off-Ramp	SR-92 EB Emerald Bay On to Foster City Off	SR-92 EB @ W of Foster City Off-Ramp	SR-92 EB E of Foster City
6:00 AM	6:15 AM	58	57	53	49	50	51	50	46	50	48	53	53	57	60	58	59
6:15 AM	6:30 AM	58	57	53	49	50	51	50	45	50	42	50	51	57	60	58	58
6:30 AM	6:45 AM	58	57	53	49	50	51	50	45	50	42	50	52	56	60	58	58
6:45 AM	7:00 AM	58	57	53	49	50	51	50	46	50	41	49	51	56	60	58	58
7:00 AM	7:15 AM	56	57	54	47	45	47	43	38	44	38	46	48	55	55	49	58
7:15 AM	7:30 AM	56	57	54	47	45	47	43	37	45	38	46	47	55	54	47	58
7:30 AM	7:45 AM	55	56	54	47	45	47	43	37	39	37	46	47	55	54	47	58
7:45 AM	8:00 AM	56	56	54	47	45	47	42	37	39	38	46	47	55	54	47	58
8:00 AM	8:15 AM	55	56	53	44	42	44	39	33	35	28	44	45	53	52	44	59
8:15 AM	8:30 AM	54	56	52	43	42	44	38	32	39	28	44	44	51	51	42	60
8:30 AM	8:45 AM	54	55	52	43	41	44	37	30	39	28	43	44	52	52	42	59
8:45 AM	9:00 AM	54	55	51	43	42	44	39	31	39	28	44	45	52	52	42	60
9:00 AM	9:15 AM	54	55	52	45	44	46	41	33	42	41	46	45	52	55	48	54
9:15 AM	9:30 AM	55	56	53	45	44	46	41	33	42	42	46	45	51	56	51	53
9:30 AM	9:45 AM	54	56	52	45	44	46	41	33	42	42	45	45	51	56	50	53
9:45 AM	10:00 AM	56	56	52	45	44	46	41	33	42	42	46	45	51	56	50	52

Westbound SR92

AM Peak Period

Capital Packages Baseline

Start	End	SR-92 WB E of Foster City	SR-92 WB Foster City On to Baker Way Off	SR-92 WB @ E of Edgewater Off-Ramp	SR-92 WB @ E of NB 101 Off-Ramp	SR-92 WB US-101 NB Off to US-101 SB Off	SR-92 WB @ E of SB 101 Off-Ramp	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On	SR-92 WB @ E of Delaware On-Ramp	SR-92 WB @ E of El Camino Real NB Off-Ramp	SR-92 WB @ E of El Camino Real NB On-Ramp	SR-92 WB @ E of El Camino Real SB Off-Ramp	SR-92 WB N El Camino Off to N El Camino On	SR-92 WB @ E of El Camino Real SB On-Ramp	SR-92 WB @ E of Alameda De Las Pulgas Off-Ramp
6:00 AM	6:15 AM	58	57	57	54	57	57	53	57	60	58	55	58	56	57	56	57
6:15 AM	6:30 AM	58	57	57	54	56	57	52	57	60	58	55	59	57	58	57	56
6:30 AM	6:45 AM	58	57	57	54	57	57	52	57	60	58	55	59	57	58	57	57
6:45 AM	7:00 AM	58	57	57	54	57	57	52	57	60	58	55	58	56	58	57	57
7:00 AM	7:15 AM	58	56	55	55	56	54	50	56	59	54	53	55	55	58	54	50
7:15 AM	7:30 AM	58	56	54	55	56	52	49	54	57	51	52	52	54	58	54	48
7:30 AM	7:45 AM	58	56	55	55	56	54	48	52	57	50	51	52	54	58	54	46
7:45 AM	8:00 AM	58	55	56	55	56	54	49	52	56	49	51	51	54	57	54	47
8:00 AM	8:15 AM	58	55	55	46	55	55	38	52	55	48	51	51	53	57	54	46
8:15 AM	8:30 AM	58	55	56	46	54	50	36	50	53	47	49	50	53	57	53	45
8:30 AM	8:45 AM	58	55	55	46	55	53	36	49	53	46	48	48	52	57	53	46
8:45 AM	9:00 AM	58	55	54	46	55	54	36	49	53	47	47	47	52	57	53	45
9:00 AM	9:15 AM	58	56	56	55	57	54	39	40	52	49	50	51	53	57	53	49
9:15 AM	9:30 AM	58	56	56	55	57	56	42	41	55	52	51	53	53	57	54	51
9:30 AM	9:45 AM	58	57	56	55	57	55	40	41	54	50	51	53	53	57	54	51
9:45 AM	10:00 AM	58	57	56	55	57	55	40	42	55	53	52	54	54	57	54	51

Capital Package 1

Start	End	SR-92 WB E of Foster City	SR-92 WB Foster City On to Baker Way Off	SR-92 WB @ E of Edgewater Off-Ramp	SR-92 WB @ E of NB 101 Off-Ramp	SR-92 WB US-101 NB Off to US-101 SB Off	SR-92 WB @ E of SB 101 Off-Ramp	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On	SR-92 WB @ E of Delaware On-Ramp	SR-92 WB @ E of El Camino Real NB Off-Ramp	SR-92 WB @ E of El Camino Real NB On-Ramp	SR-92 WB @ E of El Camino Real SB Off-Ramp	SR-92 WB N El Camino Off to N El Camino On	SR-92 WB @ E of El Camino Real SB On-Ramp	SR-92 WB @ E of Alameda De Las Pulgas Off-Ramp
6:00 AM	6:15 AM	58	57	57	54	57	57	53	57	60	58	55	58	56	57	56	57
6:15 AM	6:30 AM	58	57	57	54	56	57	52	57	60	58	55	59	57	58	57	56
6:30 AM	6:45 AM	58	57	57	54	57	57	52	57	60	58	55	59	57	58	57	57
6:45 AM	7:00 AM	58	57	57	54	57	57	52	57	60	58	55	58	56	58	57	57
7:00 AM	7:15 AM	58	56	55	55	56	54	50	55	59	53	53	54	55	58	54	49
7:15 AM	7:30 AM	58	56	54	55	56	52	49	53	58	50	52	53	54	58	54	46
7:30 AM	7:45 AM	58	56	55	55	56	54	48	52	57	51	52	52	54	58	54	46
7:45 AM	8:00 AM	58	55	56	55	56	54	48	53	58	51	52	51	54	57	54	47
8:00 AM	8:15 AM	58	55	55	46	55	55	38	53	57	50	50	50	53	57	54	45
8:15 AM	8:30 AM	58	55	56	46	55	55	37	51	55	48	49	50	53	57	54	45
8:30 AM	8:45 AM	58	55	55	46	55	53	36	51	54	47	50	49	53	57	53	45
8:45 AM	9:00 AM	58	55	54	46	55	54	35	52	55	48	48	49	53	57	53	44
9:00 AM	9:15 AM	58	56	56	55	57	54	38	41	53	50	51	52	53	57	54	49
9:15 AM	9:30 AM	58	56	56	55	57	56	43	41	55	53	52	54	53	57	55	51
9:30 AM	9:45 AM	58	57	56	55	57	55	41	41	54	52	51	53	53	57	54	51
9:45 AM	10:00 AM	58	57	56	55	57	55	40	42	54	52	52	54	54	58	54	50

Northbound US101 to Westbound SR92

AM Peak Period

Capital Packages Baseline

Start	End	US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB Off to SR-92 WB Connector Ramp	US-101 NB Off to SR-92 WB @ Midpoint	US-101 NB Off to SR-92 WB @ Endpoint	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On
6:00 AM	6:15 AM	62	62	61	61	61	61	62	55	51	53	57	60
6:15 AM	6:30 AM	62	62	61	61	61	61	62	56	51	52	57	60
6:30 AM	6:45 AM	62	62	61	61	61	61	62	55	51	52	57	60
6:45 AM	7:00 AM	62	62	61	61	61	61	62	55	51	52	57	60
7:00 AM	7:15 AM	62	62	54	60	59	56	62	54	53	50	56	59
7:15 AM	7:30 AM	62	62	53	55	45	57	61	54	53	49	54	57
7:30 AM	7:45 AM	62	62	52	54	45	57	61	54	52	48	52	57
7:45 AM	8:00 AM	62	62	52	50	28	25	59	54	53	49	52	56
8:00 AM	8:15 AM	62	37	32	29	28	24	58	54	49	38	52	55
8:15 AM	8:30 AM	62	28	27	16	28	22	58	54	47	36	50	53
8:30 AM	8:45 AM	62	28	26	16	27	21	57	54	47	36	49	53
8:45 AM	9:00 AM	62	28	27	16	27	21	57	54	47	36	49	53
9:00 AM	9:15 AM	62	28	28	46	42	48	59	53	49	39	40	52
9:15 AM	9:30 AM	62	27	28	59	57	53	60	54	52	42	41	55
9:30 AM	9:45 AM	62	55	46	47	56	53	60	54	51	40	41	54
9:45 AM	10:00 AM	62	62	49	59	58	53	61	54	51	40	42	55

Capital Package 1

Start	End	US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB Off to SR-92 WB Connector Ramp	US-101 NB Off to SR-92 WB @ Midpoint	US-101 NB Off to SR-92 WB @ Endpoint	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On
6:00 AM	6:15 AM	62	62	61	61	61	61	62	55	51	53	57	60
6:15 AM	6:30 AM	62	62	61	61	61	61	62	56	51	52	57	60
6:30 AM	6:45 AM	62	62	61	61	61	61	62	55	51	52	57	60
6:45 AM	7:00 AM	62	62	61	61	61	61	62	55	51	52	57	60
7:00 AM	7:15 AM	62	62	54	60	59	56	62	54	53	50	55	59
7:15 AM	7:30 AM	62	62	53	55	45	57	61	54	53	49	53	58
7:30 AM	7:45 AM	62	62	52	54	45	57	61	54	52	48	52	57
7:45 AM	8:00 AM	62	62	52	50	28	25	59	54	52	48	53	58
8:00 AM	8:15 AM	62	37	32	29	28	24	58	54	49	38	53	57
8:15 AM	8:30 AM	62	28	27	16	28	22	58	54	47	37	51	55
8:30 AM	8:45 AM	62	28	26	16	27	21	57	53	46	36	51	54
8:45 AM	9:00 AM	62	28	27	16	27	21	57	54	46	35	52	55
9:00 AM	9:15 AM	62	28	28	46	42	47	59	53	48	38	41	53
9:15 AM	9:30 AM	62	27	28	59	57	54	61	54	52	43	41	55
9:30 AM	9:45 AM	62	55	46	49	56	53	60	54	51	41	41	54
9:45 AM	10:00 AM	62	62	49	59	58	54	61	54	51	40	42	54

Northbound US101

PM Peak Period

Capital Packages Baseline

Start	End	US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB SR-92 Off to SR-92 EB On	US-101 NB @ S of EB 92 On-Ramp	US-101 NB SR-92 EB On to SR-92 WB On	US-101 NB @ S of WB92 On-Ramp	US-101 NB Fashion Island On to Kehoe Off	US-101 NB Kehoe On to 3rd Off	US-101 NB @ S of 3rd Off-Ramp	US-101 NB N of 3rd
2:30 PM	2:45 PM	57	58	56	58	56	55	59	57	57	56	53	57	50	59
2:45 PM	3:00 PM	57	58	56	56	56	56	59	57	57	55	53	57	48	58
3:00 PM	3:15 PM	57	58	56	57	56	55	59	57	57	55	51	57	48	58
3:15 PM	3:30 PM	57	58	56	57	56	55	59	57	57	55	53	56	48	58
3:30 PM	3:45 PM	57	58	56	57	56	55	59	57	57	55	50	56	48	58
3:45 PM	4:00 PM	57	58	56	52	44	57	59	57	57	55	50	56	48	58
4:00 PM	4:15 PM	57	58	56	52	43	57	59	57	57	55	52	56	48	58
4:15 PM	4:30 PM	57	58	55	52	43	57	59	57	57	55	51	55	48	58
4:30 PM	4:45 PM	51	57	51	49	44	57	59	57	57	54	42	52	47	58
4:45 PM	5:00 PM	40	53	49	50	44	57	59	57	57	54	38	46	48	57
5:00 PM	5:15 PM	37	49	48	50	44	57	59	57	57	53	37	45	36	57
5:15 PM	5:30 PM	33	50	50	52	52	55	24	23	23	29	44	47	36	58
5:30 PM	5:45 PM	35	42	42	41	38	37	24	23	23	30	45	48	36	58
5:45 PM	6:00 PM	35	38	43	49	51	50	24	23	23	30	51	54	47	58
6:00 PM	6:15 PM	39	44	48	52	54	55	55	24	49	30	45	51	47	58
6:15 PM	6:30 PM	41	51	51	53	55	56	58	56	51	29	45	50	46	58
6:30 PM	6:45 PM	49	54	52	56	55	55	59	57	58	55	46	48	47	58
6:45 PM	7:00 PM	56	56	55	58	57	57	59	57	58	55	53	56	50	58
7:00 PM	7:15 PM	58	58	56	58	57	57	59	57	58	55	54	57	50	58
7:15 PM	7:30 PM	58	58	55	58	57	57	59	57	58	56	55	57	50	59

Capital Package 1

US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB SR-92 Off to SR-92 EB On	US-101 NB @ S of EB 92 On-Ramp	US-101 NB SR-92 EB On to SR-92 WB On	US-101 NB @ S of WB92 On-Ramp	US-101 NB Fashion Island On to Kehoe Off	US-101 NB Kehoe On to 3rd Off	US-101 NB @ S of 3rd Off-Ramp	US-101 NB N of 3rd
57	58	56	58	56	55	59	57	57	55	55	58	57	59
57	58	56	56	56	56	59	57	57	55	53	58	57	58
57	58	56	57	56	55	59	57	57	55	52	57	56	58
57	58	56	57	56	55	59	57	57	55	53	58	57	58
57	58	56	57	56	55	59	57	57	54	53	57	57	58
57	58	56	52	44	57	59	57	57	55	53	57	56	58
57	58	56	52	43	57	59	57	57	54	53	57	57	58
57	58	55	52	43	57	59	57	57	55	53	57	57	58
51	57	51	49	44	57	59	57	57	54	46	57	56	58
40	53	49	50	44	57	59	57	57	54	46	57	56	58
37	49	48	50	44	57	59	57	57	54	43	57	55	58
33	50	50	52	52	55	28	27	28	32	50	57	57	58
35	43	44	46	42	42	28	27	28	32	51	57	57	58
38	46	49	53	55	56	28	27	28	30	51	57	57	58
45	52	52	55	55	55	57	28	46	27	48	57	57	58
47	57	55	57	56	56	59	56	49	26	46	57	57	58
53	58	54	57	56	56	59	57	57	51	49	57	57	58
57	58	55	58	58	57	59	57	58	55	55	58	58	59
58	58	55	58	57	57	59	57	57	55	54	58	57	59
58	58	55	58	57	57	59	57	58	55	56	58	57	59

Southbound US101

PM Peak Period

Capital Packages Baseline

Start	End	US-101 SB N of 3rd	US-101 SB 3rd On to SR-92 Off	US-101 SB @ N of 92 Off-Ramps	US-101 SB SR-92 Off to SR-92 WB On	US-101 @ N of WB 92 On-Ramp	US-101 SB SR-92 WB On to Fashion Island On	US-101 SB Fashion Island On to SR-92 EB On	US-101 SB SR-92 EB On to Hillsdale Off	US-101 SB @ N of Hillsdale Loop On-Ramp	US-101 SB Hillsdale On to Ralston Off	US-101 SB Ralston On to Harbor Off	US-101 SB S of Harbor
2:30 PM	2:45 PM	62	62	61	54	49	58	61	52	56	57	58	59
2:45 PM	3:00 PM	62	62	61	54	49	58	60	52	56	56	57	57
3:00 PM	3:15 PM	62	62	61	54	49	58	60	51	55	56	57	57
3:15 PM	3:30 PM	62	62	61	54	49	58	60	51	55	56	57	57
3:30 PM	3:45 PM	62	62	61	54	49	58	60	52	55	56	57	57
3:45 PM	4:00 PM	62	62	61	54	49	58	60	52	55	56	57	57
4:00 PM	4:15 PM	62	62	61	54	49	58	60	52	55	56	57	57
4:15 PM	4:30 PM	62	62	61	54	49	58	60	52	55	56	57	57
4:30 PM	4:45 PM	62	62	61	54	48	57	60	51	55	56	56	57
4:45 PM	5:00 PM	62	62	61	54	48	57	60	51	55	55	56	57
5:00 PM	5:15 PM	62	62	61	54	48	57	45	43	54	55	56	56
5:15 PM	5:30 PM	62	62	61	45	49	58	45	43	53	55	56	57
5:30 PM	5:45 PM	62	62	61	44	48	57	45	43	54	55	57	57
5:45 PM	6:00 PM	62	62	62	43	48	57	45	43	54	56	57	57
6:00 PM	6:15 PM	62	62	62	44	48	57	45	43	55	56	57	57
6:15 PM	6:30 PM	62	62	61	44	48	56	60	51	55	57	57	58
6:30 PM	6:45 PM	62	62	62	54	48	57	60	51	56	57	57	58
6:45 PM	7:00 PM	62	62	62	54	48	57	60	51	56	57	57	58
7:00 PM	7:15 PM	62	62	62	54	48	57	60	49	54	55	56	57
7:15 PM	7:30 PM	62	62	62	54	48	57	60	51	56	57	57	57

Capital Package 1

US-101 SB N of 3rd	US-101 SB 3rd On to SR-92 Off	US-101 SB @ N of 92 Off-Ramps	US-101 SB SR-92 Off to SR-92 WB On	US-101 @ N of WB 92 On-Ramp	US-101 SB SR-92 WB On to Fashion Island On	US-101 SB Fashion Island On to SR-92 EB On	US-101 SB SR-92 EB On to Hillsdale Off	US-101 SB @ N of Hillsdale Loop On-Ramp	US-101 SB Hillsdale On to Ralston Off	US-101 SB Ralston On to Harbor Off	US-101 SB S of Harbor
62	62	61	63	56	58	60	53	57	56	58	59
62	62	61	63	55	58	60	53	56	55	57	57
62	62	61	63	55	58	60	52	56	55	57	57
62	62	61	63	55	58	60	52	56	55	57	57
62	62	61	63	56	58	60	53	56	55	57	57
62	62	61	63	56	58	60	53	56	55	57	57
62	62	61	63	55	58	60	53	56	55	57	57
62	62	61	63	56	58	60	53	56	55	57	57
62	62	61	63	55	58	60	52	56	55	57	57
62	62	61	63	55	58	60	52	56	55	56	57
62	62	61	63	55	58	60	52	56	55	57	57
62	62	61	63	55	58	60	52	56	55	57	57
62	62	61	63	54	57	60	52	56	55	57	57
62	62	62	63	54	57	60	53	56	55	57	58
62	62	62	63	53	57	60	53	56	56	57	58
62	62	61	63	53	57	60	52	56	56	57	58
62	62	61	63	54	57	60	53	56	56	57	58
62	62	62	63	54	58	60	53	56	56	58	58
62	62	62	63	54	57	60	51	55	54	56	57
62	62	62	63	54	58	60	53	56	56	57	57

Eastbound SR92

PM Peak Period

Capital Packages Baseline

Start	End	SR-92 EB @ W of El Camino Real Off-Ramp	SR-92 EB S El Camino Off to S El Camino On	SR-92 EB @ W of El Camino Real Loop On-Ramp	SR-92 EB @ W of El Camino Real Loop Off-Ramp	SR-92 EB @ W of El Camino Real Direct On-Ramp	SR-92 EB @ W of Delaware Off-Ramp	SR-92 EB Delaware Off to Delaware On	SR-92 EB @ W of Delaware On-Ramp	SR-92 EB @ W of SB 101 Off-Ramp	SR-92 EB @ W of NB 101 Off-Ramp	SR-92 EB US-101 NB Off to US-101 On	SR-92 EB @ W of 101 On-Ramps	SR-92 EB @ W of Egewater Off-Ramp	SR-92 EB Emerald Bay On to Foster City Off	SR-92 EB @ W of Foster City Off-Ramp	SR-92 EB E of Foster City
2:30 PM	2:45 PM	56	57	57	46	39	42	38	36	39	40	46	45	52	55	48	55
2:45 PM	3:00 PM	55	57	57	46	39	42	39	36	39	38	46	44	51	54	45	53
3:00 PM	3:15 PM	55	57	57	46	40	43	39	37	39	39	46	45	51	55	48	53
3:15 PM	3:30 PM	55	58	57	46	40	43	39	37	39	39	46	44	50	54	47	53
3:30 PM	3:45 PM	54	57	56	46	39	42	39	37	40	39	45	42	49	54	42	53
3:45 PM	4:00 PM	55	57	56	45	38	42	38	36	39	39	45	40	49	53	38	52
4:00 PM	4:15 PM	54	57	56	45	38	42	38	36	39	37	44	38	49	53	38	52
4:15 PM	4:30 PM	54	57	56	45	38	42	38	35	39	38	44	39	48	53	38	52
4:30 PM	4:45 PM	52	57	56	44	38	43	37	35	39	38	45	39	48	53	36	52
4:45 PM	5:00 PM	51	57	56	43	38	42	36	35	38	39	44	37	48	53	34	51
5:00 PM	5:15 PM	51	57	56	44	37	41	36	34	38	38	43	35	48	53	34	51
5:15 PM	5:30 PM	52	57	56	44	37	42	37	35	38	38	43	35	48	53	33	51
5:30 PM	5:45 PM	53	57	56	48	42	45	41	39	41	42	47	44	51	55	43	53
5:45 PM	6:00 PM	53	57	57	47	42	45	42	40	42	42	48	44	51	55	45	54
6:00 PM	6:15 PM	53	57	56	47	41	45	42	39	42	42	48	45	51	55	45	54
6:15 PM	6:30 PM	53	57	56	47	42	46	42	40	42	43	47	45	51	55	44	55
6:30 PM	6:45 PM	56	57	57	47	44	46	43	41	43	44	48	46	52	56	46	55
6:45 PM	7:00 PM	56	58	57	47	44	47	44	43	43	45	49	47	52	56	48	55
7:00 PM	7:15 PM	56	57	57	43	37	39	36	35	37	39	43	41	50	53	40	52
7:15 PM	7:30 PM	56	58	57	47	42	44	41	40	42	43	47	46	52	55	47	55

Capital Package 1

SR-92 EB @ W of El Camino Real Off-Ramp	SR-92 EB S El Camino Off to S El Camino On	SR-92 EB @ W of El Camino Real Loop On-Ramp	SR-92 EB @ W of El Camino Real Loop Off-Ramp	SR-92 EB @ W of El Camino Real Direct On-Ramp	SR-92 EB @ W of Delaware Off-Ramp	SR-92 EB Delaware Off to Delaware On	SR-92 EB @ W of Delaware On-Ramp	SR-92 EB @ W of SB 101 Off-Ramp	SR-92 EB @ W of NB 101 Off-Ramp	SR-92 EB US-101 NB Off to US-101 On	SR-92 EB @ W of 101 On-Ramps	SR-92 EB @ W of Egewater Off-Ramp	SR-92 EB Emerald Bay On to Foster City Off	SR-92 EB @ W of Foster City Off-Ramp	SR-92 EB E of Foster City
56	57	57	45	39	42	38	36	40	40	47	45	52	55	49	55
55	57	57	46	39	42	39	37	40	39	46	45	51	54	47	53
55	57	57	46	40	43	39	36	39	39	46	44	51	54	47	53
55	58	57	46	41	44	39	37	39	39	46	44	51	55	47	53
54	57	56	46	39	43	39	37	40	39	45	42	49	54	40	53
55	57	56	45	38	42	38	36	39	39	44	40	49	53	38	52
54	57	56	45	38	42	38	36	39	38	44	38	48	53	37	52
54	57	56	46	38	42	37	36	40	38	44	39	49	53	37	52
52	57	56	45	38	42	37	36	38	38	44	39	49	53	36	52
51	57	56	44	38	42	36	35	38	37	43	37	48	53	33	51
51	57	56	44	37	41	36	34	38	38	43	35	48	53	35	51
52	57	56	44	37	41	36	34	38	38	43	35	48	53	35	50
53	57	56	48	42	45	41	39	41	42	47	43	51	55	42	53
53	57	57	48	42	46	42	40	42	43	48	45	52	55	45	54
53	57	56	47	41	45	41	40	42	43	48	45	51	55	46	55
53	57	56	47	42	46	42	40	42	42	47	44	51	55	44	54
56	57	57	47	44	47	44	42	43	44	49	47	52	56	48	55
56	58	57	47	44	47	44	43	43	45	48	47	53	56	49	55
56	57	57	43	37	39	36	34	37	40	43	42	50	54	42	52
56	58	57	47	42	44	41	40	42	44	47	46	52	56	47	55

Westbound SR92

PM Peak Period

Capital Packages Baseline

Start	End	SR-92 WB E of Foster City	SR-92 WB Foster City On to Baker Way Off	SR-92 WB @ E of Edgewater Off-Ramp	SR-92 WB @ E of NB 101 Off-Ramp	SR-92 WB US-101 NB Off to US-101 SB Off	SR-92 WB @ E of SB 101 Off-Ramp	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On	SR-92 WB @ E of Delaware On-Ramp	SR-92 WB @ E of El Camino Real NB Off-Ramp	SR-92 WB @ E of El Camino Real NB On-Ramp	SR-92 WB @ E of El Camino Real SB Off-Ramp	SR-92 WB N El Camino Off to N El Camino On	SR-92 WB @ E of El Camino Real SB On-Ramp	SR-92 WB @ E of Alameda De Las Pulgas Off-Ramp
2:30 PM	2:45 PM	58	58	57	58	58	56	55	54	58	54	52	55	54	57	54	45
2:45 PM	3:00 PM	58	58	57	58	58	56	54	52	57	51	51	53	53	57	54	44
3:00 PM	3:15 PM	58	58	58	58	58	55	53	53	58	51	51	54	53	57	54	46
3:15 PM	3:30 PM	58	58	57	58	58	56	53	53	58	52	51	54	53	57	54	45
3:30 PM	3:45 PM	58	58	57	58	58	54	53	51	56	51	50	54	53	57	53	47
3:45 PM	4:00 PM	58	58	57	58	58	54	53	52	57	51	50	53	53	57	53	45
4:00 PM	4:15 PM	58	58	57	58	58	54	53	50	56	50	50	52	53	57	53	46
4:15 PM	4:30 PM	58	58	57	58	58	54	53	53	57	51	50	53	53	57	53	45
4:30 PM	4:45 PM	58	58	56	57	57	49	53	50	56	51	49	52	53	56	51	44
4:45 PM	5:00 PM	58	58	55	57	57	48	53	48	54	49	47	49	51	53	47	45
5:00 PM	5:15 PM	58	57	55	55	56	48	54	47	53	47	45	48	51	53	46	45
5:15 PM	5:30 PM	58	57	55	55	56	49	26	21	29	32	48	55	54	56	52	46
5:30 PM	5:45 PM	58	58	54	56	57	51	19	21	29	31	49	56	54	57	52	44
5:45 PM	6:00 PM	58	58	53	57	57	51	38	39	49	44	47	50	52	56	50	45
6:00 PM	6:15 PM	58	58	54	57	57	51	54	50	56	49	49	53	53	56	53	46
6:15 PM	6:30 PM	58	58	54	57	58	51	54	51	57	52	50	53	53	56	52	45
6:30 PM	6:45 PM	58	58	57	58	58	55	54	53	58	51	51	55	53	57	55	49
6:45 PM	7:00 PM	58	58	58	58	58	56	54	55	58	53	51	56	53	57	54	51
7:00 PM	7:15 PM	58	58	57	58	58	56	56	54	58	53	51	56	54	57	53	50
7:15 PM	7:30 PM	58	58	57	58	58	56	55	55	58	54	51	57	54	57	55	51

Capital Package 1

SR-92 WB E of Foster City	SR-92 WB Foster City On to Baker Way Off	SR-92 WB @ E of Edgewater Off-Ramp	SR-92 WB @ E of NB 101 Off-Ramp	SR-92 WB US-101 NB Off to US-101 SB Off	SR-92 WB @ E of SB 101 Off-Ramp	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On	SR-92 WB @ E of Delaware On-Ramp	SR-92 WB @ E of El Camino Real NB Off-Ramp	SR-92 WB @ E of El Camino Real NB On-Ramp	SR-92 WB @ E of El Camino Real SB Off-Ramp	SR-92 WB N El Camino Off to N El Camino On	SR-92 WB @ E of El Camino Real SB On-Ramp	SR-92 WB @ E of Alameda De Las Pulgas Off-Ramp
58	58	57	58	58	56	55	54	58	54	51	56	54	57	54	46
58	58	57	58	58	56	54	53	58	50	50	53	53	57	55	44
58	58	58	58	58	55	53	53	58	51	51	54	53	57	54	46
58	58	57	58	58	56	53	53	58	53	51	54	53	57	54	45
58	58	57	58	58	54	53	51	57	51	50	53	53	57	53	46
58	58	57	58	58	54	53	52	57	50	50	53	53	57	54	44
58	58	57	58	58	54	53	51	56	51	50	53	53	57	54	45
58	58	57	58	58	54	53	52	57	52	50	52	53	57	53	46
58	58	56	57	57	49	54	50	56	52	48	52	53	56	51	45
58	58	55	57	57	48	53	47	53	49	47	48	51	54	48	45
58	57	55	56	56	48	53	46	53	49	46	49	51	52	46	45
58	57	55	55	56	50	26	21	29	32	48	55	54	56	51	45
58	58	54	56	57	52	25	29	27	30	46	52	53	56	51	44
58	58	53	57	57	51	53	49	53	47	48	52	53	56	52	45
58	58	54	57	57	51	54	51	57	52	50	54	54	56	52	46
58	58	54	57	58	51	54	51	56	52	50	53	53	57	53	46
58	58	57	58	58	55	54	55	58	51	51	55	53	57	55	50
58	58	58	58	58	56	54	55	58	53	51	56	54	57	55	51
58	58	57	58	58	56	55	54	58	53	51	56	54	57	54	51
58	58	57	58	58	56	55	54	58	54	51	56	54	57	55	51

Northbound US101 to Westbound SR92

PM Peak Period

Capital Packages Baseline

Start	End	US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB Off to SR-92 WB Connector Ramp	US-101 NB Off to SR-92 WB @ Midpoint	US-101 NB Off to SR-92 WB @ Endpoint	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On
2:30 PM	2:45 PM	57	58	56	58	56	55	58	48	54	55	54	58
2:45 PM	3:00 PM	57	58	56	56	56	56	57	47	53	54	52	57
3:00 PM	3:15 PM	57	58	56	57	56	55	57	47	53	53	53	58
3:15 PM	3:30 PM	57	58	56	57	56	55	58	47	53	53	53	58
3:30 PM	3:45 PM	57	58	56	57	56	55	58	47	53	53	51	56
3:45 PM	4:00 PM	57	58	56	52	44	57	58	47	53	53	52	57
4:00 PM	4:15 PM	57	58	56	52	43	57	57	47	53	53	50	56
4:15 PM	4:30 PM	57	58	55	52	43	57	57	47	53	53	53	57
4:30 PM	4:45 PM	51	57	51	49	44	57	58	47	53	53	50	56
4:45 PM	5:00 PM	40	53	49	50	44	57	57	47	53	53	48	54
5:00 PM	5:15 PM	37	49	48	50	44	57	58	47	53	54	47	53
5:15 PM	5:30 PM	33	50	50	52	52	55	52	39	32	26	21	29
5:30 PM	5:45 PM	35	42	42	41	38	37	31	27	21	19	21	29
5:45 PM	6:00 PM	35	38	43	49	51	50	49	42	44	38	39	49
6:00 PM	6:15 PM	39	44	48	52	54	55	56	47	53	54	50	56
6:15 PM	6:30 PM	41	51	51	53	55	56	57	47	53	54	51	57
6:30 PM	6:45 PM	49	54	52	56	55	55	57	47	53	54	53	58
6:45 PM	7:00 PM	56	56	55	58	57	57	58	48	53	54	55	58
7:00 PM	7:15 PM	58	58	56	58	57	57	58	48	54	56	54	58
7:15 PM	7:30 PM	58	58	55	58	57	57	59	47	53	55	55	58

Capital Package 1

Start	End	US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB Off to SR-92 WB Connector Ramp	US-101 NB Off to SR-92 WB @ Midpoint	US-101 NB Off to SR-92 WB @ Endpoint	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On
2:30 PM	2:45 PM	57	58	56	58	56	55	58	48	53	55	54	58
2:45 PM	3:00 PM	57	58	56	56	56	56	57	47	53	54	53	58
3:00 PM	3:15 PM	57	58	56	57	56	55	57	47	53	53	53	58
3:15 PM	3:30 PM	57	58	56	57	56	55	58	47	53	53	53	58
3:30 PM	3:45 PM	57	58	56	57	56	55	58	47	53	53	51	57
3:45 PM	4:00 PM	57	58	56	52	44	57	58	47	53	53	52	57
4:00 PM	4:15 PM	57	58	56	52	43	57	57	47	53	53	51	56
4:15 PM	4:30 PM	57	58	55	52	43	57	57	47	53	53	52	57
4:30 PM	4:45 PM	51	57	51	49	44	57	58	47	53	54	50	56
4:45 PM	5:00 PM	40	53	49	50	44	57	57	47	53	53	47	53
5:00 PM	5:15 PM	37	49	48	50	44	57	58	47	53	53	46	53
5:15 PM	5:30 PM	33	50	50	52	52	55	52	40	32	26	21	29
5:30 PM	5:45 PM	35	43	44	46	42	42	42	38	38	25	29	27
5:45 PM	6:00 PM	38	46	49	53	55	56	57	47	53	53	49	53
6:00 PM	6:15 PM	45	52	52	55	55	55	57	47	53	54	51	57
6:15 PM	6:30 PM	47	57	55	57	56	56	58	47	53	54	51	56
6:30 PM	6:45 PM	53	58	54	57	56	56	58	48	53	54	55	58
6:45 PM	7:00 PM	57	58	55	58	58	57	58	48	53	54	55	58
7:00 PM	7:15 PM	58	58	55	58	57	57	59	48	54	55	54	58
7:15 PM	7:30 PM	58	58	55	58	57	57	58	47	54	55	54	58

Northbound US101

AM Peak Period

Capital Packages Baseline

Start	End	US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB SR-92 Off to SR-92 EB On	US-101 NB @ S of EB 92 On-Ramp	US-101 NB SR-92 EB On to SR-92 WB On	US-101 NB @ S of WB92 On-Ramp	US-101 NB Fashion Island On to Kehoe Off	US-101 NB Kehoe On to 3rd Off	US-101 NB @ S of 3rd Off-Ramp	US-101 NB N of 3rd
6:00 AM	6:15 AM	62	62	61	61	61	61	62	60	60	53	58	58	52	60
6:15 AM	6:30 AM	62	62	61	61	61	61	62	60	60	53	57	58	53	59
6:30 AM	6:45 AM	62	62	61	61	61	61	62	60	60	54	58	58	52	59
6:45 AM	7:00 AM	62	62	61	61	61	61	62	60	60	53	58	58	51	59
7:00 AM	7:15 AM	62	62	54	60	59	56	62	60	59	52	52	56	47	58
7:15 AM	7:30 AM	62	62	53	55	45	57	62	60	59	52	51	55	42	58
7:30 AM	7:45 AM	62	62	52	54	45	57	62	60	52	29	26	28	27	57
7:45 AM	8:00 AM	62	62	52	50	28	25	62	47	11	19	26	25	20	57
8:00 AM	8:15 AM	62	37	32	29	28	24	11	36	11	19	27	27	23	57
8:15 AM	8:30 AM	62	28	27	16	28	22	11	36	11	23	27	28	26	57
8:30 AM	8:45 AM	62	28	26	16	27	21	11	38	43	43	46	45	40	57
8:45 AM	9:00 AM	62	28	27	16	27	21	11	39	58	52	50	54	43	58
9:00 AM	9:15 AM	62	28	28	46	42	48	51	54	57	53	47	49	42	58
9:15 AM	9:30 AM	62	27	28	59	57	53	62	60	59	54	55	56	45	58
9:30 AM	9:45 AM	62	55	46	47	56	53	62	60	59	54	53	56	46	58
9:45 AM	10:00 AM	62	62	49	59	58	53	62	60	59	54	55	56	46	58

Capital Package 2

US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB SR-92 Off to SR-92 EB On	US-101 NB @ S of EB 92 On-Ramp	US-101 NB SR-92 EB On to SR-92 WB On	US-101 NB @ S of WB92 On-Ramp	US-101 NB Fashion Island On to Kehoe Off	US-101 NB Kehoe On to 3rd Off	US-101 NB @ S of 3rd Off-Ramp	US-101 NB N of 3rd
62	62	60	61	61	61	62	60	62	54	59	60	52	60
62	62	61	61	62	61	62	60	62	54	59	60	50	60
62	62	61	61	61	61	62	60	62	54	59	60	49	60
62	62	61	61	61	61	62	60	62	54	59	60	50	60
62	62	55	61	59	56	62	61	62	54	54	59	43	60
62	62	53	55	45	56	62	61	62	54	52	56	42	60
62	62	53	54	45	56	62	61	53	29	26	29	27	59
62	62	52	51	28	25	62	48	11	19	26	25	20	59
62	37	32	30	28	24	12	42	11	19	27	26	23	59
62	27	27	16	27	22	11	42	11	23	27	27	26	59
62	28	26	16	26	21	11	48	45	44	46	45	40	59
62	28	26	16	27	21	11	50	61	54	51	58	40	60
62	28	28	47	43	48	52	57	60	55	50	54	43	60
62	28	28	60	57	54	62	60	62	55	56	60	42	60
62	54	46	50	55	50	62	60	61	56	55	58	40	60
62	62	51	58	57	54	62	60	62	55	57	59	40	60

Southbound US101

AM Peak Period

Capital Packages Baseline

Start	End	US-101 SB N of 3rd	US-101 SB 3rd On to SR-92 Off	US-101 SB @ N of 92 Off-Ramps	US-101 SB SR-92 Off to SR-92 WB On	US-101 @ N of WB 92 On-Ramp	US-101 SB SR-92 WB On to Fashion Island On	US-101 SB Fashion Island On to SR-92 EB On	US-101 SB SR-92 EB On to Hillsdale Off	US-101 SB @ N of Hillsdale Loop On-Ramp	US-101 SB Hillsdale On to Ralston Off	US-101 SB Ralston On to Harbor Off	US-101 SB S of Harbor
6:00 AM	6:15 AM	63	62	59	62	56	58	61	59	59	61	60	60
6:15 AM	6:30 AM	63	62	59	62	57	58	61	59	59	60	60	60
6:30 AM	6:45 AM	63	62	59	62	56	58	61	59	59	60	60	60
6:45 AM	7:00 AM	62	62	59	62	56	58	61	59	59	60	60	60
7:00 AM	7:15 AM	62	58	56	58	46	53	57	53	53	56	56	56
7:15 AM	7:30 AM	62	27	26	58	46	52	56	50	52	55	53	53
7:30 AM	7:45 AM	62	26	24	58	45	52	56	49	52	55	53	53
7:45 AM	8:00 AM	62	26	24	38	11	49	57	54	49	56	54	54
8:00 AM	8:15 AM	62	54	48	23	11	39	37	29	36	57	56	56
8:15 AM	8:30 AM	62	57	55	14	11	32	16	29	42	53	52	52
8:30 AM	8:45 AM	62	57	55	11	34	36	17	35	51	54	53	53
8:45 AM	9:00 AM	62	57	54	11	36	28	16	27	52	55	54	54
9:00 AM	9:15 AM	62	61	59	11	35	28	30	27	52	56	55	55
9:15 AM	9:30 AM	62	61	60	49	36	53	31	28	52	58	57	57
9:30 AM	9:45 AM	62	61	60	53	36	54	32	29	53	58	57	57
9:45 AM	10:00 AM	62	61	60	52	36	54	31	29	52	58	58	58

Capital Package 2

Start	End	US-101 SB N of 3rd	US-101 SB 3rd On to SR-92 Off	US-101 SB @ N of 92 Off-Ramps	US-101 SB SR-92 Off to SR-92 WB On	US-101 @ N of WB 92 On-Ramp	US-101 SB SR-92 WB On to Fashion Island On	US-101 SB Fashion Island On to SR-92 EB On	US-101 SB SR-92 EB On to Hillsdale Off	US-101 SB @ N of Hillsdale Loop On-Ramp	US-101 SB Hillsdale On to Ralston Off	US-101 SB Ralston On to Harbor Off	US-101 SB S of Harbor
6:00 AM	6:15 AM	63	62	59	62	56	58	61	59	60	61	61	61
6:15 AM	6:30 AM	63	62	59	62	56	58	61	59	60	61	61	60
6:30 AM	6:45 AM	63	62	59	62	56	58	61	59	60	61	61	60
6:45 AM	7:00 AM	62	62	59	62	56	58	61	59	60	61	61	60
7:00 AM	7:15 AM	62	58	56	58	46	53	56	52	56	58	58	58
7:15 AM	7:30 AM	62	27	25	58	46	53	56	48	56	57	57	57
7:30 AM	7:45 AM	62	27	25	58	47	53	55	45	56	57	57	57
7:45 AM	8:00 AM	62	26	24	37	11	49	57	54	53	58	57	57
8:00 AM	8:15 AM	62	55	48	24	11	40	37	28	36	58	58	58
8:15 AM	8:30 AM	62	57	54	15	11	32	32	29	50	56	56	55
8:30 AM	8:45 AM	62	57	55	11	39	36	39	34	55	57	56	56
8:45 AM	9:00 AM	62	57	56	11	42	28	30	26	54	57	56	56
9:00 AM	9:15 AM	62	61	59	11	41	28	30	27	54	58	57	57
9:15 AM	9:30 AM	62	61	59	56	55	55	31	28	55	60	59	59
9:30 AM	9:45 AM	62	61	59	61	56	56	31	28	54	59	59	59
9:45 AM	10:00 AM	62	61	60	61	57	56	31	28	54	59	59	59

Eastbound SR92

AM Peak Period

Capital Packages Baseline

Start	End	SR-92 EB @ W of El Camino Real Off-Ramp	SR-92 EB S El Camino Off to S El Camino On	SR-92 EB @ W of El Camino Real Loop On-Ramp	SR-92 EB @ W of El Camino Real Loop Off-Ramp	SR-92 EB @ W of El Camino Real Direct On-Ramp	SR-92 EB @ W of Delaware Off-Ramp	SR-92 EB Delaware Off to Delaware On	SR-92 EB @ W of Delaware On-Ramp	SR-92 EB @ W of SB 101 Off-Ramp	SR-92 EB @ W of NB 101 Off-Ramp	SR-92 EB US-101 NB Off to US-101 On	SR-92 EB @ W of 101 On-Ramps	SR-92 EB @ W of Egewater Off-Ramp	SR-92 EB Emerald Bay On to Foster City Off	SR-92 EB @ W of Foster City Off-Ramp	SR-92 EB E of Foster City
6:00 AM	6:15 AM	58	57	53	49	50	51	50	46	50	48	52	53	57	60	58	59
6:15 AM	6:30 AM	58	57	53	49	50	51	50	45	50	42	50	51	57	60	58	58
6:30 AM	6:45 AM	58	57	53	49	50	51	50	45	50	42	50	51	56	60	58	58
6:45 AM	7:00 AM	58	57	53	49	50	51	50	46	50	41	49	51	56	60	58	58
7:00 AM	7:15 AM	56	57	54	47	45	47	43	37	44	37	46	47	55	55	49	58
7:15 AM	7:30 AM	56	56	54	47	45	47	43	37	44	38	46	47	55	54	47	58
7:30 AM	7:45 AM	55	56	54	47	45	47	43	38	40	37	46	47	55	54	47	58
7:45 AM	8:00 AM	56	56	54	47	45	47	43	37	39	37	46	47	55	54	46	59
8:00 AM	8:15 AM	55	56	53	44	42	44	39	32	35	28	45	46	52	52	44	59
8:15 AM	8:30 AM	53	55	52	42	41	43	35	29	36	28	43	44	52	51	43	60
8:30 AM	8:45 AM	53	54	51	42	41	43	36	30	39	28	44	44	51	51	41	59
8:45 AM	9:00 AM	54	55	51	43	42	44	38	31	39	28	44	45	52	51	42	60
9:00 AM	9:15 AM	54	55	52	44	44	46	41	32	41	42	46	45	51	55	49	54
9:15 AM	9:30 AM	55	56	52	45	44	46	40	33	41	42	46	45	51	56	50	53
9:30 AM	9:45 AM	54	56	52	45	44	46	41	33	42	42	47	46	50	56	50	53
9:45 AM	10:00 AM	56	56	52	45	44	46	41	33	42	41	46	45	51	56	51	52

Capital Package 2

Start	End	SR-92 EB @ W of El Camino Real Off-Ramp	SR-92 EB S El Camino Off to S El Camino On	SR-92 EB @ W of El Camino Real Loop On-Ramp	SR-92 EB @ W of El Camino Real Loop Off-Ramp	SR-92 EB @ W of El Camino Real Direct On-Ramp	SR-92 EB @ W of Delaware Off-Ramp	SR-92 EB Delaware Off to Delaware On	SR-92 EB @ W of Delaware On-Ramp	SR-92 EB @ W of SB 101 Off-Ramp	SR-92 EB @ W of NB 101 Off-Ramp	SR-92 EB US-101 NB Off to US-101 On	SR-92 EB @ W of 101 On-Ramps	SR-92 EB @ W of Egewater Off-Ramp	SR-92 EB Emerald Bay On to Foster City Off	SR-92 EB @ W of Foster City Off-Ramp	SR-92 EB E of Foster City
6:00 AM	6:15 AM	58	58	54	47	53	49	58	55	56	58	58	58	61	61	59	60
6:15 AM	6:30 AM	58	58	54	47	53	50	58	55	57	58	59	59	61	61	59	60
6:30 AM	6:45 AM	58	58	54	47	53	50	57	55	57	58	59	59	61	61	59	60
6:45 AM	7:00 AM	58	58	54	47	53	50	58	55	57	58	59	59	61	61	59	60
7:00 AM	7:15 AM	57	58	55	45	54	50	57	54	56	58	58	58	60	59	54	60
7:15 AM	7:30 AM	56	58	55	44	54	49	57	54	56	58	58	58	60	59	52	60
7:30 AM	7:45 AM	55	58	56	44	54	49	57	53	56	58	58	58	60	59	52	60
7:45 AM	8:00 AM	57	58	56	44	54	49	57	54	56	57	58	58	60	59	53	60
8:00 AM	8:15 AM	54	57	55	40	53	47	56	52	56	58	58	58	59	59	50	59
8:15 AM	8:30 AM	55	57	54	39	53	47	56	49	51	58	58	58	59	59	50	60
8:30 AM	8:45 AM	54	56	53	36	53	47	56	52	56	57	58	58	59	59	48	60
8:45 AM	9:00 AM	54	56	54	38	53	47	56	51	56	57	58	58	59	59	50	60
9:00 AM	9:15 AM	54	58	55	42	53	47	56	52	56	58	58	58	60	60	57	59
9:15 AM	9:30 AM	56	58	55	42	53	48	57	52	56	58	58	58	60	61	57	59
9:30 AM	9:45 AM	55	58	55	42	53	48	57	53	56	58	58	58	60	61	57	59
9:45 AM	10:00 AM	56	58	55	42	53	48	56	51	56	58	58	58	61	61	57	59

Westbound SR92

AM Peak Period

Capital Packages Baseline

Start	End	SR-92 WB E of Foster City	SR-92 WB Foster City On to Baker Way Off	SR-92 WB @ E of Edgewater Off-Ramp	SR-92 WB @ E of NB 101 Off-Ramp	SR-92 WB US-101 NB Off to US-101 SB Off	SR-92 WB @ E of SB 101 Off-Ramp	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On	SR-92 WB @ E of Delaware On-Ramp	SR-92 WB @ E of El Camino Real NB Off-Ramp	SR-92 WB @ E of El Camino Real NB On-Ramp	SR-92 WB @ E of El Camino Real SB Off-Ramp	SR-92 WB N El Camino Off to N El Camino On	SR-92 WB @ E of El Camino Real SB On-Ramp	SR-92 WB @ E of Alameda De Las Pulgas Off-Ramp
6:00 AM	6:15 AM	58	57	57	54	57	57	53	57	60	58	55	58	56	57	56	57
6:15 AM	6:30 AM	58	57	57	54	56	57	52	57	60	58	55	59	57	58	57	56
6:30 AM	6:45 AM	58	57	57	54	57	57	52	57	60	58	55	59	57	58	57	57
6:45 AM	7:00 AM	58	57	57	54	57	57	52	57	60	58	55	58	56	58	57	57
7:00 AM	7:15 AM	58	56	55	55	56	54	50	56	59	54	53	55	55	58	54	50
7:15 AM	7:30 AM	58	56	54	55	56	52	49	54	57	51	52	52	54	58	54	48
7:30 AM	7:45 AM	58	56	55	55	56	54	48	52	57	50	51	52	54	58	54	46
7:45 AM	8:00 AM	58	55	56	55	56	54	49	52	56	49	51	51	54	57	54	47
8:00 AM	8:15 AM	58	55	55	46	55	55	38	52	55	48	51	51	53	57	54	46
8:15 AM	8:30 AM	58	55	56	46	54	50	36	50	53	47	49	50	53	57	53	45
8:30 AM	8:45 AM	58	55	55	46	55	53	36	49	53	46	48	48	52	57	53	46
8:45 AM	9:00 AM	58	55	54	46	55	54	36	49	53	47	47	47	52	57	53	45
9:00 AM	9:15 AM	58	56	56	55	57	54	39	40	52	49	50	51	53	57	53	49
9:15 AM	9:30 AM	58	56	56	55	57	56	42	41	55	52	51	53	53	57	54	51
9:30 AM	9:45 AM	58	57	56	55	57	55	40	41	54	50	51	53	53	57	54	51
9:45 AM	10:00 AM	58	57	56	55	57	55	40	42	55	53	52	54	54	57	54	51

Capital Package 2

Start	End	SR-92 WB E of Foster City	SR-92 WB Foster City On to Baker Way Off	SR-92 WB @ E of Edgewater Off-Ramp	SR-92 WB @ E of NB 101 Off-Ramp	SR-92 WB US-101 NB Off to US-101 SB Off	SR-92 WB @ E of SB 101 Off-Ramp	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On	SR-92 WB @ E of Delaware On-Ramp	SR-92 WB @ E of El Camino Real NB Off-Ramp	SR-92 WB @ E of El Camino Real NB On-Ramp	SR-92 WB @ E of El Camino Real SB Off-Ramp	SR-92 WB N El Camino Off to N El Camino On	SR-92 WB @ E of El Camino Real SB On-Ramp	SR-92 WB @ E of Alameda De Las Pulgas Off-Ramp
6:00 AM	6:15 AM	58	57	57	54	57	57	56	57	60	60	54	54	51	53	56	57
6:15 AM	6:30 AM	58	57	57	54	56	57	56	58	60	60	54	54	52	54	56	58
6:30 AM	6:45 AM	58	57	57	54	57	57	56	58	60	60	54	55	52	54	56	58
6:45 AM	7:00 AM	58	57	57	54	57	57	56	57	60	60	54	54	53	55	56	58
7:00 AM	7:15 AM	58	56	55	55	56	54	54	56	59	60	54	57	46	46	51	55
7:15 AM	7:30 AM	58	56	54	55	56	52	53	56	59	60	53	57	46	46	51	55
7:30 AM	7:45 AM	58	56	55	55	56	54	53	56	59	60	53	57	46	46	51	55
7:45 AM	8:00 AM	58	55	56	55	56	54	53	56	59	59	53	57	45	45	51	55
8:00 AM	8:15 AM	58	55	55	55	57	54	53	55	58	59	52	57	42	43	50	55
8:15 AM	8:30 AM	58	55	56	55	56	51	53	54	58	59	51	56	42	44	50	54
8:30 AM	8:45 AM	58	55	55	55	57	53	53	54	57	59	51	57	44	45	49	54
8:45 AM	9:00 AM	58	55	54	55	57	53	53	53	57	59	52	56	43	45	50	54
9:00 AM	9:15 AM	58	56	56	55	57	54	53	55	58	59	51	56	47	47	52	55
9:15 AM	9:30 AM	58	56	56	55	57	56	54	56	59	60	52	56	47	48	52	56
9:30 AM	9:45 AM	58	57	56	55	57	55	53	55	58	59	51	56	47	48	52	56
9:45 AM	10:00 AM	58	57	56	55	57	55	53	56	59	60	52	56	47	48	52	55

Northbound US101 to Westbound SR92

AM Peak Period

Capital Packages Baseline

Start	End	US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB Off to SR-92 WB Connector Ramp	US-101 NB Off to SR-92 WB @ Midpoint	US-101 NB Off to SR-92 WB @ Endpoint	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On
6:00 AM	6:15 AM	62	62	61	61	61	61	62	55	51	53	57	60
6:15 AM	6:30 AM	62	62	61	61	61	61	62	56	51	52	57	60
6:30 AM	6:45 AM	62	62	61	61	61	61	62	55	51	52	57	60
6:45 AM	7:00 AM	62	62	61	61	61	61	62	55	51	52	57	60
7:00 AM	7:15 AM	62	62	54	60	59	56	62	54	53	50	56	59
7:15 AM	7:30 AM	62	62	53	55	45	57	61	54	53	49	54	57
7:30 AM	7:45 AM	62	62	52	54	45	57	61	54	52	48	52	57
7:45 AM	8:00 AM	62	62	52	50	28	25	59	54	53	49	52	56
8:00 AM	8:15 AM	62	37	32	29	28	24	58	54	49	38	52	55
8:15 AM	8:30 AM	62	28	27	16	28	22	58	54	47	36	50	53
8:30 AM	8:45 AM	62	28	26	16	27	21	57	54	47	36	49	53
8:45 AM	9:00 AM	62	28	27	16	27	21	57	54	47	36	49	53
9:00 AM	9:15 AM	62	28	28	46	42	48	59	53	49	39	40	52
9:15 AM	9:30 AM	62	27	28	59	57	53	60	54	52	42	41	55
9:30 AM	9:45 AM	62	55	46	47	56	53	60	54	51	40	41	54
9:45 AM	10:00 AM	62	62	49	59	58	53	61	54	51	40	42	55

Capital Package 2

US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB Off to SR-92 WB Connector Ramp	US-101 NB Off to SR-92 WB @ Midpoint	US-101 NB Off to SR-92 WB @ Endpoint	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On
62	62	60	61	61	61	63	56	60	56	57	60
62	62	61	61	62	61	62	56	60	56	58	60
62	62	61	61	61	61	62	55	60	56	58	60
62	62	61	61	61	61	62	55	60	56	57	60
62	62	55	61	59	56	62	54	59	54	56	59
62	62	53	55	45	56	61	54	58	53	56	59
62	62	53	54	45	56	61	54	58	53	56	59
62	62	52	51	28	25	59	53	58	53	56	59
62	37	32	30	28	24	58	54	58	53	55	58
62	27	27	16	27	22	58	54	58	53	54	58
62	28	26	16	26	21	57	54	58	53	54	57
62	28	26	16	27	21	57	54	58	53	53	57
62	28	28	47	43	48	60	54	58	53	55	58
62	28	28	60	57	54	60	54	58	54	56	59
62	54	46	50	55	50	60	54	58	53	55	58
62	62	51	58	57	54	60	54	59	53	56	59

Northbound US101

PM Peak Period

Capital Packages Baseline

Start	End	US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB SR-92 Off to SR-92 EB On	US-101 NB @ S of EB 92 On-Ramp	US-101 NB SR-92 EB On to SR-92 WB On	US-101 NB @ S of WB92 On-Ramp	US-101 NB Fashion Island On to Kehoe Off	US-101 NB Kehoe On to 3rd Off	US-101 NB @ S of 3rd Off-Ramp	US-101 NB N of 3rd
2:30 PM	2:45 PM	57	58	56	58	56	55	59	57	57	56	53	57	50	59
2:45 PM	3:00 PM	57	58	56	56	56	56	59	57	57	55	53	57	48	58
3:00 PM	3:15 PM	57	58	56	57	56	55	59	57	57	55	51	57	48	58
3:15 PM	3:30 PM	57	58	56	57	56	55	59	57	57	55	53	56	48	58
3:30 PM	3:45 PM	57	58	56	57	56	55	59	57	57	55	50	56	48	58
3:45 PM	4:00 PM	57	58	56	52	44	57	59	57	57	55	50	56	48	58
4:00 PM	4:15 PM	57	58	56	52	43	57	59	57	57	55	52	56	48	58
4:15 PM	4:30 PM	57	58	55	52	43	57	59	57	57	55	51	55	48	58
4:30 PM	4:45 PM	51	57	51	49	44	57	59	57	57	54	42	52	47	58
4:45 PM	5:00 PM	40	53	49	50	44	57	59	57	57	54	38	46	48	57
5:00 PM	5:15 PM	37	49	48	50	44	57	59	57	57	53	37	45	36	57
5:15 PM	5:30 PM	33	50	50	52	52	55	24	23	23	29	44	47	36	58
5:30 PM	5:45 PM	35	42	42	41	38	37	24	23	23	30	45	48	36	58
5:45 PM	6:00 PM	35	38	43	49	51	50	24	23	23	30	51	54	47	58
6:00 PM	6:15 PM	39	44	48	52	54	55	55	24	49	30	45	51	47	58
6:15 PM	6:30 PM	41	51	51	53	55	56	58	56	51	29	45	50	46	58
6:30 PM	6:45 PM	49	54	52	56	55	55	59	57	58	55	46	48	47	58
6:45 PM	7:00 PM	56	56	55	58	57	57	59	57	58	55	53	56	50	58
7:00 PM	7:15 PM	58	58	56	58	57	57	59	57	58	55	54	57	50	58
7:15 PM	7:30 PM	58	58	55	58	57	57	59	57	58	56	55	57	50	59

Capital Package 2

US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB SR-92 Off to SR-92 EB On	US-101 NB @ S of EB 92 On-Ramp	US-101 NB SR-92 EB On to SR-92 WB On	US-101 NB @ S of WB92 On-Ramp	US-101 NB Fashion Island On to Kehoe Off	US-101 NB Kehoe On to 3rd Off	US-101 NB @ S of 3rd Off-Ramp	US-101 NB N of 3rd
57	58	56	57	56	55	59	57	58	56	55	58	49	59
57	58	56	56	55	55	59	57	58	56	53	58	47	59
57	58	56	57	56	56	59	57	58	56	52	57	47	59
57	58	56	57	56	56	59	57	58	56	53	57	47	59
57	58	55	57	56	55	59	57	58	55	51	58	47	59
57	58	56	52	44	57	59	57	58	55	50	57	48	58
57	58	55	52	43	57	59	57	58	56	52	57	47	59
57	58	56	52	44	57	59	57	58	56	50	56	47	59
52	57	52	49	44	57	59	57	58	55	42	52	48	58
38	54	48	50	44	57	59	57	58	55	40	47	48	58
36	51	48	50	44	56	59	57	57	54	39	45	36	58
32	48	48	50	52	55	24	23	23	28	42	47	36	58
35	48	50	53	54	54	23	23	23	29	43	45	36	58
42	55	54	55	55	55	23	23	23	30	48	50	46	59
48	58	55	56	56	55	55	23	50	30	47	52	46	58
50	58	55	58	56	55	59	56	51	29	46	50	47	58
56	58	56	58	57	57	59	57	58	56	47	51	47	59
58	58	56	58	57	57	59	57	58	56	56	58	50	59
58	58	56	58	57	57	59	57	58	56	54	58	50	59
58	58	55	58	57	56	59	57	58	56	55	58	50	59

Southbound US101

PM Peak Period

Capital Packages Baseline

Start	End	US-101 SB N of 3rd	US-101 SB 3rd On to SR-92 Off	US-101 SB @ N of 92 Off-Ramps	US-101 SB SR-92 Off to SR-92 WB On	US-101 @ N of WB 92 On-Ramp	US-101 SB SR-92 WB On to Fashion Island On	US-101 SB Fashion Island On to SR-92 EB On	US-101 SB SR-92 EB On to Hillsdale Off	US-101 SB @ N of Hillsdale Loop On-Ramp	US-101 SB Hillsdale On to Ralston Off	US-101 SB Ralston On to Harbor Off	US-101 SB S of Harbor
2:30 PM	2:45 PM	62	62	61	54	49	58	61	52	56	57	58	59
2:45 PM	3:00 PM	62	62	61	54	49	58	60	52	56	56	57	57
3:00 PM	3:15 PM	62	62	61	54	49	58	60	51	55	56	57	57
3:15 PM	3:30 PM	62	62	61	54	49	58	60	51	55	56	57	57
3:30 PM	3:45 PM	62	62	61	54	49	58	60	52	55	56	57	57
3:45 PM	4:00 PM	62	62	61	54	49	58	60	52	55	56	57	57
4:00 PM	4:15 PM	62	62	61	54	49	58	60	52	55	56	57	57
4:15 PM	4:30 PM	62	62	61	54	49	58	60	52	55	56	57	57
4:30 PM	4:45 PM	62	62	61	54	48	57	60	51	55	56	56	57
4:45 PM	5:00 PM	62	62	61	54	48	57	60	51	55	55	56	57
5:00 PM	5:15 PM	62	62	61	54	48	57	45	43	54	55	56	56
5:15 PM	5:30 PM	62	62	61	45	49	58	45	43	53	55	56	57
5:30 PM	5:45 PM	62	62	61	44	48	57	45	43	54	55	57	57
5:45 PM	6:00 PM	62	62	62	43	48	57	45	43	54	56	57	57
6:00 PM	6:15 PM	62	62	62	44	48	57	45	43	55	56	57	57
6:15 PM	6:30 PM	62	62	61	44	48	56	60	51	55	57	57	58
6:30 PM	6:45 PM	62	62	62	54	48	57	60	51	56	57	57	58
6:45 PM	7:00 PM	62	62	62	54	48	57	60	51	56	57	57	58
7:00 PM	7:15 PM	62	62	62	54	48	57	60	49	54	55	56	57
7:15 PM	7:30 PM	62	62	62	54	48	57	60	51	56	57	57	57

Capital Package 2

Start	End	US-101 SB N of 3rd	US-101 SB 3rd On to SR-92 Off	US-101 SB @ N of 92 Off-Ramps	US-101 SB SR-92 Off to SR-92 WB On	US-101 @ N of WB 92 On-Ramp	US-101 SB SR-92 WB On to Fashion Island On	US-101 SB Fashion Island On to SR-92 EB On	US-101 SB SR-92 EB On to Hillsdale Off	US-101 SB @ N of Hillsdale Loop On-Ramp	US-101 SB Hillsdale On to Ralston Off	US-101 SB Ralston On to Harbor Off	US-101 SB S of Harbor
2:30 PM	2:45 PM	62	62	61	54	49	58	61	57	59	57	57	57
2:45 PM	3:00 PM	62	62	61	54	49	58	61	57	59	57	57	57
3:00 PM	3:15 PM	62	62	61	54	49	58	61	57	58	57	57	57
3:15 PM	3:30 PM	62	62	61	54	49	58	61	57	59	57	57	57
3:30 PM	3:45 PM	62	62	61	54	49	58	61	57	59	57	57	57
3:45 PM	4:00 PM	62	62	61	54	49	58	61	57	58	57	57	57
4:00 PM	4:15 PM	62	62	61	54	49	58	61	57	59	57	57	57
4:15 PM	4:30 PM	62	62	61	54	49	58	61	57	59	57	57	57
4:30 PM	4:45 PM	62	62	61	54	49	57	60	57	58	57	57	57
4:45 PM	5:00 PM	62	62	61	54	49	57	60	57	58	57	57	57
5:00 PM	5:15 PM	62	62	61	54	48	57	45	43	58	57	57	57
5:15 PM	5:30 PM	62	62	61	45	49	57	45	43	58	57	57	57
5:30 PM	5:45 PM	62	62	61	44	48	57	45	43	59	57	57	57
5:45 PM	6:00 PM	62	62	61	44	48	57	45	43	59	57	57	57
6:00 PM	6:15 PM	62	62	62	44	48	56	45	43	58	57	57	57
6:15 PM	6:30 PM	62	62	61	44	48	57	60	56	58	57	57	57
6:30 PM	6:45 PM	62	62	61	54	47	57	60	56	58	57	57	57
6:45 PM	7:00 PM	62	62	62	54	48	57	61	56	58	57	57	57
7:00 PM	7:15 PM	62	62	61	54	48	57	60	56	59	57	57	57
7:15 PM	7:30 PM	62	62	61	54	48	57	60	56	59	57	57	57

Eastbound SR92

PM Peak Period

Capital Packages Baseline

Start	End	SR-92 EB @ W of El Camino Real Off-Ramp	SR-92 EB S El Camino Off to S El Camino On	SR-92 EB @ W of El Camino Real Loop On-Ramp	SR-92 EB @ W of El Camino Real Loop Off-Ramp	SR-92 EB @ W of El Camino Real Direct On-Ramp	SR-92 EB @ W of Delaware Off-Ramp	SR-92 EB Delaware Off to Delaware On	SR-92 EB @ W of Delaware On-Ramp	SR-92 EB @ W of SB 101 Off-Ramp	SR-92 EB @ W of NB 101 Off-Ramp	SR-92 EB US-101 NB Off to US-101 On	SR-92 EB @ W of 101 On-Ramps	SR-92 EB @ W of Egewater Off-Ramp	SR-92 EB Emerald Bay On to Foster City Off	SR-92 EB @ W of Foster City Off-Ramp	SR-92 EB E of Foster City
2:30 PM	2:45 PM	56	57	57	46	39	42	38	36	39	40	46	45	52	55	48	55
2:45 PM	3:00 PM	55	57	57	46	39	42	39	36	39	38	46	44	51	54	45	53
3:00 PM	3:15 PM	55	57	57	46	40	43	39	37	39	39	46	45	51	55	48	53
3:15 PM	3:30 PM	55	58	57	46	40	43	39	37	39	39	46	44	50	54	47	53
3:30 PM	3:45 PM	54	57	56	46	39	42	39	37	40	39	45	42	49	54	42	53
3:45 PM	4:00 PM	55	57	56	45	38	42	38	36	39	39	45	40	49	53	38	52
4:00 PM	4:15 PM	54	57	56	45	38	42	38	36	39	37	44	38	49	53	38	52
4:15 PM	4:30 PM	54	57	56	45	38	42	38	35	39	38	44	39	48	53	38	52
4:30 PM	4:45 PM	52	57	56	44	38	43	37	35	39	38	45	39	48	53	36	52
4:45 PM	5:00 PM	51	57	56	43	38	42	36	35	38	39	44	37	48	53	34	51
5:00 PM	5:15 PM	51	57	56	44	37	41	36	34	38	38	43	35	48	53	34	51
5:15 PM	5:30 PM	52	57	56	44	37	42	37	35	38	38	43	35	48	53	33	51
5:30 PM	5:45 PM	53	57	56	48	42	45	41	39	41	42	47	44	51	55	43	53
5:45 PM	6:00 PM	53	57	57	47	42	45	42	40	42	42	48	44	51	55	45	54
6:00 PM	6:15 PM	53	57	56	47	41	45	42	39	42	42	48	45	51	55	45	54
6:15 PM	6:30 PM	53	57	56	47	42	46	42	40	42	43	47	45	51	55	44	55
6:30 PM	6:45 PM	56	57	57	47	44	46	43	41	43	44	48	46	52	56	46	55
6:45 PM	7:00 PM	56	58	57	47	44	47	44	43	43	45	49	47	52	56	48	55
7:00 PM	7:15 PM	56	57	57	43	37	39	36	35	37	39	43	41	50	53	40	52
7:15 PM	7:30 PM	56	58	57	47	42	44	41	40	42	43	47	46	52	55	47	55

Capital Package 2

SR-92 EB @ W of El Camino Real Off-Ramp	SR-92 EB S El Camino Off to S El Camino On	SR-92 EB @ W of El Camino Real Loop On-Ramp	SR-92 EB @ W of El Camino Real Loop Off-Ramp	SR-92 EB @ W of El Camino Real Direct On-Ramp	SR-92 EB @ W of Delaware Off-Ramp	SR-92 EB Delaware Off to Delaware On	SR-92 EB @ W of Delaware On-Ramp	SR-92 EB @ W of SB 101 Off-Ramp	SR-92 EB @ W of NB 101 Off-Ramp	SR-92 EB US-101 NB Off to US-101 On	SR-92 EB @ W of 101 On-Ramps	SR-92 EB @ W of Egewater Off-Ramp	SR-92 EB Emerald Bay On to Foster City Off	SR-92 EB @ W of Foster City Off-Ramp	SR-92 EB E of Foster City
56	58	56	54	55	54	55	39	55	52	56	56	57	59	47	58
56	58	56	54	55	55	55	40	55	52	56	56	57	59	46	58
56	58	56	54	55	55	55	40	55	51	56	56	57	59	47	58
56	58	56	53	55	55	56	41	55	52	56	56	57	59	47	58
54	58	56	54	55	55	55	40	55	52	56	56	56	59	44	58
54	58	56	54	55	55	56	40	55	50	56	56	56	59	43	58
54	58	56	54	55	55	55	40	55	38	56	56	55	59	41	58
53	58	56	54	55	55	55	40	55	39	56	56	56	59	43	58
53	58	56	54	55	55	55	39	54	38	56	56	55	59	41	58
52	58	56	54	55	54	55	39	55	38	56	56	56	59	40	58
53	58	56	54	55	54	55	39	55	37	56	56	55	59	40	58
53	58	56	54	55	55	55	39	55	37	56	56	55	59	39	58
54	58	56	54	55	55	55	39	54	52	56	56	57	59	43	58
54	58	56	54	55	55	55	41	55	53	56	56	57	59	44	58
54	58	56	54	55	55	56	40	55	53	56	56	57	59	45	58
54	58	56	54	55	55	56	39	55	52	56	56	57	59	45	58
56	58	55	53	55	55	56	42	55	55	57	56	57	60	46	58
57	58	55	53	55	55	56	53	55	55	57	56	57	60	45	59
56	58	55	54	55	55	56	52	55	55	57	56	57	60	45	59
56	58	55	54	55	55	56	52	55	55	56	56	57	60	46	59

Westbound SR92

PM Peak Period

Capital Packages Baseline

Start	End	SR-92 WB E of Foster City	SR-92 WB Foster City On to Baker Way Off	SR-92 WB @ E of Edgewater Off-Ramp	SR-92 WB @ E of NB 101 Off-Ramp	SR-92 WB US-101 NB Off to US-101 SB Off	SR-92 WB @ E of SB 101 Off-Ramp	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On	SR-92 WB @ E of Delaware On-Ramp	SR-92 WB @ E of El Camino Real NB Off-Ramp	SR-92 WB @ E of El Camino Real NB On-Ramp	SR-92 WB @ E of El Camino Real SB Off-Ramp	SR-92 WB N El Camino Off to N El Camino On	SR-92 WB @ E of El Camino Real SB On-Ramp	SR-92 WB @ E of Alameda De Las Pulgas Off-Ramp
2:30 PM	2:45 PM	58	58	57	58	58	56	55	54	58	54	52	55	54	57	54	45
2:45 PM	3:00 PM	58	58	57	58	58	56	54	52	57	51	51	53	53	57	54	44
3:00 PM	3:15 PM	58	58	58	58	58	55	53	53	58	51	51	54	53	57	54	46
3:15 PM	3:30 PM	58	58	57	58	58	56	53	53	58	52	51	54	53	57	54	45
3:30 PM	3:45 PM	58	58	57	58	58	54	53	51	56	51	50	54	53	57	53	47
3:45 PM	4:00 PM	58	58	57	58	58	54	53	52	57	51	50	53	53	57	53	45
4:00 PM	4:15 PM	58	58	57	58	58	54	53	50	56	50	50	52	53	57	53	46
4:15 PM	4:30 PM	58	58	57	58	58	54	53	53	57	51	50	53	53	57	53	45
4:30 PM	4:45 PM	58	58	56	57	57	49	53	50	56	51	49	52	53	56	51	44
4:45 PM	5:00 PM	58	58	55	57	57	48	53	48	54	49	47	49	51	53	47	45
5:00 PM	5:15 PM	58	57	55	55	56	48	54	47	53	47	45	48	51	53	46	45
5:15 PM	5:30 PM	58	57	55	55	56	49	26	21	29	32	48	55	54	56	52	46
5:30 PM	5:45 PM	58	58	54	56	57	51	19	21	29	31	49	56	54	57	52	44
5:45 PM	6:00 PM	58	58	53	57	57	51	38	39	49	44	47	50	52	56	50	45
6:00 PM	6:15 PM	58	58	54	57	57	51	54	50	56	49	49	53	53	56	53	46
6:15 PM	6:30 PM	58	58	54	57	58	51	54	51	57	52	50	53	53	56	52	45
6:30 PM	6:45 PM	58	58	57	58	58	55	54	53	58	51	51	55	53	57	55	49
6:45 PM	7:00 PM	58	58	58	58	58	56	54	55	58	53	51	56	53	57	54	51
7:00 PM	7:15 PM	58	58	57	58	58	56	56	54	58	53	51	56	54	57	53	50
7:15 PM	7:30 PM	58	58	57	58	58	56	55	55	58	54	51	57	54	57	55	51

Capital Package 2

SR-92 WB E of Foster City	SR-92 WB Foster City On to Baker Way Off	SR-92 WB @ E of Edgewater Off-Ramp	SR-92 WB @ E of NB 101 Off-Ramp	SR-92 WB US-101 NB Off to US-101 SB Off	SR-92 WB @ E of SB 101 Off-Ramp	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On	SR-92 WB @ E of Delaware On-Ramp	SR-92 WB @ E of El Camino Real NB Off-Ramp	SR-92 WB @ E of El Camino Real NB On-Ramp	SR-92 WB @ E of El Camino Real SB Off-Ramp	SR-92 WB N El Camino Off to N El Camino On	SR-92 WB @ E of El Camino Real SB On-Ramp	SR-92 WB @ E of Alameda De Las Pulgas Off-Ramp
58	58	57	58	58	56	55	56	59	59	57	55	55	55	51	51
58	58	57	58	58	56	54	56	59	59	57	56	56	56	51	51
58	58	58	58	58	55	52	56	59	59	57	56	55	56	52	40
58	58	57	58	58	56	52	56	59	59	57	56	55	56	52	40
58	58	57	58	58	54	53	56	58	59	56	56	54	56	51	40
58	58	57	58	58	54	53	55	58	59	56	56	54	56	51	40
58	58	57	58	58	53	53	55	58	59	56	56	54	56	51	40
58	58	57	58	58	54	53	56	58	59	56	56	54	55	50	40
58	58	56	57	57	48	54	55	58	59	56	56	54	54	48	40
58	58	55	57	57	49	53	54	57	58	54	55	53	52	46	39
58	57	55	55	56	49	54	54	57	58	55	56	53	51	33	40
58	57	55	52	55	50	53	54	57	58	55	56	52	50	32	40
58	58	54	52	55	52	54	54	58	59	56	56	54	55	48	40
58	58	53	54	56	51	54	55	58	59	56	56	54	55	50	40
58	58	54	56	57	50	54	55	58	59	56	56	54	55	51	40
58	58	54	57	57	51	54	56	58	59	57	56	54	55	51	40
58	58	57	58	58	55	54	56	59	59	58	55	54	56	52	41
58	58	58	58	58	56	54	56	59	59	58	55	54	56	52	52
58	58	57	58	58	55	56	57	59	59	57	55	55	56	52	53
58	58	57	58	58	56	56	57	59	59	58	55	55	56	53	53

Northbound US101 to Westbound SR92

PM Peak Period

Capital Packages Baseline

Start	End	US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB Off to SR-92 WB Connector Ramp	US-101 NB Off to SR-92 WB @ Midpoint	US-101 NB Off to SR-92 WB @ Endpoint	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On
2:30 PM	2:45 PM	57	58	56	58	56	55	58	48	54	55	54	58
2:45 PM	3:00 PM	57	58	56	56	56	56	57	47	53	54	52	57
3:00 PM	3:15 PM	57	58	56	57	56	55	57	47	53	53	53	58
3:15 PM	3:30 PM	57	58	56	57	56	55	58	47	53	53	53	58
3:30 PM	3:45 PM	57	58	56	57	56	55	58	47	53	53	51	56
3:45 PM	4:00 PM	57	58	56	52	44	57	58	47	53	53	52	57
4:00 PM	4:15 PM	57	58	56	52	43	57	57	47	53	53	50	56
4:15 PM	4:30 PM	57	58	55	52	43	57	57	47	53	53	53	57
4:30 PM	4:45 PM	51	57	51	49	44	57	58	47	53	53	50	56
4:45 PM	5:00 PM	40	53	49	50	44	57	57	47	53	53	48	54
5:00 PM	5:15 PM	37	49	48	50	44	57	58	47	53	54	47	53
5:15 PM	5:30 PM	33	50	50	52	52	55	52	39	32	26	21	29
5:30 PM	5:45 PM	35	42	42	41	38	37	31	27	21	19	21	29
5:45 PM	6:00 PM	35	38	43	49	51	50	49	42	44	38	39	49
6:00 PM	6:15 PM	39	44	48	52	54	55	56	47	53	54	50	56
6:15 PM	6:30 PM	41	51	51	53	55	56	57	47	53	54	51	57
6:30 PM	6:45 PM	49	54	52	56	55	55	57	47	53	54	53	58
6:45 PM	7:00 PM	56	56	55	58	57	57	58	48	53	54	55	58
7:00 PM	7:15 PM	58	58	56	58	57	57	58	48	54	56	54	58
7:15 PM	7:30 PM	58	58	55	58	57	57	59	47	53	55	55	58

Capital Package 2

Start	End	US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB Off to SR-92 WB Connector Ramp	US-101 NB Off to SR-92 WB @ Midpoint	US-101 NB Off to SR-92 WB @ Endpoint	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On
2:30 PM	2:45 PM	57	58	56	57	56	55	58	47	55	55	56	59
2:45 PM	3:00 PM	57	58	56	56	55	55	57	47	55	54	56	59
3:00 PM	3:15 PM	57	58	56	57	56	56	58	47	55	52	56	59
3:15 PM	3:30 PM	57	58	56	57	56	56	58	48	55	52	56	59
3:30 PM	3:45 PM	57	58	55	57	56	55	58	47	55	53	56	58
3:45 PM	4:00 PM	57	58	56	52	44	57	58	47	55	53	55	58
4:00 PM	4:15 PM	57	58	55	52	43	57	57	47	55	53	55	58
4:15 PM	4:30 PM	57	58	56	52	44	57	57	47	55	53	56	58
4:30 PM	4:45 PM	52	57	52	49	44	57	58	47	55	54	55	58
4:45 PM	5:00 PM	38	54	48	50	44	57	57	47	55	53	54	57
5:00 PM	5:15 PM	36	51	48	50	44	56	57	47	55	54	54	57
5:15 PM	5:30 PM	32	48	48	50	52	55	55	47	55	53	54	57
5:30 PM	5:45 PM	35	48	50	53	54	54	54	47	55	54	54	58
5:45 PM	6:00 PM	42	55	54	55	55	55	56	47	55	54	55	58
6:00 PM	6:15 PM	48	58	55	56	56	55	58	47	55	54	55	58
6:15 PM	6:30 PM	50	58	55	58	56	55	58	47	55	54	56	58
6:30 PM	6:45 PM	56	58	56	58	57	57	58	48	55	54	56	59
6:45 PM	7:00 PM	58	58	56	58	57	57	59	48	56	54	56	59
7:00 PM	7:15 PM	58	58	56	58	57	57	58	48	55	56	57	59
7:15 PM	7:30 PM	58	58	55	58	57	56	59	47	55	56	57	59

Northbound US101

AM Peak Period

Capital Projects Baseline

Start	End	US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB SR-92 Off to SR-92 EB On	US-101 NB @ S of EB 92 On-Ramp	US-101 NB SR-92 EB On to SR-92 WB On	US-101 NB @ S of WB92 On-Ramp	US-101 NB Fashion Island On to Kehoe Off	US-101 NB Kehoe On to 3rd Off	US-101 NB @ S of 3rd Off-Ramp	US-101 NB N of 3rd
6:00 AM	6:15 AM	62	62	61	61	61	61	62	60	60	53	58	58	52	60
6:15 AM	6:30 AM	62	62	61	61	61	61	62	60	60	53	57	58	53	59
6:30 AM	6:45 AM	62	62	61	61	61	61	62	60	60	54	58	58	52	59
6:45 AM	7:00 AM	62	62	61	61	61	61	62	60	60	53	58	58	51	59
7:00 AM	7:15 AM	62	62	54	60	59	56	62	60	59	52	52	56	47	58
7:15 AM	7:30 AM	62	62	53	55	45	57	62	60	59	52	51	55	42	58
7:30 AM	7:45 AM	62	62	52	54	45	57	62	60	52	29	26	28	27	57
7:45 AM	8:00 AM	62	62	52	50	28	25	62	47	11	19	26	25	20	57
8:00 AM	8:15 AM	62	37	32	29	28	24	11	36	11	19	27	27	23	57
8:15 AM	8:30 AM	62	28	27	16	28	22	11	36	11	23	27	28	26	57
8:30 AM	8:45 AM	62	28	26	16	27	21	11	38	43	43	46	45	40	57
8:45 AM	9:00 AM	62	28	27	16	27	21	11	39	58	52	50	54	43	58
9:00 AM	9:15 AM	62	28	28	46	42	48	51	54	57	53	47	49	42	58
9:15 AM	9:30 AM	62	27	28	59	57	53	62	60	59	54	55	56	45	58
9:30 AM	9:45 AM	62	55	46	47	56	53	62	60	59	54	53	56	46	58
9:45 AM	10:00 AM	62	62	49	59	58	53	62	60	59	54	55	56	46	58

Capital Package 3

US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB SR-92 Off to SR-92 EB On	US-101 NB @ S of EB 92 On-Ramp	US-101 NB SR-92 EB On to SR-92 WB On	US-101 NB @ S of WB92 On-Ramp	US-101 NB Fashion Island On to Kehoe Off	US-101 NB Kehoe On to 3rd Off	US-101 NB @ S of 3rd Off-Ramp	US-101 NB N of 3rd
62	62	59	62	62	62	62	60	61	54	59	60	60	60
62	62	59	62	62	62	62	60	61	54	59	59	60	60
62	62	60	62	62	62	62	60	61	54	59	59	60	60
62	62	60	62	62	61	62	60	61	54	59	59	59	60
62	62	50	62	62	61	62	60	61	53	55	58	59	60
62	62	48	62	62	61	62	60	61	53	55	57	59	59
62	62	46	62	62	61	62	60	52	28	53	57	59	59
62	62	50	62	62	61	62	44	11	18	53	57	59	59
62	61	45	62	62	50	11	32	11	19	53	59	59	60
62	61	43	62	62	50	11	31	11	23	55	58	60	59
62	61	43	62	62	50	11	37	44	44	52	58	60	59
62	62	44	62	62	50	11	39	59	53	51	58	59	59
62	61	44	62	62	61	53	56	60	55	52	59	59	60
62	61	44	62	62	61	62	60	61	55	57	59	59	60
62	61	43	62	62	61	62	60	61	55	57	59	58	60
62	61	44	62	62	61	62	60	61	55	57	59	59	60

Southbound US101

AM Peak Period

Capital Projects Baseline

Start	End	US-101 SB N of 3rd	US-101 SB 3rd On to SR-92 Off	US-101 SB @ N of 92 Off-Ramps	US-101 SB SR-92 Off to SR-92 WB On	US-101 @ N of WB 92 On-Ramp	US-101 SB SR-92 WB On to Fashion Island On	US-101 SB Fashion Island On to SR-92 EB On	US-101 SB SR-92 EB On to Hillsdale Off	US-101 SB @ N of Hillsdale Loop On-Ramp	US-101 SB Hillsdale On to Ralston Off	US-101 SB Ralston On to Harbor Off	US-101 SB S of Harbor
6:00 AM	6:15 AM	63	62	59	62	56	58	61	59	59	61	60	60
6:15 AM	6:30 AM	63	62	59	62	57	58	61	59	59	60	60	60
6:30 AM	6:45 AM	63	62	59	62	56	58	61	59	59	60	60	60
6:45 AM	7:00 AM	62	62	59	62	56	58	61	59	59	60	60	60
7:00 AM	7:15 AM	62	58	56	58	46	53	57	53	53	56	56	56
7:15 AM	7:30 AM	62	27	26	58	46	52	56	50	52	55	53	53
7:30 AM	7:45 AM	62	26	24	58	45	52	56	49	52	55	53	53
7:45 AM	8:00 AM	62	26	24	38	11	49	57	54	49	56	54	54
8:00 AM	8:15 AM	62	54	48	23	11	39	37	29	36	57	56	56
8:15 AM	8:30 AM	62	57	55	14	11	32	16	29	42	53	52	52
8:30 AM	8:45 AM	62	57	55	11	34	36	17	35	51	54	53	53
8:45 AM	9:00 AM	62	57	54	11	36	28	16	27	52	55	54	54
9:00 AM	9:15 AM	62	61	59	11	35	28	30	27	52	56	55	55
9:15 AM	9:30 AM	62	61	60	49	36	53	31	28	52	58	57	57
9:30 AM	9:45 AM	62	61	60	53	36	54	32	29	53	58	57	57
9:45 AM	10:00 AM	62	61	60	52	36	54	31	29	52	58	58	58

Capital Package 3

US-101 SB N of 3rd	US-101 SB 3rd On to SR-92 Off	US-101 SB @ N of 92 Off-Ramps	US-101 SB SR-92 Off to SR-92 WB On	US-101 @ N of WB 92 On-Ramp	US-101 SB SR-92 WB On to Fashion Island On	US-101 SB Fashion Island On to SR-92 EB On	US-101 SB SR-92 EB On to Hillsdale Off	US-101 SB @ N of Hillsdale Loop On-Ramp	US-101 SB Hillsdale On to Ralston Off	US-101 SB Ralston On to Harbor Off	US-101 SB S of Harbor
63	62	62	62	58	62	62	62	61	61	61	61
63	62	62	62	58	62	63	62	60	61	60	60
63	62	62	62	57	62	62	62	60	61	60	60
62	62	62	62	58	62	62	62	60	61	61	61
62	58	57	58	51	58	59	58	57	58	57	57
62	27	27	58	50	57	58	58	56	58	57	56
62	26	26	58	49	57	58	58	57	58	56	56
62	26	26	58	51	57	58	58	56	57	56	56
62	54	51	57	48	57	57	57	56	57	56	56
62	57	55	57	50	57	57	57	56	57	56	56
62	57	55	57	50	57	57	57	56	57	56	56
62	57	55	57	50	57	57	57	56	57	56	56
62	61	60	60	55	60	60	59	58	59	58	58
62	61	60	61	56	61	61	60	58	59	59	59
62	61	60	61	56	61	61	60	58	59	59	59
62	61	60	61	56	61	61	60	58	59	59	59

Eastbound SR92

AM Peak Period

Capital Projects Baseline

Start	End	SR-92 EB @ W of El Camino Real Off-Ramp	SR-92 EB S El Camino Off to S El Camino On	SR-92 EB @ W of El Camino Real Loop On-Ramp	SR-92 EB @ W of El Camino Real Loop Off-Ramp	SR-92 EB @ W of El Camino Real Direct On-Ramp	SR-92 EB @ W of Delaware Off-Ramp	SR-92 EB Delaware Off to Delaware On	SR-92 EB @ W of Delaware On-Ramp	SR-92 EB @ W of SB 101 Off-Ramp	SR-92 EB @ W of NB 101 Off-Ramp	SR-92 EB US-101 NB Off to US-101 On	SR-92 EB @ W of 101 On-Ramps	SR-92 EB @ W of Egewater Off-Ramp	SR-92 EB Emerald Bay On to Foster City Off	SR-92 EB @ W of Foster City Off-Ramp	SR-92 EB E of Foster City
6:00 AM	6:15 AM	58	57	53	49	50	51	50	46	50	48	52	53	57	60	58	59
6:15 AM	6:30 AM	58	57	53	49	50	51	50	45	50	42	50	51	57	60	58	58
6:30 AM	6:45 AM	58	57	53	49	50	51	50	45	50	42	50	51	56	60	58	58
6:45 AM	7:00 AM	58	57	53	49	50	51	50	46	50	41	49	51	56	60	58	58
7:00 AM	7:15 AM	56	57	54	47	45	47	43	37	44	37	46	47	55	55	49	58
7:15 AM	7:30 AM	56	56	54	47	45	47	43	37	44	38	46	47	55	54	47	58
7:30 AM	7:45 AM	55	56	54	47	45	47	43	38	40	37	46	47	55	54	47	58
7:45 AM	8:00 AM	56	56	54	47	45	47	43	37	39	37	46	47	55	54	46	59
8:00 AM	8:15 AM	55	56	53	44	42	44	39	32	35	28	45	46	52	52	44	59
8:15 AM	8:30 AM	53	55	52	42	41	43	35	29	36	28	43	44	52	51	43	60
8:30 AM	8:45 AM	53	54	51	42	41	43	36	30	39	28	44	44	51	51	41	59
8:45 AM	9:00 AM	54	55	51	43	42	44	38	31	39	28	44	45	52	51	42	60
9:00 AM	9:15 AM	54	55	52	44	44	46	41	32	41	42	46	45	51	55	49	54
9:15 AM	9:30 AM	55	56	52	45	44	46	40	33	41	42	46	45	51	56	50	53
9:30 AM	9:45 AM	54	56	52	45	44	46	41	33	42	42	47	46	50	56	50	53
9:45 AM	10:00 AM	56	56	52	45	44	46	41	33	42	41	46	45	51	56	51	52

Capital Package 3

Start	End	SR-92 EB @ W of El Camino Real Off-Ramp	SR-92 EB S El Camino Off to S El Camino On	SR-92 EB @ W of El Camino Real Loop On-Ramp	SR-92 EB @ W of El Camino Real Loop Off-Ramp	SR-92 EB @ W of El Camino Real Direct On-Ramp	SR-92 EB @ W of Delaware Off-Ramp	SR-92 EB Delaware Off to Delaware On	SR-92 EB @ W of Delaware On-Ramp	SR-92 EB @ W of SB 101 Off-Ramp	SR-92 EB @ W of NB 101 Off-Ramp	SR-92 EB US-101 NB Off to US-101 On	SR-92 EB @ W of 101 On-Ramps	SR-92 EB @ W of Egewater Off-Ramp	SR-92 EB Emerald Bay On to Foster City Off	SR-92 EB @ W of Foster City Off-Ramp	SR-92 EB E of Foster City
6:00 AM	6:15 AM	58	57	56	43	52	54	57	42	55	55	57	57	60	61	59	60
6:15 AM	6:30 AM	58	57	56	43	53	54	57	42	55	50	56	57	60	61	59	60
6:30 AM	6:45 AM	58	57	56	43	53	54	57	42	55	50	56	57	60	61	59	60
6:45 AM	7:00 AM	58	57	56	43	53	54	57	43	55	50	56	57	60	61	59	60
7:00 AM	7:15 AM	56	57	56	42	43	43	42	39	44	48	56	56	59	58	53	60
7:15 AM	7:30 AM	56	57	55	42	43	43	42	39	44	48	56	57	59	58	53	59
7:30 AM	7:45 AM	55	56	55	42	43	43	42	39	44	48	56	56	59	58	52	60
7:45 AM	8:00 AM	56	56	55	42	43	43	42	39	44	48	56	56	59	58	53	60
8:00 AM	8:15 AM	55	56	54	41	43	43	42	36	44	28	54	56	58	57	49	59
8:15 AM	8:30 AM	54	56	54	41	43	43	42	37	44	28	54	56	58	57	48	60
8:30 AM	8:45 AM	54	55	53	41	43	43	42	36	44	28	54	56	58	57	47	60
8:45 AM	9:00 AM	54	55	53	41	43	43	42	36	44	28	54	56	58	57	49	60
9:00 AM	9:15 AM	55	56	54	42	43	43	42	37	44	54	56	55	59	59	54	58
9:15 AM	9:30 AM	55	56	54	42	43	43	42	38	44	56	56	55	60	60	55	58
9:30 AM	9:45 AM	54	56	54	42	43	43	42	38	44	56	56	55	60	60	55	58
9:45 AM	10:00 AM	56	56	54	42	43	43	42	38	44	56	56	55	60	60	56	57

Westbound SR92

AM Peak Period

Capital Projects Baseline

Start	End	SR-92 WB E of Foster City	SR-92 WB Foster City On to Baker Way Off	SR-92 WB @ E of Edgewater Off-Ramp	SR-92 WB @ E of NB 101 Off-Ramp	SR-92 WB US-101 NB Off to US-101 SB Off	SR-92 WB @ E of SB 101 Off-Ramp	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On	SR-92 WB @ E of Delaware On-Ramp	SR-92 WB @ E of El Camino Real NB Off-Ramp	SR-92 WB @ E of El Camino Real NB On-Ramp	SR-92 WB @ E of El Camino Real SB Off-Ramp	SR-92 WB N El Camino Off to N El Camino On	SR-92 WB @ E of El Camino Real SB On-Ramp	SR-92 WB @ E of Alameda De Las Pulgas Off-Ramp
6:00 AM	6:15 AM	58	57	57	54	57	57	53	57	60	58	55	58	56	57	56	57
6:15 AM	6:30 AM	58	57	57	54	56	57	52	57	60	58	55	59	57	58	57	56
6:30 AM	6:45 AM	58	57	57	54	57	57	52	57	60	58	55	59	57	58	57	57
6:45 AM	7:00 AM	58	57	57	54	57	57	52	57	60	58	55	58	56	58	57	57
7:00 AM	7:15 AM	58	56	55	55	56	54	50	56	59	54	53	55	55	58	54	50
7:15 AM	7:30 AM	58	56	54	55	56	52	49	54	57	51	52	52	54	58	54	48
7:30 AM	7:45 AM	58	56	55	55	56	54	48	52	57	50	51	52	54	58	54	46
7:45 AM	8:00 AM	58	55	56	55	56	54	49	52	56	49	51	51	54	57	54	47
8:00 AM	8:15 AM	58	55	55	46	55	55	38	52	55	48	51	51	53	57	54	46
8:15 AM	8:30 AM	58	55	56	46	54	50	36	50	53	47	49	50	53	57	53	45
8:30 AM	8:45 AM	58	55	55	46	55	53	36	49	53	46	48	48	52	57	53	46
8:45 AM	9:00 AM	58	55	54	46	55	54	36	49	53	47	47	47	52	57	53	45
9:00 AM	9:15 AM	58	56	56	55	57	54	39	40	52	49	50	51	53	57	53	49
9:15 AM	9:30 AM	58	56	56	55	57	56	42	41	55	52	51	53	53	57	54	51
9:30 AM	9:45 AM	58	57	56	55	57	55	40	41	54	50	51	53	53	57	54	51
9:45 AM	10:00 AM	58	57	56	55	57	55	40	42	55	53	52	54	54	57	54	51

Capital Package 3

Start	End	SR-92 WB E of Foster City	SR-92 WB Foster City On to Baker Way Off	SR-92 WB @ E of Edgewater Off-Ramp	SR-92 WB @ E of NB 101 Off-Ramp	SR-92 WB US-101 NB Off to US-101 SB Off	SR-92 WB @ E of SB 101 Off-Ramp	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On	SR-92 WB @ E of Delaware On-Ramp	SR-92 WB @ E of El Camino Real NB Off-Ramp	SR-92 WB @ E of El Camino Real NB On-Ramp	SR-92 WB @ E of El Camino Real SB Off-Ramp	SR-92 WB N El Camino Off to N El Camino On	SR-92 WB @ E of El Camino Real SB On-Ramp	SR-92 WB @ E of Alameda De Las Pulgas Off-Ramp
6:00 AM	6:15 AM	58	57	57	53	58	58	53	57	60	58	55	58	56	57	56	56
6:15 AM	6:30 AM	58	57	57	52	58	58	52	58	60	58	55	59	57	58	57	57
6:30 AM	6:45 AM	58	57	57	52	58	58	52	57	60	58	55	58	57	58	57	57
6:45 AM	7:00 AM	58	57	57	52	58	58	52	57	60	58	55	59	57	58	57	57
7:00 AM	7:15 AM	58	55	55	52	57	58	50	55	59	53	53	54	54	58	55	49
7:15 AM	7:30 AM	58	54	55	51	56	58	50	55	58	50	51	52	54	58	54	47
7:30 AM	7:45 AM	58	55	54	50	56	58	48	54	58	51	52	52	54	57	54	46
7:45 AM	8:00 AM	58	54	55	50	56	58	49	53	57	50	52	53	54	58	54	44
8:00 AM	8:15 AM	58	54	54	41	55	58	38	51	56	48	50	51	53	57	54	45
8:15 AM	8:30 AM	58	54	56	41	55	58	37	50	54	48	48	49	53	57	53	44
8:30 AM	8:45 AM	58	54	54	40	54	58	36	52	55	47	48	49	53	57	53	45
8:45 AM	9:00 AM	58	54	55	39	54	58	37	50	52	46	48	48	52	57	53	44
9:00 AM	9:15 AM	58	56	56	52	57	58	42	41	54	51	51	52	53	57	54	48
9:15 AM	9:30 AM	58	56	56	51	57	58	43	42	55	54	52	54	53	57	54	52
9:30 AM	9:45 AM	58	56	56	52	57	58	42	41	55	52	52	54	53	58	54	51
9:45 AM	10:00 AM	58	56	56	52	57	58	41	41	54	53	52	55	54	58	54	51

Northbound US101 to Westbound SR92

AM Peak Period

Capital Projects Baseline

Start	End	US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB Off to SR-92 WB Connector Ramp	US-101 NB Off to SR-92 WB @ Midpoint	US-101 NB Off to SR-92 WB @ Endpoint	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On
6:00 AM	6:15 AM	62	62	61	61	61	61	62	55	51	53	57	60
6:15 AM	6:30 AM	62	62	61	61	61	61	62	56	51	52	57	60
6:30 AM	6:45 AM	62	62	61	61	61	61	62	55	51	52	57	60
6:45 AM	7:00 AM	62	62	61	61	61	61	62	55	51	52	57	60
7:00 AM	7:15 AM	62	62	54	60	59	56	62	54	53	50	56	59
7:15 AM	7:30 AM	62	62	53	55	45	57	61	54	53	49	54	57
7:30 AM	7:45 AM	62	62	52	54	45	57	61	54	52	48	52	57
7:45 AM	8:00 AM	62	62	52	50	28	25	59	54	53	49	52	56
8:00 AM	8:15 AM	62	37	32	29	28	24	58	54	49	38	52	55
8:15 AM	8:30 AM	62	28	27	16	28	22	58	54	47	36	50	53
8:30 AM	8:45 AM	62	28	26	16	27	21	57	54	47	36	49	53
8:45 AM	9:00 AM	62	28	27	16	27	21	57	54	47	36	49	53
9:00 AM	9:15 AM	62	28	28	46	42	48	59	53	49	39	40	52
9:15 AM	9:30 AM	62	27	28	59	57	53	60	54	52	42	41	55
9:30 AM	9:45 AM	62	55	46	47	56	53	60	54	51	40	41	54
9:45 AM	10:00 AM	62	62	49	59	58	53	61	54	51	40	42	55

Capital Package 3

Start	End	US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB Off to SR-92 WB Connector Ramp	US-101 NB Off to SR-92 WB @ Midpoint	US-101 NB Off to SR-92 WB @ Endpoint	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On
6:00 AM	6:15 AM	62	62	59	62	62	62	62	55	51	53	57	60
6:15 AM	6:30 AM	62	62	59	62	62	62	62	55	51	52	58	60
6:30 AM	6:45 AM	62	62	60	62	62	62	62	55	51	52	57	60
6:45 AM	7:00 AM	62	62	60	62	62	61	62	55	51	52	57	60
7:00 AM	7:15 AM	62	62	50	62	62	61	62	54	53	50	55	59
7:15 AM	7:30 AM	62	62	48	62	62	61	62	54	53	50	55	58
7:30 AM	7:45 AM	62	62	46	62	62	61	62	54	53	48	54	58
7:45 AM	8:00 AM	62	62	50	62	62	61	62	54	53	49	53	57
8:00 AM	8:15 AM	62	61	45	62	62	50	62	54	49	38	51	56
8:15 AM	8:30 AM	62	61	43	62	62	50	62	53	49	37	50	54
8:30 AM	8:45 AM	62	61	43	62	62	50	62	53	47	36	52	55
8:45 AM	9:00 AM	62	62	44	62	62	50	62	53	48	37	50	52
9:00 AM	9:15 AM	62	61	44	62	62	61	62	54	51	42	41	54
9:15 AM	9:30 AM	62	61	44	62	62	61	62	54	52	43	42	55
9:30 AM	9:45 AM	62	61	43	62	62	61	62	54	51	42	41	55
9:45 AM	10:00 AM	62	61	44	62	62	61	62	54	51	41	41	54

Northbound US101

PM Peak Period

Capital Projects Baseline

Start	End	US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB SR-92 Off to SR-92 EB On	US-101 NB @ S of EB 92 On-Ramp	US-101 NB SR-92 EB On to SR-92 WB On	US-101 NB @ S of WB92 On-Ramp	US-101 NB Fashion Island On to Kehoe Off	US-101 NB Kehoe On to 3rd Off	US-101 NB @ S of 3rd Off-Ramp	US-101 NB N of 3rd
2:30 PM	2:45 PM	57	58	56	58	56	55	59	57	57	56	53	57	50	59
2:45 PM	3:00 PM	57	58	56	56	56	56	59	57	57	55	53	57	48	58
3:00 PM	3:15 PM	57	58	56	57	56	55	59	57	57	55	51	57	48	58
3:15 PM	3:30 PM	57	58	56	57	56	55	59	57	57	55	53	56	48	58
3:30 PM	3:45 PM	57	58	56	57	56	55	59	57	57	55	50	56	48	58
3:45 PM	4:00 PM	57	58	56	52	44	57	59	57	57	55	50	56	48	58
4:00 PM	4:15 PM	57	58	56	52	43	57	59	57	57	55	52	56	48	58
4:15 PM	4:30 PM	57	58	55	52	43	57	59	57	57	55	51	55	48	58
4:30 PM	4:45 PM	51	57	51	49	44	57	59	57	57	54	42	52	47	58
4:45 PM	5:00 PM	40	53	49	50	44	57	59	57	57	54	38	46	48	57
5:00 PM	5:15 PM	37	49	48	50	44	57	59	57	57	53	37	45	36	57
5:15 PM	5:30 PM	33	50	50	52	52	55	24	23	23	29	44	47	36	58
5:30 PM	5:45 PM	35	42	42	41	38	37	24	23	23	30	45	48	36	58
5:45 PM	6:00 PM	35	38	43	49	51	50	24	23	23	30	51	54	47	58
6:00 PM	6:15 PM	39	44	48	52	54	55	55	24	49	30	45	51	47	58
6:15 PM	6:30 PM	41	51	51	53	55	56	58	56	51	29	45	50	46	58
6:30 PM	6:45 PM	49	54	52	56	55	55	59	57	58	55	46	48	47	58
6:45 PM	7:00 PM	56	56	55	58	57	57	59	57	58	55	53	56	50	58
7:00 PM	7:15 PM	58	58	56	58	57	57	59	57	58	55	54	57	50	58
7:15 PM	7:30 PM	58	58	55	58	57	57	59	57	58	56	55	57	50	59

Capital Package 3

US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB SR-92 Off to SR-92 EB On	US-101 NB @ S of EB 92 On-Ramp	US-101 NB SR-92 EB On to SR-92 WB On	US-101 NB @ S of WB92 On-Ramp	US-101 NB Fashion Island On to Kehoe Off	US-101 NB Kehoe On to 3rd Off	US-101 NB @ S of 3rd Off-Ramp	US-101 NB N of 3rd
57	58	42	59	59	59	59	56	58	56	52	58	57	59
57	58	41	59	59	59	59	56	58	56	51	58	56	59
57	58	42	59	59	58	59	56	58	55	50	58	57	59
57	58	42	59	59	58	59	56	58	55	50	58	56	59
57	58	40	59	58	58	59	56	58	55	50	58	57	58
57	58	40	59	59	58	59	56	58	55	48	58	56	58
57	58	39	59	59	58	59	56	58	55	49	58	57	58
57	58	40	58	58	58	59	56	58	55	50	58	57	58
57	51	41	58	58	58	58	56	57	54	44	58	56	58
57	49	40	58	58	58	58	55	57	54	41	58	56	58
57	48	41	58	58	58	58	54	54	50	40	58	57	58
57	47	41	58	58	58	23	22	22	28	44	58	57	58
57	48	39	58	58	58	22	22	22	29	44	58	57	58
53	48	37	59	59	58	23	23	22	30	48	58	58	58
50	48	39	59	59	58	54	23	48	29	43	58	57	58
51	49	39	59	59	58	58	55	49	28	44	58	58	58
51	51	43	59	59	59	59	56	58	55	45	58	57	59
53	53	44	59	59	59	59	56	58	55	51	58	57	59
56	56	45	59	59	59	59	57	58	56	51	58	57	59
58	58	44	59	59	59	59	57	58	56	53	58	58	59

Southbound US101

PM Peak Period

Capital Projects Baseline

Start	End	US-101 SB N of 3rd	US-101 SB 3rd On to SR-92 Off	US-101 SB @ N of 92 Off-Ramps	US-101 SB SR-92 Off to SR-92 WB On	US-101 @ N of WB 92 On-Ramp	US-101 SB SR-92 WB On to Fashion Island On	US-101 SB Fashion Island On to SR-92 EB On	US-101 SB SR-92 EB On to Hillsdale Off	US-101 SB @ N of Hillsdale Loop On-Ramp	US-101 SB Hillsdale On to Ralston Off	US-101 SB Ralston On to Harbor Off	US-101 SB S of Harbor
2:30 PM	2:45 PM	62	62	61	54	49	58	61	52	56	57	58	59
2:45 PM	3:00 PM	62	62	61	54	49	58	60	52	56	56	57	57
3:00 PM	3:15 PM	62	62	61	54	49	58	60	51	55	56	57	57
3:15 PM	3:30 PM	62	62	61	54	49	58	60	51	55	56	57	57
3:30 PM	3:45 PM	62	62	61	54	49	58	60	52	55	56	57	57
3:45 PM	4:00 PM	62	62	61	54	49	58	60	52	55	56	57	57
4:00 PM	4:15 PM	62	62	61	54	49	58	60	52	55	56	57	57
4:15 PM	4:30 PM	62	62	61	54	49	58	60	52	55	56	57	57
4:30 PM	4:45 PM	62	62	61	54	48	57	60	51	55	56	56	57
4:45 PM	5:00 PM	62	62	61	54	48	57	60	51	55	55	56	57
5:00 PM	5:15 PM	62	62	61	54	48	57	45	43	54	55	56	56
5:15 PM	5:30 PM	62	62	61	45	49	58	45	43	53	55	56	57
5:30 PM	5:45 PM	62	62	61	44	48	57	45	43	54	55	57	57
5:45 PM	6:00 PM	62	62	62	43	48	57	45	43	54	56	57	57
6:00 PM	6:15 PM	62	62	62	44	48	57	45	43	55	56	57	57
6:15 PM	6:30 PM	62	62	61	44	48	56	60	51	55	57	57	58
6:30 PM	6:45 PM	62	62	62	54	48	57	60	51	56	57	57	58
6:45 PM	7:00 PM	62	62	62	54	48	57	60	51	56	57	57	58
7:00 PM	7:15 PM	62	62	62	54	48	57	60	49	54	55	56	57
7:15 PM	7:30 PM	62	62	62	54	48	57	60	51	56	57	57	57

Capital Package 3

US-101 SB N of 3rd	US-101 SB 3rd On to SR-92 Off	US-101 SB @ N of 92 Off-Ramps	US-101 SB SR-92 Off to SR-92 WB On	US-101 @ N of WB 92 On-Ramp	US-101 SB SR-92 WB On to Fashion Island On	US-101 SB Fashion Island On to SR-92 EB On	US-101 SB SR-92 EB On to Hillsdale Off	US-101 SB @ N of Hillsdale Loop On-Ramp	US-101 SB Hillsdale On to Ralston Off	US-101 SB Ralston On to Harbor Off	US-101 SB S of Harbor
62	62	61	63	59	62	63	60	59	57	57	57
62	62	61	63	59	63	63	60	59	57	57	57
62	62	61	63	58	62	63	60	58	57	57	57
62	62	61	63	59	63	63	60	58	57	57	57
62	62	61	63	59	63	63	60	58	57	57	57
62	62	61	63	59	62	63	60	58	57	57	57
62	62	61	63	59	62	63	60	58	57	57	57
62	62	61	63	59	63	63	60	58	57	57	57
62	62	61	63	58	62	63	60	58	57	57	57
62	62	61	63	58	62	63	60	58	57	57	57
62	62	61	63	58	62	63	60	58	57	57	57
62	62	61	63	58	62	63	60	58	57	57	57
62	62	61	63	58	62	63	60	58	57	57	57
62	62	61	63	58	62	63	60	58	57	57	57
62	62	62	63	57	62	63	60	58	57	57	57
62	62	61	63	57	62	63	60	58	57	57	57
62	62	61	63	58	62	63	60	58	57	57	57
62	62	61	63	57	62	63	60	58	57	57	57
62	62	62	63	58	63	63	60	58	57	57	57
62	62	61	63	58	63	63	59	58	57	57	57
62	62	61	63	58	63	63	60	59	57	57	57

Eastbound SR92

PM Peak Period

Capital Projects Baseline

Start	End	SR-92 EB @ W of El Camino Real Off-Ramp	SR-92 EB S El Camino Off to S El Camino On	SR-92 EB @ W of El Camino Real Loop On-Ramp	SR-92 EB @ W of El Camino Real Loop Off-Ramp	SR-92 EB @ W of El Camino Real Direct On-Ramp	SR-92 EB @ W of Delaware Off-Ramp	SR-92 EB Delaware Off to Delaware On	SR-92 EB @ W of Delaware On-Ramp	SR-92 EB @ W of SB 101 Off-Ramp	SR-92 EB @ W of NB 101 Off-Ramp	SR-92 EB US-101 NB Off to US-101 On	SR-92 EB @ W of 101 On-Ramps	SR-92 EB @ W of Egewater Off-Ramp	SR-92 EB Emerald Bay On to Foster City Off	SR-92 EB @ W of Foster City Off-Ramp	SR-92 EB E of Foster City
2:30 PM	2:45 PM	56	57	57	46	39	42	38	36	39	40	46	45	52	55	48	55
2:45 PM	3:00 PM	55	57	57	46	39	42	39	36	39	38	46	44	51	54	45	53
3:00 PM	3:15 PM	55	57	57	46	40	43	39	37	39	39	46	45	51	55	48	53
3:15 PM	3:30 PM	55	58	57	46	40	43	39	37	39	39	46	44	50	54	47	53
3:30 PM	3:45 PM	54	57	56	46	39	42	39	37	40	39	45	42	49	54	42	53
3:45 PM	4:00 PM	55	57	56	45	38	42	38	36	39	39	45	40	49	53	38	52
4:00 PM	4:15 PM	54	57	56	45	38	42	38	36	39	37	44	38	49	53	38	52
4:15 PM	4:30 PM	54	57	56	45	38	42	38	35	39	38	44	39	48	53	38	52
4:30 PM	4:45 PM	52	57	56	44	38	43	37	35	39	38	45	39	48	53	36	52
4:45 PM	5:00 PM	51	57	56	43	38	42	36	35	38	39	44	37	48	53	34	51
5:00 PM	5:15 PM	51	57	56	44	37	41	36	34	38	38	43	35	48	53	34	51
5:15 PM	5:30 PM	52	57	56	44	37	42	37	35	38	38	43	35	48	53	33	51
5:30 PM	5:45 PM	53	57	56	48	42	45	41	39	41	42	47	44	51	55	43	53
5:45 PM	6:00 PM	53	57	57	47	42	45	42	40	42	42	48	44	51	55	45	54
6:00 PM	6:15 PM	53	57	56	47	41	45	42	39	42	42	48	45	51	55	45	54
6:15 PM	6:30 PM	53	57	56	47	42	46	42	40	42	43	47	45	51	55	44	55
6:30 PM	6:45 PM	56	57	57	47	44	46	43	41	43	44	48	46	52	56	46	55
6:45 PM	7:00 PM	56	58	57	47	44	47	44	43	43	45	49	47	52	56	48	55
7:00 PM	7:15 PM	56	57	57	43	37	39	36	35	37	39	43	41	50	53	40	52
7:15 PM	7:30 PM	56	58	57	47	42	44	41	40	42	43	47	46	52	55	47	55

Capital Package 3

SR-92 EB @ W of El Camino Real Off-Ramp	SR-92 EB S El Camino Off to S El Camino On	SR-92 EB @ W of El Camino Real Loop On-Ramp	SR-92 EB @ W of El Camino Real Loop Off-Ramp	SR-92 EB @ W of El Camino Real Direct On-Ramp	SR-92 EB @ W of Delaware Off-Ramp	SR-92 EB Delaware Off to Delaware On	SR-92 EB @ W of Delaware On-Ramp	SR-92 EB @ W of SB 101 Off-Ramp	SR-92 EB @ W of NB 101 Off-Ramp	SR-92 EB US-101 NB Off to US-101 On	SR-92 EB @ W of 101 On-Ramps	SR-92 EB @ W of Egewater Off-Ramp	SR-92 EB Emerald Bay On to Foster City Off	SR-92 EB @ W of Foster City Off-Ramp	SR-92 EB E of Foster City
57	58	57	42	43	43	43	33	43	40	43	52	59	59	41	58
57	57	57	42	43	43	43	33	43	39	43	51	59	59	39	58
57	58	57	42	43	43	43	34	43	39	43	52	59	59	40	58
57	58	57	42	43	43	43	34	43	39	43	52	59	59	40	58
56	57	57	42	43	43	43	33	43	39	43	45	58	59	38	58
57	57	57	42	43	43	42	33	43	39	43	43	58	59	36	58
56	57	57	42	43	43	42	33	42	39	43	43	58	59	35	58
56	57	57	42	43	43	42	33	43	39	43	43	58	59	37	58
55	57	56	42	43	43	42	33	43	39	43	40	58	59	35	58
56	57	56	41	43	42	42	32	43	39	43	39	58	59	34	58
56	57	56	41	43	42	42	32	42	39	43	36	58	59	34	58
55	57	56	42	43	43	42	33	43	39	43	39	58	59	35	58
56	57	57	42	43	43	43	34	43	40	43	47	58	59	37	58
56	57	57	42	43	43	43	34	43	40	43	45	58	59	38	58
56	57	57	42	43	43	43	34	43	40	43	47	58	59	38	58
56	57	57	42	43	43	43	34	43	40	43	48	58	59	38	58
57	58	57	42	43	43	43	35	43	41	43	50	59	59	39	58
57	58	57	42	43	43	43	35	43	41	43	51	59	60	39	59
57	58	57	42	43	43	43	34	43	41	43	51	59	59	37	58
57	58	57	42	43	43	43	34	43	41	43	51	59	60	39	59

Westbound SR92

PM Peak Period

Capital Projects Baseline

Start	End	SR-92 WB E of Foster City	SR-92 WB Foster City On to Baker Way Off	SR-92 WB @ E of Edgewater Off-Ramp	SR-92 WB @ E of NB 101 Off-Ramp	SR-92 WB US-101 NB Off to US-101 SB Off	SR-92 WB @ E of SB 101 Off-Ramp	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On	SR-92 WB @ E of Delaware On-Ramp	SR-92 WB @ E of El Camino Real NB Off-Ramp	SR-92 WB @ E of El Camino Real NB On-Ramp	SR-92 WB @ E of El Camino Real SB Off-Ramp	SR-92 WB N El Camino Off to N El Camino On	SR-92 WB @ E of El Camino Real SB On-Ramp	SR-92 WB @ E of Alameda De Las Pulgas Off-Ramp
2:30 PM	2:45 PM	58	58	57	58	58	56	55	54	58	54	52	55	54	57	54	45
2:45 PM	3:00 PM	58	58	57	58	58	56	54	52	57	51	51	53	53	57	54	44
3:00 PM	3:15 PM	58	58	58	58	58	55	53	53	58	51	51	54	53	57	54	46
3:15 PM	3:30 PM	58	58	57	58	58	56	53	53	58	52	51	54	53	57	54	45
3:30 PM	3:45 PM	58	58	57	58	58	54	53	51	56	51	50	54	53	57	53	47
3:45 PM	4:00 PM	58	58	57	58	58	54	53	52	57	51	50	53	53	57	53	45
4:00 PM	4:15 PM	58	58	57	58	58	54	53	50	56	50	50	52	53	57	53	46
4:15 PM	4:30 PM	58	58	57	58	58	54	53	53	57	51	50	53	53	57	53	45
4:30 PM	4:45 PM	58	58	56	57	57	49	53	50	56	51	49	52	53	56	51	44
4:45 PM	5:00 PM	58	58	55	57	57	48	53	48	54	49	47	49	51	53	47	45
5:00 PM	5:15 PM	58	57	55	55	56	48	54	47	53	47	45	48	51	53	46	45
5:15 PM	5:30 PM	58	57	55	55	56	49	26	21	29	32	48	55	54	56	52	46
5:30 PM	5:45 PM	58	58	54	56	57	51	19	21	29	31	49	56	54	57	52	44
5:45 PM	6:00 PM	58	58	53	57	57	51	38	39	49	44	47	50	52	56	50	45
6:00 PM	6:15 PM	58	58	54	57	57	51	54	50	56	49	49	53	53	56	53	46
6:15 PM	6:30 PM	58	58	54	57	58	51	54	51	57	52	50	53	53	56	52	45
6:30 PM	6:45 PM	58	58	57	58	58	55	54	53	58	51	51	55	53	57	55	49
6:45 PM	7:00 PM	58	58	58	58	58	56	54	55	58	53	51	56	53	57	54	51
7:00 PM	7:15 PM	58	58	57	58	58	56	56	54	58	53	51	56	54	57	53	50
7:15 PM	7:30 PM	58	58	57	58	58	56	55	55	58	54	51	57	54	57	55	51

Capital Package 3

Start	End	SR-92 WB E of Foster City	SR-92 WB Foster City On to Baker Way Off	SR-92 WB @ E of Edgewater Off-Ramp	SR-92 WB @ E of NB 101 Off-Ramp	SR-92 WB US-101 NB Off to US-101 SB Off	SR-92 WB @ E of SB 101 Off-Ramp	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On	SR-92 WB @ E of Delaware On-Ramp	SR-92 WB @ E of El Camino Real NB Off-Ramp	SR-92 WB @ E of El Camino Real NB On-Ramp	SR-92 WB @ E of El Camino Real SB Off-Ramp	SR-92 WB N El Camino Off to N El Camino On	SR-92 WB @ E of El Camino Real SB On-Ramp	SR-92 WB @ E of Alameda De Las Pulgas Off-Ramp
2:30 PM	2:45 PM	58	58	57	57	58	58	55	53	58	53	52	55	54	57	55	48
2:45 PM	3:00 PM	58	58	57	57	58	58	54	53	57	51	50	51	53	57	55	46
3:00 PM	3:15 PM	58	58	57	57	58	58	53	53	58	53	51	54	53	57	54	47
3:15 PM	3:30 PM	58	58	57	57	58	58	53	53	58	52	51	53	53	57	54	48
3:30 PM	3:45 PM	58	58	57	57	58	58	53	51	56	50	50	53	53	57	53	48
3:45 PM	4:00 PM	58	58	57	57	58	58	53	51	56	51	50	51	53	57	54	48
4:00 PM	4:15 PM	58	58	56	56	58	58	53	51	56	50	50	52	53	57	54	46
4:15 PM	4:30 PM	58	58	57	56	57	58	53	51	56	50	50	52	53	57	54	47
4:30 PM	4:45 PM	58	57	56	56	57	58	53	48	54	49	48	50	52	56	51	46
4:45 PM	5:00 PM	58	57	55	55	57	58	53	48	53	49	46	47	50	53	46	46
5:00 PM	5:15 PM	58	57	53	52	57	58	53	48	53	47	45	48	52	55	50	48
5:15 PM	5:30 PM	58	56	54	48	56	58	26	21	29	31	48	55	54	57	53	48
5:30 PM	5:45 PM	58	55	53	50	57	58	19	21	29	31	48	55	54	57	53	44
5:45 PM	6:00 PM	58	57	54	53	57	58	39	38	47	43	46	50	52	55	49	46
6:00 PM	6:15 PM	58	58	55	53	57	58	54	51	56	51	50	54	54	56	52	48
6:15 PM	6:30 PM	58	58	55	54	57	58	54	53	57	51	50	54	54	57	53	47
6:30 PM	6:45 PM	58	58	58	57	58	58	54	54	58	52	51	55	53	57	55	50
6:45 PM	7:00 PM	58	58	57	57	58	58	54	55	58	52	51	57	54	57	55	53
7:00 PM	7:15 PM	58	58	57	57	58	58	56	54	58	53	51	56	54	57	54	52
7:15 PM	7:30 PM	58	58	57	57	58	58	56	54	58	53	51	56	54	57	55	52

Northbound US101 to Westbound SR92

PM Peak Period

Capital Projects Baseline

Start	End	US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB Off to SR-92 WB Connector Ramp	US-101 NB Off to SR-92 WB @ Midpoint	US-101 NB Off to SR-92 WB @ Endpoint	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On
2:30 PM	2:45 PM	57	58	56	58	56	55	58	48	54	55	54	58
2:45 PM	3:00 PM	57	58	56	56	56	56	57	47	53	54	52	57
3:00 PM	3:15 PM	57	58	56	57	56	55	57	47	53	53	53	58
3:15 PM	3:30 PM	57	58	56	57	56	55	58	47	53	53	53	58
3:30 PM	3:45 PM	57	58	56	57	56	55	58	47	53	53	51	56
3:45 PM	4:00 PM	57	58	56	52	44	57	58	47	53	53	52	57
4:00 PM	4:15 PM	57	58	56	52	43	57	57	47	53	53	50	56
4:15 PM	4:30 PM	57	58	55	52	43	57	57	47	53	53	53	57
4:30 PM	4:45 PM	51	57	51	49	44	57	58	47	53	53	50	56
4:45 PM	5:00 PM	40	53	49	50	44	57	57	47	53	53	48	54
5:00 PM	5:15 PM	37	49	48	50	44	57	58	47	53	54	47	53
5:15 PM	5:30 PM	33	50	50	52	52	55	52	39	32	26	21	29
5:30 PM	5:45 PM	35	42	42	41	38	37	31	27	21	19	21	29
5:45 PM	6:00 PM	35	38	43	49	51	50	49	42	44	38	39	49
6:00 PM	6:15 PM	39	44	48	52	54	55	56	47	53	54	50	56
6:15 PM	6:30 PM	41	51	51	53	55	56	57	47	53	54	51	57
6:30 PM	6:45 PM	49	54	52	56	55	55	57	47	53	54	53	58
6:45 PM	7:00 PM	56	56	55	58	57	57	58	48	53	54	55	58
7:00 PM	7:15 PM	58	58	56	58	57	57	58	48	54	56	54	58
7:15 PM	7:30 PM	58	58	55	58	57	57	59	47	53	55	55	58

Capital Package 3

Start	End	US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB Off to SR-92 WB Connector Ramp	US-101 NB Off to SR-92 WB @ Midpoint	US-101 NB Off to SR-92 WB @ Endpoint	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On
2:30 PM	2:45 PM	57	58	42	59	59	59	58	47	53	55	53	58
2:45 PM	3:00 PM	57	58	41	59	59	59	58	47	53	54	53	57
3:00 PM	3:15 PM	57	58	42	59	59	58	58	47	53	53	53	58
3:15 PM	3:30 PM	57	58	42	59	59	58	58	47	53	53	53	58
3:30 PM	3:45 PM	57	58	40	59	58	58	58	47	53	53	51	56
3:45 PM	4:00 PM	57	58	40	59	59	58	58	47	53	53	51	56
4:00 PM	4:15 PM	57	58	39	59	59	58	58	47	53	53	51	56
4:15 PM	4:30 PM	57	58	40	58	58	58	58	47	53	53	51	56
4:30 PM	4:45 PM	57	51	41	58	58	58	58	47	53	53	48	54
4:45 PM	5:00 PM	57	49	40	58	58	58	58	47	53	53	48	53
5:00 PM	5:15 PM	57	48	41	58	58	58	58	47	53	53	48	53
5:15 PM	5:30 PM	57	47	41	58	58	58	52	40	34	26	21	29
5:30 PM	5:45 PM	57	48	39	58	58	58	35	29	22	19	21	29
5:45 PM	6:00 PM	53	48	37	59	59	58	45	41	45	39	38	47
6:00 PM	6:15 PM	50	48	39	59	59	58	58	47	53	54	51	56
6:15 PM	6:30 PM	51	49	39	59	59	58	58	47	53	54	53	57
6:30 PM	6:45 PM	51	51	43	59	59	59	58	47	53	54	54	58
6:45 PM	7:00 PM	53	53	44	59	59	59	58	47	53	54	55	58
7:00 PM	7:15 PM	56	56	45	59	59	59	58	47	53	56	54	58
7:15 PM	7:30 PM	58	58	44	59	59	59	59	47	53	56	54	58

Appendix E:
Travel Time Comparisons

Travel Time Comparison
Capital Projects Package #1 vs. Capital Projects Baseline
AM Peak Period

		1	2	3	4	5	6	7	8	9	10	11	12
		101 SB	**101 NB**	**W Hillsdale to Foster City**	**Foster to W Hillsdale**	**Foster to 3rd**	**Foster to Ralston**	**3rd 101 SB to Foster**	**3rd 101 SB to W Hillsdale**	**W Hillsdale to Ralston**	**W Hillsdale to 3rd**	**Ralston to Foster**	**Ralston to W Hillsdale**
		B	D	F	H	J	L	N	P	R	T	V	X
6:00AM to 7:00AM	Package 1	228	229	272	264	204	294	195	262	336	307	217	307
	Std. Dev.	0.2	0.4	2.9	0.4	0.7	0.8	0.5	0.8	0.8	1.3	3.9	0.8
	Cap.Projs.Bsln.	230	232	272	264	208	295	195	262	340	312	217	307
	Diff	-1	-3	1	0	-3	-1	0	0	-4	-4	0	0
	% Diff	-1%	-1%	0%	0%	-2%	0%	0%	0%	-1%	-1%	0%	0%
7:00AM to 8:00AM	Package 1	277	267	297	278	241	313	235	328	372	353	244	349
	Std. Dev.	1.8	1.4	3.2	1.9	3.0	1.4	2.2	4.4	2.6	3.6	2.7	2.6
	Cap.Projs.Bsln.	303	323	298	279	284	322	237	329	387	412	244	350
	Diff	-26	-55	0	0	-43	-10	-2	-1	-15	-59	0	-1
	% Diff	-8%	-17%	0%	0%	-15%	-3%	-1%	0%	-4%	-14%	0%	0%
8:00AM to 9:00AM	Package 1	258	511	301	290	245	310	247	339	383	390	406	520
	Std. Dev.	1.5	2.5	14.3	2.3	2.7	0.9	5.7	6.9	2.4	3.9	4.9	3.4
	Cap.Projs.Bsln.	515	570	299	291	293	456	248	343	496	463	407	522
	Diff	-257	-59	3	-1	-48	-146	-1	-4	-114	-73	-1	-1
	% Diff	-50%	-10%	1%	0%	-17%	-32%	-1%	-1%	-23%	-16%	0%	0%
9:00AM to 10:00AM	Package 1	233	311	299	279	220	284	222	310	360	338	413	432
	Std. Dev.	0.5	2.8	6.9	1.6	1.9	1.1	3.5	4.8	1.8	4.5	21.2	7.4
	Cap.Projs.Bsln.	328	329	297	280	227	332	222	312	402	356	421	435
	Diff	-96	-18	2	-1	-8	-48	0	-1	-42	-18	-9	-3
	% Diff	-29%	-6%	1%	0%	-3%	-14%	0%	0%	-10%	-5%	-2%	-1%

Green shading indicates travel time reduction of 10% or more.
Red shading indicates travel time increase of 10% or more.

Travel Time Comparison
Capital Projects Package #1 vs. Capital Projects Baseline
PM Peak Period

		1	2	3	4	5	6	7	8	9	10	11	12
		101 SB	**101 NB**	**W Hillsdale to Foster City**	**Foster to W Hillsdale**	**Foster to 3rd**	**Foster to Ralston**	**3rd 101 SB to Foster**	**3rd 101 SB to W Hillsdale**	**W Hillsdale to Ralston**	**W Hillsdale to 3rd**	**Ralston to Foster**	**Ralston to W Hillsdale**
2:30PM to 3:30PM	Package 1	229	249	311	272	206	272	234	285	367	334	251	346
	Std. Dev.	0.5	0.7	2.9	2.9	1.3	1.2	1.8	7.3	1.3	2.2	3.9	3.7
	Cap.Projs.Bsln.	233	258	311	271	218	274	233	287	370	345	250	346
	Diff	-4	-9	0	1	-12	-2	0	-2	-3	-11	0	0
	% Diff	-2%	-3%	0%	0%	-6%	-1%	0%	-1%	-1%	-3%	0%	0%
3:30PM to 4:30PM	Package 1	229	253	332	278	210	273	256	307	373	340	272	362
	Std. Dev.	0.6	0.6	2.9	2.3	1.2	1.0	2.7	14.1	2.1	1.9	4.8	5.6
	Cap.Projs.Bsln.	233	264	332	278	225	275	256	307	376	356	272	362
	Diff	-4	-12	-1	0	-16	-2	0	0	-3	-16	0	0
	% Diff	-2%	-4%	0%	0%	-7%	-1%	0%	0%	-1%	-4%	0%	0%
4:30PM to 5:30PM	Package 1	230	281	345	308	250	280	269	319	383	359	340	458
	Std. Dev.	0.6	11.8	2.6	6.5	19.8	1.4	5.9	6.7	1.7	2.8	35.3	32.8
	Cap.Projs.Bsln.	242	334	344	308	315	286	270	321	387	419	339	457
	Diff	-12	-53	1	0	-65	-6	-1	-2	-4	-60	1	0
	% Diff	-5%	-16%	0%	0%	-21%	-2%	0%	0%	-1%	-14%	0%	0%
5:30PM to 6:30PM	Package 1	229	311	314	313	297	278	244	320	370	353	403	588
	Std. Dev.	1.1	18.0	2.5	10.9	34.8	2.2	1.9	8.1	1.2	1.9	72.7	74.7
	Cap.Projs.Bsln.	256	363	313	324	309	286	243	332	373	397	477	717
	Diff	-27	-52	1	-10	-13	-8	1	-13	-3	-45	-74	-129
	% Diff	-11%	-14%	0%	-3%	-4%	-3%	0%	-4%	-1%	-11%	-16%	-18%
6:30PM to 7:30PM	Package 1	228	249	301	270	220	271	235	272	361	325	248	338
	Std. Dev.	0.9	1.2	2.1	1.3	4.0	1.0	1.6	1.9	1.7	1.3	3.1	3.2
	Cap.Projs.Bsln.	232	263	301	270	223	272	235	272	363	340	250	344
	Diff	-4	-14	-1	0	-3	-1	0	0	-2	-15	-2	-6
	% Diff	-2%	-5%	0%	0%	-1%	-1%	0%	0%	0%	-4%	-1%	-2%

Green shading indicates travel time reduction of 10% or more.
Red shading indicates travel time increase of 10% or more.

Travel Time Comparison
Capital Projects Package #2 vs. Capital Projects Baseline
AM Peak Period

		1	2	3	4	5	6	7	8	9	10	11	12
		101 SB	**101 NB**	**W Hillsdale to Foster City**	**Foster to W Hillsdale**	**Foster to 3rd**	**Foster to Ralston**	**3rd 101 SB to Foster**	**3rd 101 SB to W Hillsdale**	**W Hillsdale to Ralston**	**W Hillsdale to 3rd**	**Ralston to Foster**	**Ralston to W Hillsdale**
6:00AM to 7:00AM	Package 2	229	231	262	264	205	257	193	263	325	304	217	305
	Std. Dev.	0.3	0.5	1.7	0.3	0.8	0.6	0.2	0.6	0.6	0.9	4.8	1.0
	Cap.Projs.Bsln.	230	232	272	264	208	295	195	262	340	312	217	307
	Diff	-1	0	-10	0	-2	-38	-2	0	-15	-8	1	-2
	% Diff	0%	0%	-4%	0%	-1%	-13%	-1%	0%	-4%	-3%	0%	-1%
7:00AM to 8:00AM	Package 2	299	319	268	271	280	282	230	324	353	389	241	336
	Std. Dev.	2.1	2.5	1.2	1.2	2.8	1.1	1.8	6.3	3.5	6.1	2.6	2.2
	Cap.Projs.Bsln.	303	323	298	279	284	322	237	329	387	412	244	350
	Diff	-4	-4	-30	-8	-4	-40	-7	-6	-34	-24	-3	-14
	% Diff	-1%	-1%	-10%	-3%	-1%	-13%	-3%	-2%	-9%	-6%	-1%	-4%
8:00AM to 9:00AM	Package 2	504	559	271	275	285	410	249	325	470	425	398	498
	Std. Dev.	27.9	5.6	8.4	1.7	5.2	18.0	8.5	7.7	14.5	7.7	9.3	7.8
	Cap.Projs.Bsln.	515	570	299	291	293	456	248	343	496	463	407	522
	Diff	-11	-11	-27	-17	-8	-46	1	-19	-26	-38	-9	-23
	% Diff	-2%	-2%	-9%	-6%	-3%	-10%	0%	-5%	-5%	-8%	-2%	-4%
9:00AM to 10:00AM	Package 2	307	326	270	268	227	319	207	299	377	334	408	411
	Std. Dev.	1.9	2.9	4.2	1.3	2.8	1.3	2.6	12.4	2.6	5.8	19.5	7.6
	Cap.Projs.Bsln.	328	329	297	280	227	332	222	312	402	356	421	435
	Diff	-22	-3	-27	-12	-1	-14	-15	-13	-25	-23	-13	-24
	% Diff	-7%	-1%	-9%	-4%	0%	-4%	-7%	-4%	-6%	-6%	-3%	-5%

Green shading indicates travel time reduction of 10% or more.
Red shading indicates travel time increase of 10% or more.

Travel Time Comparison
Capital Projects Package #2 vs. Capital Projects Baseline
PM Peak Period

		1	2	3	4	5	6	7	8	9	10	11	12
		101 SB	**101 NB**	**W Hillsdale to Foster City**	**Foster to W Hillsdale**	**Foster to 3rd**	**Foster to Ralston**	**3rd 101 SB to Foster**	**3rd 101 SB to W Hillsdale**	**W Hillsdale to Ralston**	**W Hillsdale to 3rd**	**Ralston to Foster**	**Ralston to W Hillsdale**
		B	D	F	H	J	L	N	P	R	T	V	X
2:30PM to 3:30PM	Package 2	230	260	272	269	221	270	220	284	328	328	248	342
	Std. Dev.	0.7	1.8	1.4	2.1	3.7	1.1	1.1	6.5	0.7	4.2	4.5	2.8
	Cap.Projs.Bsln.	233	258	311	271	218	274	233	287	370	345	250	346
	Diff	-3	2	-38	-3	3	-4	-14	-2	-42	-17	-2	-3
	% Diff	-1%	1%	-12%	-1%	1%	-2%	-6%	-1%	-11%	-5%	-1%	-1%
3:30PM to 4:30PM	Package 2	230	267	278	274	227	271	226	301	330	334	270	358
	Std. Dev.	0.5	2.6	1.0	1.5	3.3	1.0	1.6	13.7	0.9	3.2	3.8	4.0
	Cap.Projs.Bsln.	233	264	332	278	225	275	256	307	376	356	272	362
	Diff	-4	2	-55	-4	2	-4	-30	-6	-46	-22	-2	-4
	% Diff	-2%	1%	-16%	-1%	1%	-2%	-12%	-2%	-12%	-6%	-1%	-1%
4:30PM to 5:30PM	Package 2	237	335	284	286	318	280	231	301	337	392	363	432
	Std. Dev.	0.8	19.3	1.4	3.2	39.6	1.1	3.1	4.1	1.3	18.6	43.4	35.0
	Cap.Projs.Bsln.	242	334	344	308	315	286	270	321	387	419	339	457
	Diff	-4	2	-60	-22	3	-5	-39	-20	-50	-27	24	-26
	% Diff	-2%	0%	-17%	-7%	1%	-2%	-14%	-6%	-13%	-6%	7%	-6%
5:30PM to 6:30PM	Package 2	253	341	275	279	349	281	223	287	336	394	336	399
	Std. Dev.	0.8	7.8	0.8	1.8	72.8	2.5	1.2	2.6	1.0	13.0	40.1	35.7
	Cap.Projs.Bsln.	256	363	313	324	309	286	243	332	373	397	477	717
	Diff	-3	-21	-38	-44	40	-4	-20	-45	-37	-4	-141	-318
	% Diff	-1%	-6%	-12%	-14%	13%	-1%	-8%	-14%	-10%	-1%	-30%	-44%
6:30PM to 7:30PM	Package 2	229	261	268	269	223	270	221	270	324	322	244	336
	Std. Dev.	1.1	3.4	0.7	1.4	7.2	0.6	1.2	1.4	1.0	5.0	2.3	1.3
	Cap.Projs.Bsln.	232	263	301	270	223	272	235	272	363	340	250	344
	Diff	-2	-3	-33	-1	1	-3	-14	-2	-39	-18	-6	-8
	% Diff	-1%	-1%	-11%	0%	0%	-1%	-6%	-1%	-11%	-5%	-2%	-2%

Green shading indicates travel time reduction of 10% or more.
Red shading indicates travel time increase of 10% or more.

Travel Time Comparison
Capital Projects Package #3 vs. Capital Projects Baseline
AM Peak Period

		1	2	3	4	5	6	7	8	9	10	11	12
		101 SB	**101 NB**	**W Hillsdale to Foster City**	**Foster to W Hillsdale**	**Foster to 3rd**	**Foster to Ralston**	**3rd 101 SB to Foster**	**3rd 101 SB to W Hillsdale**	**W Hillsdale to Ralston**	**W Hillsdale to 3rd**	**Ralston to Foster**	**Ralston to W Hillsdale**
6:00AM to 7:00AM	Package 3	227	229	272	264	204	234	195	262	325	305	228	308
	Std. Dev.	0.2	0.3	1.8	0.9	0.8	0.5	0.2	0.6	0.8	0.5	6.4	0.5
	CapProjsBsln	230	232	272	264	208	295	195	262	340	312	217	307
	Diff	-3	-3	0	0	-4	-61	-1	0	-15	-7	11	1
	% Diff	-1%	-1%	0%	0%	-2%	-21%	0%	0%	-4%	-2%	5%	0%
7:00AM to 8:00AM	Package 3	273	258	284	279	248	251	233	331	350	341	237	334
	Std. Dev.	1.6	1.8	1.3	2.1	2.2	1.5	1.6	5.9	1.6	3.8	3.2	2.2
	CapProjsBsln	303	323	298	279	284	322	237	329	387	412	244	350
	Diff	-30	-64	-13	0	-36	-72	-4	2	-36	-71	-7	-16
	% Diff	-10%	-20%	-4%	0%	-13%	-22%	-2%	0%	-9%	-17%	-3%	-5%
8:00AM to 9:00AM	Package 3	254	371	282	295	247	248	245	340	355	379	244	359
	Std. Dev.	1.3	2.7	5.7	5.4	2.8	1.4	11.4	6.5	3.0	5.1	2.7	6.8
	CapProjsBsln	515	570	299	291	293	456	248	343	496	463	407	522
	Diff	-262	-199	-16	4	-46	-209	-4	-3	-142	-84	-163	-163
	% Diff	-51%	-35%	-5%	1%	-16%	-46%	-1%	-1%	-29%	-18%	-40%	-31%
9:00AM to 10:00AM	Package 3	230	253	281	280	221	239	213	312	339	322	253	345
	Std. Dev.	0.5	2.0	2.9	2.7	3.0	1.0	2.0	8.6	1.3	3.0	19.6	4.1
	CapProjsBsln	328	329	297	280	227	332	222	312	402	356	337	435
	Diff	-99	-77	-17	0	-6	-94	-9	0	-63	-35	-84	-90
	% Diff	-30%	-23%	-6%	0%	-3%	-28%	-4%	0%	-16%	-9.7%	-25%	-21%

Green shading indicates travel time reduction of 10% or more.
Red shading indicates travel time increase of 10% or more.

Travel Time Comparison
Capital Projects Package #3 vs. Capital Projects Package #1
AM Peak Period

		1	2	3	4	5	6	7	8	9	10	11	12
		101 SB	**101 NB**	**W Hillsdale to Foster City**	**Foster to W Hillsdale**	**Foster to 3rd**	**Foster to Ralston**	**3rd 101 SB to Foster**	**3rd 101 SB to W Hillsdale**	**W Hillsdale to Ralston**	**W Hillsdale to 3rd**	**Ralston to Foster**	**Ralston to W Hillsdale**
6:00AM to 7:00AM	Package 3	227	229	272	264	204	234	195	262	325	305	228	308
	Std. Dev.	0.2	0.3	1.8	0.9	0.8	0.5	0.2	0.6	0.8	0.5	6.4	0.5
	Package 1	228	229	272	264	204	294	195	262	336	307	217	307
	Diff	-2	0	0	0	-1	-60	0	0	-11	-3	10	1
	% Diff	-1%	0%	0%	0%	0%	-20%	0%	0%	-3%	-1%	5%	0%
7:00AM to 8:00AM	Package 3	273	258	284	279	248	251	233	331	350	341	237	334
	Std. Dev.	1.6	1.8	1.3	2.1	2.2	1.5	1.6	5.9	1.6	3.8	3.2	2.2
	Package 1	277	267	297	278	241	313	235	328	372	353	244	349
	Diff	-5	-9	-13	1	7	-62	-2	3	-22	-12	-7	-15
	% Diff	-2%	-3%	-4%	0%	3%	-20%	-1%	1%	-6%	-3%	-3%	-4%
8:00AM to 9:00AM	Package 3	254	371	282	295	247	248	245	340	355	379	244	359
	Std. Dev.	1.3	2.7	5.7	5.4	2.8	1.4	11.4	6.5	3.0	5.1	2.7	6.8
	Package 1	258	511	301	290	245	310	247	339	383	390	406	520
	Diff	-4	-140	-19	5	2	-63	-2	1	-28	-12	-162	-162
	% Diff	-2%	-27%	-6%	2%	1%	-20%	-1%	0%	-7%	-3%	-40%	-31%
9:00AM to 10:00AM	Package 3	230	253	281	280	221	239	213	312	339	322	253	345
	Std. Dev.	0.5	2.0	2.9	2.7	3.0	1.0	2.0	8.6	1.3	3.0	19.6	4.1
	Package 1	233	311	299	279	220	284	222	310	360	338	413	432
	Diff	-3	-58	-18	1	2	-46	-9	1	-21	-17	-160	-87
	% Diff	-1%	-19%	-6%	0%	1%	-16%	-4%	0%	-6%	-5%	-39%	-20%

Green shading indicates travel time reduction of 10% or more.
Red shading indicates travel time increase of 10% or more.

Travel Time Comparison
Capital Projects Package #3 vs. Capital Projects Baseline
PM Peak Period

		1	2	3	4	5	6	7	8	9	10	11	12
		101 SB	**101 NB**	**W Hillsdale to Foster City**	**Foster to W Hillsdale**	**Foster to 3rd**	**Foster to Ralston**	**3rd 101 SB to Foster**	**3rd 101 SB to W Hillsdale**	**W Hillsdale to Ralston**	**W Hillsdale to 3rd**	**Ralston to Foster**	**Ralston to W Hillsdale**
2:30PM to 3:30PM	Package 3	226	259	286	270	206	251	224	283	335	322	251	346
	Std. Dev.	0.6	3.4	1.2	1.8	1.3	4.1	0.9	7.3	0.8	1.0	2.7	4.6
	CapProjsBsln	233	258	311	271	218	274	233	287	370	345	250	346
	Diff	-7	1	-25	-1	-12	-23	-10	-3	-35	-24	1	1
	% Diff	-3%	0%	-8%	0%	-5%	-8%	-4%	-1%	-9.6%	-7%	0%	0%
3:30PM to 4:30PM	Package 3	226	264	293	275	212	253	238	304	337	324	257	352
	Std. Dev.	0.6	1.8	1.2	1.1	1.7	3.3	2.1	14.3	0.7	1.9	3.0	3.2
	CapProjsBsln	233	264	332	278	225	275	256	307	376	356	272	362
	Diff	-7	-1	-39	-3	-13	-22	-17	-3	-39	-32	-16	-10
	% Diff	-3%	0%	-12%	-1%	-6%	-8%	-7%	-1%	-10%	-9%	-6%	-3%
4:30PM to 5:30PM	Package 3	227	305	300	302	282	300	250	320	341	345	280	403
	Std. Dev.	0.7	9.9	1.6	7.0	20.7	47.9	5.5	8.3	1.8	5.0	7.9	9.5
	CapProjsBsln	242	334	344	308	315	286	270	321	387	419	339	457
	Diff	-15	-28	-44	-6	-33	15	-20	0	-47	-74	-59	-55
	% Diff	-6%	-8%	-13%	-2%	-11%	5%	-8%	0%	-12%	-18%	-17%	-12%
5:30PM to 6:30PM	Package 3	226	335	291	314	291	264	233	329	337	363	333	591
	Std. Dev.	1.3	27.3	1.8	4.5	25.7	10.1	3.5	5.6	1.0	24.0	47.6	52.7
	CapProjsBsln	256	363	313	324	309	286	243	332	373	397	477	717
	Diff	-30	-28	-22	-9	-19	-22	-10	-3	-37	-35	-144	-126
	% Diff	-12%	-8%	-7%	-3%	-6%	-8%	-4%	-1%	-9.8%	-9%	-30%	-18%
6:30PM to 7:30PM	Package 3	225	269	285	282	208	245	225	271	345	320	250	343
	Std. Dev.	0.9	25.8	1.1	41.4	3.0	1.1	1.5	1.8	36.5	1.6	1.7	3.2
	CapProjsBsln	232	263	301	270	223	272	235	272	363	340	250	344
	Diff	-7	5	-17	12	-15	-27	-10	-1	-18	-20	0	-1
	% Diff	-3%	2%	-6%	4%	-7%	-10%	-4%	0%	-5%	-6%	0%	0%

Green shading indicates travel time reduction of 10% or more.
Red shading indicates travel time increase of 10% or more.

Travel Time Comparison
Capital Projects Package #3 vs. Capital Projects Package #1
PM Peak Period

		1	2	3	4	5	6	7	8	9	10	11	12
		101 SB	**101 NB**	**W Hillsdale to Foster City**	**Foster to W Hillsdale**	**Foster to 3rd**	**Foster to Ralston**	**3rd 101 SB to Foster**	**3rd 101 SB to W Hillsdale**	**W Hillsdale to Ralston**	**W Hillsdale to 3rd**	**Ralston to Foster**	**Ralston to W Hillsdale**
2:30PM to 3:30PM	Package 3	226	259	286	270	206	251	224	283	335	322	251	346
	Std. Dev.	0.6	3.4	1.2	1.8	1.3	4.1	0.9	7.3	0.8	1.0	2.7	4.6
	Package 1	229	249	311	272	206	272	234	285	367	334	251	346
	Diff	-3	10	-25	-2	0	-21	-10	-2	-33	-12	0	0
	% Diff	-1%	4%	-8%	-1%	0%	-8%	-4%	-1%	-9%	-4%	0%	0%
3:30PM to 4:30PM	Package 3	226	264	293	275	212	253	238	304	337	324	257	352
	Std. Dev.	0.6	1.8	1.2	1.1	1.7	3.3	2.1	14.3	0.7	1.9	3.0	3.2
	Package 1	229	253	332	278	210	273	256	307	373	340	272	362
	Diff	-3	11	-38	-3	3	-20	-18	-3	-36	-16	-16	-10
	% Diff	-1%	4%	-12%	-1%	1%	-7%	-7%	-1%	-9.6%	-5%	-6%	-3%
4:30PM to 5:30PM	Package 3	227	305	300	302	282	300	250	320	341	345	280	403
	Std. Dev.	0.7	9.9	1.6	7.0	20.7	47.9	5.5	8.3	1.8	5.0	7.9	9.5
	Package 1	230	281	345	308	250	280	269	319	383	359	340	458
	Diff	-4	25	-45	-6	32	21	-20	1	-43	-14	-60	-55
	% Diff	-2%	9%	-13%	-2%	13%	7%	-7%	0%	-11%	-4%	-18%	-12%
5:30PM to 6:30PM	Package 3	226	335	291	314	291	264	233	329	337	363	333	591
	Std. Dev.	1.3	27.3	1.8	4.5	25.7	10.1	3.5	5.6	1.0	24.0	47.6	52.7
	Package 1	229	311	314	313	297	278	244	320	370	353	403	588
	Diff	-3	24	-23	1	-6	-14	-11	10	-33	10	-70	3
	% Diff	-1%	8%	-7%	0%	-2%	-5%	-5%	3%	-9%	3%	-17%	1%
6:30PM to 7:30PM	Package 3	225	269	285	282	208	245	225	271	345	320	250	343
	Std. Dev.	0.9	25.8	1.1	41.4	3.0	1.1	1.5	1.8	36.5	1.6	1.7	3.2
	Package 1	228	249	301	270	220	271	235	272	361	325	248	338
	Diff	-3	19	-16	12	-12	-26	-10	-2	-16	-5	1	5
	% Diff	-1%	8%	-5%	4%	-5%	-9.5%	-4%	-1%	-5%	-2%	1%	1%

Green shading indicates travel time reduction of 10% or more.
Red shading indicates travel time increase of 10% or more.

Appendix F:
Performance Measure Comparisons

Performance Measure Comparison Summary
Capital Projects Package 1 vs. Capital Projects Baseline
AM Peak Period

Performance Measure		Capital Projects Baseline	Package 1	Difference
Bottleneck Locations		NB 101: 3rd Ave. off/on ramps SB 101: Hillsdale loop/diagonal on-ramps	NB 101: WB 92 / F.I. Blvd. on - Kehoe	Hidden bottleneck on NB 101 revealed; SB 101 bottleneck eliminated
Queue Lengths		NB 101: South of Hillsdale SB 101: North of SR92 Off	NB 101: to SR92	Less Queuing NB; SB Queuing Eliminated
Travel Time (sec)		Peak hour range: 248 (SB to EB) to 570 (NB thru)	Peak hour range: 245 (WB to NB) to 520 (NB to WB)	Reductions up to 50%
Conflicting Movements		NB 101 between Hillsdale and 92 SB 101 between EB92 on-ramp and Hillsdale off-ramp		Same movements, but smoother traffic flow reduces conflicts
Emissions and fuel consumption	CO	768,673	756,189	-1.62%
	Nox	149,556	147,127	-1.62%
	VOC	178,147	175,254	-1.62%
	Fuel Cons.	10,997	10,818	-1.63%
Person-throughput		136,515	136,596	0.06%
Total Person Miles Traveled (PMT)		538,687	538,919	0.04%
Total Distance Traveled (VMT)		445,196	445,387	0.04%
Duration of Congestion		NB 101: 7:30-9:30 SB 101: 7:15-10:00	NB 101: 7:30-9:30 SB 101: None	SB Congested conditions eliminated

Performance Measure Comparison Summary
Capital Projects Package 1 vs. Capital Projects Baseline
PM Peak Period

Performance Measure		Capital Projects Baseline	Package 1	Difference
Bottleneck Locations		NB 101: Betw. WB92/F.I. Blvd. on and Kehoe WB 92: Delaware on to El Camino off		No Change
Queue Lengths		NB 101: to SR92 WB 92: NB-WB connector ramp back to 101		No Change
Travel Time (sec)		Peak hour range: 243 (SB to EB) to 717 (NB to WB)	Peak hour range: 229 (SB thru) to 588 (NB to WB)	Reductions up to 21% (WB-NB)
Conflicting Movements		NB 101 between Hillsdale and 92 NB 101 between Fash. Is./WB92 on EB92 between 101 and Edgewater WB92 between 101 and Delaware		Same movements, but smoother traffic flow reduces conflicts
Emissions and fuel consumption	CO	1,027,617	1,020,675	-0.68%
	Nox	199,937	198,586	-0.68%
	VOC	238,160	236,551	-0.68%
	Fuel Cons.	14,701	14,602	-0.67%
Person-throughput		185,182	185,268	0.05%
Total Person Miles Traveled (PMT)		705,200	705,658	0.06%
Total Distance Traveled (VMT)		582,810	583,188	0.06%
Duration of Congestion		NB 101: 5:15-6:30 WB92: 5:15-5:45	NB 101: 5:15-6:30 WB92: 5:15-5:45	No Change

Performance Measure Comparison Summary
Capital Projects Package 2 vs. Capital Projects Baseline
AM Peak Period

Performance Measure		Capital Projects Baseline	Package 2	Difference
Bottleneck Locations		NB 101: 3rd Ave. off/on ramps SB 101: Hillsdale loop/diagonal on-ramps		No change
Queue Lengths		NB 101: South of Hillsdale SB 101: North of SR92 Off		No change
Travel Time (sec)		Peak hour range: 248 (SB to EB) to 570 (NB thru)	Peak hour range: 249 (SB to EB) to 559 (NB thru)	Mostly slight reductions; 1 up to 21%
Conflicting Movements		NB 101 between Hillsdale and 92 SB 101 between EB92 on-ramp and Hillsdale off-ramp		No change
Emissions and fuel consumption	CO	768,673	757,492	-1.45%
	Nox	149,556	147,380	-1.45%
	VOC	178,147	175,556	-1.45%
	Fuel Cons.	10,997	10,837	-1.46%
Person-throughput		136,515	135,718	-0.58%
Total Person Miles Traveled (PMT)		538,687	536,509	-0.40%
Total Distance Traveled (VMT)		445,196	443,396	-0.40%
Duration of Congestion		NB 101: 7:30-9:30 SB 101: 7:15-10:00	NB 101: 7:30-9:30 SB 101: 7:15-10:00	No change

Performance Measure Comparison Summary
Capital Projects Package 2 vs. Capital Projects Baseline
PM Peak Period

Performance Measure		Capital Projects Baseline	Package 2	Difference
Bottleneck Locations		NB 101: Betw. WB92/F.I. Blvd. on and Kehoe WB 92: Delaware on to El Camino off	NB 101: Betw. WB92/F.I. Blvd. on and Kehoe	101 Bottleneck Remains 92 Bottleneck eliminated
Queue Lengths		NB 101: South of Hillsdale WB 92: NB-WB connector ramp back to 101	NB 101: South of Hillsdale	Queuing Eliminated on 92; No change on 101
Travel Time (sec)		Peak hour range: 243 (SB to EB) to 717 (NB to WB)	Peak hour range: 223 (SB to EB) to 399 (NB to WB)	Reductions up to 44%
Conflicting Movements		NB 101 between Hillsdale and 92 NB 101 between Fash. Is./WB92 on EB92 between 101 and Edgewater WB92 between 101 and Delaware		Same movements (although more lanes to cross), but smoother traffic flow reduces conflicts
Emissions and fuel consumption	CO	1,027,617	1,001,592	-2.53%
	Nox	199,937	194,873	-2.53%
	VOC	238,160	232,129	-2.53%
	Fuel Cons.	14,701	14,329	-2.53%
Person-throughput		185,182	183,476	-0.92%
Total Person Miles Traveled (PMT)		705,200	702,367	-0.40%
Total Distance Traveled (VMT)		582,810	580,469	-0.40%
Duration of Congestion		NB 101: 5:15-6:30 WB92: 5:15-5:45	NB 101: 5:15-6:30 WB92: None	Congested conditions eliminated on 92; no change on 101

Performance Measure Comparison Summary
Capital Projects Package 3 vs. Capital Projects Baseline
AM Peak Period

Performance Measure		Capital Projects Baseline	Package 3	Difference
Bottleneck Locations		NB 101: 3rd Ave. off/on ramps SB 101: Hillsdale loop/diagonal on-ramps	NB 101: WB 92 / F.I. Blvd. on - Kehoe	Bottlenecks Eliminated
Queue Lengths		NB 101: South of Hillsdale SB 101: North of SR92 Off	NB 101: to SR92	Less Queuing NB; SB Queuing Eliminated
Travel Time (sec)		Peak hour range: 248 (SB to EB) to 570 (NB thru)	Peak hour range: 244 (NB to EB) to 379 (WB to NB)	Reductions up to over 50%
Conflicting Movements		NB 101 between Hillsdale and 92 SB 101 between EB92 on-ramp and Hillsdale off-ramp	None	Braided ramp systems remove conflicts
Emissions and fuel consumption	CO	768,673	757,134	-1.50%
	Nox	149,556	147,311	-1.50%
	VOC	178,147	175,473	-1.50%
	Fuel Cons.	10,997	10,832	-1.50%
Person-throughput		136,515	136,215	-0.22%
Total Person Miles Traveled (PMT)		538,687	536,522	-0.40%
Total Distance Traveled (VMT)		445,196	443,407	-0.40%
Duration of Congestion		NB 101: 7:30-9:30 SB 101: 7:15-10:00	NB 101: 7:30-9:00 SB 101: None	NB congested duration shorter; SB eliminated

Performance Measure Comparison Summary
Capital Projects Package 3 vs. Capital Projects Baseline
PM Peak Period

Performance Measure		Capital Projects Baseline	Package 3	Difference
Bottleneck Locations		NB 101: Betw. WB92/F.I. Blvd. on and Kehoe WB 92: Delaware on to El Camino off		No Change
Queue Lengths		NB 101: South of Hillsdale WB 92: NB-WB connector ramp back to 101	NB 101: to SR92 WB 92: NB-WB connector back to split with NB-EB	Queuing Reduced on 101; no change on 92
Travel Time (sec)		Peak hour range: 243 (SB to EB) to 717 (NB to WB)	Peak hour range: 226 (SB thru) to 591 (NB to WB)	Reductions up to 30%
Conflicting Movements		NB 101 between Hillsdale and 92 NB 101 between Fash. Is./WB92 on EB92 between 101 and Edgewater WB92 between 101 and Delaware	NB 101 between Fash. Is./WB92 on EB92 between 101 and Edgewater WB92 between 101 and Delaware	Braided ramp systems remove conflicts between Hills. & 92
Emissions and fuel consumption	CO	1,027,617	1,009,048	-1.81%
	Nox	199,937	196,324	-1.81%
	VOC	238,160	233,857	-1.81%
	Fuel Cons.	14,701	14,436	-1.81%
Person-throughput		185,182	184,816	-0.20%
Total Person Miles Traveled (PMT)		705,200	700,458	-0.67%
Total Distance Traveled (VMT)		582,810	578,891	-0.67%
Duration of Congestion		NB 101: 5:15-6:30 WB92: 5:15-5:45	NB 101: 5:15-6:30 WB92: 5:15-5:45	No Change

Appendix G:
Synchro Reports

HCM Signalized Intersection Capacity Analysis
101: Barneson Ave. & El Camino Real

9/26/2012

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	139	109	81	1460	1486	133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	1.00			0.91	0.91	
Frt	0.94			1.00	0.99	
Flt Protected	0.97			1.00	1.00	
Satd. Flow (prot)	1704			5072	5023	
Flt Permitted	0.97			0.72	1.00	
Satd. Flow (perm)	1704			3646	5023	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	146	115	85	1537	1564	140
RTOR Reduction (vph)	29	0	0	0	7	0
Lane Group Flow (vph)	232	0	0	1622	1697	0
Turn Type			Perm			
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	19.9			82.1	82.1	
Effective Green, g (s)	19.9			82.1	82.1	
Actuated g/C Ratio	0.18			0.75	0.75	
Clearance Time (s)	4.0			4.0	4.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	308			2721	3749	
v/s Ratio Prot	c0.14				0.34	
v/s Ratio Perm				c0.44		
v/c Ratio	0.75			0.60	0.45	
Uniform Delay, d1	42.7			6.4	5.3	
Progression Factor	1.00			0.14	1.00	
Incremental Delay, d2	10.0			0.2	0.4	
Delay (s)	52.8			1.1	5.7	
Level of Service	D			A	A	
Approach Delay (s)	52.8			1.1	5.7	
Approach LOS	D			A	A	

Intersection Summary			
HCM Average Control Delay	7.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	85.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	21	62	262	518	70	55	354	1717	635	113	1479	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	3.0	4.0	4.0		3.0	4.0		3.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.91		1.00	0.91	
Frt	1.00	1.00	0.85	1.00	0.93		1.00	0.96		1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1740		1770	4879		1770	5072	
Flt Permitted	0.65	1.00	1.00	0.71	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1208	1863	1583	1331	1740		1770	4879		1770	5072	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	22	65	276	545	74	58	373	1807	668	119	1557	28
RTOR Reduction (vph)	0	0	0	0	26	0	0	61	0	0	1	0
Lane Group Flow (vph)	22	65	276	545	106	0	373	2414	0	119	1584	0
Turn Type	Perm		pm+ov	Perm			Prot			Prot		
Protected Phases		4	5		8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)	41.0	41.0	64.0	41.0	41.0		23.0	51.0		7.0	35.0	
Effective Green, g (s)	41.0	41.0	64.0	41.0	41.0		23.0	51.0		7.0	35.0	
Actuated g/C Ratio	0.37	0.37	0.58	0.37	0.37		0.21	0.46		0.06	0.32	
Clearance Time (s)	4.0	4.0	3.0	4.0	4.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	450	694	964	496	649		370	2262		113	1614	
v/s Ratio Prot		0.03	0.06		0.06		c0.21	c0.49		0.07	0.31	
v/s Ratio Perm	0.02		0.11	c0.41								
v/c Ratio	0.05	0.09	0.29	1.10	0.16		1.01	1.07		1.05	0.98	
Uniform Delay, d1	22.0	22.4	11.5	34.5	23.0		43.5	29.5		51.5	37.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.94	0.73		0.90	0.98	
Incremental Delay, d2	0.0	0.1	0.2	70.1	0.1		42.0	37.7		96.0	17.4	
Delay (s)	22.1	22.5	11.7	104.6	23.2		83.0	59.3		142.3	53.8	
Level of Service	C	C	B	F	C		F	E		F	D	
Approach Delay (s)		14.3			88.7			62.4			60.0	
Approach LOS		B			F			E			E	

Intersection Summary			
HCM Average Control Delay	61.7	HCM Level of Service	E
HCM Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	99.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	337	58	39	64	51	318	121	1249	52	472	1039	311
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0			3.0	3.0	3.0	4.0		3.0	4.0	
Lane Util. Factor	0.95	0.95			1.00	1.00	1.00	0.91		1.00	0.91	
Frt	1.00	0.97			1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected	0.95	0.97			0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1675			1813	1583	1770	5055		1770	4910	
Flt Permitted	0.95	0.97			0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1675			1813	1583	1770	5055		1770	4910	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	355	61	41	67	54	335	127	1315	55	497	1094	327
RTOR Reduction (vph)	0	8	0	0	0	276	0	3	0	0	37	0
Lane Group Flow (vph)	231	218	0	0	121	59	127	1367	0	497	1384	0
Turn Type	Split			Split		Perm	Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	20.8	20.8			15.2	15.2	9.0	42.0		19.0	52.0	
Effective Green, g (s)	20.8	20.8			15.2	15.2	9.0	42.0		19.0	52.0	
Actuated g/C Ratio	0.19	0.19			0.14	0.14	0.08	0.38		0.17	0.47	
Clearance Time (s)	3.0	3.0			3.0	3.0	3.0	4.0		3.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	318	317			251	219	145	1930		306	2321	
v/s Ratio Prot	c0.14	0.13			c0.07		0.07	c0.27		c0.28	0.28	
v/s Ratio Perm						0.04						
v/c Ratio	0.73	0.69			0.48	0.27	0.88	0.71		1.62	0.60	
Uniform Delay, d1	41.9	41.6			43.8	42.4	49.9	28.8		45.5	21.3	
Progression Factor	1.00	1.00			1.00	1.00	0.90	0.62		1.04	0.71	
Incremental Delay, d2	8.0	6.1			1.5	0.7	37.2	2.0		293.5	1.0	
Delay (s)	49.9	47.6			45.2	43.1	82.3	19.7		340.6	16.1	
Level of Service	D	D			D	D	F	B		F	B	
Approach Delay (s)		48.8			43.7			25.0			100.1	
Approach LOS		D			D			C			F	

Intersection Summary			
HCM Average Control Delay	62.8	HCM Level of Service	E
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	117	26	298	117	55	59	1116	250	69	924	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.91		1.00	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected	0.95	0.99	1.00	0.95	0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1758	1583	1681	1731	1583	1770	4946		1770	5037	
Flt Permitted	0.95	0.99	1.00	0.95	0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1758	1583	1681	1731	1583	1770	4946		1770	5037	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	153	123	27	314	123	58	62	1175	263	73	973	66
RTOR Reduction (vph)	0	0	24	0	0	47	0	27	0	0	6	0
Lane Group Flow (vph)	135	141	3	217	220	11	62	1411	0	73	1033	0
Turn Type	Split		Perm	Split		Perm	Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	13.3	13.3	13.3	20.1	20.1	20.1	7.2	52.6		8.0	53.4	
Effective Green, g (s)	13.3	13.3	13.3	20.1	20.1	20.1	7.2	52.6		8.0	53.4	
Actuated g/C Ratio	0.12	0.12	0.12	0.18	0.18	0.18	0.07	0.48		0.07	0.49	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	203	213	191	307	316	289	116	2365		129	2445	
v/s Ratio Prot	c0.08	0.08		c0.13	0.13		0.04	c0.29		c0.04	0.21	
v/s Ratio Perm			0.00			0.01						
v/c Ratio	0.67	0.66	0.02	0.71	0.70	0.04	0.53	0.60		0.57	0.42	
Uniform Delay, d1	46.2	46.2	42.6	42.2	42.1	37.0	49.8	21.0		49.3	18.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.08	0.32	
Incremental Delay, d2	8.0	7.5	0.0	7.2	6.5	0.1	4.7	1.1		4.9	0.5	
Delay (s)	54.2	53.7	42.6	49.4	48.6	37.0	54.4	22.1		58.3	6.3	
Level of Service	D	D	D	D	D	D	D	C		E	A	
Approach Delay (s)		52.9			47.6			23.4			9.8	
Approach LOS		D			D			C			A	

Intersection Summary			
HCM Average Control Delay	25.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	59.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	540	0	624	0	2058	0	0	1504	739
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0		4.0		4.0			4.0	
Lane Util. Factor				0.97		0.88		0.91			0.91	
Frt				1.00		0.85		1.00			0.95	
Flt Protected				0.95		1.00		1.00			1.00	
Satd. Flow (prot)				3433		2787		5085			4834	
Flt Permitted				0.95		1.00		1.00			1.00	
Satd. Flow (perm)				3433		2787		5085			4834	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	568	0	657	0	2166	0	0	1583	778
RTOR Reduction (vph)	0	0	0	0	0	10	0	0	0	0	74	0
Lane Group Flow (vph)	0	0	0	568	0	647	0	2166	0	0	2287	0
Turn Type				custom		custom						
Protected Phases								2			6	
Permitted Phases				8		8						
Actuated Green, G (s)				31.3		31.3		70.7			70.7	
Effective Green, g (s)				31.3		31.3		70.7			70.7	
Actuated g/C Ratio				0.28		0.28		0.64			0.64	
Clearance Time (s)				4.0		4.0		4.0			4.0	
Vehicle Extension (s)				3.0		3.0		3.0			3.0	
Lane Grp Cap (vph)				977		793		3268			3107	
v/s Ratio Prot								0.43			c0.47	
v/s Ratio Perm				0.17		c0.23						
v/c Ratio				0.58		0.82		0.66			0.74	
Uniform Delay, d1				33.7		36.7		12.2			13.3	
Progression Factor				1.00		1.00		0.80			0.29	
Incremental Delay, d2				0.9		6.5		0.7			0.6	
Delay (s)				34.6		43.2		10.5			4.5	
Level of Service				C		D		B			A	
Approach Delay (s)		0.0			39.2			10.5			4.5	
Approach LOS		A			D			B			A	

Intersection Summary			
HCM Average Control Delay	14.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	117.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	903	0	502	0	0	0	0	1538	366	0	1317	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0					4.0			4.0	
Lane Util. Factor	0.97		0.88					0.91			0.91	
Frt	1.00		0.85					0.97			1.00	
Flt Protected	0.95		1.00					1.00			1.00	
Satd. Flow (prot)	3433		2787					4939			5085	
Flt Permitted	0.95		1.00					1.00			1.00	
Satd. Flow (perm)	3433		2787					4939			5085	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	951	0	528	0	0	0	0	1619	385	0	1386	0
RTOR Reduction (vph)	0	0	27	0	0	0	0	70	0	0	0	0
Lane Group Flow (vph)	951	0	501	0	0	0	0	1934	0	0	1386	0
Turn Type	custom		custom									
Protected Phases								2			6	
Permitted Phases	4		4									
Actuated Green, G (s)	19.2		19.2					27.8			27.8	
Effective Green, g (s)	19.2		19.2					27.8			27.8	
Actuated g/C Ratio	0.35		0.35					0.51			0.51	
Clearance Time (s)	4.0		4.0					4.0			4.0	
Vehicle Extension (s)	3.0		3.0					3.0			3.0	
Lane Grp Cap (vph)	1198		973					2496			2570	
v/s Ratio Prot								c0.39			0.27	
v/s Ratio Perm	c0.28		0.18									
v/c Ratio	0.79		0.51					0.77			0.54	
Uniform Delay, d1	16.1		14.2					11.1			9.2	
Progression Factor	1.00		1.00					1.21			0.86	
Incremental Delay, d2	3.7		0.5					1.8			0.6	
Delay (s)	19.8		14.7					15.2			8.5	
Level of Service	B		B					B			A	
Approach Delay (s)		18.0			0.0			15.2			8.5	
Approach LOS		B			A			B			A	

Intersection Summary			
HCM Average Control Delay	14.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	118.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	93	87	48	1693	1563	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	1.00			0.91	0.91	
Frt	0.93			1.00	0.99	
Flt Protected	0.97			1.00	1.00	
Satd. Flow (prot)	1697			5078	5058	
Flt Permitted	0.97			0.82	1.00	
Satd. Flow (perm)	1697			4185	5058	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	98	92	51	1782	1645	61
RTOR Reduction (vph)	15	0	0	0	3	0
Lane Group Flow (vph)	175	0	0	1833	1703	0
Turn Type			Perm			
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	12.4			54.6	54.6	
Effective Green, g (s)	12.4			54.6	54.6	
Actuated g/C Ratio	0.17			0.73	0.73	
Clearance Time (s)	4.0			4.0	4.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	281			3047	3682	
v/s Ratio Prot	c0.10				0.34	
v/s Ratio Perm				c0.44		
v/c Ratio	0.62			0.60	0.46	
Uniform Delay, d1	29.1			4.9	4.2	
Progression Factor	1.00			1.90	1.00	
Incremental Delay, d2	4.2			0.1	0.4	
Delay (s)	33.4			9.5	4.6	
Level of Service	C			A	A	
Approach Delay (s)	33.4			9.5	4.6	
Approach LOS	C			A	A	

Intersection Summary			
HCM Average Control Delay	8.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	94	111	628	649	81	50	275	1921	743	108	1727	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	3.0	4.0	4.0		3.0	4.0		3.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.91		1.00	0.91	
Frt	1.00	1.00	0.85	1.00	0.94		1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1755		1770	4873		1770	5059	
Flt Permitted	0.64	1.00	1.00	0.66	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1187	1863	1583	1233	1755		1770	4873		1770	5059	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	99	117	661	683	85	53	289	2022	782	114	1818	64
RTOR Reduction (vph)	0	0	0	0	15	0	0	46	0	0	3	0
Lane Group Flow (vph)	99	117	661	683	123	0	289	2758	0	114	1879	0
Turn Type	Perm		pm+ov	Perm			Prot			Prot		
Protected Phases		4	5		8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)	65.0	65.0	83.0	65.0	65.0		18.0	67.0		7.0	56.0	
Effective Green, g (s)	65.0	65.0	83.0	65.0	65.0		18.0	67.0		7.0	56.0	
Actuated g/C Ratio	0.43	0.43	0.55	0.43	0.43		0.12	0.45		0.05	0.37	
Clearance Time (s)	4.0	4.0	3.0	4.0	4.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	514	807	908	534	761		212	2177		83	1889	
v/s Ratio Prot		0.06	0.09		0.07		0.16	c0.57		c0.06	0.37	
v/s Ratio Perm	0.08		0.33	c0.55								
v/c Ratio	0.19	0.14	0.73	1.28	0.16		1.36	1.27		1.37	0.99	
Uniform Delay, d1	26.3	25.7	25.0	42.5	25.9		66.0	41.5		71.5	46.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.97	0.95		0.96	0.92	
Incremental Delay, d2	0.2	0.1	2.9	139.5	0.1		182.7	122.6		224.4	19.0	
Delay (s)	26.5	25.8	28.0	182.0	26.0		246.6	162.1		293.1	62.1	
Level of Service	C	C	C	F	C		F	F		F	E	
Approach Delay (s)		27.5			155.8			170.0			75.3	
Approach LOS		C			F			F			E	

Intersection Summary			
HCM Average Control Delay	122.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.28		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	119.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	357	78	88	118	74	625	101	1711	26	420	1929	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0			3.0	3.0	3.0	4.0		3.0	4.0	
Lane Util. Factor	0.95	0.95			1.00	1.00	1.00	0.91		1.00	0.91	
Frt	1.00	0.95			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected	0.95	0.98			0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1650			1807	1583	1770	5074		1770	5044	
Flt Permitted	0.95	0.98			0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1650			1807	1583	1770	5074		1770	5044	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	376	82	93	124	78	658	106	1801	27	442	2031	117
RTOR Reduction (vph)	0	12	0	0	0	277	0	1	0	0	4	0
Lane Group Flow (vph)	278	261	0	0	202	381	106	1827	0	442	2144	0
Turn Type	Split			Split		Perm	Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	27.4	27.4			29.6	29.6	10.8	48.0		32.0	69.2	
Effective Green, g (s)	27.4	27.4			29.6	29.6	10.8	48.0		32.0	69.2	
Actuated g/C Ratio	0.18	0.18			0.20	0.20	0.07	0.32		0.21	0.46	
Clearance Time (s)	3.0	3.0			3.0	3.0	3.0	4.0		3.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	307	301			357	312	127	1624		378	2327	
v/s Ratio Prot	c0.17	0.16			0.11		0.06	c0.36		c0.25	0.43	
v/s Ratio Perm						c0.24						
v/c Ratio	0.91	0.87			0.57	1.22	0.83	1.13		1.17	0.92	
Uniform Delay, d1	60.0	59.5			54.4	60.2	68.7	51.0		59.0	37.8	
Progression Factor	1.00	1.00			1.00	1.00	0.85	0.78		0.96	0.94	
Incremental Delay, d2	28.3	22.0			2.1	125.0	32.7	64.2		97.0	6.2	
Delay (s)	88.4	81.5			56.4	185.2	91.3	104.1		153.7	41.8	
Level of Service	F	F			E	F	F	F		F	D	
Approach Delay (s)		85.0			155.0			103.4			60.9	
Approach LOS		F			F			F			E	

Intersection Summary			
HCM Average Control Delay	90.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	97.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	167	117	57	308	125	73	92	1250	337	104	1231	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.91		1.00	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected	0.95	0.99	1.00	0.95	0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1752	1583	1681	1732	1583	1770	4923		1770	5027	
Flt Permitted	0.95	0.99	1.00	0.95	0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1752	1583	1681	1732	1583	1770	4923		1770	5027	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	176	123	60	324	132	77	97	1316	355	109	1296	108
RTOR Reduction (vph)	0	0	49	0	0	64	0	28	0	0	5	0
Lane Group Flow (vph)	146	153	11	224	232	13	97	1643	0	109	1399	0
Turn Type	Split		Perm	Split		Perm	Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	17.7	17.7	17.7	25.3	25.3	25.3	15.0	77.1		13.9	76.0	
Effective Green, g (s)	17.7	17.7	17.7	25.3	25.3	25.3	15.0	77.1		13.9	76.0	
Actuated g/C Ratio	0.12	0.12	0.12	0.17	0.17	0.17	0.10	0.51		0.09	0.51	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	198	207	187	284	292	267	177	2530		164	2547	
v/s Ratio Prot	0.09	c0.09		0.13	c0.13		0.05	c0.33		c0.06	0.28	
v/s Ratio Perm			0.01			0.01						
v/c Ratio	0.74	0.74	0.06	0.79	0.79	0.05	0.55	0.65		0.66	0.55	
Uniform Delay, d1	63.9	63.9	58.8	59.8	59.9	52.3	64.3	26.6		65.8	25.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.32	0.21	
Incremental Delay, d2	13.3	12.9	0.1	13.5	13.8	0.1	3.4	1.3		5.0	0.4	
Delay (s)	77.3	76.8	58.9	73.3	73.7	52.3	67.7	27.9		91.8	5.7	
Level of Service	E	E	E	E	E	D	E	C		F	A	
Approach Delay (s)		74.0			70.4			30.1			11.9	
Approach LOS		E			E			C			B	

Intersection Summary			
HCM Average Control Delay	32.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	468	0	566	0	2371	0	0	2228	853
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0		4.0		4.0			4.0	
Lane Util. Factor				0.97		0.88		0.91			0.91	
Frt				1.00		0.85		1.00			0.96	
Flt Protected				0.95		1.00		1.00			1.00	
Satd. Flow (prot)				3433		2787		5085			4874	
Flt Permitted				0.95		1.00		1.00			1.00	
Satd. Flow (perm)				3433		2787		5085			4874	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	493	0	596	0	2496	0	0	2345	898
RTOR Reduction (vph)	0	0	0	0	0	12	0	0	0	0	45	0
Lane Group Flow (vph)	0	0	0	493	0	584	0	2496	0	0	3198	0
Turn Type				custom		custom						
Protected Phases								2			6	
Permitted Phases				8		8						
Actuated Green, G (s)				34.7		34.7		107.3			107.3	
Effective Green, g (s)				34.7		34.7		107.3			107.3	
Actuated g/C Ratio				0.23		0.23		0.72			0.72	
Clearance Time (s)				4.0		4.0		4.0			4.0	
Vehicle Extension (s)				3.0		3.0		3.0			3.0	
Lane Grp Cap (vph)				794		645		3637			3487	
v/s Ratio Prot								0.49			c0.66	
v/s Ratio Perm				0.14		c0.21						
v/c Ratio				0.62		0.91		0.69			0.92	
Uniform Delay, d1				51.7		56.1		11.9			17.7	
Progression Factor				1.00		1.00		0.85			0.53	
Incremental Delay, d2				1.5		16.3		0.5			1.5	
Delay (s)				53.3		72.4		10.7			10.9	
Level of Service				D		E		B			B	
Approach Delay (s)		0.0			63.7			10.7			10.9	
Approach LOS		A			E			B			B	

Intersection Summary			
HCM Average Control Delay	19.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	137.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	847	0	541	0	0	0	0	2108	585	0	1876	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0					4.0			4.0	
Lane Util. Factor	0.97		0.88					0.91			0.91	
Frt	1.00		0.85					0.97			1.00	
Flt Protected	0.95		1.00					1.00			1.00	
Satd. Flow (prot)	3433		2787					4920			5085	
Flt Permitted	0.95		1.00					1.00			1.00	
Satd. Flow (perm)	3433		2787					4920			5085	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	892	0	569	0	0	0	0	2219	616	0	1975	0
RTOR Reduction (vph)	0	0	20	0	0	0	0	32	0	0	0	0
Lane Group Flow (vph)	892	0	549	0	0	0	0	2803	0	0	1975	0
Turn Type	custom		custom									
Protected Phases								2			6	
Permitted Phases	4		4									
Actuated Green, G (s)	43.9		43.9					98.1			98.1	
Effective Green, g (s)	43.9		43.9					98.1			98.1	
Actuated g/C Ratio	0.29		0.29					0.65			0.65	
Clearance Time (s)	4.0		4.0					4.0			4.0	
Vehicle Extension (s)	3.0		3.0					3.0			3.0	
Lane Grp Cap (vph)	1005		816					3218			3326	
v/s Ratio Prot								c0.57			0.39	
v/s Ratio Perm	c0.26		0.20									
v/c Ratio	0.89		0.67					0.87			0.59	
Uniform Delay, d1	50.7		46.7					20.9			14.7	
Progression Factor	1.00		1.00					0.55			0.88	
Incremental Delay, d2	9.6		2.2					0.3			0.4	
Delay (s)	60.3		48.9					11.9			13.3	
Level of Service	E		D					B			B	
Approach Delay (s)		55.9			0.0			11.9			13.3	
Approach LOS		E			A			B			B	

Intersection Summary			
HCM Average Control Delay	22.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	138.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Queues
201: SB82-WB92 Diag. On & El Camino Real

10/5/2012

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	568	657	2166	2361
v/c Ratio	0.58	0.82	0.66	0.74
Control Delay	35.9	44.7	11.0	4.3
Queue Delay	0.0	0.0	0.3	0.9
Total Delay	35.9	44.7	11.3	5.2
Queue Length 50th (ft)	173	236	345	106
Queue Length 95th (ft)	222	303	389	m136
Internal Link Dist (ft)			63	547
Turn Bay Length (ft)				
Base Capacity (vph)	1092	896	3269	3183
Starvation Cap Reductn	0	0	435	493
Spillback Cap Reductn	0	0	23	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.52	0.73	0.76	0.88

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues
202: EB92-SB82 Diag. Off & El Camino Real

10/5/2012

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	951	528	2004	1386
v/c Ratio	0.79	0.53	0.78	0.54
Control Delay	21.8	15.1	13.6	8.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.8	15.1	13.6	8.7
Queue Length 50th (ft)	136	67	371	80
Queue Length 95th (ft)	197	109	154	113
Internal Link Dist (ft)			550	29
Turn Bay Length (ft)				
Base Capacity (vph)	1248	1040	2564	2568
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.76	0.51	0.78	0.54

Intersection Summary

Queues
201: SB82-WB92 Diag. On & El Camino Real

10/5/2012

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	493	596	2496	3243
v/c Ratio	0.58	0.85	0.73	0.97
Control Delay	34.6	46.9	11.1	12.6
Queue Delay	0.0	0.0	0.7	0.3
Total Delay	34.6	46.9	11.8	12.8
Queue Length 50th (ft)	134	190	271	323
Queue Length 95th (ft)	185	#281	m368	m301
Internal Link Dist (ft)			63	547
Turn Bay Length (ft)				
Base Capacity (vph)	894	733	3402	3328
Starvation Cap Reductn	0	0	494	8
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.55	0.81	0.86	0.98

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Queues
202: EB92-SB82 Diag. Off & El Camino Real

10/5/2012

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	892	569	2835	1975
v/c Ratio	0.90	0.69	0.90	0.62
Control Delay	46.6	34.1	15.3	14.3
Queue Delay	0.0	0.0	5.6	0.0
Total Delay	46.6	34.1	20.9	14.3
Queue Length 50th (ft)	267	166	253	310
Queue Length 95th (ft)	#377	232	m78	m322
Internal Link Dist (ft)			550	29
Turn Bay Length (ft)				
Base Capacity (vph)	1001	831	3144	3198
Starvation Cap Reductn	0	0	280	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.89	0.68	0.99	0.62

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
37: Hillsdale & SB Off-ramp

11/21/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1114	781	1137	1350	0	0	0	0	139	0	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0		4.0
Lane Util. Factor		0.91	0.88	0.97	0.95					1.00		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		5085	2787	3433	3539					1770		1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		5085	2787	3433	3539					1770		1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1173	822	1197	1421	0	0	0	0	146	0	41
RTOR Reduction (vph)	0	0	310	0	0	0	0	0	0	0	0	36
Lane Group Flow (vph)	0	1173	512	1197	1421	0	0	0	0	146	0	5
Turn Type			Perm	Prot						custom		custom
Protected Phases		2		1	6							
Permitted Phases			2							4		4
Actuated Green, G (s)		22.0	22.0	28.0	54.0					8.0		8.0
Effective Green, g (s)		22.0	22.0	28.0	54.0					8.0		8.0
Actuated g/C Ratio		0.31	0.31	0.40	0.77					0.11		0.11
Clearance Time (s)		4.0	4.0	4.0	4.0					4.0		4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		3.0
Lane Grp Cap (vph)		1598	876	1373	2730					202		181
v/s Ratio Prot		c0.23		c0.35	0.40							
v/s Ratio Perm			0.18							c0.08		0.00
v/c Ratio		0.73	0.58	0.87	0.52					0.72		0.03
Uniform Delay, d1		21.4	20.2	19.3	3.1					29.9		27.5
Progression Factor		1.00	1.00	0.36	0.00					1.00		1.00
Incremental Delay, d2		3.0	2.8	2.4	0.2					20.0		0.3
Delay (s)		24.4	23.0	9.3	0.2					49.9		27.8
Level of Service		C	C	A	A					D		C
Approach Delay (s)		23.8			4.4			0.0			45.1	
Approach LOS		C			A			A			D	

Intersection Summary			
HCM Average Control Delay	14.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	640	613	0	0	1858	621	629	0	725	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0		4.0			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.97		0.88			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	3433	3539			5085	1583	3433		2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3433	3539			5085	1583	3433		2787			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	674	645	0	0	1956	654	662	0	763	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	313	0	0	454	0	0	0
Lane Group Flow (vph)	674	645	0	0	1956	341	662	0	309	0	0	0
Turn Type	Prot					Perm	custom		custom			
Protected Phases	5	2			6							
Permitted Phases						6	8		8			
Actuated Green, G (s)	15.0	48.0			29.0	29.0	14.0		14.0			
Effective Green, g (s)	15.0	48.0			29.0	29.0	14.0		14.0			
Actuated g/C Ratio	0.21	0.69			0.41	0.41	0.20		0.20			
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0		4.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0			
Lane Grp Cap (vph)	736	2427			2107	656	687		557			
v/s Ratio Prot	c0.20	0.18			c0.38							
v/s Ratio Perm						0.22	c0.19		0.11			
v/c Ratio	0.92	0.27			0.93	0.52	0.96		0.56			
Uniform Delay, d1	26.9	4.2			19.5	15.3	27.7		25.2			
Progression Factor	0.55	0.00			1.00	1.00	1.00		1.00			
Incremental Delay, d2	11.6	0.2			8.7	2.9	26.5		4.0			
Delay (s)	26.3	0.2			28.2	18.2	54.2		29.2			
Level of Service	C	A			C	B	D		C			
Approach Delay (s)		13.5			25.7			40.8			0.0	
Approach LOS		B			C			D			A	

Intersection Summary			
HCM Average Control Delay	26.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
37: Hillsdale & SB Off-ramp

11/21/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1383	699	711	1357	0	0	0	0	392	0	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0		4.0
Lane Util. Factor		0.91	0.88	0.97	0.95					1.00		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		5085	2787	3433	3539					1770		1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		5085	2787	3433	3539					1770		1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1456	736	748	1428	0	0	0	0	413	0	24
RTOR Reduction (vph)	0	0	491	0	0	0	0	0	0	0	0	18
Lane Group Flow (vph)	0	1456	245	748	1428	0	0	0	0	413	0	6
Turn Type			Perm	Prot						custom		custom
Protected Phases		2		1	6							
Permitted Phases			2							4		4
Actuated Green, G (s)		25.0	25.0	18.0	47.0					20.0		20.0
Effective Green, g (s)		25.0	25.0	18.0	47.0					20.0		20.0
Actuated g/C Ratio		0.33	0.33	0.24	0.63					0.27		0.27
Clearance Time (s)		4.0	4.0	4.0	4.0					4.0		4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		3.0
Lane Grp Cap (vph)		1695	929	824	2218					472		422
v/s Ratio Prot		c0.29		c0.22	0.40							
v/s Ratio Perm			0.09							c0.23		0.00
v/c Ratio		0.86	0.26	0.91	0.64					0.88		0.02
Uniform Delay, d1		23.4	18.3	27.7	8.8					26.3		20.2
Progression Factor		1.00	1.00	0.51	0.16					1.00		1.00
Incremental Delay, d2		5.9	0.7	8.0	0.8					19.8		0.1
Delay (s)		29.3	19.0	22.2	2.2					46.1		20.3
Level of Service		C	B	C	A					D		C
Approach Delay (s)		25.8			9.1			0.0			44.6	
Approach LOS		C			A			A			D	

Intersection Summary			
HCM Average Control Delay	19.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	608	1167	0	0	1217	456	851	0	917	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0		4.0			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.97		0.88			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	3433	3539			5085	1583	3433		2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3433	3539			5085	1583	3433		2787			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	640	1228	0	0	1281	480	896	0	965	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	346	0	0	56	0	0	0
Lane Group Flow (vph)	640	1228	0	0	1281	134	896	0	909	0	0	0
Turn Type	Prot					Perm	custom		custom			
Protected Phases	5	2			6							
Permitted Phases						6	8		8			
Actuated Green, G (s)	15.0	40.0			21.0	21.0	27.0		27.0			
Effective Green, g (s)	15.0	40.0			21.0	21.0	27.0		27.0			
Actuated g/C Ratio	0.20	0.53			0.28	0.28	0.36		0.36			
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0		4.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0			
Lane Grp Cap (vph)	687	1887			1424	443	1236		1003			
v/s Ratio Prot	c0.19	0.35			c0.25							
v/s Ratio Perm						0.08	0.26		c0.33			
v/c Ratio	0.93	0.65			0.90	0.30	0.72		0.91			
Uniform Delay, d1	29.5	12.5			26.0	21.2	20.8		22.8			
Progression Factor	0.40	0.09			1.00	1.00	1.00		1.00			
Incremental Delay, d2	11.1	0.8			9.4	1.8	3.7		13.2			
Delay (s)	22.8	2.0			35.4	23.0	24.5		36.0			
Level of Service	C	A			D	C	C		D			
Approach Delay (s)		9.1			32.0			30.5			0.0	
Approach LOS		A			C			C			A	

Intersection Summary			
HCM Average Control Delay	23.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Appendix H:
Cost Estimates

US101/SR92 Interchange Area Study

PLANNING LEVEL COST ESTIMATE

Location: **Package 1 - US101 Auxiliary Lane Connectors**

Project Description: Extend existing auxiliary lane on NB 101 through 3rd Ave interchange. Extend existing auxiliary lane on SB 101 north to WB 92 loop on-ramp and south through the Hillsdale interchange. Add a second auxiliary lane on SB 101 from EB 92 on-ramp to Hillsdale off-ramp.

March 2013 Estimate

Roadway Items:	Quantity	Unit	Unit Cost	Item Total	Total
Clearing and Grubbing	5	AC	$ 10,000	$ 50,000	
New Pavement - Mainline[1]	107,000	SF	$ 13	$ 1,391,000	
New Pavement - Ramp / Local Road[1]	62,000	SF	$ 10	$ 620,000	
Overlay	558,000	SF	$ 1	$ 558,000	
Sound Wall	1,100	LF	$ 320	$ 352,000	
Retaining Wall	6,000	SF	$ 90	$ 540,000	
Barrier	2,100	LF	$ 100	$ 210,000	
Landscape/Irrigation	1	LS	$ 619,000	$ 619,000	
Ramp Metering	3	EA	$ 100,000	$ 300,000	
Intersection Signal		EA	$ 300,000	$ -	
OH Sign	2	EA	$ 50,000	$ 100,000	
Street lighting	1	LS	$ 150,000	$ 150,000	
Traffic Control	1	LS	$ 978,000	$ 978,000	
Storm Drain	1	LS	$ 619,000	$ 619,000	
WPC / Treatment	1	LS	$ 516,000	$ 516,000	
Minor & Misc. items (15%)	1	LS	$ 1,051,000	$ 1,051,000	
Roadway Additions (10%)	1	LS	$ 806,000	$ 806,000	
Mobilization (10%)	1	LS	$ 806,000	$ 806,000	
Contingency (25%)	1	LS	$ 2,014,000	$ 2,014,000	
Roadway Subtotal					$ 11,700,000

Structure items:	Quantity	Unit	Unit Cost	Item Total	Total
Overhead Structure		SF		$ -	
Widen Bridge	-	SF	$ 300	$ -	
Structure Demolition		SF		$ -	
Structure Subtotal					$ -

Right of way Items:	Quantity	Unit	Unit Cost	Item Total	Total
Acquisition costs	15,000	SF	$ 110	$ 1,650,000	
Utility Relocation (Est)	1	LS	$ 500,000	$ 500,000	
Environmental Mitigation (Est)	1	LS		$ -	
Right of way Subtotal					$ 2,200,000
Subtotal "Hard Costs"					$ 13,900,000

Soft Costs[2]	Quantity	Unit	Unit Cost	Item Total	Total
Preliminary Eng/Envir (12%)	1	LS	$ 1,404,000	$ 1,404,000	
Final Design (10%)	1	LS	$ 1,170,000	$ 1,170,000	
Construction Administration (13%)	1	LS	$ 1,521,000	$ 1,521,000	
Construction Staking (2%)	1	LS	$ 234,000	$ 234,000	
R/W Engineering/Acquisition (10%)	1	LS	$ 220,000	$ 220,000	
Subtotal "Soft Costs"					$ 4,600,000
Grand Total					$ 19,000,000

1. New Pavement cost includes roadway excavation cost.
2. Soft cost is percentage of Roadway and Structure Items except R/W Engineering which is 10% of R/W Items.

Location: Package 1 - US101 Auxiliary Lane Connectors

Description: Extend existing auxiliary lane on NB 101 through 3rd Ave interchange.
Extend existing auxiliary lane on SB 101 north to WB 92 loop on-ramp and south through the Hillsdale interchange.
Add a second auxiliary lane on SB 101 from EB 92 on-ramp to Hillsdale off-ramp.

Assumptions:

1. 3rd Ave NB on-ramp would be realigned. The sound wall would be relocated and approximately 20 parking spaces would be eliminated on S Bayshore Blvd. Full R/W take would be required from one residential property.
2. New auxiliary lane on SB 101 through Hillsdale interchange would need to extend north to the WB 92 loop on-ramp.
3. A new short retaining wall and barrier would be needed to separate Hillsdale diagonal on-ramp from SB 101.

Required Design Exceptions:

1. Third NB off-ramp - 110’ deceleration length (Std 270’)/ non-std ramp geometry
2. Third SB on-ramp - non standard ramp geometry/less than 50 mph design speed/short merge distance at loop and diagonal on-ramp merge point.
3. SR 92 SB on-ramps – Distance between successive on-ramps less than 1,000’
4. Non-standard outside shoulder width at Hillsdale Blvd Overcrossing and 3rd Ave Overcrossing
5. Non-standard inside shoulder width
6. Some lane widths 11'

US101/SR92 Interchange Area Study

PLANNING LEVEL COST ESTIMATE

Location: **Package 2 - Westbound with no RR Overheads**

Project Description: Extend existing auxiliary lane on WB 92 from Delaware off-ramp to El Camino off-ramp, remove WB 92 Delaware on-ramp, convert WB portion of 92/El Camino interchange (northern half) to partial cloverleaf configuration.

March 2013 Estimate

Roadway Items:	**Quantity**	**Unit**	**Unit Cost**	**Item Total**	**Total**
Clearing and Grubbing	2	AC	$ 10,000	$ 20,000	
New Pavement - Mainline[1]	41,400	SF	$ 13	$ 539,000	
New Pavement - Ramp / Local Road[1]	57,300	SF	$ 10	$ 573,000	
Overlay / Rdwy Excavation Only	38,100	SF	$ 1	$ 39,000	
Sound Wall	430	LF	$ 320	$ 138,000	
Retaining Wall	3,500	SF	$ 90	$ 315,000	
Barrier	300	LF	$ 100	$ 30,000	
Landscape/Irrigation	1	LS	$ 340,000	$ 340,000	
Ramp Metering	2	EA	$ 100,000	$ 200,000	
Intersection Signal	1	EA	$ 300,000	$ 300,000	
OH Sign	2	EA	$ 50,000	$ 100,000	
Street lighting	1	LS	$ 50,000	$ 50,000	
Traffic Control	1	LS	$ 529,000	$ 529,000	
Storm Drain	1	LS	$ 340,000	$ 340,000	
WPC / Treatment	1	LS	$ 283,000	$ 283,000	
Minor & Misc. items (15%)	1	LS	$ 570,000	$ 570,000	
Roadway Additions (10%)	1	LS	$ 437,000	$ 437,000	
Mobilization (10%)	1	LS	$ 437,000	$ 437,000	
Contingency (25%)	1	LS	$ 1,092,000	$ 1,092,000	
Roadway Subtotal					$ 6,400,000

Structure items:	**Quantity**	**Unit**	**Unit Cost**	**Item Total**	**Total**
Overhead Structure		SF		$ -	
Widen Bridge	6,250	SF	$ 300	$ 1,875,000	
Structure Demolition		SF		$ -	
Structure Subtotal					$ 1,900,000

Right of way Items:	**Quantity**	**Unit**	**Unit Cost**	**Item Total**	**Total**
Acquisition costs	1	LS	$ 100,000	$ 100,000	
Utility Relocation (Est)	1	LS	$ 200,000	$ 200,000	
Environmental Mitigation (Est)	1	LS	$ -	$ -	
Right of way Subtotal					$ 300,000

Subtotal "Hard Costs"					$ 8,600,000

Soft Costs[2]	**Quantity**	**Unit**	**Unit Cost**	**Item Total**	**Total**
Preliminary Eng/Envir (12%)	1	LS	$ 996,000	$ 996,000	
Final Design (10%)	1	LS	$ 830,000	$ 830,000	
Construction Administration (13%)	1	LS	$ 1,079,000	$ 1,079,000	
Construction Staking (2%)	1	LS	$ 166,000	$ 166,000	
R/W Engineering/Acquisition (10%)	1	LS	$ 30,000	$ 30,000	
Subtotal "Soft Costs"					$ 3,200,000

Grand Total		$ 12,000,000

1. New Pavement cost includes roadway excavation cost.
2. Soft cost is percentage of Roadway and Structure Items except R/W Engineering which is 10% of R/W Items.

Location: Package 2 - Westbound with no RR Overheads

Description: Extend existing auxiliary lane on WB 92 from Delaware off-ramp to El Camino off-ramp, remove WB 92 Delaware on-ramp, convert WB portion of 92/El Camino interchange (northern half) to partial cloverleaf configuration.

Assumptions:

The 92/El Camino Real interchange modification is currently in PA&ED phase with City & Caltrans. It's assumed that funds for the interchange modification will be secured separately by the City of San Mateo, and that they have a separate cost estimate that has been or is currently being developed. However we included an estimate for the northern half conversion with this estimate.

1. 92/El Camino Real interchange modification to partial cloverleaf is within existing state ROW (no ROW take), except for small ROW take near ECR/WB diagonal on-ramp for ramp and sidewalk widening.
2. Widen WB 92 overcrossing structures at El Camino & RR tracks to provide 8' outside shoulder.
3. On-ramps widened to 2-lanes to accommodate HOV pref lane at ramp metering.
4. No new overlay along El Camino Real.
5. New ramp metering for on-ramps, new traffic signals at ramp/El Camino intersections
6. New soundwall assumed along 92/El Camino (ECR) WB off-ramp.

Required Design Exceptions:

1. 92/ECR off-ramps - nonstandard deceleration length
2. 92/ECR on-ramps - nonstandard taper past limit line and distance between on-ramps
3. 92/ECR ramps - nonstandard sight distance, design speed, superelevation rate/transition and side slopes
4. 92/ECR ramps - nonstandard weaving distance, no auxiliary lane between on and off-ramps (west side of I/C)
5. 92/ECR - nonstandard median width along ECR, nonstandard spacing between interchanges

US101/SR92 Interchange Area Study

PLANNING LEVEL COST ESTIMATE

Location: **Package 2 - RR Crossing at 17th Ave**

Project Description: Widen 17th Avenue to 4 lanes and construct new Rail Road Crossing and road connection to Delaware Street.

March 2013 Estimate

Roadway Items:	Quantity	Unit	Unit Cost	Item Total	Total
Clearing and Grubbing	3	AC	$ 10,000	$ 30,000	
New Pavement - Mainline[1]	-	SF	$ 13	$ -	
New Pavement - Ramp / Local Road[1]	105,000	SF	$ 10	$ 1,050,000	
Imported Borrow	25,000	CY	$ 30	$ 750,000	
Sound Wall	-	LF	$ 320	$ -	
Retaining Wall	27,500	SF	$ 90	$ 2,475,000	
Barrier	-	LF	$ 100	$ -	
Landscape/Irrigation	1	LS	$ 324,000	$ 324,000	
Ramp Metering	-	EA	$ 100,000	$ -	
Intersection Signal	3	EA	$ 300,000	$ 900,000	
OH Sign	1	EA	$ 50,000	$ 50,000	
Street lighting	1	LS	$ 100,000	$ 100,000	
Traffic Control	1	LS	$ 1,136,000	$ 1,136,000	
Storm Drain	1	LS	$ 324,000	$ 324,000	
WPC / Treatment	1	LS	$ 270,000	$ 270,000	
Minor & Misc. items (15%)	1	LS	$ 1,112,000	$ 1,112,000	
Roadway Additions (10%)	1	LS	$ 853,000	$ 853,000	
Mobilization (10%)	1	LS	$ 853,000	$ 853,000	
Contingency (35%)	1	LS	$ 2,983,000	$ 2,983,000	
Roadway Subtotal					$ 13,300,000

Structure items:	Quantity	Unit	Unit Cost	Item Total	Total
Overhead Structure	11,200	SF	$ 250	$ 2,800,000	
Widen Bridge		SF	$ 300	$ -	
Structure Demolition		SF		$ -	
Structure Subtotal					$ 2,800,000

Right of way Items:	Quantity	Unit	Unit Cost	Item Total	Total
Acquisition costs	1	LS	$ 21,100,000	$ 21,100,000	
Utility Relocation (Est)	1	LS	$ 900,000	$ 900,000	
Environmental Mitigation (Est)	1	LS	$ -	$ -	
Right of way Subtotal					$ 22,000,000

Subtotal "Hard Costs"					$ 38,100,000

Soft Costs[2]	Quantity	Unit	Unit Cost	Item Total	Total
Preliminary Eng/Envir (12%)	1	LS	$ 1,932,000	$ 1,932,000	
Final Design (10%)	1	LS	$ 1,610,000	$ 1,610,000	
Construction Administration (13%)	1	LS	$ 2,093,000	$ 2,093,000	
Construction Staking (2%)	1	LS	$ 322,000	$ 322,000	
R/W Engineering/Acquisition (10%)	1	LS	$ 2,200,000	$ 2,200,000	
Subtotal "Soft Costs"					$ 8,200,000

Grand Total					$ 46,000,000

1. New Pavement cost includes roadway excavation cost.
2. Soft cost is percentage of Roadway and Structure Items except R/W Engineering which is 10% of R/W Items.

Location: Package 2 - RR Crossing at 17th Ave

Description: Widen 17th Avenue to 4 lanes and construct new Rail Road Crossing and road connection to Delaware Street.

Assumptions:

1. A 200' long bridge structure and retaining walls were assumed for the RR crossing.
2. Full R/W take would be needed from 9 businesses and 1 residential property along 17th Ave. Additional partial R/W take would be needed from 6 other properties.
3. One right-turn pocket can be accommodated on NB El Camino Real at 17th Ave by eliminating parking and restriping the intersection. If an additional right-turn pocket is needed, several buildings would have to be removed at the south-west corner of the intersection.
4. New signals would be installed at the El Camino Real, Palm Ave and Delaware St.
5. A frontage road would be constructed on the south side of 17th Ave, connecting Gum St and Leslie St.
6. Since this project is only at concept stage, contingency was increased to 35%.

Required Design Exceptions:

1. Narrow lanes and no shoulders on El Camino Real.

US101/SR92 Interchange Area Study

PLANNING LEVEL COST ESTIMATE

Location: **Package 2 - RR Crossing at 20th Ave**

Project Description: Widen 20th Avenue to 4 lanes and construct new Rail Road Crossing and road connection to Delaware Street.

March 2013 Estimate

Roadway Items:	Quantity	Unit	Unit Cost	Item Total	Total
Clearing and Grubbing	3	AC	$ 10,000	$ 30,000	
New Pavement - Mainline[1]	-	SF	$ 13	$ -	
New Pavement - Ramp / Local Road[1]	90,300	SF	$ 10	$ 903,000	
Imported Borrow	26,700	CY	$ 30	$ 801,000	
Sound Wall	-	LF	$ 320	$ -	
Retaining Wall	32,500	SF	$ 90	$ 2,925,000	
Barrier	-	LF	$ 100	$ -	
Landscape/Irrigation	1	LS	$ 280,000	$ 280,000	
Ramp Metering	-	EA	$ 100,000	$ -	
Intersection Signal	2	EA	$ 300,000	$ 600,000	
OH Sign	1	EA	$ 50,000	$ 50,000	
Street lighting	1	LS	$ 125,000	$ 125,000	
Traffic Control	1	LS	$ 1,143,000	$ 1,143,000	
Storm Drain	1	LS	$ 280,000	$ 280,000	
WPC / Treatment	1	LS	$ 234,000	$ 234,000	
Minor & Misc. items (15%)	1	LS	$ 1,106,000	$ 1,106,000	
Roadway Additions (10%)	1	LS	$ 848,000	$ 848,000	
Mobilization (10%)	1	LS	$ 848,000	$ 848,000	
Contingency (35%)	1	LS	$ 2,967,000	$ 2,967,000	
Roadway Subtotal					$ 13,200,000

Structure items:	Quantity	Unit	Unit Cost	Item Total	Total
Overhead Structure	18,600	SF	$ 250	$ 4,650,000	
Widen Bridge		SF	$ 300	$ -	
Structure Demolition		SF		$ -	
Structure Subtotal					$ 4,700,000

Right of way Items:	Quantity	Unit	Unit Cost	Item Total	Total
Acquisition costs	1	LS	$ 11,400,000	$ 11,400,000	
Utility Relocation (Est)	1	LS	$ 800,000	$ 800,000	
Environmental Mitigation (Est)	1	LS	$ -	$ -	
Right of way Subtotal					$ 12,200,000

Subtotal "Hard Costs"					$ 30,100,000

Soft Costs[2]	Quantity	Unit	Unit Cost	Item Total	Total
Preliminary Eng/Envir (12%)	1	LS	$ 2,148,000	$ 2,148,000	
Final Design (10%)	1	LS	$ 1,790,000	$ 1,790,000	
Construction Administration (13%)	1	LS	$ 2,327,000	$ 2,327,000	
Construction Staking (2%)	1	LS	$ 358,000	$ 358,000	
R/W Engineering/Acquisition (10%)	1	LS	$ 1,220,000	$ 1,220,000	
Subtotal "Soft Costs"					$ 7,900,000

Grand Total					$ 38,000,000

1. New Pavement cost includes roadway excavation cost.
2. Soft cost is percentage of Roadway and Structure Items except R/W Engineering which is 10% of R/W Items.

Location: Package 2 - RR Crossing at 20th Ave

Description: Widen 20th Avenue to 4 lanes and construct new Rail Road Crossing and road connection to Delaware Street.

Assumptions:

1. A 250' long bridge structure and retaining walls were assumed for a new grade separated crossing at Leslie Sr, RR tracks and Pacific Blvd.
2. A 80' long bridge structure and retaining walls were assumed for a new grade separated crossing at Palm Ave.
3. 20th Ave would be widened to 4 lanes and shifted slightly north to allow room for a one-way frontage road on the south side of 20th Ave, from El Camino Real to Leslie St.
4. On the west side of the RR tracks, full R/W take would be needed from 1 businesses and 4 residential properties along the north side of 20th Ave. Additional partial R/W take would be needed from the Taco Bell property
5. On the east side of the RR tracks, partial R/W take would be needed from 2 properties (City of San Mateo maintenance facilities and former police department). For the purpose of this estimate, $110/SF was assumed for impacts on the east side of the RR tracks.
6. New signals would be installed at the El Camino Real Ave and Delaware St intersections.
7. Since this project is only at concept stage, contingency was increased to 35%.

Required Design Exceptions:

1. Narrow lanes and no shoulders on El Camino Real.

US101/SR92 Interchange Area Study

PLANNING LEVEL COST ESTIMATE

Location: **Package 2 - Eastbound with no RR Overheads**

Project Description: New auxiliary lane on EB 92 from 101 off-ramp to Edgewater off-ramp, remove EB 92 Delaware off-ramp, convert EB portion of 92/El Camino interchange (southern half) to partial cloverleaf configuration.

March 2013 Estimate

Roadway Items:	Quantity	Unit	Unit Cost	Item Total	Total
Clearing and Grubbing	2	AC	$ 10,000	$ 20,000	
New Pavement - Mainline[1]	35,000	SF	$ 13	$ 455,000	
New Pavement - Ramp / Local Road[1]	62,000	SF	$ 10	$ 620,000	
Overlay / Rdwy Excavation Only	43,000	SF	$ 1	$ 43,000	
Sound Wall	-	LF	$ 320	$ -	
Retaining Wall	3,000	SF	$ 90	$ 270,000	
Barrier	500	LF	$ 100	$ 50,000	
Landscape/Irrigation	1	LS	$ 329,000	$ 329,000	
Ramp Metering	2	EA	$ 100,000	$ 200,000	
Intersection Signal	1	EA	$ 300,000	$ 300,000	
OH Sign	2	EA	$ 50,000	$ 100,000	
Street lighting	1	LS	$ 100,000	$ 100,000	
Traffic Control	1	LS	$ 498,000	$ 498,000	
Storm Drain	1	LS	$ 329,000	$ 329,000	
WPC / Treatment	1	LS	$ 274,000	$ 274,000	
Minor & Misc. items (15%)	1	LS	$ 539,000	$ 539,000	
Roadway Additions (10%)	1	LS	$ 413,000	$ 413,000	
Mobilization (10%)	1	LS	$ 413,000	$ 413,000	
Contingency (25%)	1	LS	$ 1,032,000	$ 1,032,000	
Roadway Subtotal					$ 6,000,000

Structure items:	Quantity	Unit	Unit Cost	Item Total	Total
Widen Bridge (over slough/water)	14,500	SF	$ 400	$ 5,800,000	
Widen Bridge (over El Camino)	2,700	SF	$ 300	$ 810,000	
Structure Demolition		SF		$ -	
Structure Subtotal					$ 6,700,000

Right of way Items:	Quantity	Unit	Unit Cost	Item Total	Total
Acquisition costs	1	LS	$ -	$ -	
Utility Relocation (Est)	1	LS	$ 400,000	$ 400,000	
Environmental Mitigation (Est)	1	LS	$ -	$ -	
Right of way Subtotal					$ 400,000

Subtotal "Hard Costs"					$ 13,100,000

Soft Costs[2]	Quantity	Unit	Unit Cost	Item Total	Total
Preliminary Eng/Envir (12%)	1	LS	$ 1,524,000	$ 1,524,000	
Final Design (10%)	1	LS	$ 1,270,000	$ 1,270,000	
Construction Administration (13%)	1	LS	$ 1,651,000	$ 1,651,000	
Construction Staking (2%)	1	LS	$ 254,000	$ 254,000	
R/W Engineering/Acquisition (10%)	1	LS	$ 40,000	$ 40,000	
Subtotal "Soft Costs"					$ 4,800,000

Grand Total					$ 18,000,000

1. New Pavement cost includes roadway excavation cost.
2. Soft cost is percentage of Roadway and Structure Items except R/W Engineering which is 10% of R/W Items.

Location: Package 2 - Eastbound with no RR Overheads

Description: New auxiliary lane on EB 92 from 101 off-ramp to Edgewater off-ramp, remove EB 92 Delaware off-ramp, convert EB portion of 92/El Camino interchange (southern half) to partial cloverleaf configuration.

Assumptions:

The 92/El Camino Real interchange modification is currently in PA&ED phase with City & Caltrans. It's assumed that funds for the interchange modification will be secured separately by the City of San Mateo, and that they have a separate cost estimate that has been or is currently being developed. However we included an estimate for the northern half conversion with this estimate.

1. 92/El Camino Real interchange modification to partial cloverleaf is within existing state ROW (no ROW take).
2. Widen WB 92 overcrossing structures at El Camino to provide 8' outside shoulder.
3. On-ramps widened to 2-lanes to accommodate HOV pref lane at ramp metering.
4. No new overlay along El Camino Real.
5. New ramp metering for on-ramps, new traffic signals at ramp/El Camino intersections
6. Bridge widening for EB 92 from 101 to Edgewater is minimum 12' wide to support new columns.

Required Design Exceptions:

1. 92/ECR off-ramps - nonstandard deceleration length
2. 92/ECR on-ramps - nonstandard taper past limit line and distance between on-ramps
3. 92/ECR ramps - nonstandard sight distance, design speed, superelevation rate/transition and side slopes
4. 92/ECR ramps - nonstandard weaving distance, no auxiliary lane between on and off-ramps (west side of I/C)
5. 92/ECR - nonstandard median width along ECR, nonstandard spacing between interchanges

US101/SR92 Interchange Area Study

PLANNING LEVEL COST ESTIMATE

Location: **Package 3 NB - US101/SR92-Hillsdale**

Project Description: Relocate SR92 connector exit to same location as existing Hillsdale off-ramp.
New CD road from combined off-ramp to SR92 connector ramps.
Conversion of Hillsdale interchange to diamond configuration.
Reconstruct Hillsdale on-ramp and provide separate connection to CD road.

March 2013 Estimate

Roadway Items:	Quantity	Unit	Unit Cost	Item Total	Total
Clearing and Grubbing	5	AC	$ 10,000	$ 50,000	
New Pavement - Mainline[1]	145,000	SF	$ 13	$ 1,885,000	
New Pavement - Ramp / Local Road[1]	139,000	SF	$ 10	$ 1,390,000	
Overlay / Rdwy Excavation Only	420,000	SF	$ 1	$ 420,000	
Sound Wall	1,600	LF	$ 320	$ 512,000	
Retaining Wall	13,000	SF	$ 90	$ 1,170,000	
Barrier	2,500	LF	$ 100	$ 250,000	
Landscape/Irrigation	1	LS	$ 998,000	$ 998,000	
Ramp Metering	2	EA	$ 100,000	$ 200,000	
Intersection Signal	1	EA	$ 300,000	$ 300,000	
OH Sign	7	EA	$ 50,000	$ 350,000	
Street lighting	1	LS	$ 175,000	$ 175,000	
Traffic Control	1	LS	$ 1,540,000	$ 1,540,000	
Storm Drain	1	LS	$ 998,000	$ 998,000	
WPC / Treatment	1	LS	$ 832,000	$ 832,000	
Minor & Misc. items (15%)	1	LS	$ 1,661,000	$ 1,661,000	
Roadway Additions (10%)	1	LS	$ 1,274,000	$ 1,274,000	
Mobilization (10%)	1	LS	$ 1,274,000	$ 1,274,000	
Contingency (25%)	1	LS	$ 3,183,000	$ 3,183,000	
Roadway Subtotal					$ 18,500,000

Structure items:	Quantity	Unit	Unit Cost	Item Total	Total
Overhead Structure (Hillsdale on-ramp)	7,000	SF	$ 250	$ 1,750,000	
Widen Bridge	-	SF	$ 300	$ -	
Structure Demolition		SF		$ -	
Structure Subtotal					$ 1,800,000

Right of way Items:	Quantity	Unit	Unit Cost	Item Total	Total
Acquisition costs	1	LS	$ 9,200,000	$ 9,200,000	
Utility Relocation (Est)	1	LS	$ 1,100,000	$ 1,100,000	
Environmental Mitigation (Est)	1	LS	$ 500,000	$ 500,000	
Right of way Subtotal					$ 10,800,000

Subtotal "Hard Costs"					$ 31,100,000

Soft Costs[2]	Quantity	Unit	Unit Cost	Item Total	Total
Preliminary Eng/Envir (12%)	1	LS	$ 2,436,000	$ 2,436,000	
Final Design (10%)	1	LS	$ 2,030,000	$ 2,030,000	
Construction Administration (13%)	1	LS	$ 2,639,000	$ 2,639,000	
Construction Staking (2%)	1	LS	$ 406,000	$ 406,000	
R/W Engineering/Acquisition (10%)	1	LS	$ 1,080,000	$ 1,080,000	
Subtotal "Soft Costs"					$ 8,600,000

Grand Total					$ 40,000,000

1. New Pavement cost includes roadway excavation cost.
2. Soft cost is percentage of Roadway and Structure Items except R/W Engineering which is 10% of R/W Items.

Location: Package 3 NB - US101/SR92-Hillsdale Braided Ramps

Description: Relocate SR92 connector exit to same location as existing Hillsdale off-ramp.
New CD road from combined off-ramp to SR92 connector ramps.
Conversion of Hillsdale interchange to diamond configuration.
Reconstruct Hillsdale diagonal on-ramp to go above CD road and provide separate connection to CD road.

Assumptions:

1. New CD road will be constructed under existing Hillsdale Overcrossing at location of current loop on-ramp.
2. Full R/W take would be needed from 10 residential properties adjacent to existing Hillsdale diagonal on-ramp to construct CD road and new connection from Hillsdale diagonal on-ramp to CD road.
3. Additional partial R/W take would be needed from residential properties adjacent to existing SR92 connector ramps.
4. Approximately 1600 LF of sound wall would need to be reconstructed.
5. Retaining walls and a new bridge structure would be needed to construct new elevated diagonal on-ramp from Hillsdale Blvd to NB US101.

Required Design Exceptions:

1. Non-standard inside shoulder width on NB 101 (existing condition)

US101/SR92 Interchange Area Study

PLANNING LEVEL COST ESTIMATE

Location: **Package 3 SB - US101/SR92-Hillsdale**

Project Description: see Page 2

March 2013 Estimate

Roadway Items:	Quantity	Unit	Unit Cost	Item Total	Total
Clearing and Grubbing	5	AC	$ 10,000	$ 50,000	
New Pavement - Mainline[1]	145,000	SF	$ 13	$ 1,885,000	
New Pavement - Ramp / Local Road[1]	139,000	SF	$ 10	$ 1,390,000	
Overlay / Rdwy Excavation Only	420,000	SF	$ 1	$ 420,000	
Sound Wall	1,600	LF	$ 320	$ 512,000	
Retaining Wall	13,000	SF	$ 90	$ 1,170,000	
Barrier	2,500	LF	$ 100	$ 250,000	
Landscape/Irrigation	1	LS	$ 998,000	$ 998,000	
Ramp Metering	2	EA	$ 100,000	$ 200,000	
Intersection Signal	1	EA	$ 300,000	$ 300,000	
OH Sign	7	EA	$ 50,000	$ 350,000	
Street lighting	1	LS	$ 175,000	$ 175,000	
Traffic Control	1	LS	$ 1,540,000	$ 1,540,000	
Storm Drain	1	LS	$ 998,000	$ 998,000	
WPC / Treatment	1	LS	$ 832,000	$ 832,000	
Minor & Misc. items (15%)	1	LS	$ 1,661,000	$ 1,661,000	
Roadway Additions (10%)	1	LS	$ 1,274,000	$ 1,274,000	
Mobilization (10%)	1	LS	$ 1,274,000	$ 1,274,000	
Contingency (25%)	1	LS	$ 3,183,000	$ 3,183,000	
Roadway Subtotal					$ 18,500,000

Structure items:	Quantity	Unit	Unit Cost	Item Total	Total
Overhead Structure	153,000	SF	$ 250	$ 38,250,000	
Widen Bridge (Hillsdale OC)	3,500	SF	$ 300	$ 1,050,000	
Structure Demolition		SF		$ -	
Structure Subtotal					$ 39,300,000

Right of way Items:	Quantity	Unit	Unit Cost	Item Total	Total
Acquisition costs	1	LS	$ 86,000,000	$ 86,000,000	
Utility Relocation (Est)	1	LS	$ 1,100,000	$ 1,100,000	
Environmental Mitigation (Est)	1	LS	$ 500,000	$ 500,000	
Right of way Subtotal					$ 87,600,000

Subtotal "Hard Costs"					$ 146,000,000

Soft Costs[2]	Quantity	Unit	Unit Cost	Item Total	Total
Preliminary Eng/Envir (12%)	1	LS	$ 6,936,000	$ 6,936,000	
Final Design (10%)	1	LS	$ 5,780,000	$ 5,780,000	
Construction Administration (13%)	1	LS	$ 7,514,000	$ 7,514,000	
Construction Staking (2%)	1	LS	$ 1,156,000	$ 1,156,000	
R/W Engineering/Acquisition (10%)	1	LS	$ 8,760,000	$ 8,760,000	
Subtotal "Soft Costs"					$ 31,000,000

Grand Total					$ 180,000,000

1. New Pavement cost includes roadway excavation cost.
2. Soft cost is percentage of Roadway and Structure Items except R/W Engineering which is 10% of R/W Items.

Location: Package 3 SB - US101/SR92-Hillsdale Braided Ramps

Description: New flyover ramp from WB 92 to SB 101.
Relocate on-ramp from Fashion Island Blvd to existing location of WB 92 loop on-ramp.
Relocate Hillsdale off-ramp to just south of new Fashion Island on-ramp and construct new CD road to Hillsdale Blvd.
Slip ramp connecting new flyover to new CD road.
Slip ramp connecting EB 92/SB101 connector ramp to new CD road
Convert Hillsdale Blvd interchange to diamond configuration.

Assumptions:

1. Quantities for Roadway Items were assumed to be identical to quantities calculated for the Package 3 NB improvements. R/W and Structures items quantities were calculated separately for Package 3 SB.
2. Full R/W take and relocation would be needed for 19 residential homes, 42 condominiums and one 64,000 SF office building.
3. Residential homes were estimated at $800,000 each and condominiums at $700,000 each. An additional $100,000 each was assumed for relocation cost.
4. The office building was estimated at $36,000,000.

Required Design Exceptions:

1. Non-standard inside shoulder width on SB 101 (existing condition)

US101/SR92 Interchange Area Study

PLANNING LEVEL COST ESTIMATE

Location: **Auxiliary Lane at Kehoe (Package 1)**

Project Description: Add auxiliary lane from WB SR92 to Kehoe Ave off-ramp

March 2013 Estimate

Roadway Items:	Quantity	Unit	Unit Cost	Item Total	Total
Clearing and Grubbing	1	AC	$ 10,000	$ 10,000	
New Pavement - Mainline[1]	25,000	SF	$ 13	$ 325,000	
New Pavement - Ramp / Local Road[1]	-	SF	$ 10	$ -	
Overlay	96,000	SF	$ 1	$ 96,000	
Sound Wall		LF	$ 320	$ -	
Retaining Wall		SF	$ 90	$ -	
Barrier		LF	$ 100	$ -	
Landscape/Irrigation	1	LS	$ 101,000	$ 101,000	
Ramp Metering		EA	$ 100,000	$ -	
Intersection Signal		EA	$ 300,000	$ -	
OH Sign	1	EA	$ 50,000	$ 50,000	
Street lighting	1	LS	$ 25,000	$ 25,000	
Traffic Control	1	LS	$ 122,000	$ 122,000	
Storm Drain	1	LS	$ 101,000	$ 101,000	
WPC / Treatment	1	LS	$ 84,000	$ 84,000	
Minor & Misc. items (15%)	1	LS	$ 138,000	$ 138,000	
Roadway Additions (10%)	1	LS	$ 106,000	$ 106,000	
Mobilization (10%)	1	LS	$ 106,000	$ 106,000	
Contingency (25%)	1	LS	$ 263,000	$ 263,000	
Roadway Subtotal					$ 1,530,000

Structure items:	Quantity	Unit	Unit Cost	Item Total	Total
Overhead Structure		SF		$ -	
Widen Bridge	-	SF	$ 300	$ -	
Structure Demolition		SF		$ -	
Structure Subtotal					$ -

Right of way Items:	Quantity	Unit	Unit Cost	Item Total	Total
Acquisition costs		SF	$ 110	$ -	
Utility Relocation (21" Sewer)	1	LS	$ 150,000	$ 150,000	
Environmental Mitigation (Est)	1	LS		$ -	
Right of way Subtotal					$ 150,000

Subtotal "Hard Costs"					$ 1,700,000

Soft Costs[2]	Quantity	Unit	Unit Cost	Item Total	Total
Preliminary Eng/Envir (12%)	1	LS	$ 184,000	$ 184,000	
Final Design (10%)	1	LS	$ 153,000	$ 153,000	
Construction Administration (13%)	1	LS	$ 199,000	$ 199,000	
Construction Staking (2%)	1	LS	$ 31,000	$ 31,000	
R/W Engineering/Acquisition (10%)	1	LS	$ 15,000	$ 15,000	
Subtotal "Soft Costs"					$ 600,000

Grand Total					$ 2,300,000

1. New Pavement cost includes roadway excavation cost.
2. Soft cost is percentage of Roadway and Structure Items except R/W Engineering which is 10% of R/W Items.

Location: Auxiliary Lane at Kehoe (Package 1)

Description: Add auxiliary lane from WB SR92 to Kehoe Ave off-ramp

Assumptions:

1. Approximately 500 LF of 21" sewer would have to be relocated.

Required Design Exceptions:

1. Kehoe NB off-ramp - 220’ deceleration length (Std 270’)
2. Non-standard inside shoulder width

Appendix I:
Traffic Forecasts

III. Future Baseline Conditions

This chapter of the report covers the development of future traffic volumes to be used to evaluate future conditions, as well as the operations analysis using those volume forecasts to identify traffic problems. Solutions to the traffic problems identified here are covered in the next chapter.

A. Forecast Model Selection

1. Introduction

The first step to evaluate future conditions was to select a travel demand forecasting model. This section describes the process and decisions that were made.

There are four travel demand forecasting models that cover the study area:

- The MTC Regional model
- The C/CAG Countywide Model (developed and maintained by City/County Association of Governments of San Mateo County)
- The City of San Mateo model.
- The Santa Clara Valley Transportation Authority (VTA) Countywide Model

The MTC Regional model would not be appropriate for a focused study such as this one because its purpose is to forecast travel demand over much larger areas than this study – it lacks the zonal and network detail required for this scale of study. The Santa Clara Valley Transportation Authority (VTA) has a travel demand model that was adapted for a specific transportation study in San Mateo County. Within San Mateo County, that model uses the same zonal structure and roadway network as the C/CAG model, so, for the purposes of this study, it is considered to be identical to it. Therefore, the two remaining practical choices are the C/CAG model and the City of San Mateo model – this section compares the two models and documents how the models have been used and will continue to be used in this study.

2. Model Comparison

The C/CAG Countywide model (the "C/CAG model") and City of San Mateo model (the "City model") have many similarities because the City model was created using the C/CAG model as a base.

Software

Both models use the same software, EMME/2, so there is no difference between the two models in terms of software.

Forecast Year

Both models have 2005 as their base validation year and were built to forecast a horizon year of 2030. Additionally, the C/CAG model includes an interim forecast year of 2015 while a version the City model has been developed with an interim forecast year of 2020 for a specific development project. Forecasts for any interim year can be developed using either model by interpolating land use and conducting full model runs; interpolating trip tables from the 2005 and 2030 forecast years and conducting assignment-only model runs; or interpolating between forecast volumes on a link-by-link basis.

Model Process

Both the C/CAG model and the City model are traditional 4-step models, including detailed trip generation, trip distribution, mode choice, and trip assignment processes. Both models have the same trip purpose definitions, including ability to estimate trip making for home-based work, home-based shopping, home-based social/recreation, non-home based, home-based college and home-based school purposes. Both models also perform vehicle occupancy and time of day estimates. Finally, both models include special trip generators like the San Francisco Airport to account for trips (e.g., air passengers) usually not well represented in the socio-demographic land use estimates and traditional trip generation rates.

Model Time Periods

Initially, both models start with forecasting of daily travel in the trip generation, trip distribution and mode choice processes. Then, for the vehicle assignments, the models split daily forecasts into time-of-day periods. It is important to understand the time periods available in each model and how forecasts will be used for the traffic analysis of the US101/SR 92 interchange area. For the operations analysis (described in Section III-D below), multi-hour forecasts are needed for the simulation analysis, while single-hour peak volumes are needed for intersection analysis (and any other analysis using *Highway Capacity Manual* (HCM) methodology).

Both models include multi-hour time of day peak period forecasts. The C/CAG model has been calibrated to forecast a 4-hour AM peak period and a 4-hour PM peak period, although, in previous analysis for the US101 CSMP, factors were developed so that a 5-hour PM peak period is now a direct output of the model. The City model forecasts a 4-hour AM peak period and a 4-hour PM peak period. Additionally, the City model has been used to forecast 1-hour AM and PM peak hour traffic (using factors to convert the multi-hour forecasts) by applying a factor to the multi-hour results, while the C/CAG model has not. Note that it is possible to use existing volume profiles (with demand profiles preferred over count profiles,

if different) to create 1-hour assignments or different multi-hour assignments out of the available time periods. Therefore, both models can be used for this study, although using the City model would eliminate a step of converting multi-hour demands into single-hour demands.

Land Use

Both models use socio-demographic land use (households, population, jobs, employed residents, etc.) that is generally consistent with Association of Bay Area Governments (ABAG) Projections 2005 land use. The City model started with the same land use data as the C/CAG model, but it has been allocated to a new finer traffic analysis zone (TAZ) system created by splitting the C/CAG TAZs into smaller TAZs. Using smaller TAZs is expected to enable capturing more nuances of travel, especially within the City. It is notable to reiterate that, unlike many local models built for individual cities in the Bay Area, the City model does not use a general plan buildout land use data set, but instead incorporates land use data that is consistent with (e.g., the land use totals are relatively close, and without any particular category being significantly more different than the ABAG total than any other), albeit slightly higher than, ABAG totals for 2030 conditions. The C/CAG model's land use totals are nearly identical to the ABAG totals.

ABAG has published two subsequent socio-demographic datasets, Projections 2007 and Projections 2009. Some models around the Bay Area have been updated using Projections 2007 land use, while none have been updated to Projections 2009. However, if the main categories of the land use data for San Mateo for Year 2030 are compared between P05 and P07, the P05-based forecasts are slightly more conservative, so using a model that includes P05 land use data does not appear to have any significant negative consequences for this study:

- The population is identical for both.
- The number of households in P05 is lower, but by less than ½ of 1 percent.
- For jobs and employed residents, the P05 numbers are higher by about 8% and 4%, respectively. The number of Year 2030 jobs using P05 is actually about 2% higher than the Year 2035 value from P07. Similarly, the number of employed residents projected for Year 2030 in P05 is almost identical to that for Year 2035 in P07.

Roadway Network

The roadway network in the City of San Mateo model was created by starting with the C/CAG model's network, and increasing the detail by adding roadways that are not represented in the C/CAG model, usually smaller collectors and local streets, to support the more detailed TAZ system. Countywide models, such as the C/CAG model, don't generally include every roadway, and as a result, forecasts for a countywide model represent a more coarse estimate of travel than for a local model.

Transit Network

The transit network in the City of San Mateo model was created by starting with the C/CAG model's transit network, and includes all transit modes present within San Mateo County, including Caltrain rail, BART rail, and SamTrans bus modes.

Model Assignments

In order to make a final decision of which model to use, assignment runs were conducted for Years 2030 and 2005, and then comparisons were made within each model (i.e., 2030 versus 2005) using difference plots. During this review, some significant problems were observed in the City model's output. Specifically, Year 2030 peak period volumes on the San Mateo Bridge (and some other key locations) were significantly less than Year 2005 volumes in the peak direction. Table III-1 below shows a comparison of Year 2005 and Year 2030 volumes at selected locations. In coordinating with the City's consultant that created the model to correct the issues, it was determined that the problems could be resolved, but not in the time framed needed for this study. Excerpts from the difference plots prepared during this step are included in Appendix III-A.

Table III-1
Model Growth on Selected Links, 2005 to 2030, City of San Mateo Model

		AM 4-hour Peak		**PM 4-hour Peak**	
Location	**Assignment**	**Eastbound**	**Westbound**	**Eastbound**	**Westbound**
San Mateo Bridge	Initial	+3,581	-4,768	-2,846	+4,521
	Revised	+5,527	-1,349	+520	+6,739
SR92, West of US101	Initial	+1,786	-3,173	-4,158	-352
	Revised	+1,808	-2,007	-4,432	-319
SR92, West of El Camino	Initial	+36	-1,159	-712	-2,234
	Revised	-180	-868	-444	-2,541
SR92, East of I-280	Initial	+57	-41	-1,214	-1,174
	Revised	+224	+1,492	-351	-1,846
		Northbound	**Southbound**	**Northbound**	**Southbound**
El Camino, South of SR92	Initial	+926	-117	-827	+1,783
	Revised	+799	+898	+213	+2,278

3. Model Selection and Use

The C/CAG model was selected to be used as the primary forecast model because the C/CAG model shows reasonable growth on key roadway links throughout our study area, including on the San Mateo Bridge. The City model will be used as a reference, primarily to

check forecasts on local streets and potentially to assist in traffic routing within the study area because of its denser roadway network in the study area.

B. Forecast Modeling Inputs and Assumptions

1. Modeling Inputs and Assumptions

Horizon Years

The horizon years of the study forecasts are a 2005 base year and a 2030 long-range horizon year. Forecasts representing longer-range horizon years could be developed by extrapolating available land use and potentially adding network changes that might be expected beyond 2030, but for this level of planning study, a 2030 horizon year is sufficient. Later, as potential improvement projects are identified and those project proceed into the Caltrans Project Development process, a horizon year of 20 years beyond the anticipated construction date is typically required.

In addition to the base year and Year 2030 horizon year, an interim horizon year of 2020 was created by interpolation. Using a Year 2015 interim year would be consistent with the recent CSMP work on US101, as well as with the C/CAG travel demand model itself. However, it is unlikely any recommended improvements could be constructed by 2015, so, for this study, it was agreed that Year 2020 be selected as the interim year for near-term analysis.

The Year 2020 volumes were developed by interpolating between the Year 2030 and 2005 trip tables, and then assigning the resulting volumes. The trip tables are simply matrices that correspond to forecast volumes traveling from a given origin to a given destination. The interpolation was made for each origin-destination pair using the following straight line formula:

$$2020\ \text{Trips} = (((2030\ \text{Trips} - 2005\ \text{Trips}) / 25) \times 15) + 2005\ \text{Trips}$$

Time Periods

The time periods that the C/CAG model is calibrated to forecast are the AM 4-hour and (using a factoring step developed during the US 101 CSMP analysis) PM 5-hour periods. Longer analysis time periods may be needed for the simulation analysis (to more accurately build and dissipate queues), and such volume profiles can be created, if needed, using a combination of the 4-hour forecasts and existing volume profiles (with demand profiles being preferred over count profiles). This will be determined by reviewing the results of the simulations (both FREQ and VISSIM) – if queues do not begin to dissipate within the available time periods, the longer volume profiles will be created. The only exception to this

approach will be if it appears obvious that queues will not begin to dissipate within an additional hour or two.

The single-hour AM and PM peak forecasts for the intersection volumes were created using the multi-hour counts conducted for this study. A factor was developed for each ramp by taking the counted volume in the highest hour for each ramp and dividing by the total counted volume on that ramp within the peak period. Then, all of the factors for each peak period were averaged to develop one factor for the AM peak hour intersection forecasts and one for the PM.

Land Use

The land use in the C/CAG model was developed and allocated to the model's traffic analysis zones to be consistent with the totals (county-wide and city-by-city) from ABAG's Projections 2005. For households, the county-wide and City of San Mateo totals in the C/CAG model are indeed nearly identical to the ABAG totals. The 2005 job totals for the County and for the City are notably different, however, as shown in Table III-2 below. This is likely due to job estimation input from local jurisdictions during the model validation process. Since the model was successfully validated using the higher Year 2005 job totals and since the Year 2030 job totals correlate well to the ABAG totals (within 1%), this difference in jobs does not represent a significant deficiency in the model inputs, nor does it indicate any inability of the model to forecast Year 2030 travel demand.

Table III-2
Land Use Comparisons – C/CAG Model and ABAG Projections 2005

	Year 2005				Year 2030			
Category	C/CAG Model	ABAG	Diff.	%	C/CAG Model	ABAG	Diff.	%
Households (w/in County)	260,850	261,280	-430	-0.2%	304,020	305,390	-1,370	-0.4%
				Growth	*43,170*	*44,110*		
Households (w/in City of San Mateo)	38,413	38,580	-167	-0.4%	45,874	46,560	-686	-1.5%
				Growth	*7,461*	*7,980*		
Jobs (w/in County)	400,030	336,460	+63,570	+18.9%	505,124	507,090	-1,966	-0.4%
				Growth	*105,094*	*170,630*		
Jobs (w/in City of San Mateo)	59,216	44,360	+14,856	+33.5%	68,193	68,910	-717	-1.0%
				Growth	*8,977*	*24,550*		

Roadway Network

The intent of the roadway network inputs for this forecasting effort is to include all future projects consistent with the current San Mateo Countywide Transportation Plan and the MTC RTP. Most of the projects in these planning documents have no effect on travel demand in the study area because of their distance from the study area. Projects that are within a few miles of the study area or for some other reason are believed to potentially have an effect on travel demand in the study area are listed below. Prior to running the final forecast assignments, the model network was reviewed to ensure that these projects are represented appropriately.

The future projects close to this study's location included in the model from the planning documents noted above[1] include the following:

- Aux Lanes and Ramp Metering – 3rd to Millbrae
  Widen NB and SB auxiliary lane segments from 4 lanes to 5 and install ramp metering equipment. Ramp meters will be turned on as widening construction is completed.
- US-101 Ramp Metering
  Caltrans' SHOPP project for Ramp Metering from Rte 92 to SF County line

Other projects are listed in the applicable planning documents that are generally described as follows:

- Widening SR92 between the San Mateo-Hayward Bridge and I-280, including a truck climbing lane
- Modify the SR92/El Camino Real interchange

For these latter two projects, there are two possible approaches to take regarding the modeling.

- One approach is to code these (to the extent the description provides enough information to do so) into the model (or ensure that they are already coded), with the logic that they are listed in the planning document with committed funding, so it is a reasonable assumption to include them.
- The other approach is to not code those improvements, with the logic that the current study will confirm whether or not such projects are needed, in addition to potentially identifying other projects that might also be needed.

For this study, the latter approach was used.

[1] The text describing these projects was taken directly from the final report for the CSMP Technical Analysis study that was recently completed (September, 2010).

Transit Network

Similar to the roadway network inputs, the transit network inputs for this forecasting effort include the most current future service levels and all future transit projects consistent with the current San Mateo Countywide Transportation Plan, the SamTrans long range operating plan, Caltrain, and the MTC RTP. For transit projects, the only project within, near, or passing through the study area that might have some effect on travel demand is the electrification of Caltrain, which would increase travel speeds on that transit mode.

C. Future Baseline Traffic Forecasts

The purpose of this section of the report is to present the Year 2030 and Year 2020 Forecasts.

1. Forecast Presentation

The forecasts for Year 2020 and 2030 are presented in three formats.

- Model plots directly from the Year 2020 and 2030 assignment runs are included in Appendix III-B.
- Exhibits III-1 and III-2 for Year 2020 and III-3 and III-4 for Year 2030 show adjusted forecasts for selected roadway links, while Exhibits III-5, III-6, III-7, and III-8 show the corresponding forecast volumes for the US101/SR92 interchange itself. Section 3 below describes the adjustments. Adjusted forecasts for all of the mainline links and ramps can be found in Appendix III-C.
- Exhibits III-9 and III-10 for Existing Conditions, III-11 and III-12 for Year 2020, and III-13 and III-14 for Year 2030 show adjusted intersection turning movement forecast volumes at key intersections.

The model plots included in Appendix III-B are intended to be viewed on a computer, rather than printed on paper. The reason for using this technique is that if the font is made large enough to read when printed on paper, many of the numbers overlap one another, rendering some of the numbers impossible to read. By setting the font size to be extremely small, a PDF viewer, such as that offered by Adobe Acrobat, can be used to zoom in to read the numbers. None of the numbers overlap, so the raw forecast volumes can be seen for almost any roadway link in the plot.

2. Modeling Output

For this study, the primary output of the forecasting effort is the link and intersection volumes for the future study years. These volumes can be reported for single occupant vehicles and HOVs, although since no HOV lanes exist in the study area, these volumes are combined into single values of vehicles for the operations analysis. Then, while the operations analysis provides the most direct evaluation of the study area with performance measures from the operational models, system-wide performance measures to compare potential build versus no-build scenarios can be obtained from the forecast model, such as vehicle-miles-traveled (VMT), vehicle-hours-traveled (VHT), vehicle-hours of delay (VHD), etc.

3. Forecast Adjustments

Volume outputs from forecast models must be adjusted in most cases. The most common method for adjusting raw volumes from a forecast model is to add the model's growth increment (future year minus base year) to the existing volume. However, there are times when some other methodology is needed, depending on many different factors. For example, the typical approach for a case in which the future volume is less than the base volume is to use the existing volume ("floor to count"). But there may be a reason for an analyst to instead apply some minimal growth factor to the existing volume, such as a plausible expectation that there would actually be positive growth for the location in question. These kinds of diversions from the basic methodology are usually done on a case-by-case basis, and would always be documented individually.

In the case of this model, the technique described above (the "incremental method") was determined to be the appropriate method because the growth on most of the links appeared to be reasonable, given the context of this particular study area. Similarly, once the single-hour forecasts were developed for the intersections, the growth increments for each individual movement (left, through, right for each approach) were added to the existing intersection volumes, with the limitation that the minimum future volume for each movement was kept equal to the count.

In addition to the incremental method of adjusting raw model forecast outputs, the availability of the City of San Mateo model allowed for other adjustments. The strategy for using the City model for this study was to review the forecasts from the C/CAG model to determine of any of the results were not consistent with known or expected travel patterns. Because of the greater density of the roadway network in the City model, it may produce more realistic results on specific ramps or on specific local streets. Also, select link assignments can be implemented to test validity of travel patterns, especially when alternatives are being developed to solve anticipated traffic problems. At this point, for the future baseline forecasts, the forecast outputs from the C/CAG model appeared sufficiently reasonable, and the City model was not needed. It may still be needed for other parts of the forecasting efforts, particularly where details of future travel patterns are needed to develop the most effective alternatives to solve traffic problems.

Once the incremental adjustments were applied to the model forecasts, balancing calculations were conducted to ensure that volumes departing from one location equaled those arriving at the next location. This step is necessary because of some cases in which the model output shows a slight decrease on a ramp, for example, yet the methodology requires a minimum value of the existing volume. The steps of all of the adjustments for the mainline and ramp volumes can be found in Appendix III-C – a legend explaining the spreadsheet entries is also included.

Upon reviewing the adjusted and balanced results for Years 2020 and 2030, there were a few individual links for which the Year 2030 volume was slightly lower than the Year 2020

volume. This result can be addressed by either using a similar philosophy to the "floor to count" technique (i.e., keep the Year 2030 volume to at least the Year 2020 volume); or by ignoring it, recognizing that there may be congestion on the subject link and/or on nearby links that cause the model to legitimately assign a few vehicles to some other route. Table III-3 below lists the links for which the 2030 volume is lower than the 2020 volume.

Table III-3
Locations with Year 2030 Adjusted and Balanced Volume lower than for Year 2020

Location	Year 2020	Year 2030	Difference	% Difference
AM Peak Period				
Northbound US101, North of SR92	33,721	33,070	-651	-1.9%
Northbound US101, South of Hillsdale	27,793	27,614	-179	-0.6%
Northbound US101 on-ramp from Fashion Island Blvd.	1,178	1,166	-12	-1.0%
Southbound US101 off-ramp to Fashion Island Blvd.	1,433	1,414	-19	-1.3%
PM Peak Period				
Southbound US101, South of Hillsdale	29,557	29,254	-303	-1.0%
Westbound SR92 loop ramp to Southbound US101	7,372	7,278	-94	-1.3%

In order to resolve the issues from the table above, the following additional adjustments were made:

- The Year 2030 AM peak period volume on northbound US101, south of Hillsdale, was increased by 179 vehicles, so the volume now equals the Year 2020 volume.
- The on-ramps from Fashion Island Blvd. and from westbound SR92 to northbound US101 were increased by a total of 472 vehicles so that the AM peak period volume on northbound US101 equaled 33,721. Previously, there was no growth projected on either ramp, so adding this amount of vehicles now represents growth of approximately 4%.
- To resolve the AM peak period volume on the southbound US101 off-ramp to Fashion Island Blvd., 19 vehicles were added to the on-ramp from Third Ave. and 19 were added to the Fashion Island Blvd. ramp.
- In order to raise the PM peak period volume on southbound US101, south of Hillsdale, the westbound SR92 loop ramp to southbound US101 was increased by 94 vehicles, and the off-ramp to Hillsdale, which had shown growth of 100% with the basic adjustments, was reduced by 209 vehicles.

There was one location in the study area for which some additional scrutiny of the forecasts was needed. The raw Year 2030 PM peak period forecast for the eastbound SR92 off-ramp to Edgewater/Mariner's Island was found to be more than 1,000 vehicles less than the Year

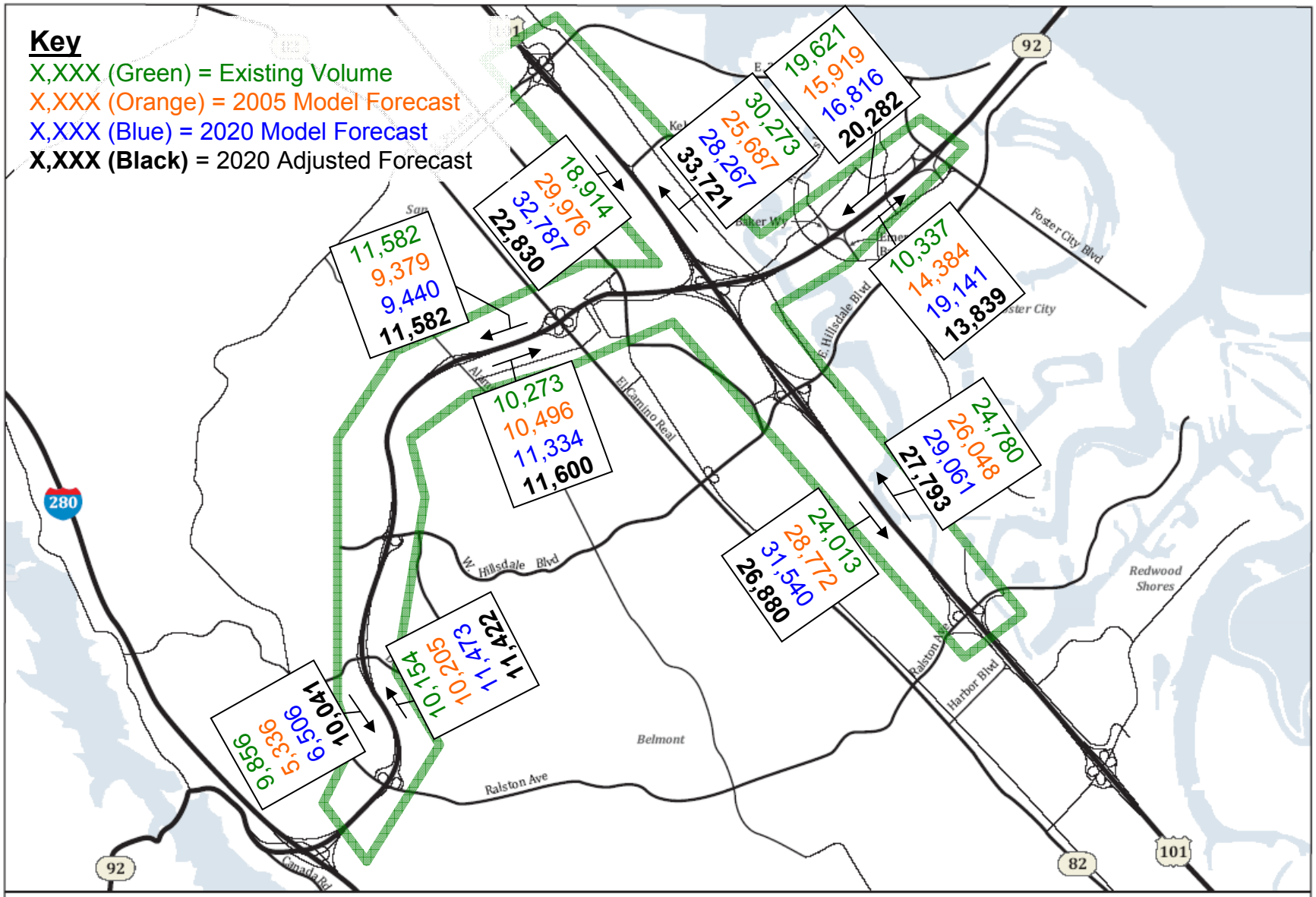
2005 volume. By conducting a select-link assignment, it was determined that vehicles were avoiding some of the future congestion on northbound US101 and the northbound-to-eastbound ramp by exiting one interchange earlier, at Hillsdale, and using surface streets to reach the area near the Edgewater/Mariner's Island off-ramp. While this diversion is actually a reasonable one to some extent, it was felt by the analysts that showing such a large decrease would not be reasonable for planning purposes. Instead, it was determined that the basic methodology of limiting the future volume to a minimum of the count would also be reasonable. One interpretation of this action would be that, as congestion grows beyond the level of existing congestion, enough vehicles will divert to that alternative route to keep the delays about the same as existing.

4. Discussion of Forecasts

The forecasts generally demonstrate reasonable growth in the study area. Model plots showing the differences in forecasts between the study years are included in Appendix III-D. Comparing the baseline (Year 2005) and Year 2030 raw forecast volumes to one another, there is a general trend of growth of approximately ½-1% per year. This growth rate range is similar to what planners would use as a rule-of-thumb growth rate in the absence of a demand model.

D. Future Baseline Traffic Operations

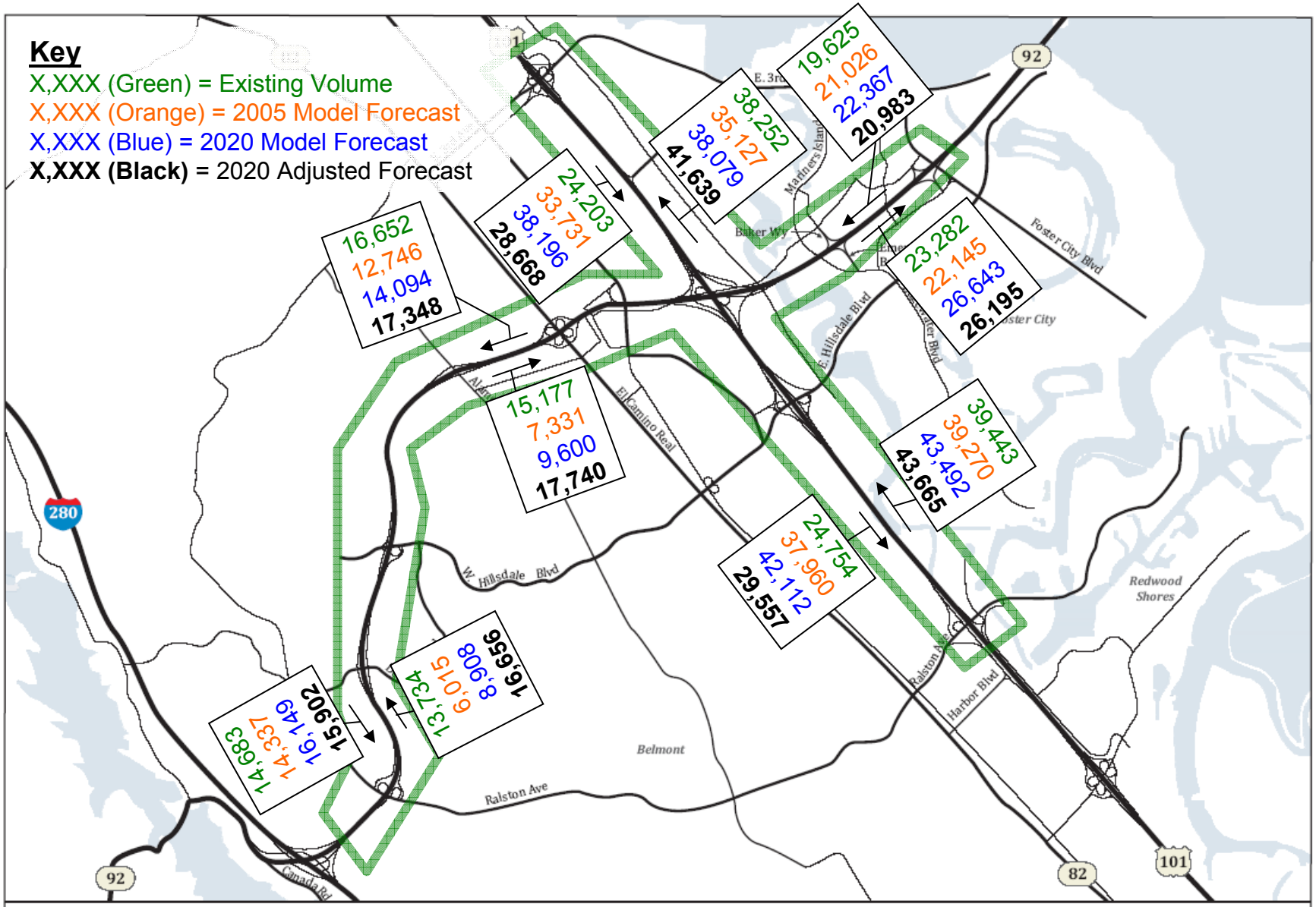
The purpose of this section of the report will be to present the Year 2030 and Year 2020 operations analysis results. The analysis will begin after the traffic forecasts have been accepted.



Not to Scale

Exhibit III-1 – Year 2020 Adjusted Forecast Volumes on Selected Roadways – AM Peak 4-hour Period

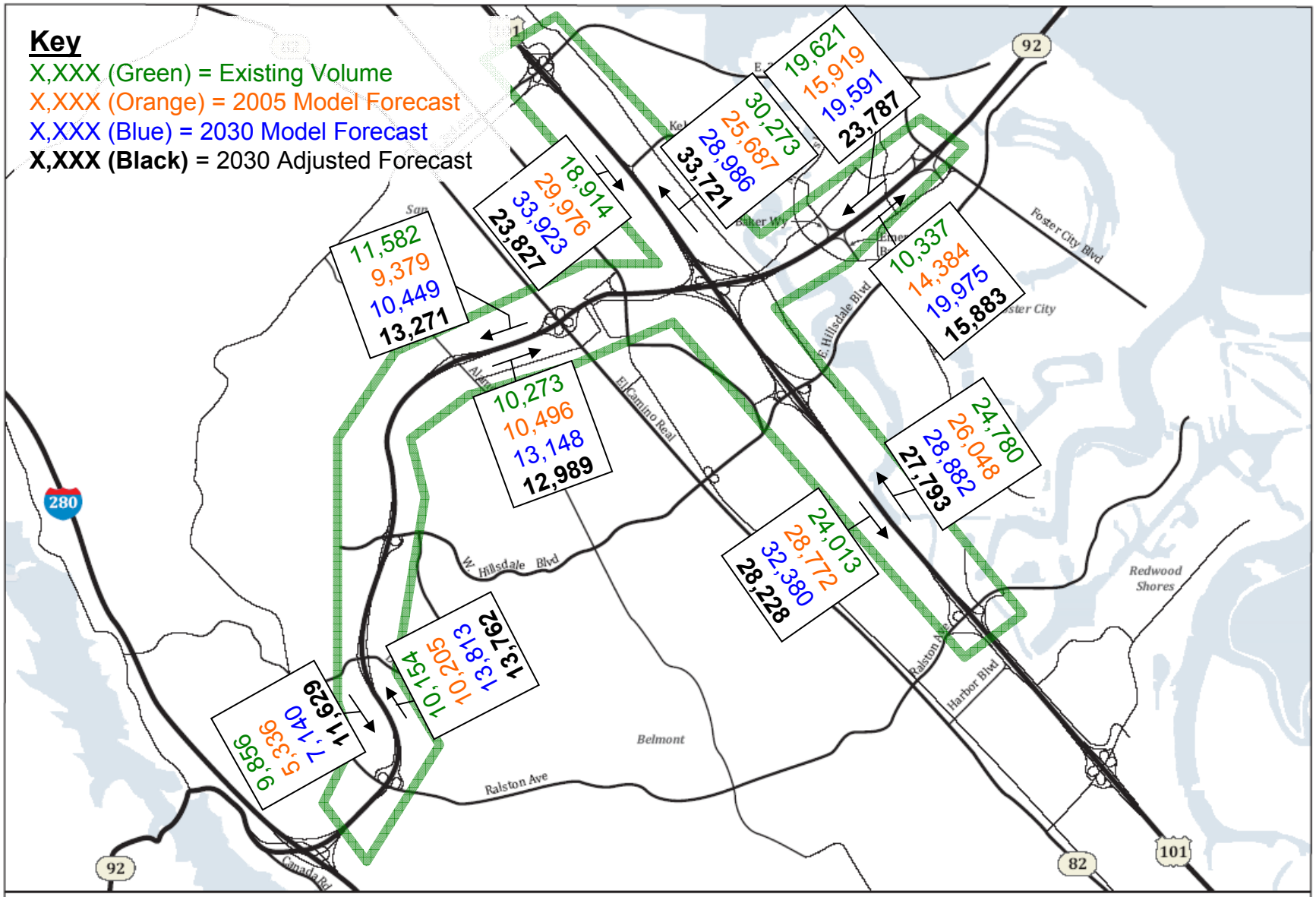
Dowling Associates, Inc.



Not to Scale

Exhibit III-2 – Year 2020 Adjusted Forecast Volumes on Selected Roadways – PM Peak 5-hour Period

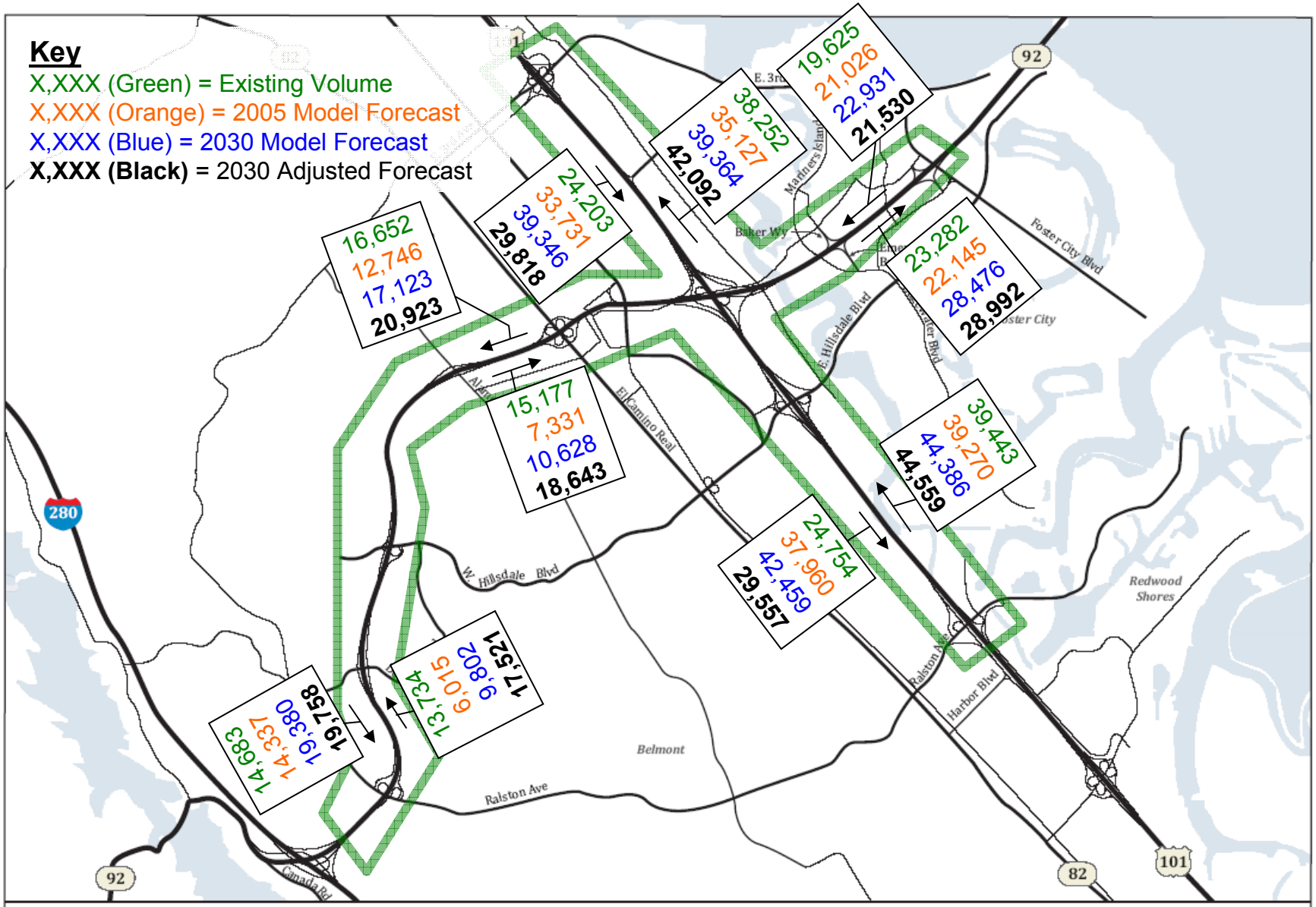
Dowling Associates, Inc.



Not to Scale

Exhibit III-3 – Year 2030 Adjusted Forecast Volumes on Selected Roadways – AM Peak 4-hour Period

Dowling Associates, Inc.



Not to Scale

Exhibit III-4 – Year 2030 Adjusted Forecast Volumes on Selected Roadways – PM Peak 5-hour Period

Dowling Associates, Inc.

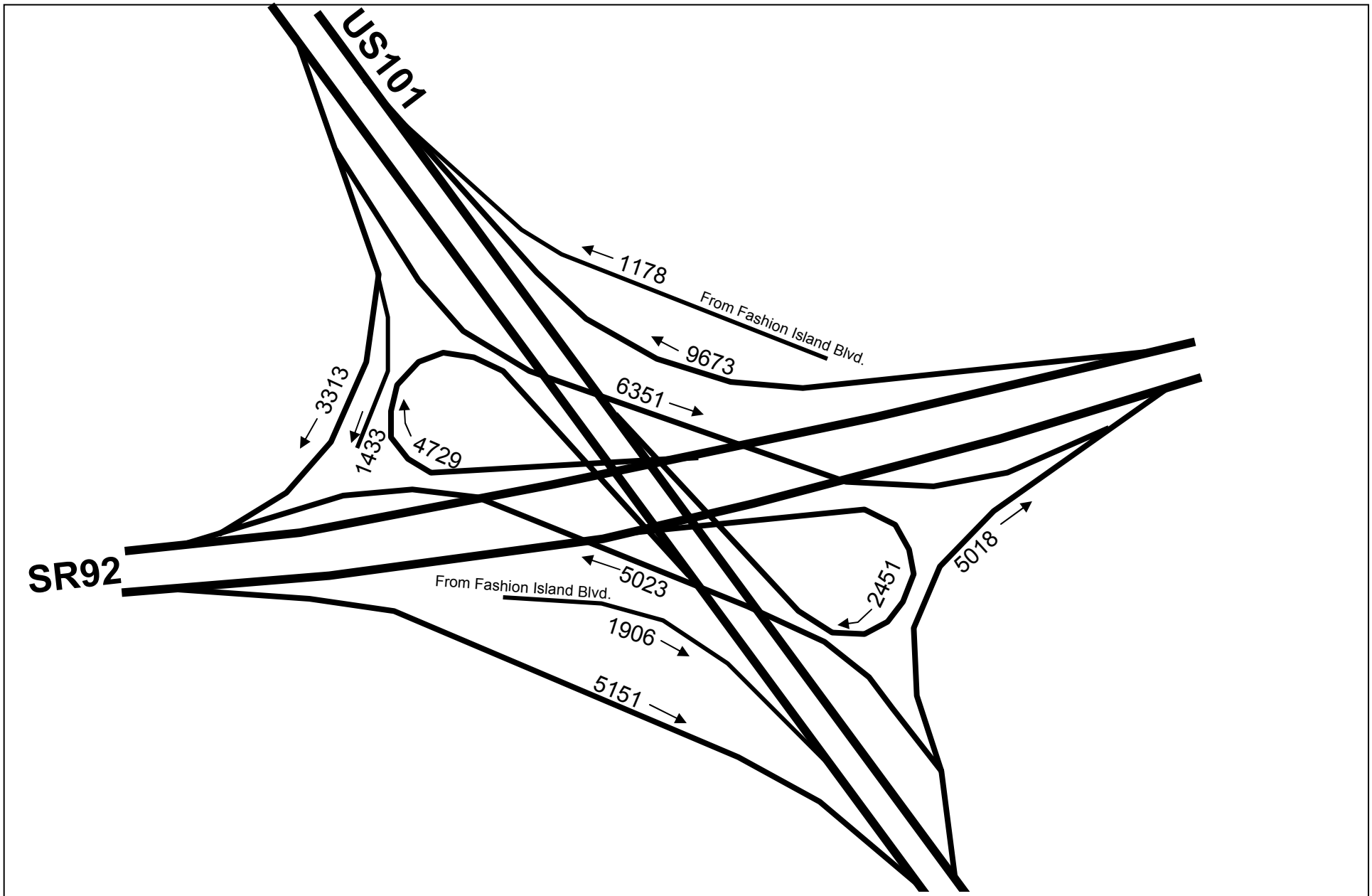


Exhibit III-5 – Year 2020 Adjusted Forecast Volumes within US101/SR92 Interchange – AM Peak 4-hour Period

Not to Scale

Dowling Associates, Inc.
Transportation Engineering • Planning • Research • Education

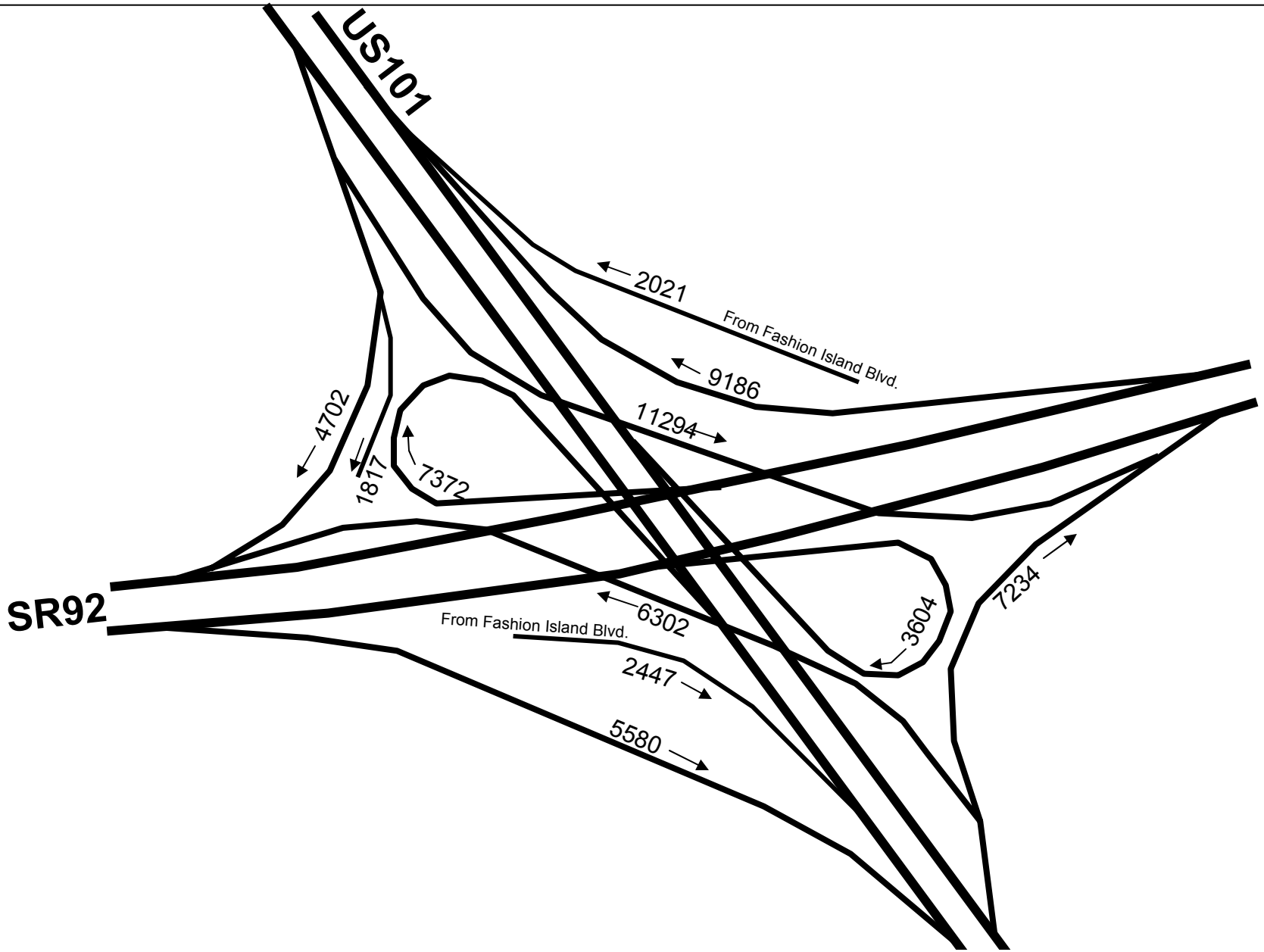


Exhibit III-6 – Year 2020 Adjusted Forecast Volumes within US101/SR92 Interchange – PM Peak 5-hour Period

Not to Scale

Dowling Associates, Inc.
Transportation Engineering • Planning • Research • Education

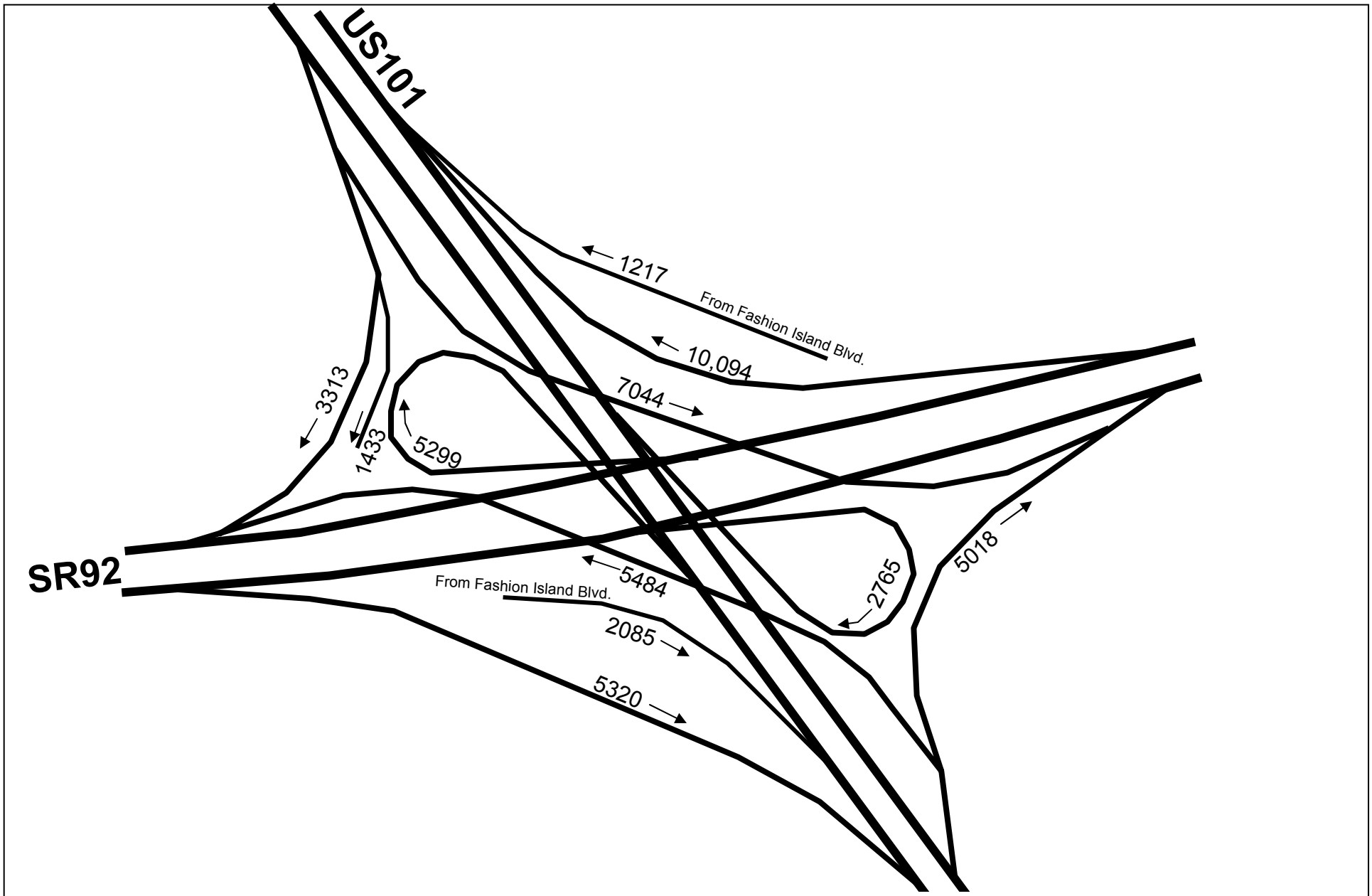


Exhibit III-7 – Year 2030 Adjusted Forecast Volumes within US101/SR92 Interchange – AM Peak 4-hour Period

Not to Scale

Dowling Associates, Inc.
Transportation Engineering • Planning • Research • Education

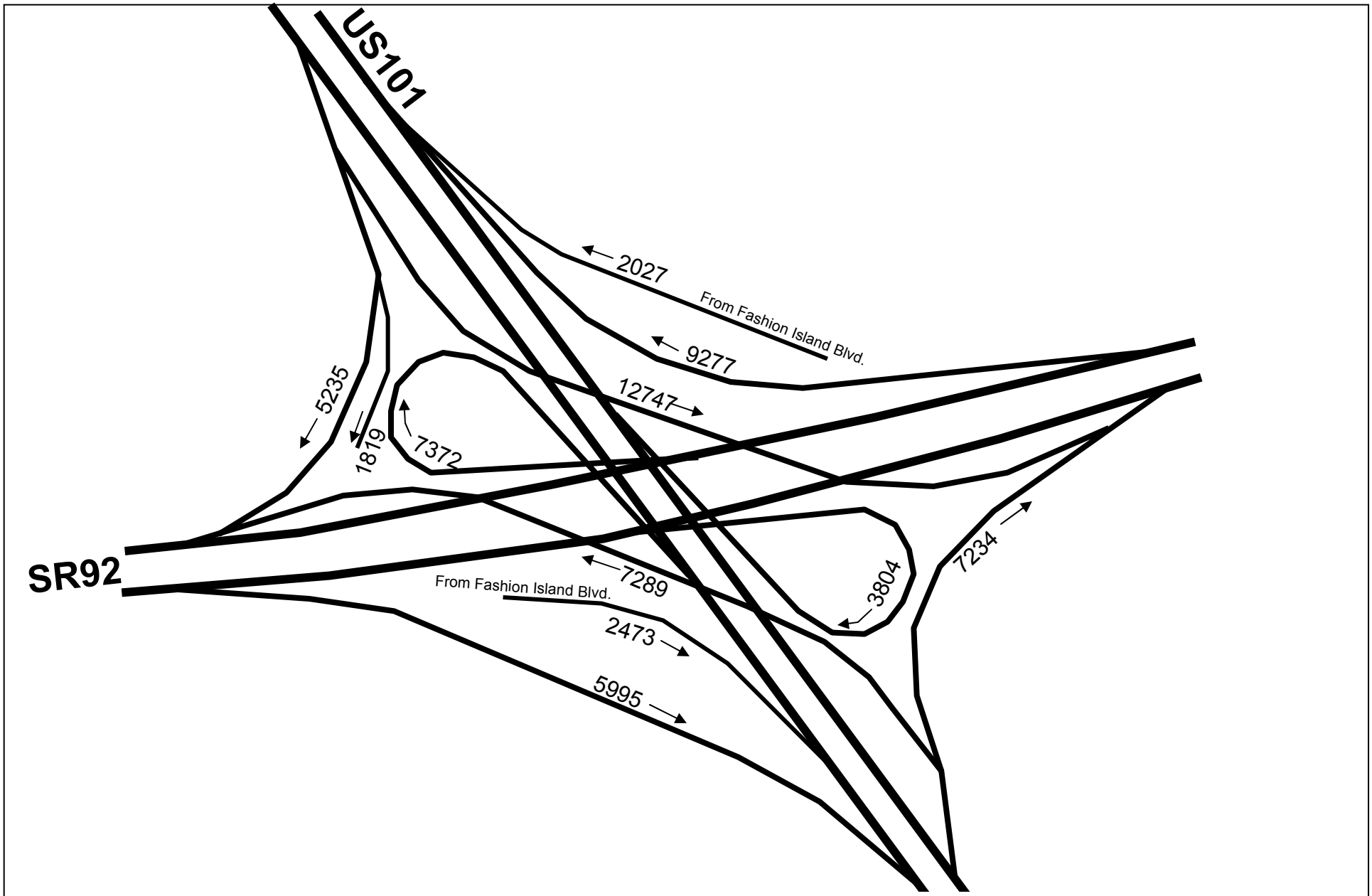


Exhibit III-8 – Year 2030 Adjusted Forecast Volumes within US101/SR92 Interchange – PM Peak 5-hour Period

Not to Scale

Dowling Associates, Inc.
Transportation Engineering • Planning • Research • Education

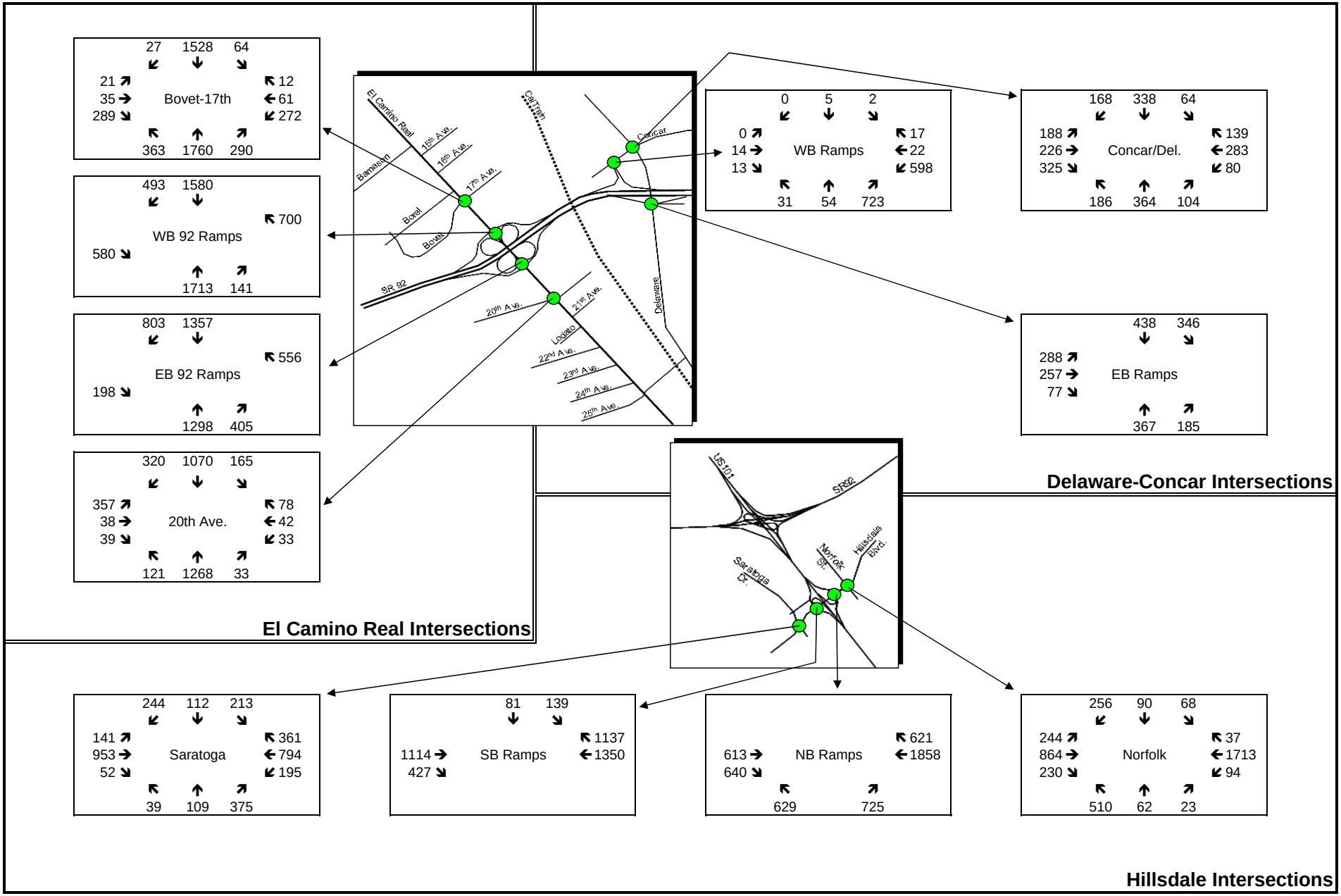


Exhibit III-9 - Intersection Volumes
Existing AM Peak Hour

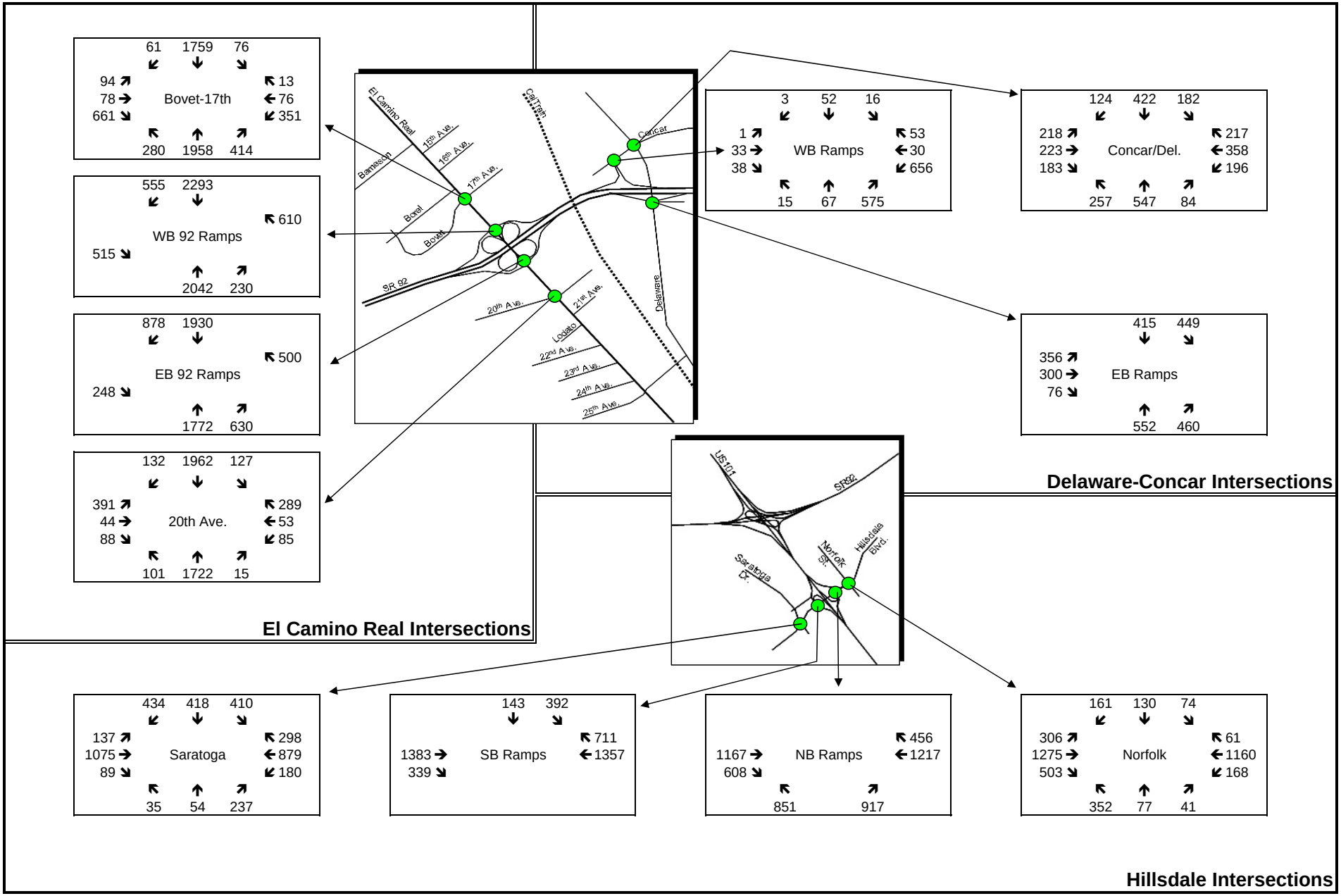


Exhibit III-10 - Intersection Volumes
Existing PM Peak Hour

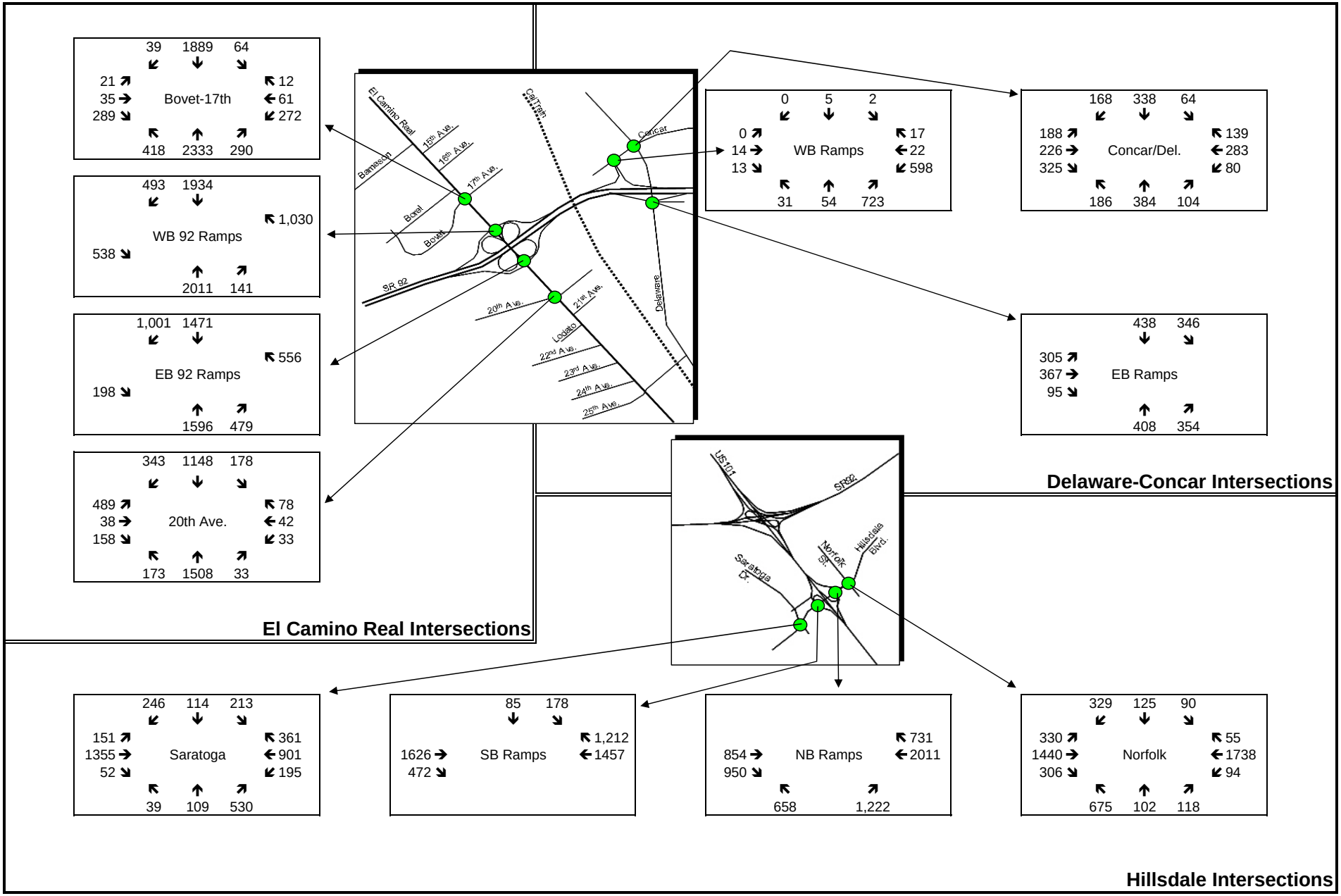


Exhibit III-11 - Intersection Volumes
Year 2020 AM Peak Hour

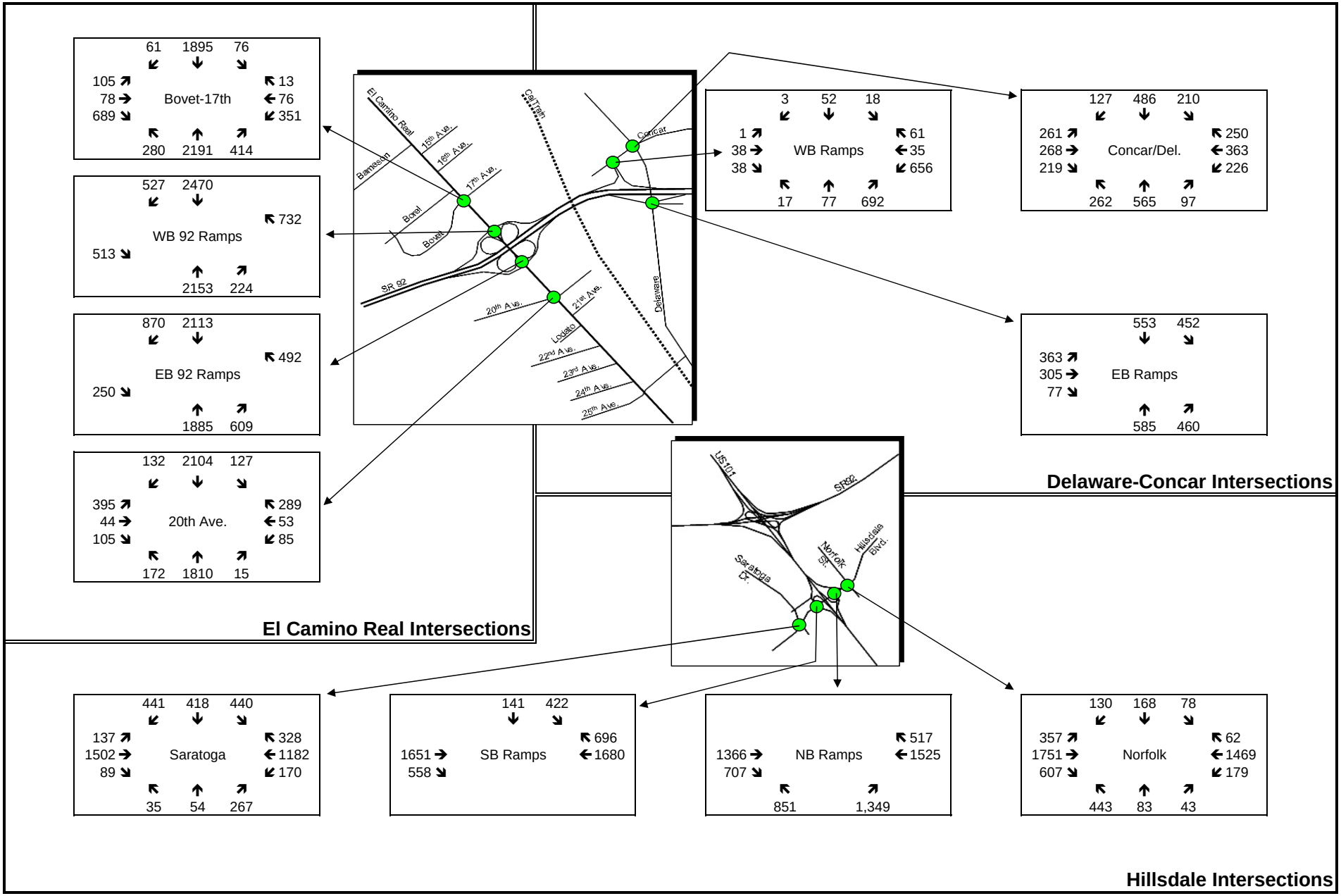


Exhibit III-12 - Intersection Volumes
Year 2020 PM Peak Hour

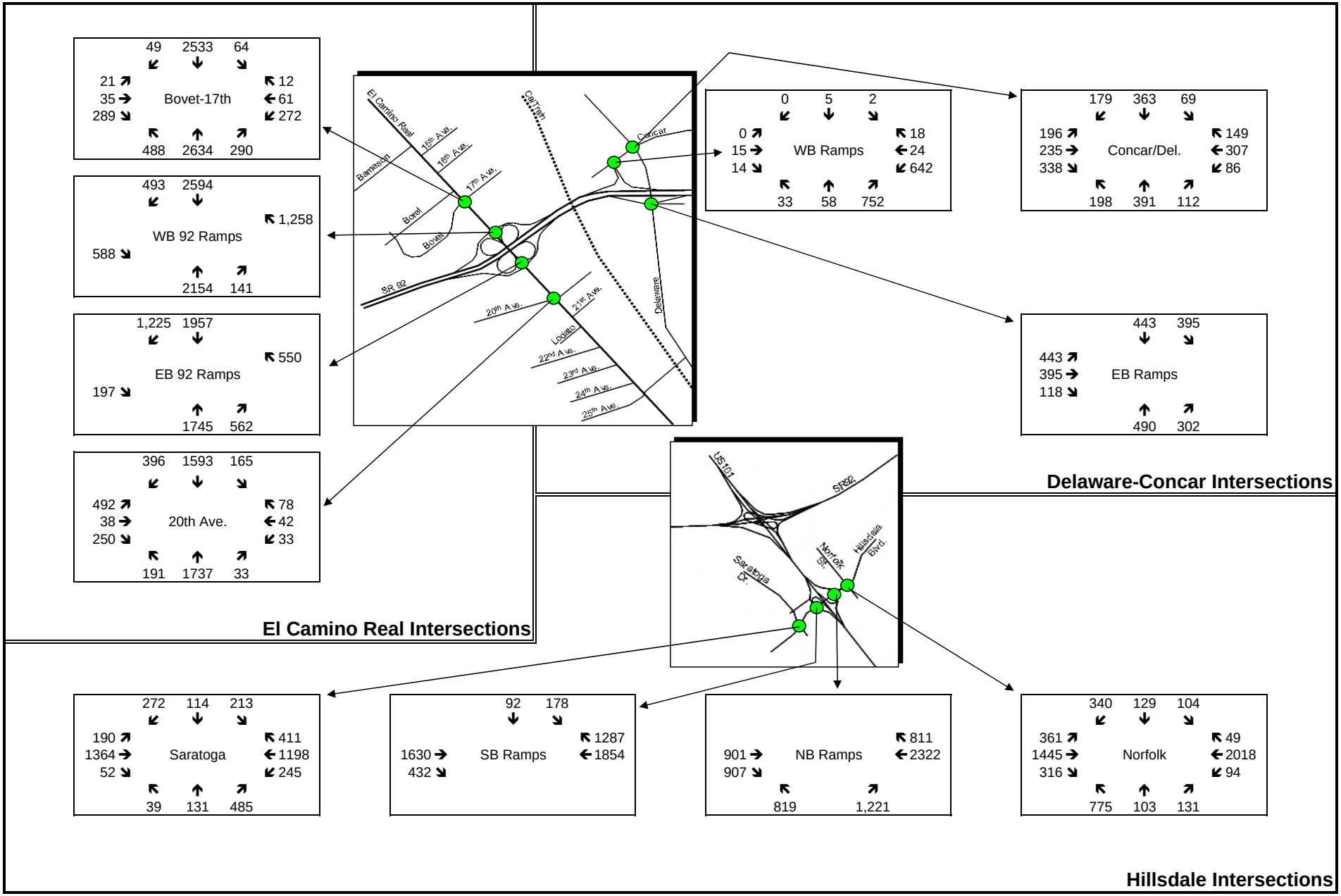


Exhibit III-13 - Intersection Volumes
Year 2030 AM Peak Hour

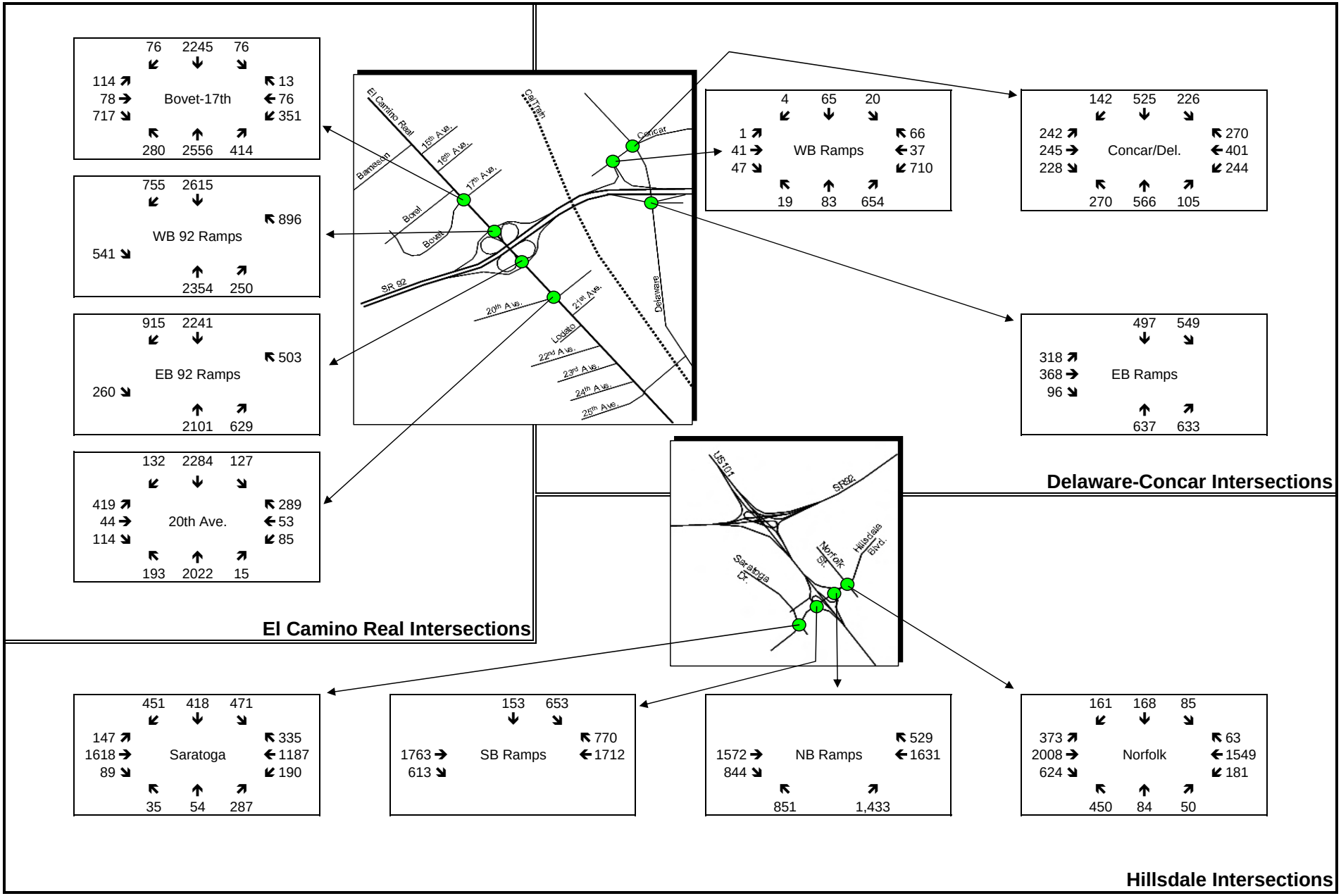
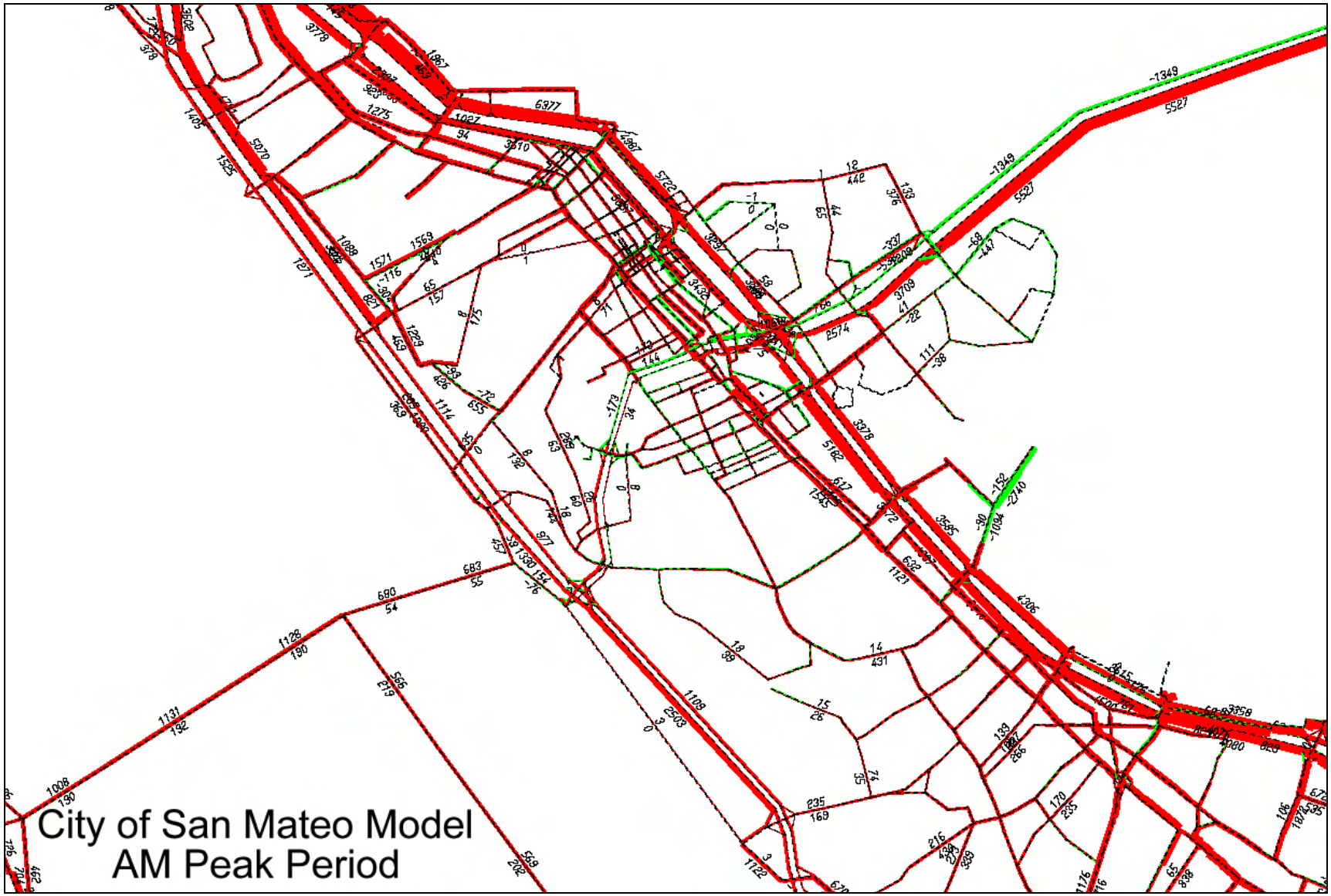
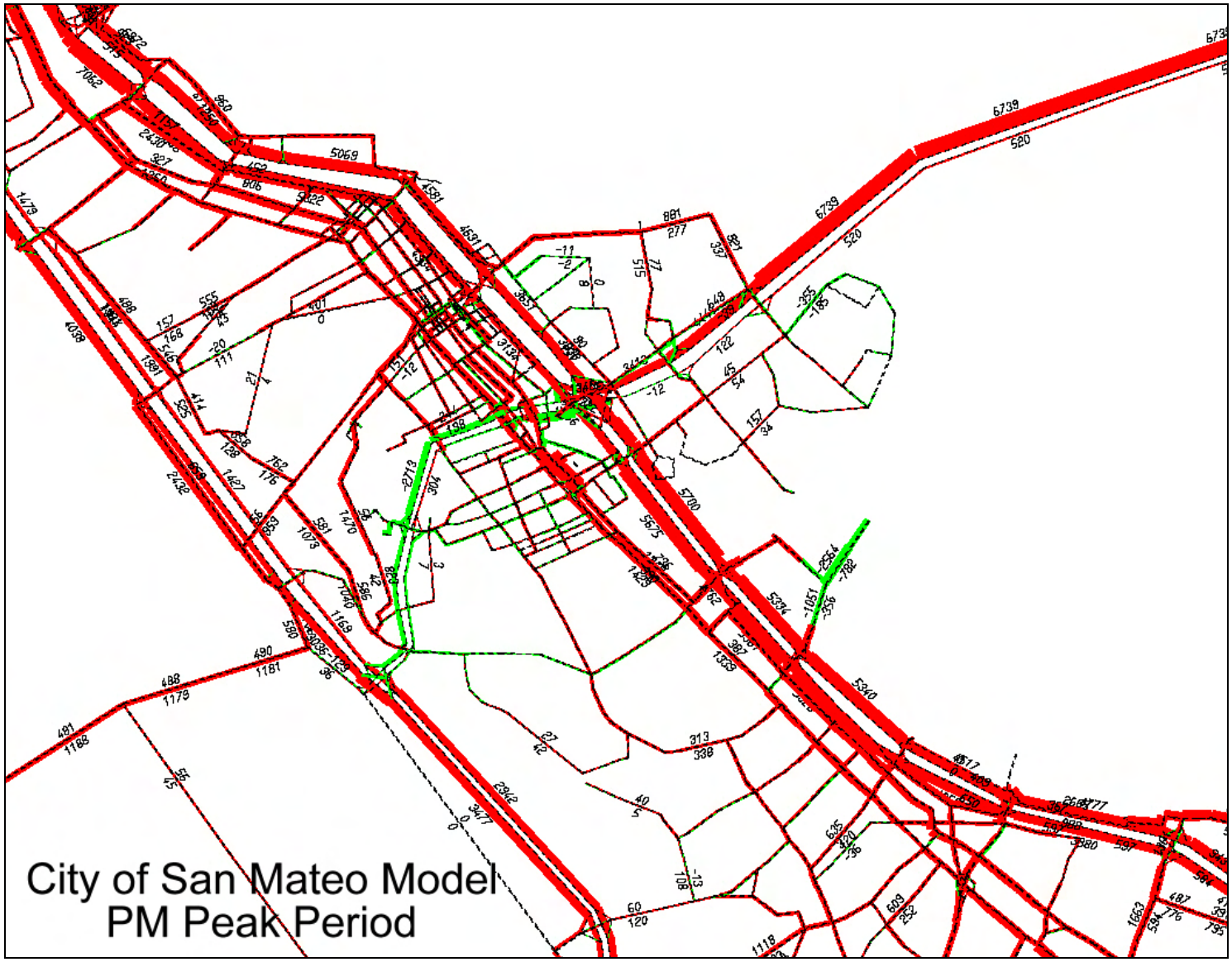


Exhibit III-14 - Intersection Volumes
Year 2030 PM Peak Hour

APPENDIX III-A

Year 2030 vs. 2005 Difference Plots (excerpts) from City of San Mateo Model


City of San Mateo Model
AM Peak Period


City of San Mateo Model
PM Peak Period

C/CAG Model
AM Peak Period

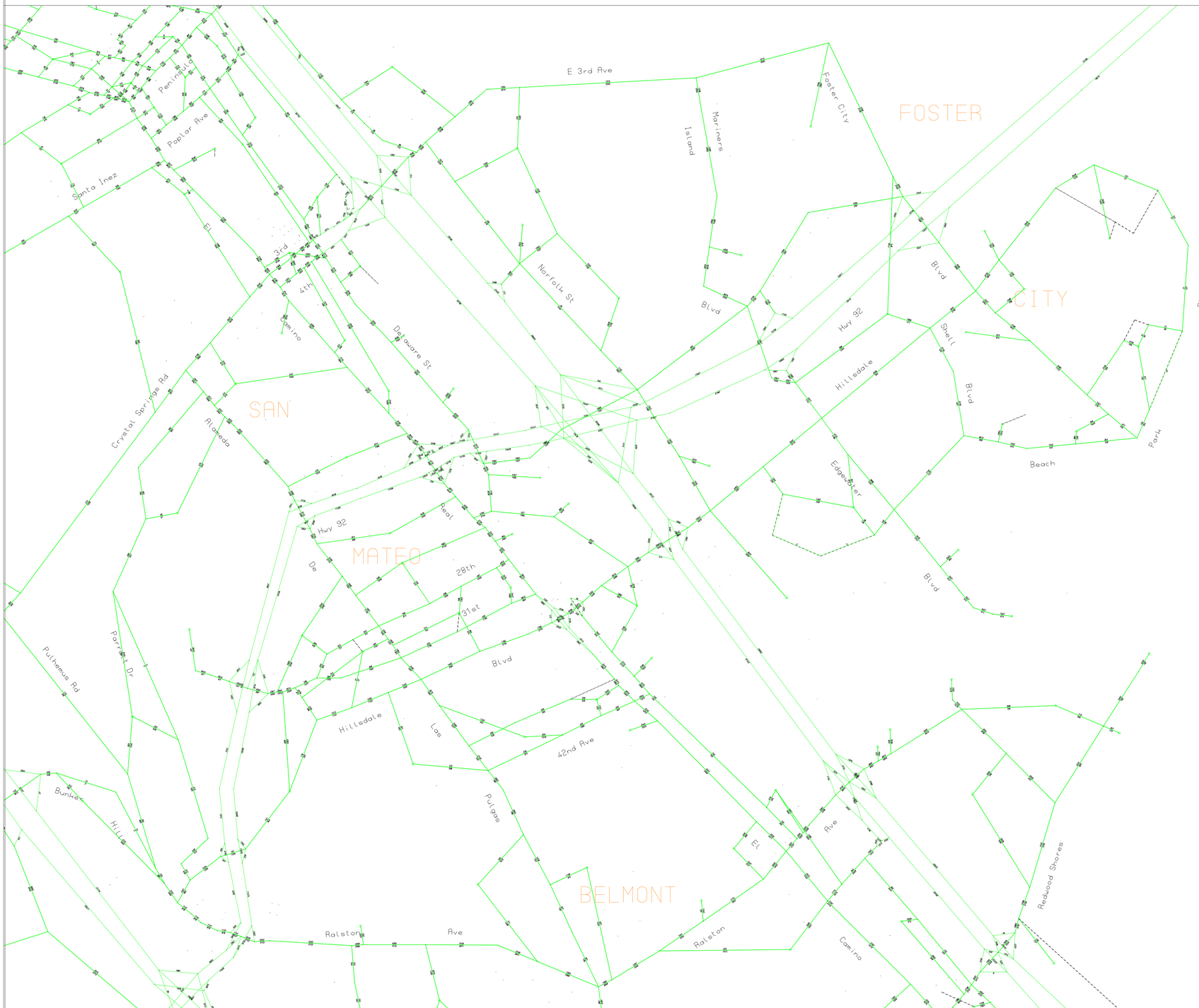
C/CAG Model
PM Peak Period

APPENDIX III-B

Year 2020 and Year 2030 Volume Plots from C/CAG Model

emme/2

LINKS:
mod=aeo



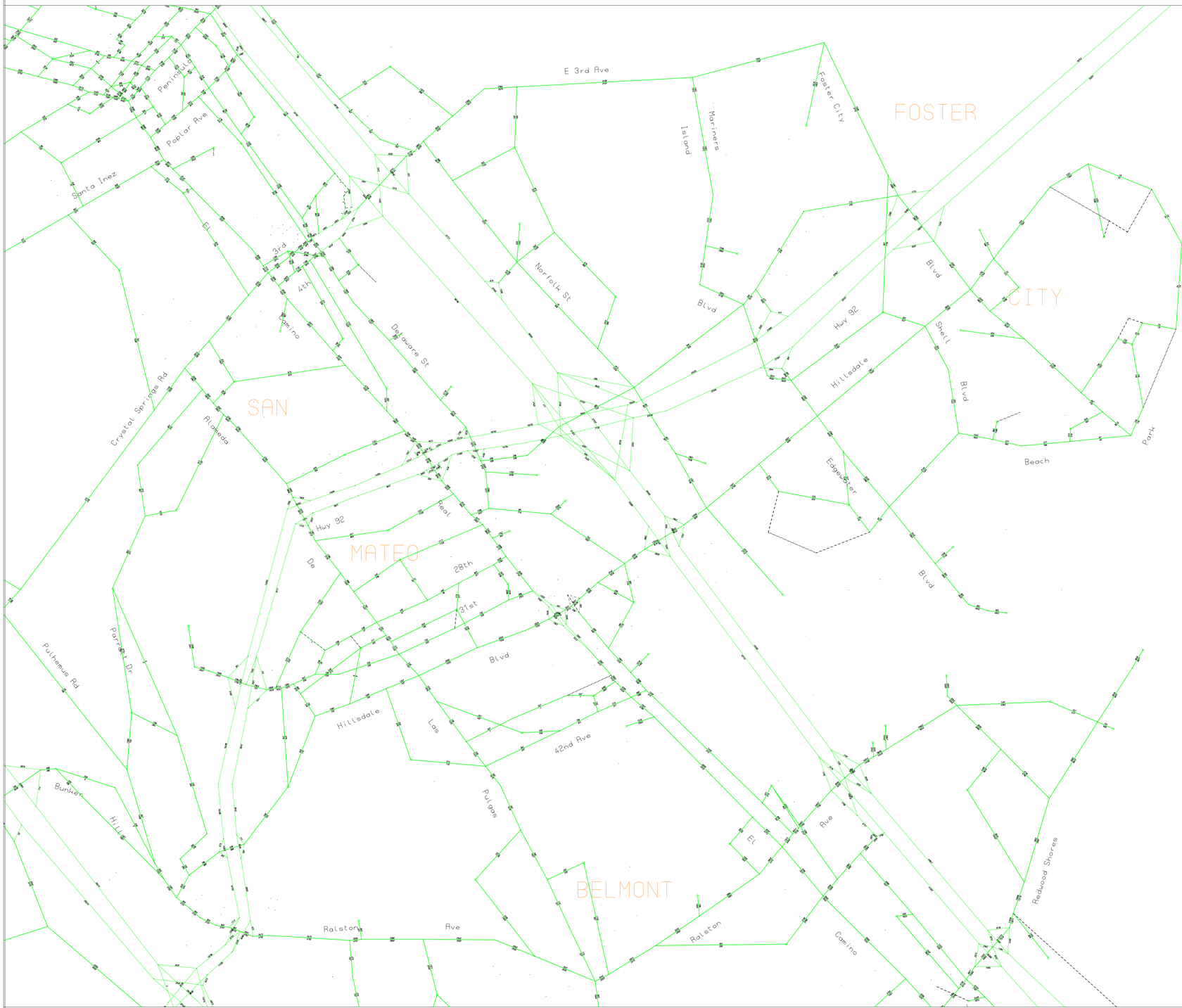
WINDOW:
46269/37175.6
50131/40072.1

EMME/2 PROJECT: C/CAG Travel Demand Model 2005 (San Mateo TA Stratg Plan)
SCENARIO 1: Year 2020 Baseline - AM 4 Hours

11-02-07 08:59
MODULE: 6.12
DOWLING+....kc

emme/2

LINKS:
mod=aeo



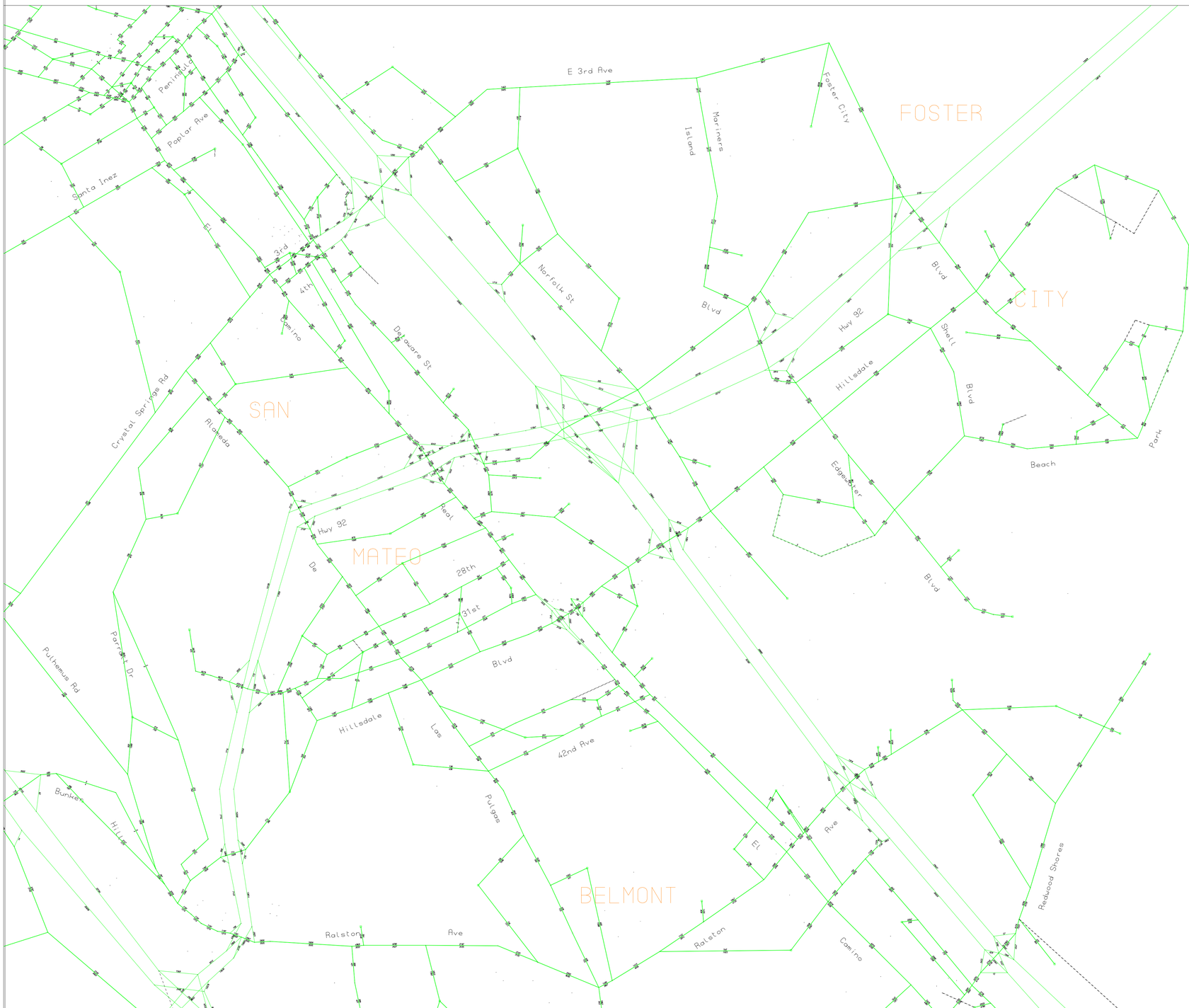
WINDOW:
46269/37175.6
50131/40072.1

EMME/2 PROJECT: C/CAG Travel Demand Model 2005 (San Mateo TA Stratg Plan)
SCENARIO 2: Year 2020 Baseline - PM 5 Hours

11-02-07 09:00
MODULE: 6.12
DOWLING+....kc

emme/2

LINKS:
mod=aeo



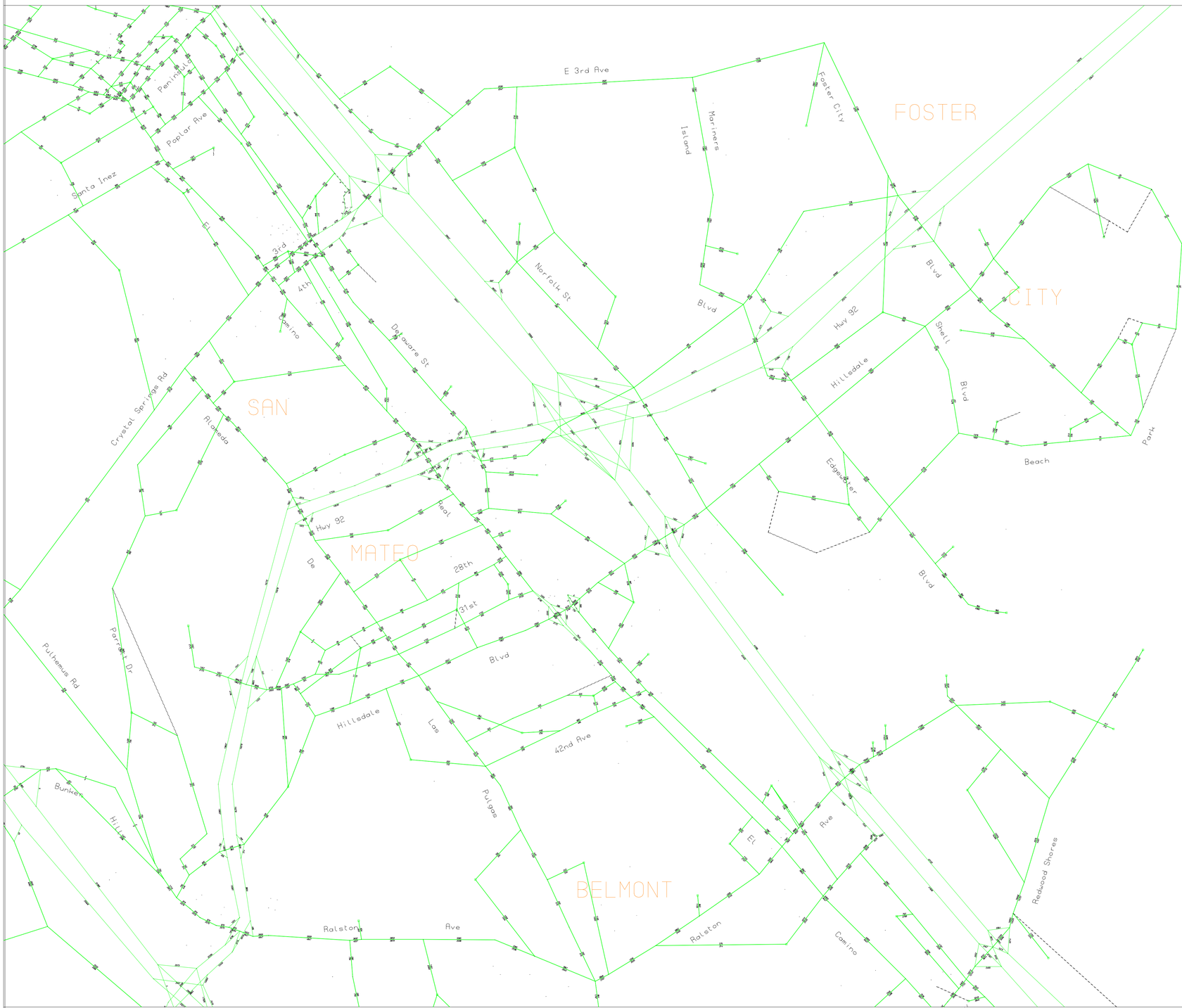
WINDOW:
46269/37175.6
50131/40072.1

EMME/2 PROJECT: C/CAG Travel Demand Model 2005 (San Mateo TA Stratg Plan)
SCENARIO 1: Year 2030 Baseline - AM 4 Hours

11-02-07 08:52
MODULE: 6.12
DOWLING+....kc

emme/2

LINKS:
mod=aeo



WINDOW:
46269/37175.6
50131/40072.1

EMME/2 PROJECT: C/CAG Travel Demand Model 2005 (San Mateo TA Stratg Plan)
SCENARIO 2: Year 2030 Baseline - PM 5 Hours

11-02-07 08:57
MODULE: 6.12
DOWLING+....kc

APPENDIX III-C

Adjusted Forecast Volumes for Mainline Links and Ramps

Step-by-Step Forecast Adjustments

1. Develop balanced existing volumes for all ramps and mainline links. This step was accomplished by reconciling mainline counts along the corridors by adding and subtracting ramp counts, as appropriate, between the mainline counts. Where necessary, slight adjustments were made to the counts to arrive at a set of mathematically consistent volumes. In the case of this study area, none of the congested locations remained congested for the entire multi-hour periods, so there is no difference between the counts and demand for each period.
2. For each ramp, calculate growth from 2005 to 2030 model forecasts. This step is a simple subtraction: Year 2030 volume minus Year 2005 volume.
3. Calculate the initial Year 2030 forecast volumes.
    a. If the result from Step 2 was positive, add the growth to the count to get the initial 2030 forecast.
    b. If the result from Step 2 was negative, set the 2030 forecast as the count.
4. Conduct balancing for the Year 2030 forecasts in the same manner as for the existing volumes, ensuring that no Year 2030 volume is less than existing. For this step, the results for the mainline links are almost always different than the count plus the model growth because there was usually at least one upstream ramp that required the adjustment noted in Step 3-b.

The annotated figure on the following page identifies the various values seen in the spreadsheet files that follow. The details of the spreadsheets can be viewed by zooming in using a PDF reader, such as Adobe Acrobat.

Legend for Adjustments Spreadsheets

Existing adjusted mainline 4-hour demand volume, calculated from upstream mainline and ramp volumes

Year 2030 adjusted mainline 4-hour demand volume, calculated from upstream mainline and ramp volumes

Difference between Year 2030 and Year 2005 unadjusted model forecasts (i.e., growth)

Existing multi-hour count

Year 2005 4-hour unadjusted model forecast

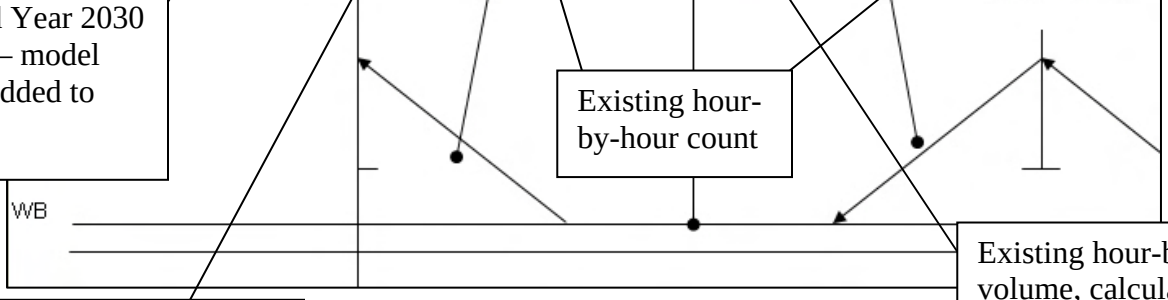
Year 2030 4-hour unadjusted model forecast

Existing AM 4-Hour	746	**10,056**	1,663
2005AM_4HR	751	**5,790**	1,042
2030AM_4HR	907	**7,713**	1,022
2030-2005AM_4HR	**156**	**1,923**	-20
2030 Adjusted AM_4HR	902	**11,948**	1,663
2030 Adjusted AM Hourly			
6:00-7:00 AM	**92**	**1,970**	**144**
7:00-8:00 AM	**241**	**3,854**	**528**
8:00-9:00 AM	**319**	**3,737**	**580**
9:00-10:00 AM	**250**	**2,387**	**411**
Growth	**21%**	**19%**	**0%**

Case where model shows reduction in volume from 2005 to 2030, so existing volume is used instead

AM (6-10AM)

Existing Hourly Volume	DeAnza Off		W Hillsdale On
6:00-7:00 AM	76	1,452	144
7:00-8:00 AM	199	3,255	528
8:00-9:00 AM	264	3,226	580
9:00-10:00 AM	207	2,123	411



Adjusted Year 2030 forecast – model growth added to count

Existing hour-by-hour count

Existing hour-by-hour volume, calculated from upstream mainline and ramp volumes

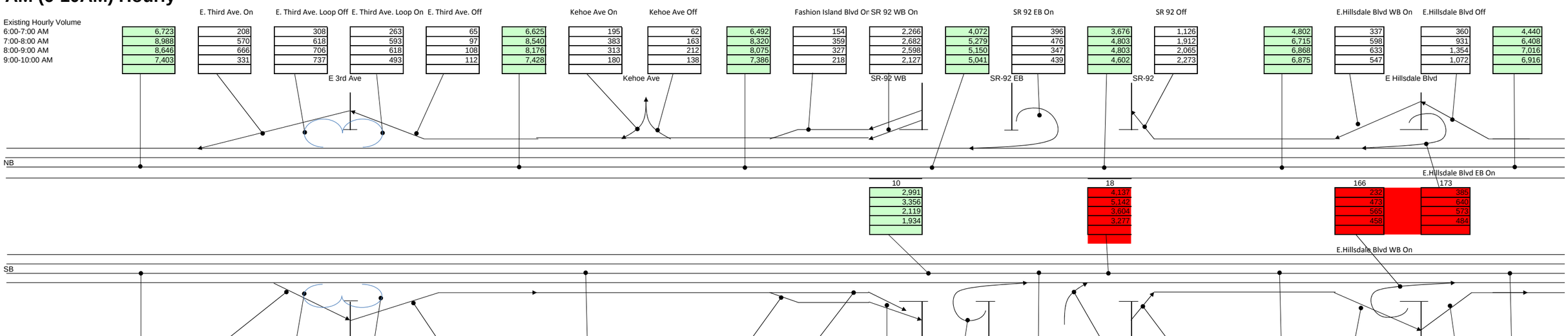
Calculated growth based on adjusted forecast and existing count

Dowling Associates, Inc.

US101/SR92 Interchange Area Study
Year 2020 Forecasts and Adjustments for Mainline and Ramps

Existing AM 4-Hour	31,760	1,775	2,369	1,967	382	**30,769**	1,071	575	**30,273**	1,058	9,673	**19,542**	1,658	**17,884**	7,376			**25,260**	2,115	2,082	3,717	24,780
															Total off	To EB	To WB					
2005AM_4HR Raw	26,123	714	2,633	1,580	475	**26,936**	1,996	747	**25,687**	226	5,907	**19,554**	1,640	**17,914**	9,335	4,653	4,682	**27,249**	2,653	1,489	2,941	26,048
2020AM_4HR Raw	30,276	1,262	1,468	1,817	514	**29,178**	1,688	777	**28,267**	346	5,010	**22,911**	2,433	**20,478**	9,677	4,624	5,053	**30,155**	2,982	2,496	4,384	29,061
2020-2005AM_4HR	**4,153**	**548**	**-1,165**	**237**	**39**	**2,242**	**-308**	**30**	**2,580**	**120**	**-897**	**3,357**	**793**	**2,564**	**342**	**-29**	**371**	**2,906**	**329**	**1,007**	**1,443**	**3,013**
2020 Adjusted AM_4HR	35,924	2,323	2,369	2,204	421	**34,187**	1,071	605	**33,721**	1,178	9,673	**22,870**	2,451	**20,419**	7,747	0	371	**28,166**	2,444	3,089	5,160	27,793
2020 Adjusted AM Hourly																				loop		
6:00-7:00 AM	**7,596**	**272**	**308**	**295**	**72**	**7,409**	**195**	**65**	**7,279**	**171**	**2,266**	**4,842**	**585**	**4,257**	**1,183**			**5,440**	**389**	**571**	**500**	**4,980**
7:00-8:00 AM	**10,210**	**746**	**618**	**664**	**107**	**9,525**	**383**	**172**	**9,314**	**400**	**2,682**	**6,232**	**704**	**5,528**	**2,008**			**7,536**	**691**	**950**	**1,292**	**7,187**
8:00-9:00 AM	**9,705**	**872**	**706**	**692**	**119**	**8,966**	**313**	**223**	**8,876**	**364**	**2,598**	**5,914**	**513**	**5,401**	**2,169**			**7,570**	**731**	**850**	**1,880**	**7,869**
9:00-10:00 AM	**8,411**	**433**	**737**	**552**	**123**	**8,286**	**180**	**145**	**8,251**	**243**	**2,127**	**5,881**	**649**	**5,232**	**2,387**			**7,619**	**632**	**718**	**1,488**	**7,757**
Growth	**13%**	**31%**	**0%**	**12%**	**10%**	**11%**	**0%**	**5%**	**11%**	**11%**	**0%**	**17%**	**48%**	**14%**	**5%**			**12%**	**16%**	**48%**	**39%**	**12%**
2020/2030	**101%**	**99%**	**100%**	**104%**	**109%**	**101%**	**100%**	**103%**	**101%**	**101%**	**100%**	**102%**	**89%**	**104%**	**94%**			**101%**	**90%**		**92%**	**100%**

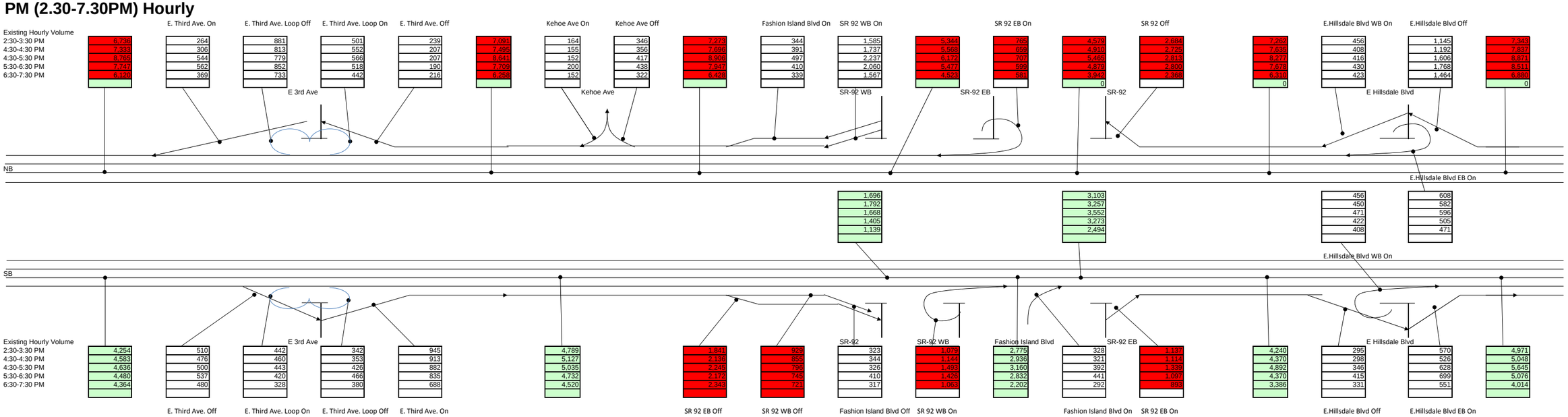
AM (6-10AM) Hourly



		E. Third Ave. Off	E. Third Ave. Loop On	E. Third Ave. Loop Off	E. Third Ave. On		SR 92 EB Off	SR 92 WB Off	Fashion Island Blvd O	SR 92 WB On		Fashion Island Blvd	SR 92 EB On		E.Hillsdale Blvd Off	E.Hillsdale Blvd EB On	
Existing AM 4-Hour	17,547	1,415	1,788	1,474	2,468	**18,914**	3,797	3,313	1,404	4,067	**14,467**	1,693	4,510	**20,670**	425	1,728	2,040	24,013
2005AM_4HR Raw	28,022	23	2,226	2,212	1,963	**29,976**	7,853	3,398	245	4,478	**22,958**	395	3,417	**26,770**	2,916	4,059	855	28,772
2020AM_4HR Raw	32,719	16	1,649	2,993	1,428	**32,787**	10,407	2,637	274	5,140	**24,609**	608	4,058	**29,275**	2,329	4,077	510	31,540
2020-2005AM_4HR	**4,697**	**-7**	**-577**	**781**	**-535**	**2,811**	**2,554**	**-761**	**29**	**662**	**1,651**	**213**	**641**	**2,505**	**-587**	**18**	**-345**	**2,768**
2020 Adjusted AM_4HR	22,244	1,415	1,788	2,255	2,468	**22,830**	6,351	3,313	1,433	4,729	**16,462**	1,906	5,151	**23,519**	425	1,746	2,040	26,880
2020 Adjusted AM Hourly																		
6:00-7:00 AM	**4,773**	**202**	**281**	**228**	**313**	**4,937**	**540**	**484**	**214**	**1,073**	**4,772**	**251**	**707**	**5,730**	**40**	**234**	**278**	**6,202**
7:00-8:00 AM	**6,196**	**372**	**556**	**673**	**709**	**6,416**	**1,035**	**997**	**377**	**1,456**	**5,463**	**601**	**1,327**	**7,391**	**80**	**478**	**457**	**8,246**
8:00-9:00 AM	**5,588**	**444**	**575**	**818**	**752**	**5,653**	**2,031**	**950**	**483**	**1,043**	**3,232**	**662**	**1,624**	**5,518**	**127**	**571**	**524**	**6,486**
9:00-10:00 AM	**5,687**	**397**	**376**	**535**	**694**	**5,825**	**2,745**	**882**	**359**	**1,157**	**2,996**	**392**	**1,493**	**4,881**	**178**	**463**	**781**	**5,947**

Existing PM 5-Hour	36,703		2,045	4,058	2,579	1,059	**37,196**	823	1,879	**38,252**	1,981	9,186	**27,085**	3,310	**23,774**	13,388			**37,163**	2,133	2,762	7,175	39,443
																Total off	To EB	To WB					
2005PM_5HR Raw	35,463	35,456	1,059	1,857	2,056	590	**34,788**	627	966	**35,127**	245	9,432	**25,450**	1,872	**23,578**	12,709	6,596	6,113	**36,287**	1,580	1,384	5,947	39,270
2020PM_5HR Raw	39,738	39,732	2,034	1,274	1,912	651	**37,711**	670	1,038	**38,079**	285	8,605	**29,189**	2,166	**27,023**	12,465	6,204	6,261	**39,488**	1,863	1,834	7,701	43,492
2020-2005PM_5HR	**4,275**		**975**	**-583**	**-144**	**61**	**2,923**	**43**	**72**	**2,952**	**40**	**-827**	**3,739**	**294**	**3,445**	**-244**	**-392**	**148**	**3,201**	**283**	**450**	**1,754**	**4,222**
2020 Adjusted PM_5HR	40,975		3,020	4,058	2,579	1,120	**40,554**	866	1,951	**41,639**	2,021	9,186	**30,432**	3,604	**26,827**	13,536	0	148	**40,364**	2,416	3,212	8,929	43,665
2020 Adjusted PM Hourly																				**loop**			
2:30-3:30 PM	**7,555**		**390**	**881**	**501**	**253**	**7,798**	**173**	**359**	**7,984**	**351**	**1,585**	**6,048**	**833**	**5,215**	**2,713**			**7,928**	**517**	**707**	**1,425**	**8,129**
4:30-4:30 PM	**8,195**		**452**	**813**	**552**	**219**	**8,223**	**163**	**370**	**8,430**	**399**	**1,737**	**6,294**	**717**	**5,577**	**2,755**			**8,332**	**462**	**677**	**1,483**	**8,676**
4:30-5:30 PM	**9,754**		**803**	**779**	**566**	**219**	**9,383**	**160**	**433**	**9,656**	**507**	**2,237**	**6,912**	**770**	**6,142**	**2,844**			**8,986**	**471**	**693**	**1,999**	**9,821**
5:30-6:30 PM	**8,645**		**830**	**852**	**518**	**201**	**8,350**	**210**	**455**	**8,595**	**418**	**2,060**	**6,117**	**652**	**5,465**	**2,831**			**8,296**	**487**	**587**	**2,200**	**9,422**
6:30-7:30 PM	**6,824**		**545**	**733**	**442**	**228**	**6,798**	**160**	**334**	**6,972**	**346**	**1,567**	**5,059**	**632**	**4,427**	**2,394**			**6,821**	**479**	**548**	**1,822**	**7,616**
Growth	**12%**		**48%**	**0%**	**0%**	**6%**	**9%**	**5%**	**4%**	**9%**	**2%**	**0%**	**12%**	**9%**	**13%**	**1%**			**9%**	**13%**	**16%**	**24%**	**11%**
2020/2030	**99%**		**94%**	**100%**	**100%**	**96%**	**99%**	**98%**	**100%**	**99%**	**100%**	**100%**	**99%**	**95%**	**99%**	**93%**			**97%**	**98%**	**84%**	**96%**	**98%**

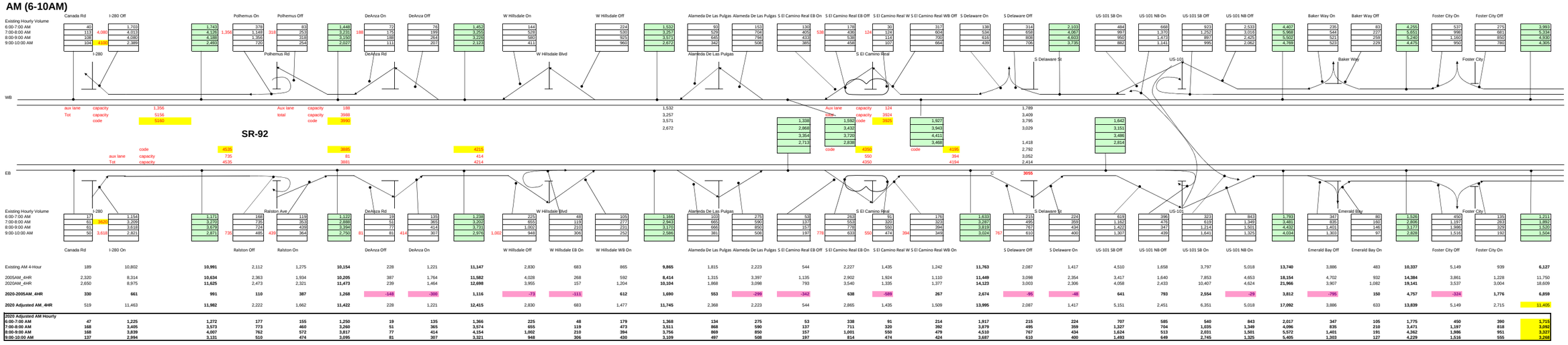
PM (2.30-7.30PM) Hourly



Existing PM 5-Hour	22,317	2,503	2,093	1,967	4,263	**24,203**	10,738	4,045	1,720	6,204	**13,904**	1,774	5,580	**21,258**	1,685	2,207	2,974	24,754
2005PM_5HR Raw	35,304	1,888	1,181	3,732	2,866	**33,731**	11,608	3,512	313	7,150	**25,448**	15	5,615	**31,078**	2,616	6,174	3,320	37,960
2020PM_5HR Raw	40,191	2,389	1,455	4,360	3,299	**38,196**	12,164	4,169	410	8,318	**29,771**	688	5,428	**35,887**	3,864	7,229	2,858	42,112
2020-2005PM_5HR	**4,887**	**501**	**274**	**628**	**433**	**4,465**	**556**	**657**	**97**	**1,168**	**4,323**	**673**	**-187**	**4,809**	**1,248**	**1,055**	**-462**	**4,152**
2020 Adjusted PM_5HR	27,204	3,004	2,367	2,595	4,696	**28,668**	11,294	4,702	1,817	7,372	**18,227**	2,447	5,580	**26,254**	2,933	3,262	2,974	29,557
2020 Adjusted PM Hourly																**loop**		
2:30-3:30 PM	**5,186**	**612**	**500**	**451**	**1,041**	**5,664**	**1,936**	**1,080**	**341**	**1,282**	**3,589**	**452**	**1,137**	**5,178**	**513**	**674**	**570**	**5,909**
4:30-4:30 PM	**5,587**	**571**	**520**	**466**	**1,006**	**6,076**	**2,247**	**993**	**363**	**1,359**	**3,832**	**443**	**1,114**	**5,389**	**519**	**665**	**526**	**6,061**
4:30-5:30 PM	**5,651**	**600**	**501**	**562**	**972**	**5,962**	**2,361**	**925**	**344**	**1,774**	**4,106**	**541**	**1,339**	**5,986**	**602**	**696**	**628**	**6,708**
5:30-6:30 PM	**5,461**	**644**	**475**	**615**	**920**	**5,597**	**2,285**	**866**	**433**	**1,695**	**3,708**	**608**	**1,097**	**5,413**	**722**	**624**	**699**	**6,014**
6:30-7:30 PM	**5,320**	**576**	**371**	**501**	**758**	**5,372**	**2,465**	**838**	**335**	**1,263**	**2,997**	**403**	**893**	**4,293**	**576**	**603**	**551**	**4,871**

Existing AM 4-Hour	365	12,185			**12,550**	3,602	908	**9,856**	546	746	**10,056**	1,663	2,639	**11,032**	1,609	2,159	11,582	1,353	1,610	375	2,285	13,749	1,727	2,486	**14,508**	3,313	4,652	4,067	10,036	**20,646**	1,823	798	**19,621**	3,645	2,586	18,562
		Total	TO NB	TO SB																															
2005AM_4HR	959	5,964	1,401	4,563	**6,922**	2,365	779	**5,336**	297	751	**5,790**	1,042	4,174	**8,922**	1,649	2,106	9,379	2,560	1,807	156	4,222	12,692	2,523	4,174	**14,343**	3,398	4,682	4,478	5,907	**16,648**	1,749	1,020	**15,919**	3,937	2,675	14,657
2020AM_4HR	1,407	7,395	1,881	5,514	**8,804**	2,956	658	**6,506**	342	849	**7,013**	1,055	3,250	**9,208**	1,914	2,146	9,440	2,503	1,548	155	5,298	13,628	2,221	3,740	**15,147**	2,637	5,053	5,140	5,010	**17,607**	1,899	1,108	**16,816**	4,068	2,439	15,187
2020-2005AM_4HR	**448**	**1,431**	**480**	**951**	**1,882**	**591**	-121	**1,170**	**45**	**98**	**1,223**	**13**	-924	**286**	**265**	**40**		-57	-259	-1	**1,076**	**936**	-302	-434	**804**	-761	**371**	**662**	-897	**959**	**150**	**88**	**897**	**131**	-236	**530**
2020 Adjusted AM_4HR	-934	13,616			**13,326**	4,193	908	**10,041**	591	844	**10,294**	1,676	2,639	**11,257**	1,874	2,199	**10,939** 11,582	**1,353**	1,610	**375**	3,361	**14,503**	**1,722**	2,486	**14,940**	3,313	5,023	4,729	10,036	**21,369**	1,973	886	**20,282**	3,776	2,586	19,092
																	644	**252**		**70**			**322**												
2020 Adjusted AM Hourly																																			
6:00-7:00 AM	**40**	**1,903**			**1,943**	**440**	**83**	**1,586**	**78**	**86**	**1,594**	**145**	**224**	**1,673**	**108**	**156**		**130**	**178**	**30**	**466**		**138**	**314**	**2,381**	**484**	**721**	**1,073**	**2,533**	**4,782**	**254**	**92**	**4,620**	**556**	**275**	**4,339**
7:00-8:00 AM	**113**	**4,484**			**4,597**	**1,336**	**253**	**3,514**	**189**	**225**	**3,560**	**532**	**530**	**3,548**	**616**	**717**		**405**	**436**	**124**	**888**		**534**	**658**	**4,568**	**997**	**1,479**	**1,456**	**3,016**	**6,564**	**589**	**252**	**6,227**	**1,034**	**681**	**5,874**
8:00-9:00 AM	**108**	**4,559**			**4,667**	**1,578**	**318**	**3,407**	**203**	**299**	**3,503**	**585**	**925**	**3,843**	**751**	**809**		**433**	**538**	**114**	**1,030**		**616**	**808**	**5,114**	**950**	**1,590**	**1,043**	**2,425**	**6,042**	**564**	**298**	**5,766**	**1,202**	**850**	**5,414**
9:00-10:00 AM	**104**	**2,670**			**2,774**	**838**	**254**	**2,190**	**120**	**234**	**2,304**	**414**	**960**	**2,850**	**398**	**517**		**385**	**458**	**107**	**977**		**439**	**706**	**4,179**	**882**	**1,232**	**1,157**	**2,062**	**5,284**	**566**	**254**	**4,972**	**984**	**780**	**4,768**
Growth	**0%**	**12%**			**11%**	**16%**	**0%**	**9%**	**8%**	**13%**	**9%**	**1%**	**0%**	**8%**	**16%**	**2%**		**0%**	**0%**	**0%**	**47%**		**0%**	**0%**	**12%**	**0%**	**8%**	**16%**	**0%**	**10%**	**8%**	**11%**	**10%**	**4%**	**0%**	**10%**
2020/2030	**42%**	**97%**			**94%**	**100%**	**98%**	**92%**	**101%**	**94%**	**92%**	**101%**	**100%**	**92%**	**90%**	**91%**		**100%**	**92%**	**100%**	**82%**		**93%**	**96%**	**90%**	**100%**	**92%**	**89%**	**100%**	**92%**	**99%**	**81%**	**91%**	**104%**	**84%**	**88%**

AM (6-10AM)



Existing AM 4-Hour	189	10,802			**10,991**	2,112	1,275	**10,154**	228	1,221	**11,147**	2,830	683	865	**9,865**	1,815	2,223	544	2,227	1,435	1,242	**11,763**	2,087	1,417	4,510	1,658	3,797	5,018	**13,740**	3,886	483	**10,337**	5,149	939	**6,127**
2005AM_4HR	2,320	8,314			**10,634**	2,363	1,934	**10,205**	387	1,764	**11,582**	4,028	268	592	**8,414**	1,315	3,397	1,135	2,902	1,924	1,110	**11,449**	3,098	2,354	3,417	1,640	7,853	4,653	**18,154**	4,702	932	**14,384**	3,861	1,228	11,750
2020AM_4HR	2,650	8,975			**11,625**	2,473	2,321	**11,473**	239	1,464	**12,698**	3,955	157	1,204	**10,104**	1,868	3,098	793	3,540	1,335	1,377	**14,123**	3,003	2,306	4,058	2,433	10,407	4,624	**21,966**	3,907	1,082	**19,141**	3,537	3,004	18,609
2020-2005AM_4HR	**330**	**661**			**991**	**110**	**387**	**1,268**	-148	-300	**1,116**	-73	-111	**612**	**1,690**	**553**	-299	-542	**638**	-589	**267**	**2,674**	-95	-48	**641**	**793**	**2,554**	-29	**3,812**	-795	**150**	**4,757**	-324	**1,776**	**6,859**
2020 Adjusted AM_4HR	519	11,463			**11,982**	2,222	1,662	**11,422**	228	1,221	**12,415**	2,830	683	1,477	**11,745**	2,368	2,223	544	2,865	1,435	1,509	**13,995**	2,087	1,417	5,151	2,451	6,351	5,018	**17,092**	3,886	633	**13,839**	5,149	2,715	11,405
2020 Adjusted AM Hourly																																			
6:00-7:00 AM	**47**	**1,225**			**1,272**	**177**	**155**	**1,250**	**19**	**135**	**1,366**	**225**	**48**	**179**	**1,368**	**134**	**275**	**53**	**338**	**91**	**214**	**1,917**	**215**	**224**	**707**	**585**	**540**	**843**	**2,017**	**347**	**105**	**1,775**	**450**	**390**	**1,715**
7:00-8:00 AM	**168**	**1,405**			**3,573**	**773**	**460**	**3,260**	**51**	**365**	**3,574**	**655**	**119**	**473**	**3,511**	**868**	**590**	**137**	**711**	**320**	**392**	**3,879**	**495**	**359**	**1,327**	**704**	**1,035**	**1,349**	**4,096**	**835**	**210**	**3,471**	**1,197**	**818**	**3,092**
8:00-9:00 AM	**168**	**3,839**			**4,007**	**762**	**572**	**3,817**	**77**	**414**	**4,154**	**1,002**	**210**	**394**	**3,756**	**869**	**850**	**157**	**1,001**	**550**	**479**	**4,510**	**767**	**434**	**1,624**	**513**	**2,031**	**1,501**	**5,572**	**1,401**	**191**	**4,362**	**1,986**	**951**	**3,327**
9:00-10:00 AM	**137**	**2,994**			**3,131**	**510**	**474**	**3,095**	**81**	**307**	**3,321**	**948**	**306**	**430**	**3,109**	**497**	**508**	**197**	**814**	**474**	**424**	**3,687**	**610**	**400**	**1,493**	**649**	**2,745**	**1,325**	**5,405**	**1,303**	**127**	**4,229**	**1,516**	**555**	**3,268**

AM Peak 4-Hour Period
State Route 92

Dowling Associates, Inc.

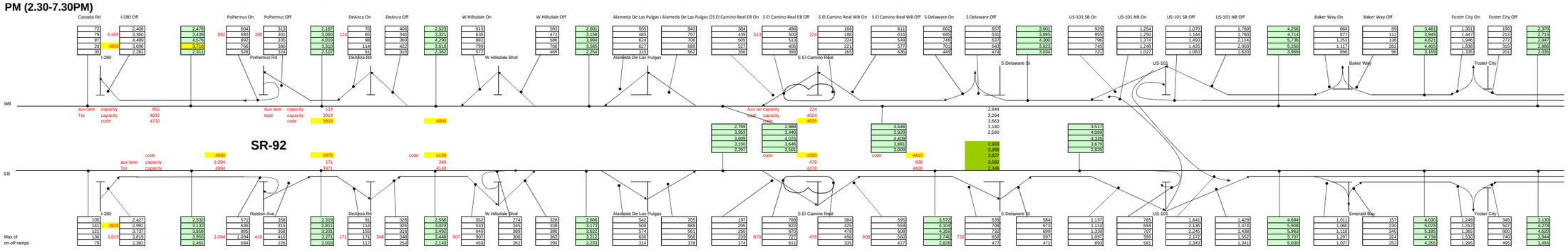
US101/SR92 Interchange Area Study
Year 2020 Forecasts and Adjustments for Mainline and Ramps

PM (2.30-7.30PM)

	Canada Rd	I-280 Off			Polhemus On	Polhemus Off		DeAnza On	DeAnza Off		W Hillsdale On	W Hillsdale Off		Alameda De Las Pulgas	Alameda De Las Pulgas	OS El Camino Real EB On	S El Camino Real EB Off		S El Camino Real WB On	S El Camino Real WB Off	S Delaware On	S Delaware Off		US-101 SB On	US-101 NB On	US-101 SB Off	US-101 NB Off		Baker Way On	Baker Way Off		Foster City On	Foster City Off	
Existing PM 5-Hour	288	16,232		**16,500**	3,470	1,653	**14,683**	428	1,859	**16,114**	3,408	2,886	**15,592**	2,606	3,666	2,211	2,308	964	2,989	3,163	3,042	**18,653**	4,045	6,154	6,204	9,277	**23,935**	5,005	695	**19,625**	7,867	1,195	12,953
		Total	TO NB TO SB																																
2005PM_5HR	2,232	15,016	2,326 12,690	**17,248**	3,883	972	**14,337**	514	726	**14,549**	3,399	1,004	**12,154**	1,471	2,063	2,339	1,183	779	4,218	1,833	2,981	**16,177**	3,512	6,113	7,150	9,432	**23,134**	2,553	445	**21,026**	5,401	1,431	17,056
2020PM_5HR	2,238	16,547	2,031 14,516	**18,785**	3,752	1,116	**16,149**	325	673	**16,497**	3,189	951	**14,259**	1,994	1,829	1,946	796	679	4,670	1,781	3,578	**18,732**	4,169	6,261	8,318	8,605	**25,225**	3,335	477	**22,367**	5,384	1,769	18,752
2020-2005PM_5HR	**6**	**1,531**	**-295** **1,826**	**1,537**	**-131**	**144**	**1,812**	**-189**	**-53**	**1,948**	**-210**	**-53**	**2,105**	**523**	**-234**	**-393**	**-387**	**-100**	**452**	**-52**	**597**	**2,555**	**657**	**148**	**1,168**	**-827**	**2,091**	**782**	**32**	**1,341**	**-17**	**338**	**1,696**
2020 Adjusted PM_5HR	**-188**	17,763		**17,575**	3,470	1,797	**15,902**	428	1,859	**17,333**	3,408	2,886	**16,811**	3,129	3,666	2,211	2,308	964	3,441	3,163	3,639	**20,398**	4,702	6,302	7,372	9,277	**26,043**	5,787	727	**20,983**	7,867	1,533	14,649
2020 Adjusted PM Hourly																																			
2:30-3:30 PM	**72**	72 **2,633**		**2,705**	**604**	**340**	**2,441**	**70**	**406**	**2,777**	**515**	**593**	**2,855**	**666**	**943**	**384**	**496**	**166**	**703**	**602**	**786**	**3,965**	**1,080**	**1,284**	**1,282**	**1,760**	**4,643**	**999**	**93**	**3,737**	**1,301**	**244**	**2,680**
4:30-4:30 PM	**79**	79 **3,677**		**3,756**	**680**	**327**	**3,403**	**85**	**346**	**3,664**	**635**	**472**	**3,501**	**582**	**767**	**439**	**500**	**188**	**709**	**665**	**755**	**4,358**	**993**	**1,281**	**1,359**	**1,780**	**5,223**	**1,014**	**117**	**4,326**	**1,447**	**273**	**3,152**
4:30-5:30 PM	**87**	87 **4,913**		**5,000**	**892**	**364**	**4,472**	**98**	**369**	**4,743**	**882**	**586**	**4,447**	**749**	**706**	**505**	**513**	**224**	**632**	**746**	**762**	**4,836**	**925**	**1,407**	**1,774**	**2,114**	**6,392**	**1,446**	**142**	**5,088**	**1,946**	**349**	**3,491**
5:30-6:30 PM	**20**	20 **4,045**		**4,065**	**766**	**413**	**3,712**	**114**	**422**	**4,020**	**799**	**766**	**3,887**	**753**	**688**	**527**	**406**	**221**	**664**	**701**	**769**	**4,312**	**866**	**1,278**	**1,695**	**2,003**	**5,866**	**1,292**	**274**	**4,848**	**1,838**	**409**	**3,419**
6:30-7:30 PM	**30**	30 **2,496**		**2,526**	**528**	**352**	**2,350**	**61**	**316**	**2,605**	**577**	**469**	**2,497**	**378**	**562**	**356**	**393**	**165**	**732**	**449**	**567**	**3,403**	**838**	**1,052**	**1,263**	**1,620**	**4,396**	**1,036**	**100**	**3,460**	**1,335**	**258**	**2,383**
Growth	**0%**	**9%**		**9%**	**0%**	**9%**	**12%**	**0%**	**0%**	**11%**	**0%**	**0%**	**11%**	**20%**	**0%**	**0%**	**0%**	**0%**	**15%**	**0%**	**20%**	**12%**	**16%**	**2%**	**19%**	**0%**	**11%**	**16%**	**4%**	**9%**	**0%**	**28%**	**17%**
2020/2030	**47%**	**84%**		**83%**	**91%**	**94%**	**82%**	**100%**	**97%**	**83%**	**83%**	**99%**	**86%**	**112%**	**100%**	**70%**	**95%**	**90%**	**82%**	**91%**	**104%**	**89%**	**90%**	**86%**	**101%**	**100%**	**96%**	**87%**	**93%**	**99%**	**100%**	**95%**	**98%**

Made additional adjustment for the minor nega

Additional /value		
0	72	72
82	-3	79
158	-71	87
155	-135	20
82	-52	30

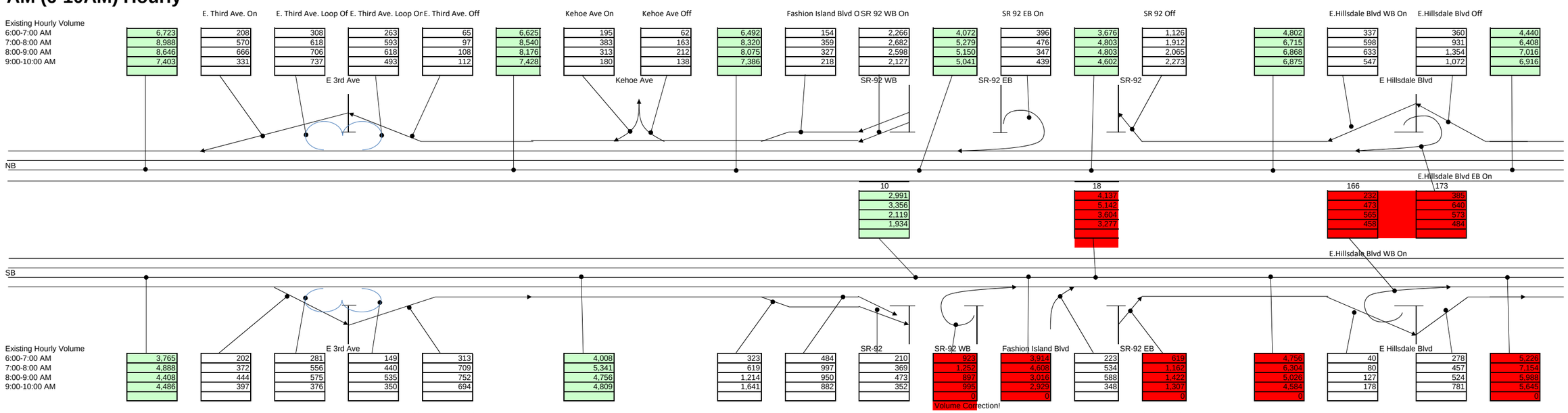


	Canada Rd	I-280 On			Ralston Off	Ralston On		DeAnza Off	DeAnza On		W Hillsdale Off	W Hillsdale EB On	W Hillsdale WB On		Alameda De Las Pulgas	Alameda De Las Pulgas OS	El Camino Real EB Off	S El Camino Real EB On	S El Camino Real WB Off	S El Camino Real WB On	S Delaware Off	S Delaware On	US-101 SB Off	US-101 NB Off	US-101 SB On	US-101 NB On	Emerald Bay Off	Emerald Bay On		Foster City Off	Foster City On	
Existing PM 5-Hour	582	15,355		**15,937**	3,870	1,667	**13,734**	648	1,572	**14,658**	3,100	1,578	1,709	**14,845**	2,568	2,900	1,065	3,819	2,080	2,749	18,600	3,214	3,024	5,580	3,310	10,738	7,234	**27,492**	5,513	1,303	**23,282**	6,751	2,891	19,422
2005PM_5HR	1,253	6,589		**7,842**	2,278	451	**6,015**	268	706	**6,453**	1,232	1,227	194	**6,642**	1,567	2,256	343	2,176	368	642	12,035	1,202	4,468	5,615	1,872	11,608	6,596	**26,018**	4,566	693	**22,145**	3,279	1,475	17,742
2020PM_5HR	2,181	9,413		**11,594**	3,108	422	**8,908**	381	714	**9,241**	1,311	1,035	151	**9,116**	1,742	2,226	338	2,102	428	648	15,775	1,257	4,406	5,428	2,166	12,164	6,204	**29,698**	3,945	890	**26,643**	3,597	1,347	20,201
2020-2005PM_5HR	**928**	**2,824**		**3,752**	**830**	**-29**	**2,893**	**113**	**8**	**2,788**	**79**	**-192**	**-43**	**2,474**	**175**	**-30**	**-5**	**-74**	**60**	**6**	**3,740**	**55**	**-62**	**-187**	**294**	**556**	**-392**	**3,680**	**-621**	**197**	**4,498**	**318**	**-128**	**2,459**
2020 Adjusted PM_5HR	1,510	18,179		**19,689**	4,700	1,667	**16,656**	761	1,580	**17,475**	3,179	1,578	1,709	**17,583**	2,743	2,900	1,065	3,819	2,140	2,755	21,109	3,269	3,024	5,580	3,604	11,294	7,234	**30,208**	5,513	1,500	**26,195**	7,069	2,891	22,017
2020 Adjusted PM Hourly																																			
2:30-3:30 PM	**272**	**2,873**		**3,145**	**693**	**358**	**2,810**	**107**	**330**	**3,033**	**566**	**274**	**328**	**3,069**	**579**	**705**	**197**	**789**	**395**	**596**	**3,988**	**650**	**584**	**1,137**	**833**	**1,936**	**1,429**	**5,317**	**1,011**	**181**	**4,487**	**1,308**	**349**	**3,528**
4:30-4:30 PM	**366**	**3,542**		**3,908**	**772**	**315**	**3,451**	**134**	**328**	**3,645**	**547**	**345**	**338**	**3,781**	**543**	**688**	**205**	**822**	**437**	**560**	**4,666**	**720**	**673**	**1,114**	**717**	**2,247**	**1,474**	**6,509**	**1,060**	**265**	**5,714**	**1,374**	**507**	**4,847**
4:30-5:30 PM	**314**	**4,424**		**4,738**	**1,075**	**358**	**4,021**	**182**	**318**	**4,157**	**666**	**389**	**390**	**4,270**	**613**	**561**	**250**	**870**	**492**	**609**	**4,955**	**745**	**699**	**1,339**	**770**	**2,361**	**1,438**	**6,599**	**1,118**	**391**	**5,872**	**1,429**	**800**	**5,243**
5:30-6:30 PM	**353**	**4,521**		**4,874**	**1,329**	**410**	**3,956**	**201**	**350**	**4,104**	**930**	**308**	**363**	**3,845**	**673**	**568**	**239**	**727**	**471**	**561**	**4,318**	**669**	**597**	**1,097**	**652**	**2,285**	**1,552**	**6,334**	**1,297**	**373**	**5,410**	**1,602**	**740**	**4,548**
6:30-7:30 PM	**205**	**2,820**		**3,025**	**831**	**226**	**2,420**	**137**	**255**	**2,538**	**471**	**262**	**290**	**2,619**	**335**	**378**	**174**	**611**	**345**	**428**	**3,182**	**485**	**471**	**893**	**632**	**2,465**	**1,341**	**5,449**	**1,027**	**290**	**4,712**	**1,356**	**495**	**3,851**
Growth	**159%**	**18%**		**24%**	**21%**	**0%**	**21%**	**17%**	**1%**	**19%**	**3%**	**0%**	**0%**	**18%**	**7%**	**0%**	**0%**	**0%**	**3%**	**0%**	**13%**	**2%**	**0%**	**0%**	**9%**	**5%**	**0%**	**10%**	**0%**	**15%**	**13%**	**5%**	**0%**	**13%**
2020/2030	**89%**	**97%**		**96%**	**100%**	**98%**	**95%**	**110%**	**96%**	**95%**	**96%**	**100%**	**100%**	**95%**	**96%**	**95%**	**96%**	**95%**	**98%**	**97%**	**95%**	**95%**	**84%**	**93%**	**95%**	**89%**	**100%**	**93%**	**100%**	**83%**	**91%**	**98%**	**90%**	**89%**

PM Peak 5-Hour Period
State Route 92

Existing AM 4-Hour	31,760	1,775	2,369	1,967	382	**30,769**	1,071	575	**30,273**	1,058	9,673	**19,542**	1,658	**17,884**	7,376		**25,260**	2,115	2,082	3,717	24,780
															Total off	To EB	To WB				
2005AM_4HR Raw	26,123	714	2,633	1,580	475	**26,936**	1,996	747	**25,687**	226	5,907	**19,554**	1,640	**17,914**	9,335	4,653	4,682	**27,249**	2,653	1,489	2,941	26,048
2030AM_4HR Raw	30,818	1,283	1,649	1,724	479	**29,940**	1,712	758	**28,986**	334	5,513	**23,139**	2,747	**20,392**	9,271	3,757	5,514	**29,663**	3,247	2,358	4,824	28,882
2030-2005AM_4HR	**4,695**	**569**	**-984**	**144**	**4**	**3,004**	**-284**	**11**	**3,299**	**108**	**-394**	**3,585**	**1,107**	**2,478**	**-64**	**-896**	**832**	**2,414**	**594**	**869**	**1,883**	**2,834**
2030 Adjusted AM_4HR	35,906	2,344	2,369	2,111	386	**34,206**	1,071	586	**33,721**	1,217	10,094	**22,410**	2,765	**19,645**	8,208	0	832	**27,853**	2,709	2,951	5,600	27,793
2030 Adjusted AM Hourly																			loop			
6:00-7:00 AM	**7,680**	**275**	**308**	**282**	**66**	**7,497**	**195**	**63**	**7,365**	**177**	**2,365**	**4,823**	**660**	**4,163**	**1,253**		**5,416**	**432**	**546**	**542**	**4,980**
7:00-8:00 AM	**10,225**	**753**	**618**	**636**	**98**	**9,552**	**383**	**166**	**9,335**	**413**	**2,799**	**6,123**	**794**	**5,329**	**2,128**		**7,457**	**766**	**907**	**1,403**	**7,187**
8:00-9:00 AM	**9,644**	**879**	**706**	**663**	**109**	**8,917**	**313**	**216**	**8,820**	**376**	**2,711**	**5,733**	**579**	**5,154**	**2,298**		**7,452**	**811**	**812**	**2,040**	**7,869**
9:00-10:00 AM	**8,358**	**437**	**737**	**529**	**113**	**8,242**	**180**	**141**	**8,203**	**251**	**2,220**	**5,732**	**732**	**5,000**	**2,529**		**7,529**	**701**	**686**	**1,615**	**7,757**
Growth	**13%**	**32%**	**0%**	**7%**	**1%**	**11%**	**0%**	**2%**	**11%**	**15%**	**4%**	**15%**	**67%**	**10%**	**11%**		**10%**	**28%**	**42%**	**51%**	**12%**

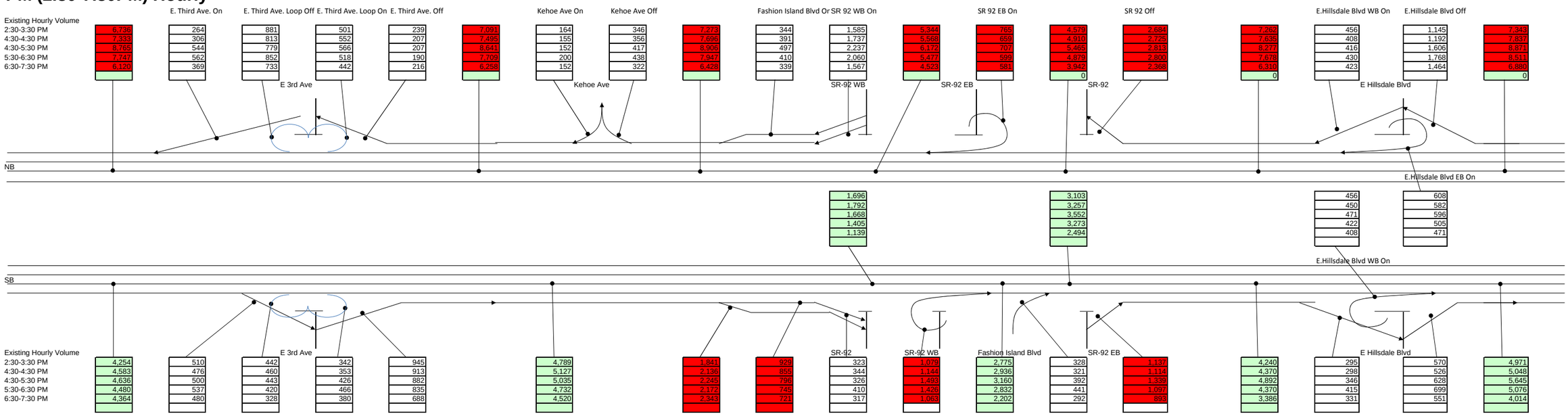
AM (6-10AM) Hourly



Existing AM 4-Hour	17,547	1,415	1,788	1,474	2,468	**18,914**	3,797	3,313	1,404	4,067	**14,467**	1,693	4,510	**20,670**	425	1,728	2,040	24,013
2005AM_4HR Raw	28,022	23	2,226	2,212	1,963	**29,976**	7,853	3,398	245	4,478	**22,958**	395	3,417	**26,770**	2,916	4,059	855	28,772
2030AM_4HR Raw	33,787	18	1,891	3,064	1,327	**33,923**	11,100	2,881	255	5,710	**25,397**	787	4,227	**30,411**	2,740	4,184	519	32,380
2030-2005AM_4HR	**5,765**	**-5**	**-335**	**852**	**-636**	**3,947**	**3,247**	**-517**	**10**	**1,232**	**2,439**	**392**	**810**	**3,641**	**-176**	**125**	**-336**	**3,608**
2030 Adjusted AM_4HR	23,312	1,415	1,788	2,326	2,487	**23,846**	7,044	3,313	1,433	5,299	**17,355**	2,085	5,320	**24,760**	425	1,853	2,040	28,228
2030 Adjusted AM Hourly																		
6:00-7:00 AM	**5,002**	**202**	**281**	**235**	**315**	**5,161**	**599**	**484**	**214**	**1,203**	**5,067**	**275**	**730**	**6,072**	**40**	**249**	**278**	**6,559**
7:00-8:00 AM	**6,494**	**372**	**556**	**694**	**714**	**6,698**	**1,148**	**997**	**377**	**1,631**	**5,807**	**658**	**1,371**	**7,836**	**80**	**507**	**457**	**8,720**
8:00-9:00 AM	**5,856**	**444**	**575**	**844**	**758**	**5,901**	**2,252**	**950**	**483**	**1,169**	**3,385**	**724**	**1,677**	**5,786**	**127**	**606**	**524**	**6,789**
9:00-10:00 AM	**5,960**	**397**	**376**	**552**	**699**	**6,086**	**3,044**	**882**	**359**	**1,296**	**3,097**	**429**	**1,542**	**5,068**	**178**	**491**	**781**	**6,162**

Existing PM 5-Hour	36,703		2,045	4,058	2,579	1,059	**37,196**	823	1,879	**38,252**	1,981	9,186	**27,085**	3,310	**23,774**	13,388			**37,163**	2,133	2,762	7,175	39,443
																Total off	To EB	To WB					
2005PM_5HR Raw	35,463	35,456	1,059	1,857	2,056	590	**34,788**	627	966	**35,127**	245	9,432	**25,450**	1,872	**23,578**	12,709	6,596	6,113	**36,287**	1,580	1,384	5,947	39,270
2030PM_5HR Raw	40,767	40,763	2,231	1,639	1,860	692	**39,003**	686	1,047	**39,364**	291	9,326	**29,747**	2,366	**27,381**	13,341	6,093	7,248	**40,722**	1,921	2,457	8,042	44,386
2030-2005PM_5HR	**5,304**		**1,172**	**-218**	**-196**	**102**	**4,215**	**59**	**81**	**4,237**	**46**	**-106**	**4,297**	**494**	**3,803**	**632**	**-503**	**1,135**	**4,435**	**341**	**1,073**	**2,095**	**5,116**
2030 Adjusted PM_5HR	41,591		3,217	4,058	2,579	1,161	**41,014**	882	1,960	**42,092**	2,027	9,186	**30,879**	3,804	**27,074**	14,523	0	1,135	**41,598**	2,474	3,835	9,270	44,559
2030 Adjusted PM Hourly																					**loop**		
2:30-3:30 PM	**7,683**		**415**	**881**	**501**	**262**	**7,910**	**176**	**361**	**8,095**	**352**	**1,585**	**6,158**	**879**	**5,279**	**2,911**			**8,190**	**529**	**844**	**1,479**	**8,296**
4:30-4:30 PM	**8,320**		**481**	**813**	**552**	**227**	**8,327**	**166**	**371**	**8,532**	**400**	**1,737**	**6,395**	**757**	**5,638**	**2,956**			**8,594**	**473**	**808**	**1,540**	**8,853**
4:30-5:30 PM	**9,910**		**856**	**779**	**566**	**227**	**9,494**	**163**	**435**	**9,766**	**509**	**2,237**	**7,020**	**813**	**6,207**	**3,051**			**9,258**	**483**	**828**	**2,075**	**10,022**
5:30-6:30 PM	**8,761**		**884**	**852**	**518**	**208**	**8,419**	**214**	**457**	**8,662**	**420**	**2,060**	**6,182**	**688**	**5,494**	**3,037**			**8,531**	**499**	**701**	**2,284**	**9,615**
6:30-7:30 PM	**6,918**		**580**	**733**	**442**	**237**	**6,866**	**163**	**336**	**7,039**	**347**	**1,567**	**5,125**	**667**	**4,458**	**2,568**			**7,026**	**491**	**654**	**1,891**	**7,772**
Growth	**13%**		**57%**	**0%**	**0%**	**10%**	**10%**	**7%**	**4%**	**10%**	**2%**	**0%**	**14%**	**15%**	**14%**	**8%**			**12%**	**16%**	**39%**	**29%**	**13%**

PM (2.30-7.30PM) Hourly



		E. Third Ave. Off	E. Third Ave. Loop On	E. Third Ave. Loop Off	E. Third Ave. On		SR 92 EB Off	SR 92 WB Off	Fashion Island Blvd O	SR 92 WB On		Fashion Island Blvd Or	SR 92 EB On		E.Hillsdale Blvd Off	E.Hillsdale Blvd EB On		
Existing PM 5-Hour	22,317	2,503	2,093	1,967	4,263	**24,203**	10,738	4,045	1,720	6,204	**13,904**	1,774	5,580	**21,258**	1,685	2,207	2,974	24,754
2005PM_5HR Raw	35,304	1,888	1,181	3,732	2,866	**33,731**	11,608	3,512	313	7,150	**25,448**	15	5,615	**31,078**	2,616	6,174	3,320	37,960
2030PM_5HR Raw	40,900	2,476	1,801	4,488	3,609	**39,346**	13,617	4,702	412	8,224	**28,839**	714	6,030	**35,583**	4,306	7,575	3,604	42,459
2030-2005PM_5HR	**5,596**	**588**	**620**	**756**	**743**	**5,615**	**2,009**	**1,190**	**99**	**1,074**	**3,391**	**699**	**415**	**4,505**	**1,690**	**1,401**	**284**	**4,499**
2030 Adjusted PM_5HR	27,913	3,091	2,713	2,723	5,006	**29,818**	12,747	5,235	1,819	7,372	**17,389**	2,473	5,995	**25,857**	3,166	3,608	3,258	29,557
2030 Adjusted PM Hourly																**loop**		
2:30-3:30 PM	**5,321**	**630**	**573**	**473**	**1,110**	**5,901**	**2,185**	**1,203**	**342**	**1,282**	**3,453**	**457**	**1,222**	**5,132**	**554**	**745**	**624**	**5,947**
4:30-4:30 PM	**5,732**	**588**	**596**	**489**	**1,072**	**6,323**	**2,536**	**1,106**	**364**	**1,359**	**3,676**	**447**	**1,196**	**5,319**	**560**	**736**	**576**	**6,071**
4:30-5:30 PM	**5,798**	**617**	**574**	**590**	**1,036**	**6,201**	**2,665**	**1,030**	**345**	**1,774**	**3,935**	**546**	**1,439**	**5,920**	**650**	**770**	**688**	**6,728**
5:30-6:30 PM	**5,603**	**663**	**544**	**645**	**981**	**5,820**	**2,579**	**964**	**434**	**1,695**	**3,538**	**615**	**1,179**	**5,332**	**780**	**690**	**766**	**6,008**
6:30-7:30 PM	**5,458**	**593**	**425**	**526**	**808**	**5,572**	**2,782**	**933**	**335**	**1,263**	**2,785**	**407**	**959**	**4,151**	**622**	**667**	**604**	**4,800**

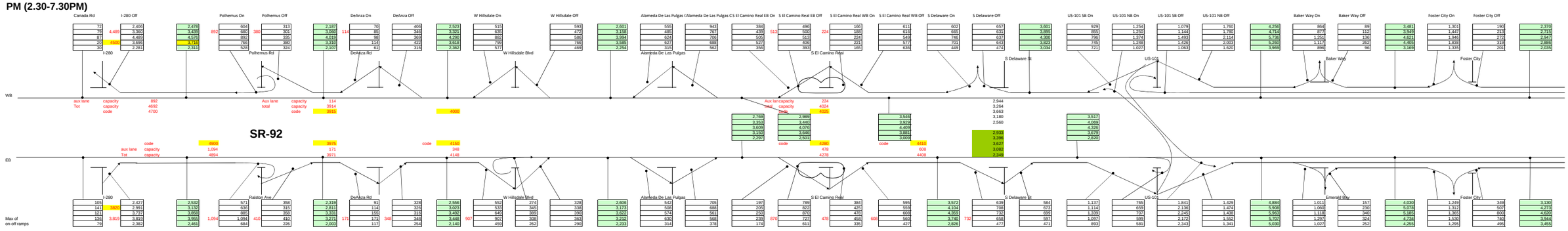
Existing AM 4-Hour	365	12,185			**12,550**	3,602	908	**9,856**	546	746	**10,056**	1,663	2,639	**11,032**	1,609	2,159	1,353	1,610	375	2,285	1,727	2,486	**14,508**	3,313	4,652	4,067	10,036	**20,646**	1,823	798	**19,621**	3,645	2,586	18,562
		Total	TO NB	TO SB																															
2005AM_4HR	959	5,964	1,401	4,563	**6,922**	2,365	779	**5,336**	297	751	**5,790**	1,042	4,174	**8,922**	1,649	2,106	2,560	1,807	156	4,222	2,523	4,174	**14,343**	3,398	4,682	4,478	5,907	**16,648**	1,749	1,020	**15,919**	3,937	2,675	14,657
2030AM_4HR	1,490	7,821	1,568	6,253	**9,309**	2,968	799	**7,140**	334	907	**7,713**	1,022	3,504	**10,195**	2,111	2,365	2,560	1,956	154	6,042	2,650	4,282	**17,365**	2,881	5,514	5,710	5,513	**20,193**	1,913	1,311	**19,591**	3,443	3,181	19,329
2030-2005AM_4HR	**531**	**1,857**	**167**	**1,690**	**2,387**	**603**	**20**	**1,804**	**37**	**156**	**1,923**	**-20**	**-670**	**1,273**	**462**	**259**	**0**	**149**	**-2**	**1,820**	**127**	**108**	**3,022**	**-517**	**832**	**1,232**	**-394**	**3,545**	**164**	**291**	**3,672**	**-494**	**506**	**4,672**
2030 Adjusted AM_4HR	**864**	14,042			**14,906**	4,205	928	**11,629**	583	902	**11,948**	1,663	2,639	**12,924**	2,071	2,418	1,353	1,759	375	4,105	1,854	2,594	**18,147**	3,313	5,484	5,299	10,036	**24,685**	1,987	1,089	**23,787**	3,645	3,092	23,234
2030 Adjusted AM_4HR Hourly																																			
6:00-7:00 AM	**348**	**1,963**			**2,311**	**441**	**85**	**1,955**	**77**	**92**	**1,970**	**144**	**224**	**2,050**	**120**	**171**	**130**	**194**	**30**	**569**	**148**	**328**	**2,884**	**484**	**787**	**1,203**	**2,533**	**5,349**	**256**	**113**	**5,206**	**537**	**329**	**4,998**
7:00-8:00 AM	**256**	**4,625**			**4,881**	**1,340**	**259**	**3,800**	**187**	**241**	**3,854**	**528**	**530**	**3,856**	**681**	**788**	**405**	**476**	**124**	**1,085**	**573**	**687**	**5,109**	**997**	**1,615**	**1,631**	**3,016**	**7,144**	**593**	**310**	**6,861**	**998**	**814**	**6,677**
8:00-9:00 AM	**175**	**4,702**			**4,877**	**1,583**	**325**	**3,619**	**201**	**319**	**3,737**	**580**	**925**	**4,082**	**830**	**889**	**433**	**588**	**114**	**1,258**	**661**	**843**	**5,622**	**950**	**1,736**	**1,169**	**2,425**	**6,530**	**568**	**353**	**6,315**	**1,160**	**1,016**	**6,171**
9:00-10:00 AM	**84**	**2,753**			**2,837**	**841**	**260**	**2,256**	**119**	**250**	**2,387**	**411**	**960**	**2,936**	**440**	**569**	**385**	**500**	**107**	**1,193**	**471**	**737**	**4,532**	**882**	**1,345**	**1,296**	**2,062**	**5,663**	**570**	**313**	**5,406**	**950**	**933**	**5,389**
Growth	**136%**	**15%**			**19%**	**17%**	**2%**	**18%**	**7%**	**21%**	**19%**	**0%**	**0%**	**17%**	**29%**	**12%**	**0%**	**9%**	**0%**	**80%**	**7%**	**4%**	**25%**	**0%**	**18%**	**30%**	**0%**	**20%**	**9%**	**36%**	**21%**	**0%**	**20%**	**25%**

AM (6-10AM)

Existing AM 4-Hour	189	10,802			**10,991**	2,112	1,275	**10,154**	228	1,221	**11,147**	2,830	683	865	**9,865**	1,815	2,223	544	2,227	1,435	1,242	**11,763**	2,087	1,417	4,510	1,658	3,797	5,018	**13,740**	3,886	483	**10,337**	5,149	939	**6,127**
2005AM_4HR	2,320	8,314			**10,634**	2,363	1,934	**10,205**	387	1,764	**11,582**	4,028	268	592	**8,414**	1,315	3,397	1,135	2,902	1,924	1,110	**11,449**	3,098	2,354	3,417	1,640	7,853	4,653	**18,154**	4,702	932	**14,384**	3,861	1,228	11,750
2030AM_4HR	3,051	10,578			**13,629**	2,738	2,922	**13,813**	234	1,688	**15,267**	4,679	172	1,232	**11,992**	2,196	3,352	1,031	4,181	1,743	1,639	**16,194**	3,611	2,282	4,227	2,747	11,100	3,757	**22,748**	3,910	1,137	**19,975**	3,756	3,601	19,819
2030-2005AM_4HR	**731**	**2,264**			**2,995**	**375**	**988**	**3,608**	**-153**	**-76**	**3,685**	**651**	**-96**	**640**	**3,578**	**881**	**-45**	**-104**	**1,279**	**-181**	**529**	**4,745**	**513**	**-72**	**810**	**1,107**	**3,247**	**-896**	**4,594**	**-792**	**205**	**5,591**	**-105**	**2,373**	**8,069**
2030 Adjusted AM_4HR	920	13,066			**13,986**	2,487	2,263	**13,762**	228	1,221	**14,755**	3,481	683	1,505	**13,462**	2,696	2,223	544	3,506	1,435	1,771	**16,287**	2,600	1,417	5,320	2,765	7,044	5,018	**19,081**	3,886	688	**15,883**	5,149	3,312	14,046
2030 Adjusted AM_4HR Hourly																																			
6:00-7:00 AM	**83**	**1,396**			**1,479**	**198**	**211**	**1,492**	**19**	**135**	**1,608**	**277**	**48**	**183**	**1,562**	**153**	**275**	**53**	**414**	**91**	**251**	**2,205**	**268**	**224**	**730**	**660**	**599**	**843**	**2,213**	**347**	**114**	**1,980**	**450**	**476**	**2,006**
7:00-8:00 AM	**297**	**3,882**			**4,179**	**866**	**627**	**3,940**	**51**	**365**	**4,254**	**806**	**119**	**482**	**4,049**	**988**	**590**	**137**	**871**	**320**	**461**	**4,526**	**617**	**359**	**1,371**	**794**	**1,148**	**1,349**	**4,600**	**835**	**228**	**3,993**	**1,197**	**998**	**3,794**
8:00-9:00 AM	**297**	**4,376**			**4,673**	**853**	**779**	**4,599**	**77**	**414**	**4,936**	**1,232**	**210**	**402**	**4,316**	**989**	**850**	**157**	**1,225**	**550**	**562**	**5,257**	**956**	**434**	**1,677**	**579**	**2,252**	**1,501**	**6,232**	**1,401**	**208**	**5,039**	**1,986**	**1,160**	**4,213**
9:00-10:00 AM	**243**	**3,412**			**3,655**	**571**	**646**	**3,730**	**81**	**307**	**3,956**	**1,166**	**306**	**438**	**3,534**	**566**	**508**	**197**	**997**	**474**	**307**	**498**	**4,300**	**760**	**400**	**1,542**	**732**	**3,044**	**1,325**	**6,035**	**1,303**	**138**	**4,870**	**1,516**	**677**	**4,031**
Growth	**387%**	**21%**			**27%**	**18%**	**77%**	**36%**	**0%**	**0%**	**32%**	**23%**	**0%**	**74%**	**36%**	**49%**	**0%**	**0%**	**57%**	**0%**	**43%**	**38%**	**25%**	**0%**	**18%**	**67%**	**85%**	**0%**	**39%**	**0%**	**42%**	**54%**	**0%**	**253%**	**129%**

Existing PM 5-Hour	288		16,232		**16,500**	3,470	1,653	**14,683**	428	1,859	**16,114**	3,408	2,886	**15,592**	2,606	3,666	2,211	2,308	964	2,989	3,163	3,042	**18,653**	4,045	6,154	6,204	9,277	**23,935**	5,005	695	**19,625**	7,867	1,195	12,953
		Total	TO NB	TO SB																														
2005PM_5HR	2,232		15,016	2,326	12,690	**17,248**	3,883	972	**14,337**	514	726	**14,549**	3,399	1,004	**12,154**	1,471	2,063	2,339	1,183	779	4,218	1,833	2,981	**16,177**	3,512	6,113	7,150	9,432	**23,134**	2,553	445	**21,026**	5,401	1,431	17,656
2030PM_5HR	2,391		20,001	2,073	17,928	**22,393**	4,236	1,223	**19,389**	326	782	**19,836**	4,106	1,041	**16,771**	1,661	2,013	3,294	1,309	891	5,441	2,154	3,440	**20,974**	4,702	7,248	8,224	9,326	**26,574**	4,171	528	**22,931**	5,418	1,857	19,370
2030-2005PM_5HR	**159**		**4,985**	**-253**	**5,238**	**5,145**	**353**	**251**	**5,043**	**-188**	**56**	**5,287**	**707**	**37**	**4,617**	**190**	**-50**	**955**	**126**	**112**	**1,223**	**321**	**459**	**4,797**	**1,190**	**1,135**	**1,074**	**-106**	**3,440**	**1,618**	**83**	**1,905**	**17**	**426**	**2,314**
2030 Adjusted PM_5HR	**460**		21,217		**21,677**	3,823	1,904	**19,758**	428	1,915	**21,245**	4,115	2,923	**20,053**	2,796	3,666	3,166	2,434	1,076	4,212	3,484	3,501	**23,344**	5,235	7,289	7,278	9,277	**27,375**	6,623	778	**21,530**	7,884	1,621	15,267
2030 Adjusted PM Hourly																																		
2:30-3:30 PM	**288**	288	**3,144**		**3,432**	**665**	**361**	**3,128**	**70**	**418**	**3,476**	**622**	**601**	**3,455**	**595**	**943**	**550**	**523**	**185**	**861**	**663**	**756**	**4,545**	**1,203**	**1,485**	**1,265**	**1,760**	**4,882**	**1,143**	**100**	**3,839**	**1,304**	**258**	**2,793**
4:30-4:30 PM	**93**	93	**4,392**		**4,485**	**749**	**347**	**4,083**	**85**	**356**	**4,354**	**767**	**478**	**4,065**	**520**	**767**	**629**	**527**	**210**	**868**	**732**	**726**	**4,862**	**1,106**	**1,481**	**1,342**	**1,780**	**5,397**	**1,161**	**125**	**4,361**	**1,450**	**289**	**3,200**
4:30-5:30 PM	**87**	87	**5,868**		**5,955**	**983**	**386**	**5,358**	**98**	**380**	**5,640**	**1,065**	**594**	**5,169**	**669**	**706**	**723**	**541**	**250**	**774**	**822**	**733**	**5,459**	**1,030**	**1,628**	**1,751**	**2,114**	**6,666**	**1,655**	**152**	**5,163**	**1,950**	**369**	**3,582**
5:30-6:30 PM	**20**	20	**4,832**		**4,852**	**844**	**438**	**4,446**	**114**	**435**	**4,767**	**965**	**776**	**4,578**	**673**	**688**	**755**	**428**	**247**	**813**	**772**	**740**	**4,800**	**964**	**1,478**	**1,673**	**2,003**	**6,034**	**1,478**	**293**	**4,849**	**1,842**	**433**	**3,440**
6:30-7:30 PM	**120**	120	**2,981**		**3,101**	**582**	**373**	**2,892**	**61**	**326**	**3,157**	**697**	**475**	**2,935**	**338**	**562**	**510**	**414**	**184**	**896**	**495**	**546**	**3,826**	**933**	**1,217**	**1,247**	**1,620**	**4,543**	**1,186**	**107**	**3,464**	**1,338**	**273**	**2,399**
Growth	**111%**		**31%**		**32%**	**10%**	**15%**	**36%**	**0%**	**3%**	**33%**	**21%**	**1%**	**30%**	**7%**	**0%**	**43%**	**5%**	**12%**	**41%**	**10%**	**15%**	**26%**	**29%**	**18%**	**17%**	**0%**	**15%**	**32%**	**12%**	**10%**	**0%**	**36%**	**19%**

PM (2.30-7.30PM)



Existing PM 5-Hour	582	15,355	**15,937**	3,870	1,667	**13,734**	648	1,572	**14,658**	3,100	1,578	1,709	**14,845**	2,568	2,900	1,065	3,819	2,080	2,749	18,600	3,214	3,024	5,580	3,310	10,738	7,234	**27,492**	5,513	1,303	**23,282**	6,751	2,891	19,422
2005PM_5HR	1,253	6,589	**7,842**	2,278	451	**6,015**	268	706	**6,453**	1,232	1,227	194	**6,642**	1,567	2,256	343	2,176	368	642	12,035	1,202	4,468	5,615	1,872	11,608	6,596	**26,018**	4,566	693	**22,145**	3,279	1,475	17,742
2030PM_5HR	2,365	10,068	**12,433**	3,116	485	**9,802**	313	788	**10,277**	1,452	1,089	163	**10,077**	1,872	2,423	387	2,374	478	736	15,775	1,422	5,062	6,030	2,366	13,617	6,093	**30,729**	3,442	1,189	**28,476**	3,723	1,791	23,641
2030-2005PM_5HR	**1,112**	**3,479**	**4,591**	**838**	**34**	**3,787**	**45**	**82**	**3,824**	**220**	**-138**	**-31**	**3,435**	**305**	**167**	**44**	**198**	**110**	**94**	**3,740**	**220**	**594**	**415**	**494**	**2,009**	**-503**	**4,711**	**-1,124**	**496**	**6,331**	**444**	**316**	**5,899**
2030 Adjusted PM_5HR	1,694	18,834	**20,528**	4,708	1,701	**17,521**	693	1,654	**18,482**	3,320	1,578	1,709	**18,449**	2,873	3,067	1,109	4,017	2,190	2,843	22,340	3,434	3,618	5,995	3,804	12,747	7,234	**32,706**	5,513	1,799	**28,992**	7,195	3,207	24,868
2030 Adjusted PM Hourly																																		
2:30-3:30 PM	**306**	**2,977**	**3,283**	**695**	**365**	**2,953**	**97**	**345**	**3,201**	**591**	**274**	**328**	**3,212**	**606**	**746**	**205**	**830**	**404**	**615**	**4,290**	**683**	**699**	**1,222**	**879**	**2,185**	**1,429**	**5,819**	**1,011**	**217**	**5,025**	**1,331**	**387**	**3,979**
4:30-4:30 PM	**410**	**3,669**	**4,079**	**774**	**321**	**3,626**	**122**	**343**	**3,847**	**571**	**345**	**338**	**3,959**	**568**	**728**	**213**	**865**	**447**	**578**	**4,930**	**756**	**805**	**1,196**	**757**	**2,536**	**1,474**	**7,036**	**1,060**	**318**	**6,294**	**1,398**	**562**	**5,400**
4:30-5:30 PM	**352**	**4,584**	**4,936**	**1,077**	**365**	**4,224**	**166**	**332**	**4,390**	**695**	**389**	**390**	**4,474**	**642**	**593**	**260**	**915**	**503**	**629**	**5,235**	**782**	**836**	**1,439**	**813**	**2,665**	**1,438**	**7,140**	**1,118**	**469**	**6,491**	**1,455**	**887**	**5,884**
5:30-6:30 PM	**396**	**4,684**	**5,080**	**1,331**	**418**	**4,167**	**183**	**366**	**4,350**	**971**	**308**	**363**	**4,050**	**705**	**601**	**249**	**765**	**482**	**579**	**4,492**	**703**	**714**	**1,179**	**688**	**2,579**	**1,552**	**6,767**	**1,297**	**447**	**5,917**	**1,631**	**821**	**5,174**
6:30-7:30 PM	**230**	**2,921**	**3,151**	**832**	**231**	**2,550**	**125**	**267**	**2,692**	**492**	**262**	**290**	**2,752**	**351**	**400**	**181**	**643**	**353**	**442**	**3,394**	**510**	**564**	**959**	**667**	**2,782**	**1,341**	**5,945**	**1,027**	**348**	**5,266**	**1,380**	**549**	**4,393**
Growth	**191%**	**23%**	**29%**	**22%**	**2%**	**28%**	**7%**	**5%**	**26%**	**7%**	**0%**	**0%**	**24%**	**12%**	**6%**	**4%**	**5%**	**5%**	**3%**	**20%**	**7%**	**20%**	**7%**	**15%**	**19%**	**0%**	**19%**	**0%**	**38%**	**25%**	**7%**	**11%**	**28%**

APPENDIX III-D

Difference Plots for Volume Comparisons between Study Years

emme/2

DIFFERENCE:
1 - 101

LINKS:
mod=aeo

SCALE: 500

2000

-4000

6000

-8000

10000

WINDOW:
45544/36525.6
50967/40593.1

EMME/2 PROJECT: C/CAG Travel Demand Model 2005 (San Mateo TA Stratg Plan)
SCENARIO 1: Year 2020 Baseline - AM 4 Hours
SCENARIO 101: Year 2005 - AM 4 Hours

11-02-07 12:51
MODULE: 6.13
DOWLING+....kc

emme/2

DIFFERENCE:
2 - 102

LINKS:
mod=aeo

SCALE: 500

2000

-4000

6000

-8000

10000

WINDOW:
45544/36525.6
50967/40593.1

EMME/2 PROJECT: C/CAG Travel Demand Model 2005 (San Mateo TA Stratg Plan)
SCENARIO 2 : Year 2020 Baseline - PM 5 Hours
SCENARIO 102 : Year 2005 - PM 5 Hours

11-02-07 12:53
MODULE: 6.13
DOWLING+....kc

DIFFERENCE:
201 - 101

LINKS:
mod=aeo

SCALE: 500

2000

-4000

6000

-8000

10000

WINDOW:
45544/36525.6
50967/40593.1

EMME/2 PROJECT: C/CAG Travel Demand Model 2005 (San Mateo TA Stratg Plan)
SCENARIO 201: Year 2030 Baseline - AM 4 Hours
SCENARIO 101: Year 2005 - AM 4 Hours

11-02-07 12:54
MODULE: 6.13
DOWLING+....kc

emme/2

DIFFERENCE:
202 - 102

LINKS:
mod=aeo

SCALE: 500

2000

-4000

6000

-8000

10000

WINDOW:
45544/36525.6
50967/40593.1

EMME/2 PROJECT: C/CAG Travel Demand Model 2005 (San Mateo TA Stratg Plan)
SCENARIO 202: Year 2030 Baseline - PM 5 Hours
SCENARIO 102: Year 2005 - PM 5 Hours

11-02-07 12:58
MODULE: 6.13
DOWLING+....kc

DIFFERENCE:
201 - 1

LINKS:
mod=aeo

SCALE: 500

2000

-4000

6000

-8000

10000

WINDOW:
45544/36525.6
50967/40593.1

EMME/2 PROJECT: C/CAG Travel Demand Model 2005 (San Mateo TA Stratg Plan)
SCENARIO 201 : Year 2030 Baseline - AM 4 Hours
SCENARIO 1 : Year 2020 Baseline - AM 4 Hours

11-02-07 12:56
MODULE: 6.13
DOWLING+....kc

emme/2

DIFFERENCE:
202 - 2

LINKS:
mod=aeo

SCALE: 500

2000

-4000

6000

-8000

10000

WINDOW:
45544/36525.6
50967/40593.1

EMME/2 PROJECT: C/CAG Travel Demand Model 2005 (San Mateo TA Stratg Plan)
SCENARIO 202 : Year 2030 Baseline - PM 5 Hours
SCENARIO 2 : Year 2020 Baseline - PM 5 Hours

11-02-07 12:57
MODULE: 6.13
DOWLING+....kc

Appendix J:
2020 Speed Contours

Northbound US101 **2020 AM Peak Period**

Capital Packages 2020 Baseline

Start	End	US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB SR-92 Off to SR-92 EB On	US-101 NB @ S of EB 92 On-Ramp	US-101 NB SR-92 EB On to SR-92 WB On	US-101 NB @ S of WB92 On-Ramp	US-101 NB Fashion Island On to Kehoe Off	US-101 NB Kehoe On to 3rd Off	US-101 NB @ S of 3rd Off-Ramp	US-101 NB N of 3rd
6:00 AM	6:15 AM	62	62	60	61	61	61	62	60	59	52	56	57	47	59
6:15 AM	6:30 AM	62	62	59	61	61	60	62	60	59	52	55	56	47	58
6:30 AM	6:45 AM	62	62	60	61	60	61	62	60	59	52	55	56	47	58
6:45 AM	7:00 AM	62	62	60	61	61	61	62	60	59	52	55	56	48	58
7:00 AM	7:15 AM	62	62	50	53	57	58	62	60	58	51	42	49	43	57
7:15 AM	7:30 AM	62	62	49	41	46	58	62	60	56	46	36	43	43	55
7:30 AM	7:45 AM	62	62	49	38	46	57	62	59	43	23	24	27	27	57
7:45 AM	8:00 AM	62	62	48	36	27	26	57	27	11	15	22	23	20	57
8:00 AM	8:15 AM	62	37	30	27	28	25	11	29	11	15	22	23	22	57
8:15 AM	8:30 AM	62	27	25	16	29	24	11	28	11	17	24	25	25	55
8:30 AM	8:45 AM	62	25	23	15	26	21	11	30	25	24	30	35	35	54
8:45 AM	9:00 AM	62	24	24	15	25	19	11	39	52	38	34	43	42	54
9:00 AM	9:15 AM	54	24	26	37	34	30	48	44	40	32	35	45	43	55
9:15 AM	9:30 AM	40	24	26	44	46	35	62	60	56	47	40	45	42	55
9:30 AM	9:45 AM	38	37	35	43	47	39	62	60	58	53	48	50	44	57
9:45 AM	10:00 AM	45	39	39	41	44	38	62	60	58	54	48	51	44	57

Capital Package 4

Start	End	US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB SR-92 Off to SR-92 EB On	US-101 NB @ S of EB 92 On-Ramp	US-101 NB SR-92 EB On to SR-92 WB On	US-101 NB @ S of WB92 On-Ramp	US-101 NB Fashion Island On to Kehoe Off	US-101 NB Kehoe On to 3rd Off	US-101 NB @ S of 3rd Off-Ramp	US-101 NB N of 3rd
6:00 AM	6:15 AM	62	62	60	62	62	61	62	59	59	53	58	59	59	59
6:15 AM	6:30 AM	62	62	59	62	62	61	62	59	59	52	57	58	59	59
6:30 AM	6:45 AM	62	62	59	62	62	61	62	59	59	53	57	58	59	59
6:45 AM	7:00 AM	62	62	60	62	62	61	62	59	59	53	57	58	59	59
7:00 AM	7:15 AM	62	62	50	62	62	60	62	57	57	50	51	55	58	58
7:15 AM	7:30 AM	62	62	48	62	62	60	62	57	56	50	49	54	57	56
7:30 AM	7:45 AM	62	62	49	62	62	60	62	55	55	47	49	54	56	56
7:45 AM	8:00 AM	62	62	51	62	62	60	62	51	36	35	51	54	57	55
8:00 AM	8:15 AM	62	62	46	62	62	57	44	52	41	38	53	57	58	57
8:15 AM	8:30 AM	62	62	47	62	62	57	43	52	41	41	53	56	58	57
8:30 AM	8:45 AM	62	61	46	62	62	57	43	53	53	49	51	56	57	57
8:45 AM	9:00 AM	62	62	47	62	62	57	44	54	58	52	53	57	58	58
9:00 AM	9:15 AM	62	59	38	62	62	61	59	57	56	52	53	57	58	58
9:15 AM	9:30 AM	62	54	35	62	62	61	62	57	56	52	54	57	58	58
9:30 AM	9:45 AM	62	52	34	62	62	61	62	58	56	52	54	57	58	58
9:45 AM	10:00 AM	62	51	35	62	62	61	62	57	56	52	55	57	57	58

Southbound US101 **2020 AM Peak Period**

Capital Packages 2020 Baseline

Start	End	US-101 SB N of 3rd	US-101 SB 3rd On to SR-92 Off	US-101 SB @ N of 92 Off-Ramps	US-101 SB SR-92 Off to SR-92 WB On	US-101 @ N of WB 92 On-Ramp	US-101 SB SR-92 WB On to Fashion Island On	US-101 SB Fashion Island On to SR-92 EB On	US-101 SB SR-92 EB On to Hillsdale Off	US-101 SB @ N of Hillsdale Loop On-Ramp	US-101 SB Hillsdale On to Ralston Off	US-101 SB Ralston On to Harbor Off	US-101 SB S of Harbor
6:00 AM	6:15 AM	62	62	59	62	54	58	61	58	59	61	60	60
6:15 AM	6:30 AM	62	62	60	62	53	58	61	57	59	60	60	60
6:30 AM	6:45 AM	62	62	60	62	53	57	61	57	59	60	60	60
6:45 AM	7:00 AM	62	62	60	62	53	58	61	58	59	60	60	60
7:00 AM	7:15 AM	59	62	56	62	53	56	59	53	57	59	59	59
7:15 AM	7:30 AM	59	27	25	62	53	56	59	48	56	59	57	57
7:30 AM	7:45 AM	58	26	24	62	53	56	59	48	56	58	57	57
7:45 AM	8:00 AM	59	26	24	62	11	48	58	51	52	59	57	57
8:00 AM	8:15 AM	58	58	40	62	11	48	56	54	35	58	58	59
8:15 AM	8:30 AM	60	62	44	24	12	48	17	47	52	58	58	58
8:30 AM	8:45 AM	59	60	44	12	33	36	17	37	54	58	58	58
8:45 AM	9:00 AM	59	60	44	12	35	29	17	27	52	58	58	58
9:00 AM	9:15 AM	61	57	44	11	32	29	30	26	52	57	57	57
9:15 AM	9:30 AM	61	54	38	47	30	51	31	26	52	57	58	58
9:30 AM	9:45 AM	61	52	34	51	31	52	31	27	52	57	58	58
9:45 AM	10:00 AM	60	38	30	51	31	52	31	27	52	58	58	58

Capital Package 4

Start	End	US-101 SB N of 3rd	US-101 SB 3rd On to SR-92 Off	US-101 SB @ N of 92 Off-Ramps	US-101 SB SR-92 Off to SR-92 WB On	US-101 @ N of WB 92 On-Ramp	US-101 SB SR-92 WB On to Fashion Island On	US-101 SB Fashion Island On to SR-92 EB On	US-101 SB SR-92 EB On to Hillsdale Off	US-101 SB @ N of Hillsdale Loop On-Ramp	US-101 SB Hillsdale On to Ralston Off	US-101 SB Ralston On to Harbor Off	US-101 SB S of Harbor
6:00 AM	6:15 AM	62	62	62	62	62	60	61	56	58	59	60	60
6:15 AM	6:30 AM	62	62	62	62	62	60	61	57	58	58	59	59
6:30 AM	6:45 AM	62	62	62	62	62	60	61	56	58	58	59	59
6:45 AM	7:00 AM	62	62	62	62	62	60	61	57	58	58	59	59
7:00 AM	7:15 AM	61	62	61	62	62	58	60	50	56	56	58	58
7:15 AM	7:30 AM	59	43	43	62	62	58	60	50	56	55	57	57
7:30 AM	7:45 AM	58	43	42	62	62	58	60	49	55	55	57	57
7:45 AM	8:00 AM	59	43	42	62	62	58	60	50	55	55	57	57
8:00 AM	8:15 AM	60	61	59	63	62	57	60	50	55	55	58	58
8:15 AM	8:30 AM	59	62	60	63	63	57	60	51	55	56	58	58
8:30 AM	8:45 AM	60	62	60	63	63	57	60	51	56	56	58	58
8:45 AM	9:00 AM	60	62	60	63	63	57	60	50	55	55	58	58
9:00 AM	9:15 AM	59	62	61	63	62	57	60	49	55	56	58	58
9:15 AM	9:30 AM	61	62	60	63	62	57	60	49	55	56	58	58
9:30 AM	9:45 AM	61	61	54	63	63	57	60	50	56	56	58	58
9:45 AM	10:00 AM	61	57	47	63	63	57	60	50	56	56	58	58

Eastbound SR92 **2020 AM Peak Period**

Capital Packages 2020 Baseline

Start	End	SR-92 EB @ W of El Camino Real Off-Ramp	SR-92 EB S El Camino Off to S El Camino On	SR-92 EB @ W of El Camino Real Loop On-Ramp	SR-92 EB @ W of El Camino Real Loop Off-Ramp	SR-92 EB @ W of El Camino Real Direct On-Ramp	SR-92 EB @ W of Delaware Off-Ramp	SR-92 EB Delaware Off to Delaware On	SR-92 EB @ W of Delaware On-Ramp	SR-92 EB @ W of SB 101 Off-Ramp	SR-92 EB @ W of NB 101 Off-Ramp	SR-92 EB US-101 NB Off to US-101 On	SR-92 EB @ W of 101 On-Ramps	SR-92 EB @ W of Egewater Off-Ramp	SR-92 EB Emerald Bay On to Foster City Off	SR-92 EB @ W of Foster City Off-Ramp	SR-92 EB E of Foster City
6:00 AM	6:15 AM	58	58	54	48	49	49	48	44	48	45	47	47	58	59	56	59
6:15 AM	6:30 AM	58	58	54	48	49	49	48	43	47	41	43	45	57	58	56	59
6:30 AM	6:45 AM	58	58	54	48	49	50	48	44	48	41	44	46	57	58	56	59
6:45 AM	7:00 AM	58	58	54	49	49	50	48	44	48	41	43	45	57	58	56	59
7:00 AM	7:15 AM	56	57	55	46	44	45	40	35	43	36	42	39	53	55	50	57
7:15 AM	7:30 AM	56	57	55	44	43	44	39	33	42	34	41	38	50	54	48	56
7:30 AM	7:45 AM	55	57	55	44	43	44	37	33	37	34	42	38	50	54	48	57
7:45 AM	8:00 AM	55	57	55	44	43	44	38	33	38	35	42	38	50	54	46	56
8:00 AM	8:15 AM	53	56	53	36	40	41	33	29	34	27	36	29	45	53	44	57
8:15 AM	8:30 AM	52	48	43	30	37	36	29	28	37	27	31	21	43	53	40	57
8:30 AM	8:45 AM	47	42	37	26	34	33	29	29	38	27	32	22	43	53	40	56
8:45 AM	9:00 AM	42	36	31	26	34	32	28	28	38	27	30	21	43	52	42	56
9:00 AM	9:15 AM	46	45	42	32	35	34	28	28	40	36	24	17	44	54	42	58
9:15 AM	9:30 AM	47	49	46	37	37	37	31	28	40	38	34	22	44	54	43	58
9:30 AM	9:45 AM	50	50	48	37	38	39	32	28	39	38	34	23	45	55	45	59
9:45 AM	10:00 AM	54	57	55	42	40	41	34	29	40	38	36	23	45	55	44	59

Capital Package 4

Start	End	SR-92 EB @ W of El Camino Real Off-Ramp	SR-92 EB S El Camino Off to S El Camino On	SR-92 EB @ W of El Camino Real Loop On-Ramp	SR-92 EB @ W of El Camino Real Loop Off-Ramp	SR-92 EB @ W of El Camino Real Direct On-Ramp	SR-92 EB @ W of Delaware Off-Ramp	SR-92 EB Delaware Off to Delaware On	SR-92 EB @ W of Delaware On-Ramp	SR-92 EB @ W of SB 101 Off-Ramp	SR-92 EB @ W of NB 101 Off-Ramp	SR-92 EB US-101 NB Off to US-101 On	SR-92 EB @ W of 101 On-Ramps	SR-92 EB @ W of Egewater Off-Ramp	SR-92 EB Emerald Bay On to Foster City Off	SR-92 EB @ W of Foster City Off-Ramp	SR-92 EB E of Foster City
6:00 AM	6:15 AM	58	57	56	51	49	50	49	45	49	46	48	49	58	59	56	59
6:15 AM	6:30 AM	58	57	56	50	49	50	49	43	48	41	44	46	57	58	55	59
6:30 AM	6:45 AM	58	57	56	50	49	50	49	44	49	40	44	46	57	58	56	59
6:45 AM	7:00 AM	58	57	56	50	49	50	49	44	48	41	44	46	57	58	56	59
7:00 AM	7:15 AM	56	57	53	47	44	45	39	34	42	35	42	39	52	55	50	57
7:15 AM	7:30 AM	56	56	53	47	43	45	39	33	42	35	42	38	51	55	48	57
7:30 AM	7:45 AM	55	56	53	47	43	44	37	32	37	34	42	37	50	54	48	57
7:45 AM	8:00 AM	55	56	53	46	43	45	37	33	38	34	42	38	51	54	46	56
8:00 AM	8:15 AM	54	56	50	40	39	39	33	30	34	27	37	28	45	53	44	57
8:15 AM	8:30 AM	54	54	47	36	36	36	30	29	38	27	35	24	44	53	40	57
8:30 AM	8:45 AM	51	47	41	31	33	33	28	29	38	27	32	22	43	52	39	56
8:45 AM	9:00 AM	48	41	36	26	32	31	28	28	38	27	33	22	43	53	38	56
9:00 AM	9:15 AM	51	47	41	31	32	31	27	28	39	37	27	19	44	54	43	58
9:15 AM	9:30 AM	54	54	49	41	38	37	31	28	40	37	33	22	44	54	42	58
9:30 AM	9:45 AM	54	56	51	43	41	42	34	28	39	37	34	22	44	54	44	58
9:45 AM	10:00 AM	54	56	51	45	42	43	36	29	41	37	35	23	45	55	43	59

Westbound SR92 **2020 AM Peak Period**

Capital Packages 2020 Baseline

Start	End	SR-92 WB E of Foster City	SR-92 WB Foster City On to Baker Way Off	SR-92 WB @ E of Edgewater Off-Ramp	SR-92 WB @ E of NB 101 Off-Ramp	SR-92 WB US-101 NB Off to US-101 SB Off	SR-92 WB @ E of SB 101 Off-Ramp	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On	SR-92 WB @ E of Delaware On-Ramp	SR-92 WB @ E of El Camino Real NB Off-Ramp	SR-92 WB @ E of El Camino Real NB On-Ramp	SR-92 WB @ E of El Camino Real SB Off-Ramp	SR-92 WB N El Camino Off to N El Camino On	SR-92 WB @ E of El Camino Real SB On-Ramp	SR-92 WB @ E of Alameda De Las Pulgas Off-Ramp
6:00 AM	6:15 AM	58	57	56	54	57	57	54	56	59	57	52	59	56	57	56	56
6:15 AM	6:30 AM	58	57	57	54	57	57	54	57	59	56	52	59	55	57	56	56
6:30 AM	6:45 AM	58	57	57	54	57	57	54	57	59	57	52	59	56	57	56	56
6:45 AM	7:00 AM	58	57	56	54	57	57	54	56	59	57	52	59	56	57	56	56
7:00 AM	7:15 AM	57	54	53	54	56	54	52	54	58	51	50	57	53	57	54	51
7:15 AM	7:30 AM	57	53	53	54	56	54	52	53	57	48	49	57	52	57	54	49
7:30 AM	7:45 AM	57	49	49	43	54	55	52	54	58	49	49	56	51	56	54	49
7:45 AM	8:00 AM	47	23	25	36	54	56	51	56	59	54	50	58	54	57	54	52
8:00 AM	8:15 AM	32	21	23	36	54	57	44	55	59	53	50	57	53	57	54	52
8:15 AM	8:30 AM	36	26	30	38	52	55	46	55	59	50	48	56	52	56	54	51
8:30 AM	8:45 AM	44	29	34	38	51	54	46	54	58	50	48	56	52	56	54	50
8:45 AM	9:00 AM	47	30	38	39	52	53	46	53	57	48	48	56	52	56	54	48
9:00 AM	9:15 AM	56	48	52	45	52	51	45	38	50	44	48	56	52	56	54	48
9:15 AM	9:30 AM	58	54	54	52	55	51	42	38	50	44	47	56	52	56	54	50
9:30 AM	9:45 AM	58	54	55	55	56	51	42	39	51	44	46	57	52	57	54	50
9:45 AM	10:00 AM	57	56	55	55	56	49	43	38	49	42	47	56	52	56	54	50

Capital Package 4

Start	End	SR-92 WB E of Foster City	SR-92 WB Foster City On to Baker Way Off	SR-92 WB @ E of Edgewater Off-Ramp	SR-92 WB @ E of NB 101 Off-Ramp	SR-92 WB US-101 NB Off to US-101 SB Off	SR-92 WB @ E of SB 101 Off-Ramp	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On	SR-92 WB @ E of Delaware On-Ramp	SR-92 WB @ E of El Camino Real NB Off-Ramp	SR-92 WB @ E of El Camino Real NB On-Ramp	SR-92 WB @ E of El Camino Real SB Off-Ramp	SR-92 WB N El Camino Off to N El Camino On	SR-92 WB @ E of El Camino Real SB On-Ramp	SR-92 WB @ E of Alameda De Las Pulgas Off-Ramp
6:00 AM	6:15 AM	58	57	57	54	57	57	55	57	60	59	47	60	59	57	55	55
6:15 AM	6:30 AM	58	57	57	54	56	57	54	57	59	59	46	60	59	57	55	56
6:30 AM	6:45 AM	58	57	57	54	56	56	54	57	60	59	46	60	59	57	55	55
6:45 AM	7:00 AM	58	56	56	54	56	56	54	57	60	59	47	60	59	57	56	56
7:00 AM	7:15 AM	57	53	54	54	55	50	54	55	59	58	44	59	57	57	53	49
7:15 AM	7:30 AM	57	52	52	54	55	50	54	54	58	58	42	59	57	56	52	48
7:30 AM	7:45 AM	57	51	53	54	55	49	54	54	58	58	41	59	57	57	52	48
7:45 AM	8:00 AM	57	52	53	55	55	50	54	54	58	58	41	59	57	57	52	48
8:00 AM	8:15 AM	57	53	54	47	54	51	50	51	57	57	40	58	56	56	52	47
8:15 AM	8:30 AM	57	53	54	47	55	51	50	52	57	57	40	58	56	56	51	45
8:30 AM	8:45 AM	58	54	54	47	55	51	50	51	57	57	40	58	56	56	51	46
8:45 AM	9:00 AM	58	53	53	47	55	51	50	52	57	57	40	58	57	56	52	46
9:00 AM	9:15 AM	58	55	55	55	57	50	50	41	54	58	43	59	57	57	53	49
9:15 AM	9:30 AM	58	56	55	55	56	50	49	41	54	58	41	59	57	57	53	51
9:30 AM	9:45 AM	58	56	55	55	56	50	49	41	54	58	42	59	57	57	53	50
9:45 AM	10:00 AM	58	56	56	55	57	50	49	41	54	58	42	59	57	57	53	50

Northbound US101 to Westbound SR92 **2020 AM Peak Period**

Capital Packages 2020 Baseline

Start	End	US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB Off to SR-92 WB Connector Ramp	US-101 NB Off to SR-92 WB @ Midpoint	US-101 NB Off to SR-92 WB @ Endpoint	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On
6:00 AM	6:15 AM	62	62	60	61	61	61	63	57	50	54	56	59
6:15 AM	6:30 AM	62	62	59	61	61	60	63	57	51	54	57	59
6:30 AM	6:45 AM	62	62	60	61	60	61	63	56	51	54	57	59
6:45 AM	7:00 AM	62	62	60	61	61	61	62	56	50	54	56	59
7:00 AM	7:15 AM	62	62	50	53	57	58	61	56	52	52	54	58
7:15 AM	7:30 AM	62	62	49	41	46	58	61	56	52	52	53	57
7:30 AM	7:45 AM	62	62	49	38	46	57	61	56	52	52	54	58
7:45 AM	8:00 AM	62	62	48	36	27	26	60	56	52	51	56	59
8:00 AM	8:15 AM	62	37	30	27	28	25	58	55	51	44	55	59
8:15 AM	8:30 AM	62	27	25	16	29	24	58	56	51	46	55	59
8:30 AM	8:45 AM	62	25	23	15	26	21	52	54	51	46	54	58
8:45 AM	9:00 AM	62	24	24	15	25	19	48	55	51	46	53	57
9:00 AM	9:15 AM	54	24	26	37	34	30	43	54	51	45	38	50
9:15 AM	9:30 AM	40	24	26	44	46	35	44	52	50	42	38	50
9:30 AM	9:45 AM	38	37	35	43	47	39	47	53	51	42	39	51
9:45 AM	10:00 AM	45	39	39	41	44	38	48	53	51	43	38	49

Capital Package 4

Start	End	US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB Off to SR-92 WB Connector Ramp	US-101 NB Off to SR-92 WB @ Midpoint	US-101 NB Off to SR-92 WB @ Endpoint	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On
6:00 AM	6:15 AM	62	62	60	62	62	61	63	57	52	55	57	60
6:15 AM	6:30 AM	62	62	59	62	62	61	62	56	52	54	57	59
6:30 AM	6:45 AM	62	62	59	62	62	61	63	56	52	54	57	60
6:45 AM	7:00 AM	62	62	60	62	62	61	62	56	52	54	57	60
7:00 AM	7:15 AM	62	62	50	62	62	60	61	56	55	54	55	59
7:15 AM	7:30 AM	62	62	48	62	62	60	61	55	55	54	54	58
7:30 AM	7:45 AM	62	62	49	62	62	60	61	55	55	54	54	58
7:45 AM	8:00 AM	62	62	51	62	62	60	61	55	55	54	54	58
8:00 AM	8:15 AM	62	62	46	62	62	57	60	55	57	50	51	57
8:15 AM	8:30 AM	62	62	47	62	62	57	49	54	57	50	52	57
8:30 AM	8:45 AM	62	61	46	62	62	57	41	53	56	50	51	57
8:45 AM	9:00 AM	62	62	47	62	62	57	40	53	56	50	52	57
9:00 AM	9:15 AM	62	59	38	62	62	61	42	53	56	50	41	54
9:15 AM	9:30 AM	62	54	35	62	62	61	43	52	55	49	41	54
9:30 AM	9:45 AM	62	52	34	62	62	61	43	52	55	49	41	54
9:45 AM	10:00 AM	62	51	35	62	62	61	44	53	55	49	41	54

Eastbound SR92 to Southbound US101 **2020 AM Peak Period**

Capital Packages 2020 Baseline

Start	End	SR-92 EB @ W of El Camino Real Off-Ramp	SR-92 EB S El Camino Off to S El Camino On	SR-92 EB @ W of El Camino Real Loop On-Ramp	SR-92 EB @ W of El Camino Real Loop Off-Ramp	SR-92 EB @ W of El Camino Real Direct On-Ramp	SR-92 EB @ W of Delaware Off-Ramp	SR-92 EB Delaware Off to Delaware On	SR-92 EB @ W of Delaware On-Ramp	SR-92 EB @ W of SB 101 Off-Ramp	SR-92 EB Off to US-101 SB @ Midpoint	SR-92 EB Off to US-101 SB @ Merge Endpoint	US-101 SB SR-92 EB On to Hillsdale Off	US-101 SB @ N of Hillsdale Loop On-Ramp	US-101 SB Hillsdale On to Ralston Off
6:00 AM	6:15 AM	58	58	54	48	49	49	48	44	48	47	44	58	59	61
6:15 AM	6:30 AM	58	58	54	48	49	49	48	43	47	48	44	57	59	60
6:30 AM	6:45 AM	58	58	54	48	49	50	48	44	48	49	45	57	59	60
6:45 AM	7:00 AM	58	58	54	49	49	50	48	44	48	47	43	58	59	60
7:00 AM	7:15 AM	56	57	55	46	44	45	40	35	43	41	39	53	57	59
7:15 AM	7:30 AM	56	57	55	44	43	44	39	33	42	41	38	48	56	59
7:30 AM	7:45 AM	55	57	55	44	43	44	37	33	37	29	41	48	56	58
7:45 AM	8:00 AM	55	57	55	44	43	44	38	33	38	28	42	51	52	59
8:00 AM	8:15 AM	53	56	53	36	40	41	33	29	34	27	13	54	35	58
8:15 AM	8:30 AM	52	48	43	30	37	36	29	28	37	35	34	47	52	58
8:30 AM	8:45 AM	47	42	37	26	34	33	29	29	38	36	30	37	54	58
8:45 AM	9:00 AM	42	36	31	26	34	32	28	28	38	36	26	27	52	58
9:00 AM	9:15 AM	46	45	42	32	35	34	28	28	40	37	26	26	52	57
9:15 AM	9:30 AM	47	49	46	37	37	37	31	28	40	38	26	26	52	57
9:30 AM	9:45 AM	50	50	48	37	38	39	32	28	39	37	26	27	52	57
9:45 AM	10:00 AM	54	57	55	42	40	41	34	29	40	38	27	27	52	58

Capital Package 4

Start	End	SR-92 EB @ W of El Camino Real Off-Ramp	SR-92 EB S El Camino Off to S El Camino On	SR-92 EB @ W of El Camino Real Loop On-Ramp	SR-92 EB @ W of El Camino Real Loop Off-Ramp	SR-92 EB @ W of El Camino Real Direct On-Ramp	SR-92 EB @ W of Delaware Off-Ramp	SR-92 EB Delaware Off to Delaware On	SR-92 EB @ W of Delaware On-Ramp	SR-92 EB @ W of SB 101 Off-Ramp	SR-92 EB Off to US-101 SB @ Midpoint	SR-92 EB Off to US-101 SB @ Merge Endpoint	US-101 SB SR-92 EB On to Hillsdale Off	US-101 SB @ N of Hillsdale Loop On-Ramp	US-101 SB Hillsdale On to Ralston Off
6:00 AM	6:15 AM	58	57	56	51	49	50	49	45	49	48	42	56	58	59
6:15 AM	6:30 AM	58	57	56	50	49	50	49	43	48	48	42	57	58	58
6:30 AM	6:45 AM	58	57	56	50	49	50	49	44	49	49	42	56	58	58
6:45 AM	7:00 AM	58	57	56	50	49	50	49	44	48	48	41	57	58	58
7:00 AM	7:15 AM	56	57	53	47	44	45	39	34	42	40	38	50	56	56
7:15 AM	7:30 AM	56	56	53	47	43	45	39	33	42	41	39	50	56	55
7:30 AM	7:45 AM	55	56	53	47	43	44	37	32	37	41	39	49	55	55
7:45 AM	8:00 AM	55	56	53	46	43	45	37	33	38	41	39	50	55	55
8:00 AM	8:15 AM	54	56	50	40	39	39	33	30	34	39	38	50	55	55
8:15 AM	8:30 AM	54	54	47	36	36	36	30	29	38	36	38	51	55	56
8:30 AM	8:45 AM	51	47	41	31	33	33	28	29	38	37	38	51	56	56
8:45 AM	9:00 AM	48	41	36	26	32	31	28	28	38	36	37	50	55	55
9:00 AM	9:15 AM	51	47	41	31	32	31	27	28	39	36	37	49	55	56
9:15 AM	9:30 AM	54	54	49	41	38	37	31	28	40	38	38	49	55	56
9:30 AM	9:45 AM	54	56	51	43	41	42	34	28	39	36	38	50	56	56
9:45 AM	10:00 AM	54	56	51	45	42	43	36	29	41	39	38	50	56	56

Northbound US101 **2020 PM Peak Period**

Capital Packages 2020 Baseline

Start	End	US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB SR-92 Off to SR-92 EB On	US-101 NB @ S of EB 92 On-Ramp	US-101 NB SR-92 EB On to SR-92 WB On	US-101 NB @ S of WB92 On-Ramp	US-101 NB Fashion Island On to Kehoe Off	US-101 NB Kehoe On to 3rd Off	US-101 NB @ S of 3rd Off-Ramp	US-101 NB N of 3rd
2:30 PM	2:45 PM	57	58	54	56	55	54	60	58	58	56	54	57	49	59
2:45 PM	3:00 PM	57	57	52	52	54	55	59	58	58	56	52	55	47	58
3:00 PM	3:15 PM	57	55	50	50	53	53	59	58	58	55	52	55	46	58
3:15 PM	3:30 PM	57	53	49	50	52	49	59	58	58	56	51	55	47	58
3:30 PM	3:45 PM	55	49	46	49	51	45	59	58	58	55	50	54	48	58
3:45 PM	4:00 PM	50	43	44	47	43	43	59	58	58	55	50	55	48	58
4:00 PM	4:15 PM	37	38	43	47	43	41	59	58	58	55	49	55	48	58
4:15 PM	4:30 PM	30	38	42	46	42	36	59	58	58	55	52	55	48	58
4:30 PM	4:45 PM	24	36	40	47	43	36	60	58	58	55	49	57	49	58
4:45 PM	5:00 PM	23	37	42	46	43	40	60	59	59	54	52	56	49	58
5:00 PM	5:15 PM	25	38	43	47	44	42	60	58	58	55	47	54	36	58
5:15 PM	5:30 PM	25	38	44	48	50	41	24	23	23	30	51	54	36	58
5:30 PM	5:45 PM	25	36	40	44	39	36	25	24	23	30	55	55	37	58
5:45 PM	6:00 PM	18	22	30	32	46	47	25	24	24	33	58	58	55	59
6:00 PM	6:15 PM	16	19	32	38	49	53	56	22	47	31	54	59	56	59
6:15 PM	6:30 PM	17	23	36	44	51	52	61	58	51	31	54	59	56	60
6:30 PM	6:45 PM	19	25	37	49	52	53	61	58	59	57	56	59	55	60
6:45 PM	7:00 PM	21	31	42	54	54	53	60	59	59	57	57	59	54	60
7:00 PM	7:15 PM	21	32	43	55	55	52	60	59	59	57	57	59	54	60
7:15 PM	7:30 PM	22	34	44	55	54	51	60	59	59	58	58	59	54	60

Capital Package 4

Start	End	US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB SR-92 Off to SR-92 EB On	US-101 NB @ S of EB 92 On-Ramp	US-101 NB SR-92 EB On to SR-92 WB On	US-101 NB @ S of WB92 On-Ramp	US-101 NB Fashion Island On to Kehoe Off	US-101 NB Kehoe On to 3rd Off	US-101 NB @ S of 3rd Off-Ramp	US-101 NB N of 3rd
2:30 PM	2:45 PM	57	58	44	59	59	59	59	57	58	56	51	58	57	59
2:45 PM	3:00 PM	57	58	43	59	59	59	59	56	58	56	49	58	57	59
3:00 PM	3:15 PM	57	58	43	59	59	58	59	57	58	55	49	58	57	58
3:15 PM	3:30 PM	57	58	43	59	59	58	59	56	58	56	51	58	56	58
3:30 PM	3:45 PM	57	58	41	59	59	59	59	57	58	56	51	58	57	58
3:45 PM	4:00 PM	57	58	42	58	46	57	59	57	58	56	51	58	57	58
4:00 PM	4:15 PM	57	57	42	58	46	57	59	57	58	56	50	58	57	58
4:15 PM	4:30 PM	57	58	41	58	46	58	59	57	58	56	50	58	57	58
4:30 PM	4:45 PM	57	53	42	58	46	58	60	56	58	56	49	58	57	58
4:45 PM	5:00 PM	56	47	41	58	47	58	60	57	58	55	49	58	57	58
5:00 PM	5:15 PM	52	41	39	58	47	58	60	58	59	55	49	58	57	58
5:15 PM	5:30 PM	46	34	38	60	58	59	44	46	44	44	52	58	58	58
5:30 PM	5:45 PM	37	31	38	60	60	59	44	46	44	44	54	59	58	59
5:45 PM	6:00 PM	31	26	38	60	60	60	44	46	44	44	54	59	58	59
6:00 PM	6:15 PM	26	19	38	61	60	60	59	42	57	50	56	59	59	59
6:15 PM	6:30 PM	20	18	39	61	61	60	61	58	60	50	56	59	59	59
6:30 PM	6:45 PM	20	18	39	61	61	60	61	58	60	56	55	59	59	59
6:45 PM	7:00 PM	20	19	39	61	61	60	61	58	60	56	56	59	59	59
7:00 PM	7:15 PM	20	18	39	61	61	61	61	58	60	57	55	59	59	59
7:15 PM	7:30 PM	20	19	39	61	61	60	61	58	59	57	55	59	58	59

Southbound US101 **2020 PM Peak Period**

Capital Packages 2020 Baseline

Start	End	US-101 SB N of 3rd	US-101 SB 3rd On to SR-92 Off	US-101 SB @ N of 92 Off-Ramps	US-101 SB SR-92 Off to SR-92 WB On	US-101 @ N of WB 92 On-Ramp	US-101 SB SR-92 WB On to Fashion Island On	US-101 SB Fashion Island On to SR-92 EB On	US-101 SB SR-92 EB On to Hillsdale Off	US-101 SB @ N of Hillsdale Loop On-Ramp	US-101 SB Hillsdale On to Ralston Off	US-101 SB Ralston On to Harbor Off	US-101 SB S of Harbor
2:30 PM	2:45 PM	62	62	61	54	48	56	58	49	55	56	57	58
2:45 PM	3:00 PM	61	62	61	54	49	57	58	48	55	55	56	57
3:00 PM	3:15 PM	61	62	61	54	48	57	58	48	54	55	56	57
3:15 PM	3:30 PM	62	62	60	54	49	57	58	48	54	55	56	57
3:30 PM	3:45 PM	61	62	60	54	49	58	58	48	54	55	56	57
3:45 PM	4:00 PM	61	62	60	54	49	57	58	48	54	55	56	57
4:00 PM	4:15 PM	61	61	55	54	51	58	58	48	54	55	56	57
4:15 PM	4:30 PM	61	41	33	54	53	58	58	47	54	54	55	56
4:30 PM	4:45 PM	61	24	23	54	51	58	57	45	54	54	56	56
4:45 PM	5:00 PM	55	23	22	54	50	57	57	44	53	53	55	56
5:00 PM	5:15 PM	39	30	25	54	49	57	43	35	52	52	54	55
5:15 PM	5:30 PM	25	24	21	45	49	57	43	37	52	52	53	55
5:30 PM	5:45 PM	16	25	22	43	50	54	39	32	53	53	54	55
5:45 PM	6:00 PM	16	31	28	43	42	42	34	29	53	54	56	56
6:00 PM	6:15 PM	16	39	33	36	33	35	30	28	54	55	56	57
6:15 PM	6:30 PM	17	53	41	31	28	30	33	27	54	55	57	57
6:30 PM	6:45 PM	17	60	51	34	27	27	32	31	54	56	57	57
6:45 PM	7:00 PM	17	58	52	32	27	28	33	31	54	56	57	58
7:00 PM	7:15 PM	17	61	55	30	28	28	32	29	54	56	57	58
7:15 PM	7:30 PM	17	58	53	32	28	28	32	29	54	56	57	58

Capital Package 4

US-101 SB N of 3rd	US-101 SB 3rd On to SR-92 Off	US-101 SB @ N of 92 Off-Ramps	US-101 SB SR-92 Off to SR-92 WB On	US-101 @ N of WB 92 On-Ramp	US-101 SB SR-92 WB On to Fashion Island On	US-101 SB Fashion Island On to SR-92 EB On	US-101 SB SR-92 EB On to Hillsdale Off	US-101 SB @ N of Hillsdale Loop On-Ramp	US-101 SB Hillsdale On to Ralston Off	US-101 SB Ralston On to Harbor Off	US-101 SB S of Harbor
62	62	60	62	62	58	59	58	58	59	60	60
61	62	61	62	62	58	59	58	58	59	59	59
61	62	60	62	62	58	59	58	58	59	59	59
62	62	60	62	62	58	59	58	58	59	59	59
61	62	60	62	62	58	59	58	58	59	59	59
61	62	60	62	62	58	59	57	58	59	59	59
61	62	60	62	62	58	59	58	58	59	59	59
61	62	60	62	62	58	59	58	58	59	59	59
61	62	60	62	62	58	58	56	58	59	59	59
60	62	60	62	62	57	57	56	58	59	59	59
59	62	60	62	62	55	56	56	58	59	59	59
60	62	60	62	62	56	57	56	58	59	59	59
61	62	61	62	62	55	56	55	58	59	59	59
60	62	60	62	62	51	55	57	58	59	59	59
60	62	60	62	62	54	55	56	58	59	59	59
60	62	61	62	62	53	56	57	57	59	59	59
61	62	61	62	62	56	57	56	57	59	59	59
62	62	61	62	62	56	57	57	57	59	59	59
61	62	61	62	62	57	57	57	58	59	59	59
61	62	61	62	62	57	58	58	58	59	59	59

Eastbound SR92 **2020 PM Peak Period**

Capital Packages 2020 Baseline

Start	End	SR-92 EB @ W of El Camino Real Off-Ramp	SR-92 EB S El Camino Off to S El Camino On	SR-92 EB @ W of El Camino Real Loop On-Ramp	SR-92 EB @ W of El Camino Real Loop Off-Ramp	SR-92 EB @ W of El Camino Real Direct On-Ramp	SR-92 EB @ W of Delaware Off-Ramp	SR-92 EB Delaware Off to Delaware On	SR-92 EB @ W of Delaware On-Ramp	SR-92 EB @ W of SB 101 Off-Ramp	SR-92 EB @ W of NB 101 Off-Ramp	SR-92 EB US-101 NB Off to US-101 On	SR-92 EB @ W of 101 On-Ramps	SR-92 EB @ W of Egewater Off-Ramp	SR-92 EB Emerald Bay On to Foster City Off	SR-92 EB @ W of Foster City Off-Ramp	SR-92 EB E of Foster City
2:30 PM	2:45 PM	55	57	56	46	41	41	38	36	40	39	44	41	49	53	46	56
2:45 PM	3:00 PM	55	57	57	46	41	41	38	36	40	39	44	38	48	52	41	54
3:00 PM	3:15 PM	55	57	56	46	41	43	38	36	39	38	44	38	48	53	44	54
3:15 PM	3:30 PM	55	57	57	47	41	43	39	37	40	37	44	38	48	53	43	55
3:30 PM	3:45 PM	53	57	55	43	40	41	37	36	39	37	34	27	47	52	38	54
3:45 PM	4:00 PM	53	56	54	40	40	41	35	36	38	36	23	20	46	51	34	52
4:00 PM	4:15 PM	51	54	52	39	40	41	36	36	38	36	22	21	46	51	34	52
4:15 PM	4:30 PM	51	55	53	40	40	41	36	36	39	36	23	20	46	52	33	52
4:30 PM	4:45 PM	51	55	53	37	38	39	34	34	38	36	25	21	46	51	32	52
4:45 PM	5:00 PM	50	53	49	34	38	37	33	34	38	36	24	20	45	51	31	52
5:00 PM	5:15 PM	49	47	43	30	36	36	33	34	37	36	24	20	45	51	32	51
5:15 PM	5:30 PM	49	49	45	32	36	36	32	34	38	36	24	21	45	51	32	52
5:30 PM	5:45 PM	50	54	52	39	40	41	35	35	39	38	27	21	45	52	36	53
5:45 PM	6:00 PM	51	57	56	45	41	42	37	37	40	38	38	30	44	52	38	54
6:00 PM	6:15 PM	51	57	56	44	41	42	37	36	40	38	41	34	46	53	40	55
6:15 PM	6:30 PM	51	55	54	43	39	40	35	34	38	41	39	32	48	53	41	55
6:30 PM	6:45 PM	50	52	52	43	41	42	39	37	40	42	44	39	49	54	45	56
6:45 PM	7:00 PM	54	55	54	45	43	44	41	40	41	43	46	40	49	54	45	56
7:00 PM	7:15 PM	53	54	53	45	41	42	39	38	41	42	46	40	49	54	44	56
7:15 PM	7:30 PM	53	54	53	45	42	42	39	38	41	43	45	41	50	53	44	55

Capital Package 4

Start	End	SR-92 EB @ W of El Camino Real Off-Ramp	SR-92 EB S El Camino Off to S El Camino On	SR-92 EB @ W of El Camino Real Loop On-Ramp	SR-92 EB @ W of El Camino Real Loop Off-Ramp	SR-92 EB @ W of El Camino Real Direct On-Ramp	SR-92 EB @ W of Delaware Off-Ramp	SR-92 EB Delaware Off to Delaware On	SR-92 EB @ W of Delaware On-Ramp	SR-92 EB @ W of SB 101 Off-Ramp	SR-92 EB @ W of NB 101 Off-Ramp	SR-92 EB US-101 NB Off to US-101 On	SR-92 EB @ W of 101 On-Ramps	SR-92 EB @ W of Egewater Off-Ramp	SR-92 EB Emerald Bay On to Foster City Off	SR-92 EB @ W of Foster City Off-Ramp	SR-92 EB E of Foster City
2:30 PM	2:45 PM	55	57	57	41	43	43	42	33	43	40	43	50	47	58	37	58
2:45 PM	3:00 PM	55	57	57	41	43	42	42	33	42	39	43	50	46	58	36	58
3:00 PM	3:15 PM	55	57	57	42	43	43	42	33	43	39	43	50	46	58	36	58
3:15 PM	3:30 PM	55	57	57	42	43	43	42	33	43	39	43	50	47	58	36	58
3:30 PM	3:45 PM	53	57	56	41	43	42	42	33	43	39	41	42	44	58	34	58
3:45 PM	4:00 PM	53	57	56	41	43	42	41	33	42	39	37	27	44	58	30	58
4:00 PM	4:15 PM	52	56	56	40	43	42	42	32	42	39	33	26	44	58	30	58
4:15 PM	4:30 PM	52	57	56	41	43	42	41	32	43	38	27	24	44	58	30	58
4:30 PM	4:45 PM	50	56	55	39	42	41	40	32	42	39	31	25	42	58	30	58
4:45 PM	5:00 PM	49	51	49	36	41	41	39	33	42	38	28	24	43	58	30	58
5:00 PM	5:15 PM	50	53	51	37	41	41	40	32	42	38	25	22	42	58	30	58
5:15 PM	5:30 PM	50	52	49	35	41	40	39	32	42	38	23	23	43	58	29	58
5:30 PM	5:45 PM	50	54	52	38	42	41	40	33	42	38	26	23	40	58	30	58
5:45 PM	6:00 PM	51	56	56	41	43	42	42	33	43	38	31	25	41	58	32	58
6:00 PM	6:15 PM	51	57	56	41	43	42	42	33	42	40	35	28	41	58	32	58
6:15 PM	6:30 PM	51	57	56	41	43	42	41	33	43	39	37	30	41	58	33	58
6:30 PM	6:45 PM	55	57	57	42	43	43	42	34	43	40	42	43	46	59	35	59
6:45 PM	7:00 PM	56	57	57	42	43	43	43	34	43	41	43	49	50	59	37	59
7:00 PM	7:15 PM	56	57	57	42	43	43	43	34	43	41	43	48	48	59	35	59
7:15 PM	7:30 PM	56	57	57	42	43	43	43	34	43	41	43	49	49	59	36	59

Westbound SR92 **2020 PM Peak Period**

Capital Packages 2020 Baseline

Start	End	SR-92 WB E of Foster City	SR-92 WB Foster City On to Baker Way Off	SR-92 WB @ E of Edgewater Off-Ramp	SR-92 WB @ E of NB 101 Off-Ramp	SR-92 WB US-101 NB Off to US-101 SB Off	SR-92 WB @ E of SB 101 Off-Ramp	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On	SR-92 WB @ E of Delaware On-Ramp	SR-92 WB @ E of El Camino Real NB Off-Ramp	SR-92 WB @ E of El Camino Real NB On-Ramp	SR-92 WB @ E of El Camino Real SB Off-Ramp	SR-92 WB N El Camino Off to N El Camino On	SR-92 WB @ E of El Camino Real SB On-Ramp	SR-92 WB @ E of Alameda De Las Pulgas Off-Ramp
2:30 PM	2:45 PM	58	57	56	57	58	55	54	53	57	52	51	55	54	57	54	43
2:45 PM	3:00 PM	58	57	57	56	57	54	54	50	56	49	49	54	53	57	54	43
3:00 PM	3:15 PM	58	58	56	56	57	55	52	51	57	51	50	53	53	57	54	45
3:15 PM	3:30 PM	58	58	56	57	57	55	52	50	57	52	50	54	54	57	55	45
3:30 PM	3:45 PM	58	57	56	57	57	52	52	46	53	47	48	51	52	56	52	45
3:45 PM	4:00 PM	58	57	56	56	57	52	51	47	53	47	49	53	53	56	52	44
4:00 PM	4:15 PM	58	57	55	56	57	52	53	49	55	49	49	52	53	56	53	44
4:15 PM	4:30 PM	58	57	55	56	57	52	53	48	55	50	49	52	53	56	53	44
4:30 PM	4:45 PM	58	57	54	54	54	48	53	44	52	47	44	49	51	53	47	45
4:45 PM	5:00 PM	58	57	53	52	54	46	53	45	52	47	44	48	49	49	43	45
5:00 PM	5:15 PM	58	57	53	53	53	45	52	43	51	44	43	47	48	49	43	44
5:15 PM	5:30 PM	58	57	53	52	53	45	24	21	29	32	48	54	53	55	50	45
5:30 PM	5:45 PM	58	57	54	55	55	45	19	21	29	32	49	55	54	56	52	44
5:45 PM	6:00 PM	58	57	52	53	53	48	31	35	45	43	46	50	51	52	47	45
6:00 PM	6:15 PM	57	49	43	41	40	38	52	52	56	53	50	54	54	56	52	47
6:15 PM	6:30 PM	46	37	34	32	31	34	53	53	58	55	51	55	54	57	53	49
6:30 PM	6:45 PM	39	28	28	28	27	32	52	55	59	54	50	57	54	57	54	53
6:45 PM	7:00 PM	32	28	28	30	28	33	53	55	59	53	51	57	54	57	55	53
7:00 PM	7:15 PM	34	29	28	30	29	35	55	55	59	54	51	57	54	57	55	52
7:15 PM	7:30 PM	33	28	29	29	28	33	55	55	59	53	51	58	54	57	55	54

Capital Package 4

Start	End	SR-92 WB E of Foster City	SR-92 WB Foster City On to Baker Way Off	SR-92 WB @ E of Edgewater Off-Ramp	SR-92 WB @ E of NB 101 Off-Ramp	SR-92 WB US-101 NB Off to US-101 SB Off	SR-92 WB @ E of SB 101 Off-Ramp	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On	SR-92 WB @ E of Delaware On-Ramp	SR-92 WB @ E of El Camino Real NB Off-Ramp	SR-92 WB @ E of El Camino Real NB On-Ramp	SR-92 WB @ E of El Camino Real SB Off-Ramp	SR-92 WB N El Camino Off to N El Camino On	SR-92 WB @ E of El Camino Real SB On-Ramp	SR-92 WB @ E of Alameda De Las Pulgas Off-Ramp
2:30 PM	2:45 PM	58	57	56	57	57	56	56	55	58	59	58	59	57	56	52	44
2:45 PM	3:00 PM	58	57	57	55	57	55	55	55	58	59	57	59	58	57	52	44
3:00 PM	3:15 PM	58	58	56	56	57	56	54	55	58	59	58	59	57	57	52	45
3:15 PM	3:30 PM	58	58	56	55	57	55	53	55	58	59	58	59	57	57	52	45
3:30 PM	3:45 PM	58	57	56	55	57	54	55	54	58	58	56	58	56	56	51	45
3:45 PM	4:00 PM	58	57	56	56	57	54	55	54	58	58	56	58	56	56	51	44
4:00 PM	4:15 PM	58	57	55	55	57	54	54	54	58	58	56	58	56	56	51	44
4:15 PM	4:30 PM	58	57	55	55	56	53	54	53	58	58	56	58	56	56	50	45
4:30 PM	4:45 PM	58	57	54	52	55	50	55	53	57	58	56	56	51	49	40	44
4:45 PM	5:00 PM	58	57	53	52	54	49	54	52	57	57	53	48	40	39	33	45
5:00 PM	5:15 PM	58	57	53	50	53	45	54	54	58	57	52	42	35	34	28	46
5:15 PM	5:30 PM	58	57	53	50	53	47	54	53	56	54	49	43	36	35	31	45
5:30 PM	5:45 PM	58	57	54	53	55	49	54	54	57	54	51	46	42	42	37	45
5:45 PM	6:00 PM	58	57	52	54	55	51	55	54	58	58	55	55	51	50	44	45
6:00 PM	6:15 PM	58	57	51	53	56	51	55	55	58	58	57	58	56	55	46	45
6:15 PM	6:30 PM	58	57	51	53	56	51	55	55	58	59	57	58	56	56	50	46
6:30 PM	6:45 PM	58	58	56	55	57	54	55	56	59	59	58	59	57	56	52	49
6:45 PM	7:00 PM	58	58	57	56	57	56	55	56	59	59	58	59	57	57	53	51
7:00 PM	7:15 PM	58	58	56	56	57	55	57	57	59	59	58	59	57	57	53	49
7:15 PM	7:30 PM	58	58	57	56	57	56	57	56	59	59	58	59	58	57	53	50

Northbound US101 to Westbound SR92 **2020 PM Peak Period**

Capital Packages 2020 Baseline

Start	End	US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB Off to SR-92 WB Connector Ramp	US-101 NB Off to SR-92 WB @ Midpoint	US-101 NB Off to SR-92 WB @ Endpoint	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On
2:30 PM	2:45 PM	57	58	54	56	55	54	58	47	53	54	53	57
2:45 PM	3:00 PM	57	57	52	52	54	55	55	47	53	54	50	56
3:00 PM	3:15 PM	57	55	50	50	53	53	53	47	52	52	51	57
3:15 PM	3:30 PM	57	53	49	50	52	49	48	47	52	52	50	57
3:30 PM	3:45 PM	55	49	46	49	51	45	47	47	52	52	46	53
3:45 PM	4:00 PM	50	43	44	47	43	43	44	47	52	51	47	53
4:00 PM	4:15 PM	37	38	43	47	43	41	44	47	53	53	49	55
4:15 PM	4:30 PM	30	38	42	46	42	36	44	47	53	53	48	55
4:30 PM	4:45 PM	24	36	40	47	43	36	44	47	52	53	44	52
4:45 PM	5:00 PM	23	37	42	46	43	40	45	47	53	53	45	52
5:00 PM	5:15 PM	25	38	43	47	44	42	45	47	52	52	43	51
5:15 PM	5:30 PM	25	38	44	48	50	41	44	40	31	24	21	29
5:30 PM	5:45 PM	25	36	40	44	39	36	23	19	14	19	21	29
5:45 PM	6:00 PM	18	22	30	32	46	47	40	36	35	31	35	45
6:00 PM	6:15 PM	16	19	32	38	49	53	57	48	52	52	52	56
6:15 PM	6:30 PM	17	23	36	44	51	52	57	48	53	53	53	58
6:30 PM	6:45 PM	19	25	37	49	52	53	56	48	53	52	55	59
6:45 PM	7:00 PM	21	31	42	54	54	53	54	47	53	53	55	59
7:00 PM	7:15 PM	21	32	43	55	55	52	54	47	53	55	55	59
7:15 PM	7:30 PM	22	34	44	55	54	51	53	47	53	55	55	59

Capital Package 4

Start	End	US-101 NB S of Ralston	US-101 NB Ralston On to Hillsdale Off	US-101 NB @ S of Hillsdale Off-Ramp	US-101 NB S of Hillsdale Loop on-ramp	US-101 NB @ S of Hillsdale Direct On-Ramp	US-101 NB Off to SR-92	US-101 NB Off to SR-92 WB Connector Ramp	US-101 NB Off to SR-92 WB @ Midpoint	US-101 NB Off to SR-92 WB @ Endpoint	SR-92 WB @ Merge from NB SB 101 On-Ramps	SR-92 WB @ E of Delaware Off-Ramp	SR-92 WB Delaware Off to Delaware On
2:30 PM	2:45 PM	57	58	44	59	59	59	58	47	53	56	55	58
2:45 PM	3:00 PM	57	58	43	59	59	59	57	47	53	55	55	58
3:00 PM	3:15 PM	57	58	43	59	59	58	57	47	53	54	55	58
3:15 PM	3:30 PM	57	58	43	59	59	58	57	47	53	53	55	58
3:30 PM	3:45 PM	57	58	41	59	59	59	57	47	53	55	54	58
3:45 PM	4:00 PM	57	58	42	58	46	57	56	47	53	55	54	58
4:00 PM	4:15 PM	57	57	42	58	46	57	55	47	53	54	54	58
4:15 PM	4:30 PM	57	58	41	58	46	58	49	47	53	54	53	58
4:30 PM	4:45 PM	57	53	42	58	46	58	47	47	52	55	53	57
4:45 PM	5:00 PM	56	47	41	58	47	58	47	47	53	54	52	57
5:00 PM	5:15 PM	52	41	39	58	47	58	47	47	52	54	54	58
5:15 PM	5:30 PM	46	34	38	60	58	59	46	47	53	54	53	56
5:30 PM	5:45 PM	37	31	38	60	60	59	48	47	52	54	54	57
5:45 PM	6:00 PM	31	26	38	60	60	60	49	47	52	55	54	58
6:00 PM	6:15 PM	26	19	38	61	60	60	51	47	52	55	55	58
6:15 PM	6:30 PM	20	18	39	61	61	60	56	48	52	55	55	58
6:30 PM	6:45 PM	20	18	39	61	61	60	58	48	51	55	56	59
6:45 PM	7:00 PM	20	19	39	61	61	60	58	48	52	55	56	59
7:00 PM	7:15 PM	20	18	39	61	61	61	59	48	51	57	57	59
7:15 PM	7:30 PM	20	19	39	61	61	60	58	48	51	57	56	59

Eastbound SR92 to Southbound US101 **2020 PM Peak Period**

Capital Packages 2020 Baseline

Start	End	SR-92 EB @ W of El Camino Real Off-Ramp	SR-92 EB S El Camino Off to S El Camino On	SR-92 EB @ W of El Camino Real Loop On-Ramp	SR-92 EB @ W of El Camino Real Loop Off-Ramp	SR-92 EB @ W of El Camino Real Direct On-Ramp	SR-92 EB @ W of Delaware Off-Ramp	SR-92 EB Delaware Off to Delaware On	SR-92 EB @ W of Delaware On-Ramp	SR-92 EB @ W of SB 101 Off-Ramp	SR-92 EB Off to US-101 SB @ Midpoint	SR-92 EB Off to US-101 SB @ Merge Endpoint	US-101 SB SR-92 EB On to Hillsdale Off	US-101 SB @ N of Hillsdale Loop On-Ramp	US-101 SB Hillsdale On to Ralston Off
2:30 PM	2:45 PM	55	57	56	46	41	41	38	36	40	32	31	49	55	56
2:45 PM	3:00 PM	55	57	57	46	41	41	38	36	40	32	31	48	55	55
3:00 PM	3:15 PM	55	57	56	46	41	43	38	36	39	30	29	48	54	55
3:15 PM	3:30 PM	55	57	57	47	41	43	39	37	40	31	30	48	54	55
3:30 PM	3:45 PM	53	57	55	43	40	41	37	36	39	31	30	48	54	55
3:45 PM	4:00 PM	53	56	54	40	40	41	35	36	38	32	31	48	54	55
4:00 PM	4:15 PM	51	54	52	39	40	41	36	36	38	32	30	48	54	55
4:15 PM	4:30 PM	51	55	53	40	40	41	36	36	39	31	30	47	54	54
4:30 PM	4:45 PM	51	55	53	37	38	39	34	34	38	31	30	45	54	54
4:45 PM	5:00 PM	50	53	49	34	38	37	33	34	38	30	29	44	53	53
5:00 PM	5:15 PM	49	47	43	30	36	36	33	34	37	31	29	35	52	52
5:15 PM	5:30 PM	49	49	45	32	36	36	32	34	38	31	29	37	52	52
5:30 PM	5:45 PM	50	54	52	39	40	41	35	35	39	31	28	32	53	53
5:45 PM	6:00 PM	51	57	56	45	41	42	37	37	40	32	28	29	53	54
6:00 PM	6:15 PM	51	57	56	44	41	42	37	36	40	31	26	28	54	55
6:15 PM	6:30 PM	51	55	54	43	39	40	35	34	38	30	25	27	54	55
6:30 PM	6:45 PM	50	52	52	43	41	42	39	37	40	31	24	31	54	56
6:45 PM	7:00 PM	54	55	54	45	43	44	41	40	41	31	26	31	54	56
7:00 PM	7:15 PM	53	54	53	45	41	42	39	38	41	33	27	29	54	56
7:15 PM	7:30 PM	53	54	53	45	42	42	39	38	41	32	26	29	54	56

Capital Package 4

Start	End	SR-92 EB @ W of El Camino Real Off-Ramp	SR-92 EB S El Camino Off to S El Camino On	SR-92 EB @ W of El Camino Real Loop On-Ramp	SR-92 EB @ W of El Camino Real Loop Off-Ramp	SR-92 EB @ W of El Camino Real Direct On-Ramp	SR-92 EB @ W of Delaware Off-Ramp	SR-92 EB Delaware Off to Delaware On	SR-92 EB @ W of Delaware On-Ramp	SR-92 EB @ W of SB 101 Off-Ramp	SR-92 EB Off to US-101 SB @ Midpoint	SR-92 EB Off to US-101 SB @ Merge Endpoint	US-101 SB SR-92 EB On to Hillsdale Off	US-101 SB @ N of Hillsdale Loop On-Ramp	US-101 SB Hillsdale On to Ralston Off
2:30 PM	2:45 PM	55	57	57	41	43	43	42	33	43	51	54	58	58	59
2:45 PM	3:00 PM	55	57	57	41	43	42	42	33	42	51	55	58	58	59
3:00 PM	3:15 PM	55	57	57	42	43	43	42	33	43	51	55	58	58	59
3:15 PM	3:30 PM	55	57	57	42	43	43	42	33	43	51	55	58	58	59
3:30 PM	3:45 PM	53	57	56	41	43	42	42	33	43	51	55	58	58	59
3:45 PM	4:00 PM	53	57	56	41	43	42	41	33	42	51	55	57	58	59
4:00 PM	4:15 PM	52	56	56	40	43	42	42	32	42	51	55	58	58	59
4:15 PM	4:30 PM	52	57	56	41	43	42	41	32	43	51	55	58	58	59
4:30 PM	4:45 PM	50	56	55	39	42	41	40	32	42	51	55	56	58	59
4:45 PM	5:00 PM	49	51	49	36	41	41	39	33	42	51	55	56	58	59
5:00 PM	5:15 PM	50	53	51	37	41	41	40	32	42	51	55	56	58	59
5:15 PM	5:30 PM	50	52	49	35	41	40	39	32	42	51	55	56	58	59
5:30 PM	5:45 PM	50	54	52	38	42	41	40	33	42	51	55	55	58	59
5:45 PM	6:00 PM	51	56	56	41	43	42	42	33	43	51	55	57	58	59
6:00 PM	6:15 PM	51	57	56	41	43	42	42	33	42	51	55	56	58	59
6:15 PM	6:30 PM	51	57	56	41	43	42	41	33	43	51	55	57	57	59
6:30 PM	6:45 PM	55	57	57	42	43	43	42	34	43	51	55	56	57	59
6:45 PM	7:00 PM	56	57	57	42	43	43	43	34	43	51	55	57	57	59
7:00 PM	7:15 PM	56	57	57	42	43	43	43	34	43	51	55	57	58	59
7:15 PM	7:30 PM	56	57	57	42	43	43	43	34	43	51	55	58	58	59