



MEETING AGENDA

Western Riverside County Programs and Projects Committee

Time: 1:30 p.m.
Date: November 26, 2018
Location: BOARD ROOM
County of Riverside Administration Center
4080 Lemon St, First Floor, Riverside CA 92501

COMMITTEE MEMBERS

Adam Rush, **Chair**/Clint Lorimore, City of Eastvale
Brian Berkson, **Vice Chair**/Verne Lauritzen,
City of Jurupa Valley
Deborah Franklin/Art Welch, City of Banning
Karen Spiegel/Randy Fox, City of Corona
Bill Zimmerman/John Denver, City of Menifee
Victoria Baca/Ulises Cabrera, City of Moreno Valley
Berwin Hanna/Ted Hoffman, City of Norco

Michael Vargas/Rita Rogers, City of Perris
Andrew Kotyuk/Scott Miller, City of San Jacinto
Ben J. Benoit/Timothy Walker, City of Wildomar
Kevin Jeffries, County of Riverside, District I
Marion Ashley, County of Riverside, District V

STAFF

Anne Mayer, Executive Director
John Standiford, Deputy Executive Director

AREAS OF RESPONSIBILITY

Air Quality, Capital Projects, Communications and Outreach Programs, Intermodal Programs, Motorist Services, New Corridors, Regional Agencies/Regional Planning, Regional Transportation Improvement Program (RTIP), Specific Transit Projects, State Transportation Improvement Program (STIP)

Transportation Uniform Mitigation Fee (TUMF) Program, and Provide Policy Direction on Transportation Programs and Projects related to Western Riverside County and other areas as may be prescribed by the Commission.

**RIVERSIDE COUNTY TRANSPORTATION COMMISSION
WESTERN RIVERSIDE COUNTY PROGRAMS AND PROJECTS COMMITTEE**

www.rctc.org

AGENDA*

**Actions may be taken on any item listed on the agenda*

1:30 p.m.

Monday, November 26, 2018

BOARD ROOM

**County Administrative Center
4080 Lemon Street, First Floor
Riverside, California**

In compliance with the Brown Act and Government Code Section 54957.5, agenda materials distributed 72 hours prior to the meeting, which are public records relating to open session agenda items, will be available for inspection by members of the public prior to the meeting at the Commission office, 4080 Lemon Street, Third Floor, Riverside, CA, and on the Commission's website, www.rctc.org.

In compliance with the Americans with Disabilities Act, Government Code Section 54954.2, and the Federal Transit Administration Title VI, please contact the Clerk of the Board at (951) 787-7141 if special assistance is needed to participate in a Commission meeting, including accessibility and translation services. Assistance is provided free of charge. Notification of at least 48 hours prior to the meeting time will assist staff in assuring reasonable arrangements can be made to provide assistance at the meeting.

- 1. CALL TO ORDER**
- 2. ROLL CALL**
- 3. PLEDGE OF ALLEGIANCE**
- 4. PUBLIC COMMENTS** – *Each individual speaker is limited to speak three (3) continuous minutes or less. The Committee may, either at the direction of the Chair or by majority vote of the Committee, waive this three minute time limitation. Depending on the number of items on the Agenda and the number of speakers, the Chair may, at his/her discretion, reduce the time of each speaker to two (2) continuous minutes. Also, the Committee may terminate public comments if such comments become repetitious. In addition, the maximum time for public comment for any individual item or topic is thirty (30) minutes. Speakers may not yield their time to others without the consent of the Chair. Any written documents to be distributed or presented to the Committee shall be submitted to the Clerk of the Board. This policy applies to Public Comments and comments on Agenda Items.*

Under the Brown Act, the Board should not take action on or discuss matters raised during public comment portion of the agenda which are not listed on the agenda. Board members may refer such matters to staff for factual information or to be placed on the subsequent agenda for consideration.

5. APPROVAL OF MINUTES – OCTOBER 22, 2018

- 6. ADDITIONS/REVISIONS** *(The Committee may add an item to the Agenda after making a finding that there is a need to take immediate action on the item and that the item came to the attention of the Committee subsequent to the posting of the agenda. An action adding an item to the agenda requires 2/3 vote of the Committee. If there are less than 2/3 of the Committee members present, adding an item to the agenda requires a unanimous vote. Added items will be placed for discussion at the end of the agenda.)*

7. REVISED EXPRESS LANES PRIVACY POLICY

Page 1

Overview

This item is for the Committee to:

- 1) Adopt Resolution No. 18-017, “Resolution of the Riverside County Transportation Commission Regarding the Revised Express Lanes Privacy Policy”; and
- 2) Forward to the Commission for final action.

8. 91 EXPRESS LANES TRAFFIC AND REVENUE STUDY UPDATE

Page 9

Overview

This item is for the Committee to:

- 1) Adopt the study results of the RCTC 91 Express Lanes Investment Grade Traffic and Revenue Study, Investment Grade Study Refresh 2018; and
- 2) Forward to the Commission for final action.

9. STATE ROUTE 91 CORRIDOR OPERATIONS PROJECT IMPROVEMENTS REPORTS AND REQUEST FOR VARIOUS AUTHORIZATIONS

Page 130

Overview

This item is for the Committee to:

- 1) Receive a report on the implementation of the following State Route 91 Corridor Operations Project (91 COP) improvements previously approved by the Commission:
 - a) Interstate 15 northbound 91 Express Lanes Ingress Improvement Option No. 1 (I-15 NB EL Option 1); and
 - b) SR-91 westbound General Purpose Lane Improvement Option No. 3 (91 WB GP Option 3);
- 2) Receive a report on the Ramp Meter Study at the SR-91 westbound Green River Road On-Ramp;
- 3) Authorize implementation of the construction phase of the SR-91 westbound General Purpose Lane Improvement modified Option No. 4 (91 WB GP Option 4M) after completing environmental and design approvals;
- 4) Authorize the inclusion of the 91 WB GP Option 4 in the list of Commission projects for prioritization and funding determination;
- 5) Authorize the Chair or Executive Director, pursuant to legal counsel review, to execute all necessary agency agreements or amendments to existing agency agreements for the Construction of the 91 WB GP Option 4 project; and
- 6) Forward to the Commission for final action.

10. AGREEMENT WITH FALCON ENGINEERING FOR CONSTRUCTION MANAGEMENT SERVICES FOR THE CONSTRUCTION OF THE STATE ROUTE 60 TRUCK LANES PROJECT

Page 137

Overview

This item is for the Committee to:

- 1) Award Agreement No. 18-31-164-00 to Falcon Engineering to provide construction management (CM), materials testing, construction surveying and environmental monitoring services for the State Route 60 (SR-60) Truck Climbing Lanes project, in the amount of \$15,920,498, plus a contingency amount of \$1,592,050, for a total amount not to exceed \$17,512,548;
- 2) Authorize the Chair or Executive Director, pursuant to legal counsel review, to execute the agreement on behalf of the Commission;
- 3) Authorize the Executive Director, or designee, to approve contingency work as may be required for the project; and
- 4) Forward to the Commission for final action.

11. COOPERATIVE AGREEMENT NO. 19-33-004-006 BETWEEN THE RIVERSIDE COUNTY TRANSPORTATION COMMISSION AND SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY FOR CONSTRUCTION OF THE RIVERSIDE LAYOVER FACILITY IMPROVEMENT PROJECT

Page 215

Overview

This item is for the Committee to:

- 1) Approve Cooperative Agreement No. 19-33-004-00 between the Commission and Southern California Regional Rail Authority (SCRRA) for the construction of the Riverside Layover Facility Improvement project (Project) for an amount not to exceed \$156,200, plus a contingency amount of \$15,800, for a total amount not to exceed \$172,000;
- 2) Authorize the Chair or Executive Director, pursuant to legal counsel review, to execute the cooperative agreement on behalf of the Commission;
- 3) Authorize the Executive Director or designee to approve the use of a contingency, as may be required for these services; and
- 4) Forward to the Commission for final action.

12. COMMISSIONERS / STAFF REPORT

Overview

This item provides the opportunity for the Commissioners and staff to report on attended and upcoming meeting/conferences and issues related to Commission activities.

13. ADJOURNMENT

AGENDA ITEM 5

MINUTES

RIVERSIDE COUNTY TRANSPORTATION COMMISSION

WESTERN RIVERSIDE COUNTY PROGRAMS AND PROJECTS COMMITTEE

Monday, October 22, 2018

MINUTES

1. CALL TO ORDER/ ROLL CALL

The meeting of the Western Riverside County Programs and Projects Committee was called to order by Chair Adam Rush at 1:31 p.m., in the Board Room at the County of Riverside Administrative Center, 4080 Lemon Street, First Floor, Riverside, California, 92501.

2. ROLL CALL

3. PLEDGE OF ALLEGIANCE

At this time, Commissioner Berwin Hanna led the Western Riverside County Programs and Projects Committee in a flag salute.

Members/Alternates Present

Marion Ashley
Victoria Baca
Ben Benoit
Brian Berkson
Randy Fox*
Deborah Franklin
Berwin Hanna
Adam Rush
Michael Vargas*
Bill Zimmerman

*arrived after meeting was called to order

Members Absent

Kevin Jeffries
Andrew Kotyuk

4. PUBLIC COMMENTS

There were no requests to speak from the public.

5. APPROVAL OF MINUTES – SEPTEMBER 24, 2018

M/S/C (Baca/Berkson) to approve the minutes as submitted.

6. ADDITIONS/REVISIONS

There were no additions or revisions at this time.

7. AGREEMENTS FOR ON-CALL ENVIRONMENTAL CONSULTING SERVICES

Alex Menor, Capital Projects Manager, presented the scope of the agreements for on-call environmental consulting services.

M/S/C (Benoit/Zimmerman) to:

- 1) Award the following agreements to provide on-call environmental consulting services for a three-year term, and one, two-year option to extend the agreements, in an amount not to exceed an aggregate value of \$1.5 million;
 - a) Agreement No. 19-31-015-00 to HDR Engineering, Inc.;
 - b) Agreement No. 19-31-016-00 to LSA Associates, Inc.; and
 - c) Agreement No. 19-31-017-00 to Stantec Consulting Services, Inc.;
- 2) Authorize the Chair or Executive Director, pursuant to legal counsel review, to execute the agreements, including option years, on behalf of the Commission;
- 3) Authorize the Executive Director, or designee, to execute task orders awarded to the consultants under the terms of the agreements; and
- 4) Forward to the Commission for final action.

At this time, Commissioner Randy Fox arrived.

8. AGREEMENTS FOR ON-CALL RIGHT OF WAY PHASE I & PHASE II ENVIRONMENTAL ASSESSMENT SERVICES

Mark Lancaster, Right of Way Manager, presented the scope of the agreements for on-call right of way phase I & phase II environmental assessment services.

In response to Commissioner Berkson's question regarding the extension of the current contract, Mark Lancaster responded it was the Commission's choice to go out for another RFP instead of extending the current contract.

M/S/C (Vargas/Zimmerman) to:

- 1) Award the following agreements to provide on-call right of way phase I & phase II environmental assessment services for a three-year term, and two, one-year options to extend the agreements, in an amount not to exceed an aggregate value of \$300,000;
 - a) Agreement No. 18-31-098-00 to Leighton Consulting, Inc.;
 - b) Agreement No. 18-31-099-00 to Ninyo & Moore; and

- c) **Agreement No. 18-31-100-00 to Stantec Consulting Services, Inc.;**
- 2) **Authorize the Chair or Executive Director, pursuant to legal counsel review, to execute the agreements, including option years, on behalf of the Commission;**
- 3) **Authorize the Executive Director, or designee, to execute task orders awarded to the consultants under the terms of the agreements; and**
- 4) **Forward to the Commission for final action.**

9. AMENDMENTS TO FREEWAY SERVICE PATROL AGREEMENTS

Michelle McCamish, Management Analyst, presented the details of the amendments to the freeway service patrol agreements.

Commissioner Deborah Franklin asked if the freeway service patrol is scheduled for peak travel times and weekends in construction project zones.

Michelle McCamish replied the specific details of when the FSP patrols is listed in the construction contract.

Michelle McCamish clarified for Chair Rush the MSRC is funding the entirety of the weekend FSP services.

M/S/C (Baca/Hanna) to:

- 1) **Approve Agreement No. 18-45-131-01, Amendment No. 1 to Agreement No. 18-45-131-00, with Coastal Pride Towing (Coastal) to provide construction freeway service patrol (CFSP) services on Beat No. 2, for an additional amount of \$630,000, for a total amount not to exceed \$2,155,212;**
- 2) **Approve Agreement No. 15-45-060-02, Amendment No. 2 to Agreement No. 15-45-060-00, with Airport Mobil Towing (Airport) to provide CFSP services on Beat No. 25, for an additional amount of \$628,000, for a total amount not to exceed \$2,166,500;**
- 3) **Approve Agreement No. 15-45-061-04, Amendment No. 3 to Agreement No. 15-45-061-00, with Pepe's Towing (Pepe's) to provide CFSP services on Beat No. 26, for an additional amount of \$310,000, for a total amount not to exceed \$1,343,000;**
- 4) **Approve Agreement No. 16-45-082-02, Amendment No. 2 to Agreement No. 16-45-082-00, with Pepe's Towing to provide CFSP services on Beat No. 4, for an additional amount of \$643,000, for a total amount not to exceed \$1,694,000;**
- 5) **Authorize the Chair or Executive Director, pursuant to legal counsel review, to execute the agreements, on behalf of the Commission; and**
- 6) **Forward to the Commission for final action.**

10. COMMISSIONERS / STAFF REPORT

- 10A. Anne Mayer announced the November 26 WRC meeting will have a follow up item on the 91 analysis.

11. ADJOURNMENT

There being no further business for consideration by the Western Riverside County Programs and Projects Committee, the meeting was adjourned at 1:52 p.m.

Respectfully submitted,

A handwritten signature in blue ink, appearing to read 'Lisa Mobley', with a stylized flourish extending to the right.

Lisa Mobley
Clerk of the Board

AGENDA ITEM 7

| <i>RIVERSIDE COUNTY TRANSPORTATION COMMISSION</i> | |
|--|--|
| DATE: | November 26, 2018 |
| TO: | Western Riverside County Programs and Projects Committee |
| FROM: | Jennifer Crosson, Toll Operations Manager |
| THROUGH: | Michael Blomquist, Toll Program Director |
| SUBJECT: | Revised Express Lanes Privacy Policy |

STAFF RECOMMENDATION:

This item is for the Committee to:

- 1) Adopt Resolution No. 18-017, *“Resolution of the Riverside County Transportation Commission Regarding the Revised Express Lanes Privacy Policy”*; and
- 2) Forward to the Commission for final action.

BACKGROUND INFORMATION:

In May 2016, the Commission adopted Resolution No. 16-008 establishing a privacy policy for the Commission’s express lanes as required by Section 31490 of the Streets and Highways Code. During the operation of the express lanes, the Commission and its contractors are in possession of personally identifiable information (PII) for people that use the express lanes toll facilities. In order to protect the privacy of express lanes customer data and to comply with current law, the Commission adopted the current privacy policy prior to the opening of the 91 Express Lanes.

Since the adoption of the privacy policy, changes to the operation and the California Toll Operator Committee Interoperability data exchange have occurred. Staff recommends that the attached revised policy be adopted to ensure the Commission remains compliant with the current law and takes measures to protect itself regarding disclosure of PII required for toll enforcement and related purposes.

The proposed revisions to the privacy policy are consistent with revisions adopted or anticipated to be adopted by the Orange County Transportation Authority, with whom the Commission jointly operates the 91 Express Lanes. The May 2016 resolution was developed to allow the use of the privacy policy for future express lanes. The revised policy continues to be intended for use on future Commission operated express lanes.

The privacy policy, as drafted, complies with current law and will serve to inform users of Commission-operated toll facilities of the privacy policy as it relates to their PII. The policy will serve to guide the processes and actions of the Commission and its contractors while working with PII.

The revised policy will go into effect at the same time the account policy changes approved by the Commission in July 2018 go into effect. As a part of the transition to the 6C transponder technology, existing 91 Express Lanes customers will be notified of the revised privacy policy and customer account agreement by mail. The mailed notification is scheduled to begin in early January 2019. The revised privacy policy will be made available on the 91 Express Lanes website on January 1, 2019.

Resolution No. 18-017 provides for proposed updates to the existing privacy policy to address changes in law, interoperability data exchange practices, and changes in operational conditions.

There is no fiscal impact related to the privacy policy.

Attachment: Resolution No. 18-017

RESOLUTION NO. 18-017
RESOLUTION OF THE
RIVERSIDE COUNTY TRANSPORTATION COMMISSION
REGARDING THE REVISED
RIVERSIDE COUNTY TRANSPORTATION COMMISSION
EXPRESS LANES PRIVACY POLICY

WHEREAS, in May of 2016, the Riverside County Transportation Commission (the “Commission”) adopted Resolution 16-008 establishing a Privacy Policy for the Express Lanes as required by Section 31490 of the Streets and Highways Code (the “Privacy Policy”);

WHEREAS, the Privacy Policy addresses issues related to the possession and use by the Commission of personally identifiable information (“PII”) for people that use the 91 Express Lanes facility;

WHEREAS, the Commission, in conjunction with Orange County Transportation Authority (“OCTA”), now proposes certain revisions to the Privacy Policy to address legal challenges that have occurred related to PII, changes to the California Toll Operator Committee (“CTOC”) Interoperability data exchange, and changes related to operation of the Express Lanes;

WHEREAS, the proposed revised Privacy Policy is attached to this resolution as Exhibit “A”, and is incorporated herein by reference (“Revised Privacy Policy”);

WHEREAS, the Commission and its contractors shall be required to adhere to the procedures included in the Revised Privacy Policy;

WHEREAS, the Executive Director shall retain the authority to amend the Revised Privacy Policy as necessary to respond to any changes in law, or to address changes in CTOC Interoperability standards;

WHEREAS, operation of the 91 Express Lanes is in cooperation with OCTA, and thus the Revised Privacy Policy is proposed as a joint policy with OCTA;

WHEREAS, the Commission anticipates the future operation of the I-15 Express Lanes, and it is the intent that the Revised Privacy Policy will be amended, prior to opening of the I-15 Express Lanes, to include said lanes. The Executive Director shall retain the authority to amend the Revised Privacy Policy to address operation of the I-15 Express Lanes, and/or to remove references to OCTA, as necessary or appropriate.

NOW, THEREFORE, be it resolved by the Commissioners of the Riverside County Transportation Commission as follows:

1. The recitals set forth above are true and correct and are incorporated into this resolution by reference as though fully set forth herein.
2. The Board of Commissioners hereby adopts the Revised Privacy Policy. The Revised Privacy Policy amends and restates, in its entirety, the original Privacy Policy, which, as of the date of adoption of the Revised Privacy Policy, shall have no further force or effect.

3. The Revised Privacy Policy shall govern the collection and use of personally identifiable information collected by the Commission and its contractor(s) as part of the operation of 91 Express Lanes, and the I-15 Express Lanes, if constructed.
4. The Revised Privacy Policy may, as directed by the Executive Director of the Commission, and without further action of the Board of Commissioners, be amended to include specific reference to the I-15 Express Lanes prior to opening of such lanes.
5. The Revised Privacy Policy may, as directed by the Executive Director of the Commission, and without further action of the Board of Commissioners, be revised to eliminate reference to OCTA.
6. The Revised Privacy Policy may, as directed by the Executive Director of the Commission, and without further action of the Board of Commissioners, be amended to respond to any changes in law, to address changes in CTOC Interoperability standards, and/or to make any minor changes jointly identified by RCTC and OCTA.
7. The Board of Commissioners declares its intent that should any court of competent jurisdiction declare any part or provision of the Revised Privacy Policy illegal or unenforceable, then such part or provision shall be severed from the Revised Privacy Policy and the remaining parts and provisions shall be enforced in accordance with their terms.
8. This resolution shall be effective as of the date of its adoption by the Board of Commissioners. As of the effective date, the Revised Privacy Policy shall be known and referred to as the "Express Lanes Privacy Policy".

Passed, approved and adopted this ____ day of December, 2018.

Dana W. Reed, Chair
Riverside County Transportation Commissioner

ATTEST:

Lisa Mobley
Clerk of the Board

EXHIBIT "A"
EXPRESS LANES PRIVACY POLICY

[ATTACHED BEHIND THIS PAGE]

Privacy Policy

The Orange County Transportation Authority (OCTA) and the Riverside County Transportation Commission (RCTC) are committed to safeguarding the integrity and confidentiality of the personally identifiable information of the people who use the 91 Express Lanes. Personally identifiable information is any information that identifies or describes a person, including, but not limited to, your name, address, telephone number, billing address, e-mail address, credit card number and expiration date, bank account information, tracking information for checks or money orders, license plate numbers, photographs of license plates, and travel data, including the date, time and location of toll transactions (referred to in this Privacy Policy as "Personal Information"). OCTA and RCTC recognize the need for reasonable control of Personal Information. As used in this Privacy Policy, "we" and "our" refers to OCTA and RCTC.

We will not sell, rent, lease, trade, market, exchange, distribute or disclose your Personal Information to, or with, third parties other than as disclosed in this Privacy Policy. This Privacy Policy is incorporated into the terms of your account agreement with OCTA.

Certain Instances of Permitted Disclosure of Your Information: We may use third party service providers to facilitate our services, and, to the extent necessary for that purpose, we may disclose your Personal Information to them. For example, we will be disclosing your credit card information and credit card payments to our credit card processing providers. Personal Information will also be provided to contractors and subcontractors who process toll violation notices and enforce toll requirements. Information disclosed may include your name, address, account number, license plate number, phone number, email address, the date, time and location of toll transactions, the amount of unpaid toll and toll evasion penalties, and other similar information. To facilitate enforcement of unpaid tolls and associated penalties, we may disclose information about you to third parties to confirm your address and/or phone number or to obtain an updated address and/or phone number. We may also obtain and use your social security number during the collection and enforcement process.

We share some Personal Information with operators of other toll facilities to facilitate the use of a single FasTrak transponder on multiple toll facilities – referred to as "interoperability." We provide other toll facility operators with, among other things, transponder identification numbers, account numbers and license plate numbers associated with valid 91 Express Lanes FasTrak accounts. Those other toll facility operators provide similar information to us about their FasTrak account holders. This allows participating toll facility operators to easily recognize valid FasTrak accounts. If you have a FasTrak account with an entity other than OCTA and you use your transponder to drive on the 91 Express Lanes, we will send the agency managing your account basic information about your use of the 91 Express Lanes so that those transactions can be included on your account statement. That information may include, but is not limited to, your transponder identification number, your account number, your license plate number, the toll amounts owed and/or other charges, and the date, time and

location of each toll transaction. If you are a 91 Express Lanes FasTrak account holder and you use other toll facilities, the operators of those other facilities will provide us with similar information about your use of their toll facilities.

If you drive a rental car or fleet vehicle on the 91 Express Lanes without a valid FasTrak transponder, we will notify the company to whom the vehicle is registered, or the company's third party contracted processing agency. We may provide, among other things, the plate number, image of the vehicle plate, toll and penalty amounts owed, and the date, time and location of each trip. The company to whom the vehicle is registered or its third-party processing agency may provide us with your contact information, including your name and address, as well as your rental contract. We will use that information for collection and enforcement purposes.

We may have to disclose Personal Information if we are required to do so by law, such as to the government or third parties pursuant to a court order or other similar circumstances. Absent a written certification that waiting for a warrant would be detrimental to an investigation or expose a law enforcement officer to danger, we will not provide Personal Information requested by a law enforcement agency without a search warrant or other similar court order. We may disclose information about you to our service providers, as we believe necessary or appropriate in connection with investigations of activities that could expose us to liability, including investigation of fraud, intellectual property infringement, piracy, or other similar activities.

We may aggregate information about you and your use of our services with information about others, and we may disclose such information in the aggregate to the companies that provide our funding, technology and corporate expertise, or our advertisers, analysts, alliance partners, or service providers. Aggregate information may also be publically released in reports presented to the board of directors of the Orange County Transportation Authority ("OCTA") and/or Riverside County Transportation Commission ("RCTC") or their operating partners, who ultimately oversee the operations of the 91 Express Lanes.

For our records, we may retain original and updated information for business reasons related to our services. These business reasons include technical constraints, dispute resolution, troubleshooting, agreement enforcement, and standard record keeping. Except for basic account information such as your name, credit card number or other payment information, billing address, and vehicle information which is required to perform account functions such as billing, account settlement, or enforcement activities, we will not retain your Personal Information for more than four years and six months after the closure of each billing cycle, provided that all tolls and/or toll violations assessed during that billing cycle have been paid or otherwise resolved.

We will take every effort, within practical business and cost constraints, to purge your Personal Information within four years and six months after the date that your account with the Express Lanes is closed or terminated. Information deemed reasonably necessary

for collection and/or enforcement of unpaid tolls and/or toll violation penalties will not be purged unless and until those issues are resolved.

We may also disclose and transfer your Personal Information in the event that some or all of the assets of the 91 Express Lanes are sold or otherwise transferred, or in the unlikely event of a reorganization of OCTA or RCTC or their operating partners.

Changes in the Privacy Policy: OCTA and RCTC reserve the right to update, modify, or rescind this Privacy Policy from time to time and in a manner consistent with state law. We will notify you in writing via e-mail, in our quarterly newsletter, or in one or more of your account statements of any material change in this Privacy Policy before that change goes into effect. If there is a material change in this Privacy Policy, the change will be reflected in the policy posted on our website.

How to Contact Us:

If you have any questions about this Privacy Policy, please write to:

91Express Lanes
180 N. Riverview Drive, Suite 200
Anaheim, CA 92808
Or contact us online.

Changing Your Personal Information: If you wish to review your Personal Information, you may do so by contacting the 91 Express Lanes Customer Service Center at 1(800) 600-9191 or by logging onto your account at www.91expresslanes.com. You may request changes to your Personal Information by contacting the Customer Service Center.

Effective Date of Privacy Policy: This policy shall be effective as of January 1, 2019.

AGENDA ITEM 8

| <i>RIVERSIDE COUNTY TRANSPORTATION COMMISSION</i> | |
|--|--|
| DATE: | November 26, 2018 |
| TO: | Western Riverside County Programs and Projects Committee |
| FROM: | Michael Blomquist, Toll Program Director |
| THROUGH: | Anne Mayer, Executive Director |
| SUBJECT: | 91 Express Lanes Traffic and Revenue Study Update |

STAFF RECOMMENDATION:

This item is for the Commission to:

- 1) Adopt the study results of the RCTC 91 Express Lanes Investment Grade Traffic and Revenue Study, Investment Grade Study Refresh 2018; and
- 2) Forward to the Commission for final action.

BACKGROUND INFORMATION:

Traffic and Revenue Study

In 2012 the Commission, through its consultant Stantec Consulting Services, Inc. (Stantec), completed a “level 3” or investment grade traffic and revenue study. This traffic and revenue study was an integral part of the Commission’s successful 2013 financing of the \$1.4 billion 91 Project that opened to traffic in March 2017. Based on the traffic and revenue study estimates and the Commission’s financing plan, the Commission borrowed about \$1.06 billion to fully fund the 91 Project. Close to \$598 million of this total borrowing is to be paid back by future tolls collected through the Commission’s operation of the 91 Express Lanes.

The 2012 traffic and revenue study assumptions were based on the Commission’s adopted toll policy goals. At its June 2012 meeting, the Commission adopted the following toll policy goals:

- 1) Provide a safe, reliable, and predictable commute for 91 Express Lanes customers;
- 2) Optimize vehicle throughput at free flow speeds;
- 3) Pay debt service and maintain debt service coverage;
- 4) Increase average vehicle occupancy;
- 5) Balance capacity and demand to serve customers who pay tolls as well as carpoolers with three or more persons who are offered discounted tolls;
- 6) Generate sufficient revenue to sustain the financial viability of the Commission’s 91 Express Lanes;
- 7) Ensure all covenants in the financing documents are met; and
- 8) Provide net revenues for Riverside Freeway/SR-91 corridor improvements.

At its May 2018 meeting, staff recommended the need to update the traffic and revenue study given the passage of six years since the original study, to analyze toll revenue impacts of potential SR-91 corridor projects being considered for implementation, and to inform future decisions related to project financing and project implementation. The Commission authorized staff to update the “level 3” 2012 SR-91 investment grade traffic and revenue study.

DISCUSSION:

Stantec has completed the work for the traffic and revenue study update. This update accounts for actual 91 Express Lanes opening results since March 2017; updated employment, population, and household data; updates to regional projects that affect the traffic network; updates to regional land development; actual express lane traffic capacities; and other relevant factors. The complete methodology and full results of the study are contained in the attached RCTC 91 Express Lanes Investment Grade Traffic and Revenue Study, Investment Grade Study Refresh 2018, dated November 12, 2018.

Base Case Result Summary

Annual gross potential toll revenue for the RCTC 91 Express Lanes is expected to increase to over \$73 million by FY 2025 (\$60.4 million in 2017 \$’s), while annual toll transactions would grow to over 13 million. This represents a nominal dollar revenue increase of 54% or a real dollar increase of nearly 30% from FY 2018 levels (\$48 million). Full toll transactions by FY 2025 would be nearly 16% above current levels. See Figure 1.

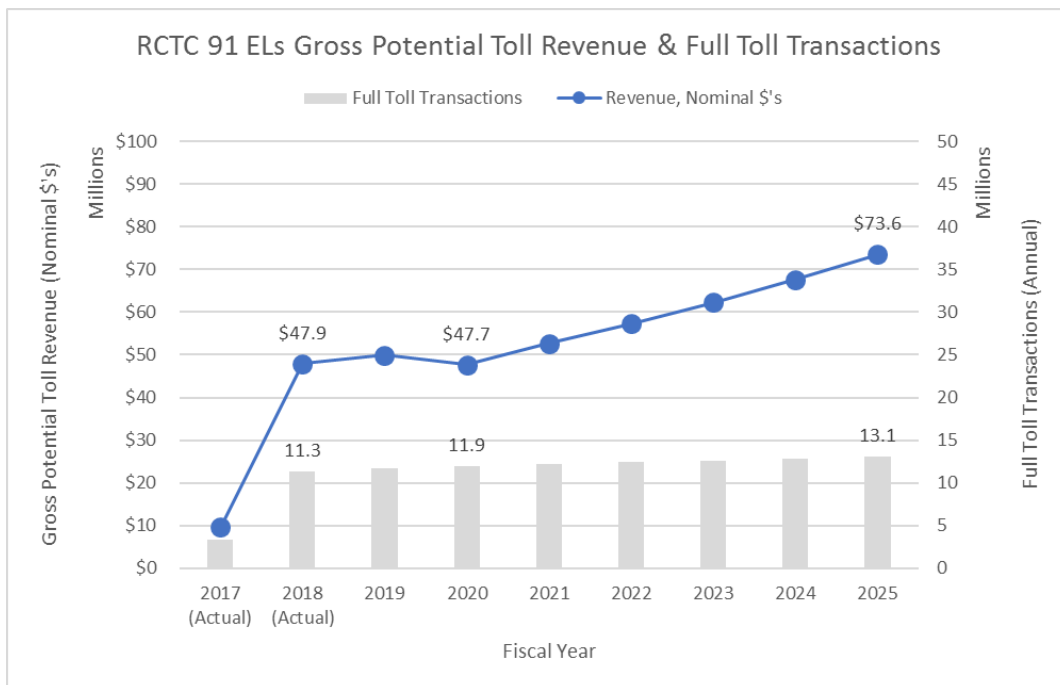


Figure 1 Estimated Toll Revenue and Toll Transactions, FY 2019-FY 2025

The increase in this estimated traffic and revenue is supported by the expectation that the Inland Empire will continue to be a desirable place for people to live while the coastal counties of Los Angeles and Orange County will remain significant employment centers. Population in the Inland Empire is expected to grow by 1.2% per year from now until 2025, an increase of over 427,000 people and 165,000 households. While the number of jobs in the Inland Empire would grow by 171,000, Los Angeles and Orange County employment would increase by over 423,000. A significant portion of this growth in trip making is expected to be made along the region's primary east-west corridors, SR-91, SR-60, and I-10.

Stantec's updated forecast of the RCTC 91 Express Lanes revenue shows more revenue than originally expected from the 2012 forecast. The 2018 forecast of RCTC 91 Express Lanes toll revenue from FY 2019 to FY 2066 is in the aggregate approximately \$926 million higher than the original 2012 forecast, or an increase of approximately 10%. See Figure 2.

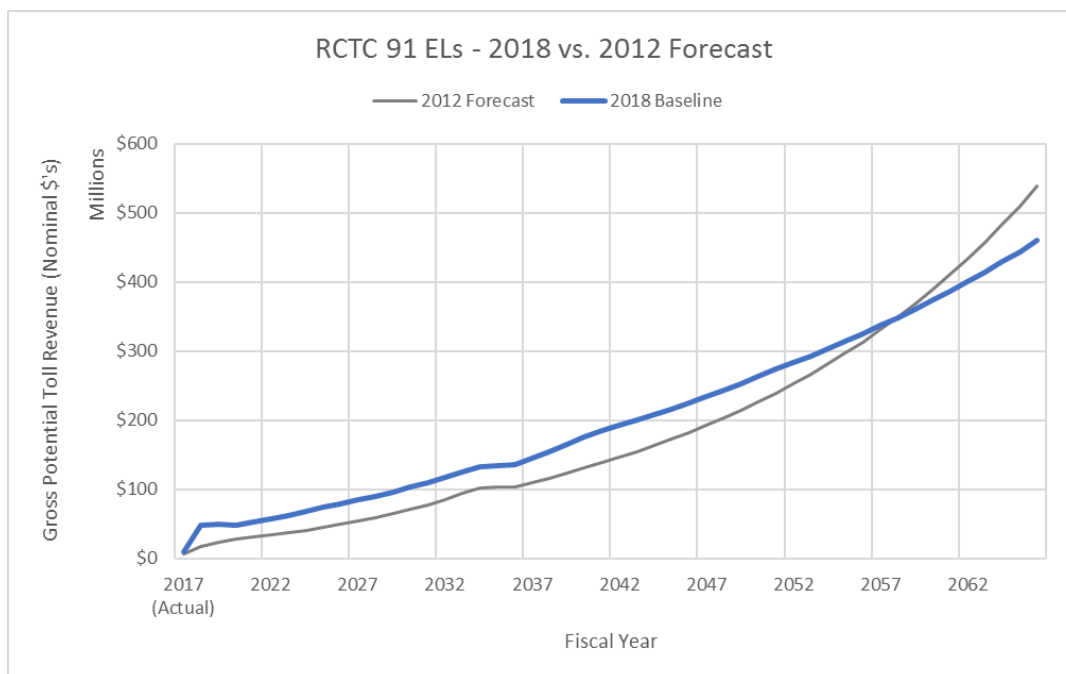


Figure 2 Toll Revenue Comparison, 2012 vs. 2018 Forecast

Sensitivity Analyses Summary

In addition to the base case assumptions and results, staff directed that sensitivity analyses (i.e. what-if scenarios) be performed to forecast the likely traffic and revenue impact to the RCTC 91 Express Lanes if various corridor improvements or toll policy changes were implemented. Sensitivity cases consisted of:

- Sensitivity Case #1: Construct 91 Option 4M WB lane (Green River Rd. to SR-241) by 2022**
 This case includes the addition of a westbound SR-91 general purpose (GP) lane from Green River Road to SR-241 by FY 2022 (91 Option 4M). This 91 Option 4M results in a forecasted reduction of 2018 base case toll revenue of \$166 million from FY 2022 to

FY 2035, or 2% over the life of the facility. This reduction in toll revenue is attributed to the improvement in westbound GP lane throughput and operations which would reduce the attractiveness of the 91 Express Lanes. The toll revenues generated with 91 Option 4M are forecasted to be above the original 2012 forecasted toll revenues.

- *Sensitivity Case #2: Construct 91 Ultimate Project GP Lanes (SR-71 to SR-241) by 2028*
This case includes the addition of a SR-91 GP lane in both directions between SR-241 and SR-71 by 2028 (vs. 2035 in the base case). This case results in a forecasted reduction of 2018 base case toll revenue of \$76 million, from 2019 to 2066; however, the forecasted revenues are still above the original 2012 forecast levels. This toll revenue drop is attributed to a reduction in westbound toll revenue, comparable to the reduction expected due to 91 Option 4M, but are partially offset by an increase in eastbound toll revenue. The eastbound toll revenue increase is attributed to expected additional traffic crossing the county line via the new eastbound SR-91 GP lane. This additional county line traffic is expected to increase the queues in the eastbound SR-91 GP lanes in Riverside County thereby increasing the attractiveness of the eastbound 91 Express Lanes.
- *Sensitivity Case #3: Assess HOV3+ vehicles a 50% toll WB morning 5 a.m. to 8 a.m.*
This case assesses the impact of charging HOV3+ vehicles a 50% toll discount from 5 a.m. to 8 a.m. in the westbound direction. This case results in a forecasted increase of 2018 base case toll revenue of 0.2% in FY 2025 and 2.2% in FY 2040. HOV3+ traffic would decline approximately 40% from the base case and overall toll rates would drop. The decline in HOV3+ customers would be offset by full toll-paying customers with a net increase in HOV3+ and total revenue. This case is being studied in conjunction with other options to reduce the amount of carpool violators in the morning peak period.
- *Sensitivity Case #4: Do Not Construct the 241/91 Express Direct Connector (EDC)*
This case assesses the impact of not constructing the proposed 241/91 EDC. This case results in a forecasted decrease of 2018 base case toll revenue of 8.4% in FY 2025 and 9.5% in FY 2040. The revenue reduction is attributed to a reduction in eastbound 91 Express Lane demand.

Study Use and Future Updates

Staff intends to use the study results to help inform Commission decisions about proposed capital improvements in the SR-91 corridor, potential 91 Express Lanes toll policy changes, and potential project financing strategies. Staff may seek future updates to the study depending on changes in employment, housing, capital project implementation, economic changes, and other factors if warranted to provide realistic traffic and revenue forecasts for decision-making.

Attachment: RCTC 91 Express Lanes Investment Grade Traffic and Revenue Study, Investment Grade Study Refresh 2018, dated November 12, 2018



RCTC 91 Express Lanes Investment Grade Traffic and Revenue Study

Investment Grade Study Refresh 2018

DRAFT

November 12, 2018

Prepared for:

Riverside County Transportation
Commission (RCTC)

Prepared by:

Stantec Consulting Services Inc.

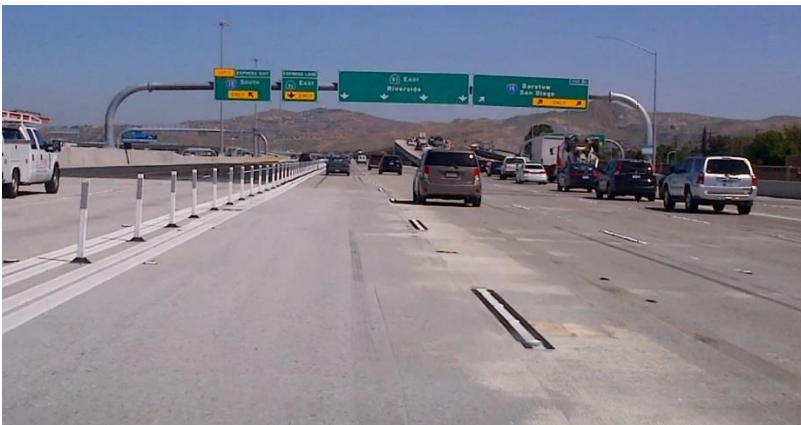


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Executive Summary

ES. 1 INTRODUCTION

Stantec Consulting Services Inc. (“Stantec”) was retained by the Riverside County Transportation Commission (RCTC) to update the long-term traffic and revenue forecast for the RCTC 91 Express Lanes in Riverside County, California. This study includes forecasts of likely toll traffic and revenue for the RCTC 91 Express Lanes from fiscal year 2019 through 2066.

This Investment Grade Traffic and Revenue study was developed as part of an effort to re-assess the near term and long-term revenue potential of the RCTC 91 Express Lanes, and to assess the revenue impacts of proposed corridor improvements. Our efforts included traffic data collection, the development and calibration of T&R forecasting models, and independent socioeconomic forecasts.

Stantec had the overall lead for the Traffic and Revenue Investment Grade Study and was responsible for project management and coordination, data collection, calibrating and validating the T&R forecasting models, and ultimately forecasting traffic and gross toll revenues.

WSP USA Inc. (WSP) provided the socioeconomic and land use review of employment, population, and household projections used in the T&R model.

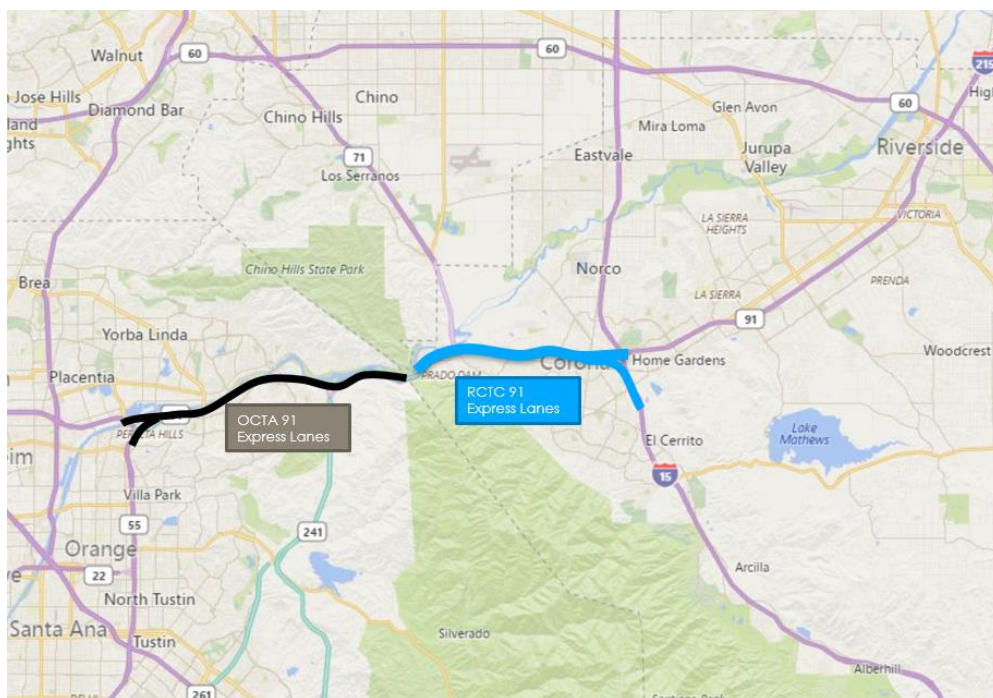
ES. 2 PROJECT DESCRIPTION

When the RCTC 91 Express Lanes (ELs) opened in March 2017, it extended the existing 10-mile OCTA 91 Express Lanes from SR 55 to the Riverside/Orange County Line (“County Line”) by 8 miles to the SR 91/I-15 interchange making a total of 18 miles of express lanes within the SR-91 corridor. The RCTC 91 Express Lanes were part of a broader expansion of the corridor consisting of a conversion and widening of the pre-existing HOV lane to a two-lane per direction Express Lane, and a widening of the adjacent 91 General Purpose lanes (GP) from 4 lanes per direction to 5 lanes per direction. Several other bridge reconstructions, ramp reconfigurations, and auxiliary lanes were added to the corridor as well.

Since the early days of the RCTC 91 ELs operations in Spring of 2017, utilization of the lanes has outpaced expectations. The Express Lanes see daily utilization in excess of 42,000 vehicles per day, and in the past fiscal year (2018) achieved gross potential toll revenue of over \$48 million. The RCTC 91 ELs high utilization is a function of several factors, but the primary factor is that the SR 91 corridor (GP and ELs) is heavily traveled, carrying over 300,000 vehicles per day through the County Line.



Figure 1-1: SR 91 Corridor and Express Lanes



ES. 3 EXISTING TRAFFIC CONDITIONS

The SR 91 corridor, defined as the SR 91 GP & Express Lanes between SR 55 in Orange County to Pierce Street in Riverside County, is characterized by high utilization of both the free GP lanes as well as the tolled Express Lanes. Over 300,000 vehicles traverse the SR 91 across the Riverside / Orange County Line on typical weekdays, with about 15 percent utilizing the Express Lanes. During the morning rush-hours, the westbound SR 91 general purpose lanes in Riverside County are heavily congested, with delays appearing before 5 AM and not resolved until past 10 AM. Speeds for much of the trip between I-15 and the County Line are less than 20 miles per hour, which translate to delays of over 30 minutes. Express Lane utilization in Riverside County is high due to the heavy congestion seen in the adjacent free general purpose lanes. Continuing into Orange County, the WB GP lanes operate with fewer delays – traffic is metered at the County Line, which limits the amount of traffic that can reach the GP lanes in Orange County. PM peak period travel conditions on the eastbound (EB) 91 GP lanes mirror those in the morning rush hours. Delays can appear before 2 PM and persist until 8 PM. Unlike the morning rush hours, the heaviest delays on the EB 91 GP lanes are seen in Orange County approaching the County Line. Although traffic is also metered at the County Line, the EB SR 91 GP lanes in Riverside County still operate with heavy delays for 3 to 4 hours of the PM peak period due to high travel demand and limited capacity through the interchange with I-15. The higher level of congestion seen in Orange County partly explains why OCTA 91 EB Express Lane utilization is greater than RCTC 91 EB Express Lane utilization during the afternoon and evening rush hours.

ES. 4 SOCIOECONOMIC VARIABLES AND LAND USE

Employment in the Study Area, defined for socioeconomic review purposes, as Los Angeles, Orange, Riverside, and San Bernardino Counties, is forecast to grow by 1.7 million jobs, from 7.2 to 8.9 million during the Forecast Period, a



compound annual growth rate of 0.9 percent per year. Households in the Study Area will grow by 1.2 million by 2040 from 5.6 to 6.8 million, a 0.8 percent per year compound annual growth rate. Housing growth will closely track job growth region-wide, although housing production will vary by market due to differing levels of developable land availability and housing affordability by submarket. For example, the Inland Empire is poised to grow at a more rapid pace as compared to Orange and Los Angeles counties due to higher levels of available land and lower housing prices relative to Orange County and other coastal areas.

The relatively high cost of living in Orange County has caused many people with jobs there to seek lower cost housing options in places such as the Inland Empire. This relationship between coastal and inland communities results in strong traffic demand on linkages between the two areas, such as the SR 91. The Inland Empire is expected to realize the strongest percentage employment and household growth in the Study Area over the Forecast Period and the already robust (and growing) job market in Orange County will cause traffic demand on the SR 91 to continue rising.

ES. 5 MODEL DEVELOPMENT AND CALIBRATION

Stantec's traffic and revenue forecast was developed by utilizing three different but complementary modeling techniques: 1) regional travel demand modeling, 2) market share modeling, and 3) operational modeling. The regional travel demand modeling centers around a four-step modeling technique which is designed to predict the amount of future travel demand, and their regional route choice. This process incorporates Stantec's toll diversion modeling as well, and therefore is able to allocate traffic between free lanes and tolled facilities like the 91 Express Lanes. Stantec's market share model (MSM) is a spreadsheet-based technique that applies "market share curves" to traffic at a slice of an Express Lane corridor to forecast the allocation of traffic between GP and express lanes. The MSM was originally developed to reflect utilization of OCTA's 91 Express Lanes and has been updated to reflect RCTC 91 Express Lane behavior. Lastly, operational modeling, consisting of a mesoscopic (Cube Avenue) and a separate microscopic model (VISSIM) were developed and used to better understand how queuing and capacity changes in the corridor impact operations. Insights from each of the three models were used to develop the RCTC 91 Express Lanes traffic and revenue forecast.

ES. 6 TRAFFIC AND REVENUE FORECASTS

Annual traffic and gross potential toll revenue for the RCTC 91 Express Lanes is expected to increase to over \$73 million by FY 2025 (\$60.4 million in 2017 \$'s), while full toll transactions would grow to over 13 million. This represents a nominal dollar revenue increase of 54 percent or a real dollar increase of nearly 30 percent from FY 2018 levels (\$48 million). Full toll transactions by FY 2025 would be nearly 16 percent above current levels. Traffic and revenue would almost double in real dollar terms, to \$99 million by 2040, or in nominal dollar terms, \$175 million. RCTC 91 EL revenue from FY 2019 to FY 2040 would grow about 7 percent per year, while full toll traffic would grow around 1.7 percent per year. Full toll transactions would be near 15 million by 2040, an increase of 34 percent from today's levels.

The increase in traffic and revenue is supported by the expectation that the Inland Empire will continue to be a desirable place for people to live, while the coastal counties of LA and Orange County will remain significant employment centers. Population in the Inland Empire is expected to grow by 1.2 percent per year from now until 2025, an increase of over 427,000 people and 165,000 households. While the number of jobs in the Inland Empire would grow by 171,000, LA and Orange County employment would increase by over 423,000. A significant portion of this growth in trip making is expected to be made along the region's primary east-west corridors, the SR 91, SR 60, and I-10.



1.0 INTRODUCTION

Stantec Consulting Services Inc. (“Stantec”) was retained by the Riverside County Transportation Commission (RCTC) to update the long term traffic and revenue forecast for the RCTC 91 Express Lanes in Riverside County, California. This study includes forecasts of likely toll traffic and revenue for the RCTC 91 Express Lanes from fiscal year 2019 through 2066.

1.1 PURPOSE AND FOCUS OF THE STUDY

This Investment Grade Traffic and Revenue study was developed as part of an effort to re-assess the near term and long-term revenue potential of the RCTC 91 Express Lanes, and to assess the revenue impacts of proposed corridor improvements. Our efforts included traffic data collection, the development and calibration of T&R forecasting models, and independent socioeconomic forecasts.

1.2 THE CONSULTANT TEAM

Stantec had the overall lead for the Traffic and Revenue Investment Grade Study and was responsible for project management and coordination, data collection, calibrating and validating the T&R forecasting models, and ultimately forecasting traffic and gross toll revenues.

WSP USA Inc. (WSP) provided the socioeconomic and land use review of employment, population, and household projections used in the T&R model.

1.3 OVERVIEW OF THE REPORT

The following is a brief description of the contents of each chapter:

- Chapter 2: Project Description and Setting – describes the RCTC 91 Express Lanes and its history.
- Chapter 3: Existing Traffic Conditions – summarizes the traffic data collected throughout the study area including traffic volumes, travel speeds, and OD patterns.
- Chapter 4: Socio-Economic Variables and Land Use – describes the assessment of the regional area's economy and the study area forecast of future year occupied households, population, and employment.
- Chapter 5: Model Development and Calibration – explains the modeling methodology used to forecast RCTC 91 Express Lanes traffic and revenue. This includes a discussion of the regional travel demand modeling, market share modeling, and operational models.
- Chapter 6: Traffic and Revenue Forecast – presents T&R assumptions and forecasts.



2.0 PROJECT DESCRIPTION

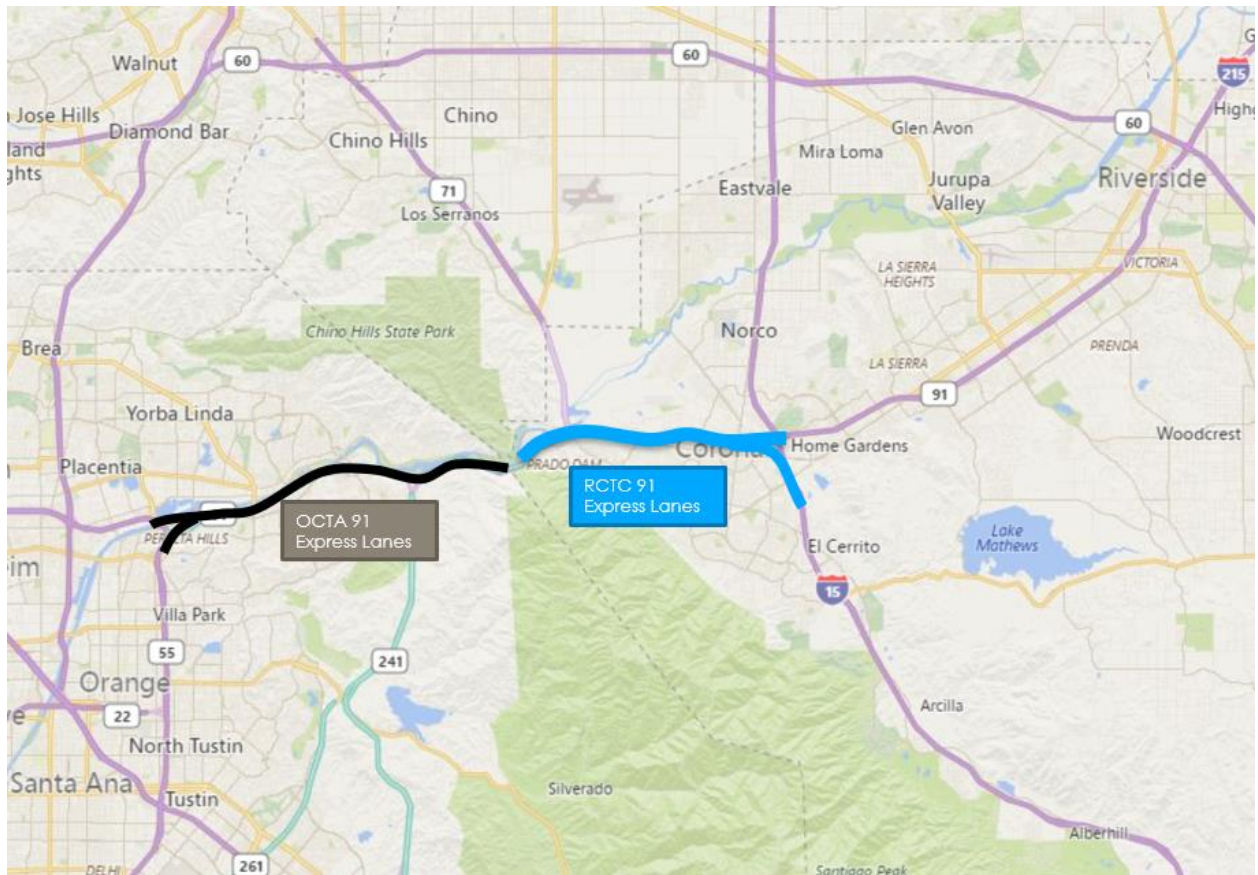
When the RCTC 91 Express Lanes (ELs) opened in March 2017, they extended the existing 10-mile OCTA 91 Express Lanes from SR 55 to the Riverside/Orange County line by 8 miles to the SR 91/I-15 interchange making a total of 18 miles of express lanes on the SR 91 corridor. The RCTC 91 Express Lanes were part of a broader expansion of the corridor consisting of a conversion and widening of the pre-existing HOV lane to a two-lane per direction Express Lane, and a widening of the adjacent 91 General purpose lanes from four lanes per direction to five lanes per direction. Several other bridge reconstructions, ramp reconfigurations, and auxiliary lanes were added to the corridor as well. The western terminus of RCTC 91 ELs is located at the Riverside / Orange County Line between SR 241 and Green River Road. A mixing area permits full access to and from the SR 91 GP lanes; EL and GP lane traffic can get into or out of the ELs at this mixing area. This location reflects the mid-point of the 91 Express Lane corridor, with the OCTA 91 Express Lanes to the west, and the RCTC 91 Express Lanes to the east. The RCTC 91 ELs terminus at the east end serves two travel markets. One travel market are users of the I-15 south of SR 91 – Express Lane users can connect to I-15 via a direct-connector ramp whose terminus is between Ontario and Magnolia Avenue. The other travel market is users of SR 91 east of I-15. The Express Lanes eastern terminus is located along SR 91 at I-15. Eastbound EL users continue past I-15 on the 91 GP lanes, with the first exit at McKinley Street. Figure 2-1 highlights the extents and locations of the OCTA and RCTC 91 Express Lanes.

Users of the facility are required to mount a transponder on their windshield; video / pay-by-mail payment or cash are not options. Tolls for utilization are charged on a static variable basis, similar to the OCTA 91 Express Lanes. Tolls can vary hourly, but do not change in real-time. Instead, traffic and tolls are regularly reviewed and increased or decreased to both promote throughput and maintain reliable travel speeds, but on a set schedule.

Since the early days of the RCTC 91 ELs operations in Spring of 2017, utilization of the lanes has far outpaced expectations. The Express Lanes see daily utilization in excess of 42,000 vehicles per day, and in the past fiscal year (2018) achieved gross potential toll revenue of over \$48 million. The RCTC 91 ELs high utilization is a function of several factors, but the primary factor is that the SR 91 corridor (GP and ELs) is a heavily traveled corridor, carrying over 300,000 vehicles per day. The SR 91 is the primary, and for some, the only feasible east-west roadway that allows people to travel from their homes in the Inland Empire to employment centers in Orange County and Los Angeles. A critical commuter route, the SR 91 is also a feeder roadway which connects with other regionally significant roadways including the I-15 and I-215, thereby facilitating inter-state travel. The SR 91 carries over 300,000 vehicles per day through the Riverside / Orange County Line. Even after the SR 91 Project added GP and Express Lanes, strong corridor traffic growth meant recurring and heavy delays on the free SR 91 general purpose lanes, a rapid ramp-up of the RCTC 91 Express Lanes, and relatively low sensitivity to toll increases.



Figure 2-1: OCTA and RCTC 91 Express Lanes



3.0 EXISTING CONDITIONS

The SR 91 corridor, defined as the SR 91 GP & Express Lanes between SR 55 in Orange County to Pierce Street in Riverside County, is characterized by high utilization of both the free GP lanes as well as the tolled Express Lanes. Over 300,000 vehicles traverse the SR 91 across the Riverside / Orange County Line on typical weekdays, with about 15 percent utilizing the Express Lanes. During the morning rush-hours, the westbound SR 91 general purpose lanes in Riverside County are heavily congested, with delays appearing before 5 AM and not resolved until past 10 AM. Speeds for much of the trip between I-15 and the County Line are less than 20 miles per hour, which translate to delays of over 30 minutes. Express Lane utilization in Riverside County is high due to the heavy congestion seen in the adjacent free general purpose lanes. Continuing into Orange County, the WB GP lanes operate with fewer delays – traffic is metered at the County Line, which limits the amount of traffic that can reach the GP lanes in Orange County. PM peak period travel conditions on the eastbound (EB) 91 GP lanes mirror those in the morning rush hours. Delays can appear before 2 PM and persist until 8 PM. Unlike the morning rush hours, the heaviest delays on the EB 91 GP lanes are seen in Orange County approaching the County Line. Although traffic is also metered at the County Line, the EB SR 91 GP lanes in Riverside County still operate with heavy delays for 3 to 4 hours of the PM peak period due to high travel demand and limited capacity through the interchange with I-15. The higher level of congestion seen in Orange County partly explains why OCTA 91 EB Express Lane utilization is greater than RCTC 91 EB Express Lane utilization during the afternoon and evening rush hours.

3.1 RIVERSIDE COUNTY SR 91 EXPRESS LANES

The RCTC 91 Express Lanes extend the 10-mile OCTA 91 Express Lanes from SR 55 to Riverside/Orange County Line by 8 miles to the SR 91/I-15 interchange making a total of 18 miles of express lanes on SR 91 corridor. As shown in Table 3-1, an average of almost 43,000 vehicles per typical weekday use the SR 91 Express Lanes in either direction with about 35,000 of the vehicles (81 percent) paying a full toll. The remaining 19 percent are HOV-3+ carpools that are generally free but are charged a 50 percent discounted toll between 4 and 6 PM in the eastbound direction. Gross potential revenue in fiscal year 2018 was \$48.6 million with over 60 percent attributable to the westbound express lanes. The average daily toll was \$4.85 on the westbound lanes (Full toll traffic, excluding HOV) and \$3.47 for travel on the eastbound lanes.

Table 3-1: RCTC SR 91 Express Lanes - FY 2018 Traffic and Revenue

| FY 2018 Statistics | Total | Eastbound | Westbound |
|--|--------------|------------------|------------------|
| Gross Potential Toll Revenue (Annual, millions \$) | \$48.6 | \$18.2 | \$29.4 |
| Average Daily Traffic | 39,800 | 18,500 | 21,300 |
| Average Daily Full Toll Traffic | 30,950 | 14,350 | 16,600 |
| Average Toll (Full Toll Traffic Only) | \$4.23 | \$3.47 | \$4.85 |
| Average Typical Weekday (Mon-Thurs) Traffic | 42,950 | 18,900 | 24,050 |

Table 3-2 shows the revenue distribution by direction, time of day and day of week. More than 70 percent of the RCTC 91 ELs annual gross potential toll revenue comes from typical weekdays (Monday-Thursday), 16 percent comes from Fridays and the remaining 6 and 4 percent comes from Saturdays and Sundays, respectively. More than half of the



weekday revenue comes from the westbound ELs with the vast majority coming from the morning hours of 4 to 10 AM. Approximately 60 percent of traffic is coming from typical weekdays (Monday-Thursday), 16 percent comes from Fridays and the remaining 13 and 10 percent comes from Saturdays and Sundays, respectively. Unlike the revenue, the distribution of traffic is more evenly distributed between the morning and evening peak period and peak travel directions: 20 percent of the weekday traffic is coming from westbound in the morning and a comparable 15 percent of traffic is coming from eastbound in the late afternoon to evening hours.

Table 3-2: Revenue Distribution by Direction, Time of Day, Day of Week

| | Time | MON-THURS | FRI | SAT | SUN |
|--------|------------|-----------|-------|------|------|
| WB | 4-10 am | 46.8% | 5.4% | 0.5% | 0.1% |
| | 10 am-2 pm | 3.1% | 0.7% | 0.9% | 0.9% |
| | 2-8 pm | 2.7% | 0.9% | 1.2% | 1.1% |
| | 8 pm-4 am | 0.4% | 0.1% | 0.2% | 0.2% |
| EB | 4-10 am | 1.3% | 0.4% | 0.3% | 0.1% |
| | 10 am-2 pm | 2.5% | 1.9% | 1.1% | 0.5% |
| | 2-8 pm | 14.6% | 6.7% | 2.1% | 0.9% |
| | 8 pm-4 am | 1.2% | 0.5% | 0.4% | 0.3% |
| Totals | | 72.6% | 16.6% | 6.6% | 4.2% |

Table 3-3: Express Traffic Distribution by Direction, Time of Day and Day of Week

| | Time | MON-THURS | FRI | SAT | SUN |
|--------|------------|-----------|-------|-------|-------|
| WB | 4-10 am | 20.7% | 4.5% | 1.3% | 0.6% |
| | 10 am-2 pm | 5.9% | 1.5% | 1.9% | 1.9% |
| | 2-8 pm | 6.1% | 2.0% | 2.4% | 2.4% |
| | 8 pm-4 am | 1.1% | 0.4% | 0.5% | 0.6% |
| EB | 4-10 am | 3.1% | 0.9% | 0.7% | 0.3% |
| | 10 am-2 pm | 4.6% | 2.0% | 1.8% | 1.1% |
| | 2-8 pm | 15.4% | 4.1% | 3.1% | 2.3% |
| | 8 pm-4 am | 3.4% | 1.3% | 1.3% | 1.0% |
| Totals | | 60.3% | 16.5% | 13.0% | 10.1% |

3.1.1 Express Lane Utilization

Usage of the Express Lanes is highest westbound during the morning and eastbound during the evening. Westbound express lane usage regularly peaks over 2,850 vehicles per hour during the 7-8 AM hour, with 1,400 vehicles coming from I-15 northbound paying a peak toll of \$11.40 and 1,450 vehicles coming from McKinley paying a peak toll of \$12.65. Westbound tolls vary by day of week with the highest tolls charged on typical weekdays (Monday to Thursday). Tolls on Fridays are about half of the weekday's levels, while tolls on Saturdays and Sundays are at or near minimum levels.

Figure 3-1 shows March to May 2018 Monday to Thursday average traffic and tolls on the westbound RCTC 91 Express Lanes. AM Peak hour traffic being in the range of 2,800 vehicles per hour and the average McKinley and Southern Direct Connector (SDC) (i.e. I-15 Northbound to SR 91 Westbound express connector) tolls roughly peak at \$16.50 and \$14.50, respectively, during the 5-6 AM hour. Express lane usage drops significantly by 10 AM to less than 1,000 vehicles per hour in the midday hours before falling to less than 100 vehicles per hour during overnight hours.



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Figure 3-2 shows the variation of westbound RCTC 91 Express Lanes traffic via the 25th, 50th (median) and 75th percentiles. The 50th percentile or median represents the average and is defined as the volumes below or above which 50 percent of the observed traffic falls. It is evident from the graph that there is modest variation, both the upper and lower bounds of traffic are within 100 vehicles of the median in the observed 2018 express lane volumes. Figure 3-2 also shows that HOV-3+ (and other toll-free EL traffic) peaks at approximately 750 vehicles per hour from the 5-6 AM hour, representing about one-quarter of all WB EL traffic.

Figure 3-1: Westbound 91 Express Lanes Traffic and Tolls - Average Monday-Thursday

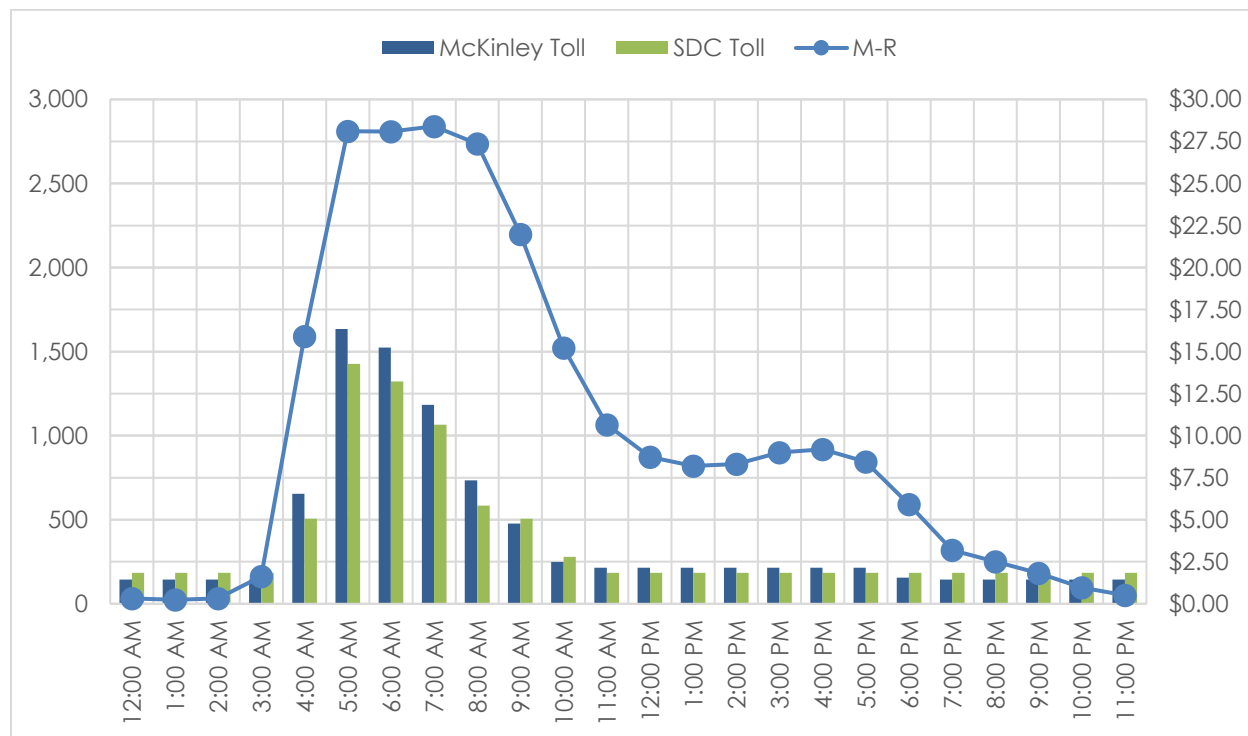
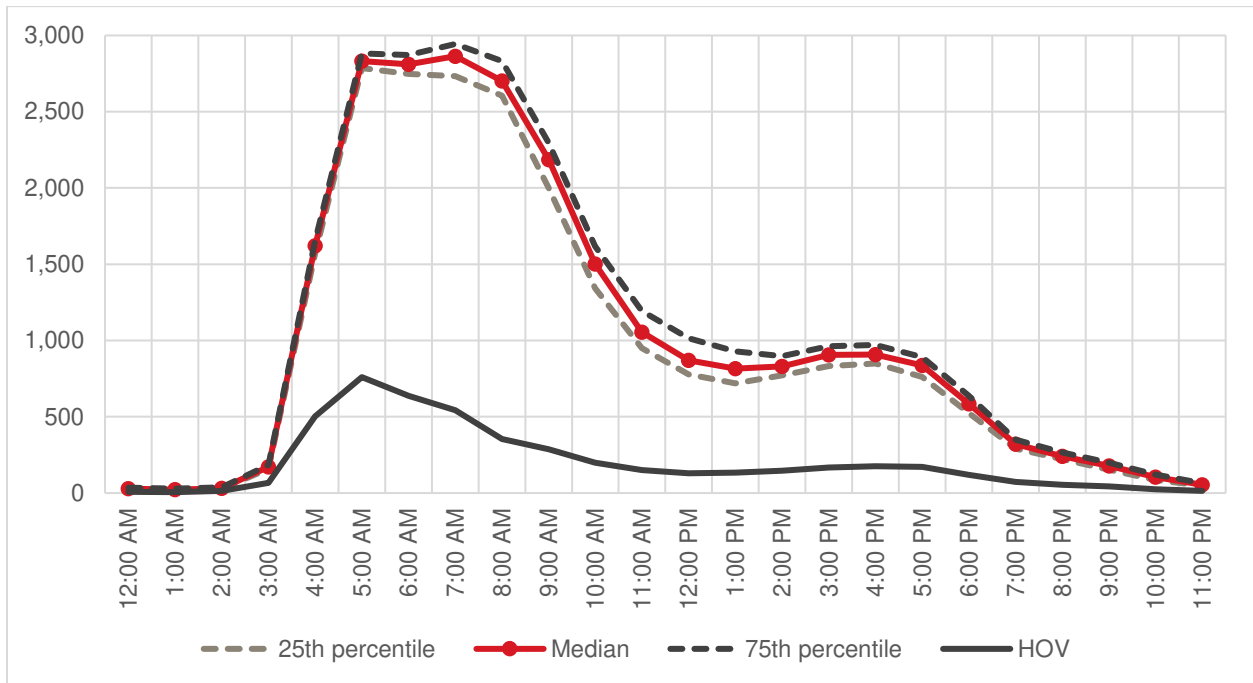
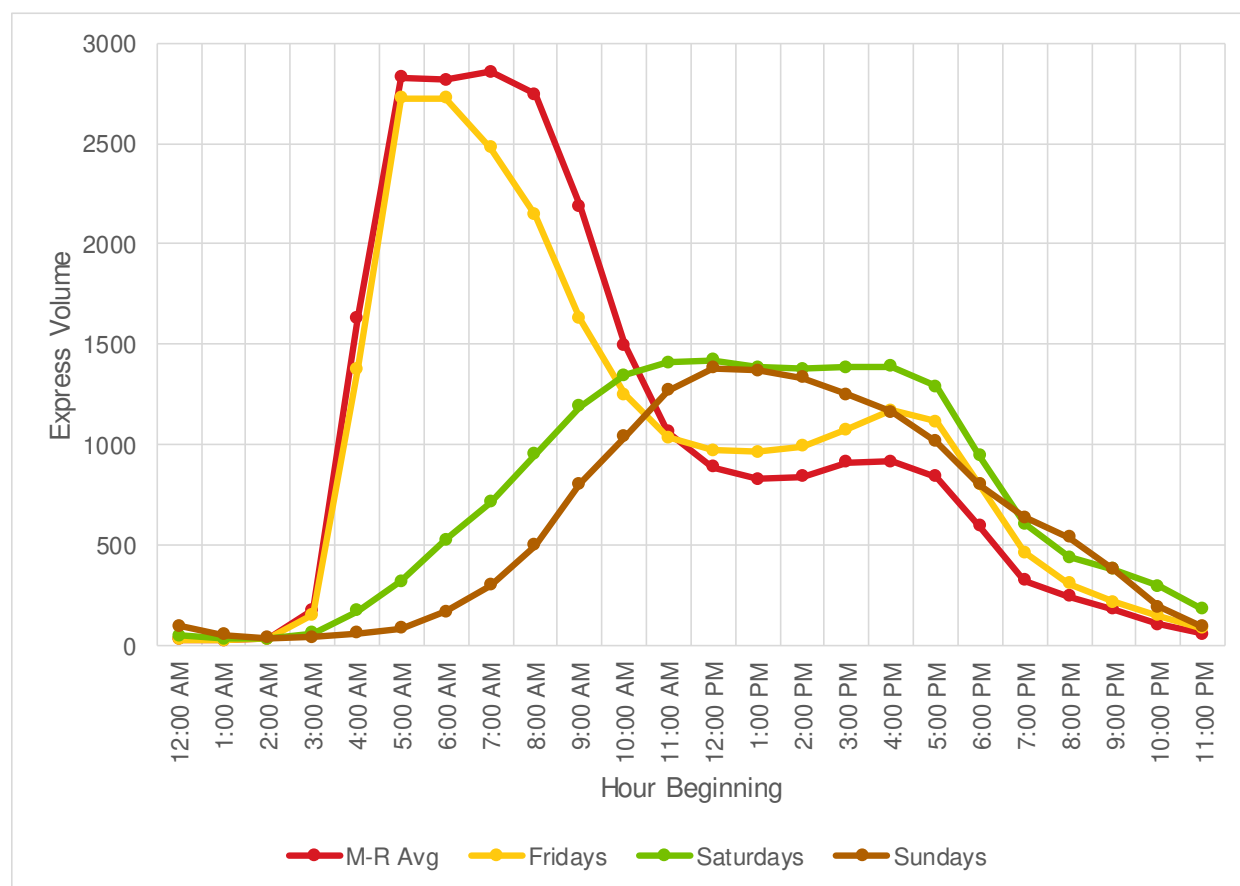


Figure 3-2: Westbound SR 91 Express Lanes 2018 Traffic by Hour – Riverside County



While westbound RCTC 91 Express Lane utilization is relatively stable from week to week, day of week variations are more notable. While westbound EL 24-hour traffic volumes on typical Fridays is comparable to typical weekday levels of about 24,000 vehicles per day, the temporal distribution of traffic varies, as shown in Figure 3-3. From 7 to 9 AM, westbound EL traffic on Fridays is several hundred vehicles per hour lower than it is on typical weekdays. Reduced EL utilization during the late morning hours on Fridays is attributable to GP lane traffic operating with less delay than exists during typical weekdays. By 12 PM, westbound traffic on Fridays exceeds traffic observed on typical Monday to Thursdays. The elevated Express Lane volumes correspond with an increase in corridor demand seen on Fridays in the westbound direction. Westbound EL demand on weekends is concentrated during the late morning and early evening hours. Weekend demand peaks at just under 1,400 vehicles per hour, half of the peak weekday and Friday levels. Demand on Saturdays maintains a peak of 1,400 vehicles per hour for about 8 hours (10 AM to 6 PM), while the Sunday peak encompasses only 3 hours from 12 to 3 PM.

Figure 3-3: Westbound 91 Express Hourly Volumes by Day of Week - 2018



The variation in Express Lane traffic by day of week results in a corresponding responses in westbound toll rates. As shown in Table 3-4, AM peak period tolls on Fridays are about one-half of typical weekday levels. Saturday and Sunday levels vary from \$1.45 for the movement to McKinley during overnight hours to a high of \$3.95 from 4 to 6 PM on Saturday for the movement to McKinley. Tolls during all other hours are below \$3.

Table 3-4: Westbound RCTC 91 Express Tolls by Day of Week (May 2018)

| WB AM Hourly Tolls | | From McKinley (WB) | | | | From SDC (WB) | | | |
|--------------------|----------|--------------------|--------|----------|--------|---------------|--------|----------|--------|
| Hour Start | Hour End | Mon-Thurs Avg | Friday | Saturday | Sunday | Mon-Thurs Avg | Friday | Saturday | Sunday |
| 3:00 AM | 4:00 AM | \$1.45 | \$1.45 | \$1.45 | \$1.45 | \$1.85 | \$1.85 | \$1.85 | \$1.85 |
| 4:00 AM | 5:00 AM | \$6.55 | \$3.95 | \$1.45 | \$1.45 | \$5.05 | \$5.05 | \$1.85 | \$1.85 |
| 5:00 AM | 6:00 AM | \$17.03 | \$7.90 | \$1.45 | \$1.45 | \$14.40 | \$6.50 | \$1.85 | \$1.85 |
| 6:00 AM | 7:00 AM | \$15.75 | \$7.15 | \$1.45 | \$1.45 | \$13.90 | \$5.05 | \$1.85 | \$1.85 |
| 7:00 AM | 8:00 AM | \$11.84 | \$5.05 | \$1.45 | \$1.45 | \$10.65 | \$5.05 | \$1.85 | \$1.85 |
| 8:00 AM | 9:00 AM | \$7.34 | \$5.05 | \$2.15 | \$1.45 | \$5.78 | \$5.05 | \$1.85 | \$1.85 |
| 9:00 AM | 10:00 AM | \$4.78 | \$3.95 | \$2.15 | \$2.15 | \$5.05 | \$2.80 | \$2.80 | \$1.85 |
| 10:00 AM | 11:00 AM | \$2.15 | \$2.15 | \$2.15 | \$2.15 | \$2.80 | \$2.80 | \$2.80 | \$2.80 |
| 11:00 AM | 12:00 PM | \$2.15 | \$2.15 | \$2.15 | \$2.15 | \$1.85 | \$2.80 | \$2.80 | \$2.80 |
| 12:00 PM | 1:00 PM | \$2.15 | \$2.15 | \$2.15 | \$2.15 | \$1.85 | \$1.85 | \$2.80 | \$2.80 |
| 1:00 PM | 2:00 PM | \$2.15 | \$2.15 | \$2.15 | \$2.15 | \$1.85 | \$1.85 | \$2.80 | \$2.80 |
| 2:00 PM | 3:00 PM | \$2.15 | \$2.15 | \$2.15 | \$2.15 | \$1.85 | \$1.85 | \$2.80 | \$2.80 |
| 3:00 PM | 4:00 PM | \$2.15 | \$2.15 | \$2.15 | \$2.15 | \$1.85 | \$2.80 | \$2.80 | \$2.80 |
| 4:00 PM | 5:00 PM | \$2.15 | \$2.15 | \$3.95 | \$2.15 | \$1.85 | \$2.80 | \$2.80 | \$2.80 |
| 5:00 PM | 6:00 PM | \$2.15 | \$2.15 | \$3.95 | \$2.15 | \$1.85 | \$1.85 | \$2.80 | \$1.85 |
| 6:00 PM | 7:00 PM | \$1.63 | \$2.15 | \$2.15 | \$2.15 | \$1.85 | \$1.85 | \$2.80 | \$1.85 |
| 7:00 PM | 8:00 PM | \$1.45 | \$1.45 | \$1.45 | \$1.45 | \$1.85 | \$1.85 | \$1.85 | \$1.85 |
| 8:00 PM | 9:00 PM | \$1.45 | \$1.45 | \$1.45 | \$1.45 | \$1.85 | \$1.85 | \$1.85 | \$1.85 |
| 9:00 PM | 10:00 PM | \$1.45 | \$1.45 | \$1.45 | \$1.45 | \$1.85 | \$1.85 | \$1.85 | \$1.85 |

Usage of the eastbound RCTC 91 Express Lanes is highest during the late afternoon hours. Eastbound express lane usage regularly exceeds 2,000 vehicles per hour during the 3-4 PM hour, with 800 vehicles destined to I-15 southbound paying a peak toll of \$5.15 (Wednesday and Thursday) and 1,250 vehicles destined to McKinley paying a peak toll of \$9.60 (Thursday).

Outside of the peak period, eastbound 91 Express lane usage is below 100 vehicles per hour during early morning hours and increases to less than 500 vehicles per hour during the morning hours. Overnight volumes on the EB ELs fall below 500 vehicles per hour by 10 PM and maintains that level throughout the night. Figure 3-4 shows the March to May 2018 Monday to Thursday average traffic and tolls on the eastbound 91 express lanes.

Figure 3-5 shows the variation of eastbound RCTC 91 Express Lanes traffic via 25th, 50th (median) and 75th percentiles. The 50th percentile or median represents the average and is defined as the volumes below or above which 50 percent of the observed traffic falls. It is evident from the graph that there is little variation, both the upper and lower bounds of traffic are within 100 vehicles of the median in the observed 2018 express lane volumes. HOV-3+ traffic which are toll-free except from 4-6 PM in the eastbound direction during weekdays does not exceed 500 vehicles per hour, representing approximately 20 percent of eastbound EL volume during the 3-4 PM hour.



Figure 3-4: Eastbound 91 Express Lanes Traffic and Tolls - Average Monday - Thursday

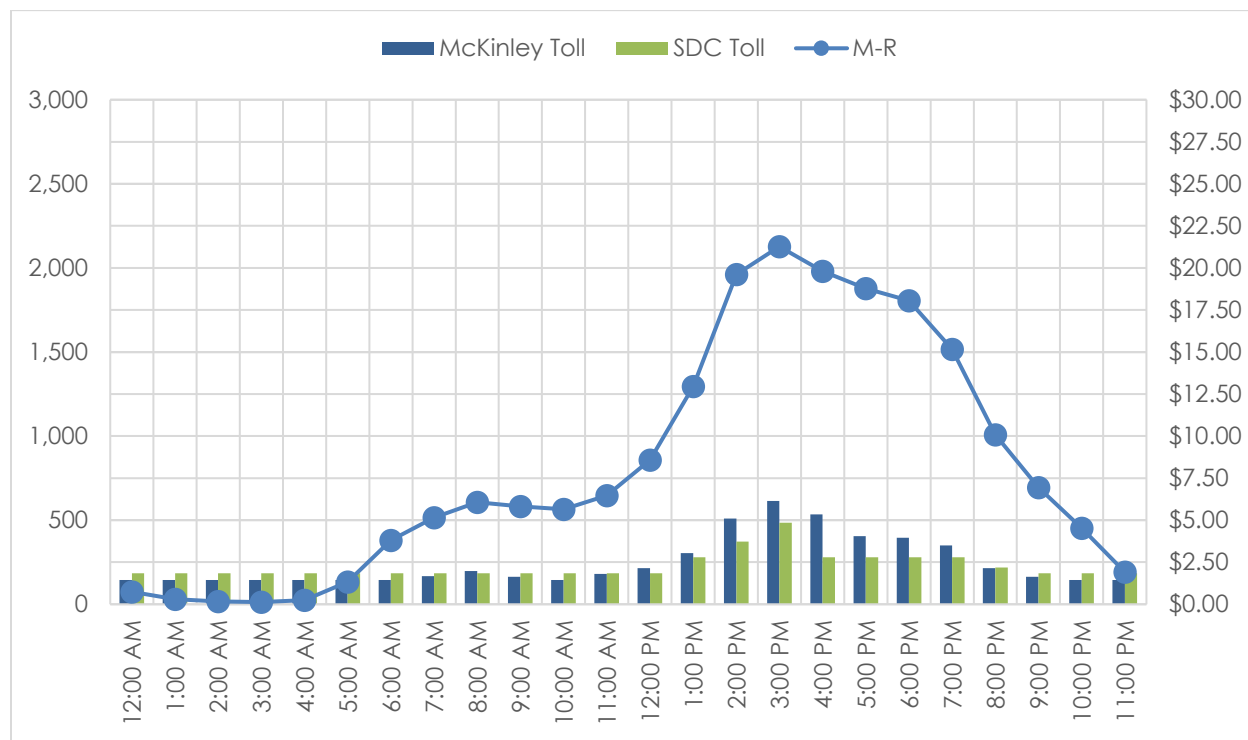
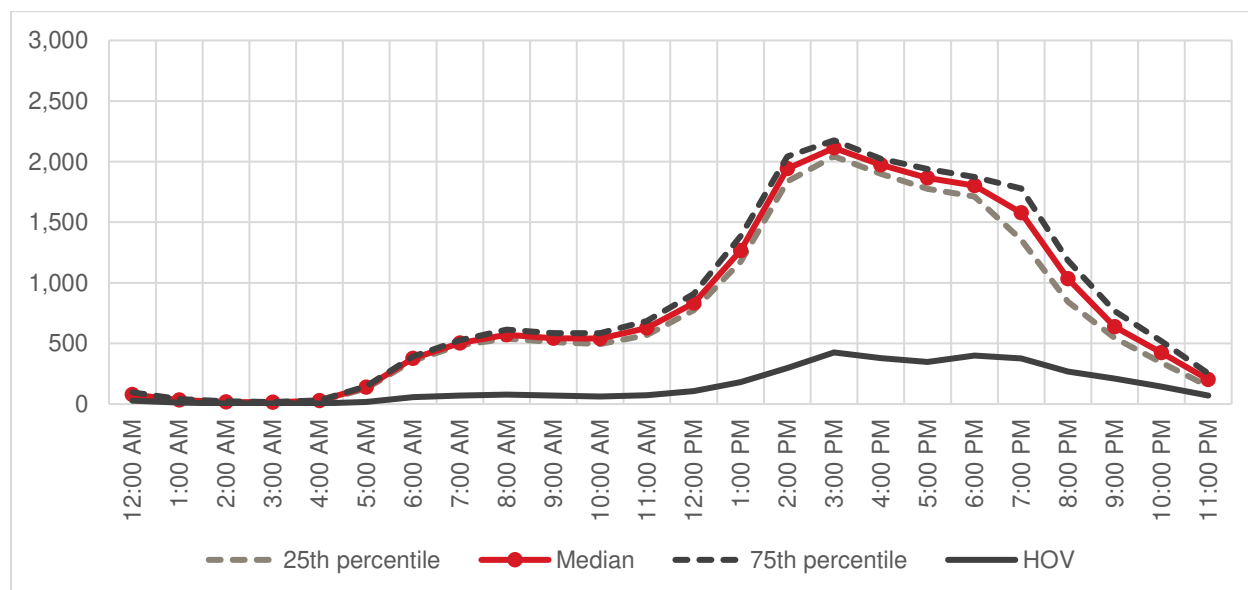


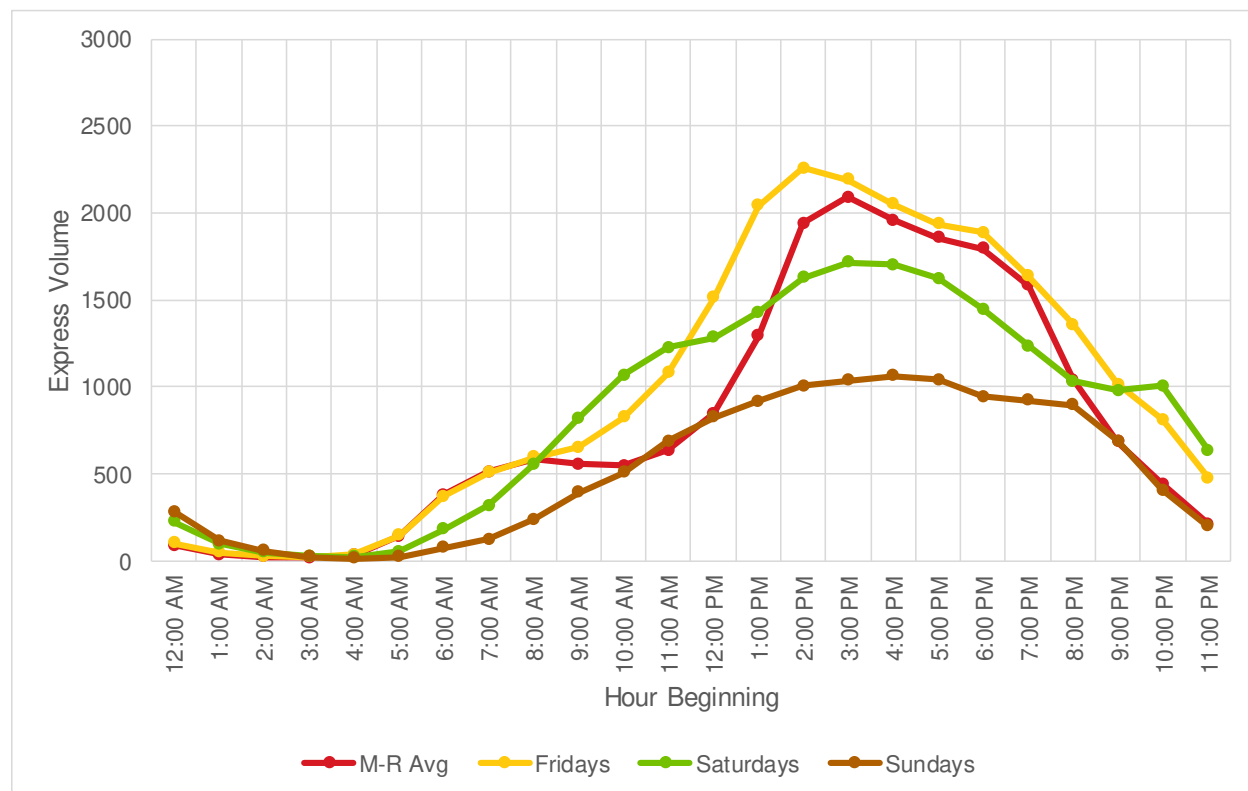
Figure 3-5: Eastbound SR 91 Express Lanes Traffic by Hour – Riverside County



Eastbound RCTC 91 EL traffic varies significantly by day of week. Traffic on typical Fridays exceeds typical weekday traffic by several hundred vehicles per hour from 10 AM to 3 PM, and from 8 PM to midnight, as shown in Figure 3-6. The increased utilization of the EB ELs during Friday is attributable to the general increase in EB 91 corridor traffic and

increase in congestion on typical Fridays. EB EL traffic on Saturdays is in total comparable to typical weekday levels of about 20,000 vehicles per day, but the hourly distribution differs. Whereas weekday traffic rapidly increases in the hours leading up to the PM rush hours, Saturday traffic gradually rises throughout the morning hours and peaks during the mid-afternoon before gradually declining. The temporal distribution of Sunday traffic is comparable to Saturday traffic but peaks at approximately 1,000 vehicles per hour, 700 vehicles per hour lower than the Saturday peak volume of 1,700 vehicles per hour.

Figure 3-6: Eastbound 91 Express Hourly Volumes by Day of Week - 2018



Eastbound EL tolls vary by day of week with the lowest tolls on Mondays and the highest tolls on Fridays, as shown in Table 3-5. Toll rates are commensurate with the demand for each movement, as well as the relative congestion seen in the eastbound GP lanes. Express Lane tolls for the trip to I-15 SB using the Southern Direct Connector (SDC) are at minimum levels for most of the day and only reach \$5.15 during the 3-4 PM hour whereas tolls for the movement toward McKinley Street are generally higher than SDC tolls and reach a high of \$16.40 on Fridays during the 3-4 PM hour. This stark difference in tolls exists because the demand for the movement toward McKinley Street is more than 50 percent greater than demand for the SDC. The spike in Friday tolls from Monday to Thursday levels is attributable to the increased GP lane demand, congestion, and potential time savings offered by the eastbound Express Lanes. The higher tolls on Fridays along with increased EL traffic explains why revenue generated on typical Fridays in the eastbound direction is twice as high as the average daily revenue generated by the eastbound lanes from Monday to Thursday (see Table 3-2). SDC tolls on Saturdays and Sundays are similar to weekday tolls during PM peak hours as well as the rest of the day whereas tolls for the movement to McKinley Street on Saturdays are only slightly lower than tolls on Mondays or Tuesdays.

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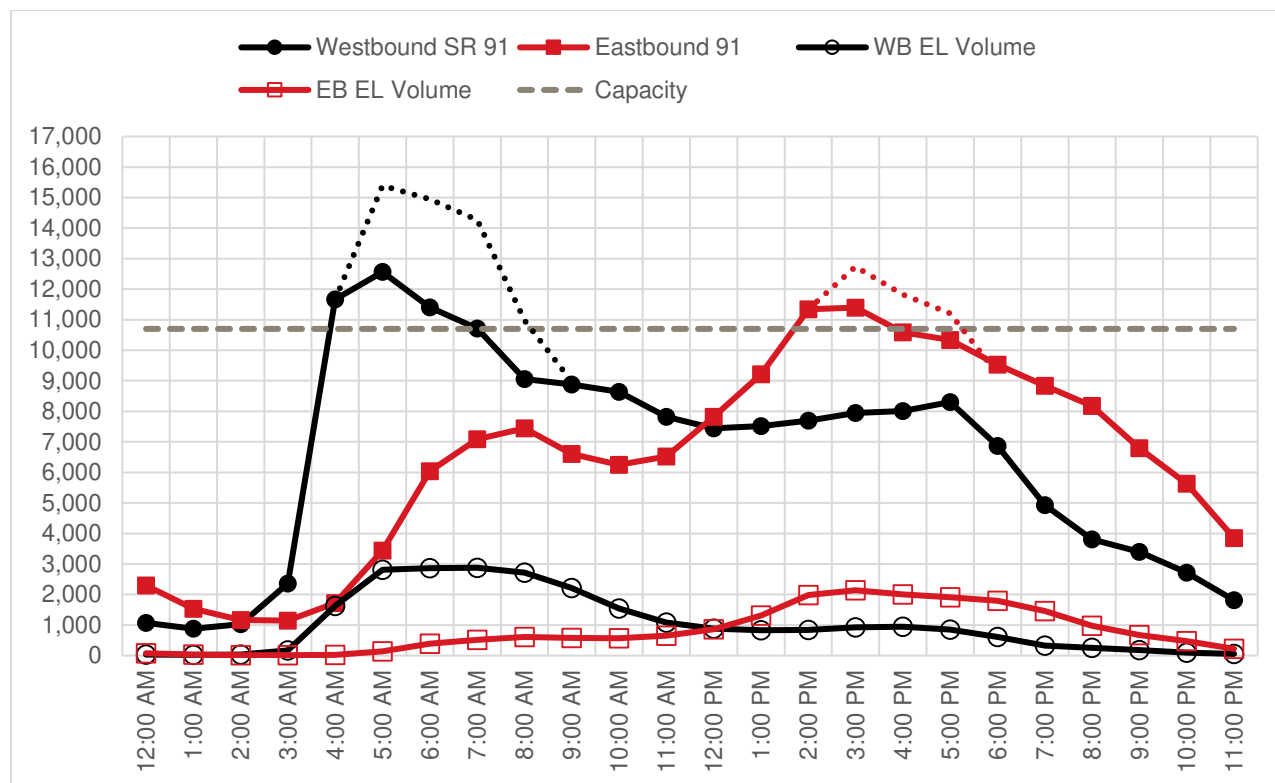
Table 3-5: Eastbound RCTC 91 Express Tolls by Day of Week (May 2018)

| EB PM Hourly Tolls | | To McKinley (EB) | | | | To SDC (EB) | | | |
|--------------------|----------|------------------|---------|----------|--------|---------------|--------|----------|--------|
| Hour Start | Hour End | Mon-Thurs Avg | Friday | Saturday | Sunday | Mon-Thurs Avg | Friday | Saturday | Sunday |
| 3:00 AM | 4:00 AM | \$1.45 | \$1.45 | \$1.45 | \$1.45 | \$1.85 | \$1.85 | \$1.85 | \$1.85 |
| 4:00 AM | 5:00 AM | \$1.45 | \$1.45 | \$1.45 | \$1.45 | \$1.85 | \$1.85 | \$1.85 | \$1.85 |
| 5:00 AM | 6:00 AM | \$1.45 | \$1.45 | \$1.45 | \$1.45 | \$1.85 | \$1.85 | \$1.85 | \$1.85 |
| 6:00 AM | 7:00 AM | \$1.45 | \$1.45 | \$1.45 | \$1.45 | \$1.85 | \$1.85 | \$1.85 | \$1.85 |
| 7:00 AM | 8:00 AM | \$1.80 | \$1.45 | \$1.45 | \$1.45 | \$1.85 | \$1.85 | \$1.85 | \$1.85 |
| 8:00 AM | 9:00 AM | \$1.98 | \$2.15 | \$1.45 | \$1.45 | \$1.85 | \$1.85 | \$1.85 | \$1.85 |
| 9:00 AM | 10:00 AM | \$1.63 | \$2.15 | \$2.15 | \$1.45 | \$1.85 | \$1.85 | \$1.85 | \$1.85 |
| 10:00 AM | 11:00 AM | \$1.45 | \$2.15 | \$2.15 | \$1.45 | \$1.85 | \$1.85 | \$1.85 | \$1.85 |
| 11:00 AM | 12:00 PM | \$1.80 | \$2.15 | \$2.15 | \$2.15 | \$1.85 | \$1.85 | \$2.80 | \$1.85 |
| 12:00 PM | 1:00 PM | \$2.15 | \$3.95 | \$3.95 | \$2.15 | \$1.85 | \$2.80 | \$2.80 | \$1.85 |
| 1:00 PM | 2:00 PM | \$3.05 | \$8.40 | \$3.95 | \$2.15 | \$2.80 | \$2.80 | \$2.80 | \$1.85 |
| 2:00 PM | 3:00 PM | \$5.09 | \$15.40 | \$3.95 | \$2.15 | \$3.93 | \$5.05 | \$2.80 | \$1.85 |
| 3:00 PM | 4:00 PM | \$6.14 | \$15.40 | \$3.95 | \$2.15 | \$5.05 | \$2.80 | \$2.80 | \$1.85 |
| 4:00 PM | 5:00 PM | \$5.34 | \$10.40 | \$3.95 | \$2.15 | \$2.80 | \$2.80 | \$2.80 | \$1.85 |
| 5:00 PM | 6:00 PM | \$3.95 | \$7.40 | \$3.95 | \$2.15 | \$2.80 | \$2.80 | \$2.80 | \$1.85 |
| 6:00 PM | 7:00 PM | \$3.95 | \$3.95 | \$3.95 | \$2.15 | \$2.80 | \$2.80 | \$2.80 | \$1.85 |
| 7:00 PM | 8:00 PM | \$3.50 | \$3.95 | \$2.15 | \$2.15 | \$2.80 | \$2.80 | \$2.80 | \$1.85 |
| 8:00 PM | 9:00 PM | \$2.15 | \$2.15 | \$2.15 | \$2.15 | \$2.09 | \$2.80 | \$1.85 | \$1.85 |
| 9:00 PM | 10:00 PM | \$1.63 | \$2.15 | \$2.15 | \$1.45 | \$1.85 | \$1.85 | \$1.85 | \$1.85 |

Figure 3-7 shows global demand and express lane usage by hour at the Riverside / Orange County Line. The dotted gray line represents the observed maximum global throughput of 10,700 vehicles per hour and the black and red dotted lines show the cumulative demand in excess of capacity during the most congested hours. Usage of the express lanes follows the trend of the cumulative demand in excess of available capacity.



Figure 3-7: SR 91 Global Demand & Express Traffic by hour - Riverside - Orange County Line



3.1.2 Travel Time Savings

The comparison of travel times on the ELs vs. GP lanes shows the amount of time saved from use of the ELs. Traveling westbound in the morning, the route from McKinley Street between the existing price sign and the Riverside / Orange County Line (7.6 miles) via the Express Lanes saves between 10 and 15 minutes during the AM peak period. Figure 3-8 shows the travel time comparison between express and general purpose lanes. The majority of the delay on the general purpose lanes is concentrated between Lincoln Avenue and the County Line with speeds less than 20 mph whereas the delays in the express lanes are concentrated east of the express lane ingress. Figure 3-9 compares speeds between the ELs and WB 91 GP lanes during the 5 AM hour. These field observations demonstrate the delays exist on the approach to the WB ELs due to high EL demand. Once vehicles have entered the ELs, travel speeds improve. On this particular day, while the ELs saved only 9 minutes vs. the GP lanes, the trip once past the entrance of the ELs required only 10 minutes, i.e., time savings within the ELs would have been closer to 20 minutes were it not for the delays encountered near the EL entrance.

Figure 3-8: Westbound Express Vs GP Travel Times - McKinley, Monday 8/28/2017

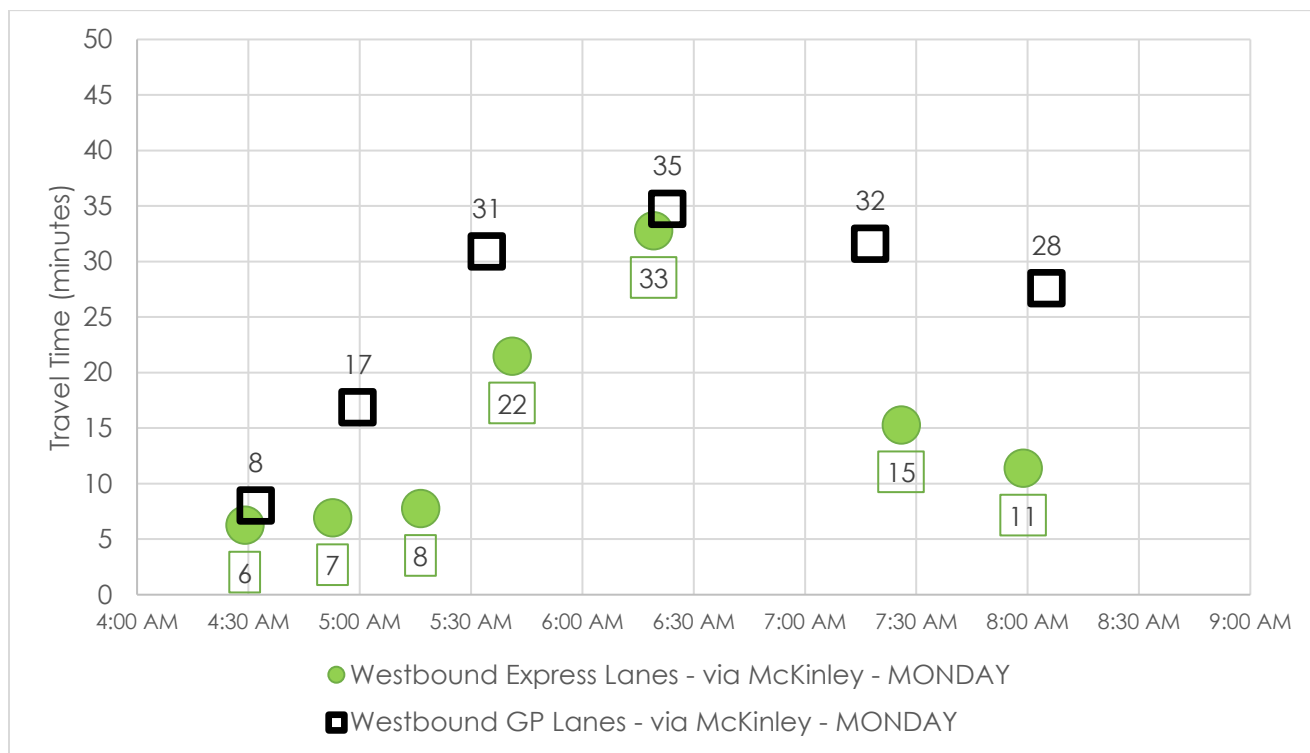
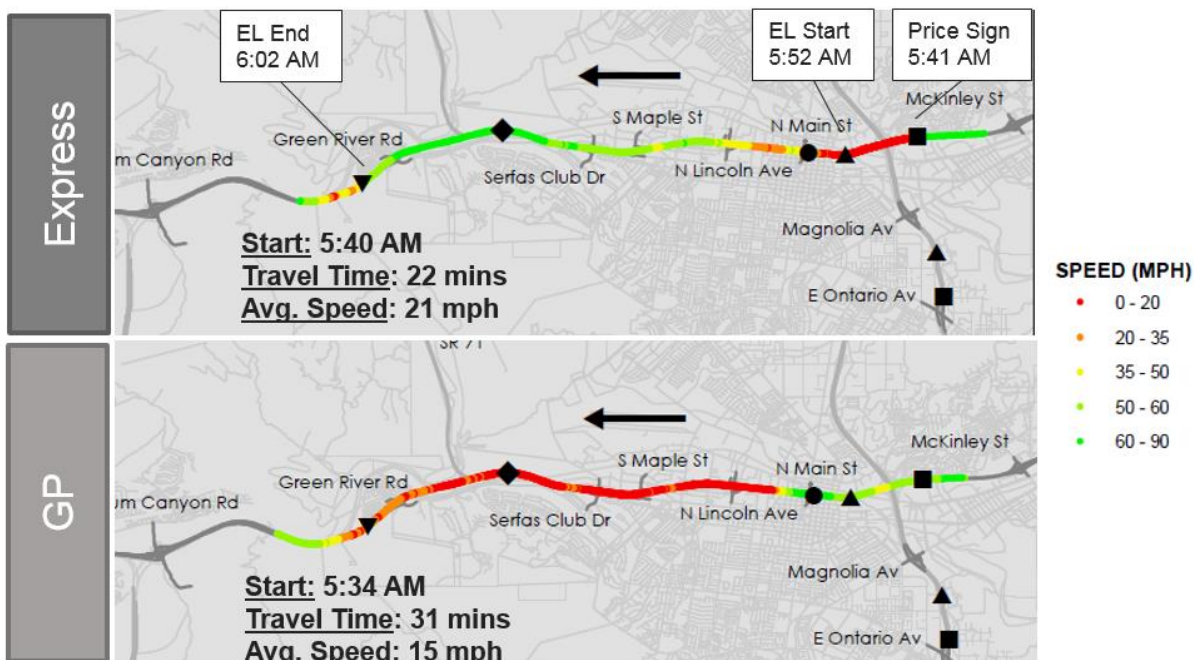


Figure 3-9: Westbound Express vs GP Speeds - McKinley, Monday 8/28/2017



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Traveling eastbound during the PM peak period, the route from the County Line to McKinley Street (~8 miles) via the Express Lanes consistently saves four to eight minutes between 3 to 6:30 PM. Figure 3-10 compares EB EL and GP travel times during a typical Tuesday. The travel time data shown in Figure 3-11 demonstrate that the EB EL trip via McKinley Street permits users to save time by bypassing the congested EB GP lanes between Lincoln Avenue and I-15. While the EB EL movement to McKinley Street is operating with delay, queues are shorter and the ELs are moving faster than the GP.

Figure 3-10: Eastbound Express Vs GP Travel Times - McKinley, Tuesday 12/12/2017

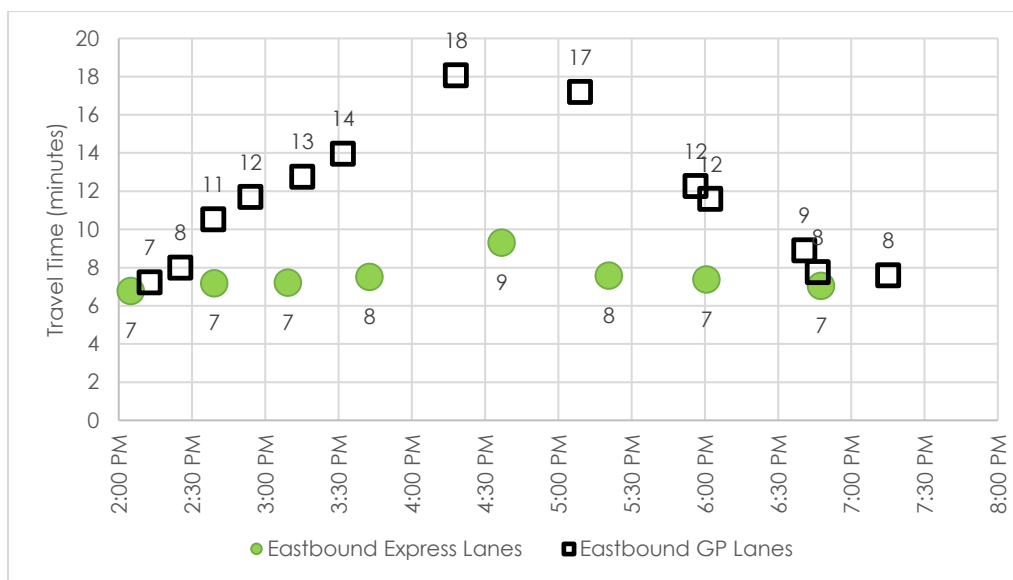
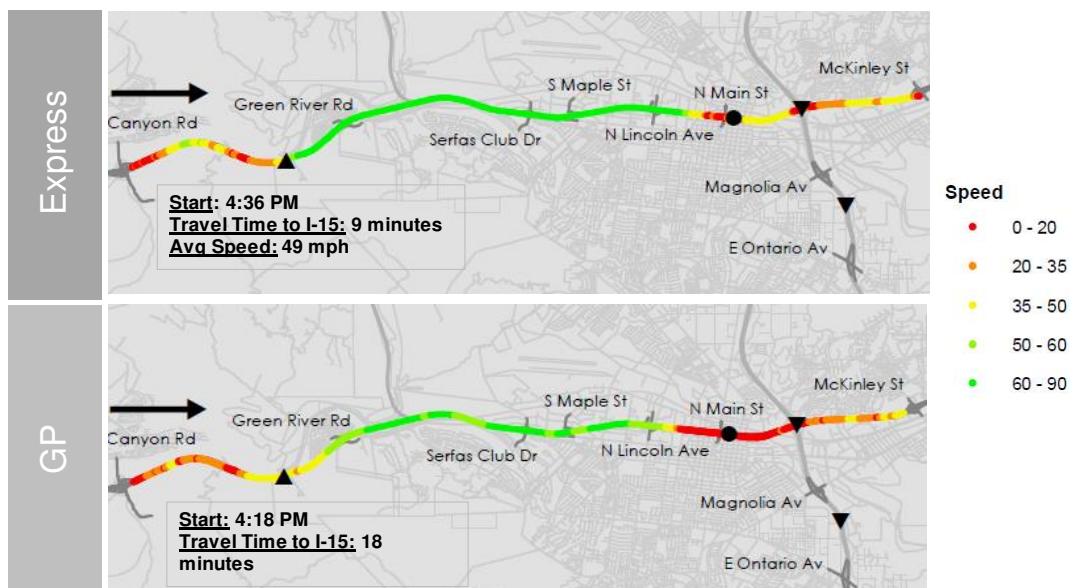


Figure 3-11: Eastbound Express vs GP Speeds – McKinley, Tuesday 12/12/2017



3.1.3 Express Lanes Traffic Composition

Figure 3-12 shows the composition of vehicle classes using the RCTC 91 Express Lanes. More than 78 percent of the total traffic are toll paying, 19 percent are High Occupancy Vehicles (HOVs), 1.6 percent are disabled persons and disabled veterans with special access plates and 0.8 percent are Zero-Emission Vehicles (ZEVs).

Figure 3-12: RCTC 91 Express Lanes Composition

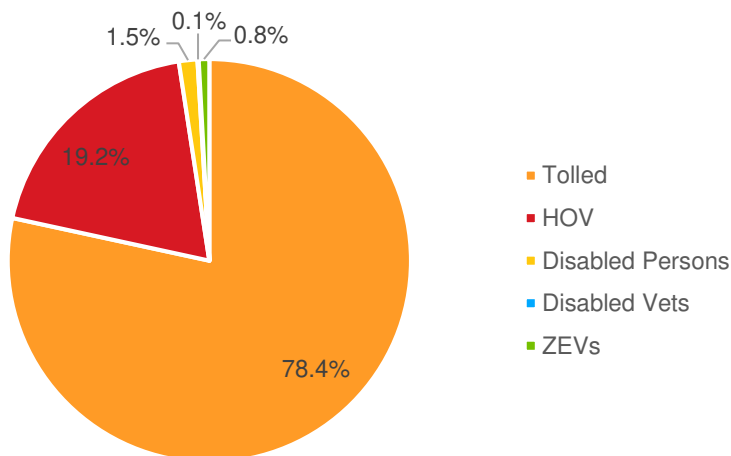
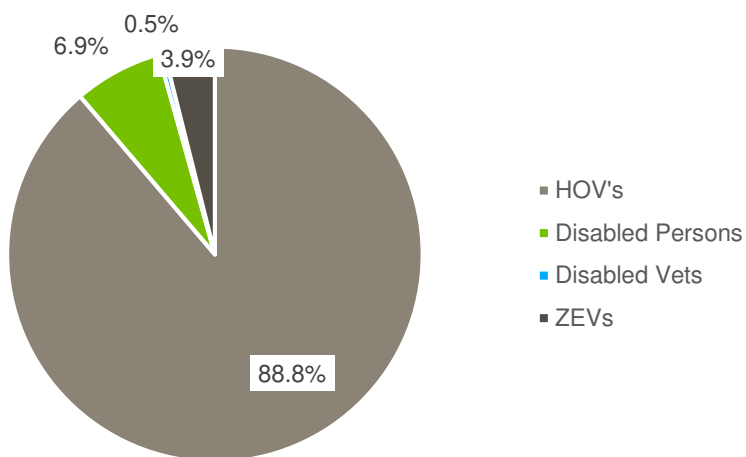


Figure 3-13 shows the toll-free vehicle distribution on the RCTC 91 Express Lanes. Almost 89 percent of the toll-free vehicles are comprised of HOVs, 7.4 percent are comprised of disabled people and disabled veterans, and the remaining 3.9 percent are ZEVs.

Figure 3-13: RCTC 91 Express Lanes - Free Vehicles Distribution



3.1.4 Frequency of Express Lanes Utilization

Analyzing customer frequency data from February to July 2018 revealed that just over half of total trips using the westbound ELs on weekday mornings (4-10 AM) are from frequent users, defined as using the facility at least once per week whereas 44 percent of the trips are made by infrequent users using the facility less than three times per month. During weekday afternoons and evenings (2-8 PM), approximately two-thirds of EL trips are made by infrequent users using the facility less than three times per month. Only one-third of the trips are comprised of frequent users using the facility at least once per week. Figure 3-14 shows the trip frequency distribution of westbound EL traffic during the morning. Figure 3-15 shows the express lanes trip frequency distribution of EB EL traffic during the afternoon and evening.

Figure 3-14: Express Lane Trip Frequency - Westbound 4-10 AM

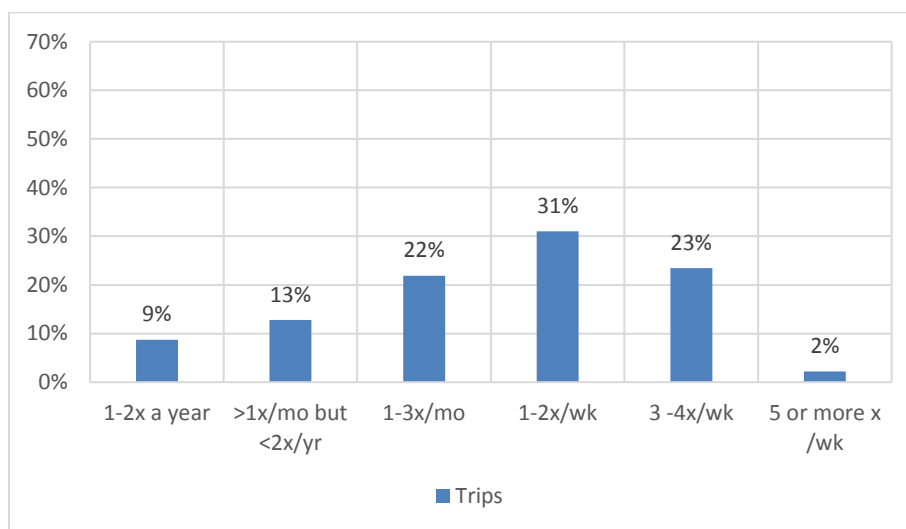
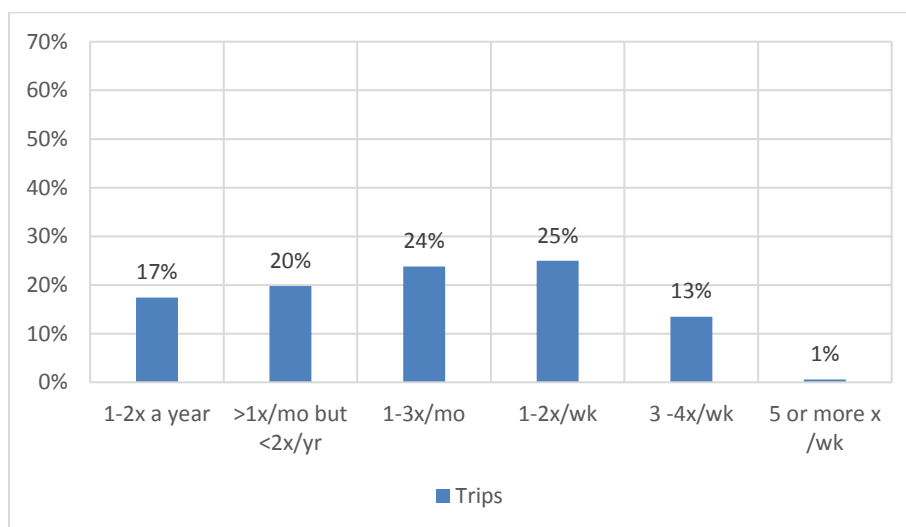


Figure 3-15: Express Lane Trip Frequency - Eastbound 2-8 PM



3.2 DATA COLLECTION PROGRAM

Traffic data in the SR 91 corridor and study area were collected over a span of a week in mid-May 2018. Supplemental data were collected in December 2017, February 2018, and June 2018. The data collected includes traffic volumes, speeds, travel times, and origin-destination patterns. Supplemental traffic data collected for concurrent studies were also incorporated. The focus of the count program was to record typical weekday traffic along the SR 91 corridor and critical parallel and feeder routes. These data were used as a baseline to calibrate the travel demand, market share, and simulation models. Weekend traffic data were also collected at select locations along SR 91. In addition to the freeway mainlines, ramp traffic counts were collected along SR 91 between SR 55 to Gypsum Canyon Road in Orange County and Green River Road to Pierce Street in Riverside County. Traffic volumes on arterials in Downtown Corona and along I-15 between Cajalco Road and SR 60 were also recorded. Origin-Destination (OD) patterns along the SR 91 corridor were collected using Streetlight data to gain an understanding of the most popular trip pairs and trip lengths. Travel speeds along SR 91 on both General Purpose (GP) and Express Lanes (EL) were collected via a combination of numerous floating car travel time surveys and publicly available sources such as SigAlert. Traffic volume data is gathered from various sources including Stantec's independent count program, which consists of redundant counts on several location on SR 91, and third-party sources. These third-party sources include Caltrans Freeway Performance Measurement System (PeMs) for various mainline and locations in the region. Hourly traffic and toll information on SR 91 Express Lanes were provided by the Orange County Transportation Agency (OCTA) and the Riverside County Transportation Commission (RCTC). Hourly traffic and toll information on the Foothill and Eastern Toll Roads in Orange County were provided by the Transportation Corridor Agencies (TCA).

3.2.1 Screenline Traffic Volumes

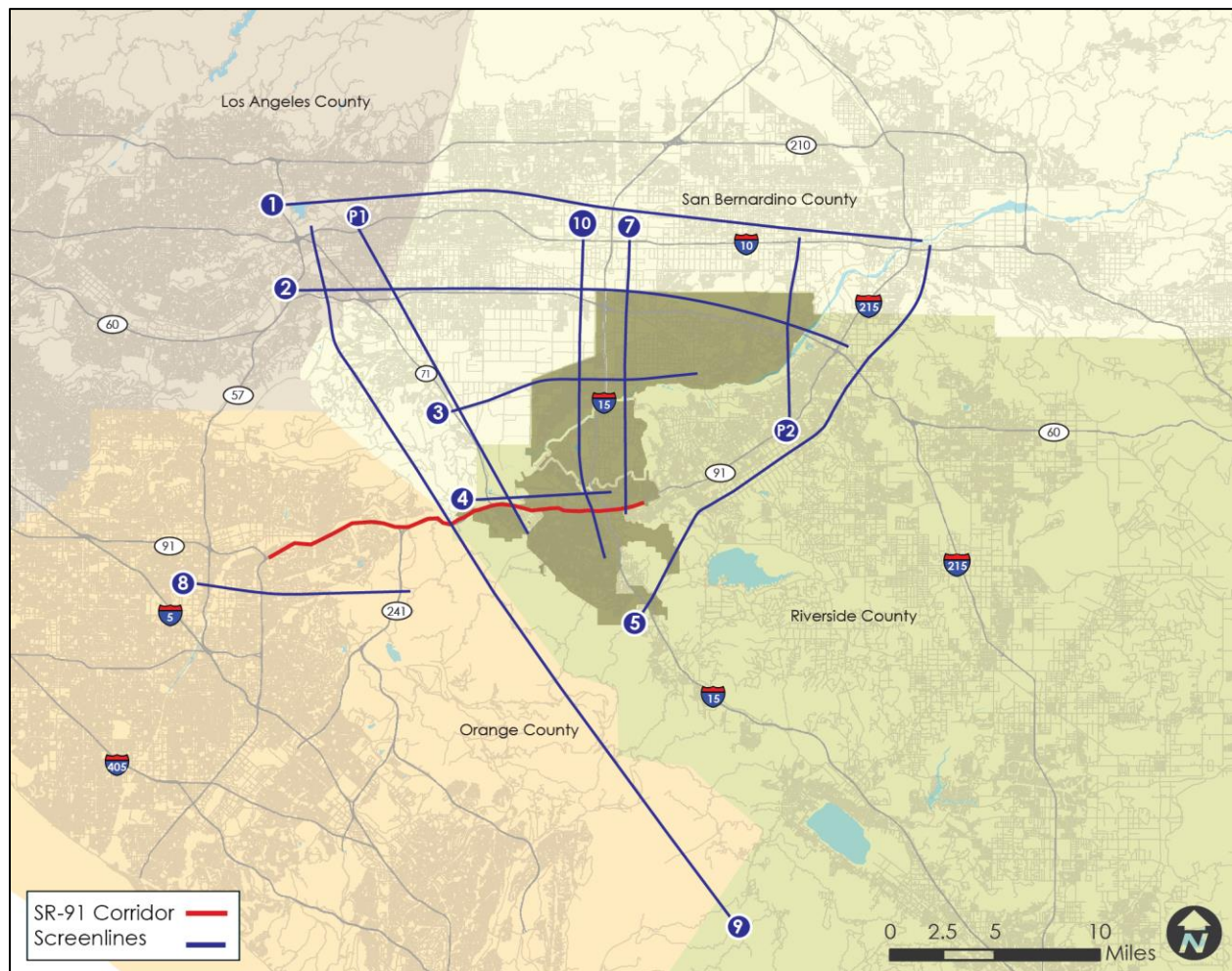
Eleven screenlines were identified to establish model calibration benchmarks in the corridor. The screenlines measure traffic traveling north and south or east and west across several parallel roadways. A critical element of travel demand model calibration is to ensure the model is assigning and distributing an appropriate amount of traffic to all the north-south and east-west roadways included in the screenline. The screenline analysis also provides insight to how the SR 91 corridor's traffic compares against other competing parallel roadways and how they relate to intersecting north-south roadways.

Six screenlines were drawn across north-south roadways (numbers 1 through 5, 8), and five screenlines were drawn across east-west roadways (numbers 7,9,10 and letters P1, P2). Figure 3-16 shows the locations of the eleven screenlines. All five east-west screenlines include SR 91 and intersect SR 91 within Orange and Riverside County. All north-south screenlines are feeders of the SR 91 corridor and all east-west screenlines include competitors or alternatives to SR 91 corridor. Screenlines 1,2,3 and 4 compare north-south traffic volumes north of the SR 91 corridor from SR 57 to I-215. Screenline 5 compares northwest-southeast traffic volumes from I-15 to I-10. Screenlines 7 and 10 compare east-west traffic volumes, east and west of I-15, respectively. Screenline 8 compares north-south traffic volumes on SR 55, SR 57, and SR 241 in Orange County. Screenline 9 compares east-west traffic on SR 91 in Corona to arterial alternatives. Screenlines P1 and P2 compare east-west traffic east of SR 71 and west of I-215, respectively.

Screenline traffic data were largely collected via the project's independent count program, Caltrans' PeMs database, the Transportation Corridor Agencies (TCA), the Orange County Transportation Authority (OCTA), and the Riverside County Transportation Commission (RCTC).



Figure 3-16: Screenline Map



3.2.2 Mainline Traffic Counts

Mainline traffic volumes along SR 91 in Riverside and Orange Counties were collected as part of the data collection program. In Riverside County, three westbound and four eastbound mainline traffic counts between I-15 and the County Line were collected. In Orange County, westbound mainline counts between Weir Canyon Road and Imperial Highway and eastbound mainline counts between Lakeview Avenue and Imperial Highway were also collected as part of a concurrent study. Count locations are shown in Figure 3-17 and listed out below:

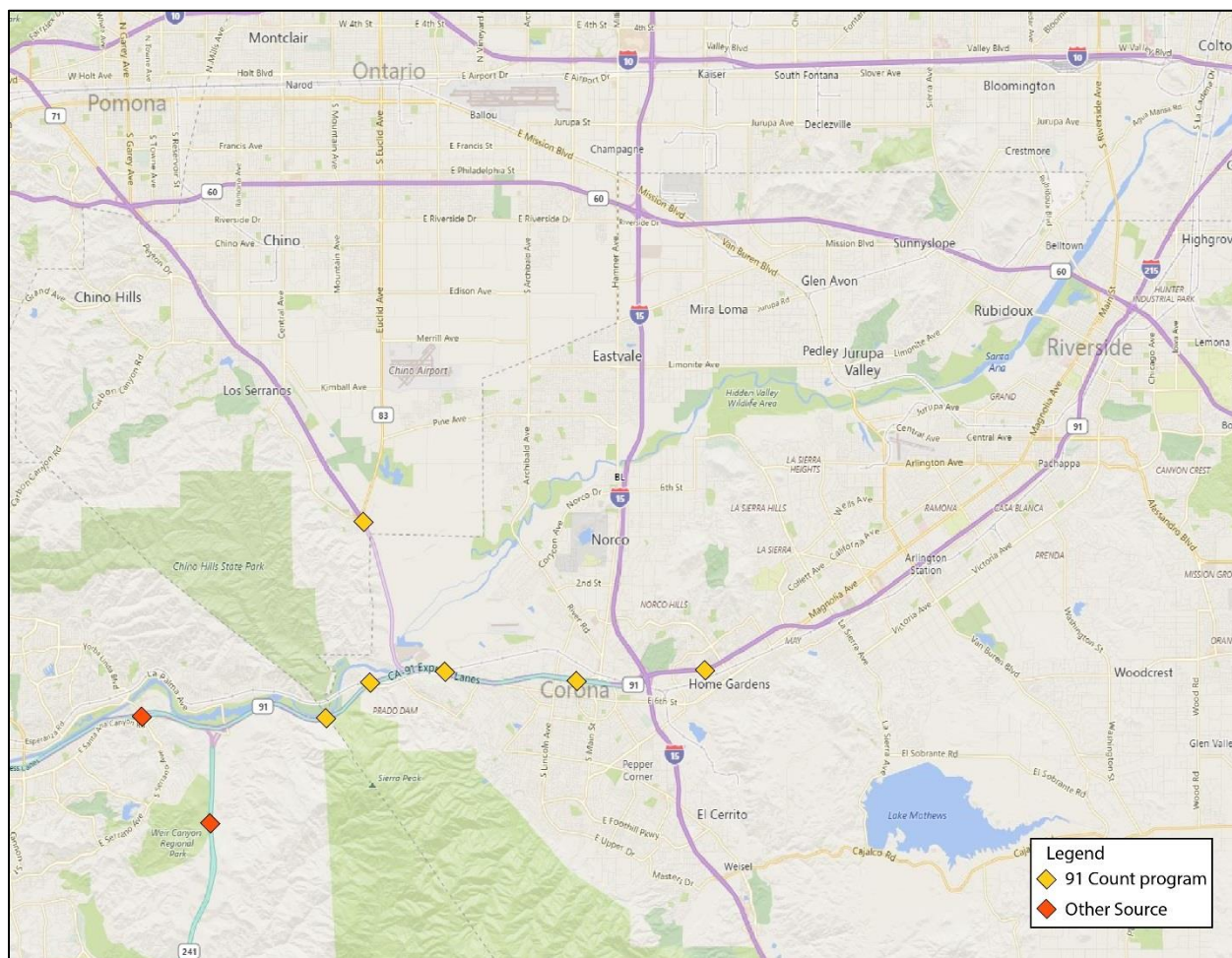
- I-15 and McKinley Street (eastbound and westbound)
- Lincoln Avenue and Main Street (westbound)
- SR 71 and Serfas Club Dr (eastbound)
- Between Green River Road Ramps (westbound)
- SR 91 at the Orange / Riverside County Line (eastbound)

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Additional mainline count data was provided by Riverside County Transportation Commission (RCTC) and Orange County Transportation Authority (OCTA) for their SR 91 Express Lanes and by the Transportation Corridor Agencies (TCA) for the Windy Ridge Toll Plaza on SR 241.

Figure 3-17: Mainline Count Locations



Other sources include OCTA and TCA

3.2.3 Ramp Counts

Traffic volumes on all SR 91 ramps between and including Green River Road and Pierce Street except for the SR 91 Eastbound off-ramp to the Main Street collector-distributor (CD) road were collected as part of the count program. Only AM and PM peak period traffic volumes were available on the direct connectors to I-15. The location of ramp counts is shown in Figure 3-18 and listed below:

- Green River Road
- SR 71
- Serfas Club Dr
- Maple Street



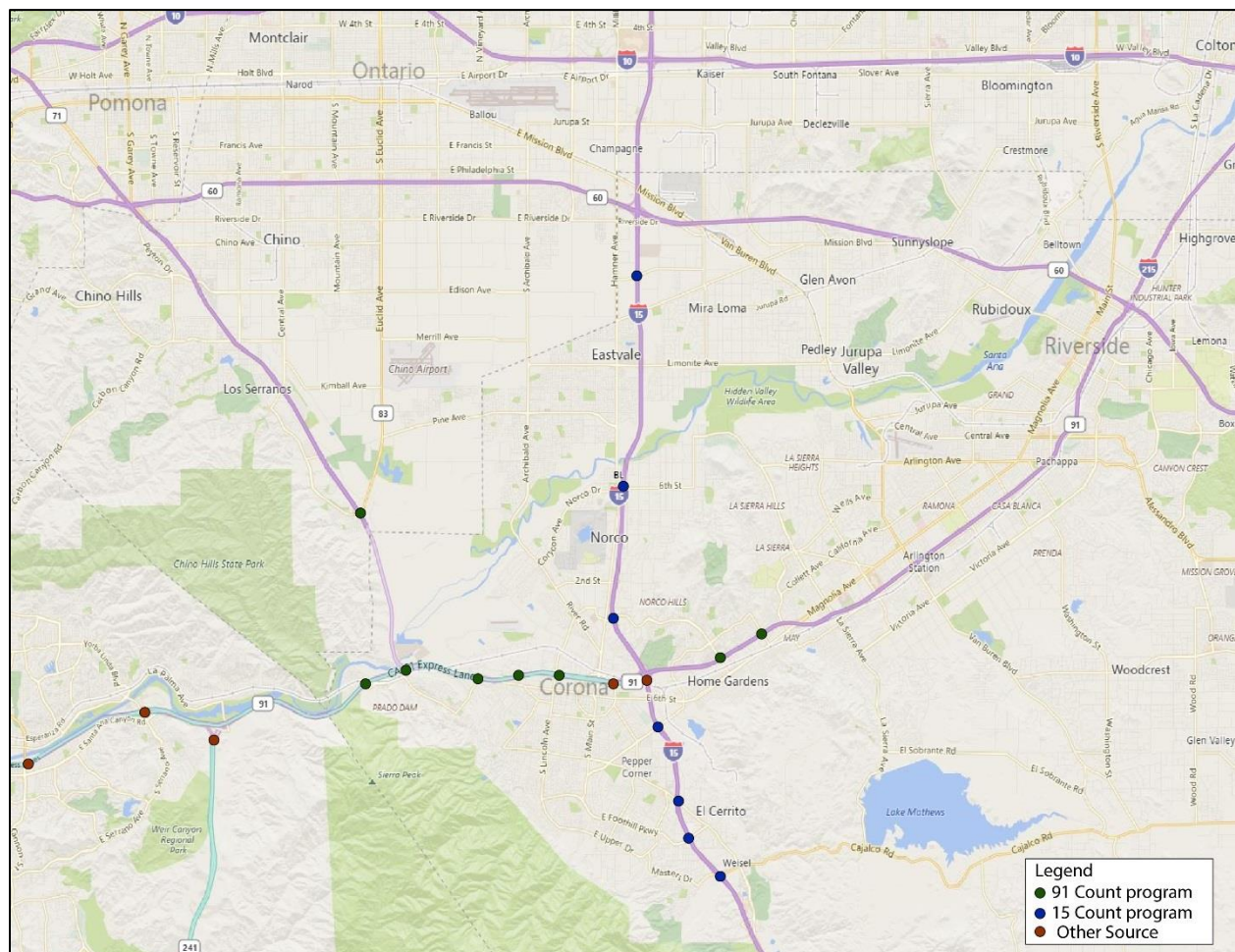
RCTC 91 EXPRESS LANES INVESTMENT GRADE TRAFFIC AND REVENUE STUDY

Existing Conditions

- Lincoln Avenue
- Main Street
- I-15
- McKinley Street
- Pierce Street

As part of a concurrent study, traffic volumes were collected on SR 91 ramps at Gypsum Canyon Road, SR 241, Weir Canyon Road, Imperial Highway, Lakeview Avenue and SR 55 in Orange County.

Figure 3-18: Ramp Count Locations



Other sources include OCTA, TCA and RCTC via Parsons

3.2.4 Arterial Traffic Counts

The SR 91 does not have any parallel local roads that allow travel through the Riverside/Orange County Line. There are however a handful of local roads, shown in Figure 3-19, that can be used to complete local trips or bypass portions of congested segments on SR 91. Understanding the balance between SR 91 mainline versus area arterials is an

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important part of the model calibration and forecasting process. Traffic counts along numerous regionally and locally significant arterial roadways were collected. Arterial Count locations are listed below and depicted in Figure 3-20.

- Green River Road, west of Palisades Drive
- Magnolia Avenue, west of McKinley Street
- Railroad Street, west of Smith Avenue
- Railroad Street, west of Lincoln Avenue
- E 6th Street, west of Promenade Avenue
- Magnolia Avenue between Fullerton Avenue and Mason Place
- W Ontario Avenue between Vicentia Avenue and Buena Vista Avenue

As part of a concurrent study, arterials along the I-15 corridor between Cajalco Road and SR 60 were also collected and analyzed for the study.

Figure 3-19: Parallel Arterials to SR 91

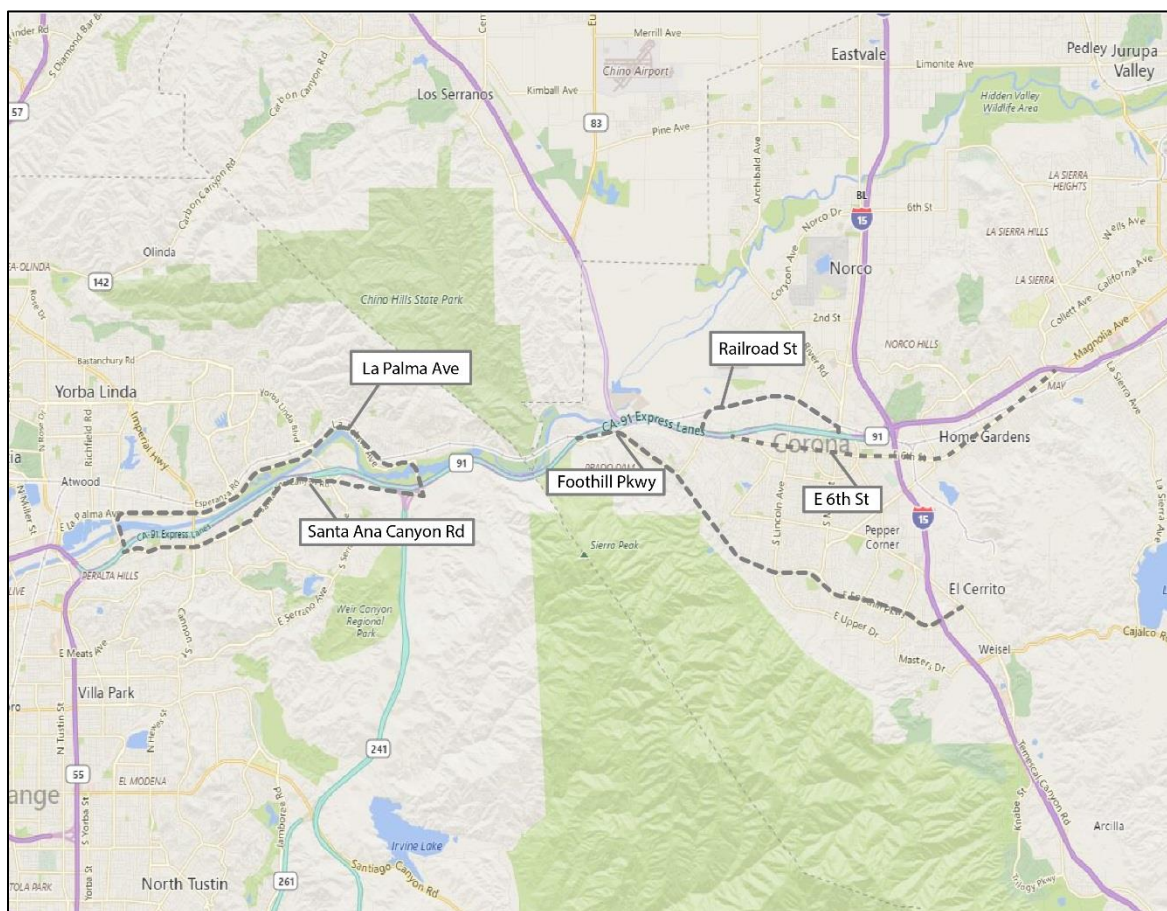
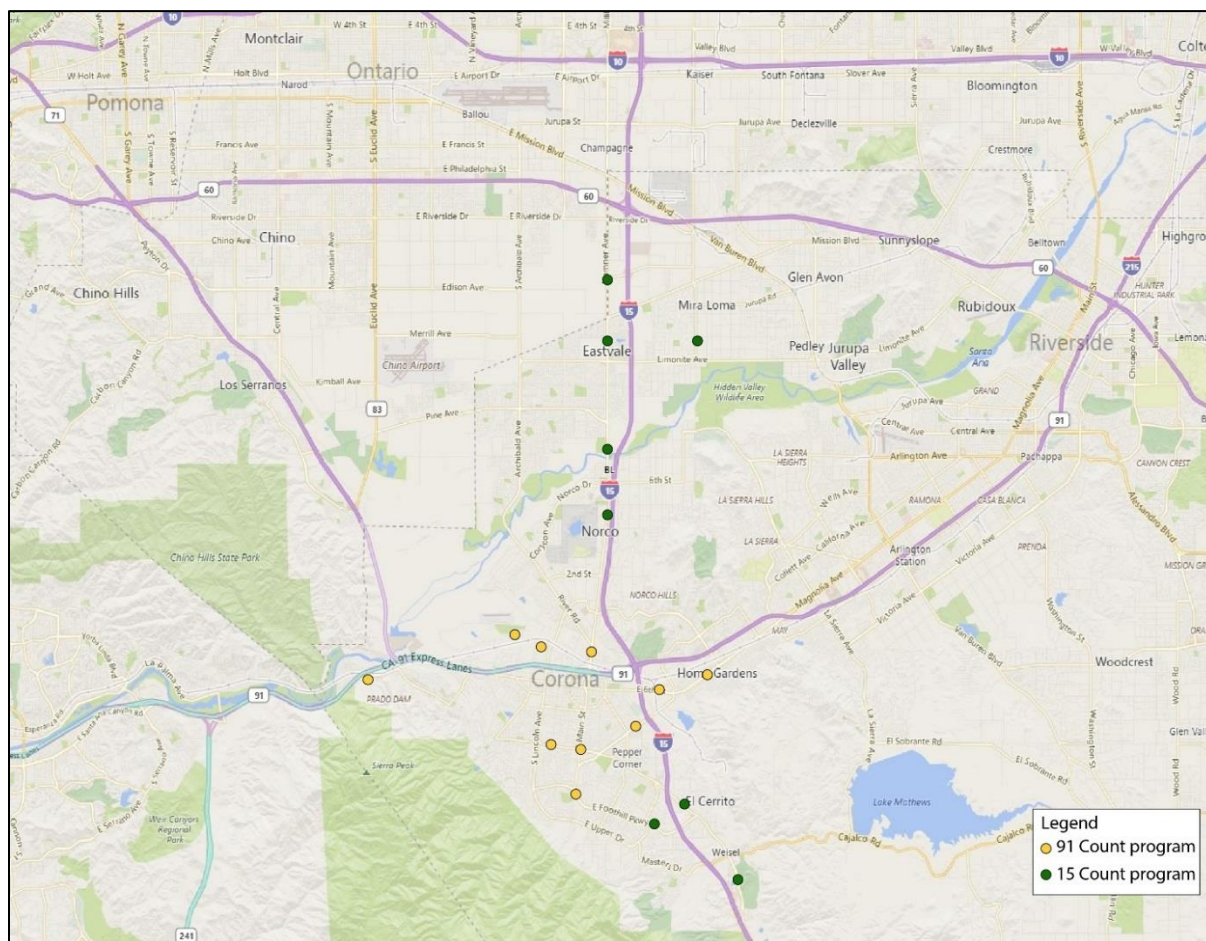


Figure 3-20: Arterial Count Locations



3.3 SR 91 CORRIDOR DATA

3.3.1 Screenline Traffic Volumes

Traffic volumes from the north-south screenlines as shown in Table 3-6 show that the region's north-south freeways namely I-15, I-215, and SR 57 represent the largest share although some arterials capture a significant share of traffic. I-15 captures a major share of all the north-south traveling traffic ranging from more than half to just about a third of traffic (150,000 to 230,000 daily traffic volume). Traffic on I-15 is meaningful to SR 91 as it directly connects to the corridor and is a feeder route to the corridor.

Traffic volumes from the east-west screenlines as shown in Table 3-7, is almost entirely comprised of region's east-west freeways, namely I-10, SR 60, and SR 91. SR 91 is a major part of each of the five screenlines traffic with approximately a third of all the traffic (212,000 to 310,000 daily traffic volume) traveling east-west in the region.

Table 3-6: Traffic Volumes on North-South Screenlines

| DESCRIPTION | | DAILY VOLUME | |
|-------------|--|----------------|-------------------|
| 1 | NORTH OF I-10 | Volume | % of Total |
| | SR 57 GP - Via Verde and W Covina Blvd | 197,200 | 31% |
| | I-15 GP - 4th St and Foothill Blvd | 219,200 | 35% |
| | I-215 GP&HOV - I-10 and Orange Show rd | 216,700 | 34% |
| | | 633,100 | 100% |
| 2 | NORTH OF SR 60 | Volume | % of Total |
| | SR 57 GP - Temple Ave and Pomona Blvd | 162,400 | 23% |
| | SR 71 GP - Rio Rancho rd and Old Pomona rd | 91,900 | 13% |
| | SR 83 GP - SR 60 and Philadelphia St | 37,600 | 5% |
| | I-15 GP - SR 60 and Jurupa St | 231,200 | 32% |
| | I-215 GP&HOV - SR 60 and Columbia Ave | 196,400 | 27% |
| | | 719,500 | 100% |
| 3 | SOUTH OF SR 60 | Volume | % of Total |
| | SR 71 GP&HOV - Pine Ave and Central Ave | 75,700 | 22% |
| | SR 83 GP - Pine Ave and Brickmore Ave | 17,800 | 5% |
| | Archibald Rd - 65th St and Limonite Ave | 21,400 | 6% |
| | Hamner Ave - Oakdale St and Limonite Ave | 26,400 | 8% |
| | I-15 GP - 68th St and Limonite Ave | 159,900 | 47% |
| | Van Buren Blvd - Limonite Ave and 56th St | 41,900 | 12% |
| | | 343,100 | 100% |
| 4 | NORTH OF SR 91 | Volume | % of Total |
| | SR 71 GP - SR 91 and Euclid Ave | 93,400 | 32% |
| | Main St - River Rd and Rincon | 32,000 | 11% |
| | I-15 GP - SR 91 and Hidden Valley Pkwy | 170,800 | 58% |
| | | 296,200 | 100% |
| 5 | SOUTH-EAST OF SR 91 | Volume | % of Total |
| | I-15 GP - Weirick Rd and Cajalco Rd | 149,600 | 20% |
| | Temescal Canyon Rd - Old Butterfield and Cajalco Rd | 22,900 | 3% |
| | Van Buren Blvd - Mockingbird Canyon and Victoria Ave | 60,800 | 8% |
| | Central Ave - Nottingham Rd and Victoria Ave | 43,700 | 6% |
| | I-215 GP&HOV - University Ave and Blaine St/3rd St | 275,300 | 36% |
| | I-10 GP - bt Mountain View Ave ramps | 207,200 | 27% |
| | | 759,500 | 100% |
| 8 | SOUTH OF SR 91 in Orange County | Volume | % of Total |
| | SR 57 GP&HOV - E Lincoln Ave and SR 91 | 298,600 | 48% |
| | SR 55 GP&HOV - E Lincoln Ave and SR 91 | 256,100 | 41% |
| | SR 241 GP - SR 91 and Santiago Canyon Rd | 67,900 | 11% |
| | | 622,600 | 100% |



Table 3-7: Traffic Volumes on East-West Screenlines

| DESCRIPTION | | DAILY VOLUME | |
|--------------------|--|---------------------|-------------------|
| 7 | EAST OF I-15 | Volume | % of Total |
| | I-10 GP - Etiwanda Ave and I-15 | 205,500 | 30% |
| | SR 60 GP&HOV - Mission Blvd and I-15 | 199,700 | 29% |
| | SR 91 Global - McKinley St and I-15 | 254,300 | 37% |
| | Magnolia Ave - Mckinley St and I-15 | 18,800 | 3% |
| | | 678,300 | 100% |
| 9 | Through Santa Ana Mountains | Volume | % of Total |
| | I-10 GP&HOV - Fairplex Dr and SR 57 | 234,100 | 29% |
| | SR 60 GP&HOV - Phillips Ranch and Diamond Bar | 250,700 | 31% |
| | SR 91 GP&EL - West of OC/RC County Line | 309,700 | 38% |
| | SR-74 GP - Grand Ave and Antonio Pkwy | 15,100 | 2% |
| | | 809,600 | 100% |
| 10 | Downtown Corona | Volume | % of Total |
| | I-10 GP&HOV - Archibald Ave and Hamner Ave | 277,700 | 31% |
| | SR 60 GP&HOV - Archibald Ave and Hamner Ave | 256,200 | 28% |
| | Railroad St - Lincoln Ave and Smith Ave | 12,900 | 1% |
| | SR 91 GP&EL - Lincoln Ave and Maple St | 282,000 | 31% |
| | W 6th St - Lincoln Ave and Sherman Ave | 37,900 | 4% |
| | W Ontario Ave - Vicentia Ave and Buena Vista Ave | 18,900 | 2% |
| | Foothill Parkway GP - Lincoln Ave to Elysia St | 18,400 | 2% |
| | | 904,000 | 100% |
| P1 | EAST OF SR 71 | Volume | % of Total |
| | I-10 GP&HOV - SR-83 and San Antonio Ave | 268,900 | 31% |
| | SR 60 GP&HOV - San Antonio Ave and Mountain Ave | 261,400 | 30% |
| | SR 91 GP&EL - Serfas Club Dr and SR 71 | 300,400 | 35% |
| | Green River Road wo Palisades Dr | 26,900 | 3% |
| | | 857,600 | 100% |
| P2 | WEST OF I-215 | Volume | % of Total |
| | I-10 GP - Sierra Ave and Alder Ave | 208,800 | 33% |
| | SR 60 GP&HOV - Armstrong Rd and Rudiboux Blvd | 216,900 | 34% |
| | SR 91 GP&HOV - Mary St and Arlington Ave | 212,000 | 33% |
| | | 637,700 | 100% |



3.3.2 SR 91 Travel Speeds

Motorists using the SR 91 corridor between Pierce St in Riverside County and SR 55 in Orange County experience recurring and extensive delays during the morning and evening peak hours. The generally five-lane per direction freeway gets heavily congested in the westbound direction during the morning between Main Street and the Riverside/Orange County Line, and between Imperial Highway and SR 55. During the late afternoon and evening the EB 91 has two main hot spots, SR 91 at the County Line and SR 91 approaching I-15. It takes less than 20 minutes to travel the approximately 18-mile SR 91 corridor during uncongested periods but 45 to 55 minutes to travel the same distance during the most congested times, representing delays of over 30 minutes.

Stantec's observations of the corridor travel speeds included numerous travel time runs in the SR 91 corridor concurrent with the May 2018 count program. These travel time runs entail drivers traveling on SR 91 with GPS loggers in the vehicle. Figure 3-21 and Figure 3-22 show the speeds from travel time runs along SR 91 WB during the AM period and SR 91 EB during the PM period.

AM Peak Period Travel Speeds

Westbound SR 91 generally has two segments of delays during the morning, one in Riverside County between Lincoln Avenue and the County Line and another shorter segment in Orange County between Imperial Highway and SR 55. Westbound speeds in Riverside County start degrading from as early as 4:30 AM and by 5 AM drivers experience stop and go conditions with speeds below 20mph for about five hours. Speeds improve after 10 AM but congestion does not completely clear until after 11 AM. Westbound speeds in Orange County are free flow (70-75 mph) for most of the peak period between the County Line and Imperial Highway but experience some congestion from Imperial Highway to SR 55 for about three to four hours due to queueing from SR 55. The trip on the WB 91 GP lanes from McKinley Street to the County Line in the Riverside County takes 35-45 minutes in the most congested hours, representing a delay of over 25 minutes. A westbound trip in the Orange County SR 91 GP lanes from the County Line to SR 55 takes about 18 minutes during the most congested hours, representing a delay of approximately 10 minutes. The majority of the delays on westbound SR 91 during the morning hours are concentrated in Riverside County. Since westbound traffic is metered due to limited capacity at the County Line, the delays are not as significant on the Orange County 91 GP Lanes to the west. Figure 3-21 shows the travel time run conducted on May 16th, 2018 beginning at 5:44 AM traveling westbound on SR 91 GP lanes between McKinley Street and Lakeview Avenue. Table 3-8 show the aggregated average speeds by segment as well as the speed and travel time from McKinley Street to SR 55 westbound in the morning.

Express Lanes speeds in the morning by approach and County are shown in Table 3-8. The majority of the westbound RCTC 91 Express Lanes delays are concentrated in the McKinley approach east of the Express Lanes ingress. Once this approach merges with express traffic coming from northbound I-15, Express Lanes speeds are generally over 45 mph. The WB OCTA 91 Express Lanes are operating at free flow speeds throughout the morning peak period.

PM Peak Period Travel Speeds

There are generally four segments of delay eastbound in the evening, two in Orange County and two in Riverside County:

- between Weir Canyon Road and the County Line (OC)
- SR 241 approaching SR 91 (OC)



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Existing Conditions

- I-15/SR91 Interchange (RC)
- I-15 southbound south of SR 91 (RC)

Eastbound speeds in Orange County start degrading from 2 PM and drivers experience stop and go conditions with speeds below 20 mph for about six hours. Congestion does not completely clear until after 8 PM. Since traffic is metered at the County Line, speeds in Riverside County are free flow for most of the PM hours between the County Line and Lincoln Avenue before congestion occurs east of Lincoln Avenue. Queues spill back from the I-15/SR 91 interchange and extend as far as Main Street. Speeds in this section are often less than 20 mph and this condition usually lasts for three to four hours. The trip in Orange County from SR 55 to the County Line takes over 35 minutes in the most congested hour representing a delay of over 25 minutes. The trip on the eastbound SR 91 GP lanes from the County Line to McKinley Street in Riverside County takes just under 20 minutes in the most congested hour representing a delay of over 10 minutes. Figure 3-22 shows travel speeds from a travel time run conducted on May 16th, 2018 beginning at 3:30 PM between SR 55 and east of I-15 at McKinley Street as well as speeds on SR 241 between Santiago Canyon Road and SR 91. Table 3-9 shows the aggregated average speeds by segment as well as speed and travel time from SR 55 to McKinley eastbound in the evening.

Express Lanes speeds in the evening by County are shown in Table 3-9. Speeds on the EB RCTC 91 ELs are free flow until the diverge at Main Street where the single lane east to McKinley operates below free flow speeds. Speeds on the SDC are generally greater than 45 mph throughout the evening peak hours.



Figure 3-21: SR 91 Westbound AM GP Travel Time Run

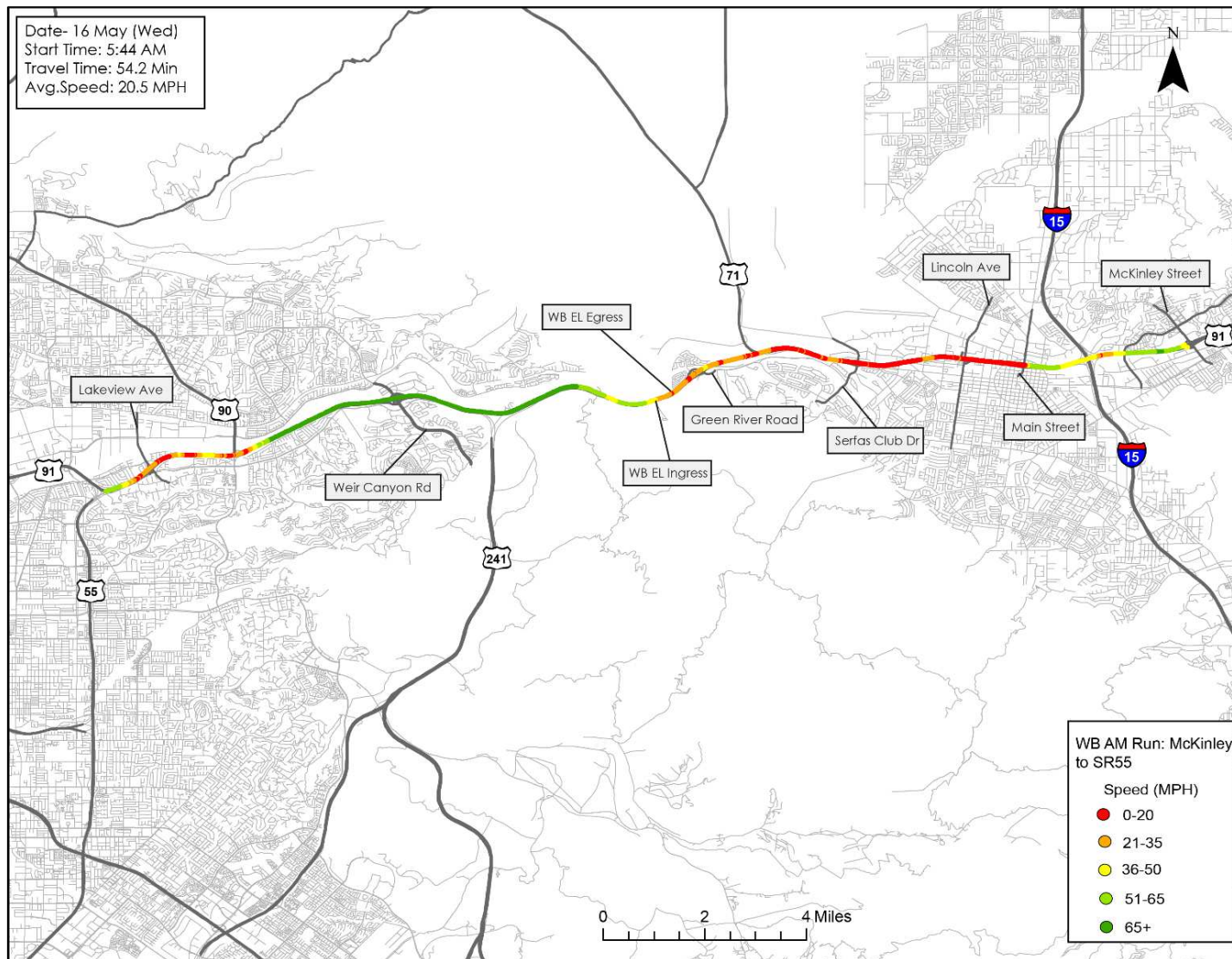
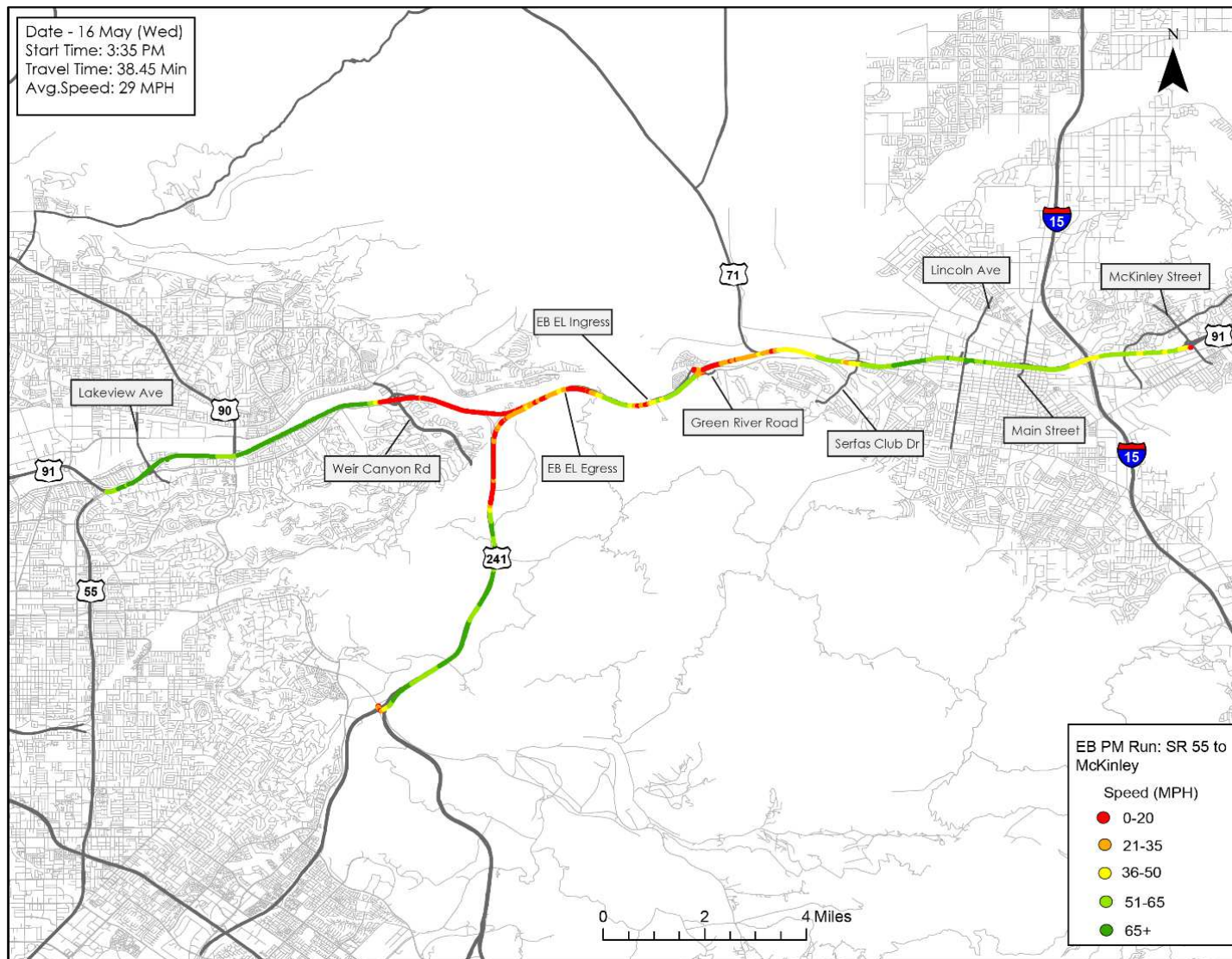


Figure 3-22: SR 91 Eastbound PM GP Travel Time Run



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Existing Conditions

Table 3-8: SR 91 Westbound AM GP Travel Speeds

| County | Orange | | | | | | | | | | | | | | | | Riverside | | | | | | | | | | | | | | End to End | | End to End | |
|----------------|--------|----------|----|----|----|------|----|----|----|--------|----|----|----|--------|----|----|-----------|-------|-------------|-------|--------|-------|----|---------|----|------|------|--------|-----------|--------------|-----------------|----|------------|----|
| Time | SR-55 | Imperial | | | | Weir | | | | SR-241 | | | | Gypsum | | | | Weave | Green River | SR-71 | Serfas | Maple | | Lincoln | | Main | I-15 | Orange | Riverside | Orange (min) | Riverside (min) | | | |
| 4:15 - 4:30 AM | 52 | 53 | 57 | 68 | 71 | 72 | 71 | 77 | 74 | 72 | 73 | 74 | 71 | 70 | 55 | 55 | 47 | 60 | 58 | 54 | 66 | 63 | 59 | 52 | 70 | 68 | 66 | 71 | 71 | 67 | 65 | 61 | 9 | 8 |
| 4:30 - 5 AM | 43 | 52 | 56 | 68 | 66 | 64 | 68 | 66 | 59 | 66 | 70 | 70 | 66 | 62 | 46 | 55 | 43 | 60 | 58 | 54 | 66 | 63 | 59 | 48 | 40 | 36 | 43 | 54 | 66 | 59 | 58 | 53 | 10 | 10 |
| 5 - 6 AM | 15 | 16 | 11 | 17 | 50 | 63 | 49 | 62 | 66 | 59 | 67 | 63 | 54 | 46 | 45 | 17 | 21 | 17 | 14 | 11 | 13 | 16 | 20 | 19 | 16 | 34 | 46 | 55 | 56 | 61 | 34 | 21 | 18 | 24 |
| 6 - 7 AM | 36 | 36 | 28 | 42 | 45 | 47 | 70 | 77 | 74 | 70 | 73 | 74 | 71 | 70 | 49 | 19 | 22 | 20 | 14 | 11 | 8 | 8 | 10 | 8 | 7 | 8 | 27 | 67 | 53 | 64 | 51 | 14 | 12 | 35 |
| 7 - 8 AM | 49 | 53 | 57 | 55 | 71 | 72 | 71 | 67 | 72 | 72 | 69 | 71 | 65 | 65 | 45 | 20 | 19 | 23 | 15 | 13 | 10 | 8 | 8 | 9 | 8 | 8 | 7 | 37 | 57 | 58 | 55 | 15 | 11 | 35 |
| 8 - 9 AM | 52 | 51 | 53 | 59 | 66 | 66 | 69 | 71 | 69 | 69 | 64 | 59 | 66 | 69 | 51 | 19 | 25 | 19 | 17 | 13 | 14 | 11 | 19 | 18 | 15 | 7 | 28 | 63 | 65 | 67 | 56 | 20 | 11 | 25 |
| 9 - 10 AM | 46 | 40 | 42 | 48 | 63 | 66 | 67 | 73 | 71 | 71 | 71 | 67 | 65 | 62 | 49 | 21 | 32 | 26 | 23 | 16 | 22 | 25 | 35 | 35 | 42 | 55 | 51 | 65 | 71 | 66 | 54 | 33 | 11 | 15 |
| 10 - 11 AM | 37 | 27 | 28 | 30 | 34 | 36 | 49 | 72 | 74 | 71 | 69 | 69 | 67 | 63 | 55 | 45 | 47 | 28 | 18 | 28 | 34 | 53 | 53 | 52 | 70 | 68 | 66 | 71 | 67 | 58 | 48 | 43 | 13 | 12 |

Table 3-9: SR 91 Eastbound PM GP Travel Speeds

| County | Orange | | | | | | | | | | | | | | | | Riverside | | | | | | | | | | | | | | | | End to End | End to End | |
|----------------|--------|----------|----|----|----|------|----|----|----|--------|----|----|----|--------|----|----|-----------|-------|-------------|-------|--------|-------|---------|----|----|----|------|------|----|----|----|--------|------------|--------------|-----------------|
| Time | SR-55 | Imperial | | | | Weir | | | | SR-241 | | | | Gypsum | | | | Weave | Green River | SR-71 | Serfas | Maple | Lincoln | | | | Main | I-15 | | | | Orange | Riverside | Orange (min) | Riverside (min) |
| 1:15 - 1:30 PM | 71 | 71 | 73 | 71 | 69 | 71 | 69 | 66 | 67 | 70 | 61 | 60 | 63 | 63 | 53 | 51 | 55 | 70 | 69 | 62 | 65 | 73 | 68 | 74 | 71 | 67 | 64 | 63 | 63 | 62 | 58 | 66 | 63 | 10 | 9 |
| 1:30 - 2 PM | 68 | 71 | 73 | 64 | 58 | 57 | 64 | 66 | 66 | 70 | 54 | 32 | 28 | 48 | 53 | 51 | 53 | 70 | 69 | 62 | 65 | 73 | 68 | 74 | 71 | 67 | 64 | 63 | 63 | 62 | 58 | 58 | 63 | 11 | 9 |
| 2 - 3 PM | 71 | 69 | 71 | 71 | 69 | 70 | 69 | 56 | 33 | 13 | 23 | 18 | 14 | 20 | 36 | 32 | 52 | 64 | 67 | 67 | 69 | 72 | 57 | 57 | 47 | 43 | 36 | 38 | 42 | 43 | 43 | 40 | 47 | 17 | 12 |
| 3 - 4 PM | 65 | 69 | 67 | 67 | 63 | 64 | 41 | 7 | 7 | 7 | 9 | 11 | 5 | 14 | 45 | 43 | 61 | 65 | 61 | 62 | 60 | 51 | 48 | 50 | 37 | 18 | 13 | 17 | 25 | 28 | 47 | 19 | 37 | 36 | 16 |
| 4 - 5 PM | 70 | 66 | 67 | 68 | 66 | 71 | 66 | 12 | 8 | 10 | 10 | 11 | 10 | 16 | 34 | 44 | 58 | 63 | 68 | 70 | 66 | 51 | 42 | 40 | 29 | 14 | 10 | 16 | 20 | 20 | 39 | 22 | 32 | 31 | 18 |
| 5 - 6 PM | 68 | 71 | 72 | 69 | 65 | 66 | 51 | 24 | 6 | 7 | 9 | 13 | 7 | 17 | 35 | 33 | 54 | 63 | 64 | 66 | 70 | 62 | 48 | 50 | 25 | 14 | 10 | 14 | 15 | 19 | 42 | 20 | 30 | 33 | 19 |
| 6 - 7 PM | 59 | 59 | 67 | 67 | 69 | 69 | 44 | 19 | 27 | 6 | 12 | 12 | 7 | 15 | 28 | 48 | 60 | 64 | 63 | 65 | 65 | 61 | 58 | 55 | 53 | 49 | 39 | 33 | 43 | 35 | 49 | 53 | 49 | 13 | 12 |
| 7 - 8 PM | 63 | 63 | 66 | 66 | 68 | 68 | 46 | 25 | 32 | 8 | 16 | 16 | 16 | 16 | 39 | 47 | 58 | 63 | 65 | 67 | 66 | 57 | 55 | 65 | 54 | 63 | 62 | 61 | 47 | 42 | 45 | 75 | 55 | 9 | 11 |

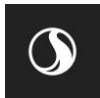


Figure 3-23: SR 91 Westbound AM Express Lane via McKinley Travel Time Run

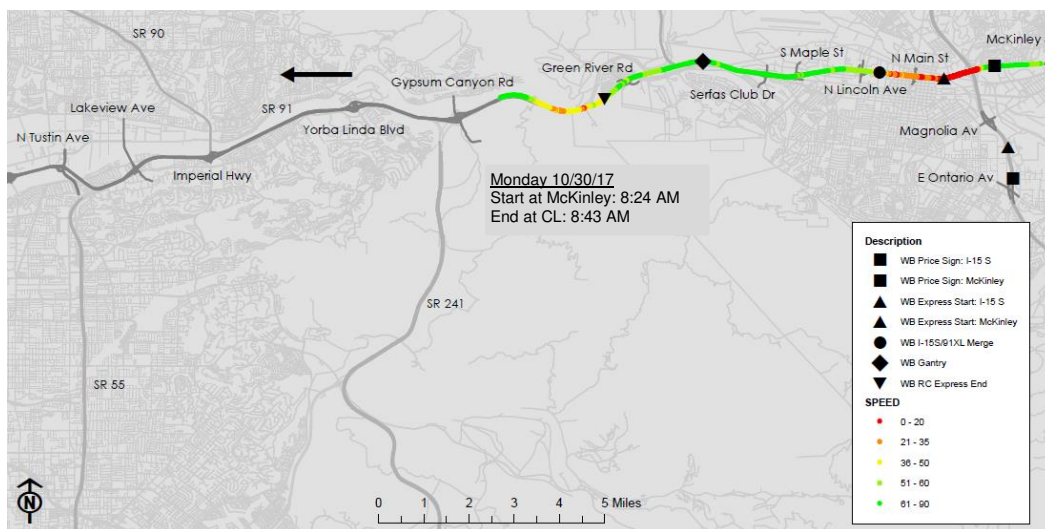


Table 3-10: SR 91 Westbound AM Express Lanes via McKinley Street Travel Speeds

| Time | Start EL to EL End (6.6 miles) | E/O 15 to Entrance (1 mi) |
|--------|--------------------------------|---------------------------|
| 4-5 AM | 69 | 69 |
| 5-6 AM | 52 | 12 |
| 6-7 AM | 37 | 3 |
| 7-8 AM | 40 | 3 |
| 8-9 AM | 46 | 7 |

Table 3-11: SR 91 Westbound AM Express Lanes via I-15 Travel Speeds

| Time | Start EL to EL End (8.3 miles) | Ontario Ave to Start EL (1 .1 miles) |
|--------|--------------------------------|--------------------------------------|
| 4-5 AM | 67 | 65 |
| 5-6 AM | 49 | 54 |
| 6-7 AM | 48 | 20 |
| 7-8 AM | 41 | 18 |
| 8-9 AM | 47 | 33 |



Figure 3-24: SR 91 Eastbound PM Express Lane via McKinley Travel Time Run

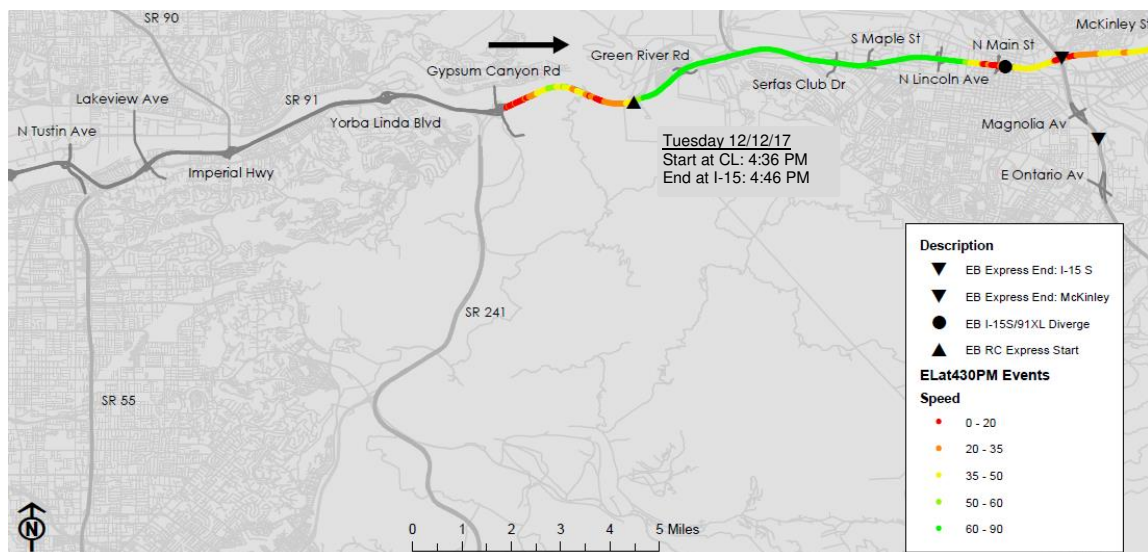


Table 3-12: SR 91 Eastbound PM Express Lanes via McKinley Street Travel Speeds

| Time | C.L. to Serfas (3.3 miles) | Serfas to Main St (3.5 miles) | to McK (0.7 mi) |
|--------|----------------------------|-------------------------------|-----------------|
| 2-3 PM | 70 | 67 | 47 |
| 3-4 PM | 67 | 62 | 39 |
| 4-5 PM | 65 | 59 | 31 |
| 5-6 PM | 61 | 61 | 30 |
| 6-7 PM | 68 | 65 | 47 |
| 7-8 PM | 75 | 69 | 53 |

Table 3-13: SR 91 Eastbound PM Express Lanes via I-15 SB Travel Speeds

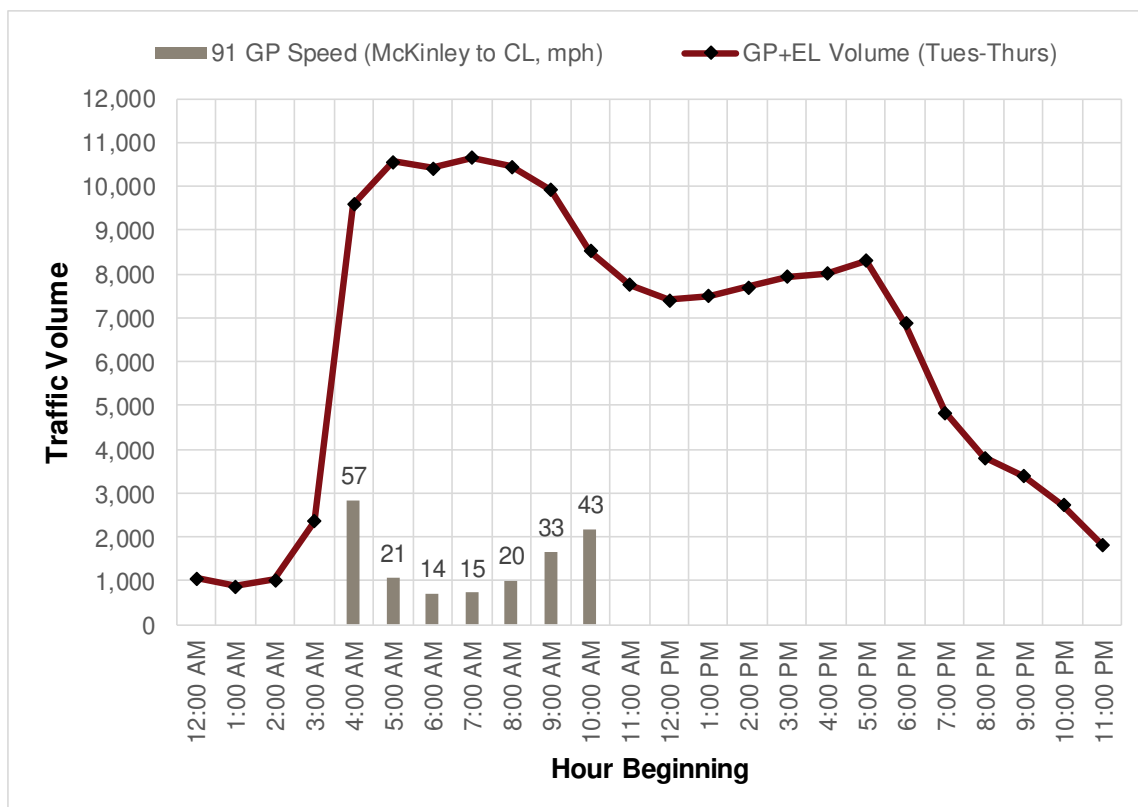
| Time | C.L. to Serfas (3.3 miles) | Serfas to Main St (3.5 miles) | to I-15 South (2 miles) |
|--------|----------------------------|-------------------------------|-------------------------|
| 2-3 PM | 70 | 67 | 63 |
| 3-4 PM | 67 | 62 | 59 |
| 4-5 PM | 65 | 59 | 44 |
| 5-6 PM | 61 | 61 | 50 |
| 6-7 PM | 68 | 65 | 52 |
| 7-8 PM | 75 | 69 | 75 |



3.3.3 Mainline Traffic by Hour

Westbound SR 91 traffic at the Riverside / Orange County Line is heaviest during the morning peak hours with demand increasing as early as 4:30 AM. Figure 3-25 shows average Tuesday through Thursday traffic volumes on westbound SR 91 by hour. Hourly global traffic for the majority of the day (4 AM to 6 PM) is between 7,500 to 10,600 vehicles per hour with a significant peak in the morning hours. The highest throughput is at 7 AM with about 10,600 vehicles per hour across five general purpose and two express lanes. This volume represents 6.9 percent of the average weekday daily volume. However, the drop in mainline travel speeds from 57 mph at 4 AM to less than 25 mph between 5 and 8 AM indicate that SR 91 traffic flow is constricted during that time due to a downstream bottleneck. The data show that although the traffic count/throughput is low in this area between 5 AM and 8 AM, travel demand is still high. During the rest of the day demand declines before increasing over 8,300 vehicles during evening rush hours and then rapidly declining throughout rest of the evening and night hours. The data demonstrated little variation in traffic on Monday, Tuesday, Wednesday or Thursday, but Friday travel demand is more evenly spread throughout the day. On Fridays, demand is higher than it is on other weekdays by late morning and continues to be elevated through midnight. Daily WB 91 traffic on Fridays is 5.7 percent higher than average WB 91 typical weekday traffic.

Figure 3-25: SR 91 WB Weekday Traffic Profiles – at the County Line



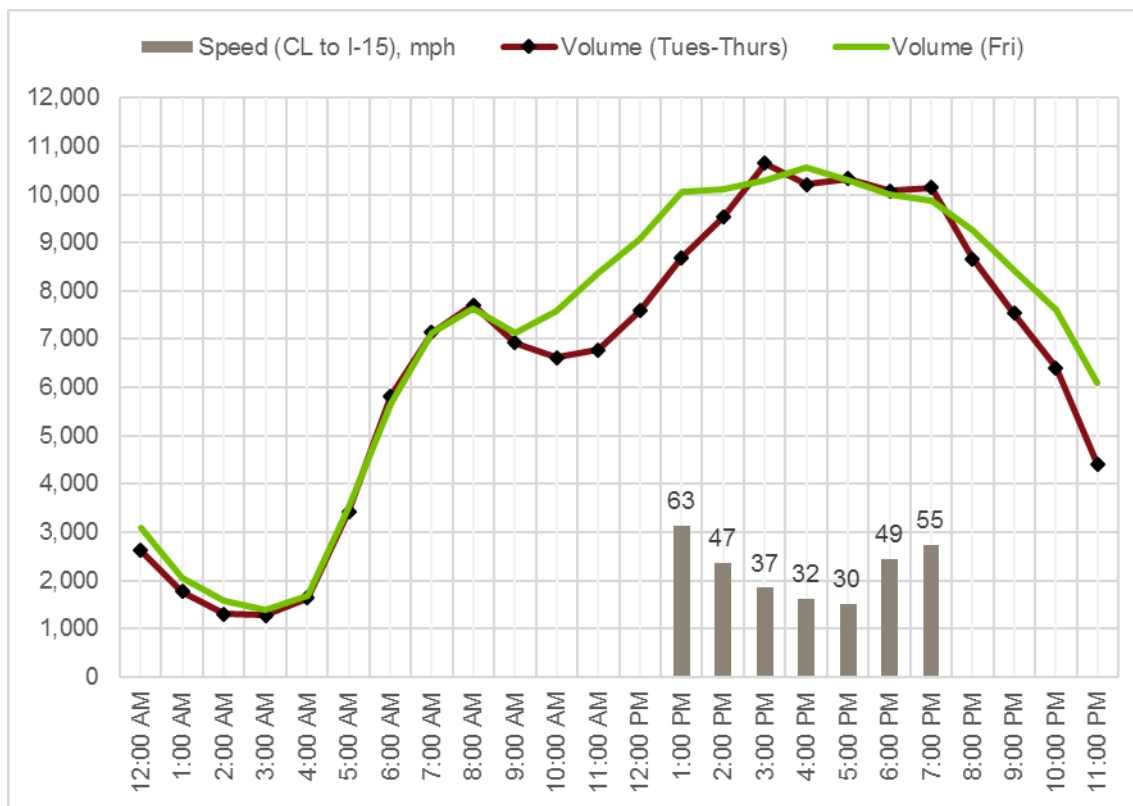
In the eastbound direction, traffic at the Orange / Riverside County Line peaks during the PM peak period between 3 PM and 8 PM. The maximum average hourly volume of about 10,500 vehicles per hour across five general purpose and two express lanes is observed from 3 to 4 PM, which represents 6.9 percent of the average weekday daily volume.



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Traffic is maintained at or near these levels through 8 PM, and rapidly declines thereafter. Figure 3-26 shows average Tuesday through Thursday and Friday traffic volumes by hour at the County Line. Travel speeds from the County Line to I-15 drop from 63 mph from 1-2 PM to as low as 30 mph from 5-6 PM. The lower travel speeds along with drop in traffic volumes between 3 to 7 PM indicates that travel demand is higher than the traffic throughput at this location. SR 241 approaching 91 eastbound is heavily congested and the queues can be as long as five miles. This high volume on-ramp is merging into the already densely packed 91 general purpose lanes causing delays and further queues. In addition, there is a significant volume of traffic egressing from the eastbound OCTA 91 Express Lanes to the 91 GP lanes. The merging of the GP lanes and the EL egress volumes adds to GP lane delay. The data demonstrated little variation in traffic on Monday, Tuesday, Wednesday or Thursday, but Friday travel demand starts to peak earlier in the day from 9 AM and is more evenly spread between 1 and 8 PM. On Fridays, demand is higher than it is on other weekdays by late morning and continues to be elevated through midnight. Daily traffic on Fridays is 8.9 percent higher than average weekday traffic.

Figure 3-26: SR 91 EB Weekday Traffic Profiles – at the County Line



3.3.4 Ramp Volumes

Ramp volumes were collected along the entire SR 91 corridor to identify the most heavily-used ramps and to create a balanced traffic volume network. The corridor is comprised of traffic traveling westbound in the morning away from Corona while traveling toward Corona eastbound in the evening. The most trafficked on-ramps in Riverside County in the AM period are from McKinley, I-15 Northbound, SR 71, and Green River Road. These ramps are high volume and cause delays on the SR 91 mainline in the AM hours. The most trafficked off-ramp in Orange County in the morning is SR 241. Figure 3-27 and Figure 3-28 show the average weekday daily and AM ramp volumes on SR 91 westbound, respectively.

The most trafficked on-ramps that are adding mainline traffic traveling toward Corona and east to Riverside County in the PM periods are from Gypsum Canyon, SR 241, and SR 71. The major destinations accessed via these off-ramps in the evening are to Green River Road, SR 71, I-15 north, I-15 south, and McKinley Street. Figure 3-29 and Figure 3-30 shows the average weekday daily and PM volumes on SR 91 corridor eastbound, respectively.



Figure 3-27: Westbound Daily Ramp Volumes

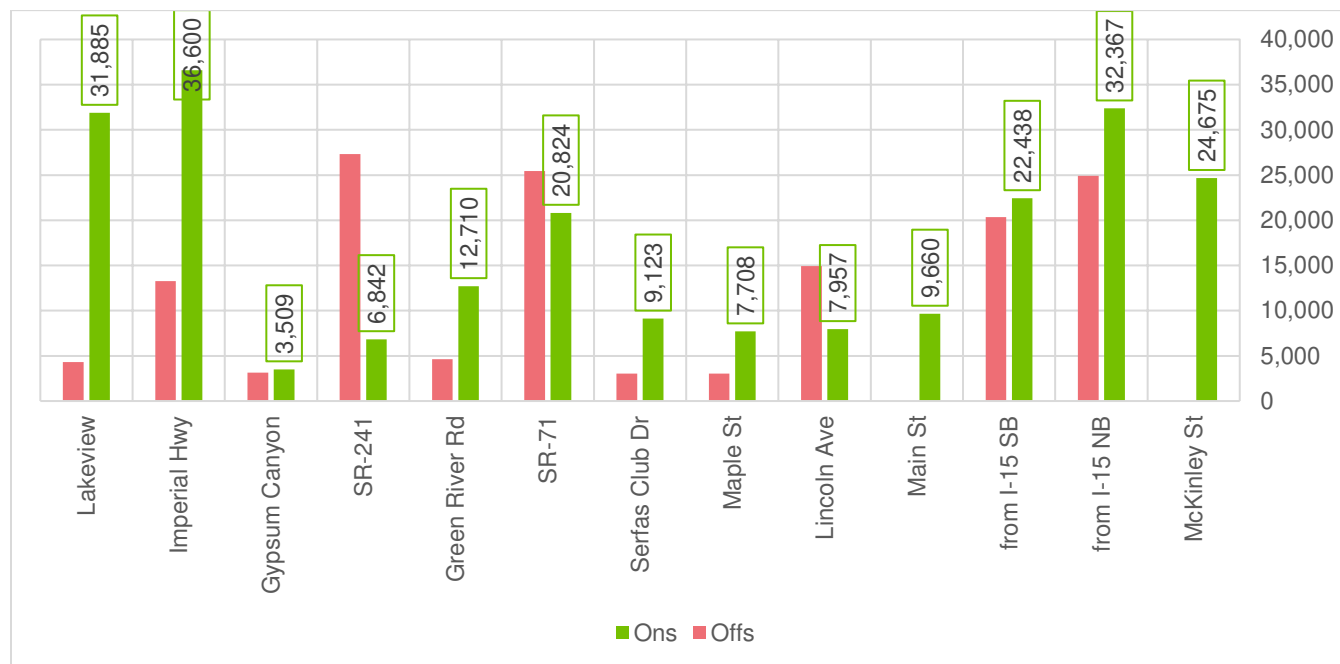


Figure 3-28: Westbound AM (4-10 AM) Ramp Volumes

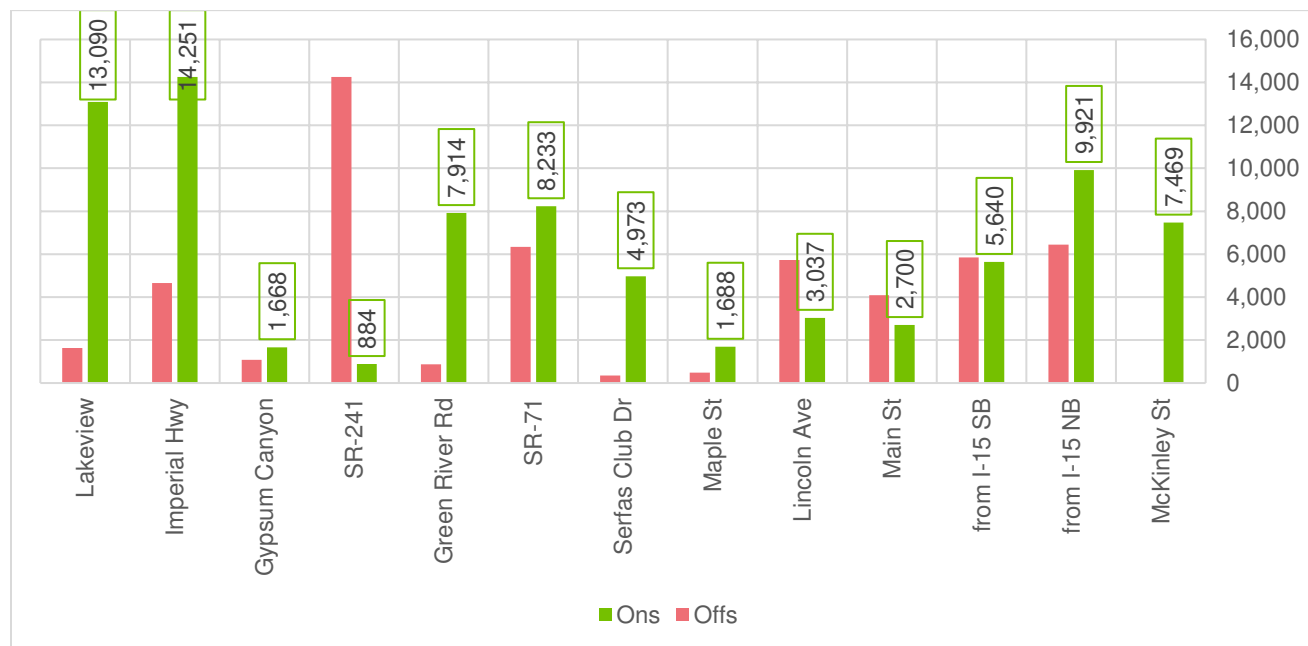


Figure 3-29: Eastbound Daily Ramp Volumes

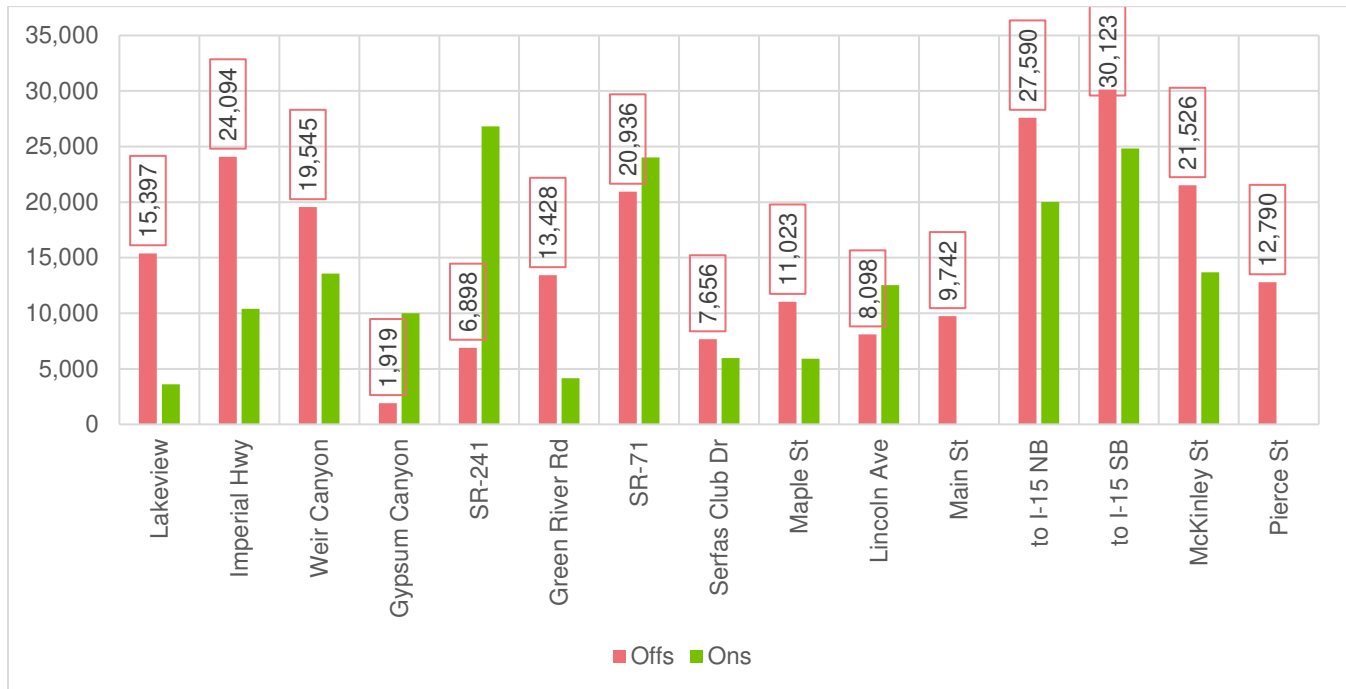
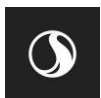
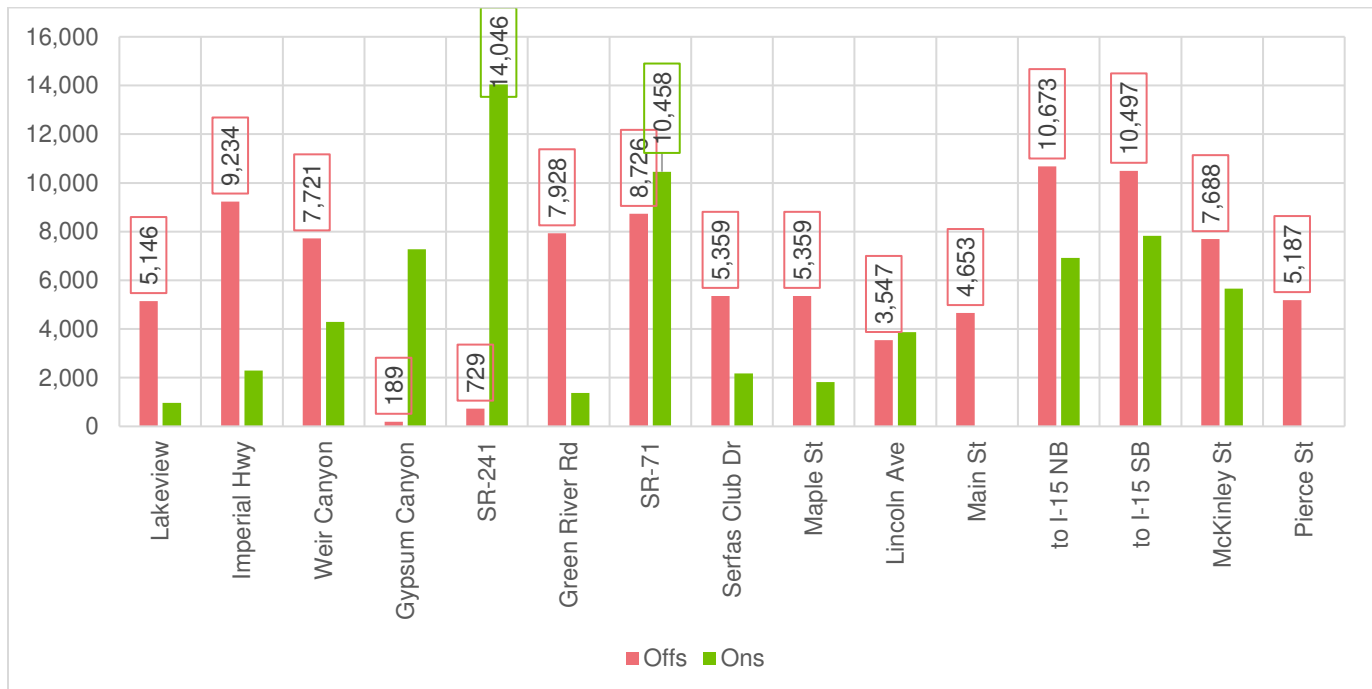


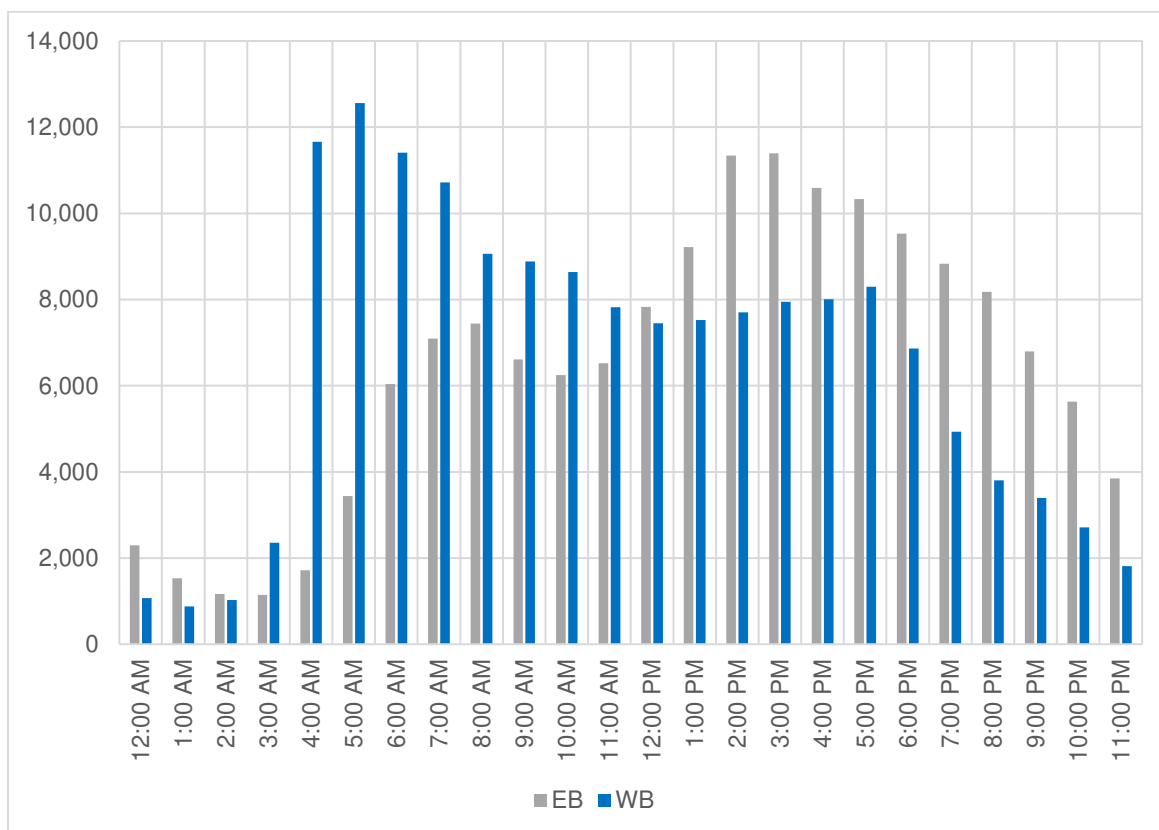
Figure 3-30: Eastbound PM (2-8 PM) Ramp Volumes



3.3.5 Mainline Traffic – Demand Adjusted and Balanced Traffic by Hour

During periods of significant congestion, traffic counts reflect throughput and not demand. Adjustments need to be made to identify the travel demand for the corridor. These adjustments utilize speed and congestion information collected as part of the study, as well as mainline and ramp counts. Hourly traffic count data were adjusted to reflect demand and to balance with upstream and downstream ramp and mainline counts. These balanced and adjusted counts were used to calibrate the forecasting models. The adjusted data generally show higher volumes than counted during the most congested times of the day. The demand adjusted and balanced hourly traffic distribution for eastbound and westbound SR 91 between Green River Road and Express lane weave at Riverside/Orange County Line is shown in Figure 3-31. The highest demand westbound in the AM is around 12,500 vehicles across seven lanes at 6 AM and eastbound in the PM is around 11,400 across seven lanes at 3 PM.

Figure 3-31: Weekday Hourly Traffic Profile - at County Line Express Lane Weave



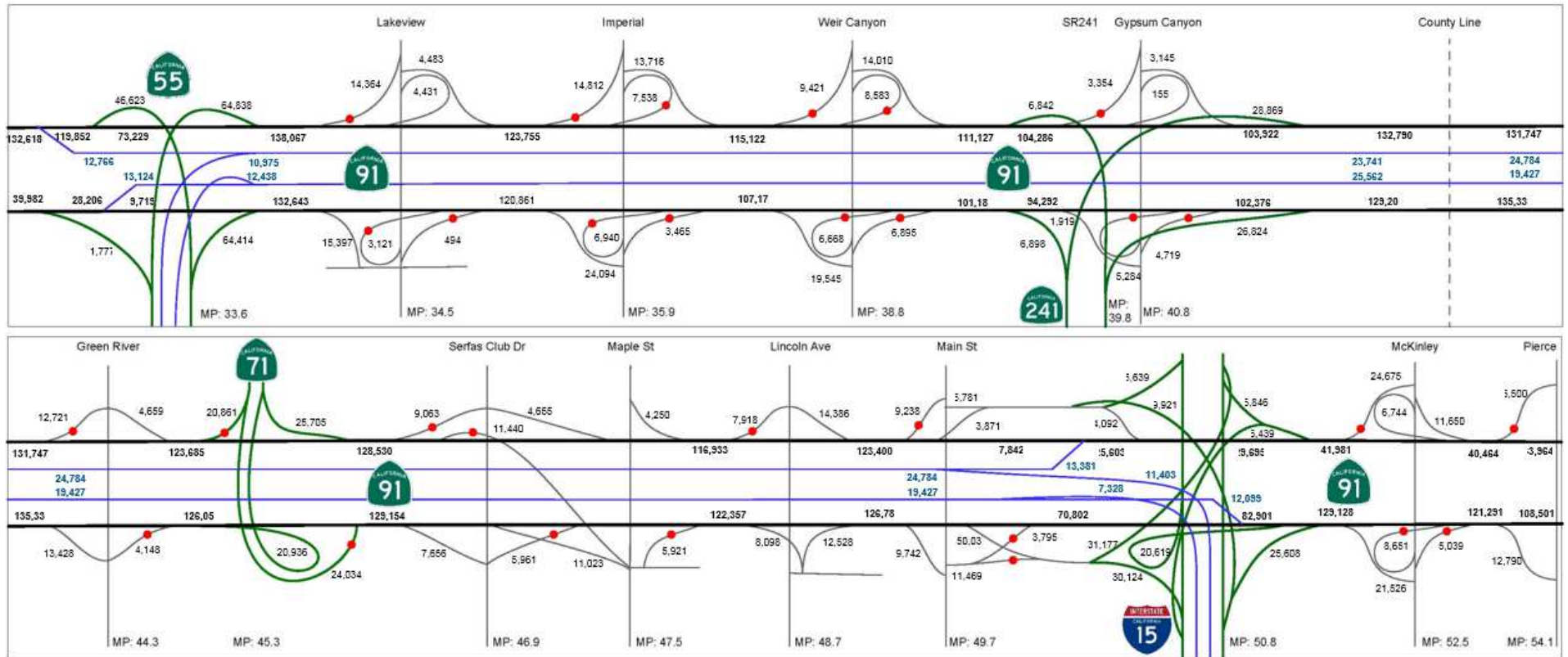
3.3.6 Balanced Traffic Network

Using ramp volumes and the mainline volumes from the count program, Stantec created balanced networks for the SR 91 corridor. Figure 3-32, Figure 3-33, and Figure 3-34 show the balanced network for the entire day, 5 to 6 AM hour, and the 2 to 3 PM hour.



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Figure 3-32: SR 91 Daily Traffic Stick Diagram



RCTC 91 EXPRESS LANES INVESTMENT GRADE TRAFFIC AND REVENUE STUDY
Existing Conditions

Figure 3-33: SR 91 Stick Diagram - 5 to 6 AM Travel Demand

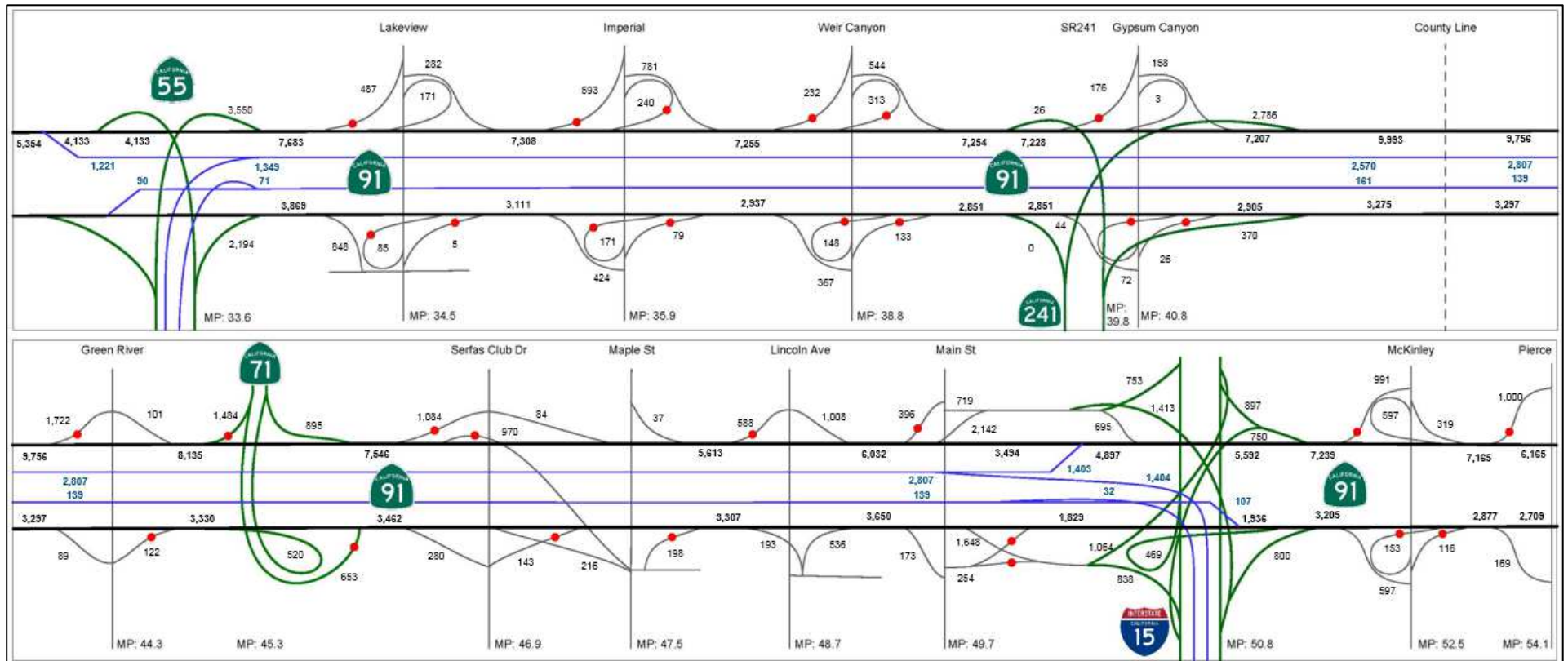
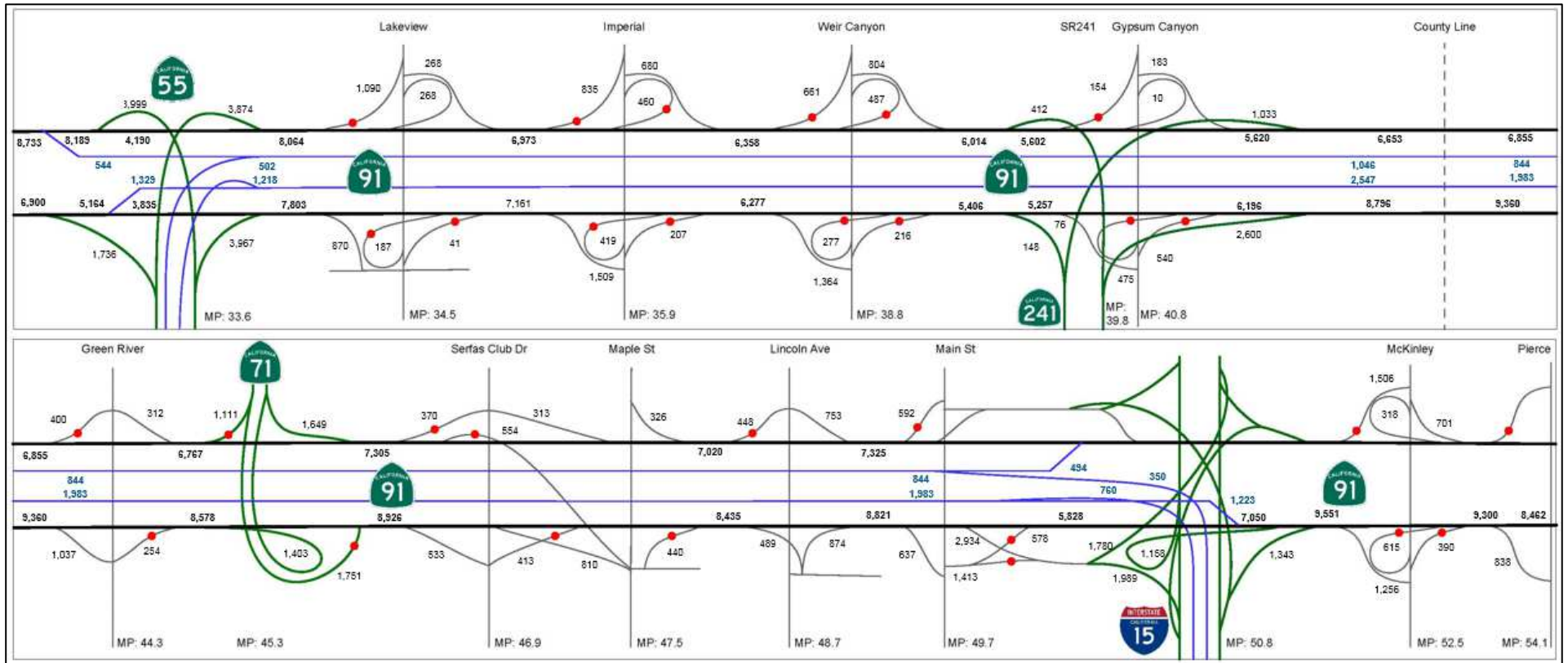


Figure 3-34: SR 91 Stick Diagram - 2 to 3 PM Travel Demand

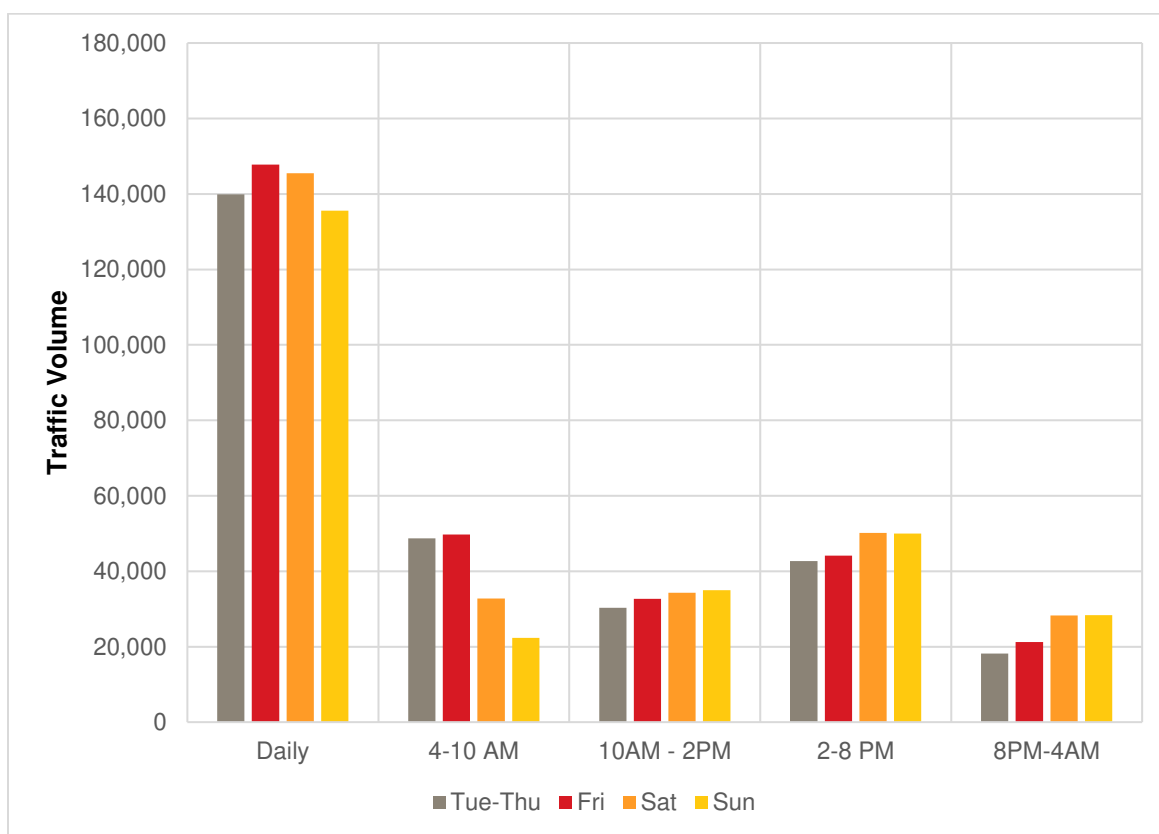


3.3.7 SR 91 Mainline Traffic by Day of Week

Traffic volumes on the SR 91 corridor are typically higher on Fridays and Saturdays than traffic on an average Tuesday to Thursday while volumes on Sunday are typically lower than the rest of the week.

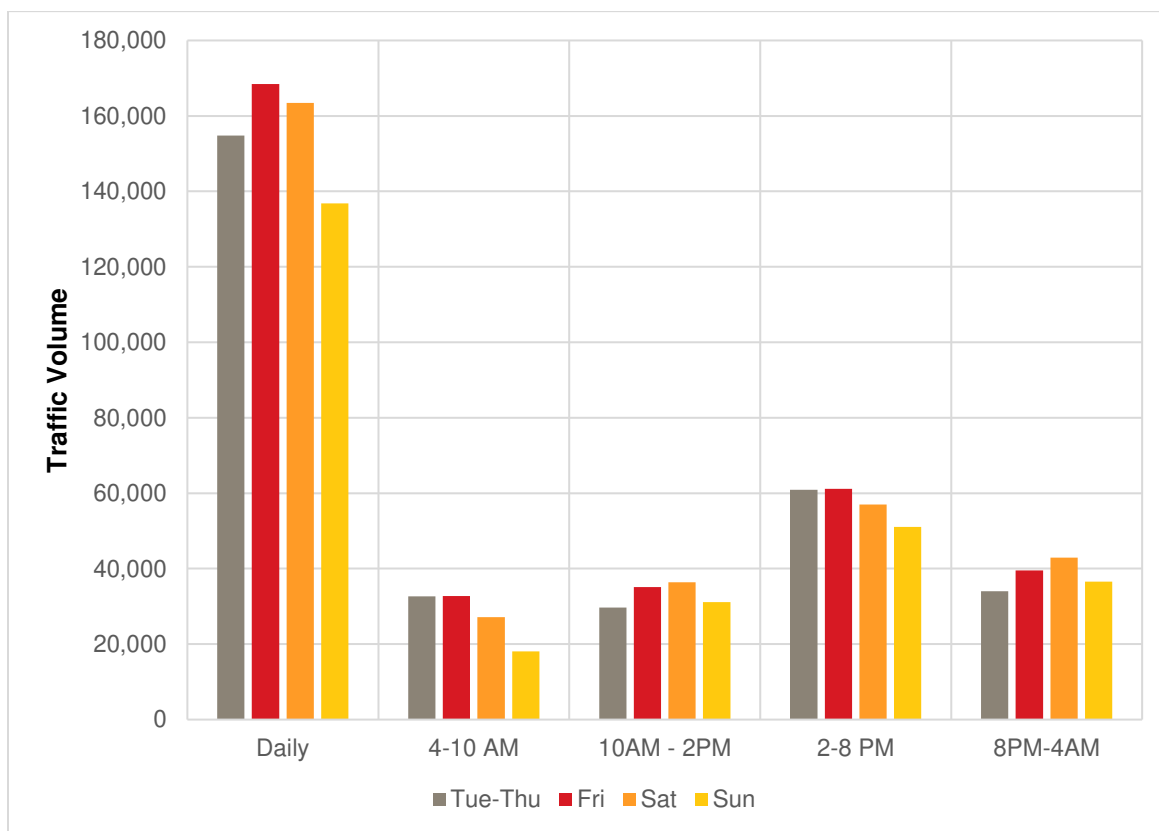
In the westbound direction, daily traffic on Friday is six percent higher and Saturday is four percent higher than average Tuesday to Thursday traffic, while Sunday traffic is three percent lower. During the 4 AM to 10 AM hours traffic on the weekends is significantly lower than average Tuesday to Thursday and Friday due to a relative lack of commuter traffic. However, traffic on weekends is typically higher during the rest of the day compared to average Tuesday to Thursdays and Fridays. Specifically, traffic on weekends is 14 percent, 17 percent, and 56 percent higher than the average Tuesday to Thursday from 10 AM – 2 PM, 2PM – 8 PM and 8PM – 4 AM, respectively. Friday traffic is 2 percent higher in the morning than the average Tuesday to Thursday, 8 percent higher in the midday, 3 percent higher in the evening, and 17 percent higher during overnight night hours.

Figure 3-35: SR 91 Westbound Volumes by Day of Week - between Green River Road



In the eastbound direction, daily traffic on Friday is nine percent higher and traffic on Saturday is six percent higher than average Tuesday to Thursday traffic, while Sunday is twelve percent lower. Traffic on Friday is similar in the morning and evening hours while it is 18 percent higher in the midday and 16 percent higher in the night hours compared to average Tuesday to Thursdays. Traffic on Saturday is 17 percent lower in the morning and 6 percent lower in the evening while it is 23 percent higher in midday and 26 percent higher in the night hours compared to average Tuesday to Thursdays. Traffic on Sunday is 45 percent lower in the morning and 16 percent lower in the evening hours while it is 5 percent higher in midday, and 7 percent higher in night hours compared to average Tuesday to Thursdays.

Figure 3-36: SR 91 EB Volumes by Day of Week - at County Line Express Lane Weave



3.3.8 Origin – Destination Patterns on SR 91

Origin–Destination (OD) data on SR 91 trips show that a minority of trips (less than 10 percent) traverse the SR 91 corridor end to end (i.e. McKinley Street in Riverside County to/from Tustin Avenue in Orange County). Figure 3-37 and Figure 3-38 show the OD patterns for traffic traveling to/from Riverside and Orange counties.

- Major origins of traffic crossing the County Line westbound are SR 91, I-15 South, SR-71, and Green River Road Ramps
 - Approximately half of the traffic originating from I-15 South is destined to SR 91 west of SR 55, 20 percent is destined to SR 241 and 20 percent destined to SR 55
 - Approximately half of the traffic originating from SR 71 is destined to SR 241, around 20 percent is destined to SR 55 and SR 91 west of SR 55 each
 - Approximately a third of traffic originating from Green River Road is destined to SR 91 west of SR 55, a third to SR 55 and 15 percent to SR 241
 - Approximately 40 percent of traffic originating from east of I-15 is destined to SR 91 west of SR 55 diverge, a quarter of traffic is destined to SR 55 and 20 percent is destined to SR 241
- Major destinations for traffic crossing the County Line westbound are SR 241, SR 55, and SR 91
- Major origins of traffic crossing the County Line eastbound are SR 91, SR 55, and SR 241
 - Approximately a third of traffic originating at 241 is destined to SR 71, 20 percent of traffic is destined to I-15 North and 15 percent is destined to SR 91 east of I-15
 - Approximately 15 percent of the traffic originating at SR 91 is destined to SR 71 and I-15 South each. 18 percent of the traffic goes through to 91 east of I-15
 - Approximately 20 percent of traffic originating at SR 55 is destined to east of I-15, 10 percent of traffic is destined to I-15 South.
- Major destinations for traffic crossing the County Line eastbound are SR 91, I-15 South, Green River Road, and SR 71



Figure 3-37: Origins and Destinations to/from Orange-Riverside County Line – WB 4 to 10 AM

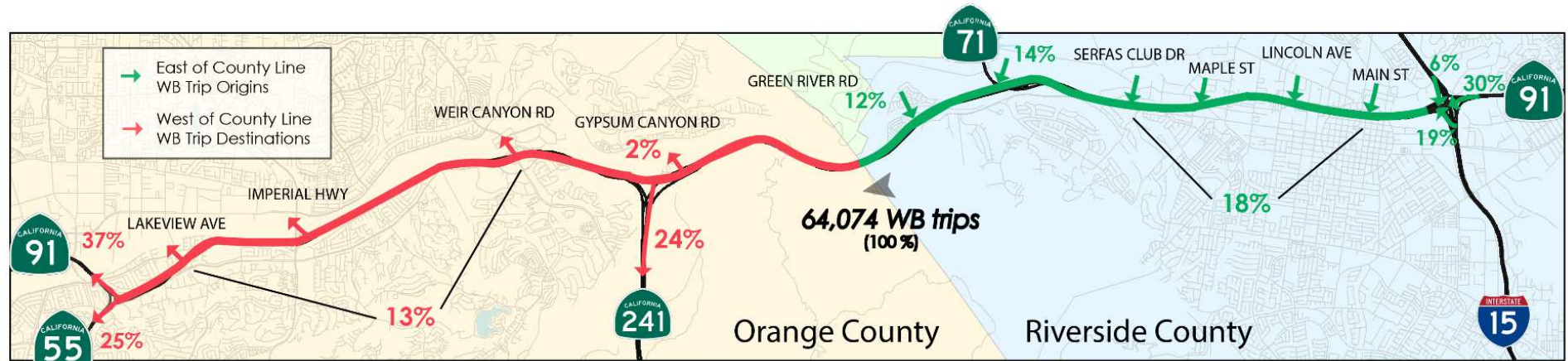
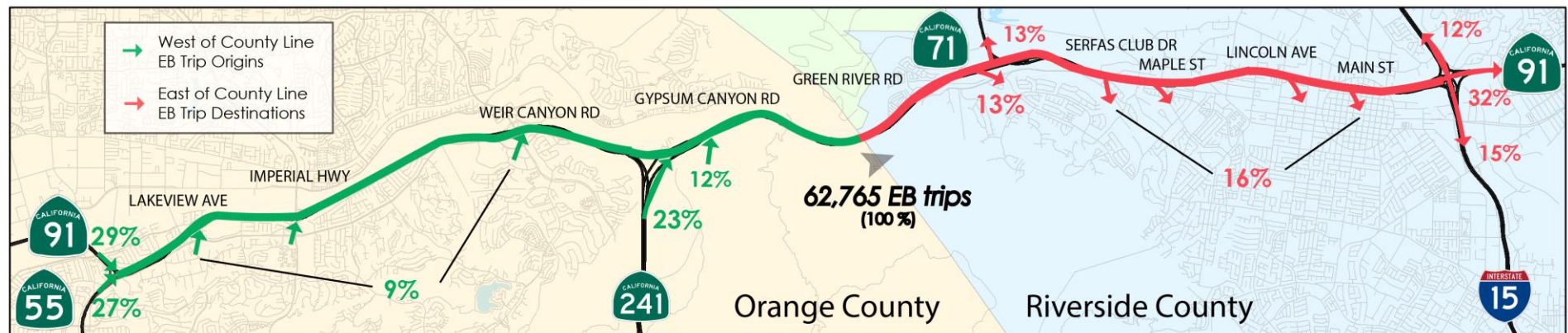


Figure 3-38: Origins and Destinations to/from Orange-Riverside County Line – EB 2 to 8 PM



4.0 SOCIOECONOMIC VARIABLES AND LAND USE

This section contains detailed forecasts and supporting commentary on socioeconomic trends in the four counties constituting the “Study Area” between 2015 and 2040 (the “Forecast Period”). The Forecast Period includes actual 2015 data for comparison and continuity from our previous forecasting efforts, though the Base Year of the forecast is 2017, as explained in more detail later.

The Study Area consists of Los Angeles, Orange, Riverside, and San Bernardino counties. Imperial, San Diego, and Ventura counties are also part of the modeled area but are not considered significant with regard to the SR 91 Express Lanes, and the forecasts from SCAG and SANDAG were adopted for these counties. The forecast data developed by WSP for use in traffic modeling on the RCTC’s roads are referred to throughout this section as the “Base Case” forecasts.

4.1 SUMMARY CONCLUSIONS

Employment¹ in the Study Area is forecast to grow by 1.7 million jobs, from 7.2 to 8.9 million during the Forecast Period, a compound annual growth rate of 0.9 percent per year. Households² in the Study Area will grow by 1.2 million over the Forecast Period from 5.6 to 6.8 million, a 0.8 percent per year compound annual growth rate. Housing growth will closely track job growth region-wide, although housing production will vary by market due to differing levels of developable land availability and housing affordability by submarket. For example, the Inland Empire³ is poised to grow at a more rapid pace as compared to Orange and Los Angeles counties due to higher levels of available land and lower housing prices relative to Orange County and other coastal areas.

The relatively high cost of living in Orange County has caused many people with jobs there to seek lower cost housing options in places such as the Inland Empire. This relationship between coastal and inland communities results in strong traffic demand on linkages between the two areas, such as the SR 91. The Inland Empire is expected to realize the strongest percentage employment and household growth in the Study Area over the Forecast Period and the already robust (and growing) job market in Orange County will cause traffic demand on the SR 91 to continue rising. Table 4-1 presents a summary of the Base Case Study Area employment and household forecasts.

¹ “Employment,” unless otherwise stated, refers to a comprehensive measure of non-farm, at-place wage and salary jobs plus government and agricultural workers.

² “Households,” unless otherwise stated, refers to occupied dwelling units.

³ For the purposes of this analysis, the “Inland Empire” is defined as the counties of Riverside and San Bernardino.



Table 4-1: Base Case Study Area Employment and Household Forecast (thousands)

| Employment | 2015 | 2017 | 2025 | 2040 | |
|-----------------------|-------------|----------------|----------------|----------------|----------------|
| Total Employment | 7,196 | 7,457 | 8,052 | 8,938 | |
| Period | | 2015-17 | 2017-25 | 2025-40 | 2015-45 |
| Incremental Growth | | 261 | 595 | 886 | 1,742 |
| Average Annual Growth | | 131 | 74 | 17 | 69.67 |
| CAGR [1] | | 1.80% | 0.96% | 0.70% | 0.87% |
| Households | 2015 | 2017 | 2025 | 2040 | |
| Total Households | 5,648 | 5,734 | 6,178 | 6,828 | |
| Period | | 2015-17 | 2017-25 | 2025-40 | 2015-45 |
| Incremental Growth | | 86 | 444 | 650 | 1,180 |
| Average Annual Growth | | 43 | 55 | 43 | 47.20 |
| CAGR | | 0.76% | 0.94% | 0.67% | 0.76% |

[1] Compound Annual Growth Rate

4.1.1 Study Area Employment Survey

The California Economic Development Department (EDD) reports that the Study Area added approximately 73,000 nonfarm jobs annually (on average) between 1995 and 2015⁴, a compound annual growth rate of 1.1 percent. Between 2007 and 2009, the Study Area lost approximately 640,000 jobs, equating to 9.1 percent of its total job base, bringing the total number of jobs down to approximately 6.4 million, a level not seen since the 1999 to 2000 period. Recovery from the Great Recession began slowly in 2010 and accelerated in 2011, sustaining an average of 2.6 percent job growth between 2011 and 2016, resulting in an average of about 175,000 jobs per year over that period. The four-county Study Area fully recovered the employment losses stemming from the Great Recession in 2015 and has surpassed the previous peak in employment in 2007 by about 500,000 jobs. Figure 4-1 shows historical and forecast employment changes in the Study Area as well as the overall level of Study Area employment at the end of each period. As shown by the green extension of the historical employment levels tapering off on the right side of the figure, the robust employment growth seen over the past seven years during the economic recovery is not expected to continue. The reduced expected growth shown between 2018 and 2020 reflects the average expected growth rate between 2017 and 2025.

The Base Case forecast includes an average of 69,700 new jobs per year added to the Study Area between 2015 and 2040. This growth is due in part to the expected deceleration of growth following the relatively long recovery from the Great Recession. There are certain issues related to the cost of operating businesses in California that may hamper growth, but the highly educated workforce, industrial diversity, large established international trade industry, and population growth of the various urban cores within the Study Area will support job growth in the long term. Figure 4-2 shows historical Study Area employment and the Base Case employment forecast. The black line is the linear trend line of the historical data series from 1990 to 2015. The figure shows that the past four years of consistently strong growth have caused total employment to surpass the historical trend line as of 2015.

⁴ California Employment Development Department Labor Market Information Division

Figure 4-1: Historical and Forecast Study Area Employment Gains and Total Employment

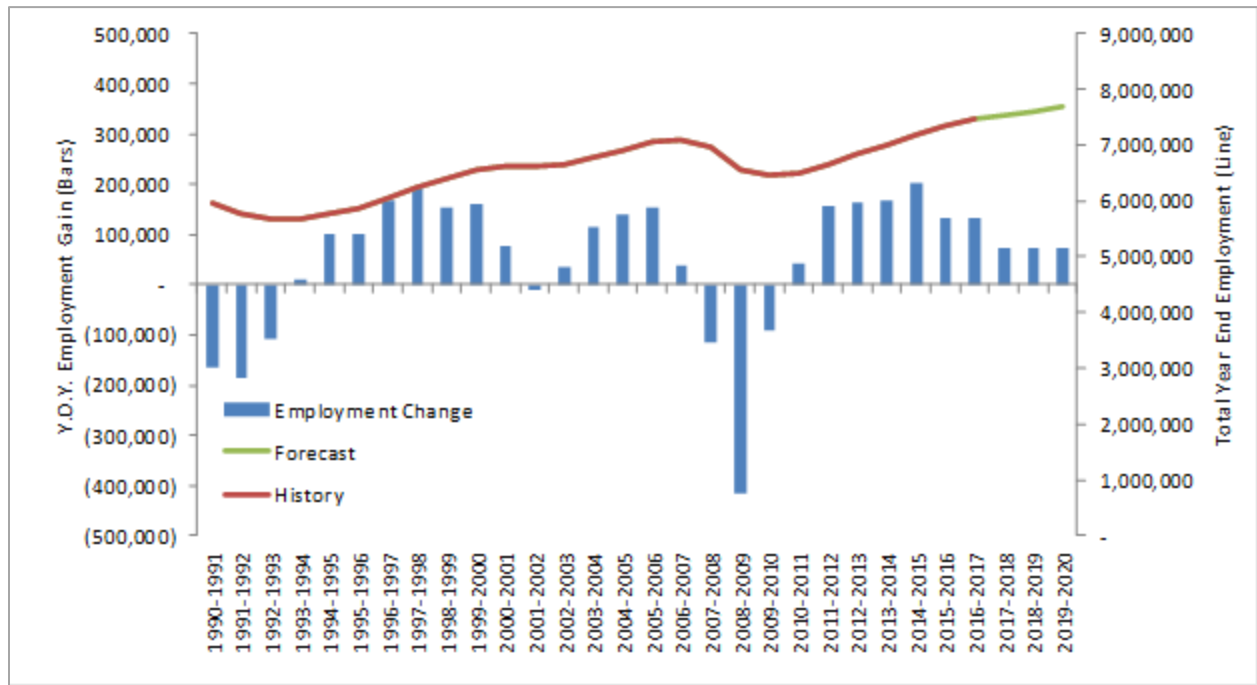
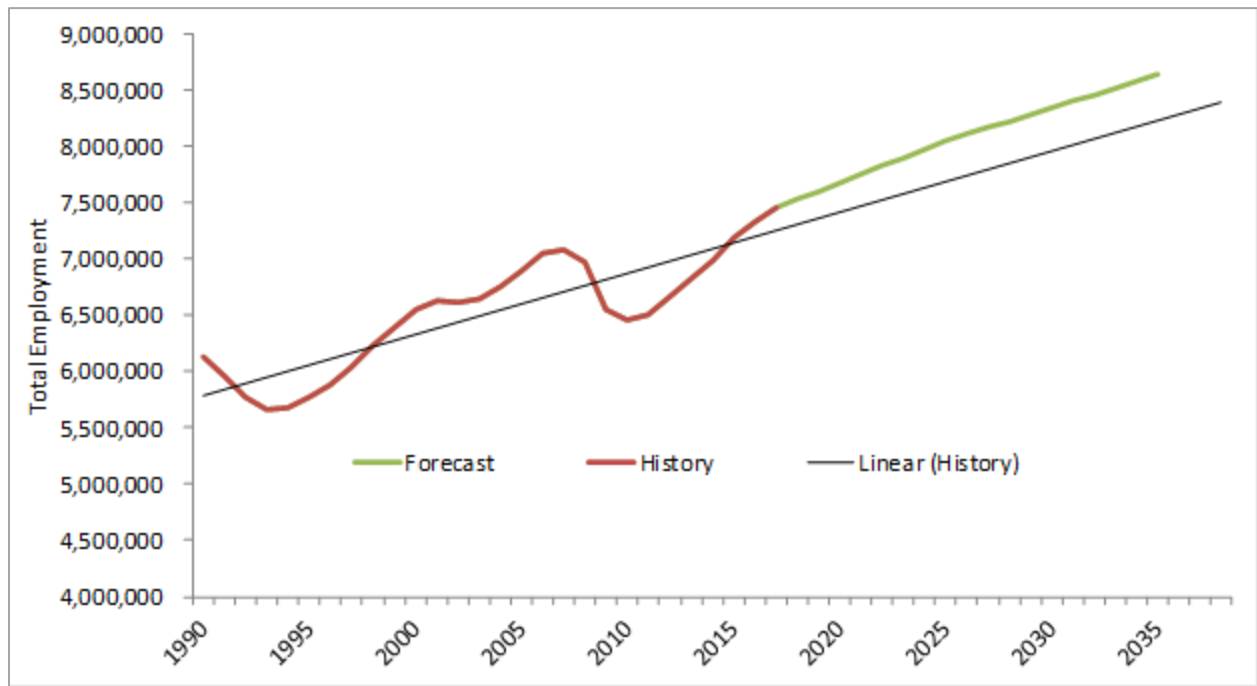


Figure 4-2: Historical and Base Case Study Area Employment Forecasts



Continued expansion is expected in the near term, with annual employment growth between 2017 and 2025 forecast to continue in the 0.8 percent to 1.6 percent range (depending on location), barring any major economic shocks. Near-term employment growth will be shaped by a number of factors, including:

- (i) Oil prices represent a double-edged sword in terms of economic impacts. On one hand, low oil prices hurt the oil-producing sectors of the economy. Businesses in this sector experience declining revenue and profits and increased credit risk, and as a result, the employment base can contract and capital investments may be halted. On the other hand, low prices benefit consumers and positively impact consumer expenditures, a critical component of the economy. Likewise, certain businesses benefiting from resulting energy costs savings may be better positioned to make capital investments during this period. The state is ranked third in the U.S. in crude oil production behind Texas and North Dakota, and half of the state's downstream activities, such as refinery operations, are located in the Study Area. After hitting a 15-year low in early 2016, oil prices have moderated into the \$60/barrel range. At this level, oil prices do not appear to be a major factor in job and household formations but if oil prices inflate, as they did prior to the last recession, household location choices could be impacted, particularly in the Inland Empire where commuters often drive long distances to work in coastal areas and fuel costs are a more significant consideration.
- (ii) Construction is typically one of the leading growth sectors in economic recovery periods due to demand that is pent-up during recessions. Historically high vacancy rates in residential and non-residential properties have mostly been absorbed during the recovery from the Great Recession, and markets (prices and inventories) have stabilized across the Study Area. The Inland Empire was hit particularly hard by foreclosures, but the number of distressed mortgages has declined to normal levels and new construction activity has been strong in recent years. The number of construction jobs in the Study Area have yet to exceed the previous highs in 2007 but are close.
- (iii) The general trend of businesses doing more with less will continue. This includes sharing work space, reducing the square footage per employee provided by office end users, working from home, investments in computer technology and automation to reduce the number of workers, and outsourcing to reduce overhead and increase profits. Certain sectors, such as manufacturing, will continue to face employment headwinds due to these trends. Non-residential development in the Inland Empire continues to be led by industrial / distribution space users seeking cheap land and good highway access. While industrial / distribution business relocation to the Inland Empire is positive in general, these uses tend to require far fewer employees per square foot, limiting the job-generating impact of these moves.

In December 2015, the Fed raised short-term borrowing rates for the first time in ten years. Citing job growth trends and healthy unemployment levels, this move signals confidence in the U.S. economy's near-term fundamentals and a departure from the monetary policy geared towards stemming the losses from the Great Recession. Most economists remain bullish on near term economic conditions with a few of the caveats cited above. In the longer-term, the Study Area forecast reflects several fundamental characteristics of Southern California that have impacted growth in the past.

- (i) The diverse mix of employment in the Study Area, including high-tech manufacturing (electronics, medical devices, defense equipment, etc.), leisure and hospitality jobs, retail jobs, medical services jobs to assist the aging population, and educational services jobs to fuel future innovation and economic growth.

- (ii) Continued migration of certain manufacturing sector components, such as distribution, which is migrating within the Study Area to less expensive operating environments such as the Inland Empire, and others (mainly less advanced manufacturing processes) that could continue moving off shore.
- (iii) Continued strong growth in Los Angeles County employment. The County's growth in the most recent recovery is a significant departure from historical trends and suggests a structural shift in the role of Los Angeles County employment in the Study Area. The county has averaged over 2 percent job growth over the past six years, representing over 50 percent of Study Area job growth over the period. In previous expansionary periods, Los Angeles County's share of Study Area growth was 39 percent (1993 to 2001) and 30 percent (2002 to 2007).
- (iv) Continued housing / jobs imbalance in certain key parts of the Study Area, including Orange County, where the build-out of remaining vacant land is arguably within the forecast horizon (2040). Even under current plans where far more land will be dedicated for residential development than commercial, long commute times will be the norm for many Orange County workers seeking less expensive residential options outside the county.
- (v) The trend towards infill development in established areas may provide a counterbalancing effect to the issues noted above in (iv). Our previous analyses in the region identified underutilized coastal areas as candidates for redevelopment. In the past, these were generally considered longer-term opportunities most likely to take place near the end of the Forecast Period. However, research and field observations suggest that this trend is accelerating and will impact employment and household development patterns sooner rather than later.
- (vi) California has developed a reputation as a challenging location to operate a business, and some businesses have relocated to more business-friendly states such as Arizona, Nevada, Texas, and Utah to avoid higher taxes, costly regulations, and the cost of living for employees, resulting in higher wage demands. Despite this reputation, during the recovery from the Great Recession, the state had one of the strongest rebounds relative to other states and the U.S. as a whole. This trend suggests that the fundamentals of the California economy remain strong despite perceptions of an unfriendly business environment.

Within the Study Area, the most significant long-term employment growth is expected in the Inland Empire where Riverside and San Bernardino counties' combined employment is expected to grow at an average annual rate of 1.2 percent over the Forecast Period, adding over 440,000 jobs by 2040. Inland Empire job growth will result from two broad trends;

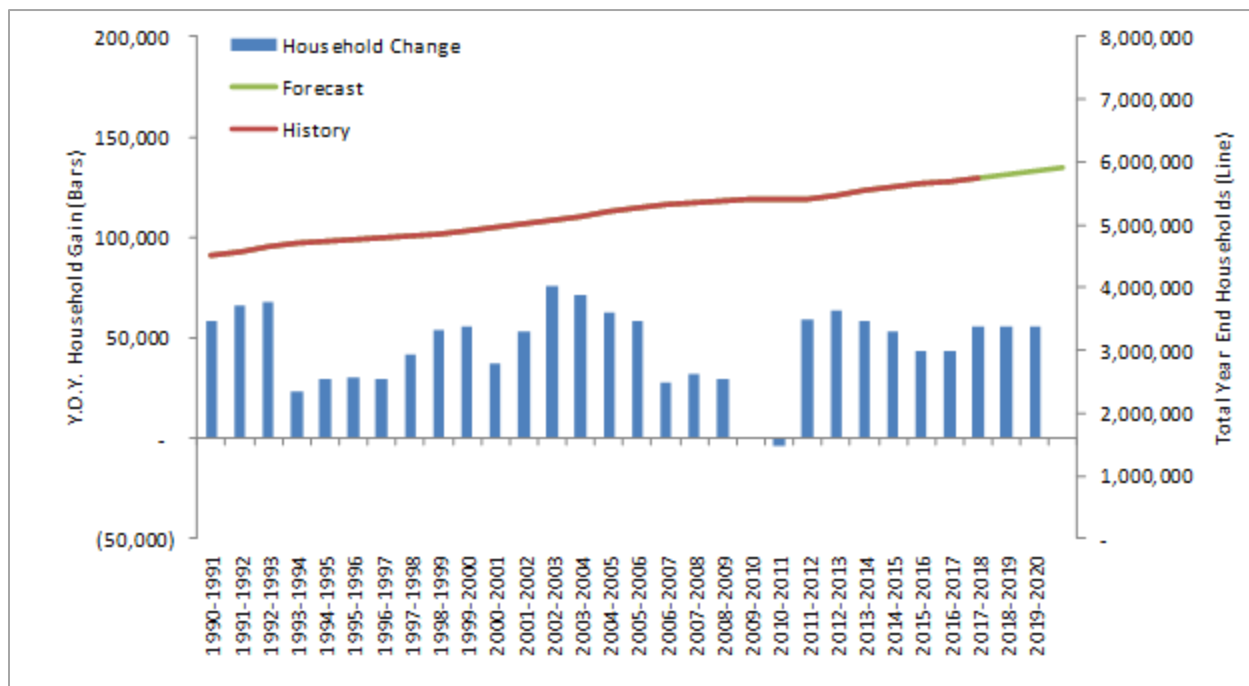
- (i) The need for nearby "population serving" jobs to serve large numbers of new residents, and
- (ii) The high cost of doing business in established Orange and Los Angeles county locations, especially for companies with large land demands such as certain types of manufacturing and distribution.

Transportation and trade related jobs have for years accounted for much of the job growth in the Inland Empire as many distribution facilities serving Ontario International Airport and the ports of Long Beach and Los Angeles are located there. Los Angeles and Orange county job growth, while at lower rates, will also be substantial, adding approximately 700,000 and 310,000 jobs, respectively between 2017 and 2040. These coastal counties are adding transit infrastructure and associated dense development, and will continue to be a preferred location for corporate headquarters other large regional office end users.

4.1.2 Study Area Household Summary

The Base Case forecast assumes that in the near-term, the ongoing strength of the economy will fuel continued household formations. Pent-up demand has largely been met, but continued strong residential growth in coastal areas and moderate expansion in inland areas between 2017 and 2020 is expected. Figure 4-3 shows historical and forecast household gains in the Study Area.

Figure 4-3: Historical and Forecast Area Households



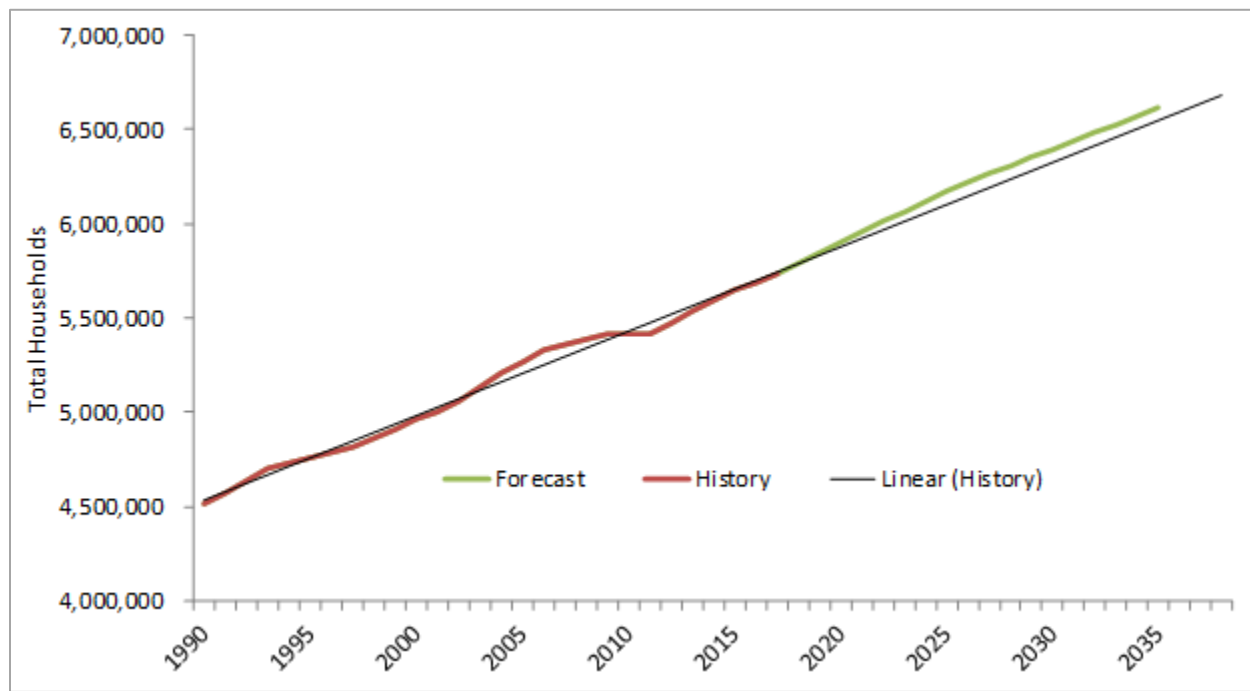
Overall, household formations reflect a higher number of employed persons per household in Orange and Los Angeles counties due to the higher proportion of dual income earning households and the daily in-migration of workers from surrounding counties. Table 4-2 shows historical and forecast jobs per household by county in the Study Area. As seen in the table, the average employment per household fell sharply between 2005 and 2010, reflecting the effect of the recession on employment in the Study Area. Employment per household is expected to return to the historical average over the Forecast Period.

Table 4-2: Jobs per Household by County

| Jobs/HH | 1990 | 1995 | 2000 | 2005 | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Los Angeles | 1.40 | 1.25 | 1.32 | 1.28 | 1.21 | 1.30 | 1.32 | 1.33 | 1.33 | 1.33 | 1.34 |
| Orange | 1.43 | 1.34 | 1.49 | 1.55 | 1.38 | 1.52 | 1.55 | 1.57 | 1.58 | 1.59 | 1.60 |
| San Bernardino | 0.89 | 0.90 | 1.03 | 1.10 | 1.00 | 1.12 | 1.14 | 1.13 | 1.13 | 1.12 | 1.12 |
| Riverside | 0.79 | 0.78 | 0.92 | 0.97 | 0.79 | 0.93 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Study Area Average | 1.30 | 1.19 | 1.28 | 1.28 | 1.16 | 1.27 | 1.30 | 1.30 | 1.31 | 1.31 | 1.31 |

Figure 4-4 shows the historical trend of household growth in the Study Area compared to the Base Case forecast. As seen in the figure, it is expected that household growth in the region will move beyond the historical trendline. This is due to an initial level of higher growth in the region between 2015 and 2020 resulting from a variety of factors. These include increased household formation resulting from continued economic growth, as adult children leave their parents' homes or leave roommates due to stronger financial situations, growth driven by the Millennial Generation, as well as positive net in-migration driven by local employment opportunities.

Figure 4-4: Historical and Forecast Base Case Households



In the long term, the western portions of the Inland Empire will achieve the strongest percentage household growth, where price points are lower than most Orange and Los Angeles county markets and reasonable commutes to Orange and Los Angeles job centers remain possible, especially given current and planned expansion of tolled express lane options on SR-91 which links Inland Empire communities to the Foothill Eastern toll road and central Orange County employment centers.

A significant component of residential growth in coastal areas (especially Los Angeles County and northern portions of Orange County) will be through redevelopment of older obsolete industrial properties and denser, multifamily infill projects. Recent permitting activity suggests that this is a growing trend. In 2015, 80 percent of Los Angeles County permits and 65 percent of Orange County permits were for multifamily units, compared to 24 percent and 28 percent for Riverside and San Bernardino Counties respectively. Another related trend in residential development is that cities are incentivizing developers to build multifamily developments near transit facilities, through tax breaks, density bonuses and other mechanisms. Concentration of new development near transit facilities and Millennial preference towards non-automotive travel is a factor that will reduce highway congestion.

4.2 FORECAST METHODOLOGY

Forecasts were developed using both the Riverside County Transportation Analysis Model (RivTAM), as well as the San Diego Association of Governments (SANDAG) traffic models. The combination of these two models includes the Study Area, San Diego, Ventura, and Imperial Counties, which, as noted earlier, are not expected to impact Riverside County to Orange County highway traffic in a material way. The Study Area forecast discussed above is the aggregation of 5,211 individual traffic analysis zone (TAZ) forecasts⁵. The disaggregated TAZ forecasts can be aggregated by county, city or Focus Area to aid in the analysis. The term “Focus Areas” refers to aggregations of TAZs assembled by WSP that represent major projects or development areas that received additional attention in the modeling process due to their expected impact on the RCTC’s traffic. Figure 4-5 is a map of the Study Area, showing the core of the four counties relative to the SR-91 Express Lanes.

Figure 4-5: Map of the Study Area



⁵ Traffic analysis zones are geographical areas, subsets of Census Tracts, established based on traffic levels and generally bound by roadways.

The forecast provides the socioeconomic inputs for 2,243 TAZs in Los Angeles County, 666 TAZs in Orange County, 1,900 TAZs in Riverside County, 402 TAZs in San Bernardino County. The specific analytical steps taken to undertake this update were:

- Reviewed Metropolitan Planning Organization (MPO) demographic forecasts including revised Southern California Association of Governments (SCAG) data and incorporated this data into our model framework.
- Incorporated the Base Case Forecasts into the RivTAM TAZ structure for use by Stantec, and performed standard tests to ensure that socioeconomic model outputs flowed seamlessly into the traffic model.
- Reviewed economic reports and forecasts from the Los Angeles Economic Development Corporation (LAEDC), California Department of Finance, Moody's Analytics, and other third party data sources to understand current national, state, and local trends in the critical trip production and attraction variables of households and at-place employment.
- Established 2017 values for the 53 socioeconomic data model parameters at the TAZ level for use by Stantec in calibrating the traffic model.
- Conducted interviews with a limited number of developers and planning agencies where key real estate development projects were planned or underway to validate expectations for those areas.
- Developed Study Area, county and Focus Area employment and household growth rates for the Forecast Period based on a review of historical trends from the California EDD, national and regional forecasts, economic reports, and first-hand information gathered through the interview process.
- Using information generated through the preceding steps, prepared a Base Case forecast for the required variables (mainly households, jobs, and variations thereof) at the Study Area, county, Focus Area, and TAZ levels.

As stated above, the Base Case has been developed using the RivTAM/TransCAD model structure and provides inputs to the traffic model for all 53 socioeconomic parameters. Some forecast parameters are directly related to, and were therefore derived from, the primary forecast parameters (total at-place employment and households) while others were adopted from the MPO base data.

4.3 HISTORICAL DATA AND TRENDS IN THE STUDY AREA

4.3.1 Historical Study Area Employment Trends

Employment in the Study Area grew from 5.8 million in 1995 to 7.2 million in 2015, corresponding to an average of 73,000 new jobs per year and a compound annual growth rate of 1.1 percent⁶. This period takes into account several economic cycles including the Great Recession and the ongoing recovery that followed. Some portions of the Study Area, specifically Los Angeles County and parts of Orange County, are more mature job markets that have experienced relatively slower growth rates over the long term; but overall, the Study Area has exhibited resiliency in post recessionary periods, with the redevelopment of obsolete properties in mature areas and steady growth in emerging

⁶ Source: California EDD LMI

submarkets. Table 4-3 shows that job growth by county varied significantly by period, with strong percentage growth in the Inland Empire counties from 1995 to 2005 and the high level of absolute job growth in Los Angeles County from 2010 to 2015.

Table 4-3: Total Employment Growth by County, 1995 to 2015

| County | 1995 | 2000 | 2005 | 2010 | 2015 |
|-----------------------|----------------|----------------|----------------|----------------|----------------|
| Los Angeles | 3,796,000 | 4,132,000 | 4,140,700 | 3,924,900 | 4,286,500 |
| Period | 1995-00 | 2000-05 | 2005-10 | 2010-15 | 1995-15 |
| Incremental Growth | 336,000 | 8,700 | (215,800) | 361,600 | 490,500 |
| Average Annual Growth | 67,200 | 1,740 | (43,160) | 72,320 | 25,816 |
| CAGR | 1.71% | 0.04% | -1.06% | 1.78% | 0.61% |
| Orange | 1,167,500 | 1,401,100 | 1,504,300 | 1,374,900 | 1,546,900 |
| Period | 1995-00 | 2000-05 | 2005-10 | 2010-15 | 1995-15 |
| Incremental Growth | 233,600 | 103,200 | (129,400) | 172,000 | 379,400 |
| Average Annual Growth | 46,720 | 20,640 | (25,880) | 34,400 | 19,968 |
| CAGR | 3.72% | 1.43% | -1.78% | 2.39% | 1.42% |
| San Bernardino | 451,000 | 545,600 | 655,000 | 616,500 | 705,600 |
| Period | 1995-00 | 2000-05 | 2005-10 | 2010-15 | 1995-15 |
| Incremental Growth | 94,600 | 109,400 | (38,500) | 89,100 | 254,600 |
| Average Annual Growth | 18,920 | 21,880 | (7,700) | 17,820 | 13,400 |
| CAGR | 3.88% | 3.72% | -1.20% | 2.74% | 2.26% |
| Riverside | 359,800 | 471,000 | 602,300 | 549,200 | 656,800 |
| Period | 1995-00 | 2000-05 | 2005-10 | 2010-15 | 1995-15 |
| Incremental Growth | 111,200 | 131,300 | (53,100) | 107,600 | 297,000 |
| Average Annual Growth | 22,240 | 26,260 | (10,620) | 21,520 | 15,632 |
| CAGR | 5.53% | 5.04% | -1.83% | 3.64% | 3.05% |
| Study Area | 5,774,300 | 6,549,700 | 6,902,300 | 6,465,500 | 7,195,800 |
| Period | 1995-00 | 2000-05 | 2005-10 | 2010-15 | 1995-15 |
| Incremental Growth | 775,400 | 352,600 | (436,800) | 730,300 | 1,421,500 |
| Average Annual Growth | 155,080 | 70,520 | (87,360) | 146,060 | 74,816 |
| CAGR | 2.55% | 1.05% | -1.30% | 2.16% | 1.11% |

Job growth in the Inland Empire has been relatively healthy for the past 20 years, and compared to other parts of the Study Area, it has a very different employment composition stemming from fundamental characteristics of its specific stage of the socioeconomic lifecycle. While Los Angeles County and Orange County represent maturing job centers, the Inland Empire is a large, fast-growing formerly agricultural area that is now a center for industrial and distribution businesses. From the mid-1990s to the mid-2000s, it was one of the fastest growing metropolitan areas in the country.

Sector specific trends reflect these distinct characteristics. Leading up to the Great Recession, the Inland Empire was undergoing an unprecedented housing boom, which led to strong but unsustainable growth in the construction sector. The Inland Empire experienced dramatic declines in housing market conditions, leading to significant job losses in the construction sector in 2008 and 2009.

From 2010 to 2014, consistent with regional, state, and national trends, the Inland Empire gradually recovered from the losses of the Great Recession. The rebound from 2010 was driven by two of the Inland Empire's key industries: logistics and construction. The Inland Empire has a competitive advantage with respect to logistics, with large amounts

of affordable land with strong access to the west coast ports and interstate network as a whole, that are key site criteria for distribution users. These sites are also attractive for e-commerce and consumer goods businesses seeking distribution hubs. Amazon recently opened fulfillment centers in Moreno Valley and Redlands, and industrial development activity continues to drive commercial real estate in the region. The Inland Empire is considered one of the strongest industrial markets in the nation. Construction and leasing activity are both healthy, and vacancy rates are hovering at about four percent. End users continue to take down large leases, with five in the 2nd quarter of 2018 between 600,000 and 1.1 million square feet, according to CBRE Research.

4.3.2 Historical Study Area Household Trends

Historical residential building permit data from 1996 to 2017 is shown in Table 4-4. During this period, the Study Area averaged approximately 45,000 residential units per year with 45 percent of these permit issuances occurring in the Inland Empire counties, 36 percent in Los Angeles County, and the remaining 19 percent taking place in Orange County.

Residential permit issuance grew significantly each year between 1995 and 2004, even during the early 2000s when the short tech bubble-related recession occurred. Permit issuance in the Study Area peaked in 2004 at 87,000. During this year over half (59 percent) of the building permits issued were in Riverside and San Bernardino counties.

The surge in housing production between 2002 and 2006, especially in Riverside and San Bernardino counties, was in large part attributable to favorable lending terms, most simply reflected in mortgage rates. After peaking in 1981, the average annual 30-year mortgage rate trended downward until reaching a 30 year low in 2003 at under 5.5 percent. This borrowing environment made homes more affordable despite robust annual price increases during the late 1990's through the mid 2000's.

Annual permit issuance began to decline significantly in 2007 and reached a low in 2009 of 13,600 issuances. Activity has increased significantly since then, reaching 45,000 in 2017, which is significantly higher than the 2009 trough, but still far below the 2004 peak. The increase in activity has been driven primarily by permits in Los Angeles County.

Geographically, trends in single and multifamily product types reflect the relative levels of maturity of each county, with more mature areas that are fully developed and space-constrained limited to higher density development. The split between single-family detached and multifamily units built between 2007 and 2017 in the Study Area was approximately 45 percent/55 percent respectively. Single-family detached homes represented approximately 76 percent of the homes built in Riverside and San Bernardino counties, an area rich with undeveloped land. Orange County, which is running out of vacant land for development, falls between Los Angeles and the Inland Empire counties with approximately 60 percent of new homes built as detached units. Table 4-5 presents actual annual residential building permit data from between 2007 and 2017.

Table 4-4: Growth of Total Residential Building permits in the Study Area

| Year | Los Angeles | Orange | Riverside | San Bernardino | Total | Y.O.Y. % Change |
|--------------|----------------|----------------|----------------|----------------|----------------|-----------------|
| 1996 | 7,731 | 10,173 | 7,540 | 4,822 | 30,266 | - |
| 1997 | 9,829 | 12,261 | 9,747 | 5,448 | 37,285 | 23.2% |
| 1998 | 11,226 | 9,704 | 12,527 | 6,127 | 39,584 | 6.2% |
| 1999 | 14,060 | 12,239 | 14,154 | 6,767 | 47,220 | 19.3% |
| 2000 | 16,968 | 12,520 | 15,025 | 6,471 | 50,984 | 8.0% |
| 2001 | 18,294 | 8,611 | 19,012 | 8,405 | 54,322 | 6.5% |
| 2002 | 16,454 | 11,796 | 22,255 | 10,219 | 60,724 | 11.8% |
| 2003 | 20,903 | 9,248 | 30,353 | 11,899 | 72,403 | 19.2% |
| 2004 | 26,529 | 9,256 | 33,446 | 18,017 | 87,248 | 20.5% |
| 2005 | 23,948 | 7,143 | 34,373 | 16,635 | 82,099 | -5.9% |
| 2006 | 25,202 | 8,303 | 24,765 | 13,324 | 71,594 | -12.8% |
| 2007 | 19,244 | 7,372 | 12,334 | 7,752 | 46,702 | -34.8% |
| 2008 | 11,810 | 3,235 | 5,763 | 3,183 | 23,991 | -48.6% |
| 2009 | 5,138 | 2,143 | 4,072 | 2,263 | 13,616 | -43.2% |
| 2010 | 7,260 | 3,134 | 4,547 | 1,789 | 16,730 | 22.9% |
| 2011 | 9,895 | 4,352 | 3,264 | 1,472 | 18,983 | 13.5% |
| 2012 | 11,365 | 6,082 | 4,052 | 1,897 | 23,396 | 23.2% |
| 2013 | 14,776 | 10,422 | 5,924 | 3,424 | 34,546 | 47.7% |
| 2014 | 17,659 | 9,291 | 6,761 | 3,405 | 37,116 | 7.4% |
| 2015 | 23,263 | 10,771 | 6,158 | 3,768 | 43,960 | 18.4% |
| 2016 | 20,591 | 11,523 | 6,996 | 3,925 | 43,035 | -2.1% |
| 2017 | 21,574 | 9,510 | 8,001 | 6,675 | 45,760 | 6.3% |
| Total | 353,719 | 189,089 | 291,069 | 147,687 | 981,564 | |

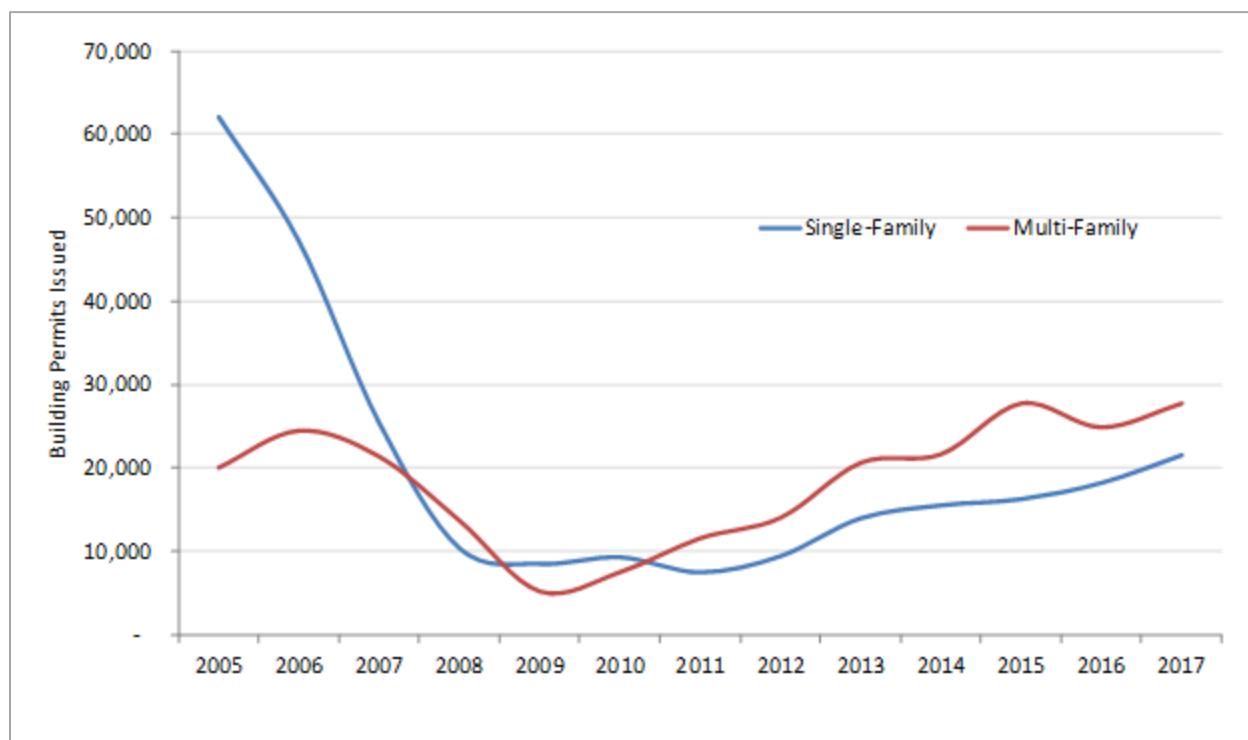
Source: U.S. Census Bureau

The increase in activity in recent years has been driven by increased multifamily development in Orange County and Los Angeles counties. This is a departure from historical trends in which the majority of permit issuances were for single-family detached units, as shown in Figure 4-6.

Table 4-5: Annual Building Permits Issued in the Study Area, 2007 to 2017

| County | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Los Angeles | | | | | | | | | | | |
| Single Family | 7,102 | 3,249 | 2,268 | 2,384 | 2,275 | 2,675 | 3,839 | 4,586 | 4,638 | 5,022 | 5,683 |
| Multi-Family | 12,142 | 8,561 | 2,870 | 4,876 | 7,620 | 8,690 | 10,937 | 13,073 | 18,625 | 15,569 | 15,891 |
| Total | 19,244 | 11,810 | 5,138 | 7,260 | 9,895 | 11,365 | 14,776 | 17,659 | 23,263 | 20,591 | 21,574 |
| Orange | | | | | | | | | | | |
| Single Family | 2,279 | 1,330 | 1,341 | 1,624 | 1,822 | 2,271 | 3,670 | 3,714 | 3,809 | 4,357 | 4,904 |
| Multi-Family | 5,093 | 1,905 | 802 | 1,510 | 2,530 | 3,811 | 6,752 | 5,577 | 6,962 | 7,166 | 4,606 |
| Total | 7,372 | 3,235 | 2,143 | 3,134 | 4,352 | 6,082 | 10,422 | 9,291 | 10,771 | 11,523 | 9,510 |
| Riverside | | | | | | | | | | | |
| Single Family | 9,717 | 3,820 | 3,406 | 4,027 | 2,275 | 3,107 | 4,432 | 5,074 | 4,934 | 5,987 | 6,703 |
| Multi-Family | 2,617 | 1,943 | 666 | 520 | 989 | 945 | 1,492 | 1,687 | 1,224 | 1,009 | 1,298 |
| Total | 12,334 | 5,763 | 4,072 | 4,547 | 3,264 | 4,052 | 5,924 | 6,761 | 6,158 | 6,996 | 8,001 |
| San Bernardino | | | | | | | | | | | |
| Single Family | 6,302 | 1,976 | 1,481 | 1,260 | 1,103 | 1,381 | 2,040 | 2,148 | 2,882 | 2,850 | 4,252 |
| Multi-Family | 1,450 | 1,207 | 782 | 529 | 369 | 516 | 1,384 | 1,257 | 886 | 1,075 | 2,423 |
| Total | 7,752 | 3,183 | 2,263 | 1,789 | 1,472 | 1,897 | 3,424 | 3,405 | 3,768 | 3,925 | 6,675 |
| Study Area | | | | | | | | | | | |
| Single Family | 25,400 | 10,375 | 8,496 | 9,295 | 7,475 | 9,434 | 13,981 | 15,522 | 16,263 | 18,216 | 21,542 |
| Multi-Family | 21,302 | 13,616 | 5,120 | 7,435 | 11,508 | 13,962 | 20,565 | 21,594 | 27,697 | 24,819 | 24,218 |
| Total | 46,702 | 23,991 | 13,616 | 16,730 | 18,983 | 23,396 | 34,546 | 37,116 | 43,960 | 43,035 | 45,760 |

Figure 4-6: Study Area Residential Building Permit Issuance, 2005 to 2015



4.4 EMPLOYMENT FORECASTS

This section provides detailed information on the Base Case Forecasts developed as inputs to the RivTAM model for the SR-91 Express Lanes traffic and revenue forecasting effort. As outlined in the methodology section above, WSP uses third-party forecasts to assist in developing its long-term forecasts at the county level. A presentation of these forecasts is provided first, along with commentary on current economic trends and expectations that resulted in the Base Case forecast.

While household and population counts are somewhat standard across forecasting platforms, most of the forecasts reviewed have varying “definitions” of employment that are not directly comparable. As such, we offer the following terminology to help clarify the dialogue that follows:

- **Wage & Salary:** A widely used definition of employment used by the Bureau of Labor Statistics (BLS) which reports payroll employment counts based on insurance claims.
- **Proprietors:** Persons who own businesses but are paid by distributions from business revenue, and are not part of the payroll.
- **Self Employed:** Persons who are contract employees operate businesses as individuals or partners and are therefore not part of company payrolls. May be some overlap with Proprietors.

Because of the differences in employment definitions and when the individual forecasts were developed, compound annual growth rates (CAGR) are displayed in the data tables to better capture each forecast’s spirit.

4.4.1 Comparative Third Party Forecasts: Long- Term

California Department of Transportation (Caltrans) Caltrans provides long-term forecasts for various socioeconomic variables. The primary data gathering source for employment is the California EDD Labor Market Information (LMI), and for households and population, the California Department of Finance Demographic Research Unit.

The Caltrans employment estimate for the Study Area totals 7.5 million jobs in 2017 and forecasts employment to increase to 8.9 million jobs by 2040, a 0.76 percent compound annual growth rate. The forecast predicts the strongest growth to occur between 2017 and 2025 at 0.9 percent annual growth, followed by 0.7 percent between 2025 and 2040.

Moody’s Analytics Moody’s Analytics provides independent economic and demographic projections through 2045. Moody’s gathers data from the U.S. Bureau of Labor Statistics (BLS), and forecasts total non-farm employment. The same BLS Current Employment Statistics (“CES”) program is used as a base for Moody’s forecasts, as well as the Quarterly Census of Employment and Wages (QCEW) produced by the BLS.

The Moody's employment forecast for the Study Area reports 7.5 million jobs in 2017 and forecasts employment to increase to 8.4 million jobs by 2040, a 0.5 percent compound annual growth rate. The forecast predicts the strongest growth to occur between 2017 and 2025 at 0.7 percent followed by periods of lower growth.

Southern California Association of Governments (SCAG) The regional metropolitan planning organization, SCAG, develops detailed forecasts for the Study Area that the RIVTAM inputs are derived from. These forecasts are not updated regularly, therefore have somewhat limited value in short-term comparisons to other third party forecasts. However, SCAG forecast updates for 2016 were obtained by WSP for use in this exercise and given the somewhat recent update, were considered relevant to the county-level comparison.

The SCAG employment forecast for the Study Area reports 7.7 million jobs in 2017 and forecasts employment to increase to 9.2 million jobs by 2040, a 0.75 percent compound annual growth rate. **Error! Reference source not found.** Table 4-6 shows each of the employment forecasts described above along with the Base Case Forecast for the Study Area. In addition to the long-term forecasts, data from the California EDD, both annual and monthly through 2017⁷, along with third party forecasts, were used to establish 2017 base year employment numbers for each county.

Table 4-6: Comparisons of Long-Term Employment Projections (thousands)

| Employment | 2015 | 2017 | 2025 | 2040 |
|-----------------------|---------|---------|---------|---------|
| Caltrans | 7,196 | 7,517 | 8,072 | 8,941 |
| Moody's | 7,173 | 7,509 | 7,905 | 8,403 |
| SCAG | 7,413 | 7,720 | 8,370 | 9,166 |
| Base Case | 7,196 | 7,457 | 8,052 | 8,938 |
| Incremental Growth | 2015-17 | 2017-25 | 2025-40 | 2015-40 |
| Caltrans | 322 | 554 | 869 | 1,745 |
| Moody's | 336 | 397 | 497 | 1,230 |
| SCAG | 307 | 650 | 796 | 1,753 |
| Base Case | 261 | 595 | 886 | 1,742 |
| Average Annual Growth | 2015-17 | 2017-25 | 2025-40 | 2015-40 |
| Caltrans | 161 | 69 | 58 | 69.8 |
| Moody's | 168 | 50 | 33 | 49.2 |
| SCAG | 153 | 81 | 53 | 70.1 |
| Base Case | 131 | 74 | 59 | 69.7 |
| CAGR | 2015-17 | 2017-25 | 2025-40 | 2015-40 |
| Caltrans | 2.2% | 0.9% | 0.7% | 0.9% |
| Moody's | 2.3% | 0.6% | 0.4% | 0.6% |
| SCAG | 2.0% | 1.0% | 0.6% | 0.9% |
| Base Case | 1.8% | 1.0% | 0.7% | 0.9% |

Note: Moody's reflects total nonfarm employment; all others include farm employment

4.4.2 Study Area Employment Forecast

Total employment growth in the Study Area between 2015 and 2040 is projected to be 1.7 million jobs or an average of approximately 69,700 jobs per year. Table 4-7 breaks this growth down by county.

⁷ Initial analysis of employment took place prior to available year-end data for 2015



With an average annual rate of 1.7 percent, Riverside County is expected to see the strongest percentage growth, adding 13,600 jobs per year on average between 2015 and 2040.

Table 4-7: Base Case Employment Forecast by County (thousands)

| Employment | 2015 | 2017 | 2025 | 2040 |
|------------------------------|----------------|----------------|----------------|----------------|
| Los Angeles | 4,287 | 4,401 | 4,692 | 5,106 |
| Orange | 1,547 | 1,598 | 1,730 | 1,909 |
| Riverside | 657 | 726 | 828 | 996 |
| San Bernardino | 706 | 732 | 802 | 926 |
| Study Area | 7,196 | 7,457 | 8,052 | 8,938 |
| Incremental Growth | 2015-17 | 2017-25 | 2025-40 | 2015-40 |
| Los Angeles | 114 | 291 | 414 | 820 |
| Orange | 51 | 132 | 179 | 362 |
| Riverside | 70 | 101 | 169 | 339 |
| San Bernardino | 27 | 70 | 124 | 220 |
| Study Area | 261 | 595 | 886 | 1,742 |
| Average Annual Growth | 2015-17 | 2017-25 | 2025-40 | 2015-40 |
| Los Angeles | 57 | 36 | 28 | 32.8 |
| Orange | 25 | 17 | 12 | 14.5 |
| Riverside | 35 | 13 | 11 | 13.6 |
| San Bernardino | 13 | 9 | 8 | 8.8 |
| Study Area | 131 | 74 | 59 | 69.7 |
| CAGR | 2015-17 | 2017-25 | 2025-40 | 2015-40 |
| Los Angeles | 1.3% | 0.8% | 0.6% | 0.7% |
| Orange | 1.6% | 1.0% | 0.7% | 0.8% |
| Riverside | 5.2% | 1.6% | 1.2% | 1.7% |
| San Bernardino | 1.9% | 1.1% | 1.0% | 1.1% |
| Study Area | 1.8% | 1.0% | 0.7% | 0.9% |

The Inland Empire will experience the highest growth in jobs with a compound annual growth rate of 1.4 percent over the 25-year period. The Inland Empire counties are expected to add approximately 22,400 new jobs annually between 2015 and 2040. Between 2000 and 2015, the Inland Empire counties experienced employment growth of approximately 21,100 jobs per year.

Los Angeles County will add approximately 33,000 jobs per year, though it will grow at the slowest rate of the four counties in the Study Area, at 0.7 percent annually. Between 2000 and 2015, Los Angeles county job growth was cyclical and averaged just 16,000 jobs on an annual average basis. However, from 2012 to 2017, the county averaged about 100,000 jobs per year. With more diversity in its job base and major investments in transportation infrastructure, specifically transit, positive but moderate job growth is expected in the future.

The shortage of developable land in Los Angeles County will limit the rate of job growth there, though it will continue to have the largest employment base in the region due to the established industries and national headquarters, airport and port facilities, location relative to the coast, and diverse housing stock. Developers will continue to seek out underutilized sites to redevelop into higher density properties, both residential and commercial. Transit-oriented

development around the rapidly developing transit system is still a relatively new trend in Los Angeles that will house a significant percentage of new development. Still, some Los Angeles County residents are expected to migrate east to San Bernardino County seeking lower costs of living. The strongest growth industries in Los Angeles are expected to be educational and professional services, as well as arts and entertainment.

Orange County will see most of its long-term job growth in the same three categories as Los Angeles County but the fourth largest industry will be Finance, Investment, and Real Estate services (FIRE). Redevelopment of older residential and industrial properties in Orange County will be geared towards new higher density residential space and reuse of industrial buildings as hybrid spaces for light manufacturing and office. Higher density office space will be developed in the medium and long-term, though there is a notable movement towards shared office space and working from home which will temper the demand for office space in Orange County and other parts of the Study Area.

With relatively low real estate costs, lower wages, access to a growing international airport (Ontario), and available land for both commercial expansion and workforce housing options, certain types of businesses have blossomed in the Inland Empire or relocated there from more expensive coastal locations. Warehousing, manufacturing and distribution facilities have led Inland Empire job growth in the past decade as the ports in Los Angeles County created demand for major distribution facilities that could not be located near the ports due to high land costs. Because of the growth of population expected in the long-term, a more balanced mix of population serving (retail) employment is expected, though primary job growth will continue to be focused in the distribution, manufacturing, construction, and transportation sectors.

4.5 HOUSEHOLD FORECAST

4.5.1 Study Area Comparative Forecasts

As in the employment forecast section, information on third-party forecasts examined by WSP to help guide its long-term county-level forecasts is presented first, followed by details of the Base Case Forecast. The same three third-party forecasts, SCAG, Moody's Analytics, and Caltrans, which were surveyed for employment, were also surveyed for household forecasting purposes. Table 4-8 compares the growth rates from each third-party forecast with the Base Case Forecast from 2015 to 2040.

The forecasts reflect differing long-term annual growth rates over the Forecast Period, ranging from 0.6 percent (Caltrans) to 0.8 percent (Moody's) with significant variation between five-year periods as well. For instance, the Moody's view is one of strong early growth followed by declines in growth longer term that are still generally higher than the other forecasts. Caltrans and SCAG forecast more consistent growth over the Forecast Period, but both show lower overall growth rates than Moody's.

The Great Recession was caused in large part by the overbuilding of residential real estate and speculative lending practices that together resulted in large inventories of empty new and resold homes. As is typical with economic models, when inventories build and demand declines, prices fall, as reflected in the Study Area from 2007 to 2011. Although all counties were hit by the recession, the most substantial percentage declines were realized in the Inland Empire from 2007 to 2009. In 2011, home prices began to rise and a major market correction occurred in 2013.

Table 4-8: Comparison of Long-Term Household Projections (thousands)

| Households | 2015 | 2017 | 2025 | 2040 |
|------------------------------|----------------|----------------|----------------|----------------|
| Caltrans | 5,648 | 5,704 | 5,993 | 6,479 |
| Moody's | 5,816 | 5,889 | 6,382 | 7,101 |
| SCAG | 5,749 | 5,903 | 6,299 | 7,005 |
| Base Case | 5,648 | 5,734 | 6,178 | 6,828 |
| Incremental Growth | 2015-17 | 2017-25 | 2025-40 | 2017-40 |
| Caltrans | 56 | 289 | 485 | 831 |
| Moody's | 74 | 492 | 719 | 1,285 |
| SCAG | 154 | 397 | 705 | 1,256 |
| Base Case | 86 | 444 | 650 | 1,180 |
| Average Annual Growth | 2015-17 | 2017-25 | 2025-40 | 2017-40 |
| Caltrans | 28 | 36 | 32 | 36 |
| Moody's | 37 | 62 | 48 | 56 |
| SCAG | 77 | 50 | 47 | 55 |
| Base Case | 43 | 55 | 43 | 51 |
| CAGR | 2015-17 | 2017-25 | 2025-40 | 2017-40 |
| Caltrans | 0.5% | 0.6% | 0.5% | 0.6% |
| Moody's | 0.6% | 1.0% | 0.7% | 0.8% |
| SCAG | 1.3% | 0.8% | 0.7% | 0.7% |
| Base Case | 0.8% | 0.9% | 0.7% | 0.8% |

Strong price increases have continued over the past five years in each county, as the economy rebounded and the inventory of unsold homes and distressed mortgages unwound.

Many families in the Study Area have been, and will continue to be, priced out of the coastal areas and are expected to seek more affordable living arrangements in other places such as the Inland Empire.

Table 4-9: Historical Study Area Median Home Prices

| Mon-Yr | Los Angeles | Orange | Riverside | San Bernardino |
|--------|-------------|-----------|-----------|----------------|
| Jun-10 | \$310,871 | \$566,508 | \$214,335 | \$141,895 |
| Jun-11 | \$301,300 | \$534,680 | \$202,910 | \$129,570 |
| Jun-12 | \$315,390 | \$567,910 | \$219,850 | \$138,110 |
| Jun-13 | \$403,760 | \$661,740 | \$298,470 | \$174,650 |
| Jun-14 | \$435,950 | \$696,680 | \$321,840 | \$204,860 |
| Jun-15 | \$473,290 | \$716,730 | \$337,380 | \$231,300 |
| Jun-16 | \$502,190 | \$754,000 | \$360,000 | \$245,220 |
| Jun-17 | \$548,220 | \$795,000 | \$385,000 | \$270,000 |
| Jun-18 | \$586,090 | \$835,500 | \$405,000 | \$293,250 |
| 10-11 | -3% | -6% | -5% | -9% |
| 11-12 | 5% | 6% | 8% | 7% |
| 12-13 | 28% | 17% | 36% | 26% |
| 13-14 | 8% | 5% | 8% | 17% |
| 14-15 | 9% | 3% | 5% | 13% |
| 15-16 | 6% | 5% | 7% | 6% |
| 16-17 | 9% | 5% | 7% | 10% |
| 17-18 | 7% | 5% | 5% | 9% |

Source: California Association of Realtors

4.5.2 Study Area Household Forecasts

Table 4-10 presents the Base Case Forecast of households. The Study Area is expected to add close to 1.2 million new households between 2015 and 2040, a compound annual rate of 0.8 percent over the Forecast Period.

About 41 percent of the new dwelling units forecast to be built in the Study Area will be located in the Inland Empire. These 484,000 new households represent about 1.5 million people. Workers not employed in San Bernardino or Riverside counties will face heavy traffic while commuting to job centers outside the Inland Empire, choosing to commute in exchange for less expensive housing. Local development experts suggest that 1.5 to 2 hours is the maximum that commuters will regularly drive each way to get to work in this area. This limits the area in the Inland Empire that can reasonably serve the Orange County job markets to the western portions in the vicinity of Corona, Chino Hills, Ontario, and Riverside, depending on the use of tolled lanes, due to heavy congestion during rush hour. Faced with this tradeoff, many Orange County workers, especially those with higher incomes, will continue to seek housing options in Orange County, despite the higher cost. There is significant near-term residential growth in western portions of the Inland Empire in large master-planned communities such as Ontario Ranch and the Preserve, which are discussed in the Focus Area section below.

The number of households within Orange County will grow at a compound annual rate of 0.63 percent during the Forecast Period. Because of the historic imbalance between residential and non-residential property development in Orange County, home prices have been driven up, as discussed above. This trend, coupled with the shortage of

developable land in Orange County, will cause developers to continue to build more multifamily structures and smaller detached units in jurisdictions less opposed to density. In south Orange County, which is comprised of more recently developed master-planned communities, covenants, conditions, and restrictions (CC&Rs) mandated by homeowners associations (HOAs) will hinder the potential for dense, infill development.

Following this continuum, Los Angeles County, the most developed of the four Study Area counties, should see the vast majority of dwelling units forecast to be built there between 2017 and 2040 in high density multifamily structures, generally at infill and redevelopment sites.

Table 4-10: Base Case Household Forecast by County (thousands)

| Households | 2015 | 2017 | 2025 | 2040 |
|------------------------------|----------------|----------------|----------------|----------------|
| Los Angeles | 3,293 | 3,331 | 3,536 | 3,816 |
| Orange | 1,019 | 1,033 | 1,105 | 1,191 |
| Riverside | 708 | 728 | 827 | 996 |
| San Bernardino | 629 | 643 | 710 | 825 |
| Study Area | 5,648 | 5,734 | 6,178 | 6,828 |
| Incremental Growth | 2015-17 | 2017-25 | 2025-40 | 2015-40 |
| Los Angeles | 38 | 206 | 280 | 524 |
| Orange | 14 | 72 | 86 | 173 |
| Riverside | 20 | 99 | 169 | 288 |
| San Bernardino | 15 | 67 | 114 | 196 |
| Study Area | 86 | 444 | 650 | 1,180 |
| Average Annual Growth | 2015-17 | 2017-25 | 2025-40 | 2015-40 |
| Los Angeles | 19 | 26 | 19 | 20.9 |
| Orange | 7 | 9 | 6 | 6.9 |
| Riverside | 10 | 12 | 11 | 11.5 |
| San Bernardino | 7 | 8 | 8 | 7.8 |
| Study Area | 43 | 55 | 43 | 47.2 |
| CAGR | 2015-17 | 2017-25 | 2025-40 | 2015-40 |
| Los Angeles | 0.6% | 0.8% | 0.5% | 0.6% |
| Orange | 0.7% | 0.9% | 0.5% | 0.6% |
| Riverside | 1.4% | 1.6% | 1.3% | 1.4% |
| San Bernardino | 1.1% | 1.3% | 1.0% | 1.1% |
| Study Area | 0.8% | 0.9% | 0.7% | 0.8% |

4.5.3 Study Area Median Household Income Forecasts

Median household incomes for the Study Area were based on a combination of SCAG's forecast data by TAZ, third-party estimates for median household incomes at the county level, and historical trends in real household income growth in the region. SCAG's income data are expressed in 2011 dollars. As such, WSP inflated these to 2017 dollars using regional CPI data. These adjustments were then applied to the TAZ-level median household income forecast data from SCAG to arrive at projections for median household income expressed in 2017 dollars over the Forecast Period. Incomes for input into the Stantec model were forecast by TAZ, but a weighted average by county is presented in Table 4-11.

The table shows that median household income growth in 2017 dollars is expected to grow by 0.45 percent annually in Orange County and 0.40 percent in the other counties in the Study Area over the Forecast Period. These rates are relatively conservative compared to the historical average growth in real incomes from 1996 to 2016, which ranged from 0.45 percent (San Bernardino) to 0.84 percent (Orange County) annually.

Table 4-11: Base Case Median Household Income Forecast (2017 Dollars)

| Median Household Income | 2017 | 2025 | 2040 |
|--------------------------------|----------------|----------------|------------------|
| Los Angeles | \$63,104 | \$65,149 | \$69,177 |
| Orange | \$83,882 | \$86,949 | \$93,006 |
| San Bernardino | \$57,137 | \$58,992 | \$62,632 |
| Riverside | \$61,409 | \$63,401 | \$67,315 |
| CAGR | 2017-25 | 2025-40 | 2017-2040 |
| Los Angeles | 0.40% | 0.40% | 0.40% |
| Orange | 0.45% | 0.45% | 0.45% |
| San Bernardino | 0.40% | 0.40% | 0.40% |
| Riverside | 0.40% | 0.40% | 0.40% |

4.6 KEY DEVELOPMENTS IN THE STUDY AREA

A critical element of the WSP forecasting effort is to develop small area forecasts for groups of TAZs containing developments that will most directly impact traffic on the proposed SR-91 Express Lanes. This is done by reviewing specific plans and interviewing planning staff and developers of properties to collect the most recent data available on how and when projects will evolve.

Guidance from previous land use work performed by WSP was combined with information acquired through current interviews and project plans to adjust TAZ-level job and household counts relative to those programmed in the base data. Jobs and households were adjusted upward or downward in some of the TAZs representing major projects such as the Preserve and Ontario Ranch in San Bernardino County, south in Lake Elsinore, Murrieta, and Temecula, and numerous large-scale developments throughout Orange County, however no major changes to development pace were observed during this review relative to our most recent previous focus area review performed at the end of 2015.

Using this data, Focus Areas, representing projects, groups of projects or potential redevelopment areas were identified, though the data obtained for each Focus Area varied significantly. In some cases, data were complete and up to date while in other cases data were scarce. To further categorize the review process, the following five examples are offered to characterize the materials that were produced from our field research.

- **Actual Specific Plans** – In some cases actual development plans (quantities and types of development) by project area or TAZ were provided by developers along with expected timing of construction. This was the goal of each interview but few projects had this level of data available.
- **Partial or Dated Plans** – For many of the projects surveyed, especially residential projects that had to some degree been put on hold due to the previous market downturn, current plans were not available. Rather, estimates of build-out and locations were the best data available and some reliance on multiple sources and professional judgment was required.
- **Professional Judgment** – In some cases, no current development plans were available for parcels that, because of their location and eligibility for development, were expected to be developed in the more distant future. In these cases, the MPO forecasts for the underlying TAZs were considered and in some instances modified based on professional judgment alone.
- **MPO Forecast Adoption** – As with most of the TAZs in the Study Area, WSP adopted the development allocations of some Focus Areas. In many cases, the development plans matched the data obtained in the field. However, there were instances where projects were planned or proposed but because limited information was available, no confirmation of the MPO's accuracy could be obtained. If the forecasts for these areas appeared reasonable, they were not adjusted.
- **Redevelopment Areas** – In the long-term, certain areas that currently contain older, lower density industrial or commercial space are expected to be redeveloped as the owners of that land move their remaining operations to lower cost locations. These areas are anticipated to accommodate growth in jobs and households, after the remaining vacant and developable land is absorbed. Development scenarios were calculated for these areas based on professional judgment and allocated in the later years of the forecasts accordingly to help avoid development being allocated where there was clearly no capacity. Assumptions for redevelopment participation, current FAR, future FAR, and development mix were applied to yield a reasonable estimate of additional jobs and households that could develop, and were generally programmed between 2025 and 2040.

Considering the levels of development review outlined above, details of certain Focus Areas are presented in the following sections. These project descriptions present the most probable project outcomes given the available data and WSP's understanding of development economics in the Study Area. While some of the Focus Area projects are ongoing, many were put on hold during the Great Recession and are anticipated to start in the near term. In many cases, overall development quantities have not changed, though the phasing of the projects and specific products built will be dictated by evolving market conditions.

Focus Areas discussed in the following sections are divided into three groups: Inland Empire areas north of SR-91, south of SR-91, and major Orange County developments. Although there are numerous development plans located throughout San Bernardino and Riverside Counties, areas that are most expected to impact SR-91 traffic were prioritized and analyzed in greater detail.

4.6.1 I-15 Corridor – North of SR-91

There are numerous large-scale projects planned, proposed, or under construction in the areas of San Bernardino and Riverside Counties near I-15 north of SR-91 that will have a significant impact on traffic SR-91 levels. Projects located

in cities such as Chino, Ontario, Fontana, and Rancho Cucamonga were researched further for more detailed information on timing and scale. Much of this area is established and built out, but significantly large development and redevelopment opportunities do still exist. These opportunities are more likely to capture demand in the near term of the forecast period due to their regional orientation, within close proximity to large job concentrations in Los Angeles and Orange Counties. Historical patterns suggest many homebuyers with jobs in these counties consider Inland Empire locations due to affordability and as such, those areas offering the shortest commutes to job concentrations in the west have a competitive advantage. Other cities researched, including Norco, Jurupa Valley, and Riverside, have development activity and plans that were confirmed to be captured in SCAG's forecast.

1. **Eastvale Commercial** – The City of Eastvale is situated along the border of San Bernardino County. The city's border extends in a panhandle to the north, bounded by Ontario Ranch to the west and I-15 to the east. In this area, plans for approximately 200 acres of undeveloped land include up to 3.7 million square feet of commercial uses. Plans include a mix of medical uses, hospitality, office, and light industrial space, with the first phase of 2 million square feet of industrial under construction. Although the mix of uses is still being refined, an estimated 4,000 new employees will work in this small area located adjacent to I-15 and north of SR 91.
2. **Ontario Ranch** - Located in Ontario along the Riverside County border, Ontario Ranch (formerly known as New Model Colony) is an 8,200-acre area poised for significant residential and commercial development throughout the Forecast Period. As of July 2017, there were eleven specific plans approved in the area, totaling 3,377 acres, 17,350 residential units, and 7.2 million square feet of non-residential development (mostly industrial). One of these specific plans, Edenglen, began delivering homes in 2007 prior to stalling during the Great Recession. The sections of Ontario Ranch with defined plans are oriented towards the eastern side of defined area, closer to the planned express lanes, while the western side remains undefined at this stage.
3. Given Ontario Ranch's proximity, this area is poised to have a dramatic impact on future traffic. Estimates of total future buildout include up to 46,000 total new residential units, of which 24,000 are anticipated to be in place by the end of the Forecast Period (2040). This pace is lower than SCAG's forecast but is consistent with current development patterns. By 2040, commercial development is estimated to result in approximately 18,000 jobs as well.
4. **The Preserve** - The Preserve is a partially developed master-planned community south of the Chino Airport and north of Pine Avenue in the City of Chino. Given its geographic orientation in the southwest corner of the county, this development is in an attractive location relative to Orange County access. The remaining portion of the project includes an additional 9,900 households by 2040 and non-residential space to house a total of 6,200 employees. A significant portion of new units in the near term include Homecoming at the Preserve, an 800-unit luxury apartment community, the first phases of which began lease up in 2014.
5. **College Park** - College Park is an existing development located centrally in the City of Chino, directly north of the Chino State Penitentiary. There are currently approximately 1,500 households, with 200 units under construction and another 500 planned. Full buildout of the 2,200 total units is expected to take place by 2020. College Park includes a small commercial component but is a primarily residentially driven development. College Park and the Preserve have combined to generate the vast majority of residential permitting activity in the city of Chino in recent years.

6. Although not part of the College Park development, the Majestic Chino Gateway is an industrial development located to the southeast within the same TAZ. The project consists of 3.1 million square feet of industrial warehouse space and an additional 40,000 square feet of retail use. The project broke ground in 2014 and Wal-Mart has preleased 1.4 million square feet for an online fulfillment center.

4.6.2 I-15 Corridor – South of SR-91

Much of this area, particularly along I-15, is somewhat constrained by mountain ranges and other geographic barriers. However, there is significant development activity in the southern portion of the I-15 corridor, including in Temecula and Lake Elsinore, not entirely captured by SCAG's baseline forecast. These areas tend to offer new construction housing with more affordable price relative to northern locations. Although they are oriented further to the south and relatively distant from SR-91, the area is rapidly growing and affordability will fuel continued growth. In addition to affordability and access to Orange County via SR-91, this area also has good access to San Diego County. Also notable is that Route 74 (Ortega Highway) provides access to southern Orange County from Lake Elsinore, though this road is windy and has limited capacity, so is not a reliable commuting option for the large employment centers in central Orange County.

1. **Arantine Hills** - While most of the City of Corona is built to capacity, there are a few parcels along I-15, south of SR-91 that remain for infill development. Many of these sites had been slated for development in the past decade but plans were abandoned at the outset of the Great Recession. Arantine Hills is a 276-acre planned community located adjacent to I-15 at Cajalco Road, the southern terminus of the I-15 Express Lanes project. Previous plans called for 1,600 new residential units and 750,000 square feet of office and retail development. However, recent plan revisions based on public feedback have scaled back the commercial component to a small-scale retail space.
2. **Terramor** – Terramor is a proposed master-planned community situated on a 900-acre property in an unincorporated area of Riverside County, located adjacent to I-15 on the east and north of Temescal Canyon Road. Plans call for a low-density development, with 1,400 single-family detached residential units and no significant commercial component. The specific plan for the project has been approved and plan amendments and tentative tract maps are currently in process.
3. **North Lake Elsinore** – Further south down I-15, the city of Lake Elsinore has numerous residential developments planned, proposed, and under construction, including 20 specific plans under review. Many of these projects are oriented on the north/northwest side of the city. Based on research of these projects and discussions with the city, WSP consolidated some of these projects into the North Lake Elsinore focus area and have incorporated these plans into the forecast accordingly. It is estimated that approximately 2,000 residential units will be delivered in this area between 2015 and 2025, and an additional 2,500 units built by 2040.
4. **East Lake** – Also located in the city of Lake Elsinore, the East Lake specific plan encompasses an area immediately adjacent to the lake. The plan calls for over 7,500 new residential units in a variety of formats. Lake Elsinore has been one of the fastest growing cities in California, due in part to successfully positioning the 3,300-acre lake as a hub for extreme sporting activities. However, recent drought issues are jeopardizing the viability of the lake, and the city has had to purchase reclaimed / recycled water from various locations to maintain adequate depths.

5. **Murrieta** – The City of Murrieta has several specific plans, including two large developments totaling 1,700 units combined. The Vineyards is an area located in the foothills west of I-15 that has the area to accommodate over 1,000 residential units which are expected to be delivered later in the Forecast Period. Murrieta Hills has plans for 750 units although it has been delayed due to archeological issues. There are several other smaller, infill projects located throughout the city as well. The city is also branding itself as a regional healthcare hub, with Loma Linda University adjacent to I-215 and an 800,000 square foot Kaiser Permanente facility planned nearby.
6. **Jefferson Redevelopment** – The city of Temecula has several developments planned, proposed, and under construction. Two significant projects include the Jefferson Specific Plan and Altair. The Jefferson Specific Plan would be a redevelopment of currently lower density older/established commercial uses. The plan calls for rezoning and densification with a significant increase in higher-density residential uses, which will displace some of the older, lower-density commercial land uses. The rezoning allows for 3,700 new residential units at buildout. However, the redevelopment would result in a reduction in commercial space from 3.8 million square feet today down to 1.9 million in the future.
7. **Altair** is a specific plan currently under review, which includes 1,500 residential units comprised of a mix of attached and detached product. The 270-acre project is located within close proximity of I-15 near the terminus of SR-79 in the foothills of the Santa Rosa Mountains. Preliminary plans indicate a small retail component but the project is primarily residentially driven.

4.6.3 Orange County Focus Areas

There is significant development activity in Orange County that will impact traffic on the SR-91 Express Lanes. Many of these large-scale developments are concentrated in the cities of Irvine and Tustin. SR-91 provides access to these areas via the TCA toll roads, SR-241, branching off further to SR-261 and SR-133, as well as multiple freeways. These areas represent some of the last large-scale development opportunities in Orange County as well as some of the largest ongoing redevelopments in Southern California.

1. **Tustin Legacy:** Tustin Legacy, formally Marine Corps Air Station Tustin, is a 1,600-acre planned community located just west of where SR-261 terminates. Since 2006, various phases have been completed including four neighborhoods totaling 2,105 units and The District shopping center. Amalfi Apartments and Anton Legacy Apartments were completed in 2015, adding over 750 more homes. Standard Pacific Homes will finish 375 more units in Greenwood Park by the end of 2017, and two more neighborhoods, including one TOD neighborhood, are planned. Non-residential developments include approximately 1.6 million square feet of office space known as Cornerstone I and Cornerstone II, 305,000 square feet of educational and supporting commercial space in the Advanced Technology & Education Park (ATEP) campus, and 248,000 square feet total of neighborhood commercial and Hoag acute care and skilled nursing facility. Ultimate build-out of the project is estimated at 20+ years and will total over 6,800 residential units with non-residential space housing over 13,000 employees.
2. **Great Park:** Great Park, referred to in previous reports as Heritage Fields at El Toro, is the redevelopment of former Marine Corps Air Station El Toro, located near SR-133. Great Park is a 688-acre redevelopment being delivered through a public-private partnership between the City of Irvine and developer FivePoint Communities. Residential sales began in 2013 and approximately 700 homes have been sold. Total buildout

of Great Park will include 9,500 total residential units. Commercial development plans include about 4.9 million square feet of retail, office, and R&D space, 2 million of which will be dedicated to 8 buildings for an Avago (previously Broadcom) Campus, the first phase of which is under construction now.

3. In addition to the land controlled by FivePoint Communities, Orange County owns 100 acres of land on the south end of Great Park. The county plans to build 2,000 residential units in 2019, 220,000 square feet of retail and entertainment by 2024, and 1.9 million square feet of office thereafter. The County also owns a parcel of land east of Great Park called Alton West. Plans include 970 units of multifamily housing at an average of 30 units per acre. Implementation of this project may be in phases starting in 2016.
4. **Portola Springs:** Located immediately adjacent to the Great Park on the northeast, Portola Springs is an ongoing master-planned community developed by the Irvine Company in an area referred to by the City of Irvine as Planning Area 6. As of 2015, there were over 2,200 existing units. Full buildout is anticipated by 2030 and will consist of a total of 5,200 units. The project is almost exclusively residential, with minimal commercial uses planned. At buildout, 40 percent of the residential units will consist of single-family detached product, with the remainder comprised of a mix of for-sale condominiums and apartments.
5. **Orchard Hills:** Orchard Hills, referred to as TIC Planning Area 1 in previous reports, land is located in the City of Irvine, east of the intersection of Portola Parkway and SR-261, just north of Portola Springs. It is planned for a total build-out of 4,100 residential units, with the majority of development taking place by 2025. As of the 3rd quarter 2015, 500 units had been built, 650 were under construction, and applications had been submitted by the Irvine Company for an additional 1,000 units.
6. **Cypress Village / Stonegate:** To the east of where SR-261 and Interstate 5 intersect, a collection of large Irvine Company projects have been under development, including Woodbury, Cypress Village, and Stonegate. Some of these communities are approaching buildout, with Woodbury's last unit sold in 2014. It is anticipated that residential development in this area will be primarily built out by 2020, with 2,800 new units delivered between 2015 and 2020. Commercial development is anticipated to house thousands of new employees, although the non-residential portion is expected to be delivered at a slower pace than the residential units, with development continuing through 2035.
7. **Quail Hill Commercial:** Quail Hill is adjacent to I-405 on the south, bound by Sand Canyon Avenue to the west and SR-133 to the east. The Irvine Company completed the residential components of this project in 2007, however, planned commercial development will include an additional 1.1 million square feet of commercial space by 2035. Given its adjacency to I-405, it is considered a strong location to attract a large single user / corporate headquarters, although there are no development plans at this time.
8. **The Irvine Company Spectrum 5:** The Irvine Company has several projects planned for the area southwest of the interchange between Interstates 405 and 5, collectively known as Spectrum 5. This area, which was mostly vacant or used for agricultural and recreational purposes, has excellent highway exposure and is intended for a mix of higher-density residential and commercial development. The majority of new residential development is planned for rental apartment units. 1,750 apartment units have been completed as part of the first phase of multifamily construction in the area, known as Los Olivos Apartment Village. The second phase will consist of an additional 1,950 apartment units to be completed by 2025. These large-scale residential developments will result in total buildout of approximately 4,500 units by 2025. Non-residential buildout is



anticipated for completion by 2030 and is likely to house approximately 3,000 additional employees in the area.

9. **The Irvine Company Spectrum 2 and 3 Redevelopment:** These areas are located on the south side of the former El Toro Marine Base within close proximity to the I-405 and I-5 interchange. These two areas contain some underutilized industrial land uses and represent longer term candidates for redevelopment / infill development. The area has the potential to house additional non-residential space amounting to approximately 1.6 million square feet by 2035.
10. **TIC Irvine Center:** The triangular area formed by Interstate 405, SR-133, and Interstate 5 has several sizable vacant parcels that are planned for commercial building by various parties, most notably the Irvine Company. There is currently a regional mall, a collection of office buildings, and a large quantity of rental residential development. An additional 1,350 apartment units are anticipated to be developed by 2020. In addition to this area, undeveloped areas west of SR-133, between I-5 and I-405 have been planned by the Irvine Company to house over 30,000 new employees by 2035. Total non-residential build-out is expected to be approximately 9 million square feet of office and light industrial space with some retail space. Over a million square feet is under construction or recently approved. One 20-story office tower is under construction and slated for completion in early 2016 while a second 20-story office building and 205-room hotel were recently approved.

5.0 MODEL DEVELOPMENT AND CALIBRATION

Stantec's traffic and revenue forecast were developed by utilizing three different but complementary modeling techniques; 1) regional travel demand modeling, 2) market share modeling, and 3) operational modeling. The regional travel demand modeling centers around a four-step modeling technique which is designed to predict the amount of future travel demand, and their regional route choice. This process incorporates Stantec's toll diversion modeling as well, and therefore is able to allocate traffic between free lanes and tolled facilities like the 91 Express Lanes. Stantec's market share modeling (MSM) is a spreadsheet-based modeling technique that applies "market share curves" to traffic at a slice of an Express Lane corridor to forecast the allocation of traffic between GP and express lanes. The MSM was originally developed to reflect utilization of OCTA's 91 Express Lanes and has been updated to reflect RCTC 91 Express Lane behavior. Lastly, operational modeling, consisting of a mesoscopic (Cube Avenue), and a separate microscopic model (VISSIM) were developed and used to better understand how queuing and capacity changes in the corridor impact operations. Insights from each of the three models were used to develop the RCTC 91 Express Lanes traffic and revenue forecast.

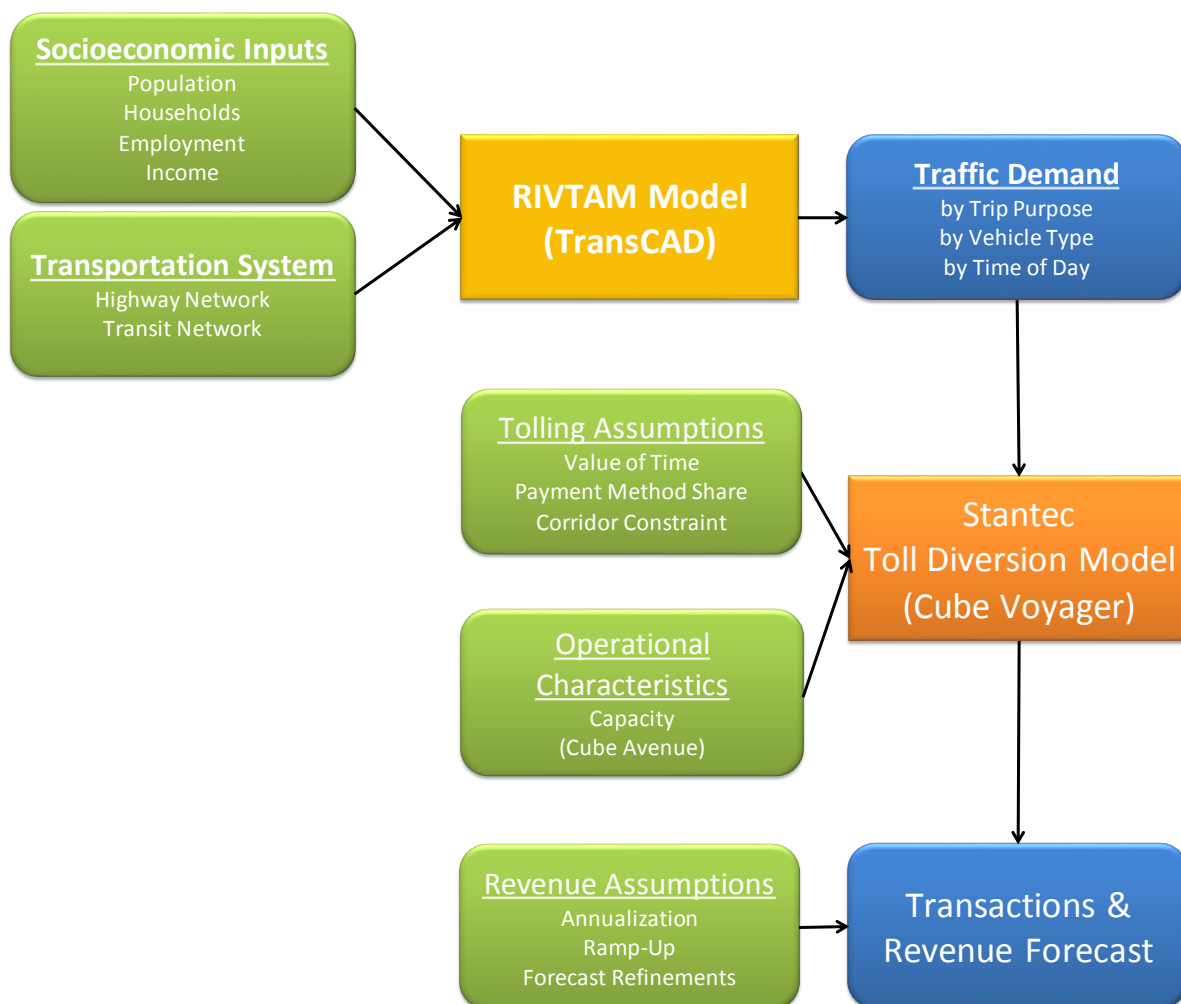
5.1 TRAVEL DEMAND MODEL

The objective of the travel demand modeling task was to develop a comprehensive forecasting tool to be used to forecast future demand along the SR 91 corridor, as well as the allocation of traffic to the SR 91 GP and Express Lanes. The forecasting tool includes a combination of a regional travel demand model, Stantec's toll diversion model, and a mesoscopic traffic model that were developed across various software platforms including TransCAD, Cube Voyager, and Cube Avenue.

The Riverside County Traffic Analysis Model (RIVTAM) was selected as the regional model since it is the official model for Riverside County. The model was developed using TransCAD and estimates the generation and distribution of trips among traffic analysis zones (TAZs) and allocation of trips by travel modes (mode choice). The highway trips were then converted into Cube Voyager's format and used as an input for Stantec's Toll Diversion Model. The toll diversion model is a customized route choice / highway assignment model that was developed within the Cube Voyager platform. It is responsive to the likely range of tolling schemes and policy options. Stantec also developed a mesoscopic model to predict congestion and throughput for congested roadway segments. This mesoscopic model, developed with Cube Avenue, predicts the length of queues and the effective capacity of freeway links. These capacity estimates were then fed into the static Cube Voyager toll diversion model and the resulting model was used to predict GP and Express Lane travel demand. Figure 5-1 illustrates the travel demand model forecasting process used in this project.



Figure 5-1: Modeling Tool for SR 91 Toll Estimation



Model development for the SR 91 Express Lanes project involved a three-tiered approach. The first tier focused on the regional coverage which includes the area covered by RIVTAM as depicted in Figure 5-1. The model encompasses Los Angeles, Orange, Riverside, San Bernardino, Ventura, and Imperial Counties. Within Riverside County, the model was refined to provide a more detailed zone structure. The regional model consists of 5,614 traffic analysis zones (TAZ's); 1,900 of them are within Riverside County. The highway-mode trip tables and the networks were then converted into Cube format as mentioned previously and used as inputs for Stantec's toll diversion model. The toll diversion model was first implemented and executed at the regional level. During the execution of the regional model, trip tables for the subsequent subarea modeling procedure were extracted from the regional model's highway assignment.

The second tier focuses on a subarea model which covers a smaller geographic area. While both the regional and subarea models consist of four time periods: AM peak period (4 - 10AM), Midday period (10AM – 2PM), PM Peak Period (2-8PM), and a night period (8PM – 4AM), the subarea model's geographic coverage is only a fraction of the regional model's geographic coverage. The subarea model's coverage area is shown in Figure 5-3. The RIVTAM model

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includes a large geographic area and includes places and roadways that would not significantly impact travel on the 91 Express Lanes. Portions of the model network far away from the RCTC 91 Express Lanes corridor and deemed to have little impact on SR 91 travel choices were removed. The remaining network comprises a subarea that becomes the basis for more detailed modeling. The geographically smaller sub-area model was developed to reduce the running time of the model while preserving the ability to route traffic between regionally significant roadways like I-10, SR 60, and SR 91.

The final tier focused on the SR 91 corridor itself including the RCTC 91 Express Lanes and SR 91 general purpose lanes. The corridor coverage also included sections of SR 241, SR 71, and I-15, as well as limited segments of adjacent local roads. The corridor model's geographic coverage is also depicted in Figure 5-3. This corridor level model was designed to be a more accurate predictor of Express Lane traffic. Instead of modeling a 6-hour peak period, the AM and PM peak periods were broken down into hourly periods, resulting in twelve 1-hour models. In addition, Stantec employed Cube Avenue to provide capacity adjustment factors to mimic the SR 91 GP lanes queuing, congestion, and effective capacity. Express lane transactions and tolls were predicted via this corridor level model.

Figure 5-2: RIVTAM Regional Model Coverage

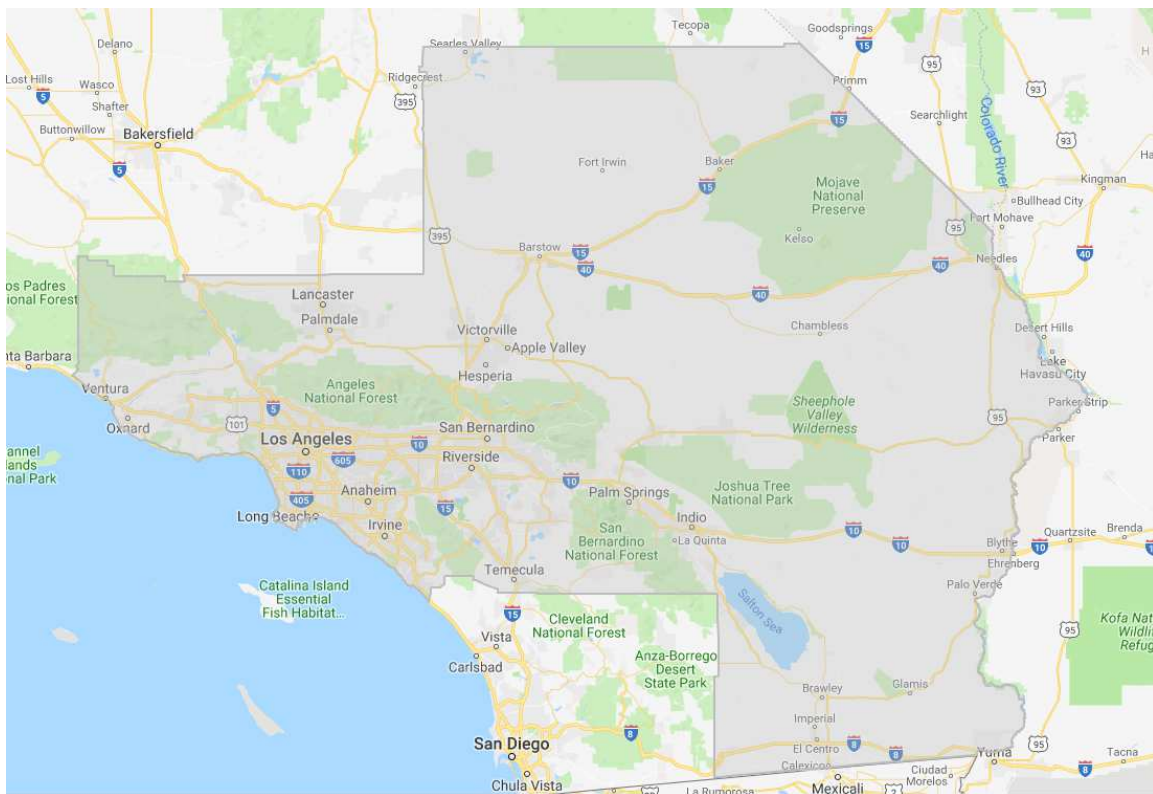
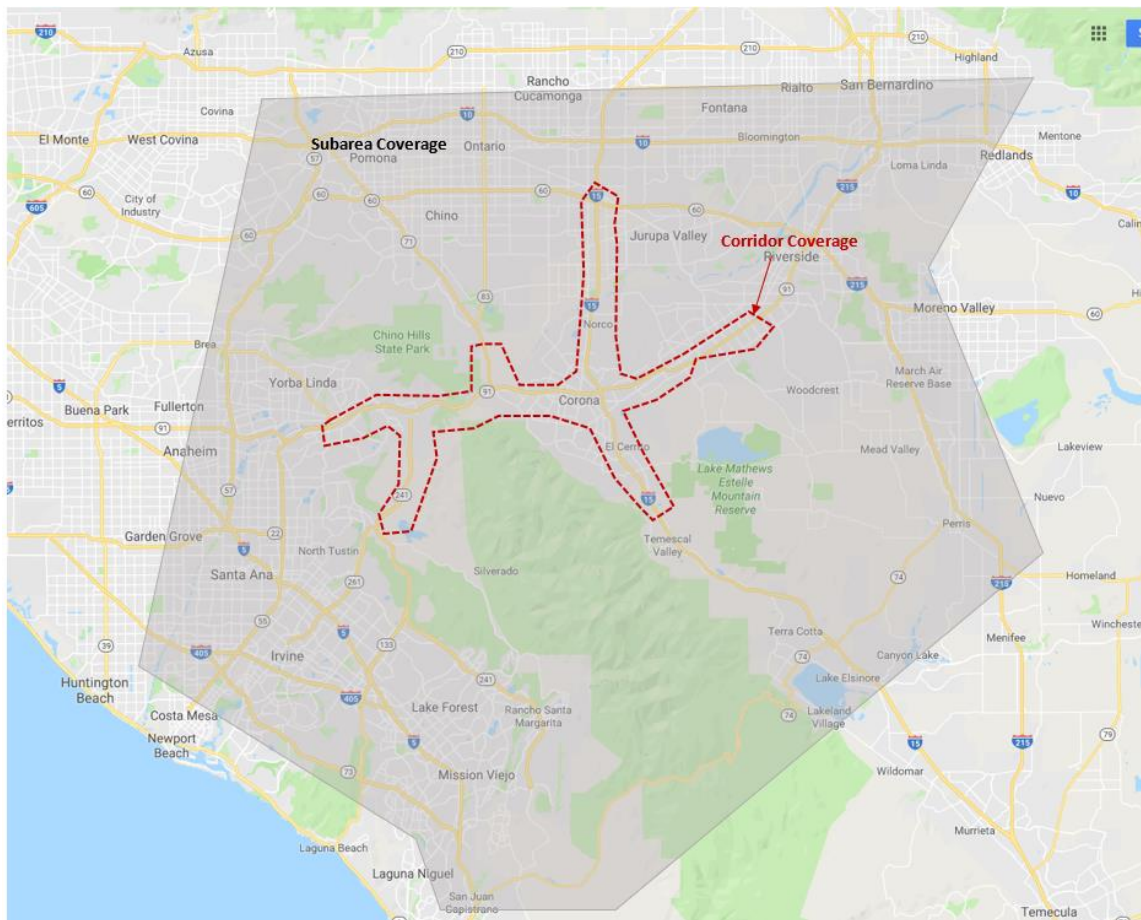


Figure 5-3: Subarea and Corridor Models Coverage



5.1.1 Model Calibration

The first level of calibration was performed at the regional level. The objective of this calibration was to capture the travel demand within the study area in preparation for the subarea analysis. As part of this regional level calibration, Stantec employed a limited Origin-Destination Matrix Estimated (ODME) technique to draw the modeled traffic volumes closer to the field observed traffic volumes. Traffic volume counts at the periphery of the subarea boundary were compared to the estimated traffic volumes. Figure 5-4 identifies the locations of these traffic counts and Table 5-1 shows the results of the regional calibration. At an aggregate level, the total estimated volumes nearly replicated the observed counts. This indicates that the traffic demand entering and/or leaving subarea is reasonably well estimated.

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Figure 5-4: Locations of Traffic Counts for Regional Calibration

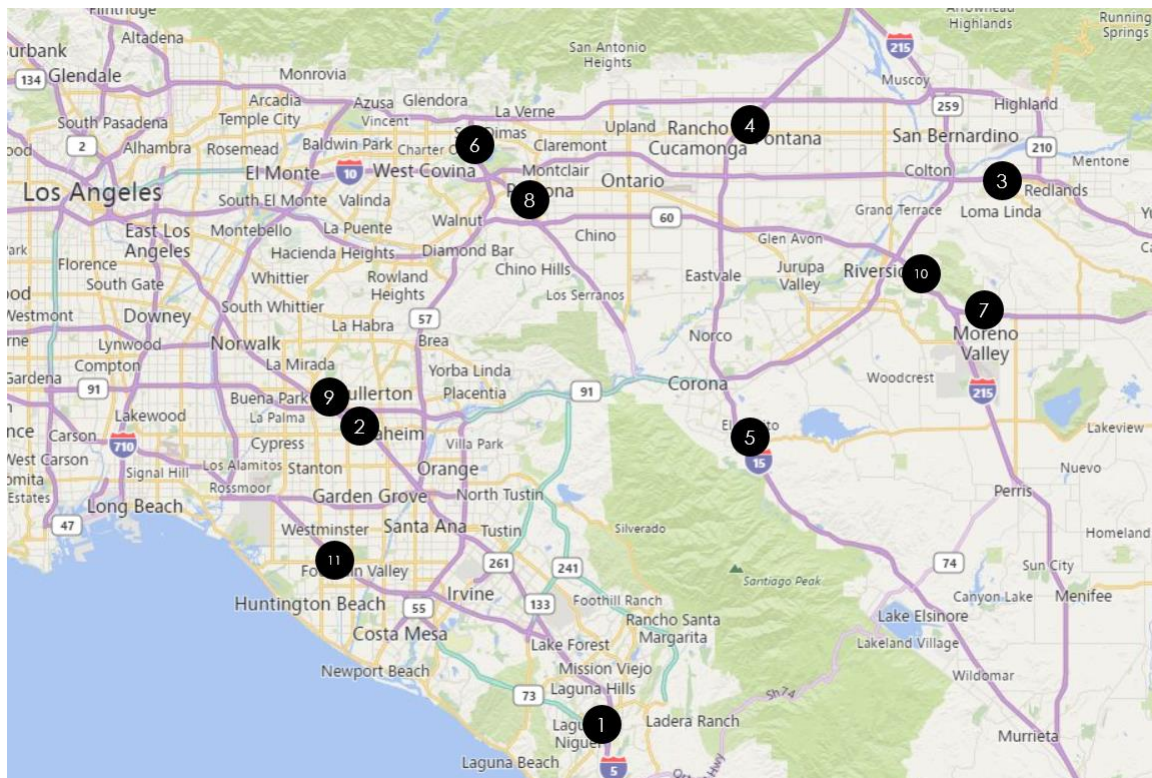


Table 5-1: Traffic Counts – Actual vs. Regional Model Forecast

| LOC. NO | LOCATION | Actual | Model | DIFF | %DIFF |
|--------------|-------------------------------|------------------|------------------|---------------|-----------|
| 1 | I-5 at Avendia Aeropuerto | 249,285 | 221,216 | -28,069 | -11% |
| 2 | I-5 W of N Euclid St | 272,953 | 283,312 | 10,359 | 4% |
| 3 | I-10 W of Mountain View Ave | 200,093 | 187,557 | -12,535 | -6% |
| 4 | I-15 at Baseline Rd | 180,073 | 169,223 | -10,850 | -6% |
| 5 | I-15 N of Weirick Rd | 152,301 | 167,456 | 15,155 | 10% |
| 6 | SR-57 S of S San Dimas Ave | 183,280 | 192,147 | 8,867 | 5% |
| 7 | SR-60 E of Day St | 151,936 | 156,703 | 4,767 | 3% |
| 8 | SR-71 N of Rio Rancho Rd | 87,440 | 88,160 | 720 | 1% |
| 9 | SR-91 E of S Gilbert St | 270,144 | 259,070 | -11,074 | -4% |
| 10 | I-215 North of University Ave | 275,266 | 275,045 | -221 | 0% |
| 11 | I-405 E of Newland St | 259,295 | 292,985 | 33,690 | 13% |
| TOTAL | | 2,282,066 | 2,292,874 | 10,809 | 0% |

The second level of calibration was performed at the subarea level. The subarea calibration included adjusting free-flow speed, the Volume-Delay Function (VDF), and capacity by facility type and area type. The more refined ODME technique using available traffic counts within the subarea was utilized as part of this calibration. Various statistics were compared and assessed. The comparison was carried out from the most aggregate level to the detail level.

The initial focus of the subarea calibration was to ensure that the aggregate demand replicated the observed traffic. Table 5-2 compares observed and model estimated traffic volumes by facility type and area type for the 470 traffic counts available within the subarea region. The comparison shows that the estimated aggregate demand is within two percent of the observed traffic counts. Demand on limited-access facilities which includes toll facilities, was well estimated across different area types. The demand on other facility type / area type categories were also estimated reasonably well. The categories with higher variances between observed and modeled traffic generally are of lesser significance (minor arterials) or have less available traffic data to compare against.

Table 5-2 Traffic Count Comparison

TRAFFIC COUNTS / OBSERVED DATA

| FACILITY TYPE | AREA TYPE | | | |
|------------------------------|-------------------|------------------|----------------|-------------------|
| | Urban | Suburban | Rural | TOTAL |
| Limited-Access Facility | 12,394,320 | 6,434,185 | 67,859 | 18,896,364 |
| Expressway | 42,257 | 46,543 | 91,670 | 180,470 |
| Principal Arterial Divided | 56,426 | 185,539 | -- | 241,965 |
| Principal Arterial Undivided | 37,923 | 68,034 | -- | 105,957 |
| Major Arterial Divided | 125,375 | 123,449 | -- | 248,824 |
| Major Arterial Undivided | 72,366 | 146,933 | -- | 219,299 |
| Minor Arterials | -- | 89,615 | -- | 89,615 |
| Ramp | 948,081 | 853,281 | -- | 1,801,362 |
| TOTAL | 13,676,748 | 7,947,579 | 159,529 | 21,783,856 |

ESTIMATED VOLUMES

| FACILITY TYPE | AREA TYPE | | | |
|------------------------------|-------------------|------------------|----------------|-------------------|
| | Urban | Suburban | Rural | TOTAL |
| Limited-Access Facility | 12,222,004 | 6,521,425 | 69,007 | 18,812,436 |
| Expressway | 41,992 | 49,436 | 85,868 | 177,296 |
| Principal Arterial Divided | 66,997 | 182,819 | -- | 249,816 |
| Principal Arterial Undivided | 38,269 | 66,365 | -- | 104,634 |
| Major Arterial Divided | 131,853 | 117,194 | -- | 249,047 |
| Major Arterial Undivided | 72,030 | 144,035 | -- | 216,065 |
| Minor Arterials | -- | 104,119 | -- | 104,119 |
| Ramp | 849,134 | 687,083 | -- | 1,536,217 |
| TOTAL | 13,422,279 | 7,872,476 | 154,875 | 21,449,630 |

ESTIMATED / OBSERVED RATIO

| FACILITY TYPE | AREA TYPE | | | |
|------------------------------|-------------|-------------|-------------|-------------|
| | Urban | Suburban | Rural | TOTAL |
| Limited-Access Facility | 0.99 | 1.01 | 1.02 | 1.00 |
| Expressway | 0.99 | 1.06 | 0.94 | 0.98 |
| Principal Arterial Divided | 1.19 | 0.99 | -- | 1.03 |
| Principal Arterial Undivided | 1.01 | 0.98 | -- | 0.99 |
| Major Arterial Divided | 1.05 | 0.95 | -- | 1.00 |
| Major Arterial Undivided | 1.00 | 0.98 | -- | 0.99 |
| Minor Arterials | -- | 1.16 | -- | 1.16 |
| Ramp | 0.90 | 0.81 | -- | 0.85 |
| TOTAL | 0.98 | 0.99 | 0.97 | 0.98 |

TOTAL AVAILABLE COUNTS

| FACILITY TYPE | AREA TYPE | | | |
|------------------------------|------------|------------|----------|------------|
| | Urban | Suburban | Rural | TOTAL |
| Limited-Access Facility | 149 | 99 | 2 | 250 |
| Expressway | 1 | 1 | 2 | 4 |
| Principal Arterial Divided | 4 | 8 | -- | 12 |
| Principal Arterial Undivided | 2 | 8 | -- | 10 |
| Major Arterial Divided | 12 | 10 | -- | 22 |
| Major Arterial Undivided | 8 | 12 | -- | 20 |
| Minor Arterials | -- | 9 | -- | 9 |
| Ramp | 78 | 65 | -- | 143 |
| TOTAL | 254 | 212 | 4 | 470 |



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The calibration process also involves ensuring that traffic is properly distributed across parallel roadways. Stantec developed screenlines, which identify a common line across which traffic data is collected and compared against modeled traffic. Figure 5-5 illustrates the ten screenlines that were developed to measure the model against. Five of the ten screenlines cross SR 91 and roadways parallel to the 91. The other five screenlines capture traffic moving north-south in the subarea. The calibrated subarea model produced traffic assignments that matched observed traffic volumes well. Modeled traffic was within five percent of the observed data, except for the northbound direction of Screenline 4, which is within ten percent of the observed data. Table 5-3 compares modeled screenline traffic against observed volumes.

Figure 5-5: Screenlines for Sub-Area Model Calibration

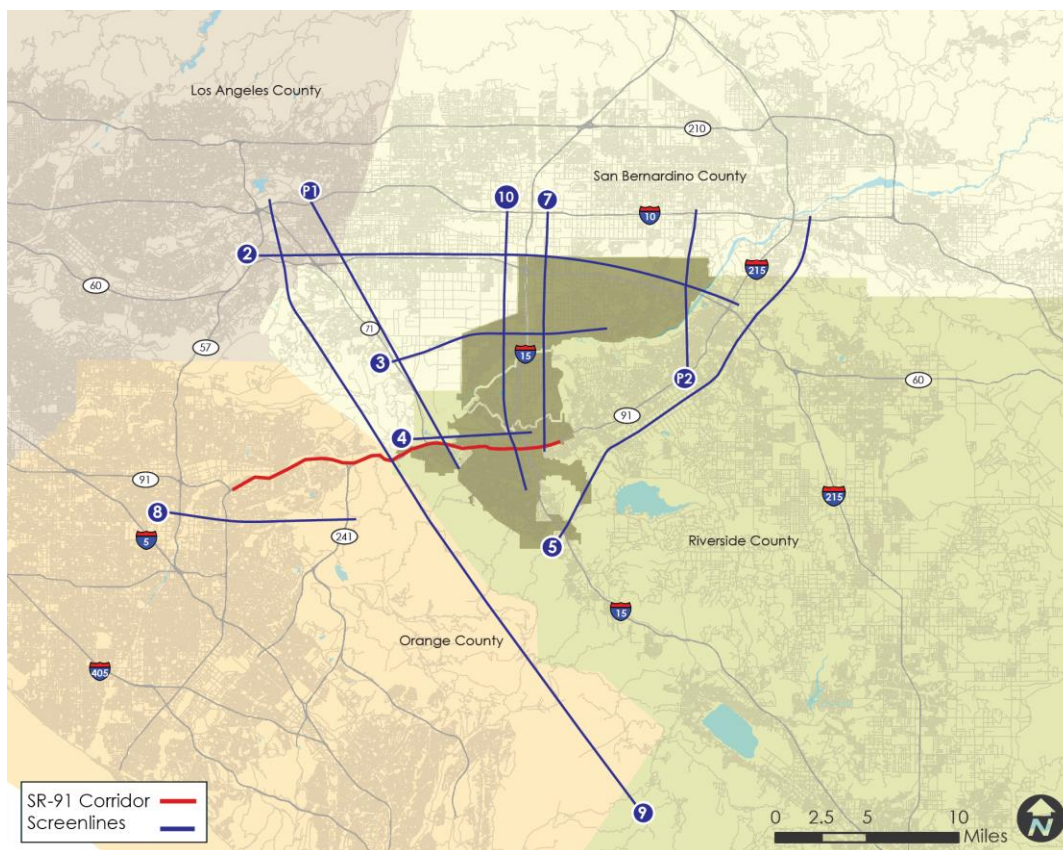


Table 5-3 Screenline Summary

| DESCRIPTION | Daily Volume | | | |
|--|--------------|-----------|----------|-------|
| | Observed | Estimated | Obs-Est | %Diff |
| Screenline 2: North of SR 60 | | | | |
| Northbound Total | 355,474 | 365,560 | 10,086 | 3% |
| Southbound Total | 364,082 | 371,362 | 7,280 | 2% |
| | | | | |
| Screenline 3: South of SR 60 | | | | |
| Northbound Total | 174,689 | 180,598 | 5,909 | 3% |
| Southbound Total | 168,411 | 173,452 | 5,041 | 3% |
| | | | | |
| Screenline 4: North of SR 91 | | | | |
| Northbound Total | 150,489 | 163,860 | 13,370 | 9% |
| Southbound Total | 145,682 | 145,688 | 5 | 0% |
| | | | | |
| Screenline 5: Southeast of SR 91 | | | | |
| Westbound Total | 381,932 | 393,215 | 11,283 | 3% |
| Eastbound Total | 377,503 | 368,476 | (9,027) | -2% |
| | | | | |
| Screenline 7: East of I-15 | | | | |
| Westbound Total | 344,863 | 358,969 | 14,106 | 4% |
| Eastbound Total | 333,434 | 347,520 | 14,086 | 4% |
| | | | | |
| Screenline 8: South of 91 in Orange | | | | |
| Northbound Total | 308,217 | 309,469 | 1,252 | 0% |
| Southbound Total | 314,304 | 301,981 | (12,323) | -4% |
| | | | | |
| Screenline 9: Santa Ana Mountains | | | | |
| Westbound Total | 407,064 | 392,868 | (14,197) | -3% |
| Eastbound Total | 402,596 | 389,801 | (12,795) | -3% |
| | | | | |
| Screenline 10: Downtown Corona | | | | |
| Westbound Total | 456,739 | 457,751 | 1,012 | 0% |
| Eastbound Total | 447,327 | 434,099 | (13,228) | -3% |
| | | | | |
| Screenline P1: East of SR 71 | | | | |
| Westbound Total | 434,595 | 427,450 | (7,144) | -2% |
| Eastbound Total | 422,992 | 413,239 | (9,752) | -2% |
| | | | | |
| Screenline P2: West of I-215 | | | | |
| Westbound Total | 324,113 | 327,105 | 2,992 | 1% |
| Eastbound Total | 313,534 | 316,737 | 3,203 | 1% |

In addition to the travel demand calibration, the subarea calibration attempted to improve the model's ability to replicate travel speeds. Improving the model's ability to match observed speeds included adjusting the free-flow speed of the various corridors and refining the volume-delay function. Table 5-4 compares modeled vs. observed average speed for the AM peak and PM peak periods. The data show that the modeled speeds are close to the observed speeds for most roadways. The eastbound SR 91's GP and EL speeds during the PM peak period were overestimated, while the WB PM Peak speeds were slightly underestimated. The subsequent corridor level modeling and calibration further improves on the calibration of the SR 91.

Table 5-4 Calibration Results – Speed Comparison by Corridor

| FACILITY | DIRECTION | LIMIT | DISTANCE | AM PEAKD SPEED | | PM PEAK SPEED | |
|--------------------|-----------|-------------------------------|----------|----------------|-----------|---------------|-----------|
| | | | | OBSERVED | ESTIMATED | OBSERVED | ESTIMATED |
| I-15 GP | NB | Temescal Canyon Road to CA-60 | 20.2 | 35 | 53 | 39 | 51 |
| | SB | CA-60 to Temescal Canyon Road | 21.3 | 57 | 49 | 41 | 54 |
| SR-91 GP | EB | SR-55 and McKinley Street | 18.4 | 66 | 58 | 27 | 53 |
| | WB | McKinley Street and SR-55 | 18.4 | 27 | 25 | 58 | 49 |
| SR-91 EL | EB | SR-55 and McKinley Street | 16.4 | 75 | 78 | 53 | 75 |
| | WB | McKinley Street and SR-55 | 16.4 | 61 | 57 | 74 | 72 |
| Magnolia / Ontario | EB | Paseo Grande and Cresta Road | 7.0 | 26 | 30 | 26 | 28 |
| | WB | Cresta Road and Paseo Grande | 7.0 | 25 | 29 | 21 | 27 |
| 6TH / Magnolia | EB | Paseo Grande and SR-91 | 7.5 | 32 | 33 | 26 | 28 |
| | WB | SR-91 to Paseo Grande | 7.5 | 29 | 20 | 21 | 28 |
| Railroad | EB | Frontage Road and Grand Blvd | 3.8 | 33 | 30 | 30 | 29 |
| | WB | Grand Blvd to Frontage Road | 3.8 | 25 | 26 | 29 | 29 |
| FHP / GRR | EB | 91 EB Ramp and E Ontario Ave | 9.7 | NA | NA | 30 | 34 |
| | WB | E Ontario Ave and 91 EB Ramp | 9.7 | 29 | 30 | NA | NA |
| SR 71 | NB | SR-91 and Valley Blvd | 16.8 | 55 | 47 | 56 | 40 |
| | SB | Valley Blvd and SR 91 | 16.7 | 36 | 43 | 43 | 37 |
| SR 241 | NB | SR 91 and Santiago Canyon Ave | 6.7 | 69 | 70 | 60 | 56 |
| | SB | Santiago Canyon Ave and SR 91 | 6.7 | 65 | 56 | 65 | 68 |

The final calibration was focused on the corridor level calibration. The calibration was performed on an hourly-basis for the two peak periods (AM and PM) to develop a more refined calibration process. The hourly analysis was particularly important in an express lane analysis, where toll rates vary by hour. The calibration involved the application of an ODME technique to replicate hourly travel patterns as indicated by hourly traffic counts, and an adjustment of GP lane capacity adjustments using the results from Cube Avenue and the VISSIM simulation model.

Table 5-5 and Table 5-6 show the EB and WB traffic comparison along the RCTC SR 91 Corridor for each time period and daily. At the aggregate level, the difference is generally within five percent, except for the SR 91 WB express lane. However, the magnitude of this difference is very small compared to the overall market in the corridor.

Table 5-7 and Table 5-8 compare observed and estimated average speed for AM and PM peak periods, respectively. At an aggregate level, the estimated average speed replicated the observed data well. The variations were more pronounced at the segment level. In general, the locations of congested roadway segments were estimated well as shown by the heat map in these tables.



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Table 5-5 Calibration Results – SR 91 EB Traffic Comparison

| LOCATION | AM | | PM | | MD | | NT | | DAILY | | | |
|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------|------------------|-----------------|------------|
| SR 91 GP Eastbound | OBS | EST | OBS | EST | OBS | EST | OBS | EST | OBS | EST | DIFF | %DIFF |
| OCTA 91 EB at CL | 30,872 | 31,246 | 53,208 | 52,508 | 27,131 | 28,062 | 28,734 | 29,990 | 139,944 | 141,805 | 1,861 | 1% |
| OCTA 91 EB before off ramp to Green River Rd | 30,070 | 30,421 | 51,877 | 46,259 | 26,113 | 27,102 | 28,113 | 29,469 | 136,172 | 133,250 | (2,922) | -2% |
| RCTC 91 EB at Green River Rd | 28,820 | 29,070 | 43,949 | 38,129 | 24,303 | 25,157 | 25,673 | 26,950 | 122,744 | 119,306 | (3,439) | -3% |
| RCTC 91 EB at SR 71 | 29,966 | 30,391 | 45,317 | 42,792 | 25,261 | 26,253 | 26,352 | 27,584 | 126,895 | 127,019 | 124 | 0% |
| RCTC 91 EB at SR 71 btw on/off ramps | 24,616 | 24,650 | 36,591 | 33,491 | 21,386 | 22,214 | 23,367 | 24,510 | 105,959 | 104,866 | (1,094) | -1% |
| RCTC 91 EB btw SR 71 and Serfas Club Dr | 28,208 | 28,674 | 47,049 | 40,538 | 27,095 | 27,108 | 27,648 | 28,767 | 129,999 | 125,087 | (4,913) | -4% |
| RCTC 91 EB at Serfas Club Dr | 26,262 | 26,540 | 43,834 | 37,338 | 25,580 | 25,473 | 26,668 | 27,746 | 122,343 | 117,097 | (5,247) | -4% |
| RCTC 91 EB btw Serfas Club Dr and W 6th St | 24,565 | 24,701 | 38,475 | 31,980 | 23,664 | 23,423 | 24,617 | 25,618 | 111,320 | 105,722 | (5,598) | -5% |
| RCTC 91 EB at W 6th St | 26,113 | 26,183 | 40,644 | 33,699 | 25,169 | 24,923 | 25,357 | 26,336 | 117,282 | 111,141 | (6,141) | -5% |
| RCTC 91 EB btw W 6th St and Lincoln Ave | 27,790 | 27,824 | 42,461 | 36,052 | 26,741 | 26,508 | 26,216 | 27,179 | 123,207 | 117,563 | (5,644) | -5% |
| RCTC 91 EB at Lincoln Ave | 26,168 | 26,115 | 38,914 | 30,860 | 25,185 | 24,842 | 24,843 | 25,748 | 115,110 | 107,565 | (7,544) | -7% |
| RCTC 91 EB btw Lincoln Ave and Main St | 30,145 | 29,953 | 42,780 | 34,837 | 28,209 | 27,786 | 26,502 | 27,377 | 127,636 | 119,953 | (7,683) | -6% |
| RCTC 91 EB btw two off ramps at Main St | 28,306 | 28,007 | 38,126 | 30,197 | 26,405 | 25,889 | 25,058 | 25,873 | 117,894 | 109,967 | (7,928) | -7% |
| RCTC 91 EB before Main St on ramp | 14,856 | 14,552 | 19,751 | 13,712 | 16,199 | 15,462 | 17,052 | 17,621 | 67,857 | 61,347 | (6,510) | -10% |
| RCTC 91 EB east of I-15 IC | 28,762 | 29,219 | 44,809 | 41,346 | 29,407 | 29,630 | 27,446 | 27,769 | 130,424 | 127,964 | (2,460) | -2% |
| TOTAL | 405,514 | 407,545 | 627,782 | 543,736 | 377,845 | 379,833 | 383,648 | 398,539 | 1,794,790 | 1,729,653 | (65,137) | -4% |

| LOCATION | AM | | PM | | MD | | NT | | DAILY | | | |
|-----------------------------|--------------|--------------|---------------|---------------|---------------|---------------|--------------|--------------|---------------|---------------|--------------|-----------|
| SR 91 EL Eastbound | OBS | EST | OBS | EST | OBS | EST | OBS | EST | OBS | EST | DIFF | %DIFF |
| RCTC 91 EB XL at SR 71 | 2,264 | 2,573 | 11,296 | 11,780 | 3,388 | 3,234 | 2,478 | 2,397 | 19,426 | 19,984 | 558 | 3% |
| RCTC 91 EB XL to I-15 South | 594 | 911 | 4,481 | 4,398 | 1,188 | 958 | 1,065 | 966 | 7,328 | 7,233 | (95) | -1% |
| RCTC 91 EB XL to McKinley | 1,672 | 1,662 | 6,814 | 7,382 | 2,200 | 2,277 | 1,413 | 1,431 | 12,099 | 12,751 | 652 | 5% |
| TOTAL | 5,992 | 6,894 | 38,962 | 34,638 | 10,662 | 11,180 | 8,005 | 7,023 | 38,853 | 39,969 | 1,116 | 3% |

Table 5-6 Calibration Results – SR 91 WB Traffic Comparison

| LOCATION | AM | | PM | | MD | | NT | | DAILY | | | |
|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------|------------------|---------------|-----------|
| SR 91 GP Westbound | OBS | EST | OBS | EST | OBS | EST | OBS | EST | OBS | EST | DIFF | %DIFF |
| RCTC 91 WB at CL | 53,331 | 56,116 | 40,569 | 39,249 | 28,437 | 28,301 | 16,483 | 16,426 | 138,820 | 140,092 | 1,272 | 1% |
| RCTC 91 WB west of Green River Rd | 46,377 | 47,423 | 39,248 | 37,323 | 27,086 | 26,956 | 16,229 | 16,171 | 128,940 | 127,873 | (1,067) | -1% |
| RCTC 91 WB at Green River Rd | 38,452 | 38,782 | 37,197 | 35,283 | 25,035 | 24,897 | 15,535 | 15,493 | 116,219 | 114,454 | (1,765) | -2% |
| RCTC 91 WB btw SR 71 and Green River Rd | 39,371 | 42,546 | 39,188 | 40,075 | 26,065 | 25,995 | 16,256 | 16,232 | 120,880 | 124,849 | 3,969 | 3% |
| RCTC 91 WB at SR 71 | 31,100 | 35,621 | 32,689 | 33,136 | 21,679 | 21,652 | 14,547 | 14,490 | 100,015 | 104,899 | 4,884 | 5% |
| RCTC 91 WB btw Serfas Club Dr and SR 71 | 37,709 | 42,507 | 42,321 | 42,733 | 27,768 | 27,873 | 17,924 | 17,855 | 125,722 | 130,968 | 5,246 | 4% |
| RCTC 91 WB at Serfas Club Dr after on ramp | 32,795 | 39,014 | 40,040 | 40,463 | 26,392 | 26,522 | 17,430 | 17,371 | 116,657 | 123,370 | 6,713 | 6% |
| RCTC 91 WB at Serfas Club Dr | 27,409 | 34,161 | 37,077 | 37,255 | 24,313 | 24,412 | 16,418 | 16,374 | 105,217 | 112,203 | 6,985 | 7% |
| RCTC 91 WB at W 6th St | 28,323 | 35,984 | 38,818 | 39,049 | 25,595 | 25,720 | 17,135 | 17,091 | 109,871 | 117,845 | 7,974 | 7% |
| RCTC 91 WB btw Lincoln Ave and W 6th St | 28,802 | 36,643 | 39,976 | 40,188 | 26,283 | 26,428 | 17,851 | 17,796 | 112,912 | 121,055 | 8,143 | 7% |
| RCTC 91 WB at Lincoln Ave | 25,782 | 34,553 | 37,556 | 37,850 | 24,646 | 24,815 | 17,009 | 16,965 | 104,993 | 114,183 | 9,190 | 9% |
| RCTC 91 WB btw Main St and Lincoln Ave | 34,407 | 39,432 | 42,248 | 42,057 | 27,935 | 27,604 | 18,811 | 18,761 | 123,400 | 127,854 | 4,453 | 4% |
| TOTAL | 423,854 | 482,782 | 466,924 | 464,661 | 311,238 | 311,176 | 201,632 | 201,024 | 1,403,648 | 1,459,643 | 55,995 | 4% |

| LOCATION | AM | | PM | | MD | | NT | | DAILY | | | |
|-------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|--------------|--------------|---------------|---------------|--------------|------------|
| SR 91 EL Westbound | OBS | EST | OBS | EST | OBS | EST | OBS | EST | OBS | EST | DIFF | %DIFF |
| RCTC 91 WB XL at SR 71 | 15,108 | 16,979 | 4,495 | 5,092 | 4,344 | 4,346 | 834 | 877 | 24,781 | 27,294 | 2,513 | 10% |
| RCTC 91 WB XL from I-15 South | 7,347 | 7,481 | 1,739 | 2,301 | 1,876 | 1,812 | 441 | 429 | 11,403 | 12,022 | 619 | 5% |
| RCTC 91 WB XL from McKinley | 7,761 | 9,499 | 2,756 | 2,792 | 2,468 | 2,534 | 393 | 448 | 13,378 | 15,272 | 1,894 | 14% |
| TOTAL | 42,264 | 45,125 | 14,758 | 15,861 | 13,764 | 13,837 | 2,516 | 2,648 | 49,562 | 54,588 | 5,026 | 10% |

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Table 5-7 SR 91 Speed Comparison AM Peak Period

| | DESCRIPTION | DISTANCE (miles) | AM PERIOD AM AVG | |
|-----------------|---|---------------------|---------------------|-----------|
| | | | Actual | Model |
| SR-91 EB | SR-91 EB GP bt SR-55 and Santa Ana | 0.3 | 62 | 62 |
| | SR-91 EB GP bt Santa Ana and South Lake loop On | 0.3 | 62 | 63 |
| | SR-91 EB GP bt South Lake loop On and On ramp | 0.4 | 62 | 62 |
| | SR-91 EB GP bt South Lake On and Imperial Hwy | 0.8 | 62 | 59 |
| | SR-91 EB GP bt Imperial Hwy Off and loop On | 0.3 | 65 | 63 |
| | SR-91 EB GP bt Imperial Hwy loop On and On ramp | 0.3 | 65 | 66 |
| | SR-91 EB GP bt Imperial Hwy On and Weir Canyon | 2.3 | 61 | 65 |
| | SR-91 EB GP bt Weir Canyon Off and loop On | 0.4 | 63 | 70 |
| | SR-91 EB GP bt Weir Canyon loop On and On ramp | 0.3 | 63 | 67 |
| | SR-91 EB GP bt Weir Canyon On and SR-241 SB DC | 0.6 | 65 | 54 |
| | SR-91 EB GP bt SR-241 SB DC and Gypsum Off | 0.7 | 65 | 57 |
| | SR-91 EB GP bt Gypsum Off and loop On | 0.4 | 64 | 66 |
| | SR-91 EB GP bt Gypsum Canyon ramps | 0.3 | 59 | 65 |
| | SR-91 EB GP bt Gypsum Canyon and SR 241 NB DC | 0.3 | 63 | 64 |
| | SR-91 EB GP bt SR 241 NB DC and RCTC EL Ingress | 2.2 | 66 | 64 |
| | SR-91 EB GP bt RCTC EL Ingress and GRR | 0.5 | 68 | 62 |
| | SR-91 EB GP bt GRR ramps | 0.6 | 69 | 64 |
| | SR-91 EB GP bt GRR and SR-71 | 0.8 | 68 | 63 |
| | SR-91 EB GP bt SR-71 ramps | 0.7 | 66 | 59 |
| | SR-91 EB GP bt SR-71 and Serfas | 1.3 | 68 | 61 |
| | SR-91 EB GP bt Serfas and Lincoln | 1.3 | 72 | 58 |
| | SR-91 EB GP bt Lincoln ramps | 0.4 | 74 | 60 |
| | SR-91 EB GP bt Lincoln and Main St | 0.6 | 74 | 62 |
| | SR-91 EB GP bt Main St and I-15 SB On | 1.3 | 72 | 63 |
| | SR-91 EB GP bt I-15 SB On and I-15 NB On | 0.3 | 65 | 51 |
| | SR-91 EB GP bt I-15 NB On and McKinley | 1.0 | 64 | 55 |
| | NB Total | 18.4 | 66 | 61 |
| SR-91 WB | | | Actual | Model |
| | SR-91 WB GP bt South Lake On ramp and SR-55 | 0.3 | 32 | 14 |
| | SR-91 WB GP bt South Lake loop On and On ramp | 0.3 | 33 | 35 |
| | SR-91 WB GP bt South Lake Off and loop On | 0.4 | 27 | 41 |
| | SR-91 WB GP bt Imperial Hwy On ramp and South Lake | 0.8 | 35 | 36 |
| | SR-91 WB GP bt Imperial Hwy loop On and On ramp | 0.3 | 51 | 44 |
| | SR-91 WB GP bt Imperial Hwy Off and loop On | 0.4 | 57 | 57 |
| | SR-91 WB GP bt Yorba Linda On ramp and Imperial Hwy | 2.2 | 64 | 50 |
| | SR-91 WB GP bt Yorba Linda loop On and On ramp | 0.3 | 69 | 59 |
| | SR-91 WB GP bt Yorba Linda Off and loop On | 0.4 | 68 | 61 |
| | SR-91 WB GP bt SR-241 NB DC and Yorba Linda | 0.6 | 67 | 53 |
| | SR-91 WB GP bt Gypsum Canyon and SR-241 NB DC | 0.6 | 68 | 30 |
| | SR-91 WB GP bt Gypsum Canyon loop ramps | 0.3 | 66 | 53 |
| | SR-91 WB GP bt Gypsum Canyon Off and loop On | 0.3 | 64 | 53 |
| | SR-91 WB GP bt SR-241 SB DC and Gypsum Canyon | 0.3 | 43 | 54 |
| | SR-91 WB GP bt OCTA EL Ingress and SR-241 SB DC | 1.1 | 27 | 13 |
| | SR-91 WB GP bt GRR and OCTA EL Ingress | 1.5 | 22 | 12 |
| | SR-91 WB GP bt GRR ramps | 0.6 | 21 | 20 |
| | SR-91 WB GP bt SR-71 and GRR | 0.5 | 16 | 17 |
| | SR-91 WB GP bt SR-71 ramps | 0.6 | 14 | 30 |
| | SR-91 WB GP bt Serfas and SR-71 | 0.9 | 12 | 23 |
| | SR-91 WB GP bt 6th St On and Serfas On | 0.3 | 12 | 32 |
| | SR-91 WB GP bt Serfas Club Dr and 6th St | 0.5 | 13 | 34 |
| | SR-91 WB GP bt Maple St and Serfas Club Dr | 0.3 | 13 | 26 |
| | SR-91 WB GP bt Lincoln Ave and Maple St | 0.7 | 14 | 26 |
| | SR-91 WB GP bt Lincoln Ave ramps | 0.4 | 15 | 29 |
| | SR-91 WB GP bt Main St and Lincoln Ave | 0.6 | 20 | 36 |
| | SR-91 WB GP bt Main St CD On and Main St On | 0.2 | 52 | 55 |
| | SR-91 WB GP bt ML On and CD On | 1.1 | 55 | 45 |
| | SR-91 WB GP bt I-15 and Main St CD | 0.6 | 60 | 9 |
| | SR-91 WB GP bt McKinley and I-15 | 0.9 | 48 | 8 |
| | SB Total | 18.4 | 27 | 23 |
| 91 EL EB | | | Actual | Model |
| | SR-91 EB EL bt SR-55 and Weir Canyon Rd | 5.0 | 75 | 75 |
| | SR-91 EB EL bt Weir Canyon Rd and SR-241 NB DC On | 2.9 | 75 | 77 |
| | SR-91 EB EL bt SR-241 NB DC On and County Line | 1.7 | 75 | 79 |
| | SR-91 EB EL bt County Line and Serfas Club dr | 3.3 | 75 | 78 |
| | SR-91 EB EL bt Serfas Club dr and Diverge | 3.5 | 75 | 77 |
| | SR-91 EB EL | 16.4 | 75 | 77 |
| 91 EL WB | | | Actual | Model |
| | SR-91 WB EL bt County Line and SR-55 | 8.5 | 75 | 66 |
| | SR-91 WB EL Mixing Area | 1.4 | 50 | 73 |
| | SR-91 WB EL Merge to County Line | 6.5 | 51 | 46 |
| | SR-91 WB EL | 16.4 | 61 | 56 |

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Table 5-8 SR 91 Speed Comparison PM Peak Period

| DESCRIPTION | | DISTANCE | PM Period | |
|-------------|---|-------------|-----------|-----------|
| | | OBS | PM AVG | |
| SR-91 EB | SR-91 EB GP bt SR-55 and Santa Ana | 0.3 | 54 | 13 |
| | SR-91 EB GP bt Santa Ana and South Lake loop On | 0.3 | 52 | 57 |
| | SR-91 EB GP bt South Lake loop On and On ramp | 0.4 | 59 | 56 |
| | SR-91 EB GP bt South Lake On and Imperial Hwy | 0.8 | 58 | 56 |
| | SR-91 EB GP bt Imperial Hwy Off and loop On | 0.3 | 48 | 58 |
| | SR-91 EB GP bt Imperial Hwy loop On and On ramp | 0.3 | 53 | 63 |
| | SR-91 EB GP bt Imperial Hwy On and Weir Canyon | 2.3 | 39 | 57 |
| | SR-91 EB GP bt Weir Canyon Off and loop On | 0.4 | 16 | 61 |
| | SR-91 EB GP bt Weir Canyon loop On and On ramp | 0.3 | 13 | 55 |
| | SR-91 EB GP bt Weir Canyon On and SR-241 SB DC | 0.6 | 12 | 42 |
| | SR-91 EB GP bt SR-241 SB DC and Gypsum Off | 0.7 | 14 | 25 |
| | SR-91 EB GP bt Gypsum Off and loop On | 0.4 | 18 | 39 |
| | SR-91 EB GP bt Gypsum Canyon ramps | 0.3 | 7 | 22 |
| | SR-91 EB GP bt Gypsum Canyon and SR 241 NB DC | 0.3 | 12 | 11 |
| | SR-91 EB GP bt SR 241 NB DC and RCTC EL Ingress | 2.2 | 29 | 24 |
| | SR-91 EB GP bt RCTC EL Ingress and GRR | 0.5 | 39 | 45 |
| | SR-91 EB GP bt GRR ramps | 0.6 | 47 | 56 |
| | SR-91 EB GP bt GRR and SR-71 | 0.8 | 52 | 31 |
| | SR-91 EB GP bt SR-71 ramps | 0.7 | 40 | 51 |
| | SR-91 EB GP bt SR-71 and Serfas | 1.3 | 39 | 31 |
| | SR-91 EB GP bt Serfas and Lincoln | 1.3 | 45 | 31 |
| | SR-91 EB GP bt Lincoln ramps | 0.4 | 41 | 20 |
| | SR-91 EB GP bt Lincoln and Main St | 0.6 | 21 | 13 |
| | SR-91 EB GP bt Main St and I-15 SB On | 1.3 | 15 | 14 |
| | SR-91 EB GP bt I-15 SB On and I-15 NB On | 0.3 | 25 | 12 |
| | SR-91 EB GP bt I-15 NB On and McKinley | 1.0 | 46 | 14 |
| | NB Total | 18.4 | 27 | 26 |
| SR-91 WB | | | Actual | Model |
| | SR-91 WB GP bt South Lake On ramp and SR-55 | 0.3 | 56 | 32 |
| | SR-91 WB GP bt South Lake loop On and On ramp | 0.3 | 45 | 44 |
| | SR-91 WB GP bt South Lake Off and loop On | 0.4 | 45 | 47 |
| | SR-91 WB GP bt Imperial Hwy On ramp and South Lake | 0.8 | 55 | 45 |
| | SR-91 WB GP bt Imperial Hwy loop On and On ramp | 0.3 | 57 | 51 |
| | SR-91 WB GP bt Imperial Hwy Off and loop On | 0.4 | 57 | 62 |
| | SR-91 WB GP bt Yorba Linda On ramp and Imperial Hwy | 2.2 | 60 | 56 |
| | SR-91 WB GP bt Yorba Linda loop On and On ramp | 0.3 | 61 | 61 |
| | SR-91 WB GP bt Yorba Linda Off and loop On | 0.4 | 61 | 64 |
| | SR-91 WB GP bt SR-241 NB DC and Yorba Linda | 0.6 | 63 | 50 |
| | SR-91 WB GP bt Gypsum Canyon and SR-241 NB DC | 0.6 | 65 | 42 |
| | SR-91 WB GP bt Gypsum Canyon loop ramps | 0.3 | 65 | 54 |
| | SR-91 WB GP bt Gypsum Canyon Off and loop On | 0.3 | 65 | 54 |
| | SR-91 WB GP bt SR-241 SB DC and Gypsum Canyon | 0.3 | 60 | 53 |
| | SR-91 WB GP bt OCTA EL Ingress and SR-241 SB DC | 1.1 | 61 | 49 |
| | SR-91 WB GP bt GRR and OCTA EL Ingress | 1.5 | 61 | 53 |
| | SR-91 WB GP bt GRR ramps | 0.6 | 53 | 55 |
| | SR-91 WB GP bt SR-71 and GRR | 0.5 | 62 | 53 |
| | SR-91 WB GP bt SR-71 ramps | 0.6 | 65 | 52 |
| | SR-91 WB GP bt Serfas and SR-71 | 0.9 | 61 | 39 |
| | SR-91 WB GP bt 6th St On and Serfas On | 0.3 | 58 | 44 |
| | SR-91 WB GP bt Serfas Club Dr and 6th St | 0.5 | 36 | 32 |
| | SR-91 WB GP bt Maple St and Serfas Club Dr | 0.3 | 64 | 28 |
| | SR-91 WB GP bt Lincoln Ave and Maple St | 0.7 | 56 | 22 |
| | SR-91 WB GP bt Lincoln Ave ramps | 0.4 | 50 | 28 |
| | SR-91 WB GP bt Main St and Lincoln Ave | 0.6 | 49 | 42 |
| | SR-91 WB GP bt Main St CD On and Main St On | 0.2 | 51 | 52 |
| | SR-91 WB GP bt ML On and CD On | 1.1 | 63 | 46 |
| | SR-91 WB GP bt I-15 and Main St CD | 0.6 | 69 | 46 |
| | SR-91 WB GP bt McKinley and I-15 | 0.9 | 65 | 17 |
| | SB Total | 18.4 | 58 | 42 |
| 91 EL EB | | | PM AVG | |
| | | | Actual | Model |
| | SR-91 EB EL bt SR-55 and Weir Canyon Rd | 5.0 | 40 | 64 |
| | SR-91 EB EL bt Weir Canyon Rd and SR-241 NB DC On | 2.9 | 54 | 70 |
| | SR-91 EB EL bt SR-241 NB DC On and County Line | 1.7 | 54 | 76 |
| | SR-91 EB EL bt County Line and Serfas Club dr | 3.3 | 68 | 65 |
| 91 EL WB | SR-91 EB EL bt Serfas Club dr and Diverge | 3.5 | 65 | 62 |
| | SR-91 EB EL | 16.4 | 53 | 66 |
| | | | Actual | Model |
| | SR-91 WB EL bt County Line and SR-55 | 8.5 | 75 | 74 |
| | SR-91 WB EL Mixing Area | 1.4 | 69 | 78 |
| | SR-91 WB EL Merge to County Line | 6.5 | 75 | 74 |
| | SR-91 WB EL | 16.4 | 74 | 75 |

5.2 ROADWAY NETWORKS

The highway networks used for this project were obtained and developed from a previous Stantec study in the region. Three future scenario years were developed in this project including 2017 (base year), 2025, and 2040. The 2017 highway network was developed from the 2015 highway networks from prior Stantec studies in the region but updated to reflect current conditions. The most notable additions were the SR 91 Express and GP lane widening within Riverside County, and the development of Foothill Parkway in Corona. The highway networks for the two forecast years included in this project, 2025 and 2040, were developed by including projects listed in the Southern California Association of Governments (SCAG) 2016 Regional Transportation Plan (RTP) and its Amendments, the 2018 SR 91 Implementation Plan, and project lists developed via discussions with the RCTC, OCTA, and TCA.

Projects on or around the SR 91 corridor are of greatest significance because they are the most likely to impact RCTC 91 Express Lanes operations. Critical projects in the corridor include:

- SR 91 COP, I-15 NB Option 1, and SR 91 WB Option 3: consists of two projects, 1) the southerly extension of the I-15 NB to SR 91 WB EL entrance by approximately 4,000 feet. The entrance to the WB 91 ELs along I-15 NB was originally located between Ontario Avenue and Magnolia Avenue but was moved south to better allow more storage for vehicles that were queuing to enter the WB ELs. This project was completed during Fall 2018 and is not expected to significantly impact RCTC 91 EL T&R. SR 91 WB Option 3 would convert the access area to/from the WB RCTC 91 ELs from an egress only followed by an ingress only zone, to a full weaving area. The conversion is expected to be complete by mid-November 2018.
- The Riverside County I-15 Express Lanes (ELP): would be built in the median of the I-15 between Cajalco Road and SR 60, a distance of almost 15-miles. The project would generally add two Express Lanes per direction and directly connect to the RCTC 91 Express Lanes. This project is under construction and expected to be completed by FY 2021. This project is included in the 2025 model.
- The 15/91 Express Lanes Direct Connector: would provide a direct connection between the RCTC 91 Express Lanes to the RCTC I-15 Express Lanes north of SR 91. This would allow EB EL users to travel directly to the northbound I-15 Express Lanes, and southbound I-15 ELP users to connect directly with the WB 91 ELs. A modification to the EB 91 GP and EL terminus at I-15 would be constructed in conjunction with the 15/91 ELC. The EB 91 GP lane drop from 4 to 3 GP lanes between Main Street and I-15 would be eliminated and upgraded to a full four GP lanes that would be carried through the I-15 interchange. The EB 91 Express terminus would be shifted east by approximately a ½ mile before merging with the GP lanes upstream of the Promenade over-crossing. The I-15 NB to EB GP lane direct connector would merge with the EB 91 GP lanes instead of continuing as an auxiliary lane as it does today. East of the Promenade Avenue over-crossing the SR 91 EB lanes would be unchanged from the exiting condition (5 GP Lanes). This project is expected to be completed by FY 2022 and is included in the 2025 model.
- The 241/91 Express Direct Connector (EDC): would directly connect the RCTC 91 Express Lanes with the SR 241 via an express-to-express direct connector. The direct connector would permit motorists to bypass some of the heavy congestion that currently exists on the NB 241 and directly connect with the EB RCTC 91 ELs. Motorists using the NB to EB EDC must continue to the EB RCTC 91 ELs and therefore are required to pay the EB RCTC 91 EL toll. The westbound to southbound movement is accessible from either the WB RCTC 91 ELs or the WB GP lanes. Travelers on the EDC would be subject to an additional dynamically priced toll (on

top of any toll charged on the RCTC 91 ELs and the SR 241 toll road, charged to all users regardless of occupancy or vehicle type. This project is assumed to be open in FY 2022 and is included in the 2025 model.

- SR 71/91 Interchange: would be reconstructed by replacing the hairpin loop ramp from EB 91 to NB 71 with a high-speed direct-connector. The reconstruction would also re-position the EB on-ramp from Green River Road such that traffic from Green River Road destined for SR 71 would connect directly via a CD road rather than enter the 91. In addition, the off-ramp to SR 71 from EB 91 would be located west of the SR 91 EB on-ramp from Green River Road. This project is assumed to be open by 2026, but is included in the 2025 model.
- The Riverside County I-15 Express Lanes South of Cajalco (15 South ELs): would extend the I-15 ELP from its terminus at Cajalco Road by another 15-miles to SR 74 to the south. This project is expected to be complete by 2028 and is included in the 2040 model.
- San Bernardino County Express Lanes (I-15 and I-10): would add approximately 30 miles of Express Lanes to I-10 between SR 210 in Redlands to the east to the LA / San Bernardino County Line to the west and would add approximately 10 miles of Express Lanes to I-15 north of SR 60. These projects are expected to be completed in phases, with the first phase of the I-10 ELs complete in 2023, and the last completed in 2025.
- The SR 91 Ultimate Project at the County Line: this widening of the SR 91 GP lanes from SR 71 in Riverside County to SR 241 in Orange County by one GP lane in each direction would upgrade the SR 91 to a 6-lane per direction freeway with 2-lanes per direction. This widening across 4-miles is expected to be a significant regional improvement and is assumed to open by year 2035. This project is included in the 2040 model. A sensitivity was run where the Ultimate Project was accelerated to year 2028.
- HOV-3+ Regional HOV policy: is expected to be in effect by year 2040. Currently, HOV lanes are open to vehicles with 2 or more occupants. However, this has left many HOV lanes fully utilized during peak hours and operating with delays. The HOV policy is assumed to convert to a 3-or more person definition by year 2040.

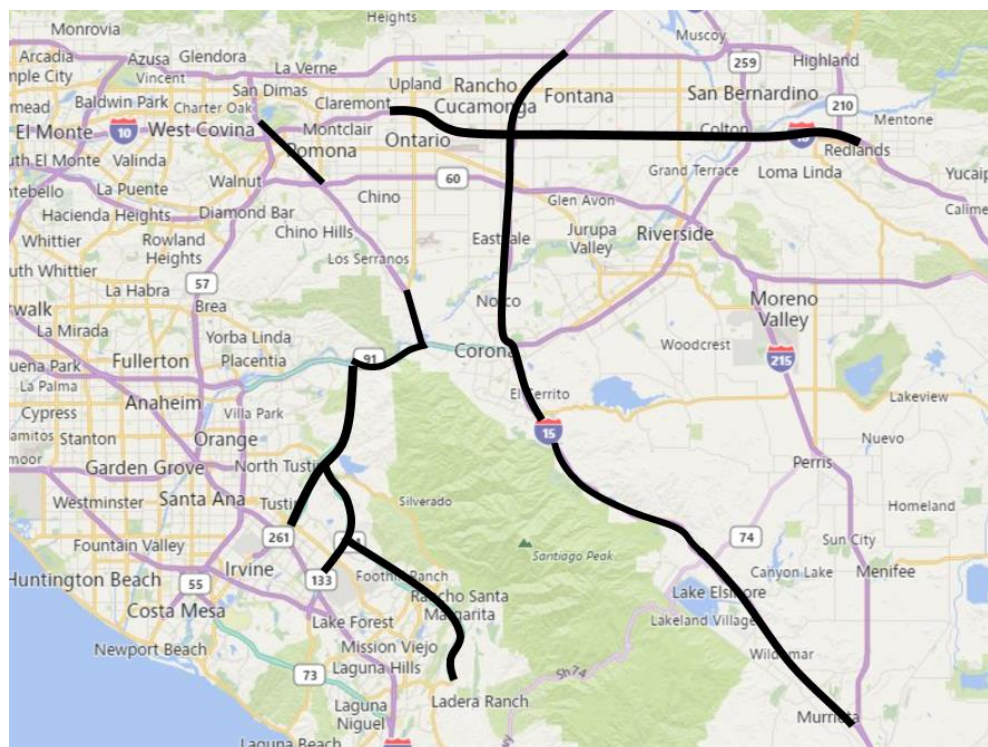
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Other projects assumed in the 2025 and 2040 highway networks are shown in the following table and are depicted in Figure 5-6. Note that numerous other smaller scale projects listed in the SCAG RTP were also coded, but are not listed herein as they are of lesser significance to the SR 91 corridor.

Table 5-9: Key Network Changes: 2018-2040

| Roadway | RTP ID | Description | County | Completion Year |
|---------|----------|--|-------------|-----------------|
| SR 241 | ORA050 | Widen Eastern Transportation Corridor (SR 241/261/133) by adding 2 lanes in each direction. | Orange | 2025 |
| | ORA051 | Widen Foothill Transportation Corridor-North by adding 2 lanes in each direction. | Orange | 2025 |
| SR-71 | 1M1001 | Add 1 HOV lane and 1 mixed flow lane in each direction from Mission Boulevard to Rio Rancho. | Los Angeles | 2029 |
| | LA0B951 | Add 1 HOV lane and 1 mixed flow lane in each direction from I-10 to SR-60. | Los Angeles | 2028 |
| | 3M01MA09 | Add 1 lane in each direction from SR-91 to San Bernardino County Line. | Riverside | 2035 |
| I-15 | 3160002 | Construct 2 HOV lanes from SR 74 to JCT I-15/I-215. | Riverside | 2039 |

Figure 5-6: Locations of Key Projects for 2025 Highway Network



5.3 MARKET SHARE MODEL

Stantec has adapted its managed lane market share model to forecast SR 91 Express Lane usage. The adapted market share model was used to provide an alternative view of traffic and revenue and its results were used to post-process some travel demand model results and to develop traffic and revenue annualization factors.

5.3.1 Model Structure and Development – Market Share Model

The market share curves are built from a compilation of traffic, speed, and income data collected in past studies to reflect the OCTA's 91 Express Lanes and recently updated to reflect RCTC 91 Express Lanes utilization. Stantec collected and analyzed traffic data from the RCTC 91 Express Lanes and the adjacent general purpose lanes in 2017 and 2018 and utilized these data to assess the relationship between corridor demand, congestion, and express lane usage.

Capture rates on both the eastbound and westbound RCTC 91 Express Lanes formed the basis for the toll market share curves. Data from SR 91 at the Riverside / Orange County Line were used to derive market share capture rates for full-toll traffic (excluding HOV-3+ and other toll-free traffic). This location represents a major bottleneck on the 91 and is also the location of the greatest corridor demand. Figure 5-7 shows global, GP, and express traffic by hour in this section. The resulting market share curves are shown in Figure 5-8. The curves were derived based on data collected during the count program as well as historical traffic data.

Figure 5-7: SR 91 Westbound Global & Express Traffic, Riverside / Orange County Line

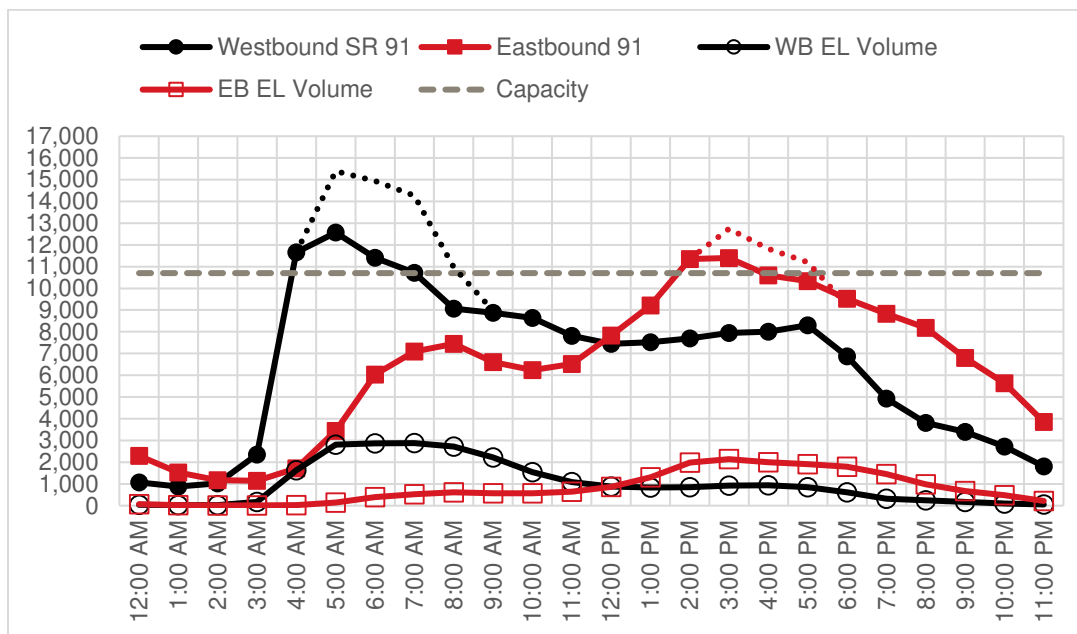
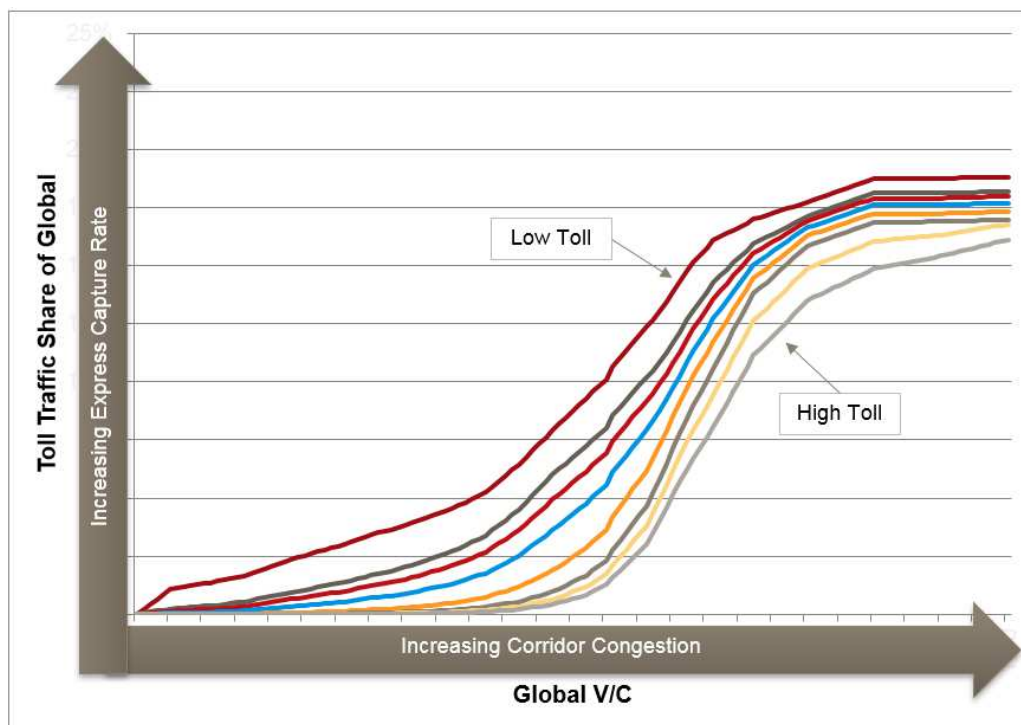


Figure 5-8: SR 91 Westbound Express Market Share Curves – Full Toll Traffic



5.3.2 Model Implementation

The SR 91 market share curves were adapted to reflect the lane configuration of RCTC 91 Express Lanes. Curves were developed for 5 GP / 2 Express lane and 6 GP / 2 Express Lane configurations.

The market share model was setup to model traffic on typical weekdays and weekends on a segment-by-segment basis by 15-minute period. Inputs used by the model include:

- Global traffic forecast by the travel demand model by period
- Traffic demand profile (15-minute distribution)
- Ratio of Friday, Saturday, and Sunday traffic versus typical weekday traffic.
- Global capacity of the 91 corridor (10,700 at the County line, increasing to 12,500 with the Ultimate Project)

Before using the model to forecast traffic and revenue, existing global traffic, capacity, and tolls were input to the MSM to identify how well the model matched reality. As shown in the following table, typical weekday (Monday to Thursday) revenue were well matched, in total within 4 percent with eastbound revenue being underpredicted by 6 percent and westbound revenue over predicted by 7 percent. Eastbound Friday and weekends were underpredicted as well by a more significant amount. Westbound revenues were generally well predicted, within 10 percent of actual. Weekly modeled revenue matches the actual levels almost exactly.

Table 5-10: RCTC 91 Express Revenue – Actual vs. Market Share Model

| Potential Actual | M-R | Friday | Saturday | Sunday | Total |
|-------------------------|------------------|------------------|-----------------|-----------------|--------------------|
| Eastbound | \$200,295 | \$96,027 | \$39,026 | \$18,127 | \$353,475 |
| Westbound | \$540,034 | \$73,229 | \$28,176 | \$24,704 | \$666,143 |
| | \$740,328 | \$169,256 | \$67,202 | \$42,832 | \$1,019,618 |
| | | | | | |
| Model 2018 | M-R | Friday | Saturday | Sunday | Total |
| Eastbound | \$188,642 | \$76,216 | \$30,482 | \$15,720 | \$311,059 |
| Westbound | \$579,697 | \$78,445 | \$28,649 | \$22,307 | \$709,098 |
| Total | \$768,338 | \$154,661 | \$59,131 | \$38,027 | \$1,020,158 |
| | | | | | |
| % Difference | M-R | Friday | Saturday | Sunday | Total |
| Eastbound | -6% | -21% | -22% | -13% | -12% |
| Westbound | 7% | 7% | 2% | -10% | 6% |
| Total | 4% | -9% | -12% | -11% | 0% |

RCTC 91 Express Lane traffic predicted by the MSM were within 1 percent of actual levels. While eastbound traffic on Saturdays were underpredicted by 12 percent, traffic on other days of the week and directions were predicted within 10 percent of actual levels.

Table 5-11: RCTC 91 Express Traffic – Actual vs. Market Share Model

| Actual 2018 | M-R | Friday | Saturday | Sunday | Total |
|---------------------|---------------|---------------|---------------|---------------|----------------|
| Eastbound | 19,354 | 24,093 | 20,037 | 13,544 | 77,028 |
| Westbound | 24,784 | 24,327 | 17,969 | 16,083 | 83,163 |
| Total | 44,138 | 48,420 | 38,006 | 29,627 | 160,191 |
| | | | | | |
| Model 2018 | M-R | Friday | Saturday | Sunday | Total |
| Eastbound | 18,062 | 22,515 | 17,727 | 13,209 | 71,513 |
| Westbound | 26,261 | 26,510 | 18,254 | 15,806 | 86,831 |
| Total | 44,323 | 49,025 | 35,981 | 29,015 | 158,344 |
| | | | | | |
| % Difference | M-R | Friday | Saturday | Sunday | Total |
| Eastbound | -7% | -7% | -12% | -2% | -7% |
| Westbound | 6% | 9% | 2% | -2% | 4% |
| Total | 0% | 1% | -5% | -2% | -1% |

The traffic and revenue forecasts were developed by combining views of tolls and traffic from both the market share model and the corridor level travel demand model. In general, the market-share model's expectations for off-peak period or direction traffic and tolls were accepted for the T&R forecast. Peak period, peak direction traffic forecasts were influenced largely by the corridor level travel demand model and supplemented with information from the market-share model. Westbound express lane traffic for the 4-10 AM period and eastbound express lane traffic for the 2-8 PM period were developed from the corridor level travel demand model and post processed based on market-share model results. The market-share model based post-processing, in aggregate, reduced express lane capture, tolls, and revenue, although in some instances would increase the travel demand model predicted traffic levels. Express traffic

volumes were post processed upward for the eastbound ELs in scenarios where the EB 91 GP lanes were widened by an additional lane at the County Line. The upward post processing was implemented based on analysis of VISSIM micro-simulation modeling results for related studies of the SR 91 corridor. The micro-simulation modeling demonstrated that the widening of the EB GP lane from five to six GP lanes would permit additional traffic to flow into Riverside County which would then result in longer and more intense queues at the SR 91/I-15 interchange. The MSM predicts that the increased flow within Riverside would result in an increase in eastbound Express Lane traffic, while the travel demand model demonstrates that eastbound 91 Express traffic would drop. The MSM view of eastbound EL behavior was more consistent with how traffic would operate in the corridor given the widening, so its impacts on eastbound EL traffic were used at the basis for the impact of widening the EB GP lanes at the County Line.

6.0 TRAFFIC AND REVENUE FORECAST

Annual traffic and gross potential toll revenue for the RCTC 91 Express Lanes is expected to increase to over \$73 million by FY 2025 (\$60.4 million in 2017 \$'s), while full toll transactions would grow to over 13 million. This represents a nominal dollar revenue increase of 54 percent or a real dollar increase of nearly 30 percent from FY 2018 levels (\$48 million). Full toll transactions by FY 2025 would be nearly 16 percent above current levels. Traffic and revenue would almost double in real dollar terms, to \$99 million by 2040, or in nominal dollar terms, \$175 million. RCTC 91 EL revenue from FY 2019 to FY 2040 would grow about 7 percent per year, while full toll traffic would grow around 1.7 percent per year. Full toll transactions would be near 15 million by 2040, an increase of 34 percent from today's levels.

The increase in traffic and revenue is supported by the expectation that the Inland Empire will continue to be a desirable place for people to live, while the coastal counties of LA and Orange County will remain significant employment centers. Population in the Inland Empire is expected to grow by 1.2 percent per year from now until 2025, an increase of over 427,000 people and 165,000 households. While the number of jobs in the Inland Empire would grow by 171,000, LA and Orange County employment would increase by over 423,000. A significant portion of this growth in trip making is expected to be made along the region's primary east-west corridors, the SR 91, SR 60, and I-10.

Several network improvements impact RCTC 91 Express Lanes growth, some positively and some negatively. Changes that would improve Express Lane revenue include the addition of the 241/91 Express Lane Direct Connector ("EDC"), the I-15/91 Express Lane Connector ("ELC"), and the widening of the eastbound 91 GP lanes between SR 241 and SR 71. Changes that would reduce 91 Express Lanes traffic and revenue include the conversion of the westbound 91 access area at the County Line to a full-length weave lane, the widening of the westbound 91 GP lanes between SR 71 and SR 241, and the widening of the eastbound 91 GP lanes in the vicinity of I-15.

Forecasts assume the SR 91 "Ultimate" project is built in year 2035. The Ultimate project would widen the SR 91 to a full six GP lanes from SR 71 to SR 241 and result in a meaningful addition of capacity to the corridor. As discussed previously, the westbound widening is expected to reduce congestion on the westbound GP lanes in Riverside County and therefore reduce westbound EL demand and revenue. The eastbound widening would decrease delays in Orange County, but result in more traffic reaching Riverside County, and thereby increasing eastbound RCTC 91 EL utilization and revenue. A portion of the Ultimate project also includes a widening of the SR 91 GP lanes between I-15 and Pierce Street, while also extending the Express Lane terminus from I-15 toward Pierce Street. This portion of the Ultimate Project east of I-15 was not considered in this analysis, consistent with the approach taken in the original SR 91 Investment Grade Traffic and Revenue Study conducted in 2012. The eastern portion of the Ultimate project contains elements that can both degrade Express Lane revenue (reducing EB congestion and EB EL demand) and improve Express Lane revenue (extending the Express Lanes, and increasing throughput from the SR 91 westbound approach toward the Express Lanes).

RCTC 91 EXPRESS LANES INVESTMENT GRADE TRAFFIC AND REVENUE STUDY
Traffic and Revenue Forecast

Table 6-1: RCTC 91 Express Lanes Traffic and Revenue Forecast, Base Scenario

| Fiscal Year | Revenue, 2017\$'s | Revenue, Nominal \$'s | % Change Year over Year | Full Toll Transactions (Excluding HOV3+) | % Change Year over Year | Average Full Toll (2017 \$'s) |
|---------------|----------------------|--------------------------|-------------------------------|---|-------------------------------|----------------------------------|
| 2017 (Actual) | \$9,618,429 | \$9,618,429 | - | 3,270,243 | - | \$2.94 |
| 2018 (Actual) | \$46,772,422 | \$47,941,733 | 398% | 11,297,276 | 245% | \$4.14 |
| 2019 (1) | \$47,570,000 | \$49,980,000 | 4.3% | 11,750,000 | 4.0% | \$4.05 |
| 2020 | \$44,260,000 | \$47,660,000 | -4.6% | 11,920,000 | 1.4% | \$3.71 |
| 2021 | \$47,710,000 | \$52,660,000 | 10.5% | 12,180,000 | 2.2% | \$3.92 |
| 2022 (2) | \$50,600,000 | \$57,250,000 | 8.7% | 12,390,000 | 1.7% | \$4.08 |
| 2023 | \$53,680,000 | \$62,250,000 | 8.7% | 12,610,000 | 1.8% | \$4.26 |
| 2024 | \$56,950,000 | \$67,690,000 | 8.7% | 12,830,000 | 1.7% | \$4.44 |
| 2025 | \$60,410,000 | \$73,600,000 | 8.7% | 13,060,000 | 1.8% | \$4.63 |
| 2026 | \$63,450,000 | \$79,240,000 | 7.7% | 13,290,000 | 1.8% | \$4.77 |
| 2027 | \$66,050,000 | \$84,550,000 | 6.7% | 13,520,000 | 1.7% | \$4.89 |
| 2028 | \$68,750,000 | \$90,200,000 | 6.7% | 13,750,000 | 1.7% | \$5.00 |
| 2029 | \$71,560,000 | \$96,240,000 | 6.7% | 13,980,000 | 1.7% | \$5.12 |
| 2030 | \$74,490,000 | \$102,690,000 | 6.7% | 14,220,000 | 1.7% | \$5.24 |
| 2031 | \$77,540,000 | \$109,560,000 | 6.7% | 14,460,000 | 1.7% | \$5.36 |
| 2032 | \$80,710,000 | \$116,890,000 | 6.7% | 14,710,000 | 1.7% | \$5.49 |
| 2033 | \$84,010,000 | \$124,710,000 | 6.7% | 14,960,000 | 1.7% | \$5.62 |
| 2034 | \$87,450,000 | \$133,060,000 | 6.7% | 15,220,000 | 1.7% | \$5.75 |
| 2035 (3) | \$86,290,000 | \$134,580,000 | 1.1% | 14,780,000 | -2.9% | \$5.84 |
| 2036 | \$85,130,000 | \$136,090,000 | 1.1% | 14,320,000 | -3.1% | \$5.94 |
| 2037 | \$88,480,000 | \$144,980,000 | 6.5% | 14,530,000 | 1.5% | \$6.09 |
| 2038 | \$91,950,000 | \$154,440,000 | 6.5% | 14,750,000 | 1.5% | \$6.23 |
| 2039 | \$95,560,000 | \$164,520,000 | 6.5% | 14,970,000 | 1.5% | \$6.38 |
| 2040 | \$99,320,000 | \$175,260,000 | 6.5% | 15,190,000 | 1.5% | \$6.54 |
| 2041 | \$101,980,000 | \$184,460,000 | 5.2% | 15,330,000 | 0.9% | \$6.65 |
| 2042 | \$103,510,000 | \$191,910,000 | 4.0% | 15,390,000 | 0.4% | \$6.73 |
| 2043 | \$105,070,000 | \$199,670,000 | 4.0% | 15,450,000 | 0.4% | \$6.80 |
| 2044 | \$106,660,000 | \$207,750,000 | 4.0% | 15,510,000 | 0.4% | \$6.88 |
| 2045 | \$108,260,000 | \$216,140,000 | 4.0% | 15,570,000 | 0.4% | \$6.95 |
| 2046 | \$109,890,000 | \$224,880,000 | 4.0% | 15,630,000 | 0.4% | \$7.03 |
| 2047 | \$111,540,000 | \$233,970,000 | 4.0% | 15,680,000 | 0.3% | \$7.11 |
| 2048 | \$113,220,000 | \$243,430,000 | 4.0% | 15,740,000 | 0.4% | \$7.19 |
| 2049 | \$114,930,000 | \$253,270,000 | 4.0% | 15,800,000 | 0.4% | \$7.27 |
| 2050 | \$116,660,000 | \$263,510,000 | 4.0% | 15,860,000 | 0.4% | \$7.36 |
| 2051 | \$118,110,000 | \$273,470,000 | 3.8% | 15,920,000 | 0.4% | \$7.42 |
| 2052 | \$119,300,000 | \$283,120,000 | 3.5% | 15,980,000 | 0.4% | \$7.47 |
| 2053 | \$120,490,000 | \$293,100,000 | 3.5% | 16,040,000 | 0.4% | \$7.51 |
| 2054 | \$121,700,000 | \$303,440,000 | 3.5% | 16,100,000 | 0.4% | \$7.56 |
| 2055 | \$122,920,000 | \$314,150,000 | 3.5% | 16,160,000 | 0.4% | \$7.61 |
| 2056 | \$124,150,000 | \$325,230,000 | 3.5% | 16,220,000 | 0.4% | \$7.65 |
| 2057 | \$125,400,000 | \$336,700,000 | 3.5% | 16,290,000 | 0.4% | \$7.70 |
| 2058 | \$126,660,000 | \$348,580,000 | 3.5% | 16,350,000 | 0.4% | \$7.75 |
| 2059 | \$127,930,000 | \$360,880,000 | 3.5% | 16,410,000 | 0.4% | \$7.80 |
| 2060 | \$129,210,000 | \$373,610,000 | 3.5% | 16,470,000 | 0.4% | \$7.85 |
| 2061 | \$130,500,000 | \$386,790,000 | 3.5% | 16,530,000 | 0.4% | \$7.89 |
| 2062 | \$131,810,000 | \$400,430,000 | 3.5% | 16,590,000 | 0.4% | \$7.95 |
| 2063 | \$133,130,000 | \$414,560,000 | 3.5% | 16,660,000 | 0.4% | \$7.99 |
| 2064 | \$134,470,000 | \$429,180,000 | 3.5% | 16,720,000 | 0.4% | \$8.04 |
| 2065 | \$135,820,000 | \$444,320,000 | 3.5% | 16,780,000 | 0.4% | \$8.09 |
| 2066 | \$137,180,000 | \$459,990,000 | 3.5% | 16,840,000 | 0.4% | \$8.15 |

(1) Westbound EL weave lane halfway in FY 2019

(2) 15/91 ELC, EB 91 Extension (to Promenade), 91/241 EDC in FY 2022

(3) Widen SR 91 GP from SR 71 to SR 241, both directions.

6.1.1 T&R Forecast Details – Time of Day and Directional Distribution

RCTC 91 Express Lanes weekday revenue is expected to grow from approximately \$185,000 per day in 2018 to \$237,000 per day in 2025, and to \$386,000 per day by 2040. The growth rate on a constant dollar basis is 3.4 percent per year, with more rapid growth from 2018 to 2025 (3.6 percent per year), and slower growth from 2025 to 2040 (1.7 percent per year). The slower growth seen from 2025 to 2040 is attributable to a widening of the SR 91 GP lanes at the County Line from SR 241 to SR 71 in year 2035.

From 2018 to 2025, revenue growth is expected to be greatest in the PM peak period – this period from 2-8 PM would account for over 90 percent of the Express Lanes' revenue increase. The AM peak period, in contrast, is expected to shrink by 2 percent versus existing levels. The decline is attributable to an expected reduction in full toll traffic, by about 10 percent and a reduction in tolls during the last two hours of the AM peak period (8-10 AM). The cut in full toll traffic and tolls is principally attributable to a capacity improvement project at the County Line (westbound weaving lane), and an increase in HOV-3+ free traffic from 3,400 to 5,100 vehicles during the 6-hour peak period. Tolls increase slightly, from an average of about \$10.20 to about \$11.45 per full toll transaction during the peak hours but would decline during the last two hours of the AM peak period (8-10 AM), reflecting the continued high demand and congestion during peak hours but improved conditions during shoulder peak hours.

Figure 6-1: RCTC 91 Express Gross Weekday Revenue Forecast by Time of Day

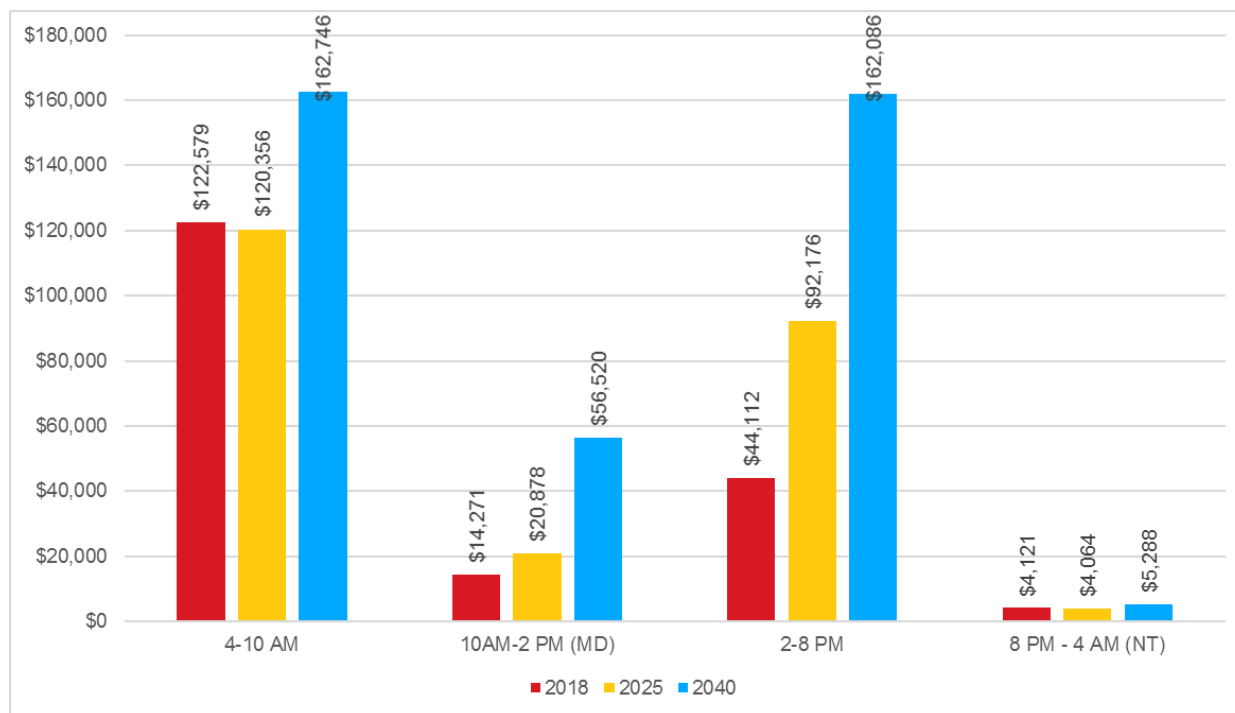


Figure 6-2: RCTC 91 Express, Revenue Split by Time of Day – Existing and Forecast

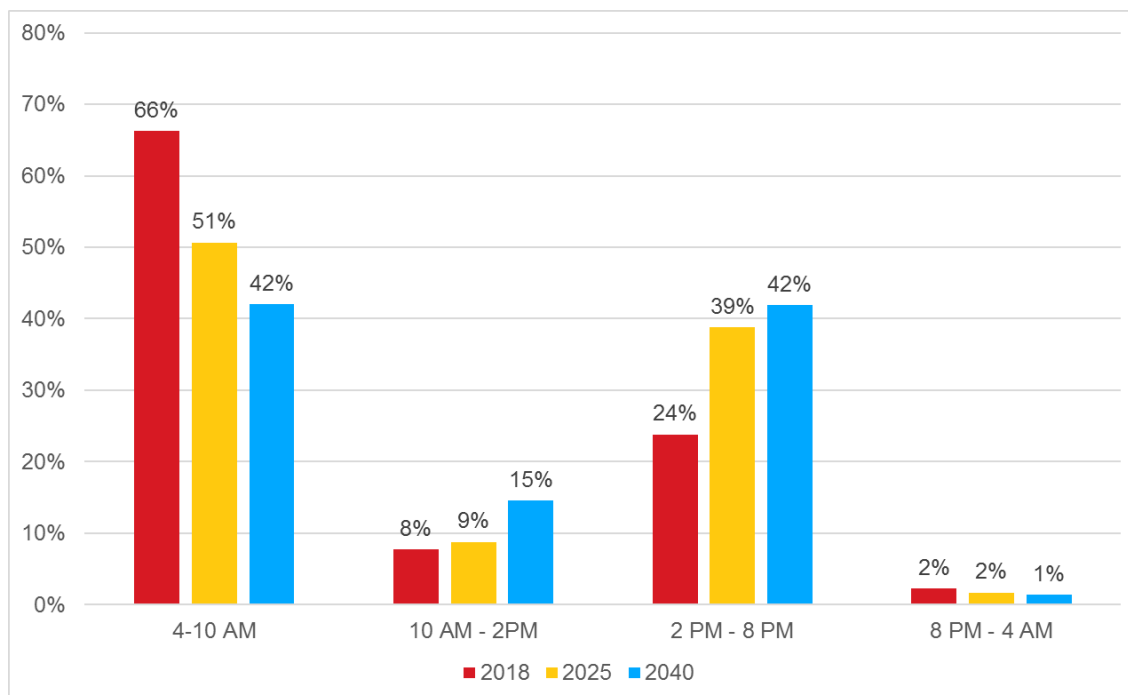
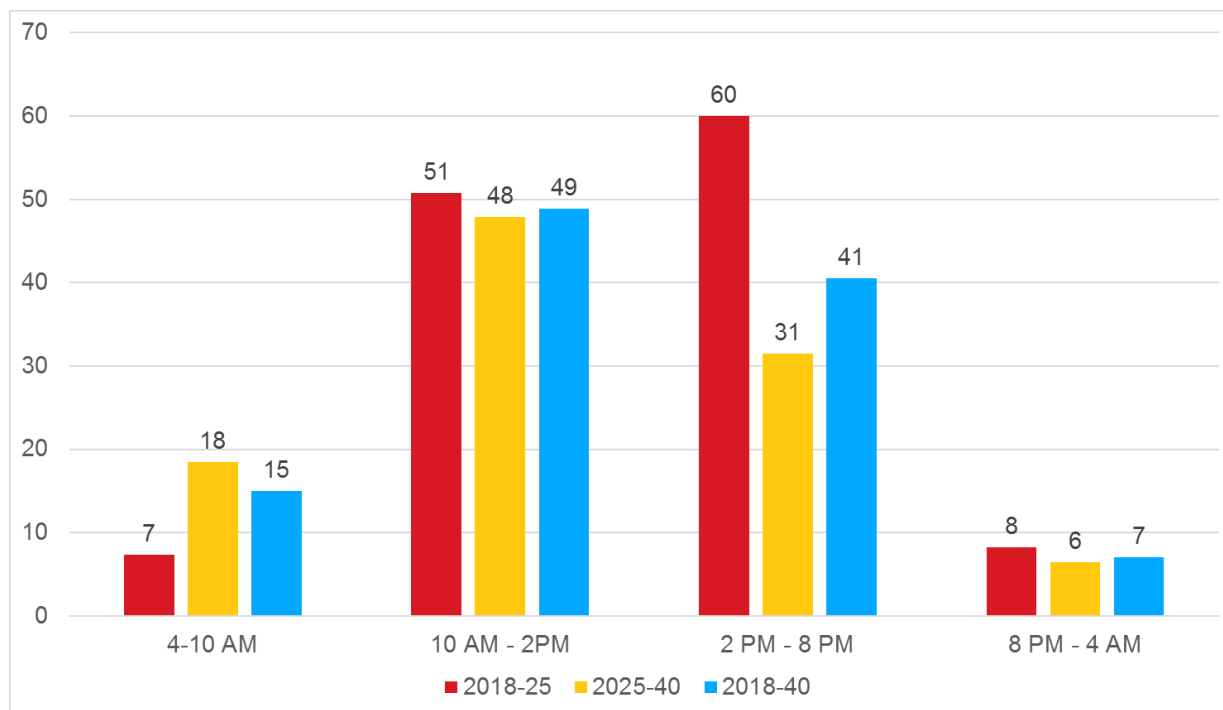


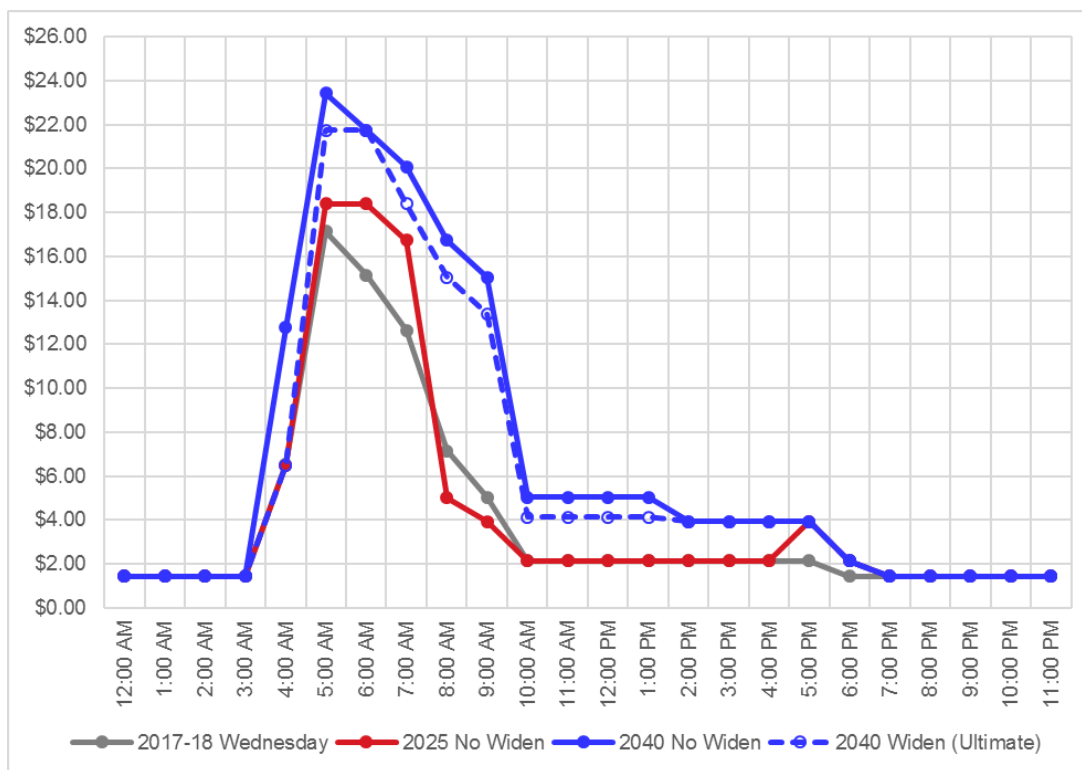
Figure 6-3: RCTC 91 Express Forecast Average Hourly Traffic Growth by Time of Day and Direction



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Tolls on the Express Lanes are expected to increase as demand in the corridor and demand for the Express Lanes increases. Current tolls on the westbound 91 Express Lanes on a typical weekday (Wednesday) are at a high of \$17.15 (as of Mid-May 2018) from 5 AM to 6 AM, \$15.15 from 6 AM to 7 AM, and \$12.65 from 7 AM to 8 AM. If the westbound 91 GP lanes were not widened, tolls for the McKinley movement would grow to over \$18 and be sustained at or near that level from 5 AM to 8 AM. Westbound Express Lane demand and toll rates are dampened by several factors: 1) a re-striping of the mixing area between the GP and Express Lanes at the Riverside/Orange County Line, 2) a re-striping at the westbound entrance which is expected to enhance Express Lane capacity and reduce the need for toll increases, and 3) the addition of the 91/241 EDC which is expected to reduce GP lane congestion and therefore reduce Express Lane demand. Westbound Express Lane demand and tolls are, however, expected to increase due to the addition of the 15/91 Express Lane Connector (ELC) in FY 2022 and from growth in corridor demand. By 2040, the westbound 91 Express Lanes toll for the movement from McKinley Street would increase to a high of \$22.00 during the hours of 5 AM and 7 AM. This forecast assumes that the westbound 91 GP lanes are widened to 6 lanes from SR 71 to SR 241 by year 2035. If the WB GP lanes were not widened, westbound Express Lane demand would be higher and tolls would rise to nearly \$24 (2017 \$'s).

Figure 6-4: Westbound 91 Express Tolls (2017\$'s), via McKinley. Existing & Forecast



Tolls for travel on the eastbound 91 Express Lanes via McKinley Street would be generally lower than the rates for travel on the westbound lanes in the morning, consistent with the existing condition. Today, tolls for travel on the eastbound 91 Express Lanes peak at just over \$5.00 from 2 PM to 5 PM. By 2025 tolls would increase by \$2.00 to \$3.00, reaching a high of just over \$8.00. The generally lower toll rates seen on the eastbound 91 Express Lanes in Riverside County are attributable to generally better operations on the eastbound GP lanes as compared to the eastbound GP lanes in Orange County and the westbound GP lanes in Riverside County during the morning. The



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eastbound SR 91 GP lanes at the Riverside / Orange County Line is a local bottleneck which meters the amount of traffic that can reach the GP lanes in Riverside County. While the eastbound SR 91 GP lanes in Orange County see high demand and are heavily congested during the PM peak period, the GP lanes in Riverside County are not nearly as congested. This lower level of congestion is one cause of generally lower EB EL demand and tolls. EB express lane demand and tolls would still increase, albeit gradually, as demand from on-ramps within Riverside increase and the bottleneck at the SR 91/I-15 interchange worsens. By 2040, the widening of the 91 at the County Line to a full 6 GP lanes from SR 241 to SR 71 would alleviate the bottleneck at the Orange / Riverside County Line, and permit greater throughput, and result in increased flow and congestion on the eastbound GP lanes in Riverside County. Eastbound express lane demand is expected to grow, and tolls for the movement to McKinley Street would spike to a high of over \$20.00.

Figure 6-5: Eastbound 91 Express Tolls (2017\$'s), via McKinley. Existing and Forecast

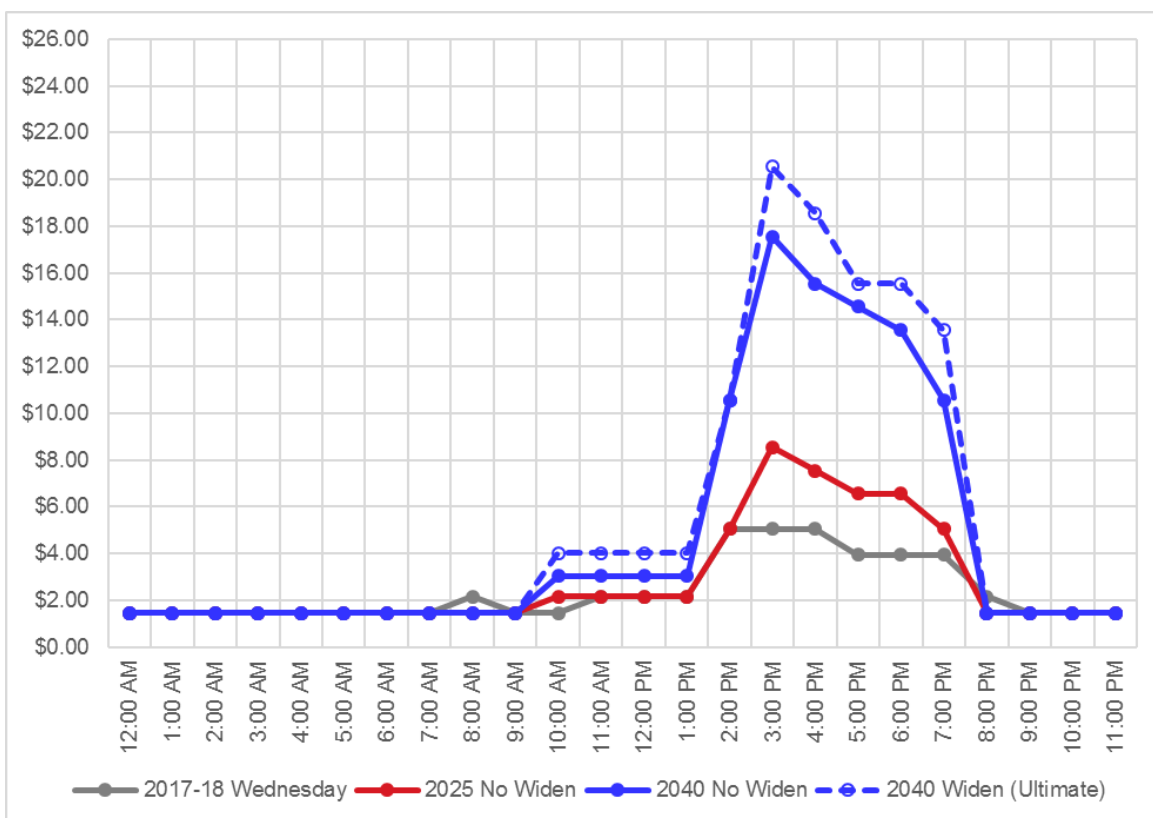


Figure 6-6: Westbound 91 Express Traffic – Existing and Forecast by Time of Day

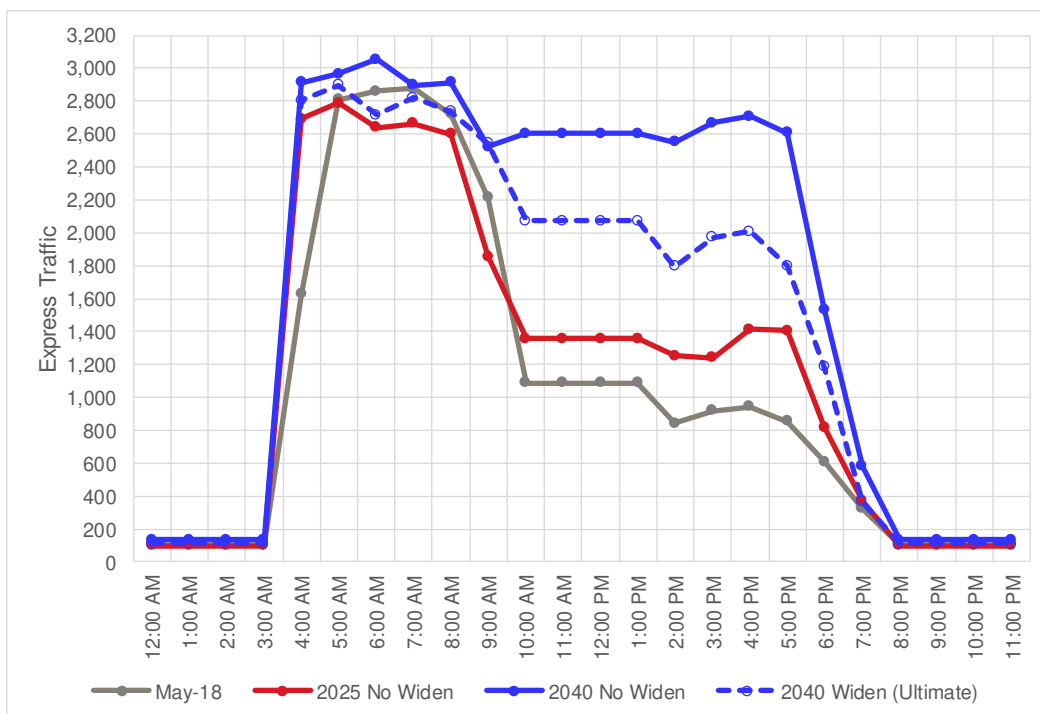
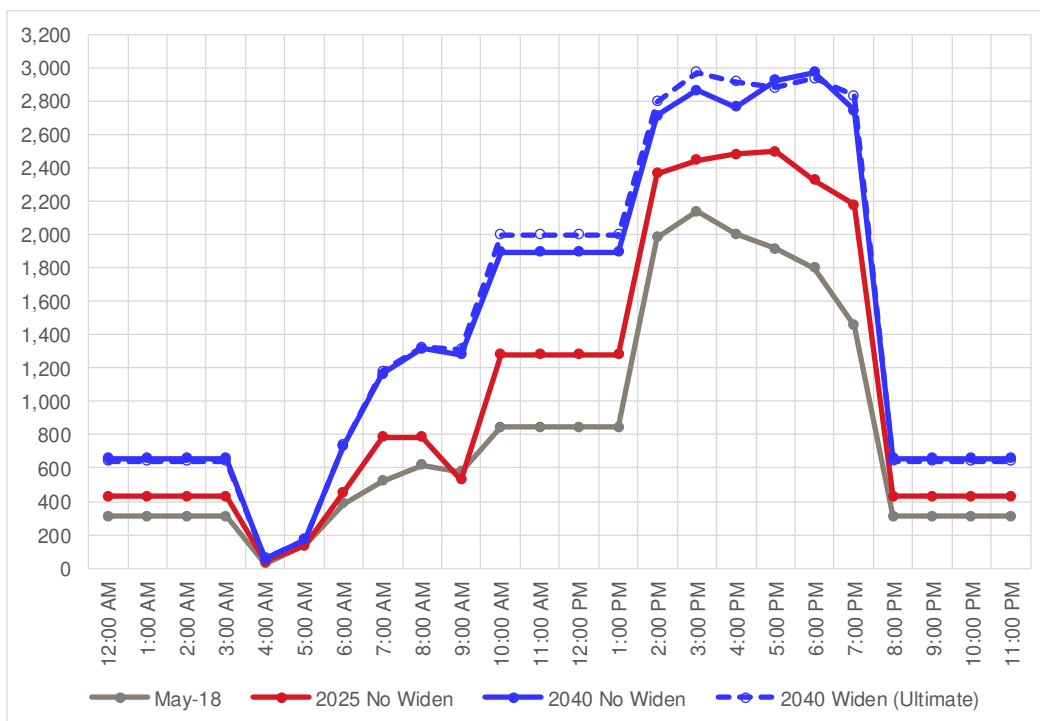


Figure 6-7: Eastbound 91 Express Traffic – Existing and Forecast by Time of Day



6.1.2 Annualization of Traffic and Revenue

Annual traffic and revenue are forecast by multiplying weekday T&R forecasts by an annualization factor; 265 for revenue and 295 to 320 for toll traffic. The annualization factor represents the contribution of weekday revenue (typical Monday to Thursday), typical Friday revenue, typical Saturday and Sunday revenue, and holidays. The traffic and revenue annualization factor were developed from a bottom-up analysis of weekday, Friday, and weekend T&R via Stantec's Express Lane market-share model (MSM).

The revenue annualization factor is conservatively assumed to be 265. Over the past 12-months, the RCTC 91 ELs revenue annualization factor was 285, about eight percent higher than the assumed value of 265. At current levels, 69 percent of annual revenue is derived from typical weekdays, 18 percent from Fridays, and 13 percent from weekends and federal holidays. Stantec's MSM shows a revenue annualization factor of 281 for the 2025 year, and 267 for the 2040 year. The declining annualization factor over time reflects an expectation that weekday revenue will grow more rapidly than Friday, Saturday, or Sunday revenue. The revenue annualization factor of 265 for the annual T&R forecast is assumed at the low end of the MSM predicted values and reflects a weekend revenue contribution that is less than six percent of annual revenue.

Table 6-2: Existing vs. Forecast Revenue Distribution by Day of Week

| % of Year | Monday-Thursday | Friday | Weekends |
|----------------|-----------------|--------|----------|
| 2017-18 Actual | 69% | 18% | 13% |
| 2025 MSM | 71% | 17% | 12% |
| 2040 MSM | 75% | 20% | 6% |

Table 6-3: Revenue Annualization Factor

| Year | Actual / MSM Model | Forecast Assumption |
|----------------|--------------------|---------------------|
| 2017-18 Actual | 285 | 265 for all years |
| 2025 | 281 | |
| 2040 | 267 | |

Annualization of typical weekday (Monday to Thursday) revenue

Full toll transactions annualization factor was assumed to be 320 in year 2020 and gradually decline to 305 in 2040, and 295 by the last forecast year, 2066. Existing data demonstrate the annualization factor for full toll transactions is 325, slightly higher than the assumed value of 320 in 2020. By 2040, the MSM modeled annualization factor would be 297, reflecting smaller contributions from Fridays, weekends, and holidays.

Table 6-4: Existing vs. Forecast Full Toll Traffic Distribution by Day of Week

| % of Year | Monday-Thursday | Friday | Weekends & Holidays | Total |
|----------------|-----------------|--------|---------------------|-------|
| 2017-18 Actual | 61% | 17% | 22% | 100% |
| 2025 MSM | 61% | 18% | 21% | 100% |
| 2040 MSM | 67% | 18% | 15% | 100% |

Table 6-5: Full Toll Transactions Annualization Factor

| Year | Actual / MSM Model | Forecast Assumption |
|----------------|--------------------|--|
| 2017-18 Actual | 325 | 320 in 2020, declining to 305 in 2040, 295 in 2066 |
| 2025 | 324 | |
| 2040 | 297 | |

6.1.3 Tolling Assumptions

The RCTC 91 Express Lanes are assumed to be priced using a policy that differs from the current policy in a few ways. Tolls are assumed to be set to gradually increase as Express Lane volume increases and to maintain free-flow speeds. HOV-3+ traffic, zero emission vehicles (ZEVs), disabled veterans, and vehicles with disabled person license plates are assumed to maintain the current policy of being toll-free except from 4 PM to 6 PM on weekdays in the eastbound Express Lanes. A handful of changes are assumed to account for the addition of the I-15/91 Express Lanes Connector (ELC) in FY 2022, and to reflect a lower expectation for Express Lane capacity.

Prices for each Express Lane movement would be set at a minimum of \$1.45 for the EB Express Lanes via McKinley Street. Prices would increase as Express Lane traffic increases. Prices are set according to the volume tiers shown in the following table. Table 6-6 demonstrates that as total directional EL volume passes a volume breakpoint (800 vph, 1,600 vph, 2,400 vph, etc.) tolls will increase to the next price level. The pricing policy would differ from the recently enacted policy (October 2018) in that the prices for the lanes are assumed to be set according to the combined 2-lane directional flow, as opposed to being priced based on flow in each movement. Surcharges would be applied to any individual segment which operates with volumes exceeding the thresholds for that movement. The thresholds are shown in Table 6-7. The thresholds are set at volume levels that are expected to maintain free-flow speed on the segment, assuming there are no downstream constraints. Lastly, the forecasts assume that hours with two-lane flows in excess of 3,000 vehicles per hour are deemed to be at super-peak levels. Tolls would be regularly increased by \$1.00 or \$1.30 (2017\$'s) until volumes are consistently lower than 3,000 vehicles per hour.

Table 6-6: Volume vs. Toll Buckets

| 2-Lane Volume Range | McKinley | I-15 South (SDC) | I-15 North (ELC) |
|---------------------|----------|------------------|------------------|
| 0-800 vehs/hr | \$1.45 | \$1.85 | \$1.65 |
| 801-1600 vehs/hr | \$2.15 | \$2.80 | \$2.50 |
| 1601-2400 vehs/hr | \$3.95 | \$5.05 | \$4.55 |
| 2401-2700 vehs/hr | \$5.05 | \$6.50 | \$5.85 |
| 2701-3000 vehs/hr | \$6.55 | \$8.40 | \$7.60 |



Table 6-7: Single lane Segment Volume Thresholds

| Segment | Hourly and Daily Traffic Volume Thresholds |
|--------------------------|--|
| EB McKinley | 1,300 |
| EB I-15 North (EB to NB) | 1,400 |
| EB I-15 South (EB to SB) | 1,400 |
| WB McKinley | 1,350 |
| WB I-15 North (SB to WB) | 1,400 |
| WB I-15 South (NB to WB) | 1,400 |

From year to year, tolls are assumed to be increased at the start of each fiscal year by the rate of inflation. This is assumed to be 2.5 percent per year for the duration of the forecast. The prices shown in the prior table are also assumed to escalate at the rate of inflation.

Tolls paid by vehicles traveling on the ELC (EB 91 to NB I-15 ELP, SB I-15 ELP to WB 91) are shared between the 91 Express Lanes and I-15 Express Lanes. The sharing of tolls reflects the fact that a trip on the ELC must utilize a portion of the I-15 ELP and passes through an I-15 ELP toll zone (north of 91 between Hidden Valley Parkway and 2nd Street). The toll for this trip is a combination of a toll on I-15 and a toll on the 91 Express Lanes. The revenue sharing policy set by the RCTC distributes 70 percent of the ELC toll to the 91 Express Lanes revenue stream, and 30 percent to the I-15 ELP revenue stream. Revenues in the T&R forecast are assumed to be distributed according to this policy. The 70/30 split is intended to be revenue neutral for the 91 Express Lanes and be revenue positive for the I-15 ELP.

6.1.4 Long Term Traffic and Revenue Growth

Beyond 2040, revenues on a nominal dollar basis are assumed to grow by 4 percent per year until 2050, and then slow to 3.5 percent per year growth rate thereafter. Full toll traffic is assumed to grow 0.4 percent per year while tolls, on average, grow at a rate of 3.5 percent per year from 2040 to 2050, and by 3 percent per year from 2050 to 2066. The increasing tolls are a combination of the underlying annual inflation adjustment, assumed at 2.5 percent per year, with the remainder attributable to real dollar toll increases. The long-term traffic and revenue growth rates are derived from a MSM analysis of traffic beyond 2040 assuming global traffic growth on SR 91 averages 0.25 percent per year. This rate of growth would translate to a nominal revenue growth rate of 3.6 percent per year with full toll transactions growing 0.4 percent per year.

Table 6-8: Traffic and Revenue Growth beyond FY 2040

| Fiscal years | Full Toll Traffic | Revenue, nominal \$'s |
|-----------------|-------------------|-----------------------|
| FY 2041 to 2051 | 0.4% | 4.0% |
| FY 2051 to 2066 | 0.4% | 3.5% |

6.1.5 Global Traffic Growth on the SR 91 Corridor

SR 91 global traffic (Express and GP) crossing the Riverside / Orange County Line is forecast to grow at a rate of 1.4 percent per year from 2018 to 2040, or from 312,000 vehicles per day to 420,000 vehicles per day. Density in the corridor is expected to increase from their current levels of 22,000 vehicles per lane per day to 24,600 vehicles per lane per day by 2025. By 2040, the 91 corridor would be widened by one lane per direction. Despite this widening, the corridor's density in 2040 would continue to increase, reaching 26,300 vehicles per lane per day. In the near term, while daily traffic would grow at over 1 percent per year, traffic during the peak travel periods and directions, WB from 4-10 AM and EB from 2-8 PM, would grow at a slower rate of 0.6 percent per year. This slower rate of growth reflects the high demand and congestion that is already present on the SR 91. From 2025 to 2040, growth would increase to 1.5 percent per year. The increased growth rate is in part attributable to the planned widening of the SR 91 at the County Line from five to six GP lanes in each direction by year 2035. Growth during the AM and PM peak periods were derived from regional and corridor level forecasts of traffic along the 91. The forecasts take into account expected households, population, and employment growth discussed in Chapter 4, as well as congestion on competing regional roadways. Raw model forecasts demonstrated more aggressive rates of growth during AM and PM peak periods, but these forecasts were scaled down to reflect Stantec's expectations for less rapid growth during peak periods, as well as capacity constraints on feeder roadways including Green River Road and SR 71.

Table 6-9: SR 91 Global (GP & EL) Weekday Traffic, Existing vs. Forecast

| Year | EB 91 | WB 91 | Total |
|---------|---------|---------|---------|
| 2018 | 155,000 | 157,000 | 312,000 |
| 2025 | 175,000 | 170,000 | 345,000 |
| 2040 | 212,000 | 208,000 | 420,000 |
| 2018-25 | 1.7% | 1.1% | 1.4% |
| 2025-40 | 1.3% | 1.4% | 1.3% |
| 2018-40 | 1.4% | 1.3% | 1.4% |

Table 6-10: SR 91 Global Peak Period & Peak Direction Traffic, Existing vs. Forecast

| Year | EB 91, 2-8 PM | WB 91, 4-10 AM | Total |
|---------|---------------|----------------|---------|
| 2018 | 62,000 | 64,000 | 126,000 |
| 2025 | 66,000 | 65,000 | 131,000 |
| 2040 | 82,000 | 81,000 | 163,000 |
| 2018-25 | 0.9% | 0.2% | 0.6% |
| 2025-40 | 1.5% | 1.5% | 1.5% |
| 2018-40 | 1.3% | 1.1% | 1.2% |

6.2 SENSITIVITY ANALYSES

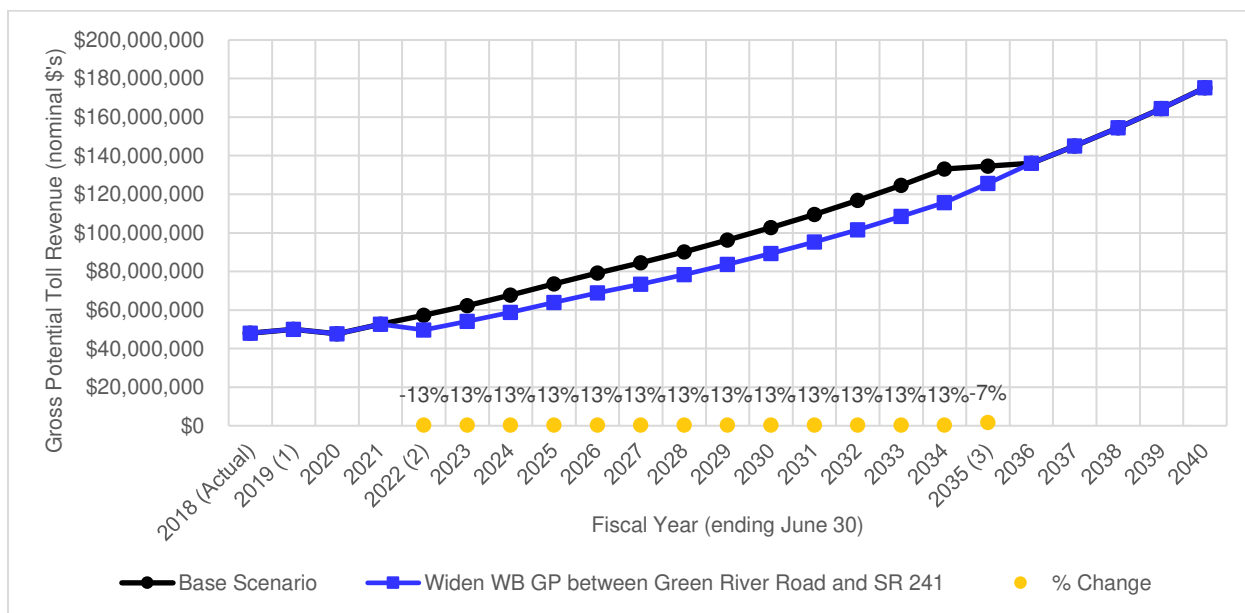
The sensitivity of RCTC 91 Express Lane traffic and revenue to changes in corridor capacity, network changes, and tolling policy changes were assessed. Sensitivities included:

- 1) Option 4M: widening the westbound SR 91 GP lanes from Green River Road to SR 241 from 5 GP lanes to 6 GP lanes by FY 2022
- 2) Accelerated Ultimate at the County Line: changes the opening year of the planned widening of the SR 91 GP lanes from SR 241 to SR 71 from 5 to 6 GP lanes in both direction from 2035 to 2028.
- 3) Charge HOV-3+ (and other generally toll-free traffic) a 50 percent discounted toll for travel on the westbound 91 Express Lanes from 5-8 AM.
- 4) Assume the 241/91 Express Lanes Direct Connector (EDC) is never built.

6.2.1 Option 4M – Widen WB 91 from Green River Rd to SR 241

The widening of the westbound SR 91 GP lanes between Green River Road and SR 241 from the existing 5 GP to 6 GP lanes by FY 2022 is expected to improve GP lane capacity and travel speeds and reduces the attractiveness of the westbound RCTC 91 Express Lanes revenue. This improvement is expected to revenue between FY 2022 and FY 2034 by 13 percent vs. the base scenario. The revenue losses are attributable entirely to a loss of westbound 91 Express traffic and tolls, totaling a revenue reduction of approximately 20 percent. The majority of the westbound revenue losses are concentrated during the heavily traveled and high toll AM peak hours. The revenue losses associated with Option 4M dissipate by year 2035 when the Ultimate Project, a widening of the EB and WB 91 GP lanes from 5 to 6 lanes between SR 241 and SR 71 is assumed to be completed. The Ultimate Project's improvements encompasses Option 4M, so by 2035, both the base and Option 4M scenarios assume identical roadway configurations, and therefore would have the same expected traffic and revenue. Figure 6-8 compares revenues under the base scenario vs. Option 4M, and Table 6-11 shows the expected traffic and revenue.

Figure 6-8: 91 Express Lanes Revenue, Base Scenario vs. Option 4M in FY 2022



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Table 6-11: 91 Express Lanes Traffic and Revenue, Option 4M in FY 2022

| Fiscal Year | Revenue, 2017\$'s | Revenue, Nominal \$'s | % Change Year over Year | Full Toll Transactions (Excluding HOV3+) | % Change Year over Year | Average Full Toll (2017 \$'s) |
|---------------|----------------------|--------------------------|-------------------------------|---|-------------------------------|----------------------------------|
| 2017 (Actual) | \$9,618,429 | \$9,618,429 | - | 3,270,243 | - | \$2.94 |
| 2018 (Actual) | \$46,772,422 | \$47,941,733 | 398% | 11,297,276 | 245% | \$4.14 |
| 2019 (1) | \$47,570,000 | \$49,980,000 | 4.3% | 11,750,000 | 4.0% | \$4.05 |
| 2020 | \$44,260,000 | \$47,660,000 | -4.6% | 11,920,000 | 1.4% | \$3.71 |
| 2021 | \$47,710,000 | \$52,660,000 | 10.5% | 12,180,000 | 2.2% | \$3.92 |
| 2022 (2) | \$43,950,000 | \$49,730,000 | -5.6% | 11,320,000 | -7.1% | \$3.88 |
| 2023 | \$46,620,000 | \$54,070,000 | 8.7% | 11,520,000 | 1.8% | \$4.05 |
| 2024 | \$49,460,000 | \$58,790,000 | 8.7% | 11,720,000 | 1.7% | \$4.22 |
| 2025 | \$52,470,000 | \$63,930,000 | 8.7% | 11,930,000 | 1.8% | \$4.40 |
| 2026 | \$55,120,000 | \$68,840,000 | 7.7% | 12,130,000 | 1.7% | \$4.54 |
| 2027 | \$57,390,000 | \$73,460,000 | 6.7% | 12,320,000 | 1.6% | \$4.66 |
| 2028 | \$59,740,000 | \$78,390,000 | 6.7% | 12,510,000 | 1.5% | \$4.78 |
| 2029 | \$62,200,000 | \$83,650,000 | 6.7% | 12,700,000 | 1.5% | \$4.90 |
| 2030 | \$64,760,000 | \$89,270,000 | 6.7% | 12,900,000 | 1.6% | \$5.02 |
| 2031 | \$67,430,000 | \$95,270,000 | 6.7% | 13,100,000 | 1.6% | \$5.15 |
| 2032 | \$70,190,000 | \$101,660,000 | 6.7% | 13,310,000 | 1.6% | \$5.27 |
| 2033 | \$73,080,000 | \$108,490,000 | 6.7% | 13,520,000 | 1.6% | \$5.41 |
| 2034 | \$76,080,000 | \$115,770,000 | 6.7% | 13,730,000 | 1.6% | \$5.54 |
| 2035 (3) | \$80,570,000 | \$125,660,000 | 8.5% | 14,020,000 | 2.1% | \$5.75 |
| 2036 | \$85,130,000 | \$136,090,000 | 8.3% | 14,320,000 | 2.1% | \$5.94 |
| 2037 | \$88,480,000 | \$144,980,000 | 6.5% | 14,530,000 | 1.5% | \$6.09 |
| 2038 | \$91,950,000 | \$154,440,000 | 6.5% | 14,750,000 | 1.5% | \$6.23 |
| 2039 | \$95,560,000 | \$164,520,000 | 6.5% | 14,970,000 | 1.5% | \$6.38 |
| 2040 | \$99,320,000 | \$175,260,000 | 6.5% | 15,190,000 | 1.5% | \$6.54 |
| 2041 | \$101,980,000 | \$184,460,000 | 5.2% | 15,330,000 | 0.9% | \$6.65 |
| 2042 | \$103,510,000 | \$191,910,000 | 4.0% | 15,390,000 | 0.4% | \$6.73 |
| 2043 | \$105,070,000 | \$199,670,000 | 4.0% | 15,450,000 | 0.4% | \$6.80 |
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| 2045 | \$108,260,000 | \$216,140,000 | 4.0% | 15,570,000 | 0.4% | \$6.95 |
| 2046 | \$109,890,000 | \$224,880,000 | 4.0% | 15,630,000 | 0.4% | \$7.03 |
| 2047 | \$111,540,000 | \$233,970,000 | 4.0% | 15,680,000 | 0.3% | \$7.11 |
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| 2050 | \$116,660,000 | \$263,510,000 | 4.0% | 15,860,000 | 0.4% | \$7.36 |
| 2051 | \$118,110,000 | \$273,470,000 | 3.8% | 15,920,000 | 0.4% | \$7.42 |
| 2052 | \$119,300,000 | \$283,120,000 | 3.5% | 15,980,000 | 0.4% | \$7.47 |
| 2053 | \$120,490,000 | \$293,100,000 | 3.5% | 16,040,000 | 0.4% | \$7.51 |
| 2054 | \$121,700,000 | \$303,440,000 | 3.5% | 16,100,000 | 0.4% | \$7.56 |
| 2055 | \$122,920,000 | \$314,150,000 | 3.5% | 16,160,000 | 0.4% | \$7.61 |
| 2056 | \$124,150,000 | \$325,230,000 | 3.5% | 16,220,000 | 0.4% | \$7.65 |
| 2057 | \$125,400,000 | \$336,700,000 | 3.5% | 16,290,000 | 0.4% | \$7.70 |
| 2058 | \$126,660,000 | \$348,580,000 | 3.5% | 16,350,000 | 0.4% | \$7.75 |
| 2059 | \$127,930,000 | \$360,880,000 | 3.5% | 16,410,000 | 0.4% | \$7.80 |
| 2060 | \$129,210,000 | \$373,610,000 | 3.5% | 16,470,000 | 0.4% | \$7.85 |
| 2061 | \$130,500,000 | \$386,790,000 | 3.5% | 16,530,000 | 0.4% | \$7.89 |
| 2062 | \$131,810,000 | \$400,430,000 | 3.5% | 16,590,000 | 0.4% | \$7.95 |
| 2063 | \$133,130,000 | \$414,560,000 | 3.5% | 16,660,000 | 0.4% | \$7.99 |
| 2064 | \$134,470,000 | \$429,180,000 | 3.5% | 16,720,000 | 0.4% | \$8.04 |
| 2065 | \$135,820,000 | \$444,320,000 | 3.5% | 16,780,000 | 0.4% | \$8.09 |
| 2066 | \$137,180,000 | \$459,990,000 | 3.5% | 16,840,000 | 0.4% | \$8.15 |

(1) Westbound EL weave lane halfway in FY 2019

(2) Widen WB 91 GP from Green River Rd. to SR 241, 15/91 ELC, EB 91 Extension (to Promenade), 91/241 EDC

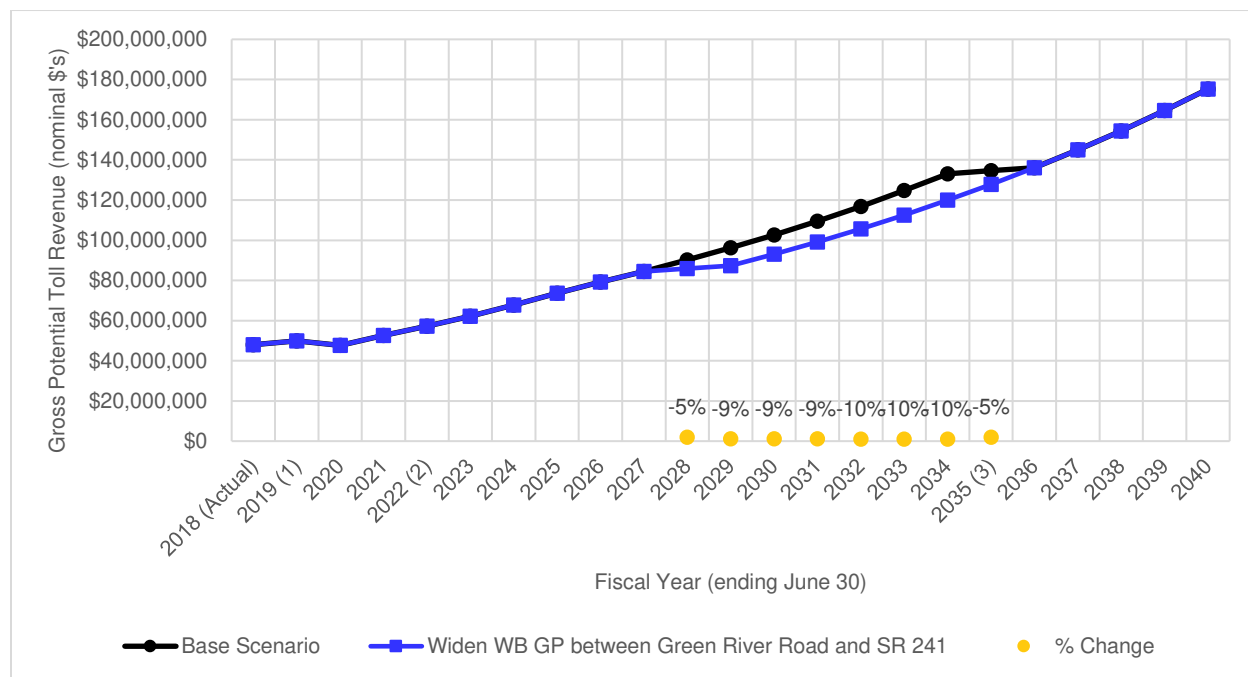
(3) Widen SR 91 GP from SR 71 to SR 241, both directions.

6.2.2 Accelerated Ultimate in 2028

Accelerating the opening of the Ultimate project at the County Line to FY 2028 reduces revenue vs. the base scenario by approximately 10 percent, but results in more express traffic and revenue than in Option 4M. The Ultimate Project widens the EB and WB 91 GP lanes between SR 241 to the west and SR 71 to the east. This adds a 6th GP lane in both directions. Modeling of a scenario where the widening of the 91 at the County Line is accelerated demonstrate a WB loss comparable to that in Option 4M, but an improvement in eastbound RCTC 91 EL T&R. The improvement is attributable to the ability of the EB 91 GP lanes to process more traffic at the County Line, thereby allowing more traffic to flow into Riverside County where it builds on the queue that currently exists at I-15. By accelerating the Ultimate Project's widening of the EB GP lanes at the County Line, the bottleneck pushes into Riverside County. This results in increased GP Lane delay in Riverside County, a reduction in GP lane delay in Orange County, and an overall improvement in the 91 Corridor's operations. By 2035, revenues would be no different than those under the base scenario because the Ultimate Project was assumed to be completed by 2035. Figure 6-9 compares expected revenue under the base scenario and revenue assuming the Ultimate Project at the County Line is accelerated to year 2028. Table 6-12 presents the forecast of annual traffic and revenue with the accelerated Ultimate Project.

Like the base scenario, the forecasts assuming the accelerated Ultimate Project do not assume any widening east of I-15. While there are plans for the Ultimate Project to widen SR 91 from I-15 to Pierce Street, this T&R forecast does not assume any widening east of I-15, consistent with assumptions in the original 2012 Investment Grade Study. The widening to Pierce Street could be expected to do three things; 1) attract more travel demand to the westbound 91 in the morning, and increase flow toward the Express Lanes, 2) Improve eastbound 91 GP lane operations, and 3) improve eastbound 91 Express Lanes operations for the movement toward McKinley Street. The westbound impacts can be viewed as negative or neutral.

Figure 6-9: 91 Express Lanes Revenue, Base Scenario vs. Accelerated Ultimate at County Line



RCTC 91 EXPRESS LANES INVESTMENT GRADE TRAFFIC AND REVENUE STUDY
Traffic and Revenue Forecast

Table 6-12: 91 Express Lanes Traffic and Revenue, Accelerated Ultimate in 2028

| Fiscal Year | Revenue, 2017 \$'s | Revenue, Nominal \$'s | % Change Year over Year | Full Toll Transactions (Excluding HOV3+) | % Change Year over Year | Average Full Toll (2017 \$'s) |
|---------------|-----------------------|--------------------------|-------------------------------|---|-------------------------------|----------------------------------|
| 2017 (Actual) | \$9,618,429 | \$9,618,429 | - | 3,270,243 | - | \$2.94 |
| 2018 (Actual) | \$46,772,422 | \$47,941,733 | 398% | 11,297,276 | 245% | \$4.14 |
| 2019 (1) | \$47,570,000 | \$49,980,000 | 4.3% | 11,750,000 | 4.0% | \$4.05 |
| 2020 | \$44,260,000 | \$47,660,000 | -4.6% | 11,920,000 | 1.4% | \$3.71 |
| 2021 | \$47,710,000 | \$52,660,000 | 10.5% | 12,180,000 | 2.2% | \$3.92 |
| 2022 (2) | \$50,600,000 | \$57,250,000 | 8.7% | 12,390,000 | 1.7% | \$4.08 |
| 2023 | \$53,680,000 | \$62,250,000 | 8.7% | 12,610,000 | 1.8% | \$4.26 |
| 2024 | \$56,950,000 | \$67,690,000 | 8.7% | 12,830,000 | 1.7% | \$4.44 |
| 2025 | \$60,410,000 | \$73,600,000 | 8.7% | 13,060,000 | 1.8% | \$4.63 |
| 2026 | \$63,450,000 | \$79,240,000 | 7.7% | 13,290,000 | 1.8% | \$4.77 |
| 2027 | \$66,050,000 | \$84,550,000 | 6.7% | 13,520,000 | 1.7% | \$4.89 |
| 2028 (3) | \$65,520,000 | \$85,970,000 | 1.7% | 13,220,000 | -2.2% | \$4.96 |
| 2029 | \$65,000,000 | \$87,420,000 | 1.7% | 12,900,000 | -2.4% | \$5.04 |
| 2030 | \$67,550,000 | \$93,120,000 | 6.5% | 13,090,000 | 1.5% | \$5.16 |
| 2031 | \$70,210,000 | \$99,200,000 | 6.5% | 13,290,000 | 1.5% | \$5.28 |
| 2032 | \$72,970,000 | \$105,680,000 | 6.5% | 13,490,000 | 1.5% | \$5.41 |
| 2033 | \$75,840,000 | \$112,580,000 | 6.5% | 13,690,000 | 1.5% | \$5.54 |
| 2034 | \$78,810,000 | \$119,920,000 | 6.5% | 13,900,000 | 1.5% | \$5.67 |
| 2035 | \$81,910,000 | \$127,750,000 | 6.5% | 14,110,000 | 1.5% | \$5.81 |
| 2036 | \$85,130,000 | \$136,090,000 | 6.5% | 14,320,000 | 1.5% | \$5.94 |
| 2037 | \$88,480,000 | \$144,980,000 | 6.5% | 14,530,000 | 1.5% | \$6.09 |
| 2038 | \$91,950,000 | \$154,440,000 | 6.5% | 14,750,000 | 1.5% | \$6.23 |
| 2039 | \$95,560,000 | \$164,520,000 | 6.5% | 14,970,000 | 1.5% | \$6.38 |
| 2040 | \$99,320,000 | \$175,260,000 | 6.5% | 15,190,000 | 1.5% | \$6.54 |
| 2041 | \$101,980,000 | \$184,460,000 | 5.2% | 15,330,000 | 0.9% | \$6.65 |
| 2042 | \$103,510,000 | \$191,910,000 | 4.0% | 15,390,000 | 0.4% | \$6.73 |
| 2043 | \$105,070,000 | \$199,670,000 | 4.0% | 15,450,000 | 0.4% | \$6.80 |
| 2044 | \$106,660,000 | \$207,750,000 | 4.0% | 15,510,000 | 0.4% | \$6.88 |
| 2045 | \$108,260,000 | \$216,140,000 | 4.0% | 15,570,000 | 0.4% | \$6.95 |
| 2046 | \$109,890,000 | \$224,880,000 | 4.0% | 15,630,000 | 0.4% | \$7.03 |
| 2047 | \$111,540,000 | \$233,970,000 | 4.0% | 15,680,000 | 0.3% | \$7.11 |
| 2048 | \$113,220,000 | \$243,430,000 | 4.0% | 15,740,000 | 0.4% | \$7.19 |
| 2049 | \$114,930,000 | \$253,270,000 | 4.0% | 15,800,000 | 0.4% | \$7.27 |
| 2050 | \$116,660,000 | \$263,510,000 | 4.0% | 15,860,000 | 0.4% | \$7.36 |
| 2051 | \$118,110,000 | \$273,470,000 | 3.8% | 15,920,000 | 0.4% | \$7.42 |
| 2052 | \$119,300,000 | \$283,120,000 | 3.5% | 15,980,000 | 0.4% | \$7.47 |
| 2053 | \$120,490,000 | \$293,100,000 | 3.5% | 16,040,000 | 0.4% | \$7.51 |
| 2054 | \$121,700,000 | \$303,440,000 | 3.5% | 16,100,000 | 0.4% | \$7.56 |
| 2055 | \$122,920,000 | \$314,150,000 | 3.5% | 16,160,000 | 0.4% | \$7.61 |
| 2056 | \$124,150,000 | \$325,230,000 | 3.5% | 16,220,000 | 0.4% | \$7.65 |
| 2057 | \$125,400,000 | \$336,700,000 | 3.5% | 16,290,000 | 0.4% | \$7.70 |
| 2058 | \$126,660,000 | \$348,580,000 | 3.5% | 16,350,000 | 0.4% | \$7.75 |
| 2059 | \$127,930,000 | \$360,880,000 | 3.5% | 16,410,000 | 0.4% | \$7.80 |
| 2060 | \$129,210,000 | \$373,610,000 | 3.5% | 16,470,000 | 0.4% | \$7.85 |
| 2061 | \$130,500,000 | \$386,790,000 | 3.5% | 16,530,000 | 0.4% | \$7.89 |
| 2062 | \$131,810,000 | \$400,430,000 | 3.5% | 16,590,000 | 0.4% | \$7.95 |
| 2063 | \$133,130,000 | \$414,560,000 | 3.5% | 16,660,000 | 0.4% | \$7.99 |
| 2064 | \$134,470,000 | \$429,180,000 | 3.5% | 16,720,000 | 0.4% | \$8.04 |
| 2065 | \$135,820,000 | \$444,320,000 | 3.5% | 16,780,000 | 0.4% | \$8.09 |
| 2066 | \$137,180,000 | \$459,990,000 | 3.5% | 16,840,000 | 0.4% | \$8.15 |

(1) Westbound EL weave lane halfway in FY 2019

(2) Widen WB 91 GP from Green River Rd. to SR 241, 15/91 ELC, EB 91 Extension (to Promenade), 91/241 EDC

(3) Widen SR 91 GP from SR 71 to SR 241, both directions.

6.2.3 Westbound Express Lanes 50 percent HOV-3+ Toll

A sensitivity testing the impact of assessing HOV-3+ vehicles a toll at a 50 percent discount from the current toll rate from 5 am to 8 am shows that RCTC 91 Express Lanes revenue would increase by 0.2 percent in 2025, and 2.2 percent in 2040. HOV-3+ traffic would decline approximately 40 percent from their baseline levels. Since HOV-3+ (and other free vehicles) traffic declines, tolls would also decline, but then be compensated for with an increase in full toll paying vehicles.

Table 6-13: HOV-3+ 50% Discounted Tolls, Westbound 5 AM to 8 AM, T&R Forecast

| Scenario* | Annual Full Toll Transactions | Annual Revenue (nominal \$'s) | Annual WB HOV Revenue | Wkday Total Express | Wkday F/T Txns | Wkday HOV-3+ Txns |
|-------------------------------|-------------------------------|-------------------------------|-----------------------|---------------------|----------------|-------------------|
| 2025 Base Case | 13,170,000 | \$ 76,670,000 | \$ - | 53,570 | 41,643 | 11,928 |
| 2025 HOV3+ 50% Toll WB 5-8 AM | 13,470,000 | \$ 76,860,000 | \$ 3,880,000 | 53,578 | 42,859 | 10,719 |
| % Change | 2.3% | 0.2% | | 0.0% | 2.9% | -10.1% |
| 2040 Base Case | 15,300,000 | \$ 180,800,000 | \$ - | 69,868 | 50,180 | 19,689 |
| 2040 HOV3+ 50% Toll WB 5-8 AM | 15,630,000 | \$ 184,760,000 | \$ 7,750,000 | 69,842 | 51,356 | 18,486 |
| % Change | 2.2% | 2.2% | | 0.0% | 2.3% | -6.1% |

6.2.4 Remove 241/91 Express Lane Direct Connector (EDC)

A sensitivity testing the impact of assuming the 241/91 EDC is never built shows that RCTC 91 Express Lanes revenue would decrease by 8.4 percent in 2025, and decrease by 9.5 percent in 2040 compared to the base case. The revenue loss in year 2025 is attributable to a reduction in eastbound Express Lane demand and toll rate reductions, while year 2040 revenue losses are attributable solely to toll rate reductions for travel in the eastbound direction.

Table 6-14: 241/91 EDC Excluded, T&R Forecast

| Scenario* | Annual Full Toll Transactions | Annual Revenue (nominal \$'s) | Wkday Total Express | Wkday F/T Txns | Wkday HOV-3+ Txns |
|---------------------|-------------------------------|-------------------------------|---------------------|----------------|-------------------|
| 2025 Base Case | 13,170,000 | \$ 76,670,000 | 53,570 | 41,643 | 11,928 |
| 2025, no 241/91 EDC | 12,830,000 | \$ 70,240,000 | 52,487 | 40,560 | 11,928 |
| % Change | -2.6% | -8.4% | -2.0% | -2.6% | 0.0% |
| 2040 Base Case | 15,300,000 | \$ 180,800,000 | 69,868 | 50,180 | 19,689 |
| 2040, no 241/91 EDC | 15,300,000 | \$ 163,560,000 | 69,868 | 50,180 | 19,689 |
| % Change | 0.0% | -9.5% | 0.0% | 0.0% | 0.0% |

AGENDA ITEM 9

| <i>RIVERSIDE COUNTY TRANSPORTATION COMMISSION</i> | |
|--|--|
| DATE: | November 26, 2018 |
| TO: | Western Riverside County Programs and Projects Committee |
| FROM: | David Thomas, Toll Project Manager |
| THROUGH: | Michael Blomquist, Toll Program Director |
| SUBJECT: | State Route 91 Corridor Operations Project Improvements Reports and Request for Various Authorizations |

STAFF RECOMMENDATION:

This item is for the Committee to:

- 1) Receive a report on the implementation of the following State Route 91 Corridor Operations Project (91 COP) improvements previously approved by the Commission:
 - a. Interstate 15 northbound 91 Express Lanes Ingress Improvement Option No. 1 (I-15 NB EL Option 1); and
 - b. SR-91 westbound General Purpose Lane Improvement Option No. 3 (91 WB GP Option 3);
- 2) Receive a report on the Ramp Meter Study at the SR-91 westbound Green River Road On-Ramp;
- 3) Authorize implementation of the construction phase of the SR-91 westbound General Purpose Lane Improvement modified Option No. 4 (91 WB GP Option 4M) after completing environmental and design approvals;
- 4) Authorize the inclusion of the 91 WB GP Option 4 in the list of Commission projects for prioritization and funding determination;
- 5) Authorize the Chair or Executive Director, pursuant to legal counsel review, to execute all necessary agency agreements or amendments to existing agency agreements for the Construction of the 91 WB GP Option 4 project; and
- 6) Forward to the Commission for final action.

BACKGROUND INFORMATION:

On March 20, 2017, the Commission opened general purpose and express lanes as part of the 91 Project. Since that time, staff has been gathering data related to traffic conditions both before and after the 91 Project opening to help evaluate the impact of the 91 Project on mobility in the SR-91 corridor. Since the opening, staff has managed demand for the express lanes through changing toll rates to match congestion levels throughout each day. Staff also made a number of minor operational improvements in the corridor since the 91 Project opening through changes in striping, signing, and channelizers.

In spite of the added general purpose and express lanes, toll rate changes, and additional operational improvements, key congestion areas remain during certain times and locations along the SR-91 corridor. Staff has taken a fact-based, data-driven approach to create and evaluate additional operational improvements at two locations along the corridor that would potentially result in reduced congestion and improved travel times. The data and potential improvements were presented through a series of Commission and Western Riverside County Programs and Projects (WRCPP) Committee meetings from February 2018 through April 2018. At its May 9 meeting, the Commission authorized staff to implement the 91 COP to include the following improvements:

1. All project development activities needed to complete environmental approvals, final design, and construction of:
 - a. I-15 NB EL Option 1; and
 - b. 91 WB GP Option 3;
2. Work with Caltrans to perform a ramp meter study at the SR-91 Green River Road WB On-Ramp and to return in fall 2018 with the results of the study; and
3. All project development activities needed to complete environmental approvals and final design of 91 WB GP Option 4 and to return in fall 2018 with a recommendation regarding the construction of 91 WB GP Option 4.

DISCUSSION:

I-15 NB EL Option 1

The I-15 NB EL Option 1, see Figure 1, was implemented on September 16, 2018 via change order to the existing Skanska Ames Joint Venture I-15 Express Lanes Project (ELP) contract for \$101,857.

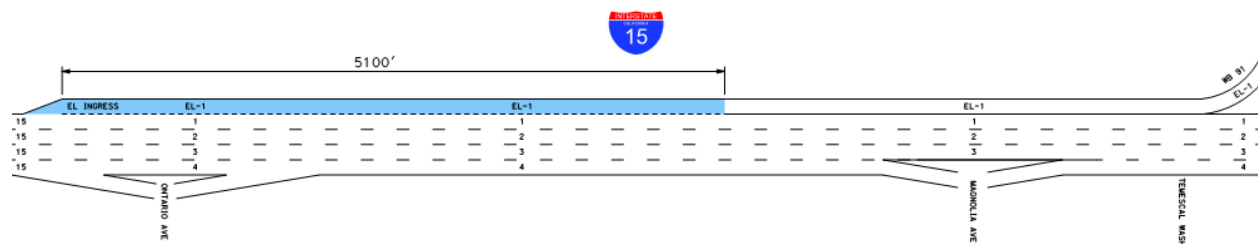


Figure 1: I-15 NB EL Option 1

Traffic Benefit → Reduces impact to General Purpose lanes from queuing in the 91 Express Lanes entrance lane.

91 WB GP Option 3

The 91 WB GP Option 3, see Figure 2, is scheduled to be implemented on November 16-19, 2018 via a maintenance contract with Skanska Ames Joint Venture, the Commission's existing contractor on the I-15 ELP for \$337,758. As part of this effort, striping improvements were also

made to the WB 91 Express Lanes McKinley entrance. Parsons performed the preliminary engineering and design at a cost of \$100,000.

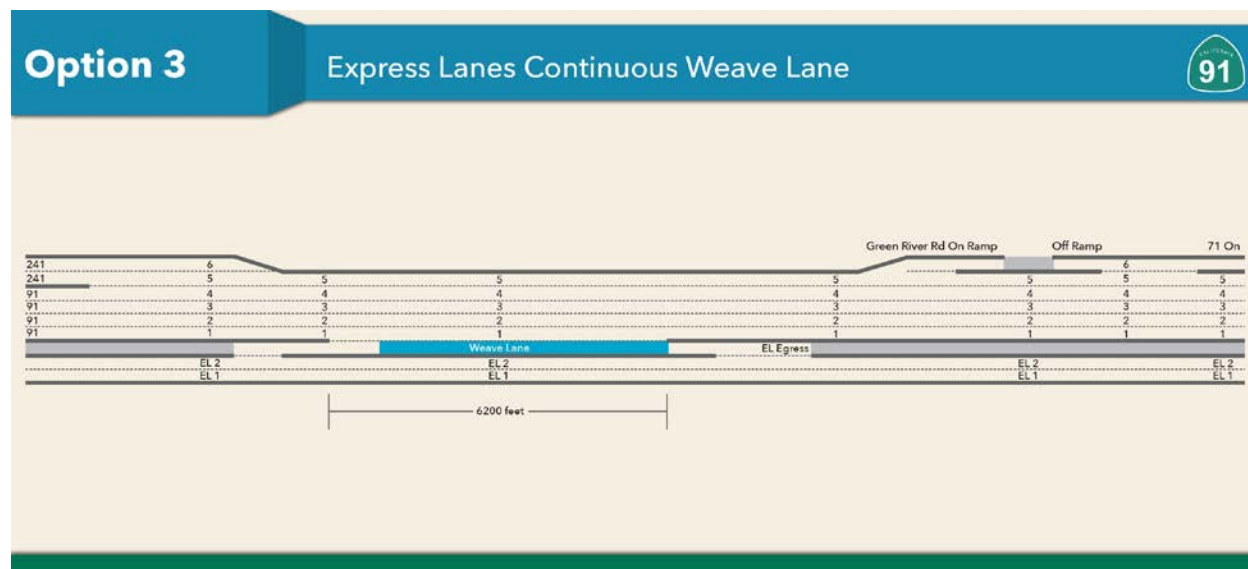


Figure 2: 91 WB GP Option 3

Traffic Benefits → As of the due date of this staff report this improvement had yet to be constructed but is scheduled for construction November 16-19, 2018. Staff will provide a construction update and initial observed traffic impacts, to the extent known, during the presentation of this item at the November 26, 2018 WRCPP Committee meeting.

SR-91 Green River Ramp Meter Study

At the May 9 Commission meeting, Commissioner Spiegel requested that Caltrans permit a study of the westbound SR-91 Green River Road onramp located in the city of Corona (City) to determine the impacts of turning off the ramp meter (signal) on this ramp. Caltrans agreed and the 91 COP authorization was modified to include performing this study. Commission staff and consultants, as well as Caltrans and City staff, participated in this study which included an extensive data collection effort for two trial periods over several weeks and was further expanded at Commissioner Spiegel's request to include a "2 car per green per lane" trial scenario. The total cost expended by the Commission for this effort is estimated at \$115,000.

On October 17, traffic engineers representing the Commission, Caltrans, and the City met to review the results of the ramp meter study. In general, the results indicated that turning off the ramp meter improved travel time along Green River Road to gain access to westbound SR-91 but degraded travel time along westbound SR-91. The net result considering all traffic is estimated at about 270 vehicle-hours of additional delay per day for the ramp meter off scenario based on the trial period. Other ramifications of turning off the ramp meter included increased traffic volumes on Green River Road and an increase in "gore jumping". "Gore jumping" refers to an

unsafe driving behavior where vehicles prematurely cut across the ramp gore area to enter the highway. The ramp meter study results are summarized as follows:

- Travel time increase for SR-91 general purpose lanes: 1-3 minutes
- Travel time decrease for Green River Road users: 5-10 minutes
- Overall (net) vehicle delay increase: 270 vehicle-hours per weekday
- SR-91 corridor vehicle throughput decrease: 600 vehicles/hour
- Green River Road vehicle demand increase: 100-200 vehicles/hour
- "Gore jumping" driver behavior increase: 200 vehicles/hour

Regarding the "2 car per green per lane" scenario, this trial was abandoned after three days at the City's request, as many drivers were not making the transition to the new scenario which contributed to excessive delays on Green River Road. Although the full trial period did not occur, it can be concluded that the "2 car per green per lane" scenario would not likely ever reach the efficiency of the "1 car per green per lane" scenario.

Based on the ramp meter study results, on November 15 Caltrans informed Commission staff of its decision to maintain operation of the ramp meter in the "1 car per green per lane" condition.

91 WB GP Option 4

This option provides a single general purpose lane from the Green River Road on-ramp to the SR-241 direct connector. As originally presented at the February 26, 2018 WRCPP Committee meeting, this additional general purpose lane will have a direct benefit for traffic entering the 91 freeway from Green River Road by increasing travel speeds to SR-241. The lane will also improve the corridor general purpose lanes by increasing travel speeds and traffic volume throughput.

Based on the Commission's direction at its May 9 meeting, staff implemented an amendment to Agreement No. 09-31-081-00 with Parsons, as the 91 Project project and construction manager, for project development services, including implementation of the 91 WB GP Option 4 (see Figure 3), for an amount of \$4,790,973.

Option 4

5+1 General Purpose to Green River On Ramp

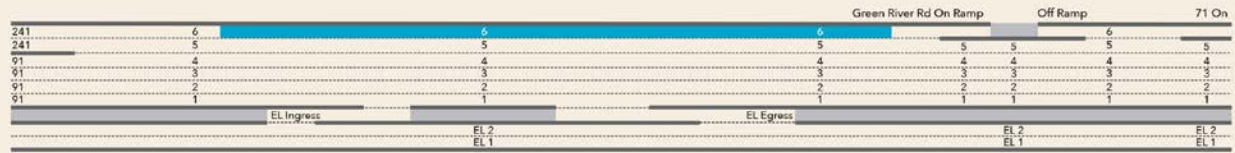


Figure 3: 91 WB GP Option 4

Staff and Parsons have been working with Caltrans, Orange County Transportation Authority, Transportation Corridor Agencies, and the City to gain concurrence on the scope of improvements and Caltrans on the scope of the environmental studies needed. Currently, environmental studies are underway, and it is anticipated that the revalidation of the 91 Project environmental document approving this project will be completed in fall 2019. Design efforts have also been initiated with completion of the design surveys. Design is expected to be completed by the end of 2019.

The construction of this work is planned to be competitively bid. Contingent upon identification of project funding, the bid advertising could be conducted in early 2020 and staff would return with a recommended construction contract award for the Commission's consideration. Anticipated construction duration is 15 months with the earliest possible completion date in fall 2021. This construction phase work is contingent upon the Commission authorizing project construction as part of this agenda item and further dependent on funding priorities to be determined by the Commission in the future.

The funding source and project delivery priority relative to other Commission projects will be determined by the Commission in 2019.

Toll Revenue Impacts

At the May 2018 Commission meeting, staff recommended updating the 2012 SR-91 Investment Grade traffic and revenue study. Staff recommended the update given the passage of six years since the original study, the current need to analyze toll revenue impacts of potential SR-91 corridor projects being considered for implementation, and to inform future decisions related to project financing and project implementation. The Commission authorized staff to update the 2012 SR-91 investment grade traffic and revenue study.

The traffic and revenue study update accounts for actual 91 Express Lanes opening results since March 2017, updated employment/population/household data, updates to regional projects that affect the traffic network, updates to regional land development, actual express lane traffic capacities, and other relevant factors. A staff report, draft study, and staff recommendation related to this traffic and revenue study update will be presented at the November 26, 2018 WRCPP Committee.

The traffic and revenue study update included the analysis of the toll revenue impact considering the 91 WB GP option 4 lane (new 91 westbound lane from Green River Road on-ramp to SR-241) would be constructed and opened in 2022. This lane addition is currently scheduled to be constructed in 2035 as part of the SR-91 “Ultimate Project” improvements at the county line area. The toll revenue loss due to constructing this lane addition 13 years earlier is \$165.5 million detailed as follows:

| Year | Baseline Revenue | 91 WB Option 4M Revenue | Revenue Loss |
|--------------|------------------|-------------------------|----------------------|
| 2022 | \$ 57,250,000 | \$ 49,730,000 | \$ 7,520,000 |
| 2023 | 62,250,000 | 54,070,000 | 8,180,000 |
| 2024 | 67,690,000 | 58,790,000 | 8,900,000 |
| 2025 | 73,600,000 | 63,930,000 | 9,670,000 |
| 2026 | 79,240,000 | 68,840,000 | 10,400,000 |
| 2027 | 84,550,000 | 73,460,000 | 11,090,000 |
| 2028 | 90,200,000 | 78,390,000 | 11,810,000 |
| 2029 | 96,240,000 | 83,650,000 | 12,590,000 |
| 2030 | 102,690,000 | 89,270,000 | 13,420,000 |
| 2031 | 109,560,000 | 95,270,000 | 14,290,000 |
| 2032 | 116,890,000 | 101,660,000 | 15,230,000 |
| 2033 | 124,710,000 | 108,490,000 | 16,220,000 |
| 2034 | 133,060,000 | 115,770,000 | 17,290,000 |
| 2035 | 134,580,000 | 125,660,000 | 8,920,000 |
| Total | | | \$165,530,000 |

The toll revenue loss associated with 91 WB GP Option 4 will result in less excess revenue funding available for investment in other SR-91 mobility projects and programs including rail service expansion and the 91 Ultimate Project improvements.

91 COP Cost Summary

The table below summarizes the estimated values of the 91 COP Commission authorizations (May 9, 2018) compared to estimated actual costs.

| Improvement/Activity | Authorization | Estimated Actual Costs |
|--|---------------------------------|------------------------|
| I-15 NB EL Option 1 | \$ 284,000 | \$ 106,326 |
| 91 WB GP Option 3 | 386,000 | 437,758 |
| SR-91 Green River Ramp Meter Study | No estimate previously provided | 115,000 |
| 91 WB GP Option 4 Environmental and Design | 3,300,000 | 4,890,973 |
| Totals | \$ 3,970,000 | \$ 5,550,057 |

STAFF RECOMMENDATION

The 91 WB GP Option 4 construction is estimated to cost \$36,150,000 for a total estimated cost of \$43 million. Approximately half of this cost would be spent on elements of work that could be utilized for the SR-91 “Ultimate Project”. Based on the projected traffic operational improvement to the general purpose lanes, the potential toll revenue impacts to the 91 Express Lanes, and the estimated total implementation cost, staff recommends proceeding with environmental approval, final design, and construction of 91 WB GP Option 4.

In pursuing this recommendation, it should be reiterated that the toll revenue impacts of this option are significant and that recommending this project as a priority could impact the delivery of other nearby projects such as the 71/91 Interchange. Final direction on the exact funding mechanism and prioritization for this project would be required at a future meeting prior to the completion of the current environmental work and the beginning of the procurement process for construction.

FINANCIAL IMPACT

There is no current financial impact related to the approval of the staff recommendations; however, implementation of the construction phase of 91 WB GP Option 4 is dependent on future Commission actions to identify a funding source(s) and approve construction related agreements.

AGENDA ITEM 10

| <i>RIVERSIDE COUNTY TRANSPORTATION COMMISSION</i> | |
|--|---|
| DATE: | November 26, 2018 |
| TO: | Western Riverside County Programs and Projects Committee |
| FROM: | Patti Castillo, Capital Projects Manager |
| THROUGH: | Marlin Feenstra, Project Delivery Director |
| SUBJECT: | Agreement with Falcon Engineering for Construction Management Services for the Construction of the State Route 60 Truck Lanes Project |

STAFF RECOMMENDATION:

This item is for the Committee to:

- 1) Award Agreement No. 18-31-164-00 to Falcon Engineering to provide construction management (CM), materials testing, construction surveying and environmental monitoring services for the State Route 60 (SR-60) Truck Climbing Lanes project, in the amount of \$15,920,498, plus a contingency amount of \$1,592,050, for a total amount not to exceed \$17,512,548;
- 2) Authorize the Chair or Executive Director, pursuant to legal counsel review, to execute the agreement on behalf of the Commission;
- 3) Authorize the Executive Director, or designee, to approve contingency work as may be required for the project; and
- 4) Forward to the Commission for final action.

BACKGROUND INFORMATION:

The SR-60 Truck Climbing Lanes project is located east of Moreno Valley from Gilman Springs Road to Jack Rabbit Trail (Figure 1). The project scope includes an eastbound truck climbing lane and a westbound truck descending lane plus inside and outside standard shoulders along a 4.5-mile stretch of SR-60. The project is designed to enhance safety and improve operations. The project is a combination of a Caltrans-sponsored safety project to construct shoulders and the Commission's project to construct the truck lanes, as well as a Caltrans-sponsored pavement rehabilitation project.

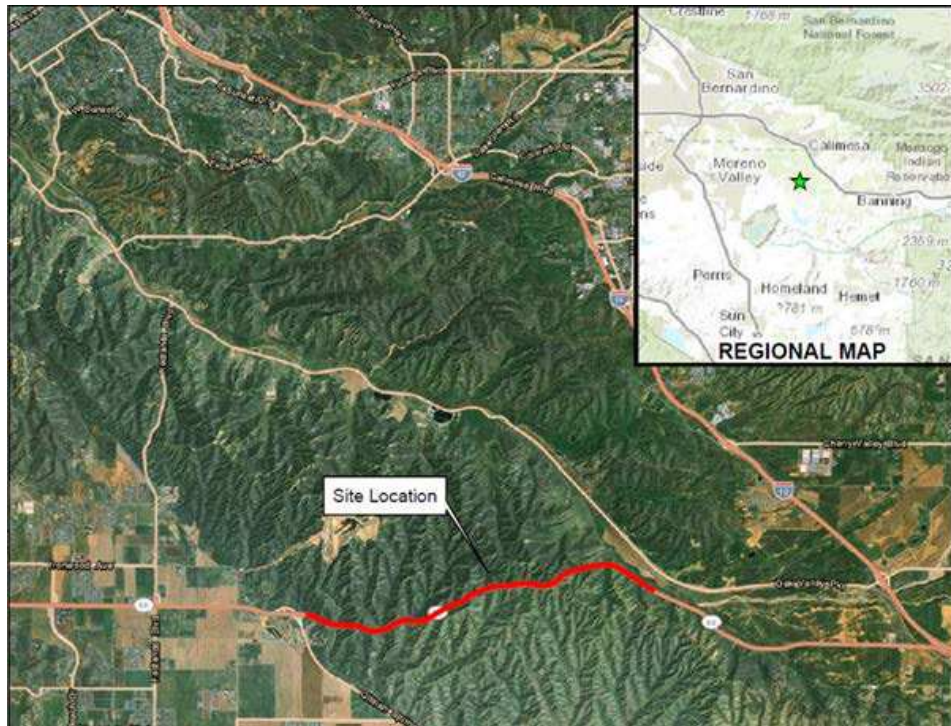


Figure 1: Project Location Map

The CM services will be paid for with \$27.6 million in State Transportation Improvement Program (STIP) funds approved by the Commission in November 2013 and Measure A funds as needed. Total construction funding is \$122 million.

The environmental document was approved in May 2016, and right of way was certified in June 2018. The lawsuit that was the final impediment to construction was resolved this summer, and the final plans and specifications were approved in August 2018. The current cost estimate for construction, excluding CM, is \$105 million.

Procurement Process:

Pursuant to Government Code 4525 et seq, the selection of architect, engineer, and related services shall be on the basis of demonstrated competence and on professional qualifications necessary for the satisfactory performance of the services required. Therefore, staff used the qualification method of selection for the procurement of these services. Evaluation criteria included elements such as qualifications of firm, qualifications of personnel, project understanding and approach, understanding of materials testing and construction surveying services, and the ability to respond to the requirements set forth under the terms of a request for qualifications (RFQ).

RFQ No. 18-31-164-00 for CM, materials testing, and construction surveying services for the project was released on June 28, 2018. A public notice was advertised in the *Press Enterprise*, and the RFQ was posted on the Commission's PlanetBids website, which is accessible through

the Commission's website. Through PlanetBids, 97 firms downloaded the RFQ, 23 of these firms are located in Riverside County. A pre-proposal conference was held on July 12, 2018 and attended by 20 firms. Staff responded to all questions submitted by potential proposers prior to the July 26 clarification deadline date. Four firms – Arcadis U.S., Inc. (Arcadis); Falcon Engineering Services (Falcon); Jacobs Project Management Co. (Jacobs); and S2 Engineering, Inc. – submitted responsive and responsible statements of qualifications (SOQ) prior to the 2:00 p.m. submittal deadline on August 23. Three of the four firms are located in Riverside County. Based on the evaluation criteria set forth in the RFQ, the firms were evaluated and scored by an evaluation committee comprised of Commission, Bechtel, and Caltrans staff.

Based on the evaluation committee's assessment of the written SOQs and pursuant to the terms of the RFQ, the evaluation committee shortlisted and invited three firms (Arcadis, Falcon, and Jacobs) to the interview phase of the evaluation and selection process. Interviews were conducted on September 20, 2018.

The evaluation committee conducted a subsequent evaluation of each firm, based on both written and interview components presented to the evaluation committee by each proposer. Accordingly, the evaluation committee recommends contract award to Falcon to provide CM, materials testing, and construction surveying services for the project, as it earned the highest total evaluation scores.

Subsequently, staff negotiated the scope (including the appropriate level of effort, labor categories/mix, etc.), cost, and schedule proposal received from Falcon for the project services and established a fair and reasonable price. As part of the federal procurement process for architectural and engineering services, the contract is subject to a pre-award audit by Caltrans Audits and Investigations Unit. The proposed cost is \$15,920,498 and may change slightly as a result of the pre-award audit and is expected to be finalized prior to Commission approval in December.

Recommendation

Staff recommends award of Agreement No. 18-31-164-00 to Falcon to perform CM services, materials testing, construction surveying services and environmental monitoring services for the SR-60 Truck Climbing Lanes project, based on the final project scope and cost included with the attachment, in the amount of \$15,920,498, plus a contingency amount of \$1,592,050 for unanticipated changes, for a total amount not to exceed \$17,512,548. The Commission's model professional services agreement will be entered into with Falcon, subject to any changes approved by the Executive Director and pursuant to legal counsel review. Further, staff recommends authorization for the Chair or Executive Director to execute the agreement on behalf of the Commission and for the Executive Director or designee to approve contingency work up to the total not to exceed amount as required for the project.

| Financial Information | | | | | |
|-----------------------------|--------------------------------------|-------|---------------------------|--------------------|----------------------------|
| In Fiscal Year Budget: | Yes N/A | Year: | FY 2018/19 FY 2019/20+ | Amount: | \$ 500,000 \$17,012,548 |
| Source of Funds: | STIP | | | Budget Adjustment: | No N/A |
| GL/Project Accounting No.: | 003029 81302 00000 0000 262 31 81301 | | | | |
| Fiscal Procedures Approved: | <i>Theresa Trevino</i> | | | Date: | 11/15/2018 |

Attachment: Draft Agreement No. 18-31-164-00

PROFESSIONAL SERVICES AGREEMENT
WITH FHWA FUNDING/ASSISTANCE

RIVERSIDE COUNTY TRANSPORTATION COMMISSION
AGREEMENT WITH
FALCON ENGINEERING SERVICES, INC.
FOR
CONSTRUCTION MANAGEMENT SERVICES
FOR THE
STATE ROUTE 60 TRUCK LANE PROJECT

Parties and Date.

This Agreement is made and entered into this ____ day of _____, 2018, by and between the RIVERSIDE COUNTY TRANSPORTATION COMMISSION ("the Commission") and FALCON ENGINEERING SERVICES, INC. ("Consultant"), a [__INSERT TYPE OF LEGAL ENTITY__]. The Commission and Consultant are sometimes referred to herein individually as "Party", and collectively as the "Parties".

Recitals.

- A. On November 8, 1988 the Voters of Riverside County approved Measure A authorizing the collection of a one-half percent (1/2 %) retail transactions and use tax (the "tax") to fund transportation programs and improvements within the County of Riverside, and adopting the Riverside County Transportation Improvement Plan (the "Plan").
- B. Pursuant to Public Utility Code Sections 240000 et seq., the Commission is authorized to allocate the proceeds of the Tax in furtherance of the Plan.
- C. On November 5, 2002, the voters of Riverside County approved an extension of the Measure A tax for an additional thirty (30) years for the continued funding of transportation and improvements within the County of Riverside.
- D. A source of funding for payment for professional services provided under this Agreement is federal funds administered by the California Department of Transportation ("Caltrans") from the United States Department of Transportation pursuant to the following project/program: [__INSERT FUNDING SOURCE__].

E. Consultant desires to perform and assume responsibility for the provision of certain professional services required by the Commission on the terms and conditions set forth in this Agreement. Consultant represents that it is experienced in providing [☐ INSERT TYPE OF SERVICES] services to public clients, is licensed in the State of California (if necessary), and is familiar with the plans of the Commission.

F. The Commission desires to engage Consultant to render such services for the [☐ INSERT PROJECT] ("Project"), as set forth in this Agreement.

Terms.

1. General Scope of Services. Consultant shall furnish all technical and professional services, including labor, material, equipment, transportation, supervision and expertise, and incidental and customary work necessary to fully and adequately supply the professional [☐ INSERT GENERAL DESCRIPTION OF SERVICES] services necessary for the Project ("Services"). The Services are more particularly described in Exhibit "A" attached hereto and incorporated herein by reference. All Services shall be subject to, and performed in accordance with, this Agreement, the exhibits attached hereto and incorporated herein by reference, and all applicable local, state and federal laws, rules and regulations.

2. Commencement of Services. [☐ USE THIS PARAGRAPH IF NOTICE TO PROCEED OR LIMITED NOTICE TO PROCEED HAS BEEN ISSUED] Commission has authorized Consultant to commence performance of the Services by a "Notice to Proceed" or "Limited Notice to Proceed" dated _____. Consultant agrees that Services already performed pursuant to the "Notice to Proceed" or "Limited Notice to Proceed" shall be governed by all the provisions of this Agreement, including all indemnification and insurance provisions.

[☐ USE THIS SENTENCE IF NO NOTICE TO PROCEED OR LIMITED NOTICE TO PROCEED HAS BEEN ISSUED] The Consultant shall commence work upon receipt of a written "Notice to Proceed" or "Limited Notice to Proceed" from Commission.

3. Pre-Award Audit. As a result of the federal funding for this Project, and to the extent Caltrans procedures apply in connection therewith, issuance of a "Notice to Proceed" may be contingent upon completion and approval of a pre-award audit. Any questions raised during the pre-award audit shall be resolved before the Commission will consider approval of this Agreement. The federal aid provided under this Agreement is contingent on meeting all Federal requirements and could be withdrawn, thereby entitling the Commission to terminate this Agreement, if the procedures are not completed. The Consultant's files shall be maintained in a manner to facilitate Federal and State process reviews. In addition, the applicable federal agency, or Caltrans acting in behalf of a federal agency, may require that prior to performance of any work for which Federal reimbursement is requested and provided, that said federal agency or Caltrans must give to Commission an "Authorization to Proceed".

4. Caltrans Audit Procedures. Consultant and subconsultant contracts, including cost proposals and ICR, are subject to audits or reviews such as, but not limited to, a contract audit, an incurred cost audit, an Independent Cost Review (ICR) Audit, or a CPA ICR audit work paper review. If selected for audit or review, this Agreement, Consultant's cost proposal and ICR and related work papers, if applicable, will be reviewed to verify compliance with 48 CFR, Part 31 and other related laws and regulations. In the instances of a CPA ICR audit work paper review it is Consultant's responsibility to ensure federal, state, or local government officials are allowed full access to the CPA's work papers including making copies as necessary. This Agreement, Consultant's cost proposal, and ICR shall be adjusted by Consultant and approved by the Commission's contract manager to conform to the audit or review recommendations. Consultant agrees that individual terms of costs identified in the audit report shall be incorporated into this Agreement by this reference if directed by Commission at its sole discretion. Refusal by Consultant to incorporate audit or review recommendations, or to ensure that the federal, state or local governments have access to CPA work papers, will be considered a breach of the Agreement terms and cause for termination of this Agreement and disallowance of prior reimbursed costs. Additional audit provisions applicable to this Agreement are set forth in Sections 23 and 24 of this Agreement.

5. Term.

5.1 This Agreement shall go into effect on the date first set forth above, contingent upon approval by Commission, and Consultant shall commence work after notification to proceed by Commission's Contract Administrator. This Agreement shall end on [___INSERT END DATE___], unless extended by contract amendment.

5.2 Consultant is advised that any recommendation for Agreement award is not binding on Commission until this Agreement is fully executed and approved by the Commission.

5.3 This Agreement shall remain in effect until the date set forth above, unless earlier terminated as provided herein. Consultant shall complete the Services within the term of this Agreement, and shall meet any other established schedules and deadlines. All applicable indemnification provisions of this Agreement shall remain in effect following the termination of this Agreement.

6. Commission's Contract Administrator. The Commission hereby designates the Commission's Executive Director, or his or her designee, to act as its Contract Administrator for the performance of this Agreement ("Commission's Contract Administrator"). Commission's Contract Administrator shall have the authority to act on behalf of the Commission for all purposes under this Agreement. Commission's Contract Administrator shall also review and give approval, as needed, to the details of Consultant's work as it progresses. Consultant shall not accept direction or orders from any person other than the Commission's Contract Administrator or his or her designee.

7. Consultant's Representative. Consultant hereby designates [__INSERT NAME OR TITLE__] to act as its Representative for the performance of this Agreement ("Consultant's Representative"). Consultant's Representative shall have full authority to act on behalf of Consultant for all purposes under this Agreement. The Consultant's Representative shall supervise and direct the Services, using his or her professional skill and attention, and shall be responsible for all means, methods, techniques, sequences and procedures and for the satisfactory coordination of all portions of the Services under this Agreement. Consultant shall work closely and cooperate fully with Commission's Contract Administrator and any other agencies which may have jurisdiction over, or an interest in, the Services. Consultant's Representative shall be available to the Commission staff at all reasonable times. Any substitution in Consultant's Representative shall be approved in writing by Commission's Contract Administrator.

8. Substitution of Key Personnel. Consultant has represented to the Commission that certain key personnel will perform and coordinate the Services under this Agreement. Should one or more of such personnel become unavailable, Consultant may substitute other personnel of at least equal competence upon written approval by the Commission. In the event that the Commission and Consultant cannot agree as to the substitution of the key personnel, the Commission shall be entitled to terminate this Agreement for cause, pursuant to the provisions herein. The key personnel for performance of this Agreement are as follows: [__INSERT NAMES OF KEY PERSONNEL__].

9. Standard of Care; Licenses. Consultant represents and maintains that it is skilled in the professional calling necessary to perform all Services, duties and obligations required by this Agreement to fully and adequately complete the Project. Consultant shall perform the Services and duties in conformance to and consistent with the standards generally recognized as being employed by professionals in the same discipline in the State of California. Consultant warrants that all employees and subcontractors shall have sufficient skill and experience to perform the Services assigned to them. Consultant further represents and warrants to the Commission that its employees and subcontractors have all licenses, permits, qualifications and approvals of whatever nature that are legally required to perform the Services, and that such licenses and approvals shall be maintained throughout the term of this Agreement. Consultant shall perform, at its own cost and expense and without reimbursement from the Commission, any services necessary to correct errors or omissions which are caused by the Consultant's failure to comply with the standard of care provided for herein, and shall be fully responsible to the Commission for all damages and other liabilities provided for in the indemnification provisions of this Agreement arising from the Consultant's errors and omissions. Any employee of Consultant or its sub-consultants who is determined by the Commission to be uncooperative, incompetent, a threat to the adequate or timely completion of the Project, a threat to the safety of persons or property, or any employee who fails or refuses to perform the Services in a manner acceptable to the Commission, shall be promptly removed from the Project by

the Consultant and shall not be re-employed to perform any of the Services or to work on the Project.

10. Independent Contractor. The Services shall be performed by Consultant or under its supervision. Consultant will determine the means, methods and details of performing the Services subject to the requirements of this Agreement. Commission retains Consultant on an independent contractor basis and not as an employee, agent or representative of the Commission. Consultant retains the right to perform similar or different services for others during the term of this Agreement. Any additional personnel performing the Services under this Agreement on behalf of Consultant shall at all times be under Consultant's exclusive direction and control. Consultant shall pay all wages, salaries and other amounts due such personnel in connection with their performance of Services and as required by law. Consultant shall be responsible for all reports and obligations respecting such personnel, including but not limited to, social security taxes, income tax withholdings, unemployment insurance, disability insurance, and workers' compensation insurance.

11. Schedule of Services. Consultant shall perform the Services expeditiously, within the term of this Agreement, and in accordance with the Schedule of Services set forth in Exhibit "B" attached hereto and incorporated herein by reference. Consultant represents that it has the professional and technical personnel to perform the Services in conformance with such conditions. In order to facilitate Consultant's conformance with the Schedule, the Commission shall respond to Consultant's submittals in a timely manner. Upon request of Commission's Contract Administrator, Consultant shall provide a more detailed schedule of anticipated performance to meet the Schedule of Services.

11.1 Modification of the Schedule. Consultant shall regularly report to the Commission, through correspondence or progress reports, its progress in providing required Services within the scheduled time periods. Commission shall be promptly informed of all anticipated delays. In the event that Consultant determines that a schedule modification is necessary, Consultant shall promptly submit a revised Schedule of Services for approval by Commission's Contract Administrator.

11.2 Trend Meetings. Consultant shall conduct trend meetings with the Commission's Contract Administrator and other interested parties, as requested by the Commission, on a bi weekly basis or as may be mutually scheduled by the Parties at a standard day and time. These trend meetings will encompass focused and informal discussions concerning scope, schedule, and current progress of Services, relevant cost issues, and future Project objectives. Consultant shall be responsible for the preparation and distribution of meeting agendas to be received by the Commission and other attendees no later than three (3) working days prior to the meeting.

11.3 Progress Reports. As part of its monthly invoice, Consultant shall submit a progress report, in a form determined by the Commission, which will indicate the progress achieved during the previous month in relation to the Schedule of Services.

Submission of such progress report by Consultant shall be a condition precedent to receipt of payment from the Commission for each monthly invoice submitted.

12. Delay in Performance.

12.1 Excusable Delays. Should Consultant be delayed or prevented from the timely performance of any act or Services required by the terms of the Agreement by reason of acts of God or of the public enemy, acts or omissions of the Commission or other governmental agencies in either their sovereign or contractual capacities, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes or unusually severe weather, performance of such act shall be excused for the period of such delay.

12.2 Written Notice. If Consultant believes it is entitled to an extension of time due to conditions set forth in subsection 12.1, Consultant shall provide written notice to the Commission within seven (7) working days from the time Consultant knows, or reasonably should have known, that performance of the Services will be delayed due to such conditions. Failure of Consultant to provide such timely notice shall constitute a waiver by Consultant of any right to an excusable delay in time of performance.

12.3 Mutual Agreement. Performance of any Services under this Agreement may be delayed upon mutual agreement of the Parties. Upon such agreement, Consultant's Schedule of Services shall be extended as necessary by the Commission. Consultant shall take all reasonable steps to minimize delay in completion, and additional costs, resulting from any such extension.

13. Preliminary Review of Work. All reports, working papers, and similar work products prepared for submission in the course of providing Services under this Agreement shall be submitted to the Commission's Contract Administrator in draft form, and the Commission may require revisions of such drafts prior to formal submission and approval. In the event plans and designs are to be developed as part of the Project, final detailed plans and designs shall be contingent upon obtaining environmental clearance as may be required in connection with Federal funding. In the event that Commission's Contract Administrator, in his or her sole discretion, determines the formally submitted work product to be not in accordance with the standard of care established under this Agreement, Commission's Contract Administrator may require Consultant to revise and resubmit the work at no cost to the Commission.

14. Appearance at Hearings. If and when required by the Commission, Consultant shall render assistance at public hearings or other meetings related to the Project or necessary to the performance of the Services. However, Consultant shall not be required to, and will not, render any decision, interpretation or recommendation regarding questions of a legal nature or which may be construed as constituting a legal opinion.

15. Opportunity to Cure; Inspection of Work. Commission may provide Consultant an opportunity to cure, at Consultant's expense, all errors and omissions which may be

disclosed during Project implementation. Should Consultant fail to make such correction in a timely manner, such correction may be made by the Commission, and the cost thereof charged to Consultant. Consultant shall allow the Commission's Contract Administrator, Caltrans and FHWA to inspect or review Consultant's work in progress at any reasonable time.

16. Claims Filed by Contractor.

16.1 If claims are filed by the Commission's contractor for the Project ("Contractor") relating to work performed by Consultant's personnel, and additional information or assistance from the Consultant's personnel is required by the Commission in order to evaluate or defend against such claims; Consultant agrees to make reasonable efforts to make its personnel available for consultation with the Commission's construction contract administration and legal staff and for testimony, if necessary, at depositions and at trial or arbitration proceedings.

16.2 Consultant's personnel that the Commission considers essential to assist in defending against Contractor claims will be made available on reasonable notice from the Commission. Consultation or testimony will be reimbursed at the same rates, including travel costs that are being paid for the Consultant's personnel services under this Agreement.

16.3 Services of the Consultant's personnel and other support staff in connection with Contractor claims will be performed pursuant to a written contract amendment, if necessary, extending the termination date of this Agreement in order to finally resolve the claims.

16.4 Nothing contained in this Section shall be construed to in any way limit Consultant's indemnification obligations contained in Section 29. In the case of any conflict between this Section and Section 29, Section 29 shall govern. This Section is not intended to obligate the Commission to reimburse Consultant for time spent by its personnel related to Contractor claims for which Consultant is required to indemnify and defend the Commission pursuant to Section 29 of this Agreement.

17. Final Acceptance. Upon determination by the Commission that Consultant has satisfactorily completed the Services required under this Agreement and within the term herein, the Commission shall give Consultant a written Notice of Final Acceptance. Upon receipt of such notice, Consultant shall incur no further costs hereunder, unless otherwise specified in the Notice of Final Acceptance. Consultant may request issuance of a Notice of Final Acceptance when, in its opinion, it has satisfactorily completed all Services required under the terms of this Agreement. In the event copyrights are permitted under this Agreement, then in connection with Federal funding, it is hereby acknowledged and agreed that the United States Department of Transportation shall have the royalty-free non-exclusive and irrevocable right to reproduce, publish, or otherwise use, and to authorize others to use, the work for governmental purposes.

18. Laws and Regulations. Consultant shall keep itself fully informed of and in compliance with all local, state and federal laws, rules and regulations in any manner affecting the performance of the Project or the Services, including all Cal/OSHA requirements, and shall give all notices required by law. For example, and not by way of limitation, Consultant shall keep itself fully informed of and in compliance with all implementing regulations, design standards, specifications, previous commitments that must be incorporated in the design of the Project, and administrative controls including those of the United States Department of Transportation. Compliance with Federal procedures may include completion of the applicable environmental documents and approved by the United States Department of Transportation. For example, and not by way of limitation, a signed Categorical Exclusion, Finding of No Significant Impact, or published Record of Decision may be required to be approved and/or completed by the United States Department of Transportation. Consultant shall be liable for all violations of such laws and regulations in connection with Services. If the Consultant performs any work knowing it to be contrary to such laws, rules and regulations and without giving written notice to the Commission, Consultant shall be solely responsible for all costs arising therefrom. Consultant shall defend, indemnify and hold Commission, its officials, directors, officers, employees and agents free and harmless, pursuant to the indemnification provisions of this Agreement, from any claim or liability arising out of any failure or alleged failure to comply with such laws, rules or regulations.

19. Fees and Payment.

19.1 The method of payment for this Agreement will be based on actual cost plus a fixed fee. Commission shall reimburse Consultant for actual costs (including labor costs, employee benefits, travel, equipment rental costs, overhead and other direct costs) incurred by Consultant in performance of the Services. Consultant shall not be reimbursed for actual costs that exceed the estimated wage rates, employee benefits, travel, equipment rental, overhead, and other estimated costs set forth in the approved Consultant cost proposal attached hereto as Exhibit "C" and incorporated herein by reference ("Cost Proposal") unless additional reimbursement is provided for by a written amendment. In no event shall Consultant be reimbursed for overhead costs at a rate that exceeds Commission's approved overhead rate set forth in the Cost Proposal. The overhead rates included in the attached Exhibit "C" shall be fixed for the term of the Master Agreement, and shall not be subject to adjustment. In the event that Commission determines that a change to the Services from that specified in the Cost Proposal and this Agreement is required, the contract time or actual costs reimbursable by Commission shall be adjusted by contract amendment to accommodate the changed work. The maximum total cost as specified in Section 19.8 shall not be exceeded, unless authorized by a written amendment.

19.2 In addition to the allowable incurred costs, Commission shall pay Consultant a fixed fee of [___INSERT DOLLAR AMOUNT___]. The fixed fee is nonadjustable for the term of this Agreement, except in the event of a significant change in the Scope of Services, and such adjustment is made by written amendment.

19.3 Reimbursement for transportation and subsistence costs shall not exceed the rates specified in the approved Cost Proposal. In addition, payments to Consultant for travel and subsistence expenses claimed for reimbursement or applied as local match credit shall not exceed rates authorized to be paid exempt non-represented State employees under current State Department of Personnel Administration (DPA) rules, unless otherwise authorized by Commission. If the rates invoiced are in excess of those authorized DPA rates, and Commission has not otherwise approved said rates, then Consultant is responsible for the cost difference and any overpayments shall be reimbursed to the Commission on demand.

19.4 When milestone cost estimates are included in the approved Cost Proposal, Consultant shall obtain prior written approval for a revised milestone cost estimate from the Contract Administrator before exceeding such cost estimate.

19.5 Progress payments shall be made monthly in arrears based on Services provided and allowable incurred costs. A pro rata portion of Consultant's fixed fee shall be included in the monthly progress payments. If Consultant fails to submit the required deliverable items according to the schedule set forth in the Scope of Services, Commission shall have the right to delay payment or terminate this Agreement in accordance with the provisions of Section 21 Termination.

19.6 No payment shall be made prior to approval of any Services, nor for any Services performed prior to approval of this Agreement.

19.7 Consultant shall be reimbursed, as promptly as fiscal procedures will permit upon receipt by Commission's Contract Administrator of itemized invoices in triplicate. Invoices shall be submitted no later than 45 calendar days after the performance of work for which Consultant is billing. Invoices shall detail the work performed on each milestone and each project as applicable. Invoices shall follow the format stipulated for the approved Cost Proposal and shall reference this Agreement number and project title. Final invoice must contain the final cost and all credits due Commission including any equipment purchased under the Equipment Purchase provisions of this Agreement. The final invoice should be submitted within 60 calendar days after completion of Consultant's work. Invoices shall be mailed to Commission's Contract Administrator at the following address:

Riverside County Transportation Commission
Attention: Accounts Payable
P.O. 12008
Riverside, CA 92502

19.8 The total amount payable by Commission including the fixed fee shall not exceed [___INSERT DOLLAR AMOUNT___].

19.9 Salary increases shall be reimbursable if the new salary is within the salary range identified in the approved Cost Proposal and is approved by Commission's Contract Administrator. For personnel subject to prevailing wage rates as described in the California Labor Code, all salary increases, which are the direct result of changes in the prevailing wage rates are reimbursable.

19.10 Consultant shall not be reimbursed for any expenses unless authorized in writing by the Commission's Contract Administrator.

19.11 All subcontracts in excess of \$25,000 shall contain the above provisions.

20. Disputes.

20.1 Any dispute, other than audit, concerning a question of fact arising under this Agreement that is not disposed of by mutual agreement of the Parties shall be decided by a committee consisting of RCTC's Contract Administrator and the Director of Capital Projects, who may consider written or verbal information submitted by Consultant.

20.2 Not later than 30 days after completion of all Services under this Agreement, Consultant may request review by the Commission's Executive Director of unresolved claims or disputes, other than audit. The request for review will be submitted in writing.

20.3 Neither the pendency of a dispute, nor its consideration by the committee will excuse Consultant from full and timely performance in accordance with the terms of this Agreement.

21. Termination.

21.1 Commission reserves the right to terminate this Agreement for any or no reason upon thirty (30) calendar days written notice to Consultant with the reasons for termination stated in the notice.

21.2 Commission may terminate this Agreement with Consultant should Consultant fail to perform the covenants herein contained at the time and in the manner herein provided. In the event of such termination, Commission may proceed with the work in any manner deemed proper by Commission. If Commission terminates this Agreement with Consultant, Commission shall pay Consultant the sum due to Consultant under this Agreement for Services completed and accepted prior to termination, unless the cost of completion to Commission exceeds the funds remaining in this Agreement. In such case, the overage shall be deducted from any sum due Consultant under this Agreement and the balance, if any, shall be paid to Consultant upon demand.

21.3 In addition to the above, payment upon termination shall include a prorated amount of profit, if applicable, but no amount shall be paid for anticipated profit on unperformed Services. Consultant shall provide documentation deemed adequate by Commission's Contract Administrator to show the Services actually completed by Consultant prior to the effective date of termination. This Agreement shall terminate on the effective date of the Notice of Termination.

21.4 Discontinuance of Services. Upon receipt of the written Notice of Termination, Consultant shall discontinue all affected Services as directed in the Notice or as otherwise provided herein, and deliver to the Commission all Documents and Data, as defined in this Agreement, as may have been prepared or accumulated by Consultant in performance of the Services, whether completed or in progress.

21.5 Effect of Termination for Cause. In addition to the above, Consultant shall be liable to the Commission for any reasonable additional costs incurred by the Commission to revise work for which the Commission has compensated Consultant under this Agreement, but which the Commission has determined in its sole discretion needs to be revised, in part or whole, to complete the Project because it did not meet the standard of care established herein. Termination of this Agreement for cause may be considered by the Commission in determining whether to enter into future agreements with Consultant.

21.6 Cumulative Remedies. The rights and remedies of the Parties provided in this Section are in addition to any other rights and remedies provided by law or under this Agreement.

21.7 Waivers. Consultant, in executing this Agreement, shall be deemed to have waived any and all claims for damages which may otherwise arise from the Commission's termination of this Agreement, for convenience or cause, as provided in this Section.

21.8 Consultant may not terminate this Agreement except for cause.

22. Cost Principles and Administrative Requirements.

22.1 Consultant agrees that the Contract Cost Principles and Procedures, 48 CFR, Federal Acquisition Regulations System, Chapter 1, Part 31.000 et seq., shall be used to determine the cost allowability of individual items.

22.2 Consultant also agrees to comply with federal procedures in accordance with 2 CFR, Part 200, Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards.

22.3 Any costs for which payment has been made to Consultant that are determined by subsequent audit to be unallowable under 2 CFR, Part 200 and 48 CFR,

Federal Acquisition Regulations System, Chapter 1, Part 31.000 et seq., are subject to repayment by Consultant to Commission.

22.4 All subcontracts in excess of \$25,000 shall contain the above provisions.

23. Retention of Records/Audit. For the purpose of determining compliance with Public Contract Code 10115, et seq. and Title 21, California Code of Regulations, Chapter 21, Section 2500 et seq., when applicable and other matters connected with the performance of this Agreement pursuant to Government Code 8546.7; Consultant, subconsultants, and Commission shall maintain and make available for inspection all books, documents, papers, accounting records, and other evidence pertaining to the performance of this Agreement, including but not limited to, the costs of administering this Agreement. All parties shall make such materials available at their respective offices at all reasonable times during this Agreement period and for three years from the date of final payment under this Agreement. The state, State Auditor, Commission, FHWA, or any duly authorized representative of the Federal Government shall have access to any books, records, and documents of Consultant and its certified public accountants (CPA) work papers that are pertinent to this Agreement and indirect cost rates (ICR) for audit, examinations, excerpts, and transactions, and copies thereof shall be furnished if requested. Subcontracts in excess of \$25,000 shall contain this provision.

23.1 Accounting System. Consultant and its subcontractors shall establish and maintain an accounting system and records that properly accumulate and segregate expenditures by line item for the Services. The accounting system of Consultant and its subcontractors shall conform to Generally Accepted Accounting Principles (GAAP), enable the determination of incurred costs at interim points of completion, and provide support for reimbursement payment vouchers or invoices.

24. Audit Review Procedures.

24.1 Any dispute concerning a question of fact arising under an interim or post audit of this Agreement that is not disposed of by agreement, shall be reviewed by Commission's Chief Financial Officer.

24.2 Not later than 30 days after issuance of the final audit report, Consultant may request a review by Commission's Chief Financial Officer of unresolved audit issues. The request for review shall be submitted in writing.

24.3 Neither the pendency of a dispute nor its consideration by Commission shall excuse Consultant from full and timely performance, in accordance with the terms of this Agreement.

25. Subcontracting.

25.1 Nothing contained in this Agreement or otherwise, shall create any contractual relation between Commission and any subconsultant(s), and no subcontract shall relieve Consultant of its responsibilities and obligations hereunder. Consultant agrees to be as fully responsible to Commission for the acts and omissions of its subconsultant(s) and of persons either directly or indirectly employed by any of them as it is for the acts and omissions of persons directly employed by Consultant. Consultant's obligation to pay its subconsultant(s) is an independent obligation from Commission's obligation to make payments to the Consultant.

25.2 Consultant shall perform the Services with resources available within its own organization and no portion of the Services shall be subcontracted without written authorization by Commission's Contract Administrator, except that, which is expressly identified in the approved Cost Proposal.

25.3 Consultant shall pay its subconsultants within ten (10) calendar days from receipt of each payment made to Consultant by Commission.

25.4 Any subcontract in excess of \$25,000 entered into as a result of this Agreement shall contain all the provisions stipulated in this Agreement to be applicable to subconsultants.

25.5 Any substitution of subconsultant(s) must be approved in writing by Commission's Contract Administrator prior to the start of work by the subconsultant(s).

25.6 Exhibit "C" may also set forth the rates at which each subconsultant shall bill the Consultant for Services and that are subject to reimbursement by the Commission to Consultant. Additional Direct Costs, as defined in Exhibit "C" shall be the same for both the Consultant and all subconsultants, unless otherwise identified in Exhibit "C". The subconsultant rate schedules and cost proposals contained herein are for accounting purposes only.

26. Equipment Purchase

26.1 Prior authorization, in writing, by Commission's Contract Administrator shall be required before Consultant enters into any unbudgeted purchase order, or subcontract for supplies, equipment, or Consultant services. Consultant shall provide an evaluation of the necessity or desirability of incurring such costs.

26.2 For purchase of any item, service or consulting work not covered in Consultant's Cost Proposal and exceeding \$5,000 prior authorization by Commission's Contract Administrator is required. Three competitive quotations must be submitted with the request for such purchase, or the absence of bidding must be adequately justified.

26.3 Any equipment purchased as a result of this Agreement is subject to the following:

Consultant shall maintain an inventory of all nonexpendable property. Nonexpendable property is defined as having a useful life of at least two years and an acquisition cost of \$5,000 or more. If the purchased equipment needs replacement and is sold or traded in, Commission shall receive a proper refund or credit at the conclusion of this Agreement, or if this Agreement is terminated, Consultant may either keep the equipment and credit Commission in an amount equal to its fair market value, or sell such equipment at the best price obtainable at a public or private sale, in accordance with established Commission procedures; and credit Commission in an amount equal to the sales price. If Consultant elects to keep the equipment, fair market value shall be determined at Consultant's expense, on the basis of a competent independent appraisal of such equipment. Appraisals shall be obtained from an appraiser mutually agreeable to Commission and Consultant. If Consultant determines to sell the equipment, the terms and conditions of such sale must be approved in advance by Commission. 2 CFR, Part 200 requires a credit to Federal funds when participating equipment with a fair market value greater than \$5,000 is credited to the project.

26.4 All subcontracts in excess \$25,000 shall contain the above provisions.

27. Labor Code Requirements.

27.1 Prevailing Wages.

(a) Consultant shall comply with the State of California's General Prevailing Wage Rate requirements in accordance with California Labor Code, Section 1770, and all Federal, State, and local laws and ordinances applicable to the Services.

(b) Any subcontract entered into as a result of this Agreement, if for more than \$25,000 for public works construction or more than \$15,000 for the alteration, demolition, repair, or maintenance of public works, shall contain all of the provisions of this Section.

(c) When prevailing wages apply to the Services described in the Scope of Services, transportation and subsistence costs shall be reimbursed at the minimum rates set by the Department of Industrial Relations (DIR) as outlined in the applicable Prevailing Wage Determination. See <http://www.dir.ca.gov>.

(d) Copies of the prevailing rate of per diem wages in effect at commencement of this Agreement are on file at the Commission's offices. Consultant shall make copies of the prevailing rates of per diem wages for each craft, classification or type of worker needed to execute the Services available to interested parties upon request, and shall post copies at the Consultant's principal place of business and at the project site. Consultant shall defend, indemnify and hold the Commission, its elected officials, officers, employees and agents free and harmless from any claims, liabilities, costs, penalties or interest arising out of any failure or alleged failure to comply with the Prevailing Wage Laws.

27.2 DIR Registration. If the Services are being performed as part of an applicable “public works” or “maintenance” project, then pursuant to Labor Code Sections 1725.5 and 1771.1, the Consultant and all subconsultants must be registered with the Department of Industrial Relations. If applicable, Consultant shall maintain registration for the duration of the Project and require the same of any subconsultants. This Project may also be subject to compliance monitoring and enforcement by the Department of Industrial Relations. It shall be Consultant’s sole responsibility to comply with all applicable registration and labor compliance requirements.

27.3 Eight-Hour Law. Pursuant to the provisions of the California Labor Code, eight hours of labor shall constitute a legal day’s work, and the time of service of any worker employed on the work shall be limited and restricted to eight hours during any one calendar day, and forty hours in any one calendar week, except when payment for overtime is made at not less than one and one-half the basic rate for all hours worked in excess of eight hours per day (“Eight-Hour Law”), unless Consultant or the Services are not subject to the Eight-Hour Law. Consultant shall forfeit to Commission as a penalty, \$50.00 for each worker employed in the execution of this Agreement by him, or by any sub-consultant under him, for each calendar day during which such workman is required or permitted to work more than eight hours in any calendar day and forty hours in any one calendar week without such compensation for overtime violation of the provisions of the California Labor Code, unless Consultant or the Services are not subject to the Eight-Hour Law.

27.4 Employment of Apprentices. This Agreement shall not prevent the employment of properly indentured apprentices in accordance with the California Labor Code, and no employer or labor union shall refuse to accept otherwise qualified employees as indentured apprentices on the work performed hereunder solely on the ground of race, creed, national origin, ancestry, color or sex. Every qualified apprentice shall be paid the standard wage paid to apprentices under the regulations of the craft or trade in which he or she is employed and shall be employed only in the craft or trade to which he or she is registered.

If California Labor Code Section 1777.5 applies to the Services, Consultant and any subcontractor hereunder who employs workers in any apprenticeable craft or trade shall apply to the joint apprenticeship council administering applicable standards for a certificate approving Consultant or any sub-consultant for the employment and training of apprentices. Upon issuance of this certificate, Consultant and any sub-consultant shall employ the number of apprentices provided for therein, as well as contribute to the fund to administer the apprenticeship program in each craft or trade in the area of the work hereunder.

The parties expressly understand that the responsibility for compliance with provisions of this Section and with Sections 1777.5, 1777.6 and 1777.7 of the California Labor Code in regard to all apprenticeable occupations lies with Consultant

28. Ownership of Materials/Confidentiality.

28.1 Documents & Data. This Agreement creates an exclusive and perpetual license for Commission to copy, use, modify, reuse, or sub-license any and all copyrights and designs embodied in plans, specifications, studies, drawings, estimates, materials, data and other documents or works of authorship fixed in any tangible medium of expression, including but not limited to, physical drawings or data magnetically or otherwise recorded on computer diskettes, which are prepared or caused to be prepared by Consultant under this Agreement ("Documents & Data").

Consultant shall require all subcontractors to agree in writing that Commission is granted an exclusive and perpetual license for any Documents & Data the subcontractor prepares under this Agreement.

Consultant represents and warrants that Consultant has the legal right to grant the exclusive and perpetual license for all such Documents & Data. Consultant makes no such representation and warranty in regard to Documents & Data which were prepared by design professionals other than Consultant or provided to Consultant by the Commission.

Commission shall not be limited in any way in its use of the Documents & Data at any time, provided that any such use not within the purposes intended by this Agreement shall be at Commission's sole risk.

28.2 Intellectual Property. In addition, Commission shall have and retain all right, title and interest (including copyright, patent, trade secret and other proprietary rights) in all plans, specifications, studies, drawings, estimates, materials, data, computer programs or software and source code, enhancements, documents, and any and all works of authorship fixed in any tangible medium or expression, including but not limited to, physical drawings or other data magnetically or otherwise recorded on computer media ("Intellectual Property") prepared or developed by or on behalf of Consultant under this Agreement as well as any other such Intellectual Property prepared or developed by or on behalf of Consultant under this Agreement.

The Commission shall have and retain all right, title and interest in Intellectual Property developed or modified under this Agreement whether or not paid for wholly or in part by Commission, whether or not developed in conjunction with Consultant, and whether or not developed by Consultant. Consultant will execute separate written assignments of any and all rights to the above referenced Intellectual Property upon request of Commission.

Consultant shall also be responsible to obtain in writing separate written assignments from any subcontractors or agents of Consultant of any and all right to the above referenced Intellectual Property. Should Consultant, either during or following termination of this Agreement, desire to use any of the above-referenced Intellectual Property, it shall first obtain the written approval of the Commission.

All materials and documents which were developed or prepared by the Consultant for general use prior to the execution of this Agreement and which are not the copyright of any other party or publicly available and any other computer applications, shall continue to be the property of the Consultant. However, unless otherwise identified and stated prior to execution of this Agreement, Consultant represents and warrants that it has the right to grant the exclusive and perpetual license for all such Intellectual Property as provided herein.

Commission further is granted by Consultant a non-exclusive and perpetual license to copy, use, modify or sub-license any and all Intellectual Property otherwise owned by Consultant which is the basis or foundation for any derivative, collective, insurrectional, or supplemental work created under this Agreement.

28.3 Confidentiality. All ideas, memoranda, specifications, plans, procedures, drawings, descriptions, computer program data, input record data, written information, and other Documents and Data either created by or provided to Consultant in connection with the performance of this Agreement shall be held confidential by Consultant. Such materials shall not, without the prior written consent of Commission, be used by Consultant for any purposes other than the performance of the Services. Nor shall such materials be disclosed to any person or entity not connected with the performance of the Services or the Project. Nothing furnished to Consultant which is otherwise known to Consultant or is generally known, or has become known, to the related industry shall be deemed confidential. Consultant shall not use Commission's name or insignia, photographs of the Project, or any publicity pertaining to the Services or the Project in any magazine, trade paper, newspaper, television or radio production or other similar medium without the prior written consent of Commission.

28.4 Infringement Indemnification. Consultant shall defend, indemnify and hold the Commission, its directors, officials, officers, employees, volunteers and agents free and harmless, pursuant to the indemnification provisions of this Agreement, for any alleged infringement of any patent, copyright, trade secret, trade name, trademark, or any other proprietary right of any person or entity in consequence of the use on the Project by Commission of the Documents & Data, including any method, process, product, or concept specified or depicted.

29. Indemnification. To the fullest extent permitted by law, Consultant shall defend (with counsel of Commission's choosing), indemnify and hold Commission, its directors, officials, officers, employees, consultants, volunteers, and agents free and harmless from any and all claims, demands, causes of action, costs, expenses, liability, loss, damage or injury, in law or equity, to property or persons, including wrongful death, in any manner arising out of or incident to alleged negligent acts, omissions, or willful misconduct of Consultant, its officials, officers, employees, agents, consultants, and contractors arising out of or in connection with the performance of the Services, the Project or this Agreement, including without limitation the payment of consequential damages, expert witness fees, and attorneys fees and other related costs and

expenses. Consultant shall defend, at Consultant's own cost, expense and risk, any and all such aforesaid suits, actions or other legal proceedings of every kind that may be brought or instituted against Commission, its directors, officials, officers, employees, consultants, agents, or volunteers. Consultant shall pay and satisfy any judgment, award or decree that may be rendered against Commission or its directors, officials, officers, employees, consultants, agents, or volunteers, in any such suit, action or other legal proceeding. Consultant shall reimburse Commission and its directors, officials, officers, employees, consultants, agents, and/or volunteers, for any and all legal expenses and costs, including reasonable attorney's fees, incurred by each of them in connection therewith or in enforcing the indemnity herein provided. Consultant's obligation to indemnify shall not be restricted to insurance proceeds, if any, received by Commission, its directors, officials officers, employees, consultants, agents, or volunteers.

If Consultant's obligation to defend, indemnify, and/or hold harmless arises out of Consultant's performance as a "design professional" (as that term is defined under Civil Code section 2782.8), then, and only to the extent required by Civil Code section 2782.8, which is fully incorporated herein, Consultant's indemnification obligation shall be limited to claims that arise out of, pertain to, or relate to the negligence, recklessness, or willful misconduct of the Consultant, and, upon Consultant obtaining a final adjudication by a court of competent jurisdiction, Consultant's liability for such claim, including the cost to defend, shall not exceed the Consultant's proportionate percentage of fault.

Consultant's obligations as set forth in this Section shall survive expiration or termination of this Agreement.

30. Insurance.

30.1 Time for Compliance. Consultant shall not commence work under this Agreement until it has provided evidence satisfactory to the Commission that it has secured all insurance required under this Section, in a form and with insurance companies acceptable to the Commission. In addition, Consultant shall not allow any subcontractor to commence work on any subcontract until it has secured all insurance required under this Section.

30.2 Minimum Requirements. Consultant shall, at its expense, procure and maintain for the duration of the Agreement insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the Agreement by the Consultant, its agents, representatives, employees or subcontractors. Consultant shall also require all of its subcontractors to procure and maintain the same insurance for the duration of the Agreement. Such insurance shall meet at least the following minimum levels of coverage:

(a) Minimum Scope of Insurance. Coverage shall be at least as broad as the latest version of the following: (1) General Liability: Insurance Services Office

Commercial General Liability coverage (occurrence form CG 0001 or exact equivalent); (2) Automobile Liability: Insurance Services Office Business Auto Coverage (form CA 0001, code 1 (any auto) or exact equivalent); and (3) Workers' Compensation and Employer's Liability: Workers' Compensation insurance as required by the State of California and Employer's Liability Insurance.

(b) Minimum Limits of Insurance. Consultant shall maintain limits no less than: (1) General Liability: \$2,000,000 per occurrence for bodily injury, personal injury and property damage. If Commercial General Liability Insurance or other form with general aggregate limit is used, either the general aggregate limit shall apply separately to this Agreement/location or the general aggregate limit shall be twice the required occurrence limit. Limits may be achieved by any combination of primary and excess or umbrella liability insurance; (2) Automobile Liability: \$2,000,000 per accident for bodily injury and property damage. Limits may be achieved by any combination of primary and excess or umbrella liability insurance; and (3) Workers' Compensation and Employer's Liability: Workers' Compensation limits as required by the Labor Code of the State of California. Employer's Practices Liability limits of \$1,000,000 per accident.

30.3 Professional Liability. Consultant shall procure and maintain, and require its sub-consultants to procure and maintain, for a period of five (5) years following completion of the Project, errors and omissions liability insurance appropriate to their profession. For Consultant, such insurance shall be in an amount not less than \$1,000,000 per claim. This insurance shall be endorsed to include contractual liability applicable to this Agreement and shall be written on a policy form coverage specifically designed to protect against acts, errors or omissions of the Consultant. "Covered Professional Services" as designated in the policy must specifically include work performed under this Agreement. The policy must "pay on behalf of" the insured and must include a provision establishing the insurer's duty to defend. Subconsultants of Consultant shall obtain such insurance in an amount not less than \$1,000,000 per claim. Notwithstanding the foregoing, the Commission may consider written requests to lower or dispense with the errors and omissions liability insurance requirement contained in this Section for certain subconsultants of Consultant, on a case-by-case basis, depending on the nature and scope of the Services to be provided by the subconsultant. Approval of such request shall be in writing, signed by the Commission's Contract Administrator.

30.4 Aircraft Liability Insurance. Prior to conducting any Services requiring use of aircraft, Consultant shall procure and maintain, or cause to be procured and maintained, aircraft liability insurance or equivalent form, with a single limit as shall be required by the Commission. Such insurance shall include coverage for owned, hired and non-owned aircraft and passengers, and shall name, or be endorsed to name, the Commission, Caltrans and their directors, officials, officers, employees and agents as additional insureds with respect to the Services or operations performed by or on behalf of the Consultant.

30.5 Insurance Endorsements. The insurance policies shall contain the following provisions, or Consultant shall provide endorsements on forms approved by the Commission to add the following provisions to the insurance policies:

(a) General Liability.

(i) Commercial General Liability Insurance must include coverage for (1) bodily Injury and property damage; (2) personal Injury/advertising Injury; (3) premises/operations liability; (4) products/completed operations liability; (5) aggregate limits that apply per Project; (6) explosion, collapse and underground (UCX) exclusion deleted; (7) contractual liability with respect to this Agreement; (8) broad form property damage; and (9) independent consultants coverage.

(ii) The policy shall contain no endorsements or provisions limiting coverage for (1) contractual liability; (2) cross liability exclusion for claims or suits by one insured against another; or (3) contain any other exclusion contrary to this Agreement.

(iii) The policy shall give the Commission, its directors, officials, officers, employees, and agents insured status using ISO endorsement forms 20 10 10 01 and 20 37 10 01, or endorsements providing the exact same coverage.

(iv) The additional insured coverage under the policy shall be “primary and non-contributory” and will not seek contribution from the Commission’s or Caltrans’ insurance or self-insurance and shall be at least as broad as CG 20 01 04 13, or endorsements providing the exact same coverage.

(b) Automobile Liability. The automobile liability policy shall be endorsed to state that: (1) the Commission, Caltrans and their directors, officials, officers, employees and agents shall be covered as additional insureds with respect to the ownership, operation, maintenance, use, loading or unloading of any auto owned, leased, hired or borrowed by the Consultant or for which the Consultant is responsible; and (2) the insurance coverage shall be primary insurance as respects the Commission, Caltrans and their directors, officials, officers, employees and agents, or if excess, shall stand in an unbroken chain of coverage excess of the Consultant’s scheduled underlying coverage. Any insurance or self-insurance maintained by the Commission, Caltrans and their directors, officials, officers, employees and agents shall be excess of the Consultant’s insurance and shall not be called upon to contribute with it in any way.

(c) Workers’ Compensation and Employers Liability Coverage.

(i) Consultant certifies that he/she is aware of the provisions of Section 3700 of the California Labor Code which requires every employer to be insured against liability for workers’ compensation or to undertake self-insurance in accordance with the provisions of that code, and he/she will comply with such provisions before commencing work under this Agreement.

(ii) The insurer shall agree to waive all rights of subrogation against the Commission, its directors, officials, officers, employees and agents for losses paid under the terms of the insurance policy which arise from work performed by the Consultant.

(d) All Coverages.

(i) Defense costs shall be payable in addition to the limits set forth hereunder.

(ii) Requirements of specific coverage or limits contained in this Section are not intended as a limitation on coverage, limits, or other requirement, or a waiver of any coverage normally provided by any insurance. It shall be a requirement under this Agreement that any available insurance proceeds broader than or in excess of the specified minimum insurance coverage requirements and/or limits set forth herein shall be available to the Commission, Caltrans and their directors, officials, officers, employees and agents as additional insureds under said policies. Furthermore, the requirements for coverage and limits shall be (1) the minimum coverage and limits specified in this Agreement; or (2) the broader coverage and maximum limits of coverage of any insurance policy or proceeds available to the named insured; whichever is greater.

(iii) The limits of insurance required in this Agreement may be satisfied by a combination of primary and umbrella or excess insurance. Any umbrella or excess insurance shall contain or be endorsed to contain a provision that such coverage shall also apply on a primary and non-contributory basis for the benefit of the Commission (if agreed to in a written contract or agreement) before the Commission's own insurance or self-insurance shall be called upon to protect it as a named insured. The umbrella/excess policy shall be provided on a "following form" basis with coverage at least as broad as provided on the underlying policy(ies).

(iv) Consultant shall provide the Commission at least thirty (30) days prior written notice of cancellation of any policy required by this Agreement, except that the Consultant shall provide at least ten (10) days prior written notice of cancellation of any such policy due to non-payment of premium. If any of the required coverage is cancelled or expires during the term of this Agreement, the Consultant shall deliver renewal certificate(s) including the General Liability Additional Insured Endorsement to the Commission at least ten (10) days prior to the effective date of cancellation or expiration.

(v) The retroactive date (if any) of each policy is to be no later than the effective date of this Agreement. Consultant shall maintain such coverage continuously for a period of at least three years after the completion of the work under this Agreement. Consultant shall purchase a one (1) year extended reporting period A) if the retroactive date is advanced past the effective date of this Agreement; B) if the

policy is cancelled or not renewed; or C) if the policy is replaced by another claims-made policy with a retroactive date subsequent to the effective date of this Agreement.

(vi) The foregoing requirements as to the types and limits of insurance coverage to be maintained by Consultant, and any approval of said insurance by the Commission, is not intended to and shall not in any manner limit or qualify the liabilities and obligations otherwise assumed by the Consultant pursuant to this Agreement, including but not limited to, the provisions concerning indemnification.

(vii) If at any time during the life of the Agreement, any policy of insurance required under this Agreement does not comply with these specifications or is canceled and not replaced, Commission has the right but not the duty to obtain the insurance it deems necessary and any premium paid by Commission will be promptly reimbursed by Consultant or Commission will withhold amounts sufficient to pay premium from Consultant payments. In the alternative, Commission may cancel this Agreement. The Commission may require the Consultant to provide complete copies of all insurance policies in effect for the duration of the Project.

(viii) Neither the Commission nor any of its directors, officials, officers, employees or agents shall be personally responsible for any liability arising under or by virtue of this Agreement.

Each insurance policy required by this Agreement shall be endorsed to state that:

30.6 Deductibles and Self-Insurance Retentions. Any deductibles or self-insured retentions must be declared to and approved by the Commission. If the Commission does not approve the deductibles or self-insured retentions as presented, Consultant shall guarantee that, at the option of the Commission, either: (1) the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the Commission, its directors, officials, officers, employees and agents; or, (2) the Consultant shall procure a bond guaranteeing payment of losses and related investigation costs, claims and administrative and defense expenses.

30.7 Acceptability of Insurers. Insurance is to be placed with insurers with a current A.M. Best's rating no less than A:VIII, licensed to do business in California, and satisfactory to the Commission.

30.8 Verification of Coverage. Consultant shall furnish Commission with original certificates of insurance and endorsements effecting coverage required by this Agreement on forms satisfactory to the Commission. The certificates and endorsements for each insurance policy shall be signed by a person authorized by that insurer to bind coverage on its behalf. All certificates and endorsements must be received and approved by the Commission before work commences. The Commission reserves the right to require complete, certified copies of all required insurance policies, at any time.

30.9 Subconsultant Insurance Requirements. Consultant shall not allow any subcontractors or subconsultants to commence work on any subcontract until they have provided evidence satisfactory to the Commission that they have secured all insurance required under this Section. Policies of commercial general liability insurance provided by such subcontractors or subconsultants shall be endorsed to name the Commission as an additional insured using ISO form CG 20 38 04 13 or an endorsement providing the exact same coverage. If requested by Consultant, the Commission may approve different scopes or minimum limits of insurance for particular subcontractors or subconsultants.

30.10 Other Insurance. At its option, the Commission may require such additional coverage(s), limits and/or the reduction of deductibles or retentions it considers reasonable and prudent based upon risk factors that may directly or indirectly impact the Project. In retaining this option Commission does not warrant Consultant's insurance program to be adequate. Consultant shall have the right to purchase insurance in addition to the insurance required in this Section.

31. Safety. Consultant shall execute and maintain its work so as to avoid injury or damage to any person or property. In carrying out its Services, the Consultant shall at all times be in compliance with all applicable local, state and federal laws, rules and regulations, and shall exercise all necessary precautions for the safety of employees appropriate to the nature of the work and the conditions under which the work is to be performed. Safety precautions as applicable shall include, but shall not be limited to: (A) adequate life protection and life saving equipment and procedures; (B) instructions in accident prevention for all employees and subcontractors, such as safe walkways, scaffolds, fall protection ladders, bridges, gang planks, confined space procedures, trenching and shoring, equipment and other safety devices, equipment and wearing apparel as are necessary or lawfully required to prevent accidents or injuries; and (C) adequate facilities for the proper inspection and maintenance of all safety measures.

As between Consultant and the construction contractors only, the construction contractors shall remain solely responsible for construction safety notwithstanding any safety obligations of Consultant at the jobsite. The foregoing sentence shall not impact nor in any way modify or alter Consultant's indemnity and defense obligations to the Commission, as set forth in Section 29 of this Agreement, not any of Consultant's duties or obligations set forth under this Agreement, including the attached exhibits.

Pursuant to the authority contained in Section 591 of the Vehicle Code, the Commission has determined that the Project will contain areas that are open to public traffic. Consultant shall comply with all of the requirements set forth in Divisions 11, 12, 13, 14, and 15 of the Vehicle Code. Consultant shall take all reasonably necessary precautions for safe operation of its vehicles and the protection of the traveling public from injury and damage from such vehicles.

32. Additional Work. Any work or activities that are in addition to, or otherwise outside of, the Services to be performed pursuant to this Agreement shall only be

performed pursuant to a separate agreement between the parties. Notwithstanding the foregoing, the Commission's Executive Director may make a change to the Agreement, other than a Cardinal Change. For purposes of this Agreement, a Cardinal Change is a change which is "outside the scope" of the Agreement; in other words, work which should not be regarded as having been fairly and reasonably within the contemplation of the parties when the Agreement was entered into. An example of a change which is not a Cardinal Change would be where, in a contract to construct a building there are many changes in the materials used, but the size and layout of the building remains the same. Cardinal Changes are not within the authority of this provision to order, and shall be processed by the Commission as "sole source" procurements according to applicable law, including the requirements of FTA Circular 4220.1D, paragraph 9(f).

(a) In addition to the changes authorized above, a modification which is signed by Consultant and the Commission's Executive Director, other than a Cardinal Change, may be made in order to: (1) make a negotiated equitable adjustment to the Agreement price, delivery schedule and other terms resulting from the issuance of a Change Order, (2) reflect definitive letter contracts, and (3) reflect other agreements of the parties modifying the terms of this Agreement ("Bilateral Contract Modification").

(b) Consultant shall not perform, nor be compensated for any change, without written authorization from the Commission's Executive Director as set forth herein. In the event such a change authorization is not issued and signed by the Commission's Executive Director, Consultant shall not provide such change.

33. Prohibited Interests.

33.1 Solicitation. Consultant maintains and warrants that it has not employed nor retained any company or person, other than a bona fide employee working solely for Consultant, to solicit or secure this Agreement. Further, Consultant warrants that it has not paid nor has it agreed to pay any company or person, other than a bona fide employee working solely for Consultant, any fee, commission, percentage, brokerage fee, gift or other consideration contingent upon or resulting from the award or making of this Agreement. For breach or violation of this warranty, the Commission shall have the right to rescind this Agreement without liability.

33.2 Consultant Conflict of Interest (Construction Management/ Administration).

(a) Consultant shall disclose any financial, business, or other relationship with Commission that may have an impact upon the outcome of this Agreement, or any ensuing Commission construction project. Consultant shall also list current clients who may have a financial interest in the outcome of this Agreement, or any ensuing Commission construction project, which will follow.

(b) Consultant hereby certifies that it does not now have, nor shall it acquire any financial or business interest that would conflict with the performance of Services under this Agreement.

(c) Any subcontract in excess of \$25,000 entered into as a result of this Agreement, shall contain all of the provisions of this Article.

(d) Consultant hereby certifies that neither Consultant, nor any firm affiliated with Consultant will bid on any construction contract, or on any contract to provide construction inspection for any construction project resulting from this Agreement. An affiliated firm is one, which is subject to the control of the same persons through joint-ownership, or otherwise.

(e) Except for subconsultants whose services are limited to providing surveying or materials testing information, no subconsultant who has provided design services in connection with this Agreement shall be eligible to bid on any construction contract, or on any contract to provide construction inspection for any construction project resulting from this Agreement.

33.3 Commission Conflict of Interest. For the term of this Agreement, no member, officer or employee of the Commission, during the term of his or her service with the Commission, shall have any direct interest in this Agreement, or obtain any present or anticipated material benefit arising therefrom.

33.4 Conflict of Employment. Employment by the Consultant of personnel currently on the payroll of the Commission shall not be permitted in the performance of this Agreement, even though such employment may occur outside of the employee's regular working hours or on weekends, holidays or vacation time. Further, the employment by the Consultant of personnel who have been on the Commission payroll within one year prior to the date of execution of this Agreement, where this employment is caused by and or dependent upon the Consultant securing this or related Agreements with the Commission, is prohibited.

33.5 Covenant Against Contingent Fees. As required in connection with federal funding, the Consultant warrants that he/she has not employed or retained any company or person, other than a bona fide employee working for the Consultant, to solicit or secure this Agreement, and that he/she has not paid or agreed to pay any company or person, other than a bona fide employee, any fee, commission, percentage, brokerage fee, gift, or any other consideration, contingent upon or resulting from the award or formation of this Agreement. For breach or violation of this warranty, the Commission shall have the right to terminate this Agreement without liability pursuant to the terms herein, or at its discretion to deduct from the Agreement price or consideration, or otherwise recover, the full amount of such fee, commission, percentage, brokerage fee, gift, or contingent fee.

33.6 Rebates, Kickbacks or Other Unlawful Consideration. Consultant warrants that this Agreement was not obtained or secured through rebates kickbacks or other unlawful consideration, either promised or paid to any Commission employee. For breach or violation of this warranty, Commission shall have the right in its discretion; to

terminate this Agreement without liability; to pay only for the value of the work actually performed; or to deduct from the contract price; or otherwise recover the full amount of such rebate, kickback or other unlawful consideration.

33.7 **Covenant Against Expenditure of Commission, State or Federal Funds for Lobbying.** The Consultant certifies that to the best of his/ her knowledge and belief no state, federal or local agency appropriated funds have been paid, or will be paid by or on behalf of the Consultant to any person for the purpose of influencing or attempting to influence an officer or employee of any state or federal agency; a Member of the State Legislature or United States Congress; an officer or employee of the Legislature or Congress; or any employee of a Member of the Legislature or Congress, in connection with the award of any state or federal contract, grant, loan, or cooperative agreement, or the extension, continuation, renewal, amendment, or modification of any state or federal contract, grant, loan, or cooperative agreement.

(a) If any funds other than federal appropriated funds have been paid, or will be paid to any person for the purpose of influencing or attempting to influence an officer or employee of any federal agency; a Member of Congress; an officer or employee of Congress, or an employee of a Member of Congress; in connection with this Agreement, the Consultant shall complete and submit the attached Exhibit "F", Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with the attached instructions.

(b) The Consultant's certification provided in this Section is a material representation of fact upon which reliance was placed when this Agreement was entered into, and is a prerequisite for entering into this Agreement pursuant to Section 1352, Title 31, US. Code. Failure to comply with the restrictions on expenditures, or the disclosure and certification requirements set forth in Section 1352, Title 31, US. Code may result in a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

(c) The Consultant also agrees by signing this Agreement that he/she shall require that the language set forth in this Section be included in all Consultant subcontracts which exceed \$100,000, and that all such subcontractors shall certify and disclose accordingly.

33.8 **Employment Adverse to the Commission.** Consultant shall notify the Commission, and shall obtain the Commission's written consent, prior to accepting work to assist with or participate in a third-party lawsuit or other legal or administrative proceeding against the Commission during the term of this Agreement.

34. **Equal Opportunity Employment.** Consultant represents that it is an equal opportunity employer and it shall not discriminate against any subcontractor, employee or applicant for employment because of race, religion, color, national origin, ancestry, sex or age. Such non-discrimination shall include, but not be limited to, all activities

related to initial employment, upgrading, demotion, transfer, recruitment or recruitment advertising, layoff or termination.

35. Right to Employ Other Consultants. Commission reserves the right to employ other consultants in connection with the Project.

36. Governing Law. This Agreement shall be governed by and construed with the laws of the State of California. Venue shall be in Riverside County.

37. Disputes; Attorneys' Fees.

37.1 Prior to commencing any action hereunder, the Parties shall attempt in good faith to resolve any dispute arising between them. The pendency of a dispute shall not excuse Consultant from full and timely performance of the Services.

37.2. If the Parties are unable to resolve a dispute after attempting in good faith to do so, the Parties may seek any other available remedy to resolve the dispute. If either Party commences an action against the other Party, either legal, administrative or otherwise, arising out of or in connection with this Agreement, the prevailing Party in such litigation shall be entitled to have and recover from the losing Party reasonable attorneys' fees and, all other costs of such actions.

38. Time of Essence. Time is of the essence for each and every provision of this Agreement.

39. Headings. Article and Section Headings, paragraph captions or marginal headings contained in this Agreement are for convenience only and shall have no effect in the construction or interpretation of any provision herein.

39.1 Notices. All notices permitted or required under this Agreement shall be given to the respective parties at the following address, or at such other address as the respective parties may provide in writing for this purpose:

CONSULTANT:

Falcon Engineering Services, Inc.
341 Corporate Terrace Circle #101
Corona, CA 92879
Attn: Wael Faqih

COMMISSION:

Riverside County Transportation Commission
4080 Lemon Street, 3rd Floor
Riverside, CA 92501
Attn: Executive Director

Such notice shall be deemed made when personally delivered or when mailed, forty-eight (48) hours after deposit in the U.S. mail, first class postage prepaid, and addressed to the Party at its applicable address. Actual notice shall be deemed adequate notice on the date actual notice occurred, regardless of the method of service.

40. Conflicting Provisions. In the event that provisions of any attached exhibits conflict in any way with the provisions set forth in this Agreement, the language, terms and conditions contained in this Agreement shall control the actions and obligations of the Parties and the interpretation of the Parties' understanding concerning the performance of the Services.
41. Amendment or Modification. No supplement, modification, or amendment of this Agreement shall be binding unless executed in writing and signed by both Parties.
42. Entire Agreement. This Agreement contains the entire agreement of the Parties relating to the subject matter hereof and supersedes all prior negotiations, agreements or understandings.
43. Invalidity; Severability. If any portion of this Agreement is declared invalid, illegal, or otherwise unenforceable by a court of competent jurisdiction, the remaining provisions shall continue in full force and effect.
44. Provisions Applicable When Federal Department of Transportation Funds Are Involved. When funding for the Services provided by this Agreement are provided, in whole or in part, from the United States Department of Transportation, Consultant shall also fully and adequately comply with the provisions included in Exhibit "D" (Federal Department of Transportation Requirements and California Department of Transportation (Caltrans) DBE program requirements) attached hereto and incorporated herein by reference.
45. Survival. All rights and obligations hereunder that by their nature are to continue after any expiration or termination of this Agreement, including, but not limited to, the indemnification and confidentiality obligations, shall survive any such expiration or termination.
46. No Third Party Beneficiaries. There are no intended third party beneficiaries of any right or obligation assumed by the Parties.
47. Labor Certification. By its signature hereunder, Consultant certifies that it is aware of the provisions of Section 3700 of the California Labor Code which require every employer to be insured against liability for Workers' Compensation or to undertake self-insurance in accordance with the provisions of that Code, and agrees to comply with such provisions before commencing the performance of the Services.
48. Counterparts. This Agreement may be signed in counterparts, each of which shall constitute an original.
49. Subpoenas or Court Orders. Should Consultant receive a subpoena or court order related to this Agreement, the Services or the Project, Consultant shall immediately provide written notice of the subpoena or court order to the Commission. Consultant shall not respond to any such subpoena or court order until notice to the

Commission is provided as required herein, and shall cooperate with the Commission in responding to the subpoena or court order.

50. Assignment or Transfer. Consultant shall not assign, hypothecate, or transfer, either directly or by operation of law, this Agreement or any interest herein, without the prior written consent of the Commission. Any attempt to do so shall be null and void, and any assignees, hypothecates or transferees shall acquire no right or interest by reason of such attempted assignment, hypothecation or transfer.

51. Successors and Assigns. This Agreement shall be binding on the successors and assigns of the parties, and shall not be assigned by Consultant without the prior written consent of Commission.

52. Incorporation of Recitals. The recitals set forth above are true and correct and are incorporated into this Agreement as though fully set forth herein.

53. No Waiver. Failure of Commission to insist on any one occasion upon strict compliance with any of the terms, covenants or conditions hereof shall not be deemed a waiver of such term, covenant or condition, nor shall any waiver or relinquishment of any rights or powers hereunder at any one time or more times be deemed a waiver or relinquishment of such other right or power at any other time or times.

[Signatures on following page]

SIGNATURE PAGE
TO
PROFESSIONAL SERVICES AGREEMENT
WITH FHWA FUNDING/ASSISTANCE

IN WITNESS WHEREOF, this Agreement was executed on the date first written above.

| | |
|---|---|
| <p>RIVERSIDE COUNTY TRANSPORTATION COMMISSION</p> <p>By: _____ Dana W. Reed Chair</p> <p><i>Approved as to Form:</i></p> <p>By: _____ Best, Best & Krieger LLP General Counsel</p> | <p>FALCON ENGINEERING SERVICES, INC.</p> <p>By: _____ Signature</p> <p>_____ Name</p> <p>_____ Title</p> <p>ATTEST:</p> <p>By: _____</p> <p>Its: _____</p> |
|---|---|

* A corporation requires the signatures of two corporate officers.

One signature shall be that of the chairman of board, the president or any vice president and the second signature (on the attest line) shall be that of the secretary, any assistant secretary, the chief financial officer or any assistant treasurer of such corporation.

If the above persons are not the intended signators, evidence of signature authority shall be provided to RCTC.

EXHIBIT "A"

SCOPE OF SERVICES

[attached behind this page]

EXHIBIT "A" SCOPE OF SERVICES

Commission is seeking proposals from qualified engineering professionals to provide Construction Management (CM), Materials Testing, Construction Surveying Public Outreach and Environmental services for construction of the SR-60 Truck Climbing Lane Project, from Gilman Springs Road Interchange, Post Mile (PM) 22.10 to approximately 1 mile West of Jack Rabbit Trail PM 26.61, in the County of Riverside, California. Services will include pre-construction constructability review, plan, specification, and estimate (PS&E) review, bid analysis, and award recommendation; construction inspection; preparation of progress payments and change orders, schedule and claim analysis; and project closeout tasks. Contractor interface and contract administration; office engineering; and other assorted duties as appropriate for construction management, as well as materials testing construction surveying and implementing, monitoring and documenting the progress and attainment of environmental commitments during construction and post construction, coordination with permitting agencies and project closeout tasks.

Background Information

The following information will be available:

1. 100% Plan set
2. 100% Standard Special Provisions
3. 100% Engineer's estimate
4. Final Project Report
5. Final Environmental Document and Environmental Commitments Record
6. RCTC Quality Assurance Plan

Construction Schedule (Tentative)

The anticipated construction schedule for the project is shown below:

| | |
|-------------------------------|---------------|
| Advertisement Date: | August 2018 |
| Bids Due: | October 2018 |
| Anticipated Commission Award: | December 2018 |
| Notice to Proceed | January 2019 |
| Anticipated Completion Date | July 2021 |
| Complete Close-Out | July 2022 |

CONSTRUCTION COST (TENTATIVE) \$110 MILLION

SCOPE OF SERVICES

Selected Offeror shall assist COMMISSION in the procurement, management, and oversight of the Contractor. Selected Offeror will provide COMMISSION with the required staff, resources, and expertise to effectively manage the Contractor. The specific tasks and scope of work for the construction management services are described in the following sections. The construction management tasks and activities include, but are not limited to:

- Review of PROJECT data and Information and perform a constructability review.
- Preparation and implementation of a Construction Management Plan.
- Assist with preparation of Bid and Contract Documents and assisting with the procurement of the construction contract.
- Management and administration of construction contract.
- Providing cost, schedule, and document control services.
- Assist in Changes and Claims resolution
- Providing project progress reports and meetings.
- Monitoring construction contractor safety compliance.
- Monitoring construction contractor labor code compliance.
- Monitoring construction contractor maintenance obligations.
- Monitoring construction contractor record drawing obligations.
- Assist in the development and monitoring of the Project Traffic Management Plan.
- Implementation of a partnering program.
- Utility Coordination
- SWPPP Preparation and Coordination
- Assist with coordination with other relevant agencies including the California Department of Transportation (Caltrans), and County of Riverside Transportation Department, US Army Corps of Engineering, US Fish and Wildlife, California Fish and Wildlife, and the State Water and Resources Control Board.
- Providing construction management services including coordination of acceptance testing and start-up, and monitoring of warranties.
- Community and Government Relations.

- Implementing, monitoring, documenting and coordinating with contractor to comply with environmental commitments as outlined in the Environmental Commitments Record during construction and post construction.

Performance Requirements

Construction Management: OFFEROR shall furnish a Resident Engineer as a single point of contact for this agreement and to coordinate OFFEROR'S operations with COMMISSION. The single point of contact shall be responsible for all matters related to OFFEROR'S personnel and operations. The Resident Engineer shall be in responsible charge of construction activity within the Project. The Resident Engineer and Structures Representative shall be Civil Engineers, registered in the State of California. Other Assistant Resident Engineers may be assigned to each specific project responsibilities as needed. A qualified electrical engineer or inspector shall be provided to review electrical and traffic systems requirements as well as electrical utility arrangements. If the Resident Engineer is not also a registered Landscape Architect, a registered Landscape Architect shall be assigned to the project responsible for daily on-site inspections and decisions regarding highway planting and the irrigation systems that comprise a small portion of the Project.

The number of OFFEROR personnel assigned to the project will vary throughout the duration of the agreement. OFFEROR personnel shall be assigned, in varying levels of responsibility, as needed by the OFFEROR to meet the project schedule, project requirements, and construction activities.

Resumes of personnel shall be submitted to COMMISSION for review and approval prior to assignment to the Project. COMMISSION and OFFEROR will jointly determine the quality and quantity of services that are required by OFFEROR's personnel. Personnel selected for assignment by OFFEROR shall be made available for personal interviews prior to acceptance by COMMISSION. If, in the opinion of COMMISSION, an individual lacks adequate experience, the individual may be rejected or may be accepted on a trial basis until such time the individual's ability to perform the required services has been demonstrated. If, at any time, the performance of OFFEROR personnel is unsatisfactory to COMMISSION, COMMISSION may release him/her by written notice and may request another qualified person be assigned.

If OFFEROR personnel are on leave of absence, the Project Manager shall provide approved, equally qualified replacement personnel until the assigned personnel returns to the Project.

The typical workday includes all hours worked by the construction Contractor. If necessary, overtime for OFFEROR personnel may be required. The construction Contractor's operations may be restricted to specific hours during the week, which shall become the normal workday for OFFEROR personnel. The Project Manager, with concurrence from COMMISSION, shall have the authority to increase, decrease, or eliminate OFFEROR personnel work hours dependent on the schedule and requirements of the construction Contractor. All overtime

required by OFFEROR personnel shall be approved and authorized by COMMISSION prior to each occurrence.

OFFEROR personnel shall be knowledgeable of and comply with all applicable local, state, and federal regulations related to construction and construction engineering. OFFEROR personnel shall cooperate and consult with COMMISSION, State, and City officials during the course of the Project. Offeror shall consult with and coordinate activities of third party agencies and utilities. OFFEROR personnel shall perform duties as may be required to assure that construction is being performed in accordance with the Project plans and specifications. OFFEROR personnel shall keep accurate and timely records and document all work performed by the Contractor and OFFEROR.

OFFEROR shall monitor for Contractor's compliance with the labor standards provisions of the contract and the related wage determination decisions of the Secretary of Labor.

OFFEROR personnel shall assist COMMISSION and local agencies in obtaining compliance with the safety and accident prevention provisions of the projects. Local agencies will retain jurisdictional control for traffic control.

All services required hereunder shall be performed in accordance with California Department of Transportation guidelines, regulations, policies, procedures, manuals, and standards, except as noted in the special provisions or superseded/augmented by Commission's procedures

Materials Testing: The number of field testing personnel assigned to the project will vary throughout the duration of the construction contract. OFFEROR personnel will be assigned as needed by the Resident Engineer to meet the schedule of the construction Contractor.

A field technician will be required throughout the construction contract period. At times, additional technicians may be required to provide support for on-going construction activities. The duration of assignments could vary from a minimum of a few days to the full term of the project. OFFEROR personnel will be available within two (2) days of written notification by COMMISSION.

It is the intent of COMMISSION to maintain a consistency of material testing quality throughout each phase of each project. OFFEROR is therefore encouraged to provide, wherever and whenever possible, the same field personnel for the duration of the project.

On days when work is not performed by the construction contractor, such as rainy or unsuitable weather days, OFFEROR will not provide services unless authorized by the COMMISSION Construction Manager.

Resumes of materials testing personnel shall be submitted to COMMISSION for review and approval prior to assignment to the Project. If, at any time, the level of

performance of any testing personnel is below expectations, COMMISSION may release that field person and request that another be assigned as needed.

If a member of OFFEROR's personnel is on a leave of absence, OFFEROR's project manager will provide an equally qualified replacement employee until the original member returns to work. The replacement employee will meet all the requirements of a permanently assigned employee.

All personnel will be knowledgeable of, and comply with, all applicable local, Caltrans, and federal regulations; cooperate and consult with COMMISSION and local agency officials during the course of the contract; and perform other duties as may be required to assure that the construction is being performed in accordance with permit requirements, the project plans and specifications. OFFEROR's personnel will keep records and document the work as directed by the Resident Engineer.

OFFEROR personnel shall assist COMMISSION and local agencies in obtaining compliance with the safety and accident prevention provisions of the project. Local agencies will retain jurisdictional control for local traffic control.

All services required hereunder will be performed in accordance with Caltrans regulations, policies, procedures, manuals, and standards as modified by the Commission's General Conditions and procedures.

Construction Surveying: OFFEROR will furnish surveying crew(s) to perform construction surveys for the project. The number of survey crew(s) assigned to the project will vary throughout the duration of the construction contract. OFFEROR personnel will be assigned as needed by the Resident Engineer to meet the schedule of the construction contractor.

It is the intent of COMMISSION to maintain a consistency of construction survey quality throughout each phase of each project. Therefore, OFFEROR is encouraged to provide the same field personnel for the duration of construction. It is important that the Field Party Chief(s) assigned to a project be completely familiar with the survey control and staking requirements established for the project.

Construction surveying will not be performed when conditions such as weather, traffic, and other factors prevent safe and efficient operation.

Resumes of OFFEROR personnel and certification must be submitted to COMMISSION for review. OFFEROR personnel must be approved by COMMISSION prior to assignment to a project. COMMISSION and OFFEROR will have the responsibility of determining the quality and quantity of work performed by OFFEROR personnel. If, at any time, the level of performance by OFFEROR personnel is below expectations, COMMISSION may release the survey crew member and request that another be assigned.

If OFFEROR's survey crew personnel assigned to the project is on a leave of
Exhibit A-5

absence, the Project Manager will provide an equally qualified replacement(s) until the original employee(s) returns to work. The replacement will be required to meet all the requirements of the permanently assigned employee.

OFFEROR personnel will:

- Be knowledgeable of, and comply with all, applicable local, Caltrans, state, and federal regulations.
- Cooperate and consult with COMMISSION officials during the course of the contract.
- Perform duties as may be required to assure construction is performed in accordance with the project plans and specifications.
- Keep contemporaneous records and document work as directed by the Resident Engineer.

All services required hereunder will be performed in accordance with Caltrans regulations, policies, procedures, manuals, and standards as modified by the Commission's General Conditions and procedures.

Environmental Services: OFFERER will furnish environmental personnel to implement, monitor and document compliance throughout the duration of the construction contract and post construction. The number of environmental personnel assigned to the project will vary throughout the duration of the construction contract. OFFEROR personnel will be assigned as needed by the Resident Engineer to meet the schedule of the construction Contractor.

A qualified biologist will be required throughout the construction contract period. At times, additional environmental personnel including but not limited to a biologist, cultural monitor, archeologist, and paleontologist may be required to provide support for on-going environmental commitment activities. The duration of assignments could vary from a minimum of a few days per month to the full term of the project and post construction. OFFEROR personnel will be available within two (2) days of written notification by COMMISSION.

It is the intent of COMMISSION to maintain consistency of implementing, monitoring and documenting environmental commitments throughout the construction of the project. OFFEROR is therefore encouraged to provide, wherever and whenever possible, the same field personnel for the duration of the project.

On days when work is not performed by the construction contractor, such as rainy or unsuitable weather days, OFFEROR will not provide services unless authorized by the COMMISSION Construction Manager.

Resumes of materials for biologists, archeologists and associate personnel shall be submitted to COMMISSION for review and approval prior to assignment to the Project. If, at any time, the level of performance of any testing personnel is below expectations, COMMISSION may release that field person and request that another

be assigned as needed.

If a member of OFFEROR's personnel is on a leave of absence, OFFEROR's project manager will provide an equally qualified replacement employee until the original member returns to work. The replacement employee will meet all the requirements of a permanently assigned employee.

All personnel will be knowledgeable of, and comply with, all applicable local, Caltrans, and federal regulations; cooperate and consult with COMMISSION and local agency officials during the course of the contract; and perform other duties as may be required to assure that the construction is being performed in accordance with permit requirements, the project plans and specifications. OFFEROR's personnel will keep records and document the work as directed by the Resident Engineer.

OFFEROR personnel shall assist COMMISSION and local agencies in obtaining compliance with the safety and accident prevention provisions of the project. Local agencies will retain jurisdictional control for local traffic control.

All services required hereunder will be performed in accordance with Caltrans regulations, policies, procedures, manuals, and standards as modified by the Commission's General Conditions and procedures.

Duties and Responsibilities

1. Pre-construction Services

a. Plan Review

OFFEROR shall review construction contract documents prior to construction. Tasks include review of plans, specifications, technical reports, Resident Engineer's pending files, and associated items in order to verify completeness and consistency throughout the Project. At a minimum, OFFEROR shall check for quantity discrepancies, potential conflicts, constructability, and consistency between plans, specifications and pay items. OFFEROR'S plan review shall include a review of various discipline plans (e.g., layout, drainage, bridge, landscaping, electrical, etc.) for conflicting or missing information.

b. Schedule

OFFEROR shall review the proposed Project schedule, compare it to the Project plans and specifications, and provide recommendations to COMMISSION, as appropriate, to ensure efficiency of Contractor and OFFEROR operations and safe and expeditious completion of the Project.

c. Budget

OFFEROR shall review the Project estimate and provide recommendations to COMMISSION, as appropriate, to ensure efficient utilization of funds and control of project costs.

2. Bid Process

a. Bid Documents

OFFEROR shall assist COMMISSION, as requested, with the following tasks:

- 1) Review of bid documents
- 2) Review bid questions and draft responses
- 3) Prepare bid tabulations

b. Pre-construction Meetings

OFFEROR shall assist COMMISSION in conducting one or more, pre-construction meetings with all involved parties on the Project. Parties may include, but are not limited to, the Contractor, the design engineer, Caltrans, county, cities, utility companies, and developers.

c. Contract Award

OFFEROR shall assist COMMISSION, as requested, with the following tasks:

- 1) Review bids for completeness and responsiveness
- 2) Perform bid analysis
- 3) Check Contractor references, licenses, insurance, and sureties
- 4) Coordinate with prospective Contractor for award of construction contract.

All processes will be consistent with procedures outlined by Caltrans for Special Funded Programs.

3. Project Administration

- a. OFFEROR shall administer the project construction contract using Caltrans Construction Manual as a guideline.
- b. OFFEROR shall conduct regular project coordination meetings with Contractor, COMMISSION, local agencies, and design engineer, as appropriate.
- c. OFFEROR shall prepare Contractor progress payments and maintain payment records and supporting documentation. All progress payments shall be reviewed by COMMISSION for approval.
- d. OFFEROR shall establish and maintain Project records. Project record keeping shall include, but are not limited to, RE and Assistant RE daily reports, correspondence, memoranda, contract documents, requests for information (RFIs), change orders, claims, COMMISSION and engineer directives, meeting minutes, shop drawings, supplementary drawings, review and approval of submittals, schedule reviews and preparation of weekly working day statements, quantity calculations and/or documented field measurement/count and Daily Extra Work Reports that support progress payments. OFFEROR shall maintain a record of the names, addresses, and telephone and fax numbers of the Contractors, subcontractors, and principal material suppliers.
- e. OFFEROR shall establish and maintain a filing system for each Project using the Caltrans Construction Manual as a guideline. OFFEROR shall transmit certain project records to the Commission using either e-Rooms or InfoWorks, an electronic transfer and collection system. (Commission will train OFFEROR in the requirements and use of the system.)
- f. OFFEROR shall monitor Contractors' construction schedules on an ongoing basis and alert COMMISSION to conditions that may lead to delays in completion of the Project.
- g. OFFEROR shall prepare and submit a Monthly Report for the project. The Monthly Report shall describe construction activity, accomplishments, issues and status of submittals, RFIs, Change Orders and the project budget and schedule status against approved Baseline Schedule. A minimum of four (4) construction photos shall be submitted.
- h. OFFEROR shall review and ensure compliance with environmental requirements.
- i. OFFEROR shall participate in partnering sessions with the Contractor,

COMMISSION, and Local Agencies, if required.

- j. COMMISSION has adopted a Quality Assurance Plan (QAP) for its Highway Capital Projects. Upon award, the successful OFFEROR shall request a copy of the COMMISSION's QAP to ensure compliance during the Project. The COMMISSION's QAP is incorporated herein by reference. OFFEROR shall also assure that the Project meets all provisions of the Caltrans Quality Assurance Program Manual. OFFEROR shall prepare and submit a project-specific Quality Assurance Plan (QAP) to the COMMISSION for review and approval. The QAP shall be reviewed quarterly and updated as necessary. All OFFEROR'S project personnel shall indicate their review of the QAP by signature.
- k. OFFEROR shall develop a Quality Management Plan (QMP) in accordance with the Construction Manual Supplement for Local Agency Resident Engineers and the Local Agency Structure Representative Guidelines.
- l. OFFEROR is responsible for source inspection. OFFEROR shall develop a Source Inspection Quality Management Plan (SIQMP).
- m. OFFEROR shall review Contractors' certified payroll records and other labor compliance records and assure the construction Contractor's compliance with Contract requirements
- n. OFFEROR shall monitor and maintain records to assure that the construction Contractor complies with all provisions of the Storm Water Pollution Prevention Plan (SWPPP).
- o. OFFEROR shall assure that the Project meets all applicable regulations of the Air Quality Management District (AQMD).

4. Construction Coordination

- a. OFFEROR shall provide a minimum of one qualified Senior Resident Engineer and other qualified Resident Engineers, as needed to effectively manage the Project.
- b. OFFEROR Resident Engineer shall act as the prime point of contact between Contractor, COMMISSION, OFFEROR's construction surveyor, OFFEROR's materials inspector, OFFEROR's public outreach, and utility companies. OFFEROR may, when requested by COMMISSION, act as point of contact between design engineers, cities, and the public.
- c. OFFEROR shall maintain regular contact with COMMISSION's Construction Manager.
- d. OFFEROR shall coordinate relocations and arrangements for power for the

site with utility companies and their designees. ,

- e. OFFEROR shall review Project plans and special provisions for possible errors and deficiencies prior to construction of any specific element and report such findings to COMMISSION. Should COMMISSION determine that changes are necessary, OFFEROR shall process and implement change orders in accordance with contract documents.
- f. OFFEROR shall provide all required monitoring, coordination, and tracking of construction progress to ensure the Project proceeds on schedule and according to the order of work in the plans and special provisions. OFFEROR shall expedite work, as required, to maintain schedule in conjunction with the overall construction staging program.
- g. OFFEROR shall review shop drawings, coordinating with the Source Inspection Project Manager and Division of Structures as appropriate. OFFEROR shall coordinate resolution of Requests for Information (RFI) with the Commission's designer and communicate actions and status with the Commission's Construction Manager. OFFEROR shall log and track all submittals and requests.
- h. OFFEROR shall provide a qualified SWPPP coordinator who shall review Contractor-prepared Storm Water Pollution Prevention Plans (SWPPP) and coordinate approval with COMMISSION. OFFEROR shall cooperate with monitoring agency inspections and field reviews.
- i. OFFEROR shall coordinate the implementation of any changes with the Construction Manager and the design engineer. All change orders shall be prepared using Commission's format and procedures. All change orders will be submitted to Caltrans (on the State Highway System) and the Commission for approval.
- j. OFFEROR shall review and approve falsework, shoring and other temporary work plans.
- k. OFFEROR shall review and approve Traffic Control Plans and forward to local jurisdictions for approval as necessary.
- l. OFFEROR shall coordinate all Project construction activities with other on-going projects within and adjacent to the Project limits.

OFFEROR shall review existing highway electrical and traffic systems arrangements with Caltrans and arrange, through the construction Contractor, any temporary facilities required during construction.

5. Construction Inspection

- a. OFFEROR shall coordinate all required inspections necessary for the Project. OFFEROR shall ensure that appropriate City and local agencies are notified and present as required throughout the Project. OFFEROR shall notify COMMISSION immediately regarding any directives, recommendations, notices, etc. received from agencies other than COMMISSION before taking action.
- b. OFFEROR shall perform and document daily on-site inspections of the progress and quality of construction to determine if the work being performed is in general conformance with the contract documents, permits, all applicable laws, codes, and ordinances.
- c. OFFEROR shall exercise reasonable care and diligence to discover and promptly report to COMMISSION any and all defects or deficiencies in the materials or workmanship used in the Project.
- d. OFFEROR personnel assigned to the Project shall be thoroughly familiar with Caltrans Standard Specifications, Caltrans Standard Plans, and Caltrans Erosion Control and Highway Planting requirements. OFFEROR personnel shall have the ability to read and interpret construction plans and specifications. OFFEROR personnel shall also have knowledge of State of California Construction Safety Orders (CalOSHA) and traffic control practices as specified in the Work Area Traffic Control Handbook (WATCH). In addition, OFFEROR personnel shall be familiar with the construction requirements of Storm Water Pollution Prevention Program.
- e. Assignments to be performed by OFFEROR personnel shall include, but are not limited to, the following:
 - 1) Earthwork inspection including source and quality of imported and/or fill material and compaction; subgrade and paving inspection including checking alignment and grade; structure work inspection including foundation construction [piling], structure element formwork, reinforcing and prestressing steel installation, concrete placement; prestressing; joint seal; and barrier layout and inspection; subsurface and finish drainage system inspection; signing and striping inspection; electrical and highway traffic system inspection; landscape hardscape, soil amendment, planting and irrigation installation inspection; fencing, temporary and permanent traffic barriers and device inspection; monitor construction traffic control and detours, and any other duties that may be required to determine that construction of the Project is being performed in accordance with the contract documents.
 - 2) Identifying actual and potential problems associated with the Project

and recommending sound engineering solutions.

- 3) Arrange testing in accordance with Caltrans highway materials testing and planting procedures. Arrange for necessary corrective work, as required. Provide comprehensive materials records including materials sources, inspection & test results and documented compliance with specifications.
- 4) Maintaining awareness of safety and health requirements. Monitoring Contractors' compliance with applicable regulations and construction contract provisions for the protection of the public and Project personnel.
- 5) Preparing complete and accurate daily reports, calculations, project records, payment quantity documents, reports, and correspondence related to Project activities. Documents shall be sufficient to support actual cost of force account work.
- 6) Preparing construction sketches, drawings, and cross-sections, as necessary.
- 7) Keep records of all deviations from the approved plans to assist the Design Engineer in the preparation of as-built plans. Provide final clearance dimensions from roadways to bridge soffits.
- 8) Providing inspections for environmental compliance. Coordinate with third-party consultants or stake holders for special monitoring or inspections and disposal of hazardous material, if required.
- 9) Maintaining awareness of water discharge requirements. Monitoring Contractors' compliance with applicable regulations and construction contract provisions.
- 10) Monitoring Contractors' compliance with applicable regulations required by AQMD.
- 11) Coordinate Contractor's lane and/or freeway traffic closures with Caltrans and the CHP including, when necessary, the provision of CHP services for COZEEP operations. Maintain records of COZEEP participation to support the Commission's payment process for the CHP.
- 12) Monitor work associated with Temporary Construction Easements and communicate with land owners through the Commission's representatives.
- 13) Other duties as may be required or reasonably requested.

6. **Project Support**

a. Construction Surveys

OFFEROR shall perform construction surveying services, field calculations, and home office calculations to support construction of the projects. OFFEROR may be requested to review available survey data, construction plans, and right-of-way plans to confirm compatibility and to identify discrepancies prior to and during construction of proposed projects. The survey effort shall assist the Construction Management team in all phases of construction. The Resident Engineer will assign survey work by issuing a "Request for Survey Services". Requests may include, but not be limited to, the following types of surveys and related services:

1) Construction Surveys

Survey calculations and adjustments shall be performed with established and computed coordinates based on the California Coordinate System.

Cross-section data collection shall be performed by conventional and terrain line interpolation survey methods.

Survey data will include topography, cross-section, and other survey data in computer formats compatible with the Caltrans computer survey and design systems.

Prepare and maintain survey documents. Survey documents include survey field notes, maps, drawings, and other survey documents.

Perform construction staking, including but not limited to:

- Utility locations
- Clearing limits
- TCE and R/W limits
- Slope staking
- Storm drain, sanitary sewer, and irrigation systems
- Drainage structures
- Curbs, gutters, and sidewalk
- Horizontal and vertical control for structures and portions of structures (bents, abutments, wingwalls, retaining walls, soundwalls, etc.)
- Rough grade
- Finish grade

Monitor foundation embankments for settlement, if required

Provide measurements to support earthwork quantity calculations

Global Positioning Satellite (GPS) equipment shall be made available if required by the COMMISSION

2) Right of Way Lines

Existing right of way will be established from Local Agency's record information and existing monumentation.

- Right of way monumentation shall be renewed and restored in accordance with Section 10.4 of the Caltrans "Survey Manual" and the State of California Land Surveyor's Act.
- Corner records and records of surveys shall be prepared and filed in accordance with the applicable standards and the State of California Land Surveyor's Act.
- Perpetuate existing monumentation. Includes restoring, renewing, referencing, and resetting existing boundary related monumentation. In addition, stake areas where construction disturbs the existing right of way, preparing and filing required maps and records.
- Right of Way Surveys. Includes research and preparation filing of required maps and records. In addition, locate and set monuments for right of way and staking for right of way fences.
- Final monumentation. Includes setting of centerline points of control upon completion of construction.

3) Special Design – Data Surveys

Includes drainage, utility, and surveys required for special field studies.

b. Materials Testing and Geotechnical Services

OFFEROR will provide experienced personnel, equipment, and facilities to perform various construction materials sampling and testing. Laboratory and field materials testing will be used to ensure that structure and roadway construction work conforms to California State Department of Transportation (Caltrans) standards, specifications, and special provisions for material quality and workmanship.

All field and laboratory testing shall be performed in accordance with California Test Methods.

OFFEROR will be responsible for the accuracy and completeness of all test data compilation and results.

c. Public Relations

OFFEROR shall retain a public relations firm to implement a public outreach program for the project. OFFEROR shall coordinate public awareness for the project with COMMISSION in conjunction with the local agencies. The OFFEROR will manage all public awareness activities for this project. OFFEROR's public relations firm will be responsible for but not limited to the following outreach activities:

- Attend construction meetings
- Dissemination of traffic advisories in both English and Spanish
- Identify and list key governmental officials, agencies, schools, hospitals, fire and law enforcement officials
- Establish and maintain a public inquiry system
- Respond to public inquiries/calls
- Organize ground breaking and ribbon cutting ceremonies
- Update project information bulletins at the completion of major project milestones
- Develop and maintain project information on the Commission's website

d. Permits

OFFEROR shall review the project for permit compliance and coordinate with COMMISSION and the design engineer to ensure that necessary permits are obtained. OFFEROR shall assist COMMISSION in the coordination, timely processing and verification of approval for all permits. OFFEROR shall maintain permits and permit documentation on site.

e. Environmental Commitments Record (ECR)

OFFEROR shall review the project ECR and provide services to ensure that environmental commitments are implemented, monitored and documented. OFFERORs Environmental Service firm will be responsible but not limited to the following activities:

- If buried cultural resources are encountered during construction, OFFEROR shall provide a qualified archaeologist to evaluate the significance of the find.
- If required, provide coordination in preparation Native American monitoring agreements as well as implementation, coordination and scheduling of Native American monitors during construction.
- A Paleontological Mitigation Report discussing findings and analysis will be prepared by a principal paleontologist upon completion of project earthmoving. The report will be included in the environmental project file and also submitted to a designated curation facility.
- Prior to clearing or construction, a qualified biologist shall designate Environmentally Sensitive Areas (ESAs) as outlined in the ECR to be preserved.
- A qualified biologist will monitor construction for the duration of the

project to ensure that vegetation removal, Best Management Practices (BMPs), Environmentally Sensitive Area (ESA) and all avoidance and minimization measures are properly implemented, constructed and followed.

- A qualified Biologist shall prepare monthly reports documenting the monitoring activities.
- Prior to construction, a qualified biologist will conduct a training session for all construction personnel to provide avoidance measures and identification of species of concern and its habitats as well as compliance with Multi Species Habitat Conservation Plan (MSHCP) and the Endangered Species Act.
- Biological monitor personnel shall review limits of disturbance prior to initiation of construction activities.
- Provide a focused survey and documentation and monitoring for plant species and animal species as outlined in the ECR prior to and during construction.
- Perform focused preconstruction nesting bird surveys and monitor implementation of avoidance and mitigation measures as required in ECR.
- Qualified biologist will monitor daytime and nighttime activities as required in ECR.
- Qualified biologist will monitor all work performed in areas functioning or with potential function to wildlife crossing or linkage.
- Provide a qualified agency approved bat biologist to perform detailed field review and surveys, monitoring and reporting as outlined in ECR.
- Conduct pre-construction and pre-ground disturbance surveys and reporting for burrowing owls as outlined in MSHCP and ECR.
- Provide protocol documentation and burrowing owl management plan and agency approval of plan for burrowing owl presence as outlined in ECR.
- Conduct pre-construction focused Lease Bells Vario surveys
- Follow all avoidance, mitigation or minimization measures of Threatened and Endangered species and Invasive species as outlined in the ECR.

7. Cost and Schedule

a. OFFEROR shall prepare and track the following:

1. Contract pay item quantities, materials-on-hand and progress payments
2. Extra work/Compensation adjustment payments
3. Contract change orders
4. Supplemental work items
5. Agency-furnished and/or State-furnished materials
6. Contingency balance

7. Project budget
 8. Anticipated final cost
- b. OFFEROR shall review and monitor Contractor's schedule and inform COMMISSION of any significant changes or deviations in the schedule.
 - c. OFFEROR shall provide and maintain a Project staffing plan of field office personnel. In cooperation with COMMISSION, the staffing plan shall be periodically updated to reflect Project progress and needs.

8. Contract Change Orders and Claims

- a. OFFEROR shall receive and evaluate requests for changes and/or substitutions by the Contractor. Contract Change Orders submitted to COMMISSION shall be accompanied by OFFEROR recommendations. Where applicable, OFFEROR shall convey proposed changes to design engineer, Caltrans Oversight Engineers or other project principals. If the requested changes are accepted, OFFEROR shall negotiate and prepare appropriate Contract Change Orders.
- b. OFFEROR shall attempt to avoid all unnecessary Contract Change Orders. When a Contract Change Order is necessary, OFFEROR shall consult with COMMISSION prior to its preparation. Unless directed otherwise by COMMISSION, the preferred method of payment for Contract Change Orders should be as follows:
 1. Agreed Price
 2. Adjustment in compensation to a bid item
 3. Time and materials or Force Account
- c. OFFEROR shall attempt to identify all potential claims, track and monitor unresolved claims, and implement claims avoidance processes.
- d. OFFEROR shall assist COMMISSION, as requested, in the identification, resolution, and final disposition of claims filed by the Contractor or third parties against COMMISSION or the Project.

9. Safety

In addition to the requirements specified elsewhere in this agreement, the following shall also apply:

- a. OFFEROR shall implement a comprehensive safety program including preparation of a project-specific Accident/Illness Prevention Plan and conduct regular tail-gate safety meetings for OFFEROR personnel. OFFEROR shall provide a monthly report of traffic and site safety incidents, accidents and issues to the COMMISSION as part of the Monthly Report.

- b. OFFEROR shall comply with State of California Construction Safety Orders and provisions of the Caltrans Construction Manual.
- c. OFFEROR shall provide appropriate safety training for all OFFEROR field personnel.
- d. OFFEROR shall provide all necessary safety equipment as required for OFFEROR personnel.

10. Project Close Out

- a. OFFEROR shall prepare a list of items to be completed and/or corrected by the Contractor for final completion of the Project.
- b. OFFEROR shall collect and furnish as-built information to the design engineer for preparation of as-built drawings including utility locations, electrical system element locations and system requirements, prestressing drawings and pile logs, as applicable.
- c. OFFEROR shall review and verify completeness of as-built drawings.
- d. OFFEROR shall conduct a final walk-through with COMMISSION, Caltrans, Local Agencies, Contractors, and design engineers.
- e. OFFEROR shall prepare final construction reports including the Project Completion Report in the format and content requirements set forth by the COMMISSION.
- f. OFFEROR shall prepare and deliver to COMMISSION all project files in hard copy and/or electronic format.
- g. OFFEROR shall assist COMMISSION and Contractor in obtaining final release of all project permits.

DELIVERABLES. NOTE: The OFFEROR shall maintain records as described below in the Construction Field Office. In addition, certain records shall be transmitted electronically as the work proceeds to the Commission using eRooms or InfoWorks per the Commissions procedures.

- a. Inspector daily reports, extra work diaries, Landscape Architect, and Resident Engineers' daily diaries environmental monitoring documentation.
- b. Monthly Project Activity Summary Reports.

- c. Monthly Contractor progress payments, back-up documentation, and Contractor payment records.
- d. Contractor final payment documents, delivered to COMMISSION no later than ten (10) working days after acceptance by COMMISSION of the completed construction project.
- e. Project Completion Report.
- f. All project files, project reports, correspondence, memoranda, shop drawings, project logs, schedule analyses and weekly working day statements, change order data, claims and claim reports, and Contractor payment records.
- g. Certified payrolls and fringe benefit statements for all employees, OFFEROR and Contractor, who are subject to the State and/or Federal prevailing wage rates.
- h. All material test results shall be provided in accordance with the applicable Standard Specifications and Special Provisions, and test methods. Failing tests shall be immediately reported to the Resident Engineer or Structures Representative. All test results shall be recorded on the appropriate forms. The test documents will be legible and show the identity of the tester where appropriate. A notebook containing all results will be kept. All test equipment shall be calibrated per California Test requirements and regularly verified.
- i. Unless otherwise specified in the survey request, the deliverables shall conform to the following:
 - 1. Survey points, lines, and monuments shall be established, marked, identified, and referenced as required by survey request and requirements herein.
 - 2. Survey notes, drawings, calculations, and other survey documents and information shall be completed as required by the survey request and the requirements herein.
- j. All original survey documents resulting from this contract, including original field notes, adjustment calculations, final results, and appropriate intermediate documents, shall be delivered to the Resident Engineer and shall become the property of COMMISSION. A copy of all survey documents furnished by COMMISSION shall be retained by OFFEROR for future reference.

When the survey is performed with a total station survey system, the original field notes shall be a hard copy in a readable format of the data (observations) as originally collected and submitted by the survey party. The hard copy shall be signed by the Party Chief. If the Party Chief is not licensed, the person in “responsible charge” will be required to sign.

- k. Survey deliverables shall follow the format specified below:
- Horizontal Control
 - Alpha numeric hard copy point listing with adjusted California Coordinate System northing and eastings and the appropriate descriptions.
 - Vertical Control
 - Alpha numeric hard copy benchmark listing with adjusted elevations compatible with the design datum.
 - Topography
 - Alpha numeric hard copy listing, hard copy drawing, and computer aided drawing and design (CADD) digital drawing. The CADD drawing shall be compatible with the systems utilized by Caltrans.

Data collection method used to collect cross-section data and the coding (feature description) of terrain data for cross-sections shall conform to the survey request requirements. Deliverables shall depend on the data collection method as follows:

- Conventional Cross – Sections (each cross – section):
For each cross - section and alpha numeric listing, a hard copy drawing, and a computer formatted file compatible with the systems utilized by Caltrans.
- Terrain Line Interpolation Cross – Section Data (each terrain line interpolation survey):
Terrain line interpolation cross – sections shall include an alpha numeric listing, a hard copy plan view drawing of the terrain lines, and a computer input file. The computer input file shall be provided in a format compatible with the systems utilized by Caltrans.

l. Data Collector Data

If specified in the survey request, the raw data from the data collector shall be provided in a format conforming to the survey request requirements

m. Other

As specified in the survey request.

Equipment and Materials to be provided by Offeror

1. OFFEROR will provide office space, telephones, desks, chairs, computers, and appropriate office equipment. One (1) office with a desk, chair, telephone, and computer with software and a laser printer (8½ x 11 & 11 x 17) will be reserved for the COMMISSION.
2. OFFEROR shall provide all necessary equipment including software, materials, supplies, miscellaneous tools, and safety equipment required for its personnel to perform the services accurately, efficiently, and safely. Only those items listed in Attachment B, OFFEROR Cost Proposal, shall be reimbursed by COMMISSION.
3. OFFEROR personnel shall provide vehicles for field personnel suitable for the location and nature of the work involved. Vehicles shall be equipped with flashing yellow lights, either permanently or temporarily affixed.
4. OFFEROR personnel shall be provided with a mobile radio, cellular phone, or other means to assure full-time communication. If a radio system is used, OFFEROR shall provide a base station at the field office.
5. OFFEROR personnel shall be provided with all applicable standard plans, specifications, and other standards as appropriate.
6. For Materials Testing, OFFEROR and its staff shall be fully equipped at all times to perform the services required, including but not limited to the following:
 - a. An on-site mobile laboratory or laboratory in close proximity to the project will be required. The type and location of the lab should be such that it can meet the needs of the project in an efficient, time effective manner. The laboratory shall be fully staffed, equipped, and supplied to conduct all required soils, materials, and concrete breaking tests in a timely manner.
 - b. OFFEROR's personnel will be provided with radios, mobile phones, or other means to assure full-time communication. OFFEROR vehicles will have flashing lights, visible from the rear, with a driver control switch. Vans without side windows will not be used. COMMISSION furnished magnetic logos will be affixed to each side of the vehicle at all times the vehicle is being used for the work under this agreement.

Each vehicle shall be fully contained with all necessary equipment and supplies necessary to perform the field sampling and tests required.

- c. Field personnel will be provided with all necessary safety equipment to permit work to be performed safely and efficiently within operating highway and construction zone environments.
- d. All equipment to be calibrated as per Section 3-10 and 3-11 of Caltrans' Quality Assurance Program Manual.
- 7. For construction surveying, OFFEROR and staff shall have adequate equipment and supplies to complete the required survey work. Equipment and supplies shall, include, but not be limited to:
 - a. Survey vehicles

Survey vehicles will be suitable to perform the required work in varying terrain and conditions encountered on the project. Vehicles shall be fully equipped with all necessary tools, instruments, supplies, and safety equipment required to perform the work accurately, efficiently, and safely. Vehicles shall be equipped with a flashing yellow beacon light.
 - b. Data Processing Systems

Data processing systems shall include hardware and software to:

 - Performing survey and staking calculations from the design plans and specifications;
 - Reduce survey data collected with conventional and total station survey systems;
 - Perform network adjustments for horizontal and vertical control surveys;
 - Format survey data to be compatible with the Caltrans computer survey and data system.
 - c. Drafting equipment and supplies.
 - d. Digital calculators.
 - e. Hand tools as appropriate for the requested survey work.
 - f. Traffic cones (minimum 25). Traffic cones shall be 28 inches in height (minimum).
 - g. Traffic control devices as required to perform the requested survey work. Traffic control devices include signs, sign bases, flags, and hand held signs.
 - h. Leveling instruments and equipment:

- Self-leveling level. Precision: standard deviation in one mile of double run leveling 0.005 feet or less.
 - Suitable level rods for the work to be performed.
- i. Distance measuring instruments and equipment:
- Electronic distance measurer (EDM). Precision: standard deviation 3 mm plus 3 PPM, or less; Range: Minimum one mile under average atmospheric conditions.
 - Prisms, sufficient to perform the required work.
 - Tapes; steel, cloth.
- j. Angle measuring instruments and equipment:
- Theodolite for non-control surveys; Precision: direct circle reading to three seconds, or equivalent, horizontal and vertical.
 - Targets as required to perform the work.
- k. When required for efficient survey operations, total station survey systems consisting of an electronic angle measuring instrument, EDM, and electronic data collector shall be provided. The angle measuring instruments and EDM shall conform to the requirements for the equipment previously listed.
- l. Radio or cellular communications equipment for communication between field office and field crews.
- m. Caltrans manuals, standards, forms, and other policies and procedures to be followed to perform the required work.

Materials to be Furnished by Commission

1. COMMISSION will provide copies of all Project construction documents including plans, special provisions, reports, designer prepared resident engineer files, and contracts.
2. COMMISSION will provide copies of all previously secured permits and Project authorizations.
3. Magnetic COMMISSION logos to be affixed to OFFEROR vehicles.

Standards

All construction inspection, surveys, materials sampling and testing, and contract administration shall be in accordance with the Contract documents and current Caltrans Manuals including:

1. Construction Manual and its revisions
2. Bridge Construction Records and Procedures Manual
3. Quality Assurance Program Manual
4. Manual of Traffic Controls for Construction and Maintenance Work Zones
5. Caltrans Standard Specifications and Standard Plans
6. Caltrans Storm Water Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual
7. Manual of Test (3 volumes)
8. Survey Manual
9. District 8 Standard Staking Procedures Manual

Work not covered by the manuals shall be performed in accordance with accepted professional standards.

Surveys performed by OFFEROR shall conform to the requirements of the Land Surveyor's Act. In accordance with the Land Surveyor's Act, "responsible charge" for the work shall reside with the Licensed Land Surveyor or a pre-January 1, 1982, Registered Professional Civil Engineer in the State of California.

Unless otherwise specified in the survey request, control surveys shall conform to second order (modified) accuracy standards as specified in the Caltrans "Survey Manual".

Additional standards for specific survey work may be included in the applicable request for survey. Such standards supplement the standards specified herein. If additional standards conflict with the standards specified herein, the "Survey Request's" standard shall govern.

The Resident Engineer and COMMISSION will decide all questions which may arise as to the quality or acceptability of deliverables furnished and work performed for this agreement. Any OFFEROR employee who does not perform adequately will be replaced if directed by the COMMISSION Construction Manager.

Availability and Work Hours

The typical workday includes all hours worked by COMMISSION's construction Contractor. The construction Contractor's operations may be restricted to specific hours during the week, which will become the normal workday for OFFEROR's personnel. On days when work is not performed by the construction contractor, such as rainy or unsuitable weather days, OFFEROR services will not be provided unless authorized by the COMMISSION Construction Manager.

Unless otherwise directed by COMMISSION, the normal work week will consist of 40 hours. From time to time, overtime may be required. However, overtime will be worked only when approved in writing by COMMISSION.

Limitations to Authority

OFFEROR does not have the authority to:

1. Authorize deviations from the contract documents.
2. Approve substitute materials or equipment; except as authorized in writing by COMMISSION.
3. Conduct or participate in tests or third party inspections; except as authorized in writing by COMMISSION.
4. Assume any of the responsibilities of the Contractors, Contractors' Superintendent, or subcontractors.
5. Exercise control over or be responsible for construction means, methods, techniques, sequences, procedures, or safety precautions.
6. Communicate directly with subcontractors or material suppliers without the prior consent of the Contractor.
7. Verbally authorize or approve change orders or extra work for the Project.
8. Offer or receive incentives, inducements, or other forms of enumeration to or from the Contractor to perform services or work outside the terms of any executed contracts for this Project.

Third Party Relationships

This Agreement is intended to provide unique services for a specific project. In the development of the Project, COMMISSION has worked closely with

various agencies and others in the preparation of the construction documents and other Project related materials. COMMISSION, however, is solely responsible for and will be the sole point of contact for all contractual matters related to the Project. OFFEROR shall take direction **only** from COMMISSION and shall regularly inform **only** COMMISSION of Project progress, outstanding issues, and all Project related matters.

During the course of the Project, OFFEROR may find occasion to meet with City or County representatives, the design engineer, Project Offerors, or other third parties who have assisted with the Project. These entities may, from time to time, offer suggestions and/or recommendations regarding the Project or elements of the Project. While COMMISSION enjoys a close relationship with and has considerable confidence in the capabilities of these other parties, OFFEROR shall not act on any suggestions, solicited or unsolicited, without obtaining specific direction from COMMISSION. All oral and written communication with outside agencies or Offerors related to the project shall be directed only to COMMISSION. Distribution of Project related communication and information shall be at the sole discretion of COMMISSION representatives.

Construction Site Safety

In addition to the requirements specified elsewhere in this agreement, the following also will apply:

1. OFFEROR will conform to the safety provisions of the Caltrans Construction Manual.
2. OFFEROR's field personnel will wear white hard hats with proper suspension, orange vests with reflective tape, sleeved shirt, long pants, and leather boots with ankle support and rubber soles at all times while working in the field.
3. OFFEROR will provide appropriate safety training for all OFFEROR's personnel.
4. All safety equipment will be provided by OFFEROR.

Basis for Survey and Monument Staking

COMMISSION will designate the existing horizontal and vertical control monuments that are the basis of OFFEROR performed surveys. COMMISSION will provide the California Coordinate System values and/or elevation values for these monuments. OFFEROR shall adjust OFFEROR performed surveys to be the designated control monuments and the values.

Monuments established by OFFEROR shall be marked by OFFEROR

with furnished disks, plugs, tags. In addition, OFFEROR shall identify OFFEROR established monuments by tagging or stamping the monuments with the license or registration number of OFFEROR'S surveyor who is in "responsible charge" of the work.

Personnel Qualifications and Responsibilities

The quantity and qualifications of field personnel to be assigned will be determined by the scope of the Project and the degree of difficulty of required tasks to be performed. All personnel and personnel assignments shall be subject to approval by COMMISSION.

EXHIBIT "B"

SCHEDULE OF SERVICES

[attached behind this page]

DRAFT

EXHIBIT "C"

COMPENSATION PROVISIONS

[attached behind this page]

EXHIBIT "D"

FEDERAL DEPARTMENT OF TRANSPORTATION
FHWA AND CALTRANS REQUIREMENTS

[attached behind this page]

DRAFT

1. STATEMENT OF COMPLIANCE.

A. Consultant's signature affixed herein shall constitute a certification under penalty of perjury under the laws of the State of California that CONSULTANT has, unless exempt, complied with, the nondiscrimination program requirements of Government Code Section 12990 and Title 2, California Administrative Code, Section 8103.

B. During the performance of this Agreement, Consultant and its subconsultants shall not unlawfully discriminate, harass, or allow harassment against any employee or applicant for employment because of sex, race, color, ancestry, religious creed, national origin, physical disability (including HIV and AIDS), mental disability, medical condition (e.g., cancer), age (over 40), marital status, and denial of family care leave. Consultant and subconsultants shall insure that the evaluation and treatment of their employees and applicants for employment are free from such discrimination and harassment. Consultant and subconsultants shall comply with the provisions of the Fair Employment and Housing Act (Gov. Code §12990 (a-f) et seq.) and the applicable regulations promulgated there under (California Code of Regulations, Title 2, Section 7285 et seq.). The applicable regulations of the Fair Employment and Housing Commission implementing Government Code Section 12990 (a-f), set forth in Chapter 5 of Division 4 of Title 2 of the California Code of Regulations, are incorporated into this Agreement by reference and made a part hereof as if set forth in full. Consultant and its subconsultants shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other Agreement.

C. If this Agreement is federally funded, the Consultant shall comply with regulations relative to Title VI (nondiscrimination in federally-assisted programs of the Department of Transportation – Title 49 Code of Federal Regulations, Part 21 - Effectuation of Title VI of the 1964 Civil Rights Act). Title VI provides that the recipients of federal assistance will implement and maintain a policy of nondiscrimination in which no person in the state of California shall, on the basis of race, color, national origin, religion, sex, age, disability, be excluded from participation in, denied the benefits of or subject to discrimination under any program or activity by the recipients of federal assistance or their assignees and successors in interest.

D. If this Agreement is federally funded, the Consultant, with regard to the work performed by it during the Agreement shall act in accordance with Title VI. Specifically, the Consultant shall not discriminate on the basis of race, color, national origin, religion, sex, age, or disability in the selection and retention of Subconsultants, including procurement of materials and leases of equipment. The Consultant shall not participate either directly or indirectly in the discrimination prohibited by Section 21.5 of the U.S. DOT's Regulations, including employment practices when the Agreement covers a program whose goal is employment.

2. DEBARMENT AND SUSPENSION CERTIFICATION

CONSULTANT's signature affixed herein, shall constitute a certification under penalty of perjury under the laws of the State of California, that CONSULTANT has complied with Title 2 CFR, Part 180, "OMB Guidelines to Agencies on Government wide Debarment and Suspension (nonprocurement)", which certifies that he/she or any person associated therewith in the capacity of owner, partner, director, officer, or manager, is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any federal agency; has not been suspended, debarred, voluntarily excluded, or determined ineligible by any federal agency within the past three (3) years; does not have a proposed debarment pending; and has not been indicted, convicted, or had a civil judgment rendered against it by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past three (3) years. Any exceptions to this certification must be disclosed to COMMISSION.

B. Exceptions will not necessarily result in denial of recommendation for award, but will be considered in determining CONSULTANT responsibility. Disclosures must indicate to whom exceptions apply, initiating agency, and dates of action.

C. Exceptions to the Federal Government Excluded Parties List System maintained by the General Services Administration are to be determined by the Federal highway Administration.

3. DISCRIMINATION

The Commission shall not discriminate on the basis of race, color, national origin, or sex in the award and performance of any DOT-assisted contract or in the implementation of the Caltrans DBE program or the requirements of 49 CFR Part 26. The Commission shall take all necessary and reasonable steps under 49 CFR Part 26 to ensure nondiscrimination in the award and administration of DOT-assisted contracts.

Consultant or subcontractor shall not discriminate on the basis of race, color, national origin, of sex in the performance of this Agreement. Consultant or subcontractor shall carry out applicable requirements of 49 CFR Part 26 and the Caltrans DBE program in the award and administration of DOT-assisted contracts, as further set forth below. Failure by the Consultant or subcontractor to carry out these requirements is a material breach of this Agreement, which may result in the termination of this Agreement or such other remedy, as the Commission deems appropriate.

4. PROMPT PAYMENT

Consultant agrees to pay each subcontractor under this prime contract for satisfactory performance of its contract no later than 10 days from the receipt of each payment the prime contractor receives from the Commission. Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of the Commission. This clause applies to both DBE and non-DBE subcontractors.

5. RELEASE OF RETAINAGE

No retainage will be withheld by the Agency from progress payments due the prime consultant. Retainage by the prime consultant or subconsultants is prohibited, and no retainage will be held by the prime consultant from progress due subconsultants. Any violation of this provision shall subject the violating prime consultant or subconsultants to the penalties, sanctions, and other remedies specified in Section 7108.5 of the California Business and Professions Code. This requirement shall not be construed to limit or impair any contractual, administrative, or judicial remedies, otherwise available to the prime consultant or subconsultant in the event of a dispute involving late payment or nonpayment by the prime consultant or deficient subconsultant performance, or noncompliance by a subconsultant. This provision applies to both DBE and non-DBE prime consultants and subconsultants.

6. LEGAL REMEDIES

In addition to those contract remedies set forth under relevant provisions of California law, either Party to this Agreement may, where applicable, seek legal redress for violations of this Agreement pursuant to the relevant provisions of 49 C.F.R. Parts 23 and 26, to the relevant federal or state statutory provisions governing civil rights violations, and to the relevant federal and state provisions governing false claims or "whistleblower" actions, as well as any and all other applicable federal and state provisions of law.

The Consultant shall include a provision to this effect in each of its agreements with its subcontractors.

7. DBE PARTICIPATION

Caltrans has developed a statewide DBE program pursuant to 49 C.F.R. Part 26. The requirements and procedures, as applicable, of the Caltrans DBE program are hereby incorporated by reference into this Agreement. Even if no DBE participation will be reported, Consultant shall complete Exhibits "E" of this Agreement in compliance with the Caltrans DBE program, and a final utilization report in the form provided by the Commission.

A. This Agreement is subject to Title 49, Part 26 of the Code of Federal Regulations entitled "Participation by Disadvantaged Business Enterprises in Department of Transportation Financial Assistance Programs." By obtaining DBE participation on this Agreement, Consultant will assist Caltrans in meeting its federally mandated statewide overall DBE goal.

B. This Agreement has a ____ DBE goal. The Consultant must meet the goal by committing DBE participation or document a good faith effort to meet the goal. If a DBE subconsultant is unable to perform, the Consultant must make a good faith effort to replace him/her with another DBE subconsultant, if the goal is not otherwise met. A DBE is a firm meeting the definition of a DBE as specified in 49 CFR.

C. DBE and other small businesses (SB), as defined in Title 49 CFR, Part 26 are encouraged to participate in the performance of agreements financed in whole or in part with federal funds. The Consultant, subrecipient or subconsultant shall not discriminate on the basis of race, color, national origin, or sex in the performance of this Agreement. The Consultant shall carry out applicable requirements of 49 CFR, Part 26 in the award and administration of US DOT- assisted agreements. Failure by the contractor to carry out these requirements is a material breach of this Agreement, which may result in the termination of this Agreement or such other remedy as the Commission, Caltrans or the Department of Transportation deems appropriate.

D. Any subcontract entered into as a result of this Agreement shall contain all of the provisions of this section.

E. A DBE may be terminated only with prior written approval from the Commission and only for the reasons specified in 49 CFR 26.53(f). Prior to requesting Commission consent for the termination, the prime consultant must meet the procedural requirements specified in 49 CFR 26.53(f).

8. DBE PARTICIPATION GENERAL INFORMATION

It is Consultant's responsibility to be fully informed regarding the requirements of 49 CFR, Part 26, and the Caltrans DBE program. Particular attention is directed to the following:

A. A DBE must be a small business firm defined pursuant to 13 CFR 121 and be certified through the California Unified Certification Program (CUCP).

B. A certified DBE may participate as a prime contractor, subcontractor, joint venture partner, as a vendor of material or supplies, or as a trucking company.

C. A DBE joint-venture partner must be responsible for specific contract items of work or clearly defined portions thereof. Responsibility means actually performing, managing and supervising the work with its own forces. The DBE joint venture partner

must share in the capital contribution, control, management, risks and profits of the joint-venture commensurate with its ownership interest.

D. A DBE must perform a commercially useful function, pursuant to 49 CFR 26.55 that is, must be responsible for the execution of a distinct element of the work and must carry out its responsibility by actually performing, managing and supervising the work, as more fully described in section 8 below.

E. The Consultant shall list only one subcontractor for each portion of work as defined in the Consultant's bid/proposal and all DBE subcontractors should be listed in the Consultant's bid/cost proposal list of subcontractors.

F. A Consultant who is a certified DBE is eligible to claim all of the work in the Agreement toward the DBE participation except that portion of the work to be performed by non-DBE subcontractors.

9. COMMERCIALLY USEFUL FUNCTION

A. A DBE performs a commercially useful function when it is responsible for execution of the work of the Agreement and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. To perform a commercially useful function, the DBE must also be responsible with respect to materials and supplies used on the Agreement, for negotiating price, determining quality and quantity, ordering the material, and installing (where applicable) and paying for the material itself. To determine whether a DBE is performing a commercially useful function, evaluate the amount of work subcontracted, industry practices; whether the amount the firm is to be paid under the Agreement is commensurate with the work it is actually performing, and other relevant factors.

B. A DBE does not perform a commercially useful function if its role is limited to that of an extra participant in a transaction, Agreement, or project through which funds are passed in order to obtain the appearance of DBE participation. In determining whether a DBE is such an extra participant, examine similar transactions, particularly those in which DBEs do not participate.

C. If a DBE does not perform or exercise responsibility for at least thirty percent of the total cost of its Agreement with its own work force, or the DBE subcontracts a greater portion of the work of the Agreement than would be expected on the basis of normal industry practice for the type of work involved, it will be presumed that it is not performing a commercially useful function.

10. DBE CERTIFICATION AND DE-CERTIFICATION STATUS

If a DBE subcontractor is decertified during the life of the Agreement, the decertified subcontractor shall notify the Contractor in writing with the date of de-certification. If a

subcontractor becomes a certified DBE during the life of the Agreement, the subcontractor shall notify the Contractor in writing with the date of certification. Any changes should be reported to the Commission's Contract Administrator within 30 days.

11. DBE RECORDS

A. The Contractor shall maintain records of materials purchased and/or supplied from all subcontracts entered into with certified DBEs. The records shall show the name and business address of each DBE or vendor and the total dollar amount actually paid each DBE or vendor, regardless of tier. The records shall show the date of payment and the total dollar figure paid to all firms. DBE prime Contractors shall also show the date of work performed by their own forces along with the corresponding dollar value of the work.

In addition to all other requirements, Consultant shall complete and submit, on a monthly basis, the Monthly DBE Payment form (Caltrans Exhibit 9-F of Chapter 9 of the LAPM).

B. Upon completion of the Agreement, a summary of these records shall be prepared and submitted on the most current version of the form entitled, "Final Report-Utilization of Disadvantaged Business Enterprises (DBE)," CEM- 2402F (Exhibit 17-F in Chapter 17 of the LAPM), certified correct by the Contractor or the Contractor's authorized representative and shall be furnished to the Commission's Contract Administrator with the final invoice. Failure to provide the summary of DBE payments with the final invoice will result in twenty-five percent (25%) of the dollar value of the invoice being withheld from payment until the form is submitted. The amount will be returned to the Contractor when a satisfactory "Final Report Utilization of Disadvantaged Business Enterprises (DBE)" is submitted to the Commission's Contract Administrator.

a. Prior to the fifteenth of each month, the Contractor shall submit documentation to the Commission's Contract Administrator showing the amount paid to DBE trucking companies. The Contractor shall also obtain and submit documentation to the Commission's Contract Administrator showing the amount paid by DBE trucking companies to all firms, including owner-operators, for the leasing of trucks. If the DBE leases trucks from a non-DBE, the Contractor may count only the fee or commission the DBE receives as a result of the lease arrangement.

b. The Contractor shall also submit to the Commission's Contract Administrator documentation showing the truck number, name of owner, California Highway Patrol CA number, and if applicable, the DBE certification number of the truck owner for all trucks used during that month. This documentation shall be submitted on the Caltrans "Monthly DBE Trucking Verification," CEM-2404(F) form provided to the Contractor by the Commission's Contract Administrator.

12. REPORTING MATERIAL OR SUPPLIES PURCHASED FROM DBEs

When Reporting DBE Participation, Material or Supplies purchased from DBEs may count as follows:

A. If the materials or supplies are obtained from a DBE manufacturer, 100 % of the cost of the materials or supplies will count toward the DBE participation. A DBE manufacturer is a firm that operates or maintains a factory or establishment that produces on the premises, the materials, supplies, articles, or equipment required under the Agreement and of the general character described by the specifications.

B. If the materials or supplies purchased from a DBE regular dealer, count 60 % of the cost of the materials or supplies toward DBE goals. A DBE regular dealer is a firm that owns, operates or maintains a store, warehouse, or other establishment in which the materials, supplies, articles or equipment of the general character described by the specifications and required under the Agreement, are bought, kept in stock, and regularly sold or leased to the public in the usual course of business. To be a DBE regular dealer, the firm must be an established, regular business that engages, as its principal business and under its own name, in the purchase and sale or lease of the products in question. A person may be a DBE regular dealer in such bulk items as petroleum products, steel, cement, gravel, stone or asphalt without owning, operating or maintaining a place of business provided in this section.

C. If the person both owns and operates distribution equipment for the products, any supplementing of regular dealers' own distribution equipment, shall be by a long-term lease agreement and not an ad hoc or Agreement-by-Agreement basis. Packagers, brokers, manufacturers' representatives, or other persons who arrange or expedite transactions are not DBE regular dealers within the meaning of this section.

D. Materials or supplies purchased from a DBE, which is neither a manufacturer nor a regular dealer, will be limited to the entire amount of fees or commissions charged for assistance in the procurement of the materials and supplies, or fees or transportation charges for the delivery of materials or supplies required on the job site, provided the fees are reasonable and not excessive as compared with fees charged for similar services.

13. REPORTING PARTICIPATION OF DBE TRUCKING COMPANIES

When Reporting DBE Participation, Participation of DBE trucking companies may count as follows:

A. The DBE must be responsible for the management and supervision of the entire trucking operation for which it is responsible.

B. The DBE must itself own and operate at least one fully licensed, insure, and operational truck used on the Agreement.

C. The DBE receives credit for the total value of the transportation services it provides on the Agreement using trucks it owns, insures, and operates using drivers it employs.

D. The DBE may lease trucks from another DBE firm including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provides on the Agreement.

E. The DBE may also lease trucks from a non-DBE firm, including an owner-operator. The DBE who leases trucks from a non-DBE is entitled to credit only for the fee or commission it receives as a result of the lease arrangement. The DBE does not receive credit for the total value of the transportation services provided by the lessee, since these services are not provided by the DBE.

F. For the purposes of this section, a lease must indicate that the DBE has exclusive use and control over the truck. This does not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, as long as the lease gives the DBE absolute priority for use of the leased truck. Leased trucks must display the name and identification number of the DBE.

14. DEBARMENT, SUSPENSION AND OTHER INELIGIBILITY AND VOLUNTARY EXCLUSION

In accordance with 49 CFR Part 29, which by this reference is incorporated herein, Consultant's subconsultants completed and submitted the Certificate of subconsultant Regarding Debarment, Suspension and Other Ineligibility and Voluntary Exclusion as part of the Consultant's proposal. If it is later determined that Consultant's subconsultants knowingly rendered an erroneous Certificate, the Commission may, among other remedies, terminate this Agreement.

15. ENVIRONMENTAL COMPLIANCE

A. Compliance with all applicable standards, orders, or requirements issued under section 306 of the Clean Air Act (42 U.S.C. 1857(h)), section 508 of the Clean Water Act (33 U.S.C. 1368), Executive Order 11738, and Environmental Protection Agency regulations (40 CFR part 15). (Contracts, subcontracts, and subgrants of amounts in excess of \$100,000).

B. Mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (Pub. L. 94-163, 89 Stat. 871).

16. NATIONAL LABOR RELATIONS BOARD CERTIFICATION

In accordance with Public Contract Code Section 10296, and by signing this Agreement, Consultant certifies under penalty of perjury that no more than one final unappealable finding of contempt of court by a federal court has been issued against Consultant within the immediately preceding two-year period, because of Consultant's failure to comply with an order of a federal court that orders Consultant to comply with an order of the National Labor Relations Board.

EXHIBIT “E”

CONSULTANT DBE COMMITMENT

[attached behind this page]

DRAFT

| Consultant to Complete this Section | | | |
|---|------------------------------------|------------------------|----------|
| 1. Local Agency Name: _____ | | | |
| 2. Project Location: _____ | | | |
| 3. Project Description: _____ | | | |
| 4. Consultant Name: _____ | | | |
| 5. Contract DBE Goal %: _____ | | | |
| DBE Commitment Information | | | |
| 6. Description of Services to be Provided | 7. DBE Firm Contact Information | 8. DBE Cert. Number | 9. DBE % |
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EXHIBIT “F”

DISCLOSURE OF LOBBYING ACTIVITIES

[attached behind this page]

DRAFT

AGENDA ITEM 11

| <i>RIVERSIDE COUNTY TRANSPORTATION COMMISSION</i> | |
|--|---|
| DATE: | November 26, 2018 |
| TO: | Western Riverside County Programs and Projects Committee |
| FROM: | Marlin Feenstra, Project Delivery Director |
| THROUGH: | Anne Mayer, Executive Director |
| SUBJECT: | Cooperative Agreement No. 19-33-004-006 between the Riverside County Transportation Commission and Southern California Regional Rail Authority for Construction of the Riverside Layover Facility Improvement Project |

STAFF RECOMMENDATION:

This item is for the Committee to:

- 1) Approve Cooperative Agreement No. 19-33-004-00 between the Commission and Southern California Regional Rail Authority (SCRRA) for the construction of the Riverside Layover Facility Improvement project (Project) for an amount not to exceed \$156,200, plus a contingency amount of \$15,800, for a total amount not to exceed \$172,000;
- 2) Authorize the Chair or Executive Director, pursuant to legal counsel review, to execute the cooperative agreement on behalf of the Commission;
- 3) Authorize the Executive Director or designee to approve the use of a contingency, as may be required for these services; and
- 4) Forward to the Commission for final action.

BACKGROUND INFORMATION:

The Commission and SCRRA wish to work together and have defined the roles and responsibilities related to the construction of the Project, which includes expansion of the existing North Layover Facility in the city of Riverside to accommodate three storage tracks with an overall storage capacity of three, six-car train sets. The existing layover facility can only accommodate one six-car train set and has limited maintenance facilities. This increased layover capacity is required for the projected near term and future increase in Metrolink ridership. The Project is located at the north end of the existing Riverside-Downtown Station on right of way owned by the Commission.

SCRRA was the lead agency on the design phase of the Project and requested that the Commission take the lead for the construction of the Project. The Commission will also be responsible for construction management and for funding construction of the Project. SCRRA will provide the following services related to the Project construction:

- a) Provide safety training to Project contractors and subcontractors;

- b) Locate and mark SCRRRA signal and communications cables within the Project area;
- c) Provide railroad protective services, including flagging, as required for the Project;
- d) Provide project management support as necessary to assist the Commission in construction of the Project, including attendance at construction meetings, management of work windows, coordination with SCRRRA's track and signal and communication maintenance contractors to support the Project, and coordination of all required SCRRRA interdepartmental support;
- e) Review and process contractor's right-of-entry permit application;
- f) Provide used rail for contractor installation for the Project; and
- g) Provide inspection of the tracks and facilities prior to Commission acceptance of the Project.

The Commission secured funding of \$5,332,444 for the Project under a Federal Transit Administration (FTA) grant and intends to use the FTA funding to reimburse SCRRRA for its services. Accordingly, the Commission and SCRRRA will expend these federal funds in compliance with federal requirements, as applicable. The cost of the SCRRRA services is estimated at \$156,200. The total Project cost estimate of \$5,330,000 includes the SCRRRA costs.

Staff recommends approval of Cooperative Agreement No. 19-33-004-00 between the Commission and SCRRRA for SCRRRA construction services required to support the construction of the Project for an amount not to exceed \$156,200, plus a contingency amount of \$15,800, for a total amount not to exceed \$172,000. Staff also recommends authorization for the Chair or Executive Director, pursuant to legal counsel review, to execute the agreement on behalf of the Commission and for the Executive Director or designee to approve the use of a contingency, as may be required for these services.

| Financial Information | | | | | |
|-----------------------------|---------------------------|-------|---------------------------|--------------------|-----------------------|
| In Fiscal Year Budget: | Yes N/A | Year: | FY 2018/19 FY 2019/20+ | Amount: | \$100,000 \$72,000 |
| Source of Funds: | FTA grant | | | Budget Adjustment: | No N/A |
| GL/Project Accounting No.: | 653822 81304 265 33 81301 | | | | |
| Fiscal Procedures Approved: | <i>Theresa Trevino</i> | | | Date: | 11/15/2018 |

Attachment: Draft Cooperative Agreement No. 19-33-004-00 with SCRRRA

COOPERATIVE AGREEMENT NO. 19-33-004-00

BETWEEN

RIVERSIDE COUNTY TRANSPORTATION COMMISSION

AND

SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY

FOR

CONSTRUCTION OF THE RIVERSIDE LAYOVER FACILITY IMPROVEMENT PROJECT

THIS COOPERATIVE AGREEMENT (Agreement) is effective this ____ day of _____ 2019, by and between the Riverside County Transportation Commission, a public agency, 4080 Lemon St, Riverside, California 92501 (hereinafter referred to as “COMMISSION” or “RCTC”), and the Southern California Regional Rail Authority, 900 Wilshire Blvd., Suite 1500, Los Angeles, CA 90017, a joint powers authority (hereinafter referred to as “SCRRA”), which are individually referred to as “Party”, and collectively referred to as “Parties”.

RECITALS:

WHEREAS, SCRRA is a five-county joint powers authority, created pursuant to California Public Utilities Code Section 130255 and California Government Code Section 6500 et seq., to build, maintain, administer, and operate the “METROLINK” commuter train system on railroad rights-of-way owned by the member agencies and through other shared use and joint operation agreements. The five-county member agencies are comprised of the following: Los Angeles County Metropolitan Transportation Authority (METRO), Ventura County Transportation Commission (VCTC), Orange County Transportation Authority (OCTA), San Bernardino San Bernardino County Transportation Authority (SBCTA), and Riverside County Transportation Commission (RCTC); and

WHEREAS, COMMISSION, as a public transportation agency and a member agency of SCRRA, and SCRRA wish to work together to define the roles and responsibilities related to construction of the Riverside Layover Facility Improvement Project (hereinafter referred to as

“PROJECT”) which includes expansion of the existing North Layover Facility in the City of Riverside to accommodate three storage tracks with an overall storage capacity of three, six-car train sets. The PROJECT is located at the north end of the existing Riverside-Downtown Station on right-of-way (ROW) owned by RCTC. The existing North Layover Facility is located between railroad mileposts (MP) 9.75 and 9.92 on Riverside Layover at Riverside Station; and

WHEREAS, COMMISSION shall enter into a contract for construction of the PROJECT, and shall be responsible for construction management, and for funding construction of the PROJECT; and

WHEREAS, COMMISSION requires certain services from SCRRA related to PROJECT construction, as detailed in the SCRRA Scope of Services, attached hereto as Exhibit “A” and the SCRRA Cost Estimate for Services, attached hereto as Exhibit “B” (hereinafter referred to as “SERVICES”) and SCRRA agrees to provide the SERVICES; and

WHEREAS, COMMISSION has secured funding for the PROJECT under Federal Transit Administration (“FTA”) grant number CA-05-0268, and intends to use FTA funding to reimburse SCRRA for the SERVICES; and

WHEREAS, COMMISSION and SCRRA mutually agree the available funding to perform the SERVICES for the PROJECT shall be expended efficiently in compliance with federal requirements, as applicable; and

WHEREAS, SCRRA was the lead agency on the design phase of the PROJECT; and

WHEREAS, COMMISSION agrees to be the lead agency on the construction phase of the PROJECT; and

WHEREAS, SCRRA is responsible for the operation of the Metrolink system; and

WHEREAS, COMMISSION will be responsible for the actual cost and expense required for SERVICES; and

WHEREAS, SCRRA is granted the authority to establish the policies and rules governing the operations on the Metrolink system under the Joint Exercise of Powers Agreement.

NOW, THEREFORE, it is mutually understood and agreed by COMMISSION and SCRRA as follows:

ARTICLE 1. COMPLETE AGREEMENT

A. This Agreement, including any attachments incorporated herein and made applicable by reference, constitutes the complete and exclusive statement of the term(s) and conditions(s) of this Agreement between COMMISSION and SCRRA and it supersedes all prior representations, understandings, and communications, written or oral. The invalidity in whole or in part of any term or condition of this Agreement shall not affect the validity of other term(s) or conditions(s) of this Agreement. The above referenced Recitals are true and correct and are incorporated by reference herein.

B. COMMISSION's failure to insist on any instance(s) of SCRRA's performance of any term(s) or condition(s) of this Agreement shall not be construed as a waiver or relinquishment of COMMISSION's right to such performance or to future performance of such term(s) or condition(s), and SCRRA's obligation in respect thereto shall continue in full force and effect. Changes to any portion of this Agreement shall not be binding upon COMMISSION except when specifically confirmed in writing by an authorized representative of COMMISSION by way of a written amendment to this Agreement and issued in accordance with the provisions of this Agreement.

C. SCRRA's failure to insist on any instance(s) of COMMISSION's performance of any term(s) or condition(s) of this Agreement shall not be construed as a waiver or relinquishment of SCRRA's right to such performance or to future performance of such term(s) or condition(s), and COMMISSION's obligation in respect thereto shall continue in full force and effect. Changes to any portion of this Agreement shall not be binding upon SCRRA except when specifically confirmed in writing by an authorized representative of SCRRA by way of a written amendment to this Agreement and issued in accordance with the provisions of this Agreement.

ARTICLE 2. SCOPE OF AGREEMENT

This Agreement specifies the roles and responsibilities of the Parties as they pertain to the subjects and projects addressed herein. Both COMMISSION and SCRRA agree that each will cooperate and coordinate with the other in all activities covered by this Agreement and any other supplemental agreements that may be required to facilitate purposes thereof.

ARTICLE 3. DELEGATED AUTHORITY

The actions required to be taken by SCRRA in the implementation of this Agreement are delegated to its Chief Executive Officer or his designee, and the actions required to be taken by COMMISSION in the implementation of this Agreement are delegated to its Executive Director or designee.

ARTICLE 4. RESPONSIBILITIES OF COMMISSION

COMMISSION agrees to the following responsibilities related to the PROJECT:

A. To provide a Project Manager or designee as its single point of contact to coordinate with SCRRA on the PROJECT, and the SERVICES to be provided by SCRRA under this Agreement.

B. To monitor and review SCRRA's invoices for SERVICES for compliance with obligations of COMMISSION under any grant, agreement, regulation, law, or other requirements.

C. To comply with state and federal environmental requirements as necessary for the PROJECT.

D. To provide construction management and construction of the PROJECT pursuant to consultant and contractor contracts.

E. To fund the SERVICES, at its sole cost and expense, up to the not-to-exceed amount as specified in Article 6, subject to Article 5(H) below, and the following conditions.

1. Notwithstanding the amount of any estimate for services by SCRRA, the COMMISSION agrees to reimburse SCRRA only for approved SERVICES adequately performed by SCRRA or its consultants or contractors up to the not to exceed amount, which shall include direct and indirect overhead costs associated therewith.

COOPERATIVE AGREEMENT NO. 19-33-004-00

F. COMMISSION shall pay invoices within 30 days after receipt, provided that any indirect costs for which COMMISSION is invoiced are in compliance with FTA requirements as set forth in Exhibit "C".

G. COMMISSION shall provide 180-day advance notice of any grant expiration impacting the projects funding.

H. COMMISSION will obtain approval from SCRRA for any construction phasing proposals, associated schedules, work plans and expected operational impacts at least sixty (60) days before the commencement of any work that has the potential to affect SCRRA operations, services, equipment, infrastructure or safety procedures. All construction phasing plans, demolition and abandonment, track removal, replacement and new installation must also be submitted for approval sixty (60) days prior to the start of the work. If no response is received from SCRRA or BNSF within thirty (30) days following the submittal, the construction phasing proposals, associated schedules, work plans and expected operation impacts may be considered approved by SCRRA..

I. COMMISSION shall, unless otherwise specified as SCRRA's responsibility, be responsible for all coordination, permits, licenses and agreements required by Utility Companies, Third Parties and Statutory Authorities for the construction, testing and integration into operational service of the PROJECT.

J. COMMISSION shall ensure that the contractor does not store materials or equipment upon the right-of-way in proximity of the track, that any material/equipment to be stored upon the right-of-way is first agreed with SCRRA and is secured, that a clear access path for maintenance or emergency vehicles is maintained at all times adjacent to tracks and that activities do not generate excessive dust.

K. COMMISSION will ensure that all construction, materials, equipment and workmanship that are to become SCRRA's responsibility to operate or maintain upon Revenue Service are fully inspected with appropriate accompanying site or supplier test certification, records, warranties and guarantees to meet SCRRA, Industry, and Statutory Authority standards and requirements.

L. COMMISSION or its contractor shall notify SCRRA's designated railroad safety provider a

minimum of three (3) weeks in advance of the daily Employee in Charge (EIC) requirements for each week. Each EIC shift shall comprise of 8 hours of support with a period of up to one hour either end of the shift solely for the purpose of establishing or taking down protection as required. EIC support shall be required at all times for any work within the railroad right-of-way or with the potential to foul the railroad. COMMISSION shall reimburse SCRRA directly for all EIC costs.

M. COMMISSION must advise the SCRRA Director of Engineering and Construction in writing of the proposed completion date of the PROJECT sixty (60) days in advance of such completion date, to allow for a meeting and punch list walkthrough a minimum of forty five (45) days prior to completion to be undertaken between COMMISSION, Contractor and SCRRA to inspect and record any outstanding work items, deficiencies or corrections required. All track, communication and station systems, and all supporting infrastructure are to be fully completed, tested and certified for functionality and operational compliance to FRA, SCRRA and other applicable standards and regulations. At completion and prior to SCRRA acceptance of the project into operational service, a further walkthrough will be arranged between all said parties to ensure all outstanding punch list items, defects, omissions, site clean-up and removal of materials/equipment with the potential to affect Railroad operations have been appropriately resolved.

N. COMMISSION will provide to SCRRA within sixty (60) days of final completion, copies of all as-constructed documentation and records pertaining to the project, to include, but not necessarily limited to;

1. As-constructed plans and shop drawings
2. QA/QC records
3. Materials compliance certification tests
4. Fabrications tests
5. Warranties and Guarantees
6. O&M manuals
7. Permits

8. Training materials for SCRRA Track and Communication staff as applicable
9. Bridge and Structures inspection records
10. Spare parts for track and communication systems ordered by the Contractor but not used in the PROJECT.
11. Spare parts for any components or systems installed by The City in completion of the track and communication systems that are technologically more advanced, or additional to, SCRRA current design criteria or maintenance standards.

ARTICLE 5. RESPONSIBILITIES OF SCRRA

SCRRA agrees to the following responsibilities for SERVICES:

A. To designate a Project Manager as the point of contact and to coordinate with COMMISSION on the PROJECT, and to manage the SERVICES through completion.

B. To provide SERVICES through final completion and close-out of the project at COMMISSION's cost, up to the not-to-exceed amount as specified in Article 6 in accordance with the Exhibits attached to this Agreement, and the terms contained herein.

C. To provide timely review and responses to all requests and to not unreasonably withhold approval of any requests.

D. To enter into agreements, as determined necessary by SCRRA, for the SERVICES. SCRRA shall be responsible for payment to its consultants and/or contractors for services rendered. SCRRA may then utilize funding provided by COMMISSION pursuant to the attached Exhibit "B" to fund such costs. SCRRA shall be responsible for reviewing consultant and/or contractor invoices for accuracy, reasonableness, terms, and completeness.

E. If SCRRA uses SCRRA labor to accomplish the SERVICES, SCRRA must utilize its approved SCRRA Indirect Cost Allocation Plan ("ICAP") overhead rate for the corresponding fiscal year labor charges, as approved by FTA, when seeking reimbursement from COMMISSION.

F. To submit to COMMISSION invoices, no less than once per quarter, for actual costs based on the prior three months' expenditures as well as any unbilled previous expenditures.

G. To be responsible for submitting a quarterly SERVICES summary report, which shall include a line item for remaining funds, changes that must be pre-approved by COMMISSION and a line item for contingency within the summary budget amount for the SERVICES, in accordance with the attached Exhibit B. SCRRA must submit an electronic invoice for all SERVICES performed, to COMMISSION's Accounts Payable office. Each SCRRA invoice shall include the following information:

1. Agreement Number 19-33-004-00 and RCTC Project Number 62-38-22;
2. The time period covered by the invoice;
3. List of itemized expenses including support documentation for costs incurred during the billing period;
4. Invoice Certification containing language acceptable to COMMISSION and SCRRA signed by an authorized representative of SCRRA as presented in Exhibit "D";
5. Such other information as reasonably requested by COMMISSION.

H. The performance of any additional services beyond the SERVICES outlined in Exhibit A, shall require an amendment to this Agreement signed by both Parties.

I. To notify COMMISSION in writing when seventy-five (75%) of the SERVICES costs have been exhausted and include an estimate of what, if any, additional funds are estimated to be needed to complete the SERVICES contemplated under this Agreement.

J. Within one hundred and eighty (180) days from completion of SERVICES, SCRRA will provide final progress report, including final expenditures.

K. To comply with all procurement and contracting laws and regulations, and FTA Requirements (defined below), as applicable to the SERVICES.

L. To minimize rail service disruptions by reviewing the construction phasing plan and

work windows necessary to complete the SERVICES and the PROJECT.

M. To comply with all funding and grant requirements for those funds that will be used to pay for SERVICES. SCRRA shall comply with all contractual provisions required by the FTA and the FTA Master Agreement, including those provisions contained in Exhibit "C" attached to this Agreement and incorporated herein by reference. The requirements set forth in FTA Circular 4220.1F, as may be amended, are hereby incorporated by reference into this Agreement. In the case of any conflict between the terms of this Agreement and any FTA mandated terms set forth in the FTA Master Agreement , FTA Circular 42201.F or the attached Exhibit "C" (collectively, "FTA Requirements") as may be amended, the FTA Requirements shall control.

N. To include all applicable FTA Requirements in its contracts with its consultants providing SERVICES under this Agreement.

O. To conduct the SERVICES and all of its activities in association with the PROJECT in a good and competent manner and in compliance with all applicable federal, state and local rules and regulations and SCRRA's standards, policies, practices and guidelines.

R. To provide a right of entry agreement(s), as may be necessary for the PROJECT, upon request by COMMISSION or its contractor after completing SCRRA's generally applicable process.

ARTICLE 6. MAXIMUM OBLIGATION

Notwithstanding any provisions of this Agreement to the contrary, COMMISSION and SCRRA mutually agree that COMMISSION's maximum cumulative payment obligation to SCRRA for the SERVICES (including SCRRA'S direct and indirect costs) shall be One hundred fifty-six thousand two hundred Dollars (\$156,200), unless otherwise agreed upon by the Parties pursuant to a written amendment to this Agreement.

ARTICLE 7. AUDIT AND INSPECTION

SCRRA shall maintain a complete set of records in accordance with generally accepted accounting principles. Upon reasonable notice, SCRRA shall permit the authorized representatives of COMMISSION to inspect and audit all work, materials, payroll, books, accounts

and other data and records of SCRRA for a period of four (4) years after final payment, or until any on-going audit is completed. For purposes of audits, the date of completion of this Agreement shall be the date of COMMISSION's payment of SCRRA's final billing (so noted on the invoice) under this Agreement. COMMISSION shall have the right to reproduce at their cost any such books, records and accounts. The above provision with respect to audits shall extend to and/or be included in contracts with SCRRA's contractor.

ARTICLE 8. INDEMNIFICATION

A. SCRRA shall indemnify and hold harmless COMMISSION, its officers, directors, employees and agents from and against any and all claims (including attorney's fees and reasonable expenses for litigation or settlement) for any loss or damages, bodily injuries, including death, worker's compensation subrogation claims, damage to property to the extent a trier of fact determines same is actually caused by the negligent acts, omissions or willful misconduct of SCRRA, its officers, directors, employees or agents in the performance of this Agreement.

B. COMMISSION shall indemnify, defend and hold harmless SCRRA, its officers, directors, employees and agents from and against any and all claims (including attorney's fees and reasonable expenses for litigation or settlement) for any loss or damages, bodily injuries, including death, worker's compensation subrogation claims, damage to property to the extent actually caused by the negligent acts, omissions or willful misconduct by COMMISSION, its officers, directors, employees or agents in connection with or arising out of the performance of this Agreement.

ARTICLE 9. ADDITIONAL PROVISIONS:

The COMMISSION and SCRRA agree to the following:

A. Term of Agreement: This Agreement shall continue in full force and effect through January 1, 2022, unless terminated earlier by mutual written consent by both Parties. In the event ICAP charges have not been billed due to an unapproved rate and paid by COMMISSION, this agreement shall be extended for one year.

B. Termination: In the event either Party defaults in the performance of their obligations, under this Agreement or breaches any of the provisions of this Agreement, the non-defaulting Party shall have the option to terminate this Agreement upon thirty (30) days' prior written notice to the other Party.

C. Termination for Convenience: Either Party may terminate this Agreement by providing thirty (30) days written notice of its intent to terminate for convenience to the other Party;

D. Effect of Termination. Upon termination by either Party, SCRRA shall be compensated for those SERVICES which have been adequately completed as of the effective date set forth in the notice of termination,

E. Compliance: COMMISSION and SCRRA shall comply with all applicable federal, state, and local laws, statutes, ordinances, and regulations of any governmental authority having jurisdiction over the PROJECT.

F. Legal Authority: COMMISSION and SCRRA hereto warrant that they are duly authorized to execute this Agreement on behalf of said Parties and that, by so executing this Agreement, the Parties hereto are formally bound to the provisions of this Agreement.

G. Amendments: This Agreement may be amended in writing at any time by the mutual consent of both Parties. No amendment shall have any force or effect unless evidenced in a writing signed by both Parties.

H. Severability: If any term, provision, covenant or condition of this Agreement is held to be invalid, void or otherwise unenforceable, to any extent, by any court of competent jurisdiction, the remainder of this Agreement shall not be affected thereby, and each term, provision, covenant or condition of this Agreement shall be valid and enforceable to the fullest extent permitted by law.

I. Counterparts of Agreement: This Agreement may be executed and delivered in any number of counterparts, each of which, when executed and delivered shall be deemed an original and all of which together shall constitute the same agreement. Facsimile signatures will be

permitted.

J. Assignment: Neither this Agreement, nor any of the Parties' rights, obligations, duties, nor authority hereunder may be assigned in whole or in part by either Party without the prior written consent of the other Party. Any such attempt of assignment shall be deemed void and of no force and effect. Consent to one assignment shall not be deemed consent to any subsequent assignment, nor the waiver of any right to consent to such subsequent assignment.

K. Obligations To Comply with Law: Nothing herein shall be deemed nor construed to authorize or require any Party to issue bonds, notes or other evidences of indebtedness under the terms, in amounts, or for purposes other than as authorized by local, state or federal law.

L. Governing Law: The laws of the State of California and applicable local and federal laws, regulations and guidelines shall govern hereunder. Venue shall be in Riverside County.

M. Litigation Fees: Should litigation arise out of this Agreement for the performance thereof, the court shall award costs and expenses, including attorney's fees, to the prevailing Party.

N. Notices: Any notices, requests or demands made between the Parties pursuant to this Agreement are to be directed as followed:

To SCRRA:

Southern California Regional Rail
Authority
2558 Supply Street
Pomona, CA 91767
Attention: Justin Fornelli, P.E.
Director, Engineering & Construction
Tel: (909) 593-4291
Email: fornelli@scrra.net

To COMMISSION:

Riverside County Transportation
Commission
4080 Lemon St
Riverside, CA 92501
Attention: Marlin Feenstra
Capital Project Manager
Tel: (951) 787-7963
Email: mfeenstra@rctc.org

O. Force Majeure: Either Party shall be excused from performing its obligations under this Agreement during the time and to the extent that it is prevented from performing by an

unforeseeable cause beyond its control, including but not limited to; any incidence of fire, flood; acts of God; commandeering of material, products, plants or facilities by the federal, state or local government; national fuel shortage; or a material act or omission by the other Party; when satisfactory evidence of such cause is presented to the other Party, and provided further that such nonperformance is unforeseeable, beyond the control and is not due to the fault or negligence of the Party not performing.

P. No Third Party Beneficiaries. There are no intended third party beneficiaries of any terms contained in or of any right or obligation assumed by the Parties under this Agreement.

Q. Incorporation of Exhibits. The SCRRA Scope of Services, attached hereto as Exhibit "A", the Cost Estimate for SERVICES, attached hereto as Exhibit "B", the FTA Requirements, attached hereto as Exhibit "C", and the Invoice Certification Form Language, attached hereto as Exhibit "D", are incorporated into this Agreement by reference.

This Agreement shall be made effective upon execution by both Parties.

[Signatures on following page]

COOPERATIVE AGREEMENT NO. 19-33-004-00

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement No. 19-33-004-00 to be executed on the date first written above.

**SOUTHERN CALIFORNIA REGIONAL
RAIL AUTHORITY**

**RIVERSIDE COUNTY TRANSPORTATION
COMMISSION**

By: _____
Ronnie Campbell
Interim Co-Chief Executive Officer

By: _____
Anne Mayer
Executive Director

APPROVED AS TO FORM:

APPROVED AS TO FORM:

Best Best & Krieger, LLP

By: _____
Don O. Del Rio
General Counsel

By: _____
General Counsel

Exhibit A SCRRA Scope of Services

Exhibit B SCRRA Cost Estimate for Services

Exhibit C FTA Requirements

Exhibit D Invoice Certification Form
Exhibit E Coordination and Responsibilities for
Construction Start and Work Windows

EXHIBIT A

**SCRRA SCOPE OF SERVICES
RIVERSIDE LAYOVER FACILITY IMPROVEMENT PROJECT**

SCRRA will provide the following services to RCTC in support of the PROJECT through all construction phases necessary to complete construction of the PROJECT.

This will include:

- a) Provide safety training to PROJECT contractors and sub-contractors as per Exhibit B.
- b) Locate and mark SCRRA signal and communications cables within PROJECT area for the contractors and sub-contractors.
- c) Provide Railroad protective services, including flagging to third party personnel working on SCRRA right-of-way as required for the PROJECT.
- d) Provide project management support as necessary to assist the RCTC in construction of the PROJECT including attendance at construction meetings, management of work windows, coordination with SCRRA's track and signal and communication maintenance contractors to support the PROJECT, and coordination of all required SCRRA interdepartmental support.

COOPERATIVE AGREEMENT NO 19-33-004-00

- e) Review and process Contractor's right-of-entry permit application including, but not limited to, SCRRRA required Forms, Insurance, Site Specific Work Plans, Plans, and Schedules.
- f) Provide used 133 RE Relay Rail for Contractor installation for the PROJECT.
- g) Provide inspection of the tracks and facilities prior to RCTC acceptance of the PROJECT.

EXHIBIT B

**SCRRA COST ESTIMATE FOR SERVICES
METROLINK RIVERSIDE LAYOVER FACILITY EXPANSION PROJECT**

| Date | 30-Oct-18 | | | | | | | | | |
|-----------------------|---|---------------|-------------------|-------|----------------|-------------|------|------------|---------------------|--|
| Cooperative Agreement | 19-33-004-006 | | | | | | | | | |
| SCRRA Project No. | TBD | | | | | | | | | |
| Project Name | Riverside Layover Facility-Construction | | | | | | | | | |
| Schedule | 8 Months Construction | | | | | | | | | |
| NO. | ITEM | QUANTITY | | | | | UNIT | UNIT COST | TOTAL COST | |
| | | No. of Months | Meeting per Month | Hours | No. of Persons | Total Hours | | | | |
| A | Project Management | | | | | | | | | |
| 1 | Meetings /Admin | 8 | 2 | 4 | 1 | 64 | HR | \$250.00 | \$16,000.00 | |
| 2 | General Coordination / PM Work | 8 | 1 | 6 | 1 | 48 | HR | \$250.00 | \$12,000.00 | |
| | Inter-Departmental Meetings | 8 | 0.25 | 2 | 4 | 16 | HR | \$250.00 | \$4,000.00 | |
| | Document Reviews (Work Windows, SSWP, Construction Staging) | | | | 2 | 16 | HR | \$250.00 | \$4,000.00 | |
| 4 | Material Procurement (SCRRA Staff) | | | | | 16 | HR | \$250.00 | \$4,000.00 | |
| | Sub-Total | | | | | 144 | | | \$40,000.00 | |
| B | Track Support Services | | | | | | | | | |
| 1 | Track Inspection (track in/out service) | | | | | 1 | LS | \$5,000.00 | \$5,000.00 | |
| | Sub-Total | | | | | | | | \$5,000.00 | |
| C | Communication & Signal Support Services | | | | | | | | | |
| 1 | C&S Maintenance Contractor Support | | | | | 1 | LS | \$5,000.00 | \$5,000.00 | |
| | Sub-Total | | | | | | | | \$5,000.00 | |
| D | SCRRA Provided Material | | | | | | | | | |
| 1 | 133 RE Relay Rail (does not include transport) | | | | | 5,000 | LF | \$10.00 | \$50,000.00 | |
| | Sub-Total | | | | | | | | \$50,000.00 | |
| E | Permit Processing | | | | | | | | | |
| 1 | Safety Training by SCRRA Consultant | | | | | 4 | EA | \$1,000.00 | \$4,000.00 | |
| 2 | SCRRA Cable Markings (includes refresh) | | | | | 6 | EA | \$500.00 | \$3,000.00 | |
| 3 | Flagging Services | | | | | 20 | Days | \$1,750.00 | \$35,000.00 | |
| | Sub-Total | | | | | | | | \$42,000.00 | |
| | Sub-Total (Items A-F) | | | | | | | | \$142,000.00 | |
| | Contingency (10%) | | | | | | | | \$14,200.00 | |
| | TOTAL ESTIMATED COST | | | | | | | | \$156,200.00 | |

NOTES:

- The cost of the SCRRA services shown is an estimate only and RCTC will reimburse SCRRA on the basis of actual costs and expenses.
- Subject to the terms of this Agreement, RCTC shall reimburse SCRRA the actual costs and expenses incurred by SCRRA and its contractors and consultants for all services and work performed in connection with the PROJECT, including an allocated overhead representing SCRRA's costs for administration and management.

EXHIBIT "C"

FEDERAL TRANSIT ADMINISTRATION REQUIREMENTS

The following provisions shall apply to this Agreement:

1. COST PRINCIPLES

- (1) SCRRA agrees that the Contract Cost Principles and Procedures, 48 CFR, Federal Acquisition Regulations System, Chapter 1, Part 31.000 et seq., shall be used to determine the cost allowability of individual items.
- (2) SCRRA also agrees to comply with federal procedures in accordance with 2 CFR, Part 200, Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards.
- (3) Any costs for which payment has been made to SCRRA that are determined by subsequent audit to be unallowable under 2 CFR, Part 200 and 48 CFR, Federal Acquisition Regulations System, Chapter 1, Part 31.000 et seq., are subject to repayment by SCRRA.
- (4) All subcontracts in excess of \$25,000 shall contain the above provisions.

2. FEDERAL GOVERNMENT OBLIGATIONS TO THIRD-PARTIES BY USE OF A DISCLAIMER

- (1) RCTC and SCRRA acknowledge and agree that, notwithstanding any concurrence by the Federal Government in or approval of the solicitation or award of the underlying contract, absent the express written consent by the Federal Government ("Government"), the Federal Government is not a party to this contract and shall not be subject to any obligations or liabilities to RCTC, SCRRA, or any other party (whether or not a party to that contract) pertaining to any matter resulting from the underlying contract.
- (2) SCRRA agrees to include the above clause in each subcontract financed in whole or in part with Federal assistance provided by FTA. It is further agreed that the clause shall not be modified, except to identify the subconsultant who will be subject to its provisions.

3. PROGRAM FRAUD AND FALSE OR FRAUDULENT STATEMENTS AND RELATED ACTS

- (1) SCRRA acknowledges that the provisions of the Program Fraud Civil Remedies Act of 1986, as amended, 31 U.S.C. §§ 3801 et seq. and U.S. DOT regulations, "Program Fraud Civil Remedies," 49 C.F.R. Part 31, apply to its actions pertaining to this Project. Upon execution of the underlying contract, SCRRA certifies or affirms the truthfulness and accuracy of any statement it has made, it makes, it may make, or causes to be made, pertaining to the underlying contract or the FTA assisted project for which this contract work is being performed. In addition to other penalties that may be applicable, SCRRA further acknowledges that if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification, the Federal Government reserves the right to impose the penalties of the Program Fraud Civil Remedies Act of 1986 on SCRRA to the extent the Federal Government deems appropriate.
- (2) SCRRA also acknowledges that if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, certification, assurance, or representation to the Federal Government under a contract connected with a project that is financed in whole

COOPERATIVE AGREEMENT NO 19-33-004-00

or in part with Federal assistance originally awarded by FTA under the authority of 49 U.S.C. chapter 53 or any other Federal law, the Government reserves the right to impose the penalties of 18 U.S.C. § 1001 and 49 U.S.C. § 5323 on SCRRA, to the extent the Federal Government deems appropriate. [Is SCRRA subject to this?]

(3) SCRRA agrees to include the above two clauses in each subcontract financed in whole or in part with Federal assistance provided by FTA. It is further agreed that the clauses shall not be modified, except to identify the consultant who will be subject to the provisions.

4. ACCESS TO RECORDS

1. SCRRA agrees to provide RCTC, the FTA Administrator, the U.S. Secretary of Transportation, the Comptroller General of the United States or any of their authorized representatives access to all Project work, materials, payrolls, and other data of SCRRA which are directly pertinent to this contract as required by 49 U.S.C. § 5325(g).

2. SCRRA agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.

3. SCRRA agrees to maintain all books, records, accounts and reports required under this contract for a period of not less than three years after the date of transmission of the final expenditure report, except in the event of litigation or settlement of claims arising from the performance of this contract, in which case SCRRA agrees to maintain same until RCTC, the FTA Administrator, the Comptroller General, or any of their duly authorized representatives, have disposed of all such litigation, appeals, claims or exceptions related thereto.

4. SCRRA agrees to require its contractors and third party contractors to provide the same.

5. FEDERAL CHANGES

SCRRA shall at all times comply with all applicable FTA regulations, policies, procedures and directives, including without limitation those listed directly or by reference in the FTA Master Agreement, the terms of which are incorporated herein by reference, as they may be amended or promulgated from time to time during the term of this MOU. SCRRA's failure to so comply shall constitute a material breach of this contract.

6. CIVIL RIGHTS REQUIREMENTS

(1) Nondiscrimination - In accordance with Title VI of the Civil Rights Act of 1964, as amended, 42 U.S.C. §§ 2000d et seq., U.S. DOT regulations, "Nondiscrimination in Federally Assisted Programs of the Department of Transportation – Effectuation of Title VI of the Civil Rights Act," 49 C.F.R. Part 21, FTA Circular 4702.1A, "Title VI and Title VI – Dependent Guidelines for Federal Transit Administration Receipts," May 13, 2007, Federal transit law at 49 U.S.C. § 5332, SCRRA agrees that it will not discriminate against any employee or applicant for employment because of race, color, creed, national origin, sex, age, or disability. In addition, SCRRA agrees to comply with applicable Federal implementing regulations and other implementing requirements FTA may issue.

(2) Equal Employment Opportunity - The following equal employment opportunity requirements apply to the underlying contract:

(a) Race, Color, Creed, National Origin, Sex - SCRRA agrees to comply with Title VII of the Civil Rights Act, as amended, 42 U.S.C. § 2000e, and equal employment opportunity provisions of 49 U.S.C. § 5332, all applicable equal employment opportunity requirements of U.S. Department of Labor (U.S. DOL) regulations, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor," 41 C.F.R.

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Parts 60 et seq., (which implement Executive Order No. 11246, "Equal Employment Opportunity," as amended by Executive Order No. 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity," 42 U.S.C. § 2000e note), and with any applicable Federal statutes, executive orders, regulations, and Federal policies that may in the future affect construction activities undertaken in the course of the Project. SCRRA agrees to take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, creed, national origin, sex, or age. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. In addition, SCRRA agrees to comply with any implementing requirements FTA may issue.

(b) Age - In accordance with the Age Discrimination in Employment Act, as amended, 29 U.S.C. §§ 621 through 634 and Federal transit law at 49 U.S.C. § 5332, SCRRA agrees to refrain from discrimination against present and prospective employees for reason of age. In addition, SCRRA agrees to comply with any implementing requirements FTA may issue.

(c) Disabilities - In accordance with section 102 of the Americans with Disabilities Act, as amended, 42 U.S.C. § 12112, SCRRA agrees that it will comply with the requirements of U.S. Equal Employment Opportunity Commission, "Regulations to Implement the Equal Employment Provisions of the Americans with Disabilities Act," 29 C.F.R. Part 1630, pertaining to employment of persons with disabilities. In addition, SCRRA agrees to comply with any implementing requirements FTA may issue.

(3) DBE Program Compliance - RCTC has established a DBE Program pursuant to 49 C.F.R. Part 26, which applies to FTA funded agreements. The requirements and procedures of RCTC's DBE Program are hereby incorporated by reference into this Agreement.

(4) SCRRA also agrees to include these requirements in each subcontract financed in whole or in part with Federal assistance provided by FTA, modified only if necessary to identify the affected parties.

7. DEBARMENT AND SUSPENSION

SCRRA shall include the following as part of the procurement documents for any consultant performing services under this MOU:

"Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion"

(1) Consultant certifies, by submission of this bid or proposal, that neither it nor its "principals" [as defined at 49 C.F.R. § 29.105(p)] is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

(2) When the consultant is unable to certify to the statements in this certification, it shall attach an explanation to this proposal.

8. LOBBYING

Lobbying Restrictions. To the extent applicable, SCRRA agrees to include the following in its subcontractor agreements:

COOPERATIVE AGREEMENT NO 19-33-004-00

(1) The consultant shall comply, and assure the compliance of each subcontractor at any tier, with U.S. DOT regulations, "New Restrictions on Lobbying," 49 C.F.R. Part 20, modified as necessary by 31 U.S.C. § 1352.

(2) The consultant shall comply with Federal statutory provisions, to the extent applicable, prohibiting the use of Federal assistance funds for activities designed to influence Congress or a State legislature on legislation or appropriations, except through proper, official channels.

DRAFT

EXHIBIT "D"

INVOICE CERTIFICATION FORM LANGUAGE

I certify that to the best of my knowledge, the hours and salary rates charged in this invoice are the actual hours and rates worked and paid to the employees listed, and that indirect costs, if billed, are in accordance with an FTA approved SCRRA Indirect Cost Allocation Plan overhead rate.

By: _____

Title: _____

DRAFT

EXHIBIT E

**COORDINATION REQUIREMENTS AND RESPONSIBILITIES FOR CONSTRUCTION
START & WORK WINDOWS**

1. COMMISSION and its Contractor shall:
 - a. Notify SCRRA sixty (60) days in advance for any work window that will require shut down or limit access or capacity at the Riverside Layover.
 - b. Attend SCRRA operations work window planning meetings, as reasonably requested by SCRRA PM, to discuss scope of work within Work Window(s), details of Work Window time, dates and tracks affected, Work Windows schedule;
 - c. Should the construction schedule change such that the planned Work Window cannot be met, advise SCRRA immediately when this is known so that a revised Work Window can be arranged;
 - d. A minimum of 30 calendar days in advance of each planned Work Window, provide to SCRRA PM an hour by hour schedule detailing all activities to be performed by all parties within the Work Window;
2. SCRRA shall:
 - a. Coordinate internally and with COMMISSION and its Contractor a date for proposed changes and associated Work Window to be undertaken;
 - b. Issue in advance of implementation, bulletins to all affected railroads to detail physical and operational changes to the current timetable; and
 - c. Revise track charts, composite maps, simulator graphics and KML files to reflect all physical changes made to the system resulting from the work in each window.