



Attachment A

LOCAL TRANSPORTATION CONTROL MEASURE REVIEW
& BEST AVAILABLE CONTROL TECHNOLOGY ANALYSIS

To: San Joaquin Valley Metropolitan Planning Organization (MPO) Staff
From: Suriya Vallamsundar and Alex Marcucci, Trinity Consultants
Date: April 12, 2023
RE: Local Transportation Control Measure Review and Best Available Control Measure (BACM) Analysis for the San Joaquin Valley 2023 Particulate Matter (PM_{2.5}) State Implementation Plan

This memorandum presents the results and methodology for conducting local Best Available Control Measure (BACM) analysis in support of the 2023 San Joaquin Valley (SJV) Particulate Matter (PM_{2.5}) State Implementation Plan (SIP) for the annual 2012 PM_{2.5} standard. In July 2022 as part of the SJV 2022 Ozone Plan development, Trinity Consultants (Trinity) conducted a comprehensive Reasonable Available Control Measure (RACM) analysis for the eight SJV Metropolitan Planning Organizations (MPOs) with the purpose of identifying additional transportation control measures (TCMs) in line with the requirements of the U.S. Environmental Protection Agency's (EPA's) Ozone Implementation Rule¹. As part of the 2022 Ozone SIP RACM analysis, new TCMs were identified and are currently being implemented by the Valley MPOs.²

The SJV is designated as Serious nonattainment for the 2012 PM_{2.5} standard and as a result, the nonattainment area is required to conduct a Best Available Control Measure (BACM) analysis including TCM review for the control of direct PM_{2.5} and PM_{2.5} precursors from on-road mobile sources for the 2023 PM_{2.5} Plan. The Final PM_{2.5} Rule³ differentiates between the RACM and BACM as follows, "... the EPA proposed to interpret the control requirements addressed by CAA section 189(e) to include RACM/RACT (and additional reasonable measures) for Moderate nonattainment areas, BACM/BACT (and additional feasible measures) for Serious nonattainment areas, most stringent measures (MSM) (for Serious areas as applicable) and NNSR on all major sources of precursors in the nonattainment areas." According to the steps laid out in the Final PM_{2.5} Rule, the TCM BACM analysis consists of reviewing existing TCMs in the SJV, as well as measures implemented in other Moderate and Serious PM_{2.5} nonattainment areas throughout the country, and evaluating the technological and economic feasibility of any new measures identified. This analysis demonstrates that TCM projects that are already being implemented in the Valley meet BACM requirements. No additional measures were identified for implementation.

Background

According to the Final Rule, the BACM selection process for implementation of the PM_{2.5} NAAQS consists of the following steps³:

¹ EPA, 2018. *Implementation of the 2015 National Ambient Air Quality Standards for Ozone: State Implementation Plan Requirements. Final Rule. U.S. Environmental Protection Agency. Vol. 83. No. 234. December 6, 2018.*

² San Joaquin Valley Air Pollution Control District. *2022 Ozone Plan for the San Joaquin Valley. Appendix D Mobile Source Control Strategy. Accessed at <https://ww2.valleyair.org/media/rtrjnlxo/13-appendix-d-mobile-source-control-strategy.pdf>.*

³ *Federal Register, Vol. 81, No 164, Accessed at <https://thefederalregister.org/81-FR/Issue-164/FR-2016-08-24.pdf>, Pg. 58084.*

- Step 1: Develop a comprehensive inventory of sources and source categories of directly emitted PM_{2.5} and PM_{2.5} precursors.
- Step 2: Identify existing and potential control measures for the sources in the inventory.
- Step 3: Evaluate the technological feasibility of potential control measures.
- Step 4: Evaluate the economic feasibility of potential control measures.
- Step 5: Determine the earliest date by which a control measure or technology can be implemented in whole or in part.

In July 2022, Trinity Consultants (Trinity) conducted a comprehensive RACM analysis for the eight SJV Metropolitan Planning Organizations (MPOs) which identified new TCMs focused on complete streets and educational campaign projects that promote non-vehicular travel modes and eco-driving techniques. In addition, the SJV MPOs, the Air District, and CARB are already implementing TCMs that aim to reduce VMT and emissions from mobile sources in response to SB 375 and other federal, state, and local goals and requirements. Appendix D of the SJV 2022 Ozone Plan² provides additional details on the RACM methodology and final TCM listing for each SJV MPO, as well as an overview of existing state and Air District control measures. In addition to the TCMs identified through the RACM process, Trinity followed the process outlined below to evaluate whether there are any additional TCMs that would be considered BACM.

BACM Analysis Methodology

Step 1: Identify measures currently implemented in the SJV

The first step consisted of developing a comprehensive listing of TCMs that are already being implemented in the eight SJV counties – Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare. Appendix D of the 2022 SJV Ozone Plan provides details on the data sources utilized and current measures implemented by the SJV MPOs.

Step 2: Develop a list of TCMs implemented in other nonattainment areas

Once existing TCMs were identified, the second step was to compile a list of all candidate TCMs that were implemented in other PM_{2.5} nonattainment areas. For this analysis, the BACM review included relevant SIPs from PM_{2.5} nonattainment areas for 1997, 2006, and 2012 PM_{2.5} standards. Since many of the SIPs reviewed as part of SJV 2022 Ozone SIP RACM analysis consist of integrated air quality plans targeting both ozone and PM_{2.5}, this step was already covered in detail as part of 2022 Ozone Plan development. However, additional TCMs were identified from PM_{2.5} nonattainment areas where the TCMs were developed specifically for particulate matter. Table 1 shows the nonattainment areas, their designation, and the applicable SIPs reviewed in support of this BACM analysis. A total of 43 unique TCMs were identified and condensed into 23 TCM categories by utilizing only the measures that are significantly different in scope and emissions reduction potential. The TCM listing was kept consistent with previous TCM lists developed as part of ozone RACM analysis. Appendix A shows the 23 TCMs identified as part of the review of PM_{2.5} SIPs and includes both new and existing TCMs.

The programs and regulations implemented in the SJV as a result of statewide or district-wide measures were also reviewed as part of the RACM analysis which will apply to the BACM process. The majority of these measures correspond to controlling the extended idling of vehicles, encouraging vehicle turnover, and employer-based trip reduction measures, etc.

Table 1. PM_{2.5} Nonattainment Areas Reviewed for Candidate TCMs

Region	Designation	Applicable SIP
South Coast Air Quality Management District	Serious for 2012 and 2006 PM _{2.5} Standards and Moderate for 1997 PM _{2.5} Standards	2020 Air Quality Management Plan, South Coast Air Quality Management District (incl. 2016 RACM/BACM analysis) ¹
Alaska Department of Environmental Conservation (Fairbanks)	Serious for 2006 PM _{2.5} Standards	2020 Amendments to the Serious SIP
Northern Sierra Air Quality Management District (Plumas County)	Serious for 2012 PM _{2.5} Standards	2017 Portola Fine Particulate Matter (PM _{2.5}) Attainment Plan
Allegheny County Health Department Air Quality Program (Allegheny)	Moderate for 2012 PM _{2.5} Standards	2019 Attainment Demonstration for the Allegheny County, PA PM _{2.5} Nonattainment Area, 2012 NAAQS
Imperial County Air Pollution Control District	Moderate for 2012 and 2006 PM _{2.5} Standards	2018 Imperial County Annual Particulate Matter less than 2.5 microns in diameter State Implementation Plan
Utah Air Quality Board (Salt Lake City)	Serious for 2006 PM _{2.5} Standards	2019 Control Measures for Area and Point Sources, Fine Particulate Matter, Serious Area PM _{2.5} SIP for the Salt Lake City, UT Nonattainment Area 2020 Technical Support Documentation for Utah's Salt Lake City and Provo 2006 24-Hour PM _{2.5} State Implementation Plans
Utah Air Quality Board (Provo)	Serious for 2006 PM _{2.5} Standards	2018 Provisions to Ensure BACM/BACT for the Provo, UT Serious PM _{2.5} Nonattainment Area 2020 Technical Support Documentation for Utah's Salt Lake City and Provo 2006 24-Hour PM _{2.5} State Implementation Plans
Oregon Department of Environmental Quality (Klamath Falls)	Moderate for 2006 PM _{2.5} Standards	2012 Klamath Falls Fine Particulate Matter (PM _{2.5}) Attainment Plan
Allegheny County Health Department Air Quality Program (Liberty-Clairton)	Moderate for 2006 and 1997 PM _{2.5} Standards	2011 Attainment Demonstration for the Liberty-Clairton PM _{2.5} Nonattainment Area
Sacramento Metropolitan Air Quality Management District (Sacramento)	Moderate for 2006 PM _{2.5} Standards	2013 PM _{2.5} Implementation/Maintenance Plan and Re-designation Request for Sacramento PM _{2.5} Nonattainment Area
Bay Area Air Quality Management District (San Francisco Bay Area)	Moderate for 2006 PM _{2.5} Standards	Spare the Air: 2017 Clean Air Plan
Montana Department of Environmental Quality (Libby)	Moderate for 1997 PM _{2.5} Standards	2020 Request for Redesignation of the Libby PM _{2.5} Nonattainment Area and Approval of an Attainment Area Limited Maintenance Plan

¹ The South Coast Air Quality Management District 2020 Air Quality Management Plan is an integrated plan for both Ozone and PM_{2.5} and was evaluated in detail as part of the RACM analysis for 2022 Serious Ozone Plan

Step 3: Evaluate Implementation Feasibility of Measures

Once the list of additional potential TCMs was compiled, the next step was to collect sufficient information on each candidate measure to determine its feasibility for each SJV MPO based on the applicability, implementational authority, and technological and economic feasibility.

Step 4: Identify the Best Available Control Measures

The final step consists of finalizing the TCMs for each SJV MPO. Table 2 shows additional TCMs identified with this BACM analysis, along with their evaluation and justification for their disqualification based on the assessment of the metrics discussed in the previous step.

Table 2. SJV New BACM TCMs Identified from PM_{2.5} SIP Review

TCM #	TCM	Description	Analysis	Comments
<i>i. Improved Public Transit</i>				
1.14	Outreach Programs	Public education focused on using the transit programs	Newly Proposed RACM TCM in the 2022 Ozone Plan	
<i>v. Reduce Extreme Cold-Start Emissions</i>				
5.1	Use of plug-ins	Expanded availability of plug-ins to facilitate cold weather starting of vehicles and reduce engine idling time	Not Applicable	
5.2	Electrification of parking lot outlets	Electrification of parking lot outlets at temps < 21° F	Not Applicable	
5.3	Outreach Programs	Public education focused on the benefits of plugging-in	Not Applicable	
<i>ix. Pre-1980 Model-Year Vehicle Scrappage</i>				
9.3	Retrofit Programs	On-road diesel engine retrofits for school buses, trucks, and transit buses	Existing	SJVAPCD Incentive Programs; CARB ATCM and Truck and Bus Rule
<i>x. Transit-Only or High Occupancy Vehicle Lanes</i>				
10.3	Express Lanes	Price travel demand on highways by developing an express lane network for vehicles	No implementation authority	Would require state agency authority and funds
<i>xv. Limit or Restrict Vehicle Use in Downtown Areas</i>				
15.11	Pricing Policies	Transportation Pricing (such as tolling and cordon pricing) to reduce the vehicle miles traveled	No implementation authority	Pricing policies are set by each jurisdiction and/or the State
<i>xvi. High-Occupancy and Ridesharing Programs</i>				
16.7	Outreach programs	Public Education and Outreach Program	Newly Proposed RACM TCM in the 2022 Ozone Plan	

BACM Analysis Results

Based on the BACM review, no additional TCMs were selected for implementation because of the following reasons:

- Based on the latest RACM analysis for the SJV 2022 Ozone Plan, all CAA Section 108(f)(1)(A) TCM categories are already being implemented in the SJV. This is the result of the most stringent air quality and conformity requirements due to SJV's extreme non-attainment status for both 2008 and 2015 ozone standards.
- The new TCMs identified through the BACM process are either already implemented in the SJV or cannot be implemented due lack of implementation authority or not being applicable to the SJV region (e.g., plug-ins in extreme cold climatic conditions in Fairbanks, AK).
- The TCMs which did not constitute RACM in 2022 Ozone Plan would not constitute BACM. The justifications given for disqualifications are as follows:
 - No Authority: if SVJ MPOs have no authority to implement a RACM TCM, the same applies to BACM.
 - Not Economically Feasible: TCMs that are cost-ineffective as RACM are also not economically feasible for BACM.
 - Not applicable: some TCMs are not feasible either because of State laws or because the TCMs are unique to the region where they are being implemented.
 - Would not advance attainment: some of the RACM TCMs were rejected based on the fact that these measures cannot advance attainment.⁴ While advancing attainment is one of the criteria for RACM analysis, it is not listed as one of the steps in a BACM process. These measures were evaluated in detail as part of the BACM process. While the key reason for rejecting these measures as a RACM TCM was not being able to advance attainment, these measures were also determined as not economically feasible or SJV MPOs do not have implementation authority to enforce some of the measures. A combination of economic infeasibility and lack of authority dismisses these TCMs as a BACM.
- The SJV MPOs comply with California's SB 375 and have adopted Sustainable Community Strategies (SCSs) that address per capita GHG emission reductions through sustainable transportation and land-use planning. While the focus of SB 375 is on GHG emissions, there are some co-benefits on the air quality side as well due to reductions in VMT and other policies such as partnering with the state and the Air District on electric vehicle deployment.

The BACM analysis demonstrates that the TCM projects being implemented in the SJV meet BACM requirements; no new measures were identified.

⁴ Measures include 2.1 Establish auto-free zones and pedestrian malls, 3.2 Providing free bikes to transit users, 15.4 Reversible lanes to change the direction of travel during special events or congested periods, and 17.4 Providing clean fleet vehicles for government employees.

Appendix A

Table A1. SJV Transportation Control Measure BACM Analysis

TCM #	TCM	Description	Analysis	Comments
<i>i. Improved Public Transit</i>				
1.2	Expansion of public transportation services	Expanded transit service includes improved service frequency on high ridership routes, new routes and better bus stop facilities	Existing	RTP/SCS
1.5	Transit rehabilitation and retrofits	Onroad diesel engine retrofits for transit buses	Existing	AFVs are required per CARB Zero Emission Transit Rule
1.6	Transit service improvement including parking management	Improve transit efficiency	Existing	RTP/SCS
1.9	Land use strategies to prioritize transit	Land use strategies to facilitate walking, bicycling and transit use	Existing	RTP/SCS
1.13	Passenger Rail Improvements	Improve Local and Regional Rail Service	Existing where applicable	RTP/SCS
1.14	Outreach Programs	Public education focused on using the transit programs	Newly Proposed RACM TCM in the 2022 Ozone Plan	
<i>iv. Control Extended Idling of Vehicles</i>				
4.2	Programs to reduce idling of vehicles	Reduce idling at drive-throughs, parking lots, in traffic, at schools, and other locations, etc. Use of APUs or special battery engines to keep air conditioning and other vehicle systems when the vehicle is not in use.	Existing/Statewide	CARB ATCM
<i>v. Reduce Extreme Cold-Start Emissions</i>				
5.1	Use of plug-ins	Expanded availability of plug-ins to facilitate cold weather starting of vehicles and reduce engine idling time	Not Applicable	
5.2	Electrification of parking lot outlets	Electrification of parking lot outlets at temps < 21° F	Not Applicable	
5.3	Outreach Programs	Public education focused on the benefits of plugging-in	Not Applicable	

	viii. Construction/Reconstruction of Paths for Non-Motorized Use			
8.1	Bicycle/pedestrian facilities	Bicycle and Pedestrian Access and Facilities Improvements	Existing	RTP/SCS
8.4	Safe Routes to School Programs	Safe Routes to Schools and Safe Routes to Transit Programs	Existing	RTP/SCS
	ix. Pre-1980 Model-Year Vehicle Scrappage			
9.3	Retrofit Programs	On-road diesel engine retrofits for school buses, trucks, and transit buses	Existing	SJVAPCD Incentive Programs and CARB ATCM and Truck and Bus Rule
	x. Transit-Only or High Occupancy Vehicle Lanes			
10.3	Express Lanes	Price travel demand on highways by developing an express lane network for vehicles	No implementation authority	Would require state agency authority and funds
	xi. Employer-Based Plans and Incentives			
11.8	Employer Rideshare Program Incentives	Employer-based rideshare incentives and introduction of strategies designed to reduce single-occupant vehicle trips. Examples include public awareness campaigns, Transportation Management Associations among employers, alternative work hours, and financial incentives for TCM participants as well as tax breaks for employers. Provide outreach and possible financial incentives to encourage local employers to provide transit passes or subsidies to encourage less individual vehicle travel.	Existing	SJVAPCD Employer Based Trip Reduction/Rule 9410
	xiii. Traffic Flow Improvements			
13.3	Intersection Improvements	Installation of turn lanes, curbs, traffic signals, realign skewed intersections to provide better traffic flow and safety.	Existing	FTIP/RTP
13.4	Eco-driving educational program	Public education and outreach to encourage drivers to observe posted speed limits and adopt other fuel-efficient driving practices	Newly Proposed RACM TCM in the 2022 Ozone Plan	
13.8	Traffic Signal Synchronization/Traffic Signal Improvements	Install synchronized traffic signals, adaptive traffic signals, median dividers, turn lanes, and grade separations	Existing	FTIP/RTP
13.14	Pavement Resurfacing and Rehabilitation	Road Paving to reduce re-suspended road dust	Existing	FTIP/RTP
	xv. Limit or Restrict Vehicle Use in Downtown Areas			
15.2	Parking Fee Regulations	Parking fees can be increased in different forms such as the highest charges for parking in central business districts, increase fees for parking garages to deter vehicle use during high ozone level days, and charging city-owned parking garage pass holders a fee for more than one entrance and exit each day, etc.	No implementation authority	Parking fees are set by each jurisdiction

15.11	Pricing Policies	Transportation Pricing (such as tolling and cordon pricing) to reduce the vehicle miles traveled	No implementation authority	Pricing policies are set by each jurisdiction and/or the State
	<i>xvi. High-Occupancy and Ridesharing Programs</i>			
16.3	Vanpool program	Commuter Van Pool program	Existing	RTP/SCS
16.7	Outreach programs	Public Education and Outreach Program	Newly Proposed RACM TCM in the 2022 Ozone Plan	