

DRAFT ORANGE COUNTY TRANSPORTATION AUTHORITY TRANSPORTATION CONTROL MEASURE SUBSTITUTION REPORT

Introduction

Transportation Control Measures (TCMs) are defined as transportation projects or programs that adjust trip patterns or otherwise modify vehicle use in ways that reduce air pollutant emissions. TCMs are included in the most recently approved applicable Air Quality Management Plan (AQMP)/State Implementation plan (SIP) as part of the overall control strategy to demonstrate a region's ability to come into attainment with the National Ambient Air Quality Standards (NAAQS). In the SCAG region, only two ozone nonattainment areas include TCMs in their AQMPs/SIPs: South Coast Air Basin and Ventura County portion of the South Central Coast Air Basin. TCM-type projects in these nonattainment areas are considered committed once they have funds programmed for right-of-way or construction in the first two years of an approved SCAG Federal Transportation Improvement Program (FTIP). When a committed TCM project cannot be delivered or will be significantly delayed, the substitution of the TCM project follows the process specified in the Federal Clean Air Act (CAA) Section 176(c)(8).

The Orange County Transportation Authority (OCTA) has requested that SCAG substitute the State Route 241/91 Express Lanes Connector project which is included as a committed TCM in the South Coast Ozone SIP (FTIP Project ID: ORA111207) with three traffic signal synchronization projects along three significant corridors in Orange County: Brookhurst Street, El Toro Road, and Magnolia Street. As documented herein, the proposed TCM substitution is consistent with all federal requirements, including the Fixing America's Surface Transportation Act or FAST Act planning requirements and the U.S. Environmental Protection Agency's (EPA) Transportation Conformity Regulations.

TCM Substitution Process

The substitution process set forth in the FAST Act and the Transportation Conformity Regulations is included in the 2016 AQMP for the South Coast Air Basin and described in SCAG's 2017 FTIP Guidelines.

The County Transportation Commissions (CTCs) and/or project sponsors notify SCAG when a TCM project cannot be delivered or will be significantly delayed. SCAG and the CTCs then identify and evaluate possible replacement measures for individual substitutions in consultation with SCAG's Transportation Conformity Working Group (TCWG), which includes members from all affected jurisdictions, federal, state and/or local air quality agencies and transportation agencies.

Substitution of individual TCMs is provided for by the CAA Section 176(c)(8), under the following conditions:

- "(i) if the substitute measures achieve equivalent or greater emissions reductions than the control measure to be replaced, as demonstrated with an emissions impact analysis that is consistent with the current methodology used for evaluating the replaced control measure in the implementation plan;
- "(ii) if the substitute control measures are implemented-
 - "(I) in accordance with a schedule that is consistent with the schedule provided for control measures in the implementation plan; or
 - "(II) if the implementation plan date for implementation of the control measure to be replaced has passed, as soon as practicable after the implementation plan date but not later than the date on which emission reductions are necessary to achieve the purpose of the implementation plan;
- "(iii) if the substitute and additional control measures are accompanied with evidence of adequate personnel and funding and authority under State or local law to implement, monitor, and enforce the control measures;
- "(iv) if the substitute and additional control measures were developed through a collaborative process that included--
 - "(I) participation by representatives of all affected jurisdictions (including local air pollution control agencies, the State air pollution control agency, and State and local transportation agencies);
 - "(II) consultation with the Administrator; and
 - "(III) reasonable public notice and opportunity for comment; and
- "(v) if the metropolitan planning organization, State air pollution control agency, and the Administrator concur with the equivalency of the substitute or additional control measures.”

In addition to the conditions above, the 2016 South Coast AQMP specifies that the substitute project shall be in the same air basin, preferably located in the same geographic area and serving the same demographic subpopulation as the TCM being replaced.

A TCM substitution does not require a new conformity determination or a formal SIP revision. SCAG adoption of the new TCM with concurrence of the U.S. EPA and the California Air Resources Board (ARB) rescinds the original TCM and the substitution becomes effective.

Project Description

The committed TCM State Route 241/91 Express Lanes Connector project (FTIP ID: ORA111207) is to construct toll ramps connecting northbound State Route 241 with the eastbound State Route 91 Express Lanes, and the westbound State Route 91 Express Lanes with southbound State Route 241. The State Route 241/91 Express Lanes Connector is scheduled to be completed by December 2020. However, the project has been delayed due to recent updates. As a result, the OCTA has initiated the TCM substitution process.

The three substitute TCM projects will improve traffic signal equipment, close infrastructure gaps, and synchronize traffic signals along three key arterial highways in Orange County: Brookhurst Street, El Toro Road, and Magnolia Street (see Attachment A of Appendix A). All the three projects will be completed by December 2020.

Compliance with TCM Substitution Requirements

Interagency Consultation. The proposed TCM substitution was presented to SCAG's publicly noticed TCWG meetings for initial interagency consultation on February 6, 2018. The TCM substitution is being released for a 30-day public review period and is scheduled to be presented to the TCWG for interagency consultation again on May 22, 2018. All comments received will be addressed and incorporated into the final TCM substitution report as appropriate.

Equivalent Emissions Reduction. OCTA has analyzed the countywide emissions impacts of the substitute project and concluded that the replacement project provide equal or greater emission reductions (see Appendix A). SCAG staff has reviewed and concurred with both the methodology and the results of the analysis.

Similar Geographic Area. Both the State Route 241/91 Express Lanes Connector TCM project and the three substitute TCM projects are located within the Orange County portion of the South Coast Air Basin.

Full Funding. Full funding has been programmed for the three substitute TCM projects in the federally approved 2017 FTIP as well in the 2019 FTIP anticipated to be adopted by SCAG's Regional Council in September 2018 and approved by FHWA/FTA in December 2018.

Similar Time Frame. The proposed substitute TCM projects are scheduled to be completed by December 2020, consistent with the schedule of the State Route 241/91 Express Lanes Connector TCM project.

Timely Implementation. The proposed substitution is the means by which the obstacle to the implementation of the State Route 241/91 Express Lanes Connector TCM is being overcome. The replacement projects will be monitored through subsequent TCM Timely Implementation Reports that SCAG releases for public review and submits for federal approval.

Legal Authority. The OCTA has the legal authority and personnel to implement and operate the substitute projects.

Agency Review and Adoption. Upon conclusion of the 30-day public review, the TCM substitution analysis is scheduled to be presented to SCAG's Energy and Environment Committee (EEC) in July 2018 for recommendation to SCAG's Regional Council for adoption. Upon adoption by the Regional Council, the TCM substitution will be forwarded to ARB and U.S. EPA for concurrence. Adoption by the Regional Council and concurrence from U.S. EPA and ARB will rescind the original TCM project and the new measures will become effective.

Programming of the Substitute TCMs. After conclusion of the TCM substitution process including adoption by SCAG's Regional Council and concurrence of ARB and EPA, the substitute TCMs will be amended as committed TCMs into the conforming FTIP.

Appendix A

OCTA TCM Substitution Request



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February 1, 2018

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Southern California Association of Governments
900 Wilshire Boulevard, Suite 1700
Los Angeles, CA 90017

RE: Transportation Control Measure Substitution Request

The Orange County Transportation Authority (OCTA) is requesting initiation of a transportation control measure (TCM) substitution for the State Route 241/ 91 Express Lanes Connector Project (ELC {ORA111207}).

OCTA requests the ELC be substituted with a set of signal synchronization projects along three significant corridors: Brookhurst Street, El Toro Road, and Magnolia Street. The three signal synchronization projects offer equivalent air quality benefits and will be implemented on a schedule that conforms to timely implementation requirements. I have attached a technical report describing the air quality analysis results prepared by OCTA staff.

OCTA would like to proceed with the substitution process for the ELC at your earliest convenience. We understand the substitution process starts with the Southern California Association of Governments' recommendation to the Transportation Conformity Working Group (TCWG). The TCWG's next meeting is scheduled for February. We would greatly appreciate your assistance in preparing for this meeting and working through the substitution process with our state and federal partners on the TCWG.

Please contact Anup Kulkarni, Section Manager, Regional Modeling, at (714) 560-5867 for next steps on the substitution process and follow-up on the attachment. Thank you for your assistance in this important matter.

Sincerely,

Darrell Johnson
Chief Executive Officer

DJ: ak
Attachment

c: Rongsheng Luo, SCAG

Transportation Control Measure Replacement of 241-91 Express Connector with Three Signal Synchronization Corridor Projects

Introduction

The Foothill/Eastern Transportation Corridor Agency (TCA) previously committed to funding of an Express Lane Connection (ELC) between of State Route (SR)-241 and the 91 Express Lanes as a single transportation control measure (TCM). This new connector would have a single lane in each direction by December 2020. However, recent updates to the ELC project have moved to the scheduled completion date beyond December 2020. OCTA is now proposing three traffic signal synchronization (TSS) projects along Brookhurst Street, El Toro Road, and Magnolia Boulevard as a single replacement TCM to the previously planned ELC in the Federal Transportation Improvement Program (FTIP). The proposed evaluation assumptions, methodology, and results are discussed below.

Project Description

The TSS projects will improve signal equipment, close infrastructure gaps, and synchronize traffic signals along three key arterial highways in Orange County: El Toro Road, Magnolia Street, and Brookhurst Street. The projects will be completed by Fiscal Year 2020/2021 (December 2020). The locations of the three traffic signal synchronization projects TCM and 241/91 Express Connector TCM are graphically illustrated in Attachment A.

Compliance with Substitution Requirements

- **Equivalent Emissions Reduction:** OCTA has analyzed the countywide emissions impacts of the substitute TCM (three traffic signal synchronization projects) relative to those of 241/91 Express Connector TCM. The replacement project will provide equivalent emission reductions (See the Air Quality Analysis Findings below).
- **Similar Geographic Area:** Both the three traffic signal synchronization projects TCM and the 241/91 Express Connector TCM are located in the Orange County portion of the South Coast Air Basin.
- **Full Funding:** OCTA has current funding for the three traffic signal synchronization projects TCM.
- **Similar Time Frame:** The proposed three traffic signal synchronization projects TCM will be operational by December 2020, equivalent to the schedule of the 241/91 Express Connector TCM schedule.

- Timely Implementation: The proposed substitution is the means by which the obstacles to implementation of the 241/91 Express Connector TCM is being overcome.
- Legal Authority: OCTA has legal authority and personnel to implement and operate the substitute three signal synchronization projects TCM.

Air Quality Analysis Methodology

The air quality impacts were calculated for the existing 241/91 Express Connector TCM and the proposed three traffic signal synchronization projects TCM using a multi-step method based on the SCAG emission methodology focused on Orange County. The following process was used:

Step 1: Obtain daily vehicle miles traveled (VMT) and speed data for freeways and arterials from the Orange County Transportation Analysis Model 4.0 (OCTAM). OCTAM is a conventional four step transportation model used to forecast travel demand with a base year of 2012 (sometimes referred to as the existing year) and a forecast year of 2040. It is consistent with SCAG's regional travel demand model as it incorporates the most recent approved socio-economic data for Orange County and the surrounding region.

Two alternatives for forecast year 2040 were run using OCTAM as part of this study. The coding of all alternatives is consistent with previous OCTAM modeling practices.

The three traffic signal synchronization projects will improve signal equipment, close infrastructure gaps, and synchronize traffic signals along three key arterial highways in Orange County: El Toro Road, Magnolia Street, and Brookhurst Street. Nearly \$3.4 million in improvements will result from this effort. The projects involve 16 jurisdictions and will improve traffic along 40 miles of arterial highways and 128 signals. 1.1 million vehicle miles are traveled along the project limits.

The 241/91 Express Connector consists of constructing direct connector ramps between SR-241 and the 91 Express Lanes. The ramps connect northbound SR-241 with the eastbound 91 Express Lanes, and the westbound 91 Express Lanes with southbound SR-241. Consistent with the current policies on SR-241 and the 91 Express Lanes, the connector ramps are assumed to be only available to drivers willing to pay a toll. The project is programmed and budgeted in the FTIP. This alternative was used for the 241/91 Express Connector TCM "with project" analysis.

Both alternatives were modeled separately using OCTAM and post-processed using the National Cooperative Highway Research Program (NCHRP) 255 process. This process provides a standard methodology to refine forecasted volumes on links based on a combination of base year traffic counts, base year model estimates, and

forecasted model estimates using incremental adjustments. The output of the travel demand model and post-processing included travel information on both the three traffic signal synchronization TCM and the 241/91 Express Connector TCM. Loaded link information, intrazonal travel speeds, and intrazonal travel volumes were extracted for all modeled time periods for both alternatives.

Step 2: The Emission Factors (EMFAC2014) model was developed by the California Air Resources Board and is used throughout California to calculate emission rates from motor vehicles, such as passenger cars and heavy-duty trucks, operating on freeways and local roads for typical summer, winter, and annual conditions. EMFAC model outputs include total emissions for all criteria pollutants for all Orange County.

A spreadsheet tool has been created to modify EMFAC input data to reflect the results of OCTAM runs. The tool was run for the base year and forecast year 2040 using the extracted information from Step 1 as input to update the VMT and vehicle speed data needed by EMFAC. This process was performed multiple times for each modeled alternative in order to analyze conditions for summer, winter, and averaged annual timeframes.

Note that interpolation of travel activity data between base year 2012 and forecast year 2040 results was used to estimate the emissions changes for interim year 2021 and 2031.

Step 3: Determine the emissions output from Step 2 (see Attachments B-D) to identify the potential emissions-related impacts of the 241/91 Express Connector TCM and three traffic signal synchronization projects.

Findings

The air quality forecasts for the three traffic signal synchronization projects TCM were compared with those of the 241/91 Express Connector TCM using the methodology described in the previous section. Criteria pollutants (Ozone, CO, NO₂, PM_{2.5} and PM₁₀) were compared for three forecast years (2021, 2031, and 2040) as well as three seasons (summer, winter, and annual) and their results are summarized in the tables below.

Year 2021

Summer Emissions - Ozone (Tons/Day)

	With Express Connector	With Traffic Signal Synchronization
ROG	16.4	16.4
NOx	28.4	28.4

Carbon Monoxide, Nitrogen Dioxide - Winter Emissions (Tons/Day)

	With Express Connector	With Traffic Signal Synchronization
NO2	30.0	30.0
CO	127.1	127.1

PM₁₀, PM_{2.5} - Annual Emissions (Tons/Day)

	With Express Connector	With Traffic Signal Synchronization
ROG	16.2	16.2
NOx	30.6	30.6
PM10	4.4	4.4
PM2.5	2.1	2.1

Year 2031

Summer Emissions - Ozone (Tons/Day)

	With Express Connector	With Traffic Signal Synchronization
ROG	9.5	9.5
NOx	14.0	14.0

Carbon Monoxide, Nitrogen Dioxide - Winter Emissions (Tons/Day)

	With 241 Extension	With Traffic Signal Synchronization
NO2	14.7	14.7
CO	67.3	67.3

PM₁₀, PM_{2.5} - Annual Emissions (Tons/Day)

	With 241 Extension	With Traffic Signal Synchronization
ROG	9.3	9.3
NOx	15.0	15.0
PM10	4.3	4.3
PM2.5	1.8	1.8

Year 2040

Summer Emissions - Ozone (Tons/Day)

	With Express Connector	With Traffic Signal Synchronization
ROG	6.7	6.7
NOx	8.3	8.3

Carbon Monoxide, Nitrogen Dioxide - Winter Emissions (Tons/Day)

	With Express Connector	With Traffic Signal Synchronization
NO2	8.6	8.6
CO	43.4	43.4

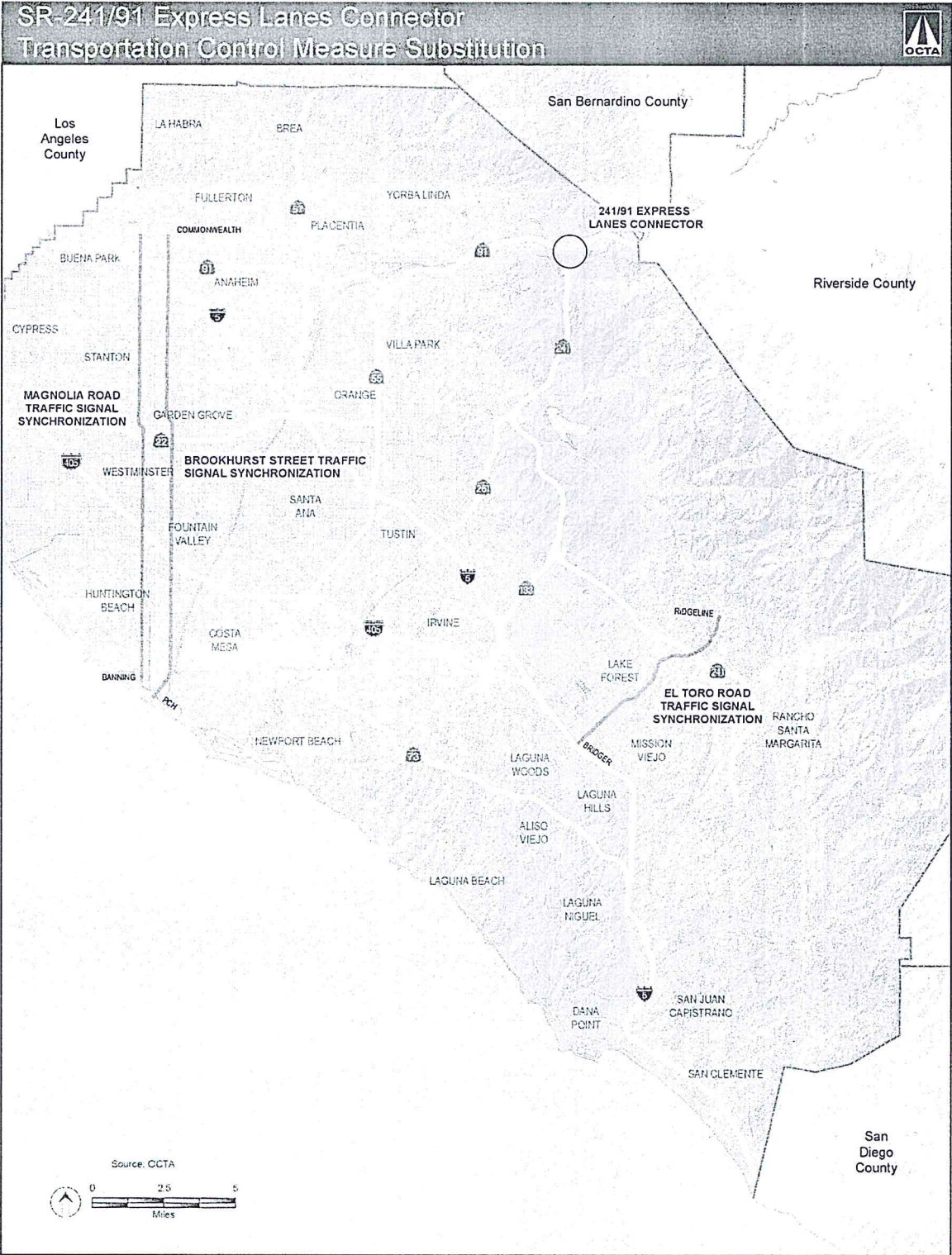
PM₁₀, PM_{2.5} - Annual Emissions (Tons/Day)

	With Express Connector	With Traffic Signal Synchronization
ROG	6.6	6.6
NOx	8.7	8.7
PM10	4.2	4.2
PM2.5	1.7	1.7

In summary, the modeling results demonstrate that the proposed three traffic signal synchronization projects TCM will have the same or lower amount of emissions compared with the 241/91 Express Connector TCM for all criteria pollutants for all milestone years.

Attachments

- A. Signal Synchronization Transportation Control Measure Substitution Map
- B. 2021 241/91 Express Connector and Traffic Signal Synchronization Projects Emissions Results
- C. 2031 241/91 Express Connector and Traffic Signal Synchronization Projects Emissions Results
- D. 241/91 Express Connector and Traffic Signal Synchronization Projects Emissions Results



1/4/2018

**2021 241/91 Express Connector and Traffic Signal Synchronization Projects
Emissions Results**

All Emissions Summary | Annual | Process:All | Technology:All

All Vehicles	Pollutants (tons)										Fuel (1000 gals)
	HC	CO	NOx	SOx	TOG	ROG	CO ₂	PM10	PM2_5	Total	
Baseline - 241-91 Connector	16.7	128.2	30.6	0.3	18.1	16.2	29,608	4.4	2.1	29,830	3,093
Replacement - TSS Projects	16.7	128.2	30.6	0.3	18.1	16.2	29,602	4.4	2.1	29,824	3,092

All Emissions Summary | Summer | Process:All | Technology:All

All Vehicles	Pollutants (tons)										Fuel (1000 gals)
	HC	CO	NOx	SOx	TOG	ROG	CO ₂	PM10	PM2_5	Total	
Baseline - 241-91 Connector	16.9	128.9	28.4	0.3	18.3	16.41	30,524	4.4	2.1	30,745	3,190
Replacement - TSS Projects	16.9	128.9	28.4	0.3	18.3	16.41	30,517	4.4	2.1	30,739	3,190

All Emissions Summary | Winter | Process:All | Technology:All

All Vehicles	Pollutants (tons)										Fuel (1000 gals)
	HC	CO	NOx	SOx	TOG	ROG	CO ₂	PM10	PM2_5	Total	
Baseline - 241-91 Connector	17.9	127.1	30.0	0.3	19.4	17.5	29,263	4.4	2.1	29,487	3,056
Replacement - TSS Projects	17.9	127.1	30.0	0.3	19.4	17.5	29,257	4.4	2.1	29,481	3,055

ATTACHMENT C

**2031 241/91 Express Connector and Traffic Signal Synchronization Projects
Emissions Results**

All Emissions Summary | Annual | Process:All | Technology:All

All Vehicles	Pollutants (tons)										Fuel (1000 gals)
	HC	CO	NOx	SOx	TOG	ROG	CO ₂	PM10	PM2_5	Total	
Baseline - 241-91 Connector	9.7	68.0	15.0	0.3	10.5	9.3	25,137	4.3	1.8	25,261	2,593
Replacement - TSS Projects	9.7	68.0	15.0	0.3	10.5	9.3	25,126	4.3	1.8	25,250	2,592

All Emissions Summary | Summer | Process:All | Technology:All

All Vehicles	Pollutants (tons)										Fuel (1000 gals)
	HC	CO	NOx	SOx	TOG	ROG	CO ₂	PM10	PM2_5	Total	
Baseline - 241-91 Connector	9.9	68.7	14.0	0.3	10.7	9.5	25,864	4.3	1.8	25,988	2,670
Replacement - TSS Projects	9.9	68.7	14.0	0.3	10.7	9.5	25,852	4.3	1.8	25,976	2,669

All Emissions Summary | Winter | Process:All | Technology:All

All Vehicles	Pollutants (tons)										Fuel (1000 gals)
	HC	CO	NOx	SOx	TOG	ROG	CO ₂	PM10	PM2_5	Total	
Baseline - 241-91 Connector	10.4	67.3	14.7	0.2	11.3	10.1	24,860	4.3	1.8	24,986	2,564
Replacement - TSS Projects	10.4	67.3	14.7	0.2	11.3	10.1	24,849	4.3	1.8	24,974	2,562

ATTACHMENT D

**2040 241/91 Express Connector and Traffic Signal Synchronization Projects
Emissions Results**

All Emissions Summary | Annual | Process:All | Technology:All

All Vehicles	Pollutants (tons)										Fuel (1000 gals)
	HC	CO	NOx	SOx	TOG	ROG	CO ₂	PM10	PM2_5	Total	
Baseline - 241-91 Connector	6.9	43.9	8.7	0.2	7.5	6.6	23,349	4.2	1.7	23,434	2,393
Replacement - TSS Projects	6.9	43.8	8.7	0.2	7.5	6.6	23,335	4.2	1.7	23,420	2,392

All Emissions Summary | Summer | Process:All | Technology:All

All Vehicles	Pollutants (tons)										Fuel (1000 gals)
	HC	CO	NOx	SOx	TOG	ROG	CO ₂	PM10	PM2_5	Total	
Baseline - 241-91 Connector	7.1	44.7	8.3	0.2	7.6	6.7	24,000	4.2	1.7	24,085	2,462
Replacement - TSS Projects	7.1	44.6	8.3	0.2	7.6	6.7	23,985	4.2	1.7	24,071	2,461

All Emissions Summary | Winter | Process:All | Technology:All

All Vehicles	Pollutants (tons)										Fuel (1000 gals)
	HC	CO	NOx	SOx	TOG	ROG	CO ₂	PM10	PM2_5	Total	
Baseline - 241-91 Connector	7.5	43.4	8.6	0.2	8.0	7.1	23,099	4.2	1.7	23,185	2,367
Replacement - TSS Projects	7.5	43.4	8.6	0.2	8.0	7.1	23,086	4.2	1.7	23,172	2,365