This Appendix was submitted by the eight Regional Councils of Governments

Appendix C

Local Controls: Conformity and RACM

This page intentionally blank.

Appendix C: Conformity and RACM

C.1 DRAFT IMPLEMENTATION OF THE LOCAL REASONABLY AVAILABLE CONTROL MEASURE (RACM) STRATEGY

December 5, 2006

The Clean Air Act (Section 172 (c)(1)) requires State Implementation Plans (SIPs) to contain Reasonably Available Control Measures (RACM) to provide for attainment of the air quality standard as expeditiously as practicable. The San Joaquin Valley Air Pollution Control District (SJVAPCD) has requested that the Valley Metropolitan Planning Organizations (MPOs) draft a RACM approach for the 8-hour Ozone State SIP. The final SIP is due for adoption by the SJVAPCD in Spring 2007, and submittal to EPA by June 15, 2007.

On October 4, 2006, the MPO Directors were presented several options for developing a local RACM strategy as part of the 8-hour Ozone SIP. The Directors recommended pursuing implementation of Option 2, which would include only the minimum number of RACM commitments required by law. In order to show a commitment to improved air quality, Option 2 also includes a recommendation to exceed the minimum RACM requirements by voluntarily adopting a Congestion Mitigation and Air Quality (CMAQ) policy to fund cost-effective emission reduction projects.

The MPOs propose to apply EPA's final rule to implement the 8-hour ozone standard for identifying the RACM commitments. If it appears that the combined RACM could not advance the attainment date by at least one year, then those additional measures are not deemed "reasonably available" under EPA policy and would not need to be included in the State Implementation Plan (SIP). Based on analyses in other areas, it is unlikely enough viable RACM measures will be identified that can show such reductions, and thus advance attainment by a year.

The purpose of the CMAQ program is to fund transportation projects or programs that will contribute to attainment or maintenance of the national ambient air quality standards (NAAQS) for ozone, carbon monoxide (CO), and particulate matter (PM). While all CMAQ funding must go to transportation-related projects that demonstrate an air quality benefit, the eight SJV MPOs currently have different criteria and processes for allocating funding to eligible agencies. There is currently no minimum cost-effectiveness established for the CMAQ program, and according to recent studies, the numbers vary widely across the country. The SJV MPOs propose to develop a standardized process across the Valley for distributing a percentage of the CMAQ funds to projects that meet a minimum cost-effectiveness. This policy will focus on achieving

the most cost-effective emission reductions, while maintaining flexibility to meet local needs.

The attached papers provide the proposed approach for implementation of Option 2: (1) evaluation of potential RACM for advancing attainment date, and (2) adoption of a cost-effective CMAQ policy.

C.2 DRAFT EVALUATION OF POTENTIAL REASONABLY AVAILABLE CONTROL MEASURES (RACM) FOR THE 8-HOUR OZONE ATTAINMENT DEMONSTRATION PLAN

December 5, 2006

Summary

The San Joaquin Valley Metropolitan Planning Organizations (MPOs) will apply EPA's final rule to implement the 8-hour ozone standard for identifying the RACM commitments (FR, Vol. 70, No. 228/November 29, 2005, pp 71659-71661). The EPA rule reinforces earlier RACM guidance providing for a limited RACM analysis of available measures, an estimate of emission reductions, and examination of the time needed to implement the measures.

If it appears that the combined RACM could not advance the attainment date by at least one year, then those measures are not deemed "reasonably available" under EPA policy and would not need to be included in the State Implementation Plan (SIP). Further guidance in implementing RACM is provided in EPA's proposed PM2.5 SIP development guidance (FR, Vol. 70, No. 210/November 1, 2005, pp. 66027-66029).

Assumptions

Several key decisions must be made to conduct the RACM analysis. Based on projected ozone precursor emissions described in the current draft SIP, it would appear that the San Joaquin Valley Air Pollution Control District (SJVAPCD) may need to ask the California Air Resources Board (CARB) to request that the San Joaquin Valley be "bumped up" to a Severe-15, Severe-17, or Extreme classification, which would change the attainment date from 2013 to 2019, 2021 or 2024.

While the statutory attainment dates range from 2013 to 2024, the corresponding attainment demonstration and control measure analysis must be conducted for the previous year (e.g., 2012 and 2023). Therefore, it is recommended that the analysis on whether a RACM can advance the attainment date by one year be conducted for both 2012 and 2023 analysis years. If RACM cannot be demonstrated to advance either attainment date, it is assumed that the same holds true for any attainment date between 2013 and 2024.

The SJVAPCD Draft 2007 Ozone Plan, dated October 17, 2006, indicates that an estimated additional 300 tons per day of combined VOC and NOx emissions are

necessary to demonstrate attainment in 2012, and approximately 100 tons per day to demonstrate attainment in 2023. These estimates are based upon the difference between the carrying capacity of the San Joaquin Valley and the currently identified control measures for the attainment analysis years.

There are a few possible ways to perform the RACM analysis. One method would be to identify how much each measure had reduced the Valley's total emissions by the attainment analysis year. The estimated emission reductions from possible RACM measures would need to yield more than 300 tons per day of combined VOC and NOx emissions in 2012, or 100 tons per day in 2023 to advance attainment. An alternative demonstration would be to assume that possible RACM measures have equal emission reductions in each of the years between SIP development (2007) and the attainment analysis year (i.e., the "straight-line approach"). As a result, the estimated emission reductions would need to be greater than 60 tons per day in EACH year to advance the 2012 attainment date or 6 tons per day in EACH year to advance the 2023 attainment date.

These examples demonstrate the magnitude of the emission reductions that must be found from a combination of RACM to qualify as "reasonably available" control measures. It is unlikely enough viable RACM measures will be identified that can show such reductions, and thus advance attainment by a year.

For comparison, EPA analyzed four one-hour ozone SIPs in the Eastern U.S. to determine if the combination of Transportation Control Measures (TCMs) in each area would advance attainment by one year. The maximum potential emissions reduction (VOC + NOx) in any one of those areas was 28 tons/day in Atlanta, which still only accounted for 11% of Atlanta's 255 ton per day needed NOx reduction in the attainment analysis year. Thus, the TCMs were not deemed "reasonably available." This area has a larger and more urbanized population than the San Joaquin Valley, and we would expect RACM/TCMs in the Valley to have fewer emissions reductions.

The EPA guidance allows implementing agencies to reject measures due to technological or economical infeasibility or supporting documentation that the measures are otherwise unreasonable. Those measures that are being considered for RACM must demonstrate that they are not likely to require an extensive and costly effort for numerous small area sources and that they can be fully implemented within the time frame of the relevant attainment date.

Approach

The following section outlines the SJV MPO proposed approach to conduct a local RACM analysis. Again, this analysis would be performed for both the 2012 and 2023 analysis years.

1. Develop a list of control measures for possible consideration. List will be developed from previous San Joaquin Valley RACM processes, more recent

guidance materials, applicable SIPs, and measures suggested by the public during the SJVAPCD Town Hall meetings.

   a. Apply the "economically or technologically feasible" test to eliminate measures for possible consideration. Examine the potential measures for partial implementation, geographical appropriateness, social acceptability, etc.

2. Estimate emission reductions for those measures that passed the tests in #1
   a. Several guides are available to assign emission reductions to specific measures. These include EPA's RACM analysis for four serious 1-hour ozone areas in the East (October 12, 2000); CARB's CMAQ Methodology; and findings of Transportation Research Board's Special Report 264, CMAQ – Assessing 10 Years of Experience. Additional sources of information on calculating emission reductions from TCMs will also be consulted as necessary. It is important to note that due to the use of EMFAC in California, use of national or other state calculators may be limited.
3. Total the VOC and NOx daily emissions from all measures that were analyzed in #2 to determine if they collectively advance attainment by a full year.
   a. If the emissions analysis determines that the combination of RACMs will advance attainment by a full year, then the SJV MPOs would work with their member jurisdictions to develop legally enforceable commitments to implement the identified RACMs.
   b. If the emissions analysis determines that the combination of RACMs will not advance attainment by a full year, then the analysis would be documented as part of the SIP record, but no further requirements to adopt local commitments for the SIP would be necessary.

C.3 DRAFT COMMITMENT TO IMPLEMENT LOCAL CMAQ POLICY

December 5, 2006

Summary

The Congestion Mitigation and Air Quality (CMAQ) program funds transportation projects or programs that will contribute to attainment or maintenance of the national ambient air quality standards. While all CMAQ funding must go to transportation-related projects that demonstrate an air quality benefit, the eight San Joaquin Valley (SJV) Metropolitan Planning Organizations (MPOs) currently have different criteria and processes for allocating funding to eligible agencies. There is currently no minimum cost-effectiveness established for the CMAQ program, and according to recent studies, the numbers vary widely across the country. The SJV MPOs propose to develop a standardized process across the Valley for distributing 20% of the CMAQ funds to projects that meet a minimum cost-effectiveness. This policy will focus on achieving the most cost-effective emission reductions, while maintaining flexibility to meet local needs.

Background

The CMAQ program was created under the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, continued under the Transportation Equity Act for the 21st Century (TEA-21), and reauthorized by the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). Over $8.6 billion is authorized over the five-year program (2005-2009), with annual authorization amounts increasing each year during this period. The San Joaquin Valley Metropolitan Planning Organizations (MPOs) currently receive approximately $40 million per year, subject to state and federal formulas. These amounts are updated annually based on available funds.

New CMAQ guidance based on SAFETEA-LU was released by the Federal Highway Administration (FHWA) on October 31, 2006. The new legislation and guidance clarifies project eligibility, including advanced truck stop electrification systems and the purchase of diesel retrofits. SAFETEA-LU directs States and MPOs to give priority to diesel retrofits and to cost-effective congestion mitigation activities that provide air quality benefits. Though SAFETEA-LU establishes these investment priorities, it also retains State and local agencies' authority in project selection, meaning that changes to local procedures are not required by the SAFETEA-LU.

Federal legislation gives local agencies discretion on how to distribute CMAQ funds. While all CMAQ funding must go to transportation-related projects that demonstrate an air quality benefit, the eight SJV MPOs currently have different criteria and processes for allocating funding to eligible agencies.

Policy Recommendations

Even though (1) SAFETEA-LU does not mandate program changes and (2) local Reasonably Available Control Measures (RACM) may not advance attainment and would therefore not be required, the San Joaquin Valley MPOs are voluntarily committing to improving the CMAQ process through this policy to assist in the clean air efforts. The San Joaquin Valley MPOs propose to adopt the following CMAQ policy through Policy Board Resolutions, possibly as part of the 2007 RTP, to be implemented beginning in FY 2011.

The policy is scheduled to be implemented in FY 2011 because the current federally approved 2007 Federal Transportation Improvement Programs (FTIPs) have committed CMAQ funds through FY 2009 and in some cases, regional commitments through FY 2010. In addition, the current CMAQ programming assists in implementing approved local RACM (Amended 2003 PM-10 Plan) that are currently committed through 2010.

Cost-effectiveness is a key component of providing funding to improve air quality and reduce congestion. Policies that focus on cost-effectiveness will result in the largest emission reductions for the lowest cost. In the state of California, the Air Resources Board (ARB) provides funding for air quality improvement projects through the Carl Moyer Program, which requires that heavy-duty vehicle projects meet a cost-effectiveness of $14,300 per ton. The San Joaquin Valley Air Pollution Control District

(SJVAPCD) also uses cost-effectiveness thresholds for projects funded through the REMOVE II and Heavy-Duty Incentive Programs. However, there is currently no minimum cost-effectiveness established for the CMAQ program, and according to recent studies, the numbers vary widely across the country and by project type. Attachment 1 provides a summary of cost-effectiveness of various types of CMAQ projects, as indicated in the most recent FHWA guidance.

The SJV MPOs propose to develop a standardized process across the Valley for distributing 20% of the CMAQ annual apportionments for each MPO to projects that must meet a minimum cost-effectiveness. This percentage will be converted to a dollar amount as part of periodic reviews and updates to the CMAQ policy. The process will focus on achieving the most cost-effective emission reductions, while maintaining flexibility to meet local needs.

CMAQ projects must demonstrate an air quality benefit, and the expected emissions reductions will continue to be estimated with the ARB "Methods to Find the Cost-Effectiveness of Funding Air Quality Projects". Tracking of the CMAQ policy will be achieved through several methods. Each MPO must submit annual reports to Caltrans and the Federal Highway Administration (FHWA) that specify how CMAQ funds have been spent and the expected air quality benefits. This report is due by the first day of February following the end of the previous Federal fiscal year (September 30) and covers all CMAQ obligations for that fiscal year. As has been the practice of several MPOs, a copy of the CMAQ annual report will also be submitted to the Air District for information purposes. Each MPO will also post information related to the implementation of the CMAQ policy on its website.

The Caltrans CMAQ web-page has annual reports provided for 2002-2003 and earlier. For the San Joaquin Valley, approximately $19.5 million of CMAQ dollars was allocated which resulted in approximately 0.26 tons/day reduction in reactive organic gases (ROG) and 0.37 tons/day reduction in nitrogen oxides (NOx). For 2001-2002, approximately $38.6 million of CMAQ dollars was allocated resulting in approximately 0.35 tons/day reduction in ROG and 0.42 tons/day reduction in NOx. It is important to note that the entire project cost is not provided and the estimated emission reduction is for the life of the project.

Due to changes in project costs and technology over time, the MPOs will revisit the minimum cost-effectiveness standard, as well as policy feasibility, with each new Regional Transportation Plan (RTP), excluding amendments. RTP updates are required by SAFETEA-LU every four years. A periodic review of the policy is necessary due to potential changes in federal transportation legislation, apportionments, and project eligibility. This policy will only affect federal CMAQ funds, and does not imply changes to other funding programs. Should future transportation legislation not include CMAQ funding, this policy will no longer be in effect.

Additional Considerations

As the specifics of the CMAQ policy are developed, the MPOs and interagency consultation partners will need to discuss several additional issues. These include such items as:

(1) How to address unspent CMAQ funds that are part of the 20% policy

(a) The SJVAPCD air quality grant incentive programs provide a possible program that MPOs could contribute to and still meet their cost-effectiveness threshold.

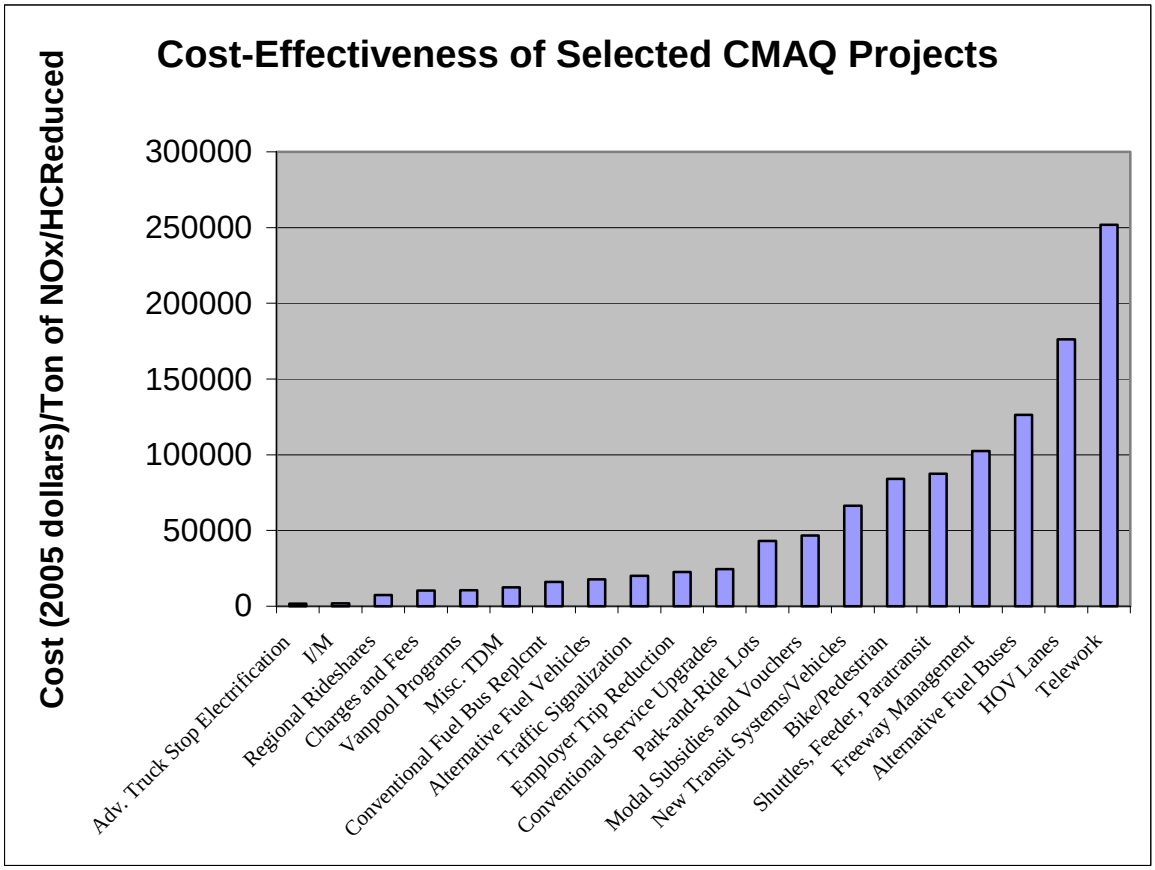
(2) Priority for Leveraging Air District Funds

(a) To provide an added incentive for funding cost-effective expenditures of CMAQ funds, the SJVAPCD should consider giving priority for matching funds for cost-effective CMAQ projects.

(3) Providing Incentives for Early Completion of Commitment

(a) The policy could allow MPOs to accrue credit for exceeding their base commitment of cost-effective CMAQ expenditure. The credit would allow an MPO to complete its annual average cost effective expenditure goal prior to the attainment date. For example, if the CMAQ policy covers a 10 year period and the expenditure goal is a minimum of 20 percent, agencies could program 100% of their CMAQ for the first 2 years and have fulfilled their 10-year commitment. This would provide an incentive to MPOs to achieve air quality improvements as early as possible.

Table C-1 Cost-Effectiveness of Selected CMAQ Projects



Source: TRB Special Report 264—The Congestion Mitigation and Air Quality Improvement Program: Assessing 10 Years of Experience, Chapter 4.

C.4 RESPONSE TO INTERAGENCY COMMENTS ON DRAFT RACM APPROACH

January 16, 2007

The local RACM approach for the 8-hour Ozone Plan was transmitted for interagency consultation on December 5, 2006.

It is important to note that no other verbal or written comments were received from the public or inter-agency consultation partners, including: the California Department of Transportation and Federal Transit Administration.

COMMENT FROM BOB O'LOUGHLIN, FHWA
(via e-mail, dated December 5, 2006)

Comment: The RACM approach looks good. On the Local CMAQ Policy, is it possible to present an estimate of how much CMAQ funds each of the SJV MPOs will have in FY 2011? It's difficult to ascertain whether 20% of each MPO's CMAQ funds (assuming they do not pool their CMAQ funds), even with potential match funds, will be sufficient to fully fund some of the cost-effectiveness CMAQ projects that would meet the minimum cost-effectiveness threshold.

Response: CMAQ funding for FY2011 will be provided by future transportation legislation; therefore, neither federal apportionments nor Caltrans estimates are not available at this time. In addition, CMAQ funding is based on the severity of the ozone and carbon monoxide classifications, which may change over time. It is important to note that funding is distributed through Caltrans by formula to the MPOs, and is not pooled across jurisdictions.

Cost-effectiveness is based on the CMAQ funds contributed to the projects. Even the MPOs that receive the smallest allocation of funding are able to complete cost-effective projects. CMAQ funds typically require a minimum 11.47% local match, so fully funding projects with federal CMAQ funds is not possible. If necessary, an MPO could require a higher matching percentage to meet the cost-effectiveness threshold, or the project sponsor could increase the amount of matching funds.

COMMENT FROM KARINA O'CONNOR, EPA
(via e-mail, dated December 12, 2006)

Comment: EPA is concerned that the focus of the approach seems to be on ensuring that no measures, even cumulatively, will qualify as advancing the attainment year - thus no measures (including TCMs) will qualify as RACM and be included in the SIP. Due to this focus, the approach does not seem to propose to develop an extensive list of control measures for consideration.

Response: The Part 1 approach does not state that there is a bias toward finding no qualified RACMs. The proposed analysis will examine all potential available control

measures and determine their cumulative emissions impact on accelerating the attainment of the 8-hour ozone standard in the SJV. The analysis will be documented and provided for interagency consultation.

Comment: The intention of RACM is to prepare a list of all available control measures for consideration. The draft approach seems to be focused on rejecting measures. The approach explains why no measures will work before you've explained what measures you will be considering. At a minimum, the approach should describe more extensively, which measures will be considered. The analysis must be able to demonstrate due diligence in identifying potential RACM.

Response: All available control measures identified in Part 1 of the RACM analysis will be examined. The draft approach does not focus on rejecting measures; rather, the EPA criteria for determining RACMs, including the economically and technically feasible tests will be applied.

Comment: By limiting the initial compilation of measure to “previous San Joaquin Valley RACM processes, more recent guidance materials, applicable SIPs, and measures suggested by the public during the SJVAPCD Town Hall meetings," the draft approach doesn't seem to go very far to compile a list of potential measures for an area that needs significant measures to reach attainment. We have seen litigation in other areas (e.g. Houston) a few years ago charging that the area did not consider certain measures that were actually being implemented in other areas. To counter the possibility of litigation, the RACM analysis needs to do a really good job describing the process used to identify the potential RACMs. For example, will you gather and incorporate info from outside expertise, literature reviews, workshops, public forums, professional associations, etc. to compile a list of measures? Only consideration of public comments gathered at town hall meetings is not enough.

Response: During our 2002 SIP development, there were well over one hundred potential RACM were identified as a result of an extensive outreach program with local jurisdictions in response to EPA’s direction that every possible RACM be included. The proposed RACM identification effort uses the existing list of potential RACM as the starting point and then identifies additional potential RACM. The proposed approach clearly indicates that the RACM identified in other SIPs will be reviewed for inclusion. Presumably, this approach will include additional information from “outside expertise, literature reviews, workshops, public forums, professional associations, etc.” that was part of that RACM process. The proposed approach in no way implies that “Only consideration of public comments gathered at town hall meetings” will be included. The proposed approach merely confirms that the public comments already received on the draft SJV Ozone Plan would be included and addressed in the new local RACM process.

Comment: The draft approach relies upon - using the 'advancing the attainment year' test to reject measures based on the high level of reductions needed for the area. We agree that you can use this test to reject measures from those that must be

implemented. However, because potential RACMs won't advance the attainment date, that doesn't mean that they shouldn't be implemented. Nothing in EPA's RACM policy prevents an area from implementing controls that are not identified as RACM.

Response: It is agreed that controls that are not identified as RACM may be implemented. The proposed implementation would not prevent an implementing entity from adopting a local control measure that does not meet the RACM criteria.

Comment: Note that given the litigation on previous San Joaquin Valley plans, these comments were drafted to identify any potential problems upfront, especially since problems with the RACM approach could lead to problems with our budget adequacy findings, and which could lead to a conformity lockdown problem in SJV. Your best defense on RACM issues is to put together a robust, inclusive process for identifying potential RACMs. As you've mentioned in your approach, any measures suggested by the public (not just in the town hall meetings), must be included in the RACM analysis. Completion of a comprehensive analysis including all potential measures in the initial analysis will less likely result in additional measure being suggested by the public and delays in the final SIP submittal or problems with budget adequacy.

Response: As documented in the proposed implementation approach, the SJV MPOs are committed to perform a comprehensive, robust analysis of identifying potential RACMs. The interagency consultation process will be used to provide our partners the opportunity to review and comment on the local RACM analysis as it is developed.

COMMENT FROM LAUREN DAWSON, SJV AIR POLLUTION CONTROL DISTRICT
(via e-mail, dated December 13, 2006)

Comment: Section 1. In "Approach" - RACM related litigation, summarized in Eisinger & Niemeier (2004),[1] suggests that a thorough review of candidate measures is a prudent course of action. The District recommends an expanded search be conducted for control measures beyond the Town Hall Meetings to include comments from our October 17, 2006 workshop, prior comments submitted to the District in 2004, other districts' plans (e.g., South Coast and Sacramento), other states, the *California Partnership for the San Joaquin Valley Strategic Action Plan* (Air Quality Work Group and Transportation Work Group) (e.g., Appendix J in the draft *2007 Ozone Plan*), and other sources. The District has received about 94 comments following our Town Hall Meetings and the October 17, 2006 workshop that dealt with the general types of topics that could be addressed by local agency RACM; topics included personal transportation choices, bike lanes, public transit, vehicle characteristics and use, lower highway speeds, highway fees, drive throughs, local governments and land use, local governments and other transportation issues, Indirect Source Review Rule, and interagency cooperation/COGs.

[1] Eisinger, D. and D. Niemeier, *Transportation Control Measures, (TCMs): Guidance for Conformity and State Implementation Plan Development,* UC Davis, Final Report, August 18, 2004.

Response: As documented in the proposed approach, all available control measures will be examined in the RACM analysis under Part 1. This will include outside expertise, literature reviews, workshops, public forums, professional associations, etc. In accordance with EPA guidance, the analysis focuses on measures that meet the EPA-directed criteria for RACMs, including the economically and technically feasible tests.

Comment: Section 3. In "Approach" - Add text that clarifies what will be done. Even is RACM is not required, measures to reduce emissions by changing vehicle use could still be implemented. These could be added as a new section 4 (under "Approach") and consist of text from the CMAQ Policy White Paper.

Response: The proposed implementation would not prevent an implementing entity from adopting a local control measure that does not meet the RACM criteria.

Comment: Section 3. "Assumption" section - the data on VOC and NOx emissions reductions needed should be updated as new releases become available.

Response: The analysis will use the most recent data available at that time.

Comment: Section 3. "Additional Considerations" under Commitment to Implement CMAQ Policy - It may not be feasible to give priority for District matching funds for cost-effective CMAQ projects.

Response: It is understood that the priority funding from the Air District might not be possible; however, it is expected that the Air District would at least consider such a request. Additional information will be provided in future discussions.

Comment: Section 3. "Additional Considerations" under Commitment to Implement CMAQ Policy - A commitment to a specific cost-effectiveness threshold should be made (e.g., Carl Moyer $14,300/ton)

Response: As with Carl Moyer and other programs that require a minimum threshold, it is expected that these numbers will change over time. The MPOs will determine an appropriate threshold in the coming years, which will be reevaluated on a regular basis (as indicated in the proposal).

Comment: Section 3. "Additional Considerations" under Commitment to Implement CMAQ Policy - The District believes that the commitment to direct only 20% of the CMAQ funds to cost-effective projects will not help produce early reductions that are needed for attainment of the NAAQS. The District encourages that a greater percentage of the CMAQ funds be dedicated to cost-effective projects that would provide maximum air quality benefits.

Response: The CMAQ (Congestion Mitigation and Air Quality) program serves a broader purpose than early reductions; the program is also designed to provide congestion relief through improved traffic flow and travel times. All CMAQ projects are required to show an air quality benefit, and MPOs strive to fund projects for both the short- and long-term benefits of the region. While projects to relieve congestion also improve air quality, it might not be feasible to have such congestion relief projects meet a stringent cost-effectiveness threshold, such as established for diesel retrofit projects. Although many MPOs use cost-effectiveness to evaluate eligible projects, there are currently no federal standards for minimum CMAQ cost-effectiveness in place. This CMAQ policy to dedicate 20% of the funding could be considered progressive, and also does not prohibit individual MPOs from exceeding this percentage.

Comment: As the fleet gets cleaner, (especially true for the time frame addressed by this Plan) measures to reduce VMT will provide fewer reductions, and will consequently become less cost effective. The process should assign higher priority to measures that reduce vehicle starts or trips vs. measures that reduce VMT. Measures targeting gross polluters would also be of benefit.

Response: SAFETEA-LU includes changes to project eligibility for the CMAQ program. In general, eligible project or programs need to contribute to attainment of the NAAQS though reductions in vehicle miles traveled, fuel consumption or through other factors. The new legislation includes eligibility for advanced truck stop electrification systems and the purchase of diesel retrofits. In addition, SAFETEA-LU states that MPOs shall give priority in distributing funds received to (1) diesel retrofits, and (2) cost-effective congestion mitigation activities.

The process is designed to focus a percentage of the program on cost-effective projects. The intent is to allow flexibility for each MPO to implement the program in a manner that best addresses the issues in that region. These issues may vary by county or even city. While it is possible to fund projects that target trip reduction or gross polluters, staff does not think that prioritizing or mandating project types is beneficial

Comment: The District recommends that the process include a provision for assigning priority to NOx vs. VOC reductions as a function of the year of implementation. VOC reductions may be more useful in the near term, with NOx providing greater benefits overall. More details will be provided in the January 2007 draft version of the plan.

Response: The CMAQ program considers emission reductions for NOx, VOC, and particulate matter. Due to funding constraints, issues associated with transportation programming, and project delivery, it may not be feasible to implement a process that prioritizes projects based on the associated emissions reductions by pollutant.

Comment: As noted in Chapter 5 of the 2007 Ozone Plan, the District intends to issue annual reports on the progress in implementing ozone and PM plan commitments. These reports would be presented to the District Governing Board in April of each year,

beginning in 2008. These reports will not only give the status of District measures, but also the status of state and local government measures. The MPO annual reports, which are due in February of each year to Caltrans and FHWA, will fit into the District reporting schedule; however, the MPO reports will be on a federal fiscal year basis and the District's reports will be on a calendar year basis. The "Commitment to Implement Local CMAQ Policy" should address this possible discrepancy in reporting periods. Is it possible to produce the CMAQ data on a calendar year basis?

Response: The proposed implementation clearly indicates that the CMAQ policy will not be included in the 2007 Ozone Plan. As a result, no projects implemented through the policy will be included in the District annual reports. However, any other local control measures commitments that are included in the 2007 Ozone Plan could be included in the annual reports. It is assumed that the District will request the reporting information directly from the implementing entities.

Comment: The District recommends that the ongoing work of the SJV Regional Blueprint Project and the potential emission reductions that will be available in the future be discussed as an activity that could provide future emissions reductions. While not meriting emission reduction credit at this point, the potential exists for land use planning to affect VMT growth rates, as well as reducing the number of starts and trips.

Response: The SJV MPOs have provided draft documentation regarding the Blueprint process in response to the District's request in November 2006. The information should be included in the next version of the 2007 Ozone Plan released for public review.

COMMENT FROM JEFF LINDBERG, ARB
(via e-mail, dated January 5, 2007)

Comment: Because of the magnitude of the emission reductions needed in the San Joaquin Valley, it is appropriate that the local planning agencies are looking beyond the U.S. EPA guidance on Reasonably Available Control Measures (RACM), to identify a local commitment commensurate with the emission reductions needed.

The Valley planning agencies are taking an important step by explicitly committing to fund cost effective emission reduction projects through the targeted usage of 20 percent of the Valley's Congestion Mitigation and Air Quality Improvement (CMAQ) funds, and should be applauded.

Response: Thank you for your comment.

Comment: In order to ensure that the CMAQ funds being committed by the local planning agencies achieve the maximum benefits, ARB staff suggests that those CMAQ dollars go explicitly to cost effective, transportation related engine replacement and/or retrofit projects. This is important since congestion mitigation projects alone, often have small benefits on air quality, relative to their cost. This clearly meets the first priority established for CMAQ funds in federal law – to fund projects with air quality and health

benefits. In your effort to determine an appropriate cost effectiveness threshold, as well as in your efforts to identify appropriate projects, we encourage you to work closely with the San Joaquin Valley Air Pollution Control District staff, which has in place an effective air pollution incentive program.

Response: While the SAFETEA-LU changes to project eligibility for the CMAQ program include advanced truck stop electrification systems and the purchase of diesel retrofits, the program is also designed to improve air quality through the implementation of other projects. The proposed policy is designed to focus a percentage of the program on cost-effective projects, not to specify project type. A mandate for the 20% of CMAQ dollars to fund engine replacement and/or retrofit projects would eliminate the necessary flexibility for each MPO to implement the program in a manner that best addresses the issues in that region. These issues may vary by county or even city. Some cities might have already implemented an aggressive replacement and retrofit program, and have less of a need for engine replacement at this time; the MPOs do not intend to limit the implementation of innovative and cost-effective emission reduction strategies.

Please be assured that the interagency consultation process will be used to provide our partners the opportunity to review and comment on the implementation details of the CMAQ policy as they are developed.

C.5 DOCUMENTATION FOR DEVELOPMENT OF LIST OF CONTROL MEASURES FOR POSSIBLE CONSIDERATION

Approach

Develop a list of control measures for possible consideration. List will be developed from previous San Joaquin Valley RACM processes, more recent guidance materials, applicable SIPs, and measures suggested by the public during the SJVAPCD Town Hall meetings.

Documentation

Step 1: Previous SJV RACM (ozone precursors)

List contains the original Local Government Control Measure (LGCM) template organized by Section 108(f) category. It is important to note that some of the measures were not considered by the MPOs for the Suggested List. Either reasoned justification was provided and subsequently approved by EPA or the measures were recommended for regional implementation by another agency, such as the Air District, Caltrans, etc.

The Suggested Lists by MPO were cross-referenced with the LGCM template. ”Extra” measures suggested during MPO public process and considered for implementation were added.

References:

The Severe Area Ozone Plan, April 2002 RTPA Ozone RACM Submittal included the following:

- Existing Local Government Control Measures in the San Joaquin Valley
    - 1994 CA ozone SIP which includes the 1994 San Joaquin Valley Ozone Attainment Plan and the Revised Post 1996 ROP Plan, according to Federal Register 62FR1150
- Example List of Local Government Control Measures in Other Ozone Nonattainment Areas
    - collating lists of local government control measures considered, and in some cases adopted, in other nonattainment areas
    - areas included: Phoenix, Bay Area, California Planning, and Dallas
- Suggested List of Measures for the Severe Area Ozone Plan (by County/MPO)
- Measures were organized by category using the specific transportation control measures listed in Section 108(f) of the Clean Air Act
- Commitments / reasoned justification for non-implementation by jurisdiction (generally through 2005)
- The public process was conducted from 2001 – 2001 and included individual MPO committee process and six SJVAPCD workshops

The Extreme Ozone Attainment Demonstration Plan, March 2004 RTPA Ozone RACM Submittal included the following:

- Severe Ozone Plan Commitments / reasoned justification
    - Strengthen existing commitments (generally through 2010)
    - Update reasoned justification
    - New commitments
    - Note: one new ozone plan was released and reviewed for potential new measures to consider; none were identified.
- The public process was conducted from 2003 – 2005 and included individual MPO committee process and three SJVAPCD workshops

Step 2: Review of Control Measures Suggested During Public Process for 8-Hour SIP Development

Six town hall meetings were conducted by the SJV APC from July 26 – 28, 2006 throughout the valley. In addition, the District conducted a workshop on the Draft Plan in October 2006. Local measures that were suggested by the public during

these meetings were cross-referenced against the list of possible measures compiled under Step 1.

- If local onroad measure already included on RACM list, added "Town Hall Meetings" to Source column
- If local onroad measure NOT already included, then added under appropriate category (Extras)

References:

The Draft 2007 Ozone Plan includes the following:

- Appendix G: Town Hall Meeting Suggestions
- Appendix L: Comments and Response

NOTE: According to EPA's Conformity Rule, the definition of a TCM is as follows: *"A transportation control measure (TCM) is any measure that is specifically identified and committed to in the applicable implementation plan that is either one of the types listed in section 108 of the CAA, or any other measure for the purpose of reducing emissions or concentrations of air pollutants from transportation sources by reducing vehicle use or changing traffic flow or congestion conditions. Notwithstanding the first sentence of this definition, vehicle technology-based, fuel-based, and maintenance-based measures which control the emissions from vehicles under fixed traffic conditions are not TCMs"*

In accordance with this definition, vehicle technology-based, fuel-based, and maintenance-based measures which control the emissions from vehicles under fixed traffic conditions were not included in the local RACM list during the cross-referencing process in Step 2 above or the Steps that follow.

Step 3: Review of EPA Proposed PM2.5 Implementation Rule, November 1, 2005.

The EPA Proposed PM2.5 Implementation Rule, dated November 1, 2005 was reviewed and local onroad control measures were cross-referenced against the list of possible measures compiled under Step 1.

- If local onroad measure already included on RACM list, added "EPA" to Source column
- If local onroad measure NOT already included, then added under appropriate category (Extras)
- NOTE: Diesel idling programs for trucks, locomotive, and other mobile sources excluded due to State rule requirements.

References:

EPA Proposed PM2.5 Implementation Rule, November 1, 2005 includes the following:

- Clean School Bus USA Program
- EPA's voluntary diesel retrofit program

- EPA's voluntary diesel retrofit program
- EPA's website on transportation control measures

Step 4: Review of EPA Draft Final PM2.5 Implementation Rule, reference to http://www.epa.gov/pm/measures.html

This website contains links to sources of information on control measures. The California SB 656 program link was reviewed, but does not contain any local onroad measures for consideration. In addition, the CARB Goods Movement emission reduction plan link was reviewed, but does not contain any local onroad measures for consideration.

However, the Lake Michigan Directors Consortium (LADCO) / Midwest Regional Planning Organization technical reports link provides numerous references for the evaluation of candidate control measures. The report "Evaluation of Candidate Mobile Source Control Measures" was reviewed and local onroad control measures were cross-referenced against the list of possible measures compiled under Step 1.

- If local onroad measure already included on RACM list, added "LADCO" to Source column
- If local onroad measure NOT already included, then added under appropriate category (Extras)

References:

Evaluation of Candidate Mobile Source Control Measures includes the following:

- AACOG. 2003. "1st Biannual Report: The Early Action Compact for the San Antonio Metropolitan Statistical Area," Report to Texas Commission of Environmental Quality, Alamo Area Council of Governments, San Antonio, TX, June 2003.
- CARB. 2003. "Proposal to Reduce Idling from New 2007+ Heavy-Duty Diesel Trucks," Presentation by Daniel Hawelti to a June 4, 2003 Public Workshop, California Air Resources Board, June 4, 2003.
- CMAQ. 1999. "Summary Review of Costs and Emissions Information for 24 Congestion Mitigation and Air Quality Improvement Program Projects," Final Report to the Office of Policy, Environmental Protection Agency, Hagler Bailey Services, Inc., Arlington, VA, September 28, 1999.
- ENVIRON. 2003a. "Workplan for the Winchester-Frederick and Berkeley-Jefferson Counties Ozone Early Action Plan (EAP) Projects," Memorandum to Wilbur-Smith Associates, ENVIRON International Corporation, September 24, 2003.

- ENVIRON. 2000a. "Evaluation of Attainment Control Strategies for the Dallas-Fort Worth State Implementation Plan," Report to the North Central Texas Council of Governments, ENVIRON International Corporation, March 2000.
- ENVIRON. 2000b. “Initial Evaluation of Emissions Reduction Potential of Candidate Measures to Obtain NOx Reductions in the Houston-Galveston Area – Draft Report.” Prepared for the Houston-Galveston Area Council. July 25.
- MWAQC. 2003. “Plan to Improve Air Quality in the Washington, DC-MD-VA Region, State Implementation Plan (SIP) “Severe Area SIP”, Demonstration Rate of Progress for 2002 and 2005; Revision to 1990 Base Year Emissions; and Severe Area Attainment Demonstration for the Washington DC-MD-VA Nonattainment Area,” District of Columbia Department of Health, Maryland Department of the Environment, and the Virginia Department of Environmental Quality, Metropolitan Washington Committee, August 4, 2003.
- NETAC. 2003. "Identification of Potential Emission Reduction Strategies for the Northeast Texas Early Action Compact," Final Report to the East Texas Council of Governments, Northeast Texas Air Care (with Contribution from ENVIRON International Corporation), June 11, 2003.
- Oklahoma. 2003. “Oklahoma Department of Environmental Quality’s Draft List of Potential Control Strategies for the Oklahoma Early Action Compacts,” Oklahoma Department of Environmental Quality, Oklahoma, April 9, 2003.
- OTC. 2003. “Draft Model Rule Overview: Solvent Cleaning Operations; Mobile Equipment Repair and Refinishing; Architectural and Industrial Maintenance Coatings, and Portable Fuel Container Spillage Control,” Ozone Transport Commission (http://www.otcair.org/), Washington, DC, 2003.
- TCEQ. 2000. “Revision to the State Implementation Plan for the Control of Ozone Air Pollution: Requirements for Gasoline Volatility in East and Central Texas & Federal Clean Air Act 221(c)(4)(C) Waiver Request,” Texas Commission on Environmental Quality, April 5, 2000.
- SMAQMD. 2003. “Clean Air Plan Update for Sacramento Air Quality Management Districts,” Sacramento Air Quality Management District, Sacramento, CA, May 21, 2003
- Tennessee. 2003. “Emission Inventories and Potential Emission Control Strategies for Ozone Early Action Compact Areas in Tennessee,” Draft Report to Division of Transportation Planning, Tennessee Department of Transportation, and Division of Air Pollution Control, Tennessee Department of Environmental and Conservation, Department of Civic and Environmental Engineering, University of Tennessee, April 2003.
- Triad. 2003. “Triad Early Action Compact: Potential Local and Regional Ozone Emission Reduction Strategies for Attainment of 8 Hour Ozone Standard,” Triad, North Carolina, 2003.
- SBDC. 2001. “Environmental Assistance to Small Businesses: An Ex-Post Evaluation of SBDC Pilot Projects,” Final Report to Pollution Prevention Division, Office of Pollution Prevention and Toxics, Environmental Protection Agency, Industrial Economics, Inc., Cambridge, MA, and Robert L. Kerr & Associates, Inc., Reston, VA, January 12, 2001.

- ENVIRON. 2003a. "Evaluation Of Emission Control Strategies Under Consideration For The Berkeley-Jefferson Counties Early Action Plan," Memorandum to Wilbur-Smith Associates, ENVIRON International Corporation, December 12, 2003.
- Metropolitan Washington DC, VA, MD AQ Committee - 2005 Ozone SIP Doc
- San Joaquin Valley 2004 SIP
- Mid-American Regional Council - Kansas City Region Control Measures: Clean Air Action Plan 2004
- Bay Area Control Measures (Tri Valley Clean Air Plan)
- Compiled list of local measures submitted by EAC areas as part of the State Implementation Plan required for the December 31, 2004 Milestone (http://www.epa.gov/ttn/naaqs/ozone/eac/#EACsummary)

Step 5: Review of EPA List of Potential Control Measures for PM2.5 and Precursors, Draft dated 12/20/06

The EPA List of Potential Control Measures for PM2.5 and Precursors, Draft dated 12/20/06 was reviewed and local onroad NOX and VOC control measures were cross-referenced against the list of possible measures compiled under Step 1.

- If local onroad measure already included on RACM list, added “EPA” to Source column
- If local onroad measure NOT already included, then added under appropriate category (Extras)

References:

EPA List of Potential Control Measures for PM2.5 and Precursors, Draft dated 12/20/06 includes the following:

- California Air Resources Board, "Currently Verified Diesel Emission Control Technologies," as of September 6, 2006 http://www.arb.ca.gov/diesel/verdev/verifiedtechnologies/cvt.htm
- California Air Resources Board, "ARB Programs," updated May 4, 2006 http://www.arb.ca.gov/html/programs.htm
- ENVIRON International Corporation, "Evaluation of Candidate Mobile Source Control Measures", Final Report, prepared for Lake Michigan Air Directors Consortium, 2250 E. Devon Ave., #250, Des Plaines, IL 60018, February 28, http://www.ladco.org/reports/rpo/Regional%20Air%20Quality/LADCO%20Control%20Report_Final.pdf
- U.S. Environmental Protection Agency, Office of Air and Radiation, "Phase II Reformulated Gasoline: The Next Major Step Toward Cleaner Air", EPA420- http://www.epa.gov/OMSWWW/rfg/f99042.pdf

- Guidance for Quantifying and Using Long Duration Truck Idling Emission Reductions In State Implementation Plans and Transportation Conformity, EPA420-B-04-001, January 2004. http://www.epa.gov/otaq/stateresources/transconf/policy/truckidlingguidance.pdf
- Draft list of potential RACT and RACM from PM rule preamble (see EPA websites on verified retrofit technologies) http://www.epa.gov/otaq/retrofit/retroverifiedlist.htm
- Guidance for Quantifying and Using Emissions Reductions from Best Workplaces for Commuter Programs in State Implementation Plans and Transportation Conformity Determinations, EPA420-B-05-016, October 2005, http://www.epa.gov/otaq/stateresources/policy/transp/commuter/420b05016.pdf
- Diesel Retrofits: Quantifying and Using Their Benefits in SIPs and Conformity, EPA420-B-06-005, June 2006. http://www.epa.gov/otaq/stateresources/transconf/policy/420b06005.pdf
- U.S. Environmental Protection Agency, Office of Transportation and Air Quality, "Diesel Retrofit Technology, An Analysis of the Cost-Effectiveness of Reducing Particulate Matter Emissions from Heavy-Duty Diesel Engines Through Retrofits", EPA420-S-06-002, March 2006. http://www.epa.gov/cleandiesel/documents/420s06002.pdf
- EPA Staff Communication: "Mobile Source Control Measures in PM NAAQS RIA", EPA, 2006
- NJDEP Diesel Initiatives Workgroup, "A Collaborative Report Presenting Air Quality Strategies for Further Consideration by the State of New Jersey," October 31, 2005. http://www.nj.gov/dep/airworkgroups/docs/final_di_workgroup_report.pdf
- NJDEP Gasoline Cars & Trucks Workgroup, "A Collaborative Report Presenting Air Quality Strategies for Further Consideration by the State of New Jersey," October 31, 2005. http://www.state.nj.us/dep/airworkgroups/docs/final_gct_report.pdf
- Ozone Transport Commission (OTC) “Candidate Control Measures.” http://www.otcair.org/projects_details.asp?FID=93&fview=stationary
- E.H. Pechan & Associates, Inc., "AirControlNET, Version 4.1 Control Measure Documentation Report," Draft Report, prepared for U.S. Environmental Protection Agency, Research Triangle Park, NC, Pechan Report No. 06.05.003/9011.002, May 2006. http://www.epa.gov/ttn/ecas/ria.html
- San Joaquin Valley Unified Air Pollution Control District (UAPCD). Final BACM Technological and Economic Feasibility Analysis, prepared by Sierra Research, March 21, 2003. http://www.soiltac.com/PDF/Final_BACM_Chapter 20 - Fugitive Dust 287Feasibility_Analysis.pdf
- The State and Territorial Air Pollution Program Administrators and the Association of Local Air Pollution Control Officials, "Controlling Fine Particulate Matter Under the Clean Air Act: A Menu of Options, " March 2006 http://www.4cleanair.org/PM25Menu-Final.pdf
- Texas Commission on Environmental Quality, Texas Air Quality Control Measures, as of September 2006 http://www.tceq.state.tx.us/implementation/air/sip/sipstrategies.html#mobile

- Regulatory Impact Analysis: 2006 National Ambient Air Quality Standards for Particle Pollution. October 6, 2006.
- Clean Ports USA, "Emission Reduction Strategies by Application, Trucks," as of September 2006 http://www.epa.gov/cleandiesel/ports/stratapp.htm#highway

Step 6: Review of other 8-hour ozone SIPs

Other 8-hour ozone SIPs were reviewed and local onroad control measures were cross-referenced against the list of possible measures compiled under Step 1.

- If local onroad measure already included on RACM list, added "SIP" to Source column
- If local onroad measure NOT already included, then added under appropriate category (Extras)

References:

The other 8-hour ozone SIPs reviewed include the following:

- 8-hour ozone SIP for South Coast, CA [SCAQMD]
- 8-hour ozone SIP for Metropolitan Sacramento, CA [SMAQMD]
- 8-hour ozone SIP for Bay Area, CA [BAAQMD]
- "Alternative SIP" for the San Joaquin Valley developed by the ISSRC (Hewlett Foundation, by Dr. James Lents – former SCAQMD APCO)
- Metropolitan Washington COG's 2004 ROP [ISSRC]
- 8-hour ozone area SIP for Dallas-Fort Worth, TX [DFW]
- 8-hour ozone area SIP for Houston-Galveston, TX [HGAC]

Summary

Steps 1 – 6 resulted in an extensive list of control measures for consideration and demonstrates due diligence in identifying potential local RACM. It is important to note that the Step 1 begins with the previous San Joaquin Valley RACM processes which have been federally approved by EPA as part of the Amended 2003 PM-10 Plan. Step 2 addresses measures suggested by the public during the development of the Draft 2007 Ozone Plan. In addition, Steps 3 – 5 address more recent EPA guidance materials. Seven additional SIPs were considered as part of Step 6. In total, over 65 documents were referenced in developing the list of control measures for consideration.

C.6 List of Control Measures for Consideration

Number	Measure Title	Source
1	**Programs For Improved Public Transit**	
	Regional Express Bus Program	Suggested List
	Transit Access to Airports	Suggested List
	Study Benefits of Bus (Particulate Trap) Retrofit Program	Suggested List
	Mass Transit Alternatives	Suggested List
	Expansion of Public Transportation Systems	Suggested List, Town Hall Meetings, LADCO
	Transit Service Improvements in Combination with Park-and-Ride Lots and Parking Management	Suggested List
	Free transit during special events	Suggested List, Town Hall Meetings
	Require that government employees use transit for home to work trips, expand transit, and encourage large businesses to promote transit use	Suggested List, Town Hall Meetings
	Increase parking at transit centers or stops	Suggested List
	Eliminate parking zoning near transit	LGCM Template
1 - Extras	Make small dial-a-ride systems free	Suggested List
	Regional Express across county lines	Suggested List
	Consolidation of Public Transit Operators	Suggested List
	Transit Stop Improvements	Suggested List
	Productivity Improvements	Suggested List, Town Hall Meetings, BAAQMD
	Ridership Targets	Suggested List
	Free transit / more incentives on Spare the Air days	Town Hall Meetings
	Create and subsidize light rail system w/in cities	Town Hall Meetings, BAAQMD
	Create and subsidize high speed rail throughout valley	Town Hall Meetings, BAAQMD
	Queue jumps for buses	MWCOG
	Personalized rapid transit; subscription bus service, Business First enhanced bus	HGAC
2	**Restriction Of Certain Roads Or Lanes To, Or Construction Of Such Roads Or Lanes For Use By, Passenger Buses Or High Occupancy**	
	Update High Occupancy Vehicle (HOV) Lane Master Plan	LGCM Template
	Study Effects of High Speed Freeway Travel	LGCM Template
	Fixed Lanes for Buses and Carpools on Arterials	Suggested List, BAAQMD
	Expand number of freeway miles available, allow use by alternative fuel vehicles, changes to HOV lane requirements and hours	LGCM Template, LADCO
2-Extras	SOV using peak pricing to managed lanes and transit stations	HGAC
3	**Employer-Based Transportation Management Plans, Including**	
	Commute Solutions	Suggested List
	Parking Cash-Out	Suggested List, MWCOG
	Employer Rideshare Program Incentives	Suggested List, LADCO, EPA, MWCOG
	Implement Parking Charge Incentive Program	LGCM Template
	Preferential Parking for Carpools and Vanpools	Suggested List, HGAC
	Employee Parking Fees	Suggested List, MCOG
	Merchant Transportation Incentives	LGCM Template, SCAQMD
	Purchase vans for vanpools	Suggested List, HGAC
	Encourage merchants and employers to subsidize the cost of transit for employees	Suggested List
	Off-days" for ozone alerts just like sick days	LGCM Template
	Pay for in-house meals on ozone action days	LGCM Template, SCAQMD
	(Promote) Voluntary business closures on ozone action days	Suggested List, LADCO
	Close government offices on Ozone action days to serve as an example	LGCM Template, SCAQMD, MWCOG
	Mandatory (or Promote) compressed work weeks	Suggested List, HGAC
	Extend parking cash-out rule to more employers	Suggested List

3 - Extras	Incentives for vanpool programs	Town Hall Meetings
4	**Trip Reduction Ordinance**	LGCM Template
4-extra	Support voluntary employer based trip reduction programs	BAAQMD
5	**Traffic Flow Improvement Programs That Achieve Emission Reductions**	
	Develop Intelligent Transportation Systems	Suggested List
	Coordinate Traffic Signal Systems	Suggested List, Town Hall Meetings
	Reduce Traffic Congestion at Major Intersections	Suggested List
	Site-Specific Transportation Control Measures	Suggested List, MWCOG
	Removal of On-Street Parking	Suggested List
	Reversible Lanes	Suggested List
	One-Way Streets	Suggested List
	On-Street Parking Restrictions	Suggested List
	Bus Pullouts in Curbs for Passenger Loading	Suggested List
	Additional Freeway Service Patrol	Suggested List
	Consider coordinating scheduling of arterial and highway maintenance to exclude ozone action days if the maintenance activities require lane reductions on heavily utilized arterials and highways	Suggested List
	Re-routing of trucks on ozone days	LGCM Template, HGAC
	Fewer stop signs (remove unwarranted and "political" stop signs and signals)	Suggested List
	Ban left turns	Suggested List, SCAQMD
	Changeable lane assignments	Suggested List
	Adaptive traffic signals and signal timing	Suggested List, LADCO
	Freeway bottleneck improvements (add lanes, construct shoulders, etc.)	Suggested List
	Minimize impact of construction on traveling public. Have contractors pay when lanes are closed as an incentive to keep lanes open	Suggested List
	Internet provided road and route information	Suggested List, LADCO
	Regional route marking systems to encourage underutilized capacity	Suggested List
	Congestion management field team to clear incidents	LGCM Template, LADCO
	Use dynamic message signs to direct/smooth speeds during incidents	Suggested List, LADCO
	Get real-time traffic information to trucking centers and rental car agencies	LGCM Template
	55 mph speed limit during ozone season	LGCM Template, LADCO, EPA
	Require 40 mph speed limit on all facilities	LGCM Template
	Require lower speeds during peak periods	LGCM Template, Town Hall Meetings
5 - Extras	Place vehicle sensors further away from intersections	Suggested List
	User fees on I-5 and highway 99	Town Hall Meetings
	Value pricing for traffic lanes	MWCOG
	Video monitor system deployment	LADCO
	Fee based VMT	EPA
	Pay-As-You-Drive insurance (per mile)	HGAC
6	***Fringe And Transportation Corridor Parking Facilities Serving Multiple Occupancy Vehicle Programs Or Transit Service***	
	Park and Ride Lots	Suggested List, EPA
	Park and Ride lots serving perimeter counties	Suggested List
7	**Programs To Limit Or Restrict Vehicle Use In Downtown Areas Or Other Areas Of Emission Concentration Particularly During Periods Of Peak Use. See also Measure 14**	
	Off-Peak Goods Movement	LGCM Template
	Truck Restrictions During Peak Periods	LGCM Template
	Involve school districts to encourage walking to school	Suggested List, Town Hall Meetings
	Adjust school hours so they do not coincide with peak traffic periods and Ozone seasons	Suggested List

	Area-wide tax for parking	LGCM Template, MWCOG
	Increase parking fees	LGCM Template, SCAQMD
	Graduated pricing starting with highest in CBD	LGCM Template
	Buy parking lots and convert to other land use	LGCM Template
	Limit the number of parking spaces at commercial airlines to support mass transit	LGCM Template
	No CBD vehicles unless LEV or alt fuel or electric	LGCM Template
	Auto restricted zones	Suggested List
	Incentives to increase density around transit centers	Suggested List
	Land use/air quality guidelines	Suggested List, Town Hall Meetings
	Incentives for cities with good development practices	Suggested List
	Cash incentives to foster jobs/housing balance	Suggested List, Town Hall Meetings
	Trip reduction oriented development	Suggested List
	Transit oriented development	Suggested List
	Sustainable development	Suggested List
7 - Extras		
	Establishment of Urban Growth Boundaries	Suggested List, ISSRC
	Shortened government work days during ozone alerts	Suggested List
	Distribute special parking passes for carpoolers	Suggested List
	Outreach program encouraging reduced trips during warmest part of the day	Suggested List
	Encourage Infill Development	Suggested List, Town Hall Meetings
	Create walkable communities	Town Hall Meetings
8	**Programs For The Provision Of All Forms Of High-Occupancy, Shared-Ride Services (see also measures 2 and 3)**	
	Financial Incentives, Including Zero Bus Fares	Suggested List
	Internet ridematching services	Suggested List
	Preferential parking for carpoolers	Suggested List
	Credits and incentives for carpoolers	Suggested List, BAAQMD
	(Encourage) Employers provide vehicles to carpoolers for running errands or emergencies	Suggested List
	Subscription Services	Suggested List
8 - Extras		
	Shared LEV Vehicles at Work Sites	Suggested List
9	**Programs To Limit Portions Of Road Surfaces Or Certain Sections Of The Metropolitan Area To The Use Of Non-Motorized Vehicles Or Pedestrian Use, Both As To Time And Place (see also measure 10).**	
	Establish Auto Free Zones and Pedestrian Malls	Suggested List
	Encouragement of Pedestrian Travel	Suggested List, Town Hall Meetings
	Bicycle/Pedestrian Program	Suggested List, LADCO, EPA, BAAQMD
	Close certain roads for use by non-motorized traffic	Suggested List, Town Hall Meetings
	Encouragement of Bicycle Travel	Suggested List, Town Hall Meetings
	Free Bikes	LGCM Template, SCAQMD
	Cash Rebates for Bikes	Suggested List
	Close streets for special events for use by bikes and pedestrians	Suggested List
	Use condemned dirt roads for bike trails	Suggested List
	Provide funding so volunteers do not have to pay the cost of trail creation and maintenance	Suggested List
9 - Extras	Safe Routes to School	Suggested List
10	**Programs For Secure Bicycle Storage Facilities And Other Facilities, Including Bicycle Lanes, For The Convenience And Protection Of**	

10	**Programs For Secure Bicycle Storage Facilities And Other Facilities, Including Bicycle Lanes, For The Convenience And Protection Of Bicyclists, In Both Public And Private Areas**	
	Region-wide mandatory bike racks at work sites	Suggested List, Town Hall Meetings
	Bike Racks on Buses	Suggested List
	Regional Bike Parking Ordinance for all new construction	Suggested List
10 - Extras	Development of Bicycle Travel Facilities	Suggested List, Town Hall Meetings
	Expedite Bicycle Projects from RTP	Suggested List
	Provide Bike/Pedestrian facilities safety patrols	Suggested List
	Require inclusion of bicycle lanes on state or federally funded thoroughfare projects.	Suggested List
	Require Inclusion of Paved Shoulders Adequate for Bicycle Use on State or Federally Funded Reconstruction or Widening of Federal Major Collectors or Greater	Suggested List
11	**Programs To Control Extended Idling Of Vehicles**	
	Limit Excessive Car Dealership Vehicle Starts	LGCM Template
	Encourage Limitations on Vehicle Idling	Suggested List, LADCO, EPA
	Turn off engines while stalled in traffic	Suggested List
	Outlaw idling in parking lots	LGCM Template
	Reduced idling at drive-throughs. Shut windows down	LGCM Template, Town Hall Meetings, EPA
	Promote use of Pony engines	Suggested List
	Idle restrictions at airport curbsides	LGCM Template
11 - Extras	Ban cruising during Ozone Alert Days	Suggested List
	Discourage drive-thrus in new development	Suggested List
	Make drive-throughs pay a fee	Town Hall Meetings
	Truck stop electrification	LADCO, EPA
12	**Program To Reduce Motor Vehicle Emissions, Consistent With Title II, Which Are Caused By Extreme Cold Start Conditions**	
13	**Employer-Sponsored Programs To Permit Flexible Work Schedules. See also measure 3.**	
	Alternative Work Schedules	Suggested List
	Modifications of Work Schedules	Suggested List
	Telecommunications-Telecommuting	Suggested List, LADCO, MWCOG
	Telecommunications-Teleconferencing	Suggested List
13 - Extras		
	Internet commerce and education	Suggested List
	Encourage employers to provide money to employees for home computer purchase so employees can work from home.	Suggested List
14	**Programs And Ordinances To Facilitate Non-Automobile Travel, Provision And Utilization Of Mass Transit, And To Generally Reduce The Need For Single-Occupant Vehicle Travel, As Part Of Transportation Planning And Development Efforts Of A Locality, Including Programs And Ordinances Applicable To New Shopping Centers, Special Events, And Other Centers Of Vehicle Activity**	
	Areawide Public Awareness Programs	Suggested List, Town Hall Meetings, LADCO
	Special Event Controls	Suggested List
	Land Use/Development Alternatives	Suggested List, LADCO, BAAQMD
	Voluntary No Drive Day Programs	Suggested List, Town Hall Meetings
	Evaluation of the Air Quality Impacts of New Development and Mitigation of Adverse Impacts	Suggested List
	Transportation for Livable Communities (TLC)/Housing Incentive Program	Suggested List

	Areawide Public Awareness Programs	Suggested List, Town Hall Meetings, LADCO
	Special Event Controls	Suggested List
	Land Use/Development Alternatives	Suggested List, LADCO, BAAQMD
	Voluntary No Drive Day Programs	Suggested List, Town Hall Meetings
	Evaluation of the Air Quality Impacts of New Development and Mitigation of Adverse Impacts	Suggested List
	Transportation for Livable Communities (TLC)/Housing Incentive Program	Suggested List
	Incentives to increase density around transit centers	Suggested List
	Incentives for cities with good development practices	Suggested List
14 - Extras	COG comments on land use planning decisions that affect transportation and air quality issues	Suggested List
	Business, Industry and Governmental Outreach Program	Suggested List, MWCOG
	Public Education Program	Suggested List, Town Hall Meetings, LADCO
	Charge businesses for every parking space	Town Hall Meetings
	Government planning require fewer parking spaces	Town Hall Meetings
	Youth transportation program	BAAQMD
	Promote traffic calming	BAAQMD
15	**Programs For New Construction And Major Reconstructions Of Paths, Tracks Or Areas Solely For The Use By Pedestrian Or Other Non-Motorized Means Of Transportation When Economically Feasible And In The Public Interest. For Purposes Of This Clause, The Administrator Shall Also Consult With The Secretary Of The Interior**	
	Encouragement of Pedestrian Travel	Suggested List
	Pedestrian and Bicycle Overpasses Where Safety Dictates	Suggested List, Town Hall Meetings
16	**Program To Encourage The Voluntary Removal From Use And The Marketplace Of Pre-1980 Model Year Light Duty Vehicles And Pre-1980 Model Light Duty Trucks**	
	Counties assess ten dollar license plate fee to fund repair/replacement program for high-emitters	LGCM Template
	Buy vehicles older than 1975	LGCM Template
	Demolish impounded vehicles that are high emitters	LGCM Template
	Do whatever is necessary to allow cities to remove the engines of high emitting vehicles (pre-1980) that are abandoned and to be auctioned	LGCM Template
	Accelerated retirement program	LGCM Template
17	**Additional Programs Not Listed in Section 108f**	
	Enforcement of Traffic, Parking, and Air Pollution Regulations	Suggested List
	Raise the driving age	LGCM Template
	License plates determine access to vehicle use (odd/even driving days)	LGCM Template
	Discounts for paying bills by mail	LGCM Template
	Waive sales taxes for internet purchases	LGCM Template
	Satellite campuses	Suggested List
	Charge more for higher emission fuels	Suggested List
	Raise fuel prices during ozone season	LGCM Template
	Vehicle tax for two and more vehicles per household	LGCM Template
	Incentives to high HOV users (track and waive registration fees)	LGCM Template
	Sell cheap lottery tickets to people who buy gas in the afternoon as opposed to the morning	LGCM Template
	Use scout troops, churches, public figures to carry message of air pollution problems	Suggested List
	Deny registration to vehicles with repeated emission failures	LGCM Template

	Cool cities approach to reduce heat build-up	Suggested List
17 - Extras		
	Contact other areas that have been subject to EPA sanctions to determine best ways to implement new air quality measures	Suggested List
	Alternative fuel outreach program	Suggested List
	Encourage the purchase and use of alternative, cleaner vehicles	Suggested List
	Programs to reduce emissions or accelerate retirement of high emitting vehicles	EPA
1994	**Existing Local Government Control Measures**	
	Traffic Flow Improvements	Suggested List
	Public Transit	Suggested List
	Rideshare Programs	Suggested List
	Bicycle Programs	Suggested List
	Alternative Fuels Program	Suggested List
ARB	Parking Cash-Out	Suggested List
EPA	Commute Benefits	Suggested List
District	Heavy Duty Engine Emission Reduction Incentive Program	Suggested List
Additional		
	Park and Ride Fringe Parking	Suggested List
	Pedestrian facilities	Suggested List
	Encourage Use of Alternative Energy Sources	Suggested List
	Develop Programs that Encourage Good Movements by Rail	Suggested List, EPA
	Promote Use of Cleaner Lawn and Garden Equipment such as Lower-Emission Four-Stroke and Electric-Powered Equipment	Suggested List
	Encourage service organizations to promote clean air practices	Suggested List

sierra research

DRAFT

C.7

Reasonably Available Control Measures (RACM) Analysis

prepared for:

San Joaquin Valley TPA Directors Association

March 5, 2007

prepared by:

Sierra Research, Inc.
1801 J Street
Sacramento, California 95814
(916) 444-6666

DRAFT REPORT

Reasonably Available Control Measures (RACM) Analysis

prepared for:

San Joaquin Valley TPA Directors Association

March 5, 2007

Principal authors:

Siona Delaney
Robert Dulla

Sierra Research, Inc.
1801 J Street
Sacramento, CA 95814
(916) 444-6666

Reasonably Available Control Measures (RACM) Analysis

Table of Contents

Page

1. Introduction and Summary 1

   1.1 Background 1
   1.2 RACM Analysis 1
   1.3 Results and Conclusions 3

2. Methodology 6

   2.1 Identifying TCMs 6
   2.2 Estimating TCM NOx Emission Benefits 11

3. TCM Benefits and Advancement of Attainment Determination 15

   3.1 NOx Reductions from TCMs 15
   3.2 Advancement of Attainment Determination 16

4. References 17

Appendix A – RACM Calculations

1. INTRODUCTION AND SUMMARY

1.1 Background

The San Joaquin Valley Air Basin (SJVAB) is currently designated nonattainment for the federal 8-hr ozone standard and is seeking to be designated as an "extreme" nonattainment area based on recent air quality modeling and analysis included in the draft 2007 Ozone Plan.[1*] Because of its nonattainment designation, the SJVAB is subject to requirements imposed on nonattainment areas under Subpart 1 Part D Title I of the Clean Air Act (CAA). Section 172(c)(1) of the CAA requires that ozone nonattainment plans include provisions for Reasonably Available Control Measures (RACM). The methodology for determining RACM is partially described in "General Preamble" regulations published by the U.S. Environmental Protection Agency (EPA) in 1992 (57 FR 13498, 13560). The General Preamble states that every available control measure needs to be considered and implemented if deemed reasonable based on whether the implementation of the measure advances the date for attainment.

According to the 2007 Ozone Plan, in order to meet the 8-hour standard by an attainment year of 2023, ozone precursor NOx emissions need to be reduced by about 75% from baseline 2005 levels. Of the total NOx emissions estimated in 2005 in the Valley, over 50% come from on-road motor vehicle sources. By 2023, even with the expected turnover of vehicles to newer and cleaner engines, the on-road mobile sources are projected to contribute approximately 37% of the San Joaquin Valley's NOx inventory. Consequently, a RACM analysis was conducted for local transportation control measures (TCMs) designed to reduce motor vehicle travel and resulting emissions in the San Joaquin Valley. Based on the General Preamble criteria, the analysis is focused on whether implementation of the different TCMs can advance ozone attainment by at least one year.

1.2 RACM Analysis

There are 16 broad categories of TCMs described under Section 108(f) of the Clean Air Act (CAA). These categories are summarized in Table 1-1. In the past, EPA has required states to consider control measures within each category described in 108(f) and to provide substantial justification when one is excluded from a State Implementation Plan (SIP). However, EPA guidance indicates that categories included in 108(f) should not be considered exhaustive, but rather as indicative of the types of measures states should consider.[2]

---

* Superscripts denote references provided in Section 4.

Table 1-1 Clean Air Act Section 108(f) Transportation Control Measures	
Category	Control Measure Summary
i	Improved Public Transit
ii	High-Occupancy Vehicle (HOV) Lanes
iii	Employer-Based Plans and Incentives
iv	Trip-Reduction Ordinances
v	Traffic Flow Improvements
vi	Fringe and Transportation Corridor Parking Facilities for Carpool/Vanpool and Transit
vii	Limit or Restrict Vehicle Use in Downtown Areas
viii	HOV and Ride-Sharing Programs
ix	Limit Access to Roads/Sections of Metro Area to Non-Vehicular or Pedestrian Use
x	Bicycle Facilities
xi	Control Extended Idling of Vehicles
xii	Reduce Extreme Cold Start Emissions
xiii	Employer-Sponsored Flexible Work Schedules
xiv	Planning and Development Efforts that Reduce Single-Occupancy Vehicle (SOV) Travel
xv	Construction/Re-construction of Paths, Tracks or Areas for Non-Motorized Transportation or Pedestrian Use
xvi	Pre-1980 Model Year Light-Duty Vehicle Scrappage

For the San Joaquin Valley Air Basin, each of the TCM categories in Table 1-1 was considered for implementation. Each TCM was evaluated for its applicability to San Joaquin Valley. For those measures determined to be applicable, a careful review of the literature was conducted to determine the maximum feasible travel reductions attributable to them. NOx reductions were then computed from the estimate of the travel reductions. Key assumptions used to ensure that the travel and NOx reduction estimates represent the maximum feasible reductions in San Joaquin Valley are outlined below.

- Travel reductions were obtained from a recent literature review of 86 separate reports documenting community experience in implementing TCMs. Most of the communities addressed in these reports are large urban areas (e.g., Chicago, Philadelphia, Houston, etc.) with high population densities and high levels of travel. Mean travel reductions (i.e., not percent but absolute reductions in vehicle miles traveled) reported for these communities were used to represent an upper bound estimate of the reductions that could be expected for implementing these measures in San Joaquin Valley communities.

- TCM effectiveness is significantly influenced by population density. Portions of the Valley are rural and TCMs will achieve limited travel reductions when implemented in those areas (e.g., measures implemented in Fresno will provide substantially greater reductions on both a percentage and an absolute basis than

measures implemented in Kings County). This analysis assumes that mean travel reductions observed for measures implemented in other communities will be achieved throughout the entire San Joaquin Valley regardless of differences in population density.

- The travel reduction estimates are based on the implementation of multiple measures for most of the applicable TCM categories. The literature review documented the implementation of 17 categories of control measures. Thus, for example, three separate categories of transit programs were documented: (1) new shuttle and/or feeder services, (2) new fixed guideway systems or equipment, and (3) conventional transit improvements. The travel reductions used to compute the NOx reductions for "Improved Public Transit" represents the sum of the mean travel reductions for all three transit program categories.

- Travel reductions from TCMs are not additive—they are typically multiplicative. Most measures target commute trips and if all are implemented at the same time their impacts overlap each other (e.g., transit, rideshare, park & ride, HOV lanes, etc.). This analysis summed the travel reductions for multiple measures where applicable for each of the individual TCM categories. NOx reductions were computed for each of these categories on the basis of those reductions. The overall estimate of the NOx reduction potential for all applicable TCMs is based on the addition of the reductions estimated for each category. Thus, the analysis assumes that all of the travel reductions achieved by each of the individual TCM categories can be achieved when they are implemented together.

The total maximum feasible emission reductions from all applicable control measures were then contrasted with the minimum emission reductions needed to advance attainment of the 8-hour ozone standard by one year. Details of the methodology used in assessing the TCMs applicability and benefits for San Joaquin Valley along with the threshold used in determining advancement of attainment are discussed in the body of this report.

1.3 Results and Conclusions

NOx Benefits from TCMs – Table 1-2 shows the measures that were found to be applicable to San Joaquin Valley, along with their maximum feasible emission reductions. As shown, the total reduction in NOx emissions that could be achieved from implementing all the TCMs is approximately 7 tons per day (tpd) in 2020 and 5 tpd in 2023. This represents less than 3% of the controlled NOx emission inventories projected for 2020 and 2023.

Table 1-2 Maximum Feasible NOx Emission Reductions from TCMs in San Joaquin Valley in 2020 and 2023		
Control Measure Category	NOx Reduction (tpd)	
	2020	2023
(i) Improved Public Transit	0.11	0.09
(ii) High-Occupancy Vehicle (HOV) Lanes	0.06	0.05
(iii) Employer-Based Plans and Incentives	0.72	0.56
(iv) Trip-Reduction Ordinances	0.62	0.49
(v) Traffic Flow Improvements	0.06	0.05
(vi) Fringe and Transportation Corridor Parking Facilities for Carpool/Vanpool and Transit	0.02	0.02
(vii) Limit or Restrict Vehicle Use in Downtown Areas	0.31	0.25
(viii) HOV and Ride-Sharing Programs	0.01	0.01
(ix) Limit Access to Roads/Sections of Metro Area to Non-Vehicular or Pedestrian Use	4.23	3.41
(x) Bicycle Facilities	0.005	0.004
(xi) Control Extended Idling of Vehicles	n/a	n/a
(xii) Reduce Extreme Cold Start Emissions	0.00	0.00
(xiii) Employer-Sponsored Flexible Work Schedules	0.04	0.03
(xiv) Planning and Development Efforts that Reduce SOV Travel	0.11	0.09
(xv) Construction/Re-construction of Paths, Tracks or Areas for Non-Motorized Transportation or Pedestrian Use	0.003	0.002
(xvi) Pre-1980 Model Year Light-Duty Vehicle Scrappage	0.43	0.41
All TCMs Maximum Feasible NOx Emission Reduction	**6.73**	**5.45**

Advancement of Attainment – The Draft 2007 Ozone Plan was used to identify the following three possible threshold estimates of the NOx reductions that would be needed to advance attainment of the 8-hour ozone plan by one year.

1. According to Table 11-1 of the draft Ozone Plan, "Black Box" measures will need to supply an additional 85 tons per day in NOx reductions to achieve attainment in 2023. Thus, one measure of the reductions needed to advance attainment by one year is the shortfall in reductions needed to ensure that attainment occurs in 2023.

2. A more stringent estimate of the reductions needed to advance attainment by one year can be found by interpolating the 101 ton per day NOx reductions needed between 2020 and 2023 to demonstrate attainment. A straight-line allocation of those reductions over a three-year period indicates that roughly 34 tons per day would be needed to advance attainment by one year.

3. The most stringent estimate of the reductions needed to advance attainment by one year comes from determining the NOx reductions required to achieve a 1 ppb decrease in ozone (i.e., the smallest change that is measurable at controlling monitors). The isopleths for the Arvin and Fresno-Sierra Sky Park monitors show

that an 8.8 ton per day reduction in NOx will be required to achieve a 1 ppb decrease in ozone concentrations at those monitoring sites.

As discussed earlier, the methodology used to compute the maximum feasible travel and NOx reductions overstates the potential reductions for the applicable control measures. Since this analysis shows that the maximum feasible NOx reductions from implementing all applicable TCMs will be approximately 7 tons per day in 2020 and 5 tons per day in 2023, it will not be possible to advance 8-hour ozone attainment in San Joaquin Valley by a single year using any of the criteria identified above.

###

2. METHODOLOGY

2.1 Identifying TCMs

A review of the literature and contacts with Federal Highway Administration (FHWA) and EPA staff confirmed there is no comprehensive source of TCM benefits available. Instead, websites for both agencies reference a broad array of reports and modeling tools that have been developed to estimate benefits for a variety of measures. A similar type of summary is available on the California Air Resources Board's (ARB's) website.

TCMs impact vehicle emissions by producing changes in trips, vehicle miles traveled (VMT), and speed. While each of theses factors impacts emissions, the principal determinant of emissions change comes from reductions in VMT. Emission changes related to trip reductions not captured in VMT changes are primarily evaporative and are not relevant to this analysis since the draft Ozone Plan has determined that only NOx reductions are needed to demonstrate attainment. While TCMs can have an impact on local speeds where a measure is implemented (e.g., the addition of a signalized intersection), the impact on region-wide speeds is quite limited. For this reason, the impact of speed changes on regional emissions is marginal relative to the impact of reductions in VMT.

In light of the above-described emission impact differences and the substantial resources that would be needed to quantify the impact of TCMs on regional speeds, this analysis has concentrated on quantifying the impact of TCMs on regional VMT levels.

The 2002 CMAQ Report

Discussions with FHWA confirmed that the most thorough current evaluation of TCM benefits is contained in the 2002 report entitled "The Congestion Mitigation and Air Quality (CMAQ) Improvement Program, Assessing 10 Years of Experience." The report was prepared by a committee formed through the joint efforts of the Transportation Research Board (TRB) and the National Research Council (NRC) in response to a congressional request to evaluate the efficacy of projects funded through the CMAQ Improvement Program.[3] The evaluation included not only a thorough analysis of past and current CMAQ-funded programs, but also an extensive literature search and a review of related research and case studies. While the report focused on a review of the cost effectiveness and emission reductions attributable to TCMs, the appendices contain a thorough review of more than 80 available TCM studies in the literature. Appendix E, entitled "Cost Effectiveness of Congestion Mitigation and Air Quality Strategies," presents a summary of the daily travel impacts (both trips and VMT; no information on

speed change was included) as well as the emission benefits and cost effectiveness for 17 separate categories of measures.

Table 2-1 summarizes the mean VMT reductions from measures in the CMAQ Report that are relevant to the 108(f) measure categories. Some of the measures addressed in the CMAQ Report do not impact travel and are not relevant to 108(f) measures, and were therefore excluded from consideration (e.g., engine replacements, alternate fuels, etc.). Other measures in the CMAQ report were grouped in a manner that makes it difficult to relate them to individual 108(f) categories. As discussed below, these measures were reorganized into categories that relate directly to the relevant 108(f) categories.

Table 2-1
Measures Evaluated In The 2002 CMAQ Report

#	Measure Type	Mean VMT Reduction	Vehicle Class Affected
1	Traffic Flow Improvements - Signalization Systems and Improvements	38,945	All
2	Traffic Flow Improvements - Freeway/Incident Management	15,372	All
3	HOV Facilities	379,850	LDVs
4	Ridesharing - Programmatic (Regional)	55,935	LDVs
5	Ridesharing - Vanpool/Buspool Programs	8,397	LDVs
6	Ridesharing - Park-and-Ride for Carpool/Vanpool	39,454	LDVs
7	Travel Demand Management - Voluntary Employer-Based	712,550	LDVs
8	Travel Demand Management - Mandatory Employer-Based	3,345,755	LDVs
9	Alternative Work Arrangements/Hours - Telecommuting/Telework	234,865	LDVs
10	Bike/Pedestrian Improvements - Bike Only	30,749	LDVs
11	Bike/Pedestrian Improvements - Pedestrian Only	17,000	LDVs
12	Transit - New Shuttle and/or Feeder Services	14,361	LDVs
13	Transit Improvements - New Fixed Guideway Systems or Equipment	462,312	LDVs
14	Transit Improvements - Conventional Transit Service Improvements	204,657	LDVs
15	Transit - Park-and-Ride at Transit Stations	106,160	LDVs
16	Pricing - Subsidies and Discounts - Employer Based	3,746,133	LDVs
17	Pricing - Subsidies and Discounts - Regional Transit	531,770	LDVs
18	Pricing - Fees and Charges - In Metro Core	1,954,500	LDVs

In Table 2-1, Measures 1-6, 9, and 12-15 use mean VMT reductions presented in Appendix E of the CMAQ report (E-Annex tables). The mean VMT reduction displayed for Measure 7 was calculated from the voluntary measures presented in Table-E-Annex-7 and Table-E-Annex-8 of the CMAQ report. Similarly, the mean VMT reduction displayed for Measure 8 was calculated from the mandatory measures presented in Tables-E-Annex 7 & 8. For Measures 10 and 11 in Table 2-1, the mean VMT reductions were estimated by separating bicycle- and pedestrian-related measures in Table-E-Annex-10, which grouped both types of measures together. The same was done for

Measures 16 and 17, which include measures combined in Table-E-Annex-16 of the report. Lastly, Measure 18 benefits were derived from Table-E-Annex-17 of the CMAQ report, which included many measures that are relevant to any of 108(f) categories (mileage and fuel fees and taxes). A detailed discussion of each of the CAA section 108(f) categories and corresponding control measures is presented in the following section.

As shown in Table 2-1, most of the measures, with the exception of Traffic Flow Improvements (1 and 2), focus on reductions in light-duty vehicle (LDV) travel. Communities represented in the Appendix E summary include major metropolitan areas such as Los Angeles, CA; Houston, TX; Washington, DC; Philadelphia, PA; the Delaware Valley; and the South Coast Air Basin, CA. Compared to the San Joaquin Valley, most of the evaluated areas have larger populations and higher levels of travel. Therefore, the reductions shown in Table 2-1 represent optimistic estimates of the maximum feasible travel reductions that can be expected from measures that could be implemented in the San Joaquin Valley Air Basin.

CAA 108(f) TCM Categories

The analysis of TCMs for implementation in the San Joaquin Valley Air Basin is organized by the general categories listed in section 108(f) of the CAA. In order to relate the measures shown in Table 2-1 to the 108(f) categories, each of the 108(f) categories was defined in the context of this study. Although some of the 108(f) categories can overlap, an effort was made to differentiate between them to avoid double counting benefits. The broad TCM categories included in section 108(f) of the CAA and the measures that fall within each category are summarized below.

(i) Improved Public Transit – Improving public transit involves a number of different measures that focus on making public transit more popular or attractive to commuters. Measures in this category can include public awareness campaigns to increase ridership, new transit service, network expansions or streamlining, roadway improvements to improve public transit, fare structures and policies, and new or improved customer amenities.

(ii) High-Occupancy Vehicle (HOV) Lanes – The use of high-occupancy vehicle (HOV) lanes is a tool for favoring bus, carpool, and vanpool travel over single-occupancy vehicles (SOVs) in order to reduce congestion and associated vehicle emissions. Having a separate dedicated lane for HOVs can provide participants with savings in travel time and a more predictable commute time compared to the typically congested lanes for other vehicles. HOV lanes can involve a physically separate roadway for buses, carpools and vanpools or a marked portion of a roadway or freeway dedicated to HOV use at all times or during hours of peak commuter traffic.

(iii) Employer-Based Plans and Incentives – As a subset of employer-based transportation management programs, this measure involves various employer-offered incentives for non-SOV commute options such as subsidized public transit, transportation allowances, incentives for not using parking spaces, ridesharing incentives, shuttle

services, and facilities for walkers and bicyclists. This category of measures was limited to voluntary employer-based programs and incentives to differentiate it from trip reduction ordinances (iv). Measures that involve work schedule choices are included in (xiii).

(iv) Trip Reduction Ordinances – Trip reduction ordinances (TROs) are state, regional, or local requirements aimed at reducing SOV travel. The majority of TROs focus on home-to-work commuters and are typically mandated for development sites and employers. Some TROs involve requiring a minimum percent reduction in SOV trips as compared to average ridership baselines without specifying the measures to implement, while others mandate specific employer-based incentives and programs. Since the category is very general, individual measures can include the same ones under (iii), (x), and (xiii). In California, mandatory employer-based trip reduction programs have been so controversial that legislation was passed in 1995 to prohibit local air districts from implementing them except where required by federal law (SB437 amending H&S §40929, later renumbered in 1998 to §40717.9). In sections 182(d)(1)(B) and 182(e) of the CAA, employer-based trip reduction is mandatory for employers with 100 or more employees in nonattainment areas designated as "severe" or "extreme."

(v) Traffic Flow Improvements – Measures to improve traffic flow are aimed at reducing or avoiding congestion and bottlenecks, along with the associated vehicle emissions. These measures include traffic signalization and improvements, redesign of traffic flow to reduce congestion (e.g., turn restrictions and one-way/two-way conversions), incident management programs, and ramp metering. Benefits assume that the improvement in traffic flow does not result in a rebound effect of increased traffic volume.

(vi) Fringe and Transportation Corridor Parking Facilities for Carpool/Vanpool and Transit – These measures refer to the development of park-and-ride lots where commuters can park their vehicles and carpool/vanpool or take public transit to their final destinations. Fringe parking refers to park-and-ride lots located at the edge of central business districts (CBDs) to promote use of the HOVs within typically congested city and business centers. Other park-and-ride lots are located nearer residential areas to be closer to the commute point of origin and can be directly connected to highways and freeways via ramps. A number of services such as convenience stores, day cares, financial services, and dry cleaning establishments can be located at or near park-and-ride lots to support lot users.

(vii) Limit or Restrict Vehicle Use in Downtown Areas – With high traffic densities and congestion common in downtown or similar areas of emission concentration (particularly during peak commute times), efforts to reduce motor vehicle use in such areas can help ease air pollution problems. Programs implemented under this category tend to focus on disincentives to discourage vehicle travel, instead of incentives and support programs. Example measures include anti-driving advisories during high pollution days, truck travel restrictions, and parking management (e.g., limited parking and parking tax in metro core). Measures that involve vehicle-free zones and pathways, which fall under the broad definition of this category, are grouped instead as part of (ix).

(viii) HOV and Ride-Sharing Programs – This category of TCMs includes support for all forms of local and regional HOV and ride-sharing programs. For the purposes of this analysis, employer-based HOV and ride-sharing programs are excluded from this category as they fall under (iii). HOV and ride-sharing support programs can include ride-share matching, shuttle and vanpool service, and transportation coordinators networks.

(ix) Limit Access to Roads/Sections of Metro Area to Non-Vehicular Use – To differentiate between this category and (vii), measures that fall within this category involve complete restriction to vehicle traffic for certain roadways and portions of the metropolitan area. Specifically, these measures include automobile restricted zones (ARZs), permanent roadway closures for pedestrian and bicycle use, and roadway closures during specific times of peak traffic in and around the metropolitan core.

(x) Bicycle Facilities – Programs under this category are designed to promote bicycle commuting over SOV travel by providing bicycles, transit bike racks, secure bicycle storage facilities, shower and locker facilities, and bicycle lanes. The programs are administered by local and regional agencies, while similar measures that are employer-based are included as part of (iii).

(xi) Control Extended Idling of Vehicles – Control of excess vehicle idling normally falls into two types of controls: (1) controls on LDV idling at drive-through facilities, and (2) control of heavy-duty vehicle (HDV) idling through mechanical means or using operating policies. In California, HDV extended idling is already controlled by ARB regulation; therefore, the benefits of controlling HDV extended idling are included in the baseline emission inventory for San Joaquin Valley. As discussed further below, regional emission reductions associated with reducing the number of drive-through facilities are expected to be minimal.

(xii) Reduce Extreme Cold Start Emissions – Extreme low-temperature cold starts are those that occur at 0°F or colder. These extreme temperatures do not occur in San Joaquin Valley; therefore, this measure is not applicable to the area and is excluded from the analysis.

(xiii) Employer-Sponsored Flexible Work Schedules – Flexible work schedules are designed to reduce vehicle congestion by redistributing vehicle travel to reduce concentration during peak commute times. Specific options for employees include flexible work times, compressed work-weeks, and telecommuting.

(xiv) Planning and Development Efforts that Reduce SOV Travel – These measures are described in the CAA as those that generally reduce SOV travel as part of land-use, transportation planning, and development efforts. Examples include controlling development density to minimize congestion, maximizing access to transit and shuttle services in development planning, incorporating necessary services (groceries, shopping, day care, schools) within development centers, and providing for pedestrians and bicycles in development designs.

(xv) Construction/Re-construction of Areas for Non-Motorized Transportation or Pedestrian Use – Measures in this category involve the creation or expansion of facilities for pedestrians, which include secure walkways and paths, locker facilities, and improvements in pedestrian access to typically high congested areas. Non-motorized transportation under this category is assumed to refer to non-bicycle forms such as skates, skateboards, and scooters. Provisions for bicycle travel are included in (x).

(xvi) Pre-1980 Model Year Light-Duty Vehicle Scrappage – Newer vehicles are subject to more stringent emission certification standards, and vehicle emissions tend to increase with age as the vehicle engine and emission control systems deteriorate. Therefore, vehicle emissions are reduced by turning over the in-use fleet from older, higher-polluting vehicles to newer, cleaner vehicles. These programs, known as accelerated vehicle retirement or scrappage programs, have been examined by private, local, and state agencies throughout the country as a means to achieve cost-effective emission reductions. Unlike the other measures listed in 108(f), no VMT reduction is expected from scrappage, because the retired vehicle is likely to be replaced by the owner. To result in benefits, however, replacement vehicles should be newer and cleaner than the retired vehicles and should not be driven significantly more than the retired vehicles.

2.2 Estimating TCM NOx Emission Benefits

Total VMT Reductions – In order to estimate VMT reductions by CAA 108(f) category, the measure types in Table 2-1 were mapped to the general TCM categories under section 108(f) as shown in Table 2-2. As indicated in the EPA TCM Guidance, TCM programs can overlap multiple 108(f) categories, as the categories are not always mutually exclusive. Nevertheless, an effort was made to distribute the measures so that each of the 108(f) categories has at least one representative control measure. For instance, category (iii) can involve all types of measures administered and offered by employers; however, those that involve work schedule options were categorized as part of (xiii) instead. When multiple measures in Table 2-1 fall within the same 108(f) category, the VMT reductions were summed. Although this approach overstates the reductions as the measures target the same group of commuters, the approach is in line with our effort to be cautious and use the most optimistic feasible assumptions.

As shown in Table 2-2, not all of the 108(f) categories were represented in the CMAQ report. Specifically, no estimated reductions in VMT were available for categories (ix), (xi), and (xiv). As previously discussed, (xii) does not apply to the SJVAB and is excluded from the analysis, and benefits for (xvi) were estimated using a different method, as it does not result in any VMT reduction. Estimated VMT reductions for (ix), (xi), and (xiv) were developed as outlined below.

- For (ix), the maximum feasible VMT reduction was assumed to be twice as much as that for (vii). The two measures have comparable goals, but (vii) involves voluntary restrictions while (ix) involves mandatory restrictions. Moreover, emission reductions for (ix) would be greater per vehicle mile reduced, because that category affects all vehicle classes whereas (vii) is aimed mainly at LDVs.

Table 2-2 Mapping CMAQ Report Measures to CAA 108(f) Categories	
Control Measure Category	CMAQ Measures #
(i) Improved Public Transit	12 - 14
(ii) High-Occupancy Vehicle (HOV) Lanes	3
(iii) Employer-Based Plans and Incentives	7, 16
(iv) Trip-Reduction Ordinances	8, 17
(v) Traffic Flow Improvements	1 – 2
(vi) Fringe and Transportation Corridor Parking Facilities for Carpool/Vanpool and Transit	6, 15
(vii) Limit or Restrict Vehicle Use in Downtown Areas	18
(viii) HOV and Ride-Sharing Programs	4 – 5
(ix) Limit Access to Roads/Sections of Metro Area to Non-Vehicular or Pedestrian Use	Twice (viii)[a]
(x) Bicycle Facilities	10
(xi) Control Extended Idling of Vehicles	NA in SJV[a]
(xii) Reduce Extreme Cold Start Emissions	---
(xiii) Employer-Sponsored Flexible Work Schedules	9
(xiv) Planning and Development Efforts that Reduce SOV Travel	Equal to (i)[a]
(xv) Construction/Re-construction of Paths, Tracks or Areas for Non-Motorized Transportation or Pedestrian Use	11
(xvi) Pre-1980 Model Year Light-Duty Vehicle Scrappage	---

[a] See the text for a discussion of benefits assumed for these measure categories.

- For (xi), a review of the EPA TCM website[4] indicates that "regional emission reductions associated with reducing the number of drive through facilities are expected to be minimal." The reason is that a small amount of travel will be impacted relative to the total level of travel represented in the inventory. The potential benefits of controls on heavy-duty idling, however, are seen to be more significant. ARB began enforcing heavy-duty idle restrictions in 2005 and the benefits of that measure are included in the baseline emissions inventory. For these reasons, no additional benefits are seen for implementation of this measure category.

- In the absence of data specific to programs related to land use planning included in (xiv), it was assumed that benefits are comparable to improvements in transit included in (i).

The resulting maximum feasible VMT reductions by CAA 108(f) category are shown in Table 2-3.

Table 2-3 TCM Maximum Feasible VMT Reduction by CAA 108(f) Category		
Control Measure Category	VMT Reduction	Affected Veh Class
(i) Improved Public Transit	681,330	LDVs
(ii) High-Occupancy Vehicle (HOV) Lanes	379,850	LDVs
(iii) Employer-Based Plans and Incentives	4,458,683	LDVs
(iv) Trip-Reduction Ordinances	3,877,524	LDVs
(v) Traffic Flow Improvements	54,317	All
(vi) Fringe and Transportation Corridor Parking Facilities for Carpool/Vanpool and Transit	145,614	LDVs
(vii) Limit or Restrict Vehicle Use in Downtown Areas	1,954,500	LDVs
(viii) HOV and Ride-Sharing Programs	64,332	LDVs
(ix) Limit Access to Roads/Sections of Metro Area to Non-Vehicular or Pedestrian Use	3,909,000	All
(x) Bicycle Facilities	30,749	LDVs
(xi) Control Extended Idling of Vehicles	minimal	LDVs
(xii) Reduce Extreme Cold Start Emissions	---	---
(xiii) Employer-Sponsored Flexible Work Schedules	234,865	LDVs
(xiv) Planning and Development Efforts that Reduce SOV Travel	681,330	LDVs
(xv) Construction/Re-construction of Paths, Tracks or Areas for Non-Motorized Transportation or Pedestrian Use	17,000	LDVs
(xvi) Pre-1980 Model Year Light-Duty Vehicle Scrappage	---	LDVs
Total Maximum Feasible VMT Reduction	16,489,095	

Estimating NOx Benefits in Tons Per Day – Where available, the estimated reduction in VMT was used along with estimates for the on-road motor vehicle summer NOx emission inventories for the SJVAB in 2020 and 2023 to estimate the NOx emission benefit for each 180(f) category in tons per day (tpd). Calendar year 2020 was chosen as a baseline year for implementing measures to meet the attainment year of 2023, and NOx emission benefits were generated for both calendar years. The 2020 and 2023 on-road mobile summer NOx emission inventories for SJVAB were developed using the EMFAC runs used to support the development of the Draft Plan (i.e., v1.06 RF 980). Results of the model runs for 2020 and 2023 are shown in Appendix A.

The on-road NOx emission benefits in tons per day were estimated for each TCM category using the VMT reductions shown in Table 2-3 in the following equation:

$$(1)\ NOx\ Reduction\ (tpd) = SJVAB\ NOx\ Inventory\ (tpd) \times \frac{VMT\ Reduction}{SJVAB\ VMT}.$$

For measures that affect all vehicle classes, the total NOx inventory and the total VMT for the entire vehicle fleet in the SJVAB were used in the equation. For those that affect light-duty vehicles, only the SJVAB NOx inventory and SJVAB VMT from light-duty passenger cars and light-duty trucks were used.

In order to estimate on-road NOx benefits from scrappage of pre-1980 model year LDVs as part of (xvi), another set of EMFAC2007 model runs were generated for 2020 and 2023 that included only pre-1980 model years. Outputs from these model runs are also shown in Appendix A. Using results of the previous model runs and the pre-1980 model runs, the following equation was used to estimate benefits from a scrappage program for 2020 and 2023:

$$(2)\ NOx\ Reduction\ (tpd) = \left(LDV\ EF_{pre\text{-}80} - LDV\ EF_{Fleet}\right) * \frac{10{,}000\ mi/yr}{365\ days/yr} * 4{,}704\ vehicles,$$

where $LDV\ EF_{pre\text{-}80}$ represents the average emission factor for pre-1980 LDVs in tons per mile, and $LDV\ EF_{Fleet}$ represents the average emission factor for all LDVs in the fleet, also in units of tons per mile. The tons per mile emission factors were calculated by dividing the total LDV NOx inventory by the total LDV VMT generated by EMFAC2007. In addition, the assumptions summarized below were made to develop equation (2).

- Scrapped and replacement vehicles are driven the same amount, at an average of 10,000 miles per year.

- EMFAC2007 runs indicate that there will be a total of 4,704 pre-1980 LDVs in the San Joaquin Valley in 2020. Assuming that all will be scrapped over three years between 2020 and 2023, a very optimistic assumption, a total of 1,568 vehicles can be retired each year. This level of scrappage compares well with a program conducted by the California Bureau of Automotive Repair (BAR) between July 2001 and the end of 2002. That program scrapped a total of 34,000 vehicles statewide (the largest number of vehicles scrapped by a program to date in California). The 4,704 vehicles that would be scrapped by this measure is comparable to the number of vehicles scrapped by the BAR program in the San Joaquin Valley. More importantly, this measure would eliminate all of the vehicles targeted by Section 108(f) Measure (xvi).

- Retired vehicles have three years of remaining life; therefore vehicles scrapped in 2020 would produce emission reductions only through 2023.

###

3. TCM BENEFITS AND ADVANCEMENT OF ATTAINMENT DETERMINATION

3.1 NOx Reductions from TCMs

Table 3-1 summarizes the maximum feasible NOx emission reductions resulting from the implementation of the transportation control measures in the CAA 108(f) categories. Also shown in the table are the total NOx emission inventories in the San Joaquin Valley Air Basin from all sources for 2020 and 2023 derived from the draft 2007 Ozone Plan for reference.

Table 3-1
Maximum Feasible NOx Emission Reductions from 108(f) TCMs in the San Joaquin Valley in 2020 and 2023

Control Measure Category	NOx Reduction (tpd)	
	2020	2023
(i) Improved Public Transit	0.11	0.09
(ii) High-Occupancy Vehicle (HOV) Lanes	0.06	0.05
(iii) Employer-Based Plans and Incentives	0.72	0.56
(iv) Trip-Reduction Ordinances	0.62	0.49
(v) Traffic Flow Improvements	0.06	0.05
(vi) Fringe and Transportation Corridor Parking Facilities for Carpool/Vanpool and Transit	0.02	0.02
(vii) Limit or Restrict Vehicle Use in Downtown Areas	0.31	0.25
(viii) HOV and Ride-Sharing Programs	0.01	0.01
(ix) Limit Access to Roads/Sections of Metro Area to Non-Vehicular or Pedestrian Use	4.23	3.41
(x) Bicycle Facilities	0.005	0.004
(xi) Control Extended Idling of Vehicles	0.00	0.00
(xii) Reduce Extreme Cold Start Emissions	0.00	0.00
(xiii) Employer-Sponsored Flexible Work Schedules	0.04	0.03
(xiv) Planning and Development Efforts that Reduce SOV Travel	0.11	0.09
(xv) Construction/Re-construction of Paths, Tracks or Areas for Non-Motorized Transportation or Pedestrian Use	0.003	0.002
(xvi) Pre-1980 Model Year Light-Duty Vehicle Scrappage	0.43	0.41
All TCMs Maximum Feasible NOx Emission Reduction	**6.73**	**5.45**

3.2 Advancement of Attainment Determination

The draft Ozone Plan was used to identify the following three possible threshold estimates of the NOx reductions that would be needed to advance attainment of the 8-hour ozone plan by one year:

1. According to Table 11-1, "Black Box" measures will need to supply an additional 85 tons per day in NOx reductions to achieve attainment in 2023. Thus, one measure of the reductions needed to advance attainment by one year is the shortfall in reductions needed to ensure that attainment occurs in 2023.

2. A more stringent estimate of the reductions needed to advance attainment by one year can be found by interpolating the 101 ton per day NOx reductions needed between 2020 and 2023 to demonstrate attainment (per information presented in Table 11-1). A straight-line allocation of those reductions over a three-year period indicates that roughly 34 tons per day would be needed to advance attainment by one year.

3. The most stringent estimate of the reductions needed to advance attainment by one year comes from determining the NOx reductions required to achieve a 1 ppb decrease in ozone (i.e., the smallest change that is measurable at the controlling monitors). The isopleths for the Arvin and Fresno-Sierra Sky Park monitors (Figures 3-5 and 3-6) show that a 2.5% reduction in NOx is required to produce a 1 ppb decrease in ozone concentrations in 2020 (i.e., from 85 ppb to 84 ppb). When this value is applied to the 352 ton per day baseline emission inventory estimate in 2020, it indicates that an 8.8 ton per day reduction in NOx will be required to achieve a 1 ppb decrease in ozone concentrations at those monitoring sites.

As discussed earlier, the methodology used to compute the maximum feasible travel and NOx reductions overstates the potential reductions for the applicable control measures. Since this analysis shows that the maximum feasible NOx reductions from TCMs will be about 7 tpd in 2020 and 5 tpd in 2023, it will not be possible to advance 8-hour ozone attainment in San Joaquin Valley by a single year using any of the criteria identified above despite using extremely conservative estimates of the achievable reductions.

###

4. REFERENCES

1. "2007 Ozone Plan," Final Draft, San Joaquin Valley Unified Air Pollution Control District, January 29, 2007.

2. "Transportation Control Measure: State Implementation Plan Guidance," Report No. 450/2-89-020, United States Environmental Protection Agency, September 1990.

3. "The Congestion Mitigation and Air Quality Improvement Program: Assessing 10 Years of Experience," Special Report 264, Committee for the Evaluation of the Congestion Mitigation and Air Quality Improvement Program, Transportation Research Board and National Research Council, National Academy Press, Washington, D.C., 2002.

4. *http://www.epa.gov/otaq/stateresources/policy/transp/tcms/extended_idling.pdf*

###

C.8

Appendix A

RACM Calculations

		CY 2020	CY 2023	
Total NOx Inventory (All Sources) in San Joaquin Valley Air Basin (tpd)		**261**	**245**	
Attainment Gap (tpd)		**101**	**85**	
Benefits by TCM Category	Veh Class	Mean	Mean	
(i) improved public transit	LDVs	0.11	0.09	
(ii) HOV lanes	LDVs	0.06	0.05	
(iii) employer-based plans and incentives	LDVs	0.72	0.56	
(iv) trip-reduction ordinances	LDVs	0.62	0.49	
(v) traffic flow improvements	All	0.06	0.05	
(vi) parking facilities for carpool/vanpool and transit	LDVs	0.02	0.02	
(vii) vehicle use restrictions in downtown areas	LDVs	0.31	0.25	
(viii) HOV, ride-sharing programs	LDVs	0.01	0.01	
(ix) restrict motor vehicle access to roads/sections of metro area	All	4.23	3.41	
(x) bicycle facilities	LDVs	0.005	0.004	
(xi) control extended idling of vehicles	All	0.00	0.00	CARB reg for HDVs, LDV control = minimal effects
(xii) reduce extreme cold start emissions	n/a	0.00	0.00	extreme cold temps not applicable in SJVAB
(xiii) employer-sponsored flexible work schedules	LDVs	0.04	0.03	
(xiv) planning and development efforts that reduce SOV travel	LDVs	0.11	0.09	
(xv) construction/re-construction of non-motorized vehicle or pedestrian ways	LDVs	0.003	0.002	
(xvi) Scrappage of pre-1980 LDVs	LDVs	0.43	0.41	assumes 5650 vehicles over 3 years
Total Benefits All TCM Categories (tpd)		**6.73**	**5.45**	
TOTAL AS % OF INVENTORY		2.6%	2.2%	

Control Measure	Daily VMT Reduction Mean	Veh Class	CAA (108)f	
CMAQ Program Report (Book)				
1 Traffic Flow Improvements - Signalization Systems and Improvements	38,945	All	v	
2 Traffic Flow Improvements - Freeway/Incident Management	15,372	All	v	
3 HOV Facilities	379,850	LDVs	ii	
4 Ridesharing - Programmatic (Regional)	55,935	LDVs	viii	
5 Ridesharing - Vanpool/Buspool Programs	8,397	LDVs	viii	
6 Ridesharing - Park-and-Ride for Carpool/Vanpool	39,454	LDVs	vi	
7 Travel Demand Management - Voluntary Employer Trip Reduction Programs and ECC	712,550	LDVs	iii	
8 Travel Demand Management - Mandatory Employer Trip Reduction Programs and EC	3,345,755	LDVs	iv	
9 Alternative Work Arrangements/Hours - Telecommuting/Telework	234,865	LDVs	xiii	
10 Bike/Pedestrian Improvements - Bike Only	30,749	LDVs	x	
11 Bike/Pedestrian Improvements - Pedestrian Only	17,000	LDVs	xv	
12 Transit - New Shuttle and/or Feeder Services	14,361	LDVs	i	
13 Transit Improvements - New Fixed Guideway Systems or Equipment	462,312	LDVs	i	
14 Transit Improvements - Conventional Transit Service Improvements	204,657	LDVs	i	
15 Transit - Park-and-Ride at Transit Stations	106,160	LDVs	vi	
16 Pricing - Subsidies and Discounts - Employer Based	3,746,133	LDVs	iii	
17 Pricing - Subsidies and Discounts - Regional Transit	531,770	LDVs	iv	
18 Pricing - Fees and Charges - In Metro Core	1,954,500	LDVs	vii	
Other CAA 108(f) Categories				
(ix) programs to limit portions of road surfaces or certain sections of the metropolitan a	3,909,000		ix	assumed to be 2x (vii)
(xi) programs to control extended idling of vehicles	n/a		xi	
(xii) programs to reduce motor vehicle emissions, consistent with title II, which are cau	0		xii	not applicable to the San Joaquin Valley
(xiv) programs and ordinances to facilitate non-automobile travel, provision and utilizat	681,330		xiv	assume to be equal to transit improvements
(xvi) program to encourage the voluntary removal from use and the marketplace of pre	n/a		xvi	
TOTAL VMT BENEFITS BY CAA CATEGORY				
(i) improved public transit	681,330	LDVs		
(ii) HOV lanes	379,850	LDVs		
(iii) employer-based plans and incentives	4,458,683	LDVs		
(iv) trip-reduction ordinances	3,877,524	LDVs		
(v) traffic flow improvements	54,317	All		
(vi) parking facilities for carpool/vanpool and transit	145,614	LDVs		
(vii) limit or restrict vehicle use in downtown areas	1,954,500	LDVs		
(viii) HOV, ride-sharing programs	64,332	LDVs		
(ix) restrict motor vehicle access to roads/sections of metro area	3,909,000	All		
(x) bicycle facilities	30,749	LDVs		
(xi) control extended idling of vehicles	n/a			
(xii) reduce extreme cold start emissions	0			
(xiii) employer-sponsored flexible work schedules	234,865	LDVs		
(xiv) planning and development efforts that reduce SOV travel	681,330	LDVs		
(xv) construction/re-construction of non-motorized vehicle or pedestrian ways	17,000	LDVs		
(xvi) scrappage of pre-1980 LDVs and LDTs	n/a	LDVs		
TOTAL	16,489,095			

Title : San Joaquin Valley (SJV); CY 2020 & 2023 Summer; By Subarea
Version : Emfac2007 V2.3 Nov 1 2006
Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
Season : Summer
Area : San Joaquin Valley Air Basin Grand
I/M Stat : See county detail
Emissions: Tons Per Day

	LDA-NCAT	LDA-CAT	LDA-DSL	LDA-TOT	LDT1-NCAT	LDT1-CAT	LDT1-DSL	LDT1-TOT	LDT2-NCAT	LDT2-CAT	LDT2-DSL	LDT2-TOT	MDV-NCAT	MDV-CAT	MDV-DSL	MDV-TOT	LHDT1-NCAT	LHDT1-CAT	LHDT1-DSL
Vehicles	171	1400790	924	1401890	161	385686	10107	395954	158	654520	547	655225	751	367535	602	368888	32	56598	17016
VMT/1000	3	51937	20	51959	3	14677	252	14932	3	24400	13	24416	15	13725	17	13756	1	2308	667
Trips	653	8732200	4776	8737630	619	2382850	56906	2440380	608	4040860	2907	4044380	2842	2274570	3450	2280860	1047	1871520	214040
Reactive Organic Gas Emissions																			
Run Exh	0.01	1.2	0	1.21	0.01	0.48	0.02	0.5	0.01	1.06	0	1.07	0.15	0.81	0	0.96	0	0.37	0.13
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.07	0
Start Ex	0	1.26	0	1.26	0	0.42	0	0.42	0	0.99	0	0.99	0.02	0.76	0	0.77	0.01	0.51	0
Total Ex	0.01	2.46	0	2.47	0.01	0.9	0.02	0.92	0.01	2.06	0	2.06	0.17	1.56	0	1.73	0.01	0.95	0.13
Diurnal	0	1.79	0	1.79	0	0.62	0	0.62	0	1.26	0	1.26	0	0.68	0	0.68	0	0.01	0
Hot Soak	0	1.55	0	1.55	0	0.5	0	0.5	0	0.98	0	0.98	0	0.54	0	0.54	0	0.1	0
Running	0.01	2.7	0	2.71	0	1.59	0	1.59	0	3.1	0	3.1	0	1.66	0	1.66	0	1.09	0
Resting	0	1.12	0	1.13	0	0.4	0	0.4	0	0.84	0	0.84	0	0.47	0	0.47	0	0	0
Total	**0.02**	**9.62**	**0**	**9.65**	**0.02**	**4**	**0.02**	**4.04**	**0.02**	**8.23**	**0**	**8.25**	**0.18**	**4.91**	**0**	**5.09**	**0.02**	**2.15**	**0.13**
Carbon Monoxide Emissions																			
Run Exh	0.11	64.73	0.01	64.85	0.17	25.48	0.14	25.79	0.17	53.49	0.01	53.66	2.9	35.85	0.01	38.76	0.1	3.99	0.83
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.45	0.02
Start Ex	0.01	15.84	0	15.85	0.02	5.86	0	5.87	0.02	12.58	0	12.59	0.24	8.67	0	8.91	0.05	5.65	0
Total Ex	**0.12**	**80.57**	**0.01**	**80.7**	**0.18**	**31.34**	**0.14**	**31.66**	**0.18**	**66.06**	**0.01**	**66.25**	**3.14**	**44.52**	**0.01**	**47.67**	**0.15**	**10.1**	**0.84**
Oxides of Nitrogen Emissions																			
Run Exh	0.01	4.45	0.03	4.49	0.01	1.84	0.41	2.26	0.01	5.06	0.02	5.09	0.14	3.61	0.03	3.79	0	0.63	1.89
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05
Start Ex	0	1.18	0	1.18	0	0.4	0	0.4	0	1.28	0	1.28	0.01	0.9	0	0.91	0	2.9	0
Total Ex	**0.01**	**5.63**	**0.03**	**5.67**	**0.01**	**2.25**	**0.41**	**2.66**	**0.01**	**6.34**	**0.02**	**6.37**	**0.15**	**4.52**	**0.03**	**4.7**	**0**	**3.54**	**1.94**
Carbon Dioxide Emissions (000)																			
Run Exh	0	22.94	0.01	22.94	0	8.09	0.1	8.19	0	13.67	0	13.67	0.01	10.51	0.01	10.52	0	2.46	0.38
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.02	0
Start Ex	0	0.68	0	0.68	0	0.23	0	0.23	0	0.4	0	0.4	0	0.31	0	0.31	0	0.09	0
Total Ex	**0**	**23.62**	**0.01**	**23.63**	**0**	**8.32**	**0.1**	**8.42**	**0**	**14.07**	**0**	**14.07**	**0.01**	**10.81**	**0.01**	**10.83**	**0**	**2.57**	**0.38**
PM10 Emissions																			
Run Exh	0	0.63	0	0.63	0	0.2	0.01	0.21	0	0.73	0	0.73	0	0.43	0	0.43	0	0.04	0.03
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0.06	0	0.06	0	0.02	0	0.02	0	0.07	0	0.07	0	0.04	0	0.04	0	0	0
Total Ex	0	0.69	0	0.7	0	0.22	0.01	0.23	0	0.81	0	0.81	0	0.47	0	0.47	0	0.05	0.03
TireWear	0	0.46	0	0.46	0	0.13	0	0.13	0	0.22	0	0.22	0	0.12	0	0.12	0	0.03	0.01
BrakeWr	0	0.72	0	0.72	0	0.2	0	0.21	0	0.34	0	0.34	0	0.19	0	0.19	0	0.03	0.01
Total	**0**	**1.87**	**0**	**1.87**	**0**	**0.55**	**0.02**	**0.57**	**0**	**1.36**	**0**	**1.36**	**0**	**0.78**	**0**	**0.78**	**0**	**0.11**	**0.05**
Lead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOx	0	0.23	0	0.23	0	0.08	0	0.08	0	0.14	0	0.14	0	0.1	0	0.1	0	0.02	0
Fuel Consumption (000 gallons)																			
Gasoline	0.19	2431.65	0	2431.84	0.2	857.3	0	857.5	0.2	1451.56	0	1451.77	1.83	1114.93	0	1116.75	0.12	264.9	0
Diesel	0	0	0.69	0.69	0	0	8.67	8.67	0	0	0.44	0.44	0	0	0.58	0.58	0	0	34.62

LHDT1-TOT	LHDT2-NCAT	LHDT2-CAT	LHDT2-DSL	LHDT2-TOT	MHDT-NCAT	MHDT-CAT	MHDT-DSL	MHDT-TOT	HHDT-NCAT	HHDT-CAT	HHDT-DSL	HHDT-TOT	OBUS-NCAT	OBUS-CAT	OBUS-DSL	OBUS-TOT	SBUS-NCAT	SBUS-CAT	SBUS-DSL
73646	3	13883	12599	26486	45	7699	32587	40330	3	1289	80042	81334	1	843	1546	2390	6	569	4032
2975	0	570	487	1057	0	434	2139	2573	0	193	15455	15648	0	36	107	143	0	29	208
2066600	110	459071	158484	617665	2062	351579	913732	1267370	133	58877	405053	464063	47	38519	43340	81906	22	2278	16128
0.5	0	0.05	0.1	0.15	0	0.07	0.35	0.43	0	0.17	7.15	7.32	0	0.02	0.02	0.03	0	0.06	0.09
0.08	0	0.02	0	0.02	0	0.02	0.01	0.03	0	0	1.21	1.21	0	0	0	0	0	0.01	0.01
0.52	0	0.12	0	0.12	0.02	0.24	0	0.25	0	0.11	0	0.11	0	0.05	0	0.05	0	0.01	0
1.09	0	0.18	0.1	0.29	0.02	0.33	0.36	0.71	0	0.29	8.36	8.65	0	0.07	0.02	0.08	0	0.07	0.1
0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.1	0	0.02	0	0.02	0	0.01	0	0.01	0	0	0	0	0	0	0	0	0	0	0
1.09	0	0.25	0	0.25	0.01	0.16	0	0.16	0	0.03	0	0.03	0	0.02	0	0.02	0	0.01	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.3	**0**	**0.46**	**0.1**	**0.56**	**0.03**	**0.5**	**0.36**	**0.89**	**0**	**0.32**	**8.36**	**8.68**	**0**	**0.09**	**0.02**	**0.11**	**0**	**0.08**	**0.1**
4.92	0.01	0.65	0.56	1.22	0.07	1.09	3.96	5.12	0.03	7.1	30.57	37.7	0	0.32	0.19	0.5	0.05	0.59	0.86
0.46	0	0.11	0.01	0.12	0	0.1	0.09	0.19	0	0	4.65	4.65	0	0.01	0	0.01	0	0.04	0.06
5.7	0	1.25	0	1.25	0.14	3.55	0	3.69	0.05	2.46	0	2.51	0	0.72	0	0.73	0	0.09	0
11.09	**0.01**	**2**	**0.58**	**2.59**	**0.21**	**4.74**	**4.05**	**9**	**0.08**	**9.56**	**35.22**	**44.86**	**0**	**1.05**	**0.19**	**1.24**	**0.05**	**0.72**	**0.92**
2.52	0	0.13	1.35	1.48	0	0.27	6.81	7.08	0	1.09	77.5	78.59	0	0.09	0.3	0.39	0	0.08	2
0.05	0	0	0.04	0.04	0	0	0.26	0.26	0	0	18.61	18.61	0	0	0.01	0.01	0	0	0.18
2.91	0	0.67	0	0.67	0	0.53	0	0.53	0	0.29	0	0.29	0	0.12	0	0.12	0	0.01	0
5.48	**0**	**0.81**	**1.39**	**2.19**	**0**	**0.8**	**7.07**	**7.88**	**0**	**1.38**	**96.11**	**97.49**	**0**	**0.21**	**0.31**	**0.52**	**0**	**0.09**	**2.18**
2.85	0	0.61	0.28	0.89	0	0.33	3.55	3.88	0	0.12	31.14	31.26	0	0.03	0.18	0.2	0	0.02	0.33
0.02	0	0	0	0.01	0	0	0.01	0.02	0	0	1.04	1.04	0	0	0	0	0	0	0.01
0.09	0	0.02	0	0.02	0	0.01	0	0.01	0	0	0	0	0	0	0	0	0	0	0
2.95	**0**	**0.63**	**0.28**	**0.92**	**0**	**0.35**	**3.56**	**3.91**	**0**	**0.13**	**32.18**	**32.31**	**0**	**0.03**	**0.18**	**0.21**	**0**	**0.02**	**0.34**
0.07	0	0.01	0.02	0.03	0	0.01	0.4	0.41	0	0	3.06	3.06	0	0	0.02	0.02	0	0	0.11
0	0	0	0	0	0	0	0	0	0	0	0.07	0.07	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.08	0	0.01	0.02	0.03	0	0.01	0.4	0.41	0	0	3.13	3.13	0	0	0.02	0.02	0	0	0.11
0.04	0	0.01	0.01	0.01	0	0.01	0.03	0.03	0	0	0.61	0.62	0	0	0	0	0	0	0
0.04	0	0.01	0.01	0.01	0	0.01	0.03	0.04	0	0.01	0.48	0.49	0	0	0	0	0	0	0
0.16	**0**	**0.03**	**0.04**	**0.06**	**0**	**0.02**	**0.46**	**0.48**	**0**	**0.01**	**4.23**	**4.24**	**0**	**0**	**0.02**	**0.02**	**0**	**0**	**0.12**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.03	0	0.01	0	0.01	0	0	0.03	0.04	0	0	0.31	0.31	0	0	0	0	0	0	0
265.03	0.01	65.37	0	65.38	0.12	36.19	0	36.31	0.02	14.51	0	14.53	0	3.18	0	3.18	0.03	2.67	0
34.62	0	0	25.4	25.4	0	0	320.63	320.63	0	0	2896.28	2896.28	0	0	16.04	16.04	0	0	30.72

SBUS-TOT	UB-NCAT	UB-CAT	UB-DSL	UB-TOT	MH-NCAT	MH-CAT	MH-DSL	MH-TOT	MCY-NCAT	MCY-CAT	MCY-DSL	MCY-TOT	ALL-TOT
4607	3	368	910	1281	32	27142	3752	30927	47861	72593	0	120454	3203410
237	0	53	137	191	0	346	45	392	436	768	0	1204	129483
18429	12	1471	3641	5123	3	2715	375	3094	95712	145172	0	240885	22288400
0.16	0	0.18	0.1	0.29	0	0.05	0	0.05	1.77	1.75	0	3.52	16.18
0.01	0	0	0	0	0	0	0	0	0	0	0	0	1.35
0.01	0	0.01	0	0.01	0	0	0	0	0.21	0.27	0	0.48	5
0.18	0	0.19	0.1	0.3	0	0.05	0	0.05	1.98	2.02	0	4	22.53
0	0	0	0	0	0	0.01	0	0.01	0.01	0.72	0	0.74	5.12
0	0	0	0	0	0	0	0	0	0	0.16	0	0.16	3.88
0.01	0	0.01	0	0.01	0	0.01	0	0.01	0.02	0.3	0	0.32	10.95
0	0	0	0	0	0	0	0	0	0.01	0.41	0	0.41	3.26
0.18	**0**	**0.2**	**0.1**	**0.3**	**0**	**0.07**	**0**	**0.07**	**2.02**	**3.61**	**0**	**5.62**	**45.74**
1.5	0.08	1.44	0.42	1.93	0.05	1.08	0.04	1.18	25.8	8.5	0	34.3	271.43
0.11	0	0	0	0	0	0	0	0	0	0	0	0	5.54
0.09	0	0.12	0	0.12	0	0.02	0	0.02	0.86	1.52	0	2.38	59.72
1.7	**0.08**	**1.56**	**0.42**	**2.05**	**0.05**	**1.1**	**0.04**	**1.2**	**26.66**	**10.02**	**0**	**36.69**	**336.7**
2.08	0	0.36	2.47	2.83	0	0.22	0.29	0.51	0.63	0.83	0	1.46	112.57
0.18	0	0	0	0	0	0	0	0	0	0	0	0	19.15
0.01	0	0.02	0	0.02	0	0	0	0	0.03	0.04	0	0.08	8.41
2.27	**0**	**0.38**	**2.47**	**2.85**	**0**	**0.22**	**0.29**	**0.51**	**0.67**	**0.88**	**0**	**1.54**	**140.13**
0.35	0	0.04	0.39	0.43	0	0.26	0.08	0.34	0.05	0.16	0	0.22	95.75
0.01	0	0	0	0	0	0	0	0	0	0	0	0	1.1
0	0	0	0	0	0	0	0	0	0.01	0	0	0.01	1.77
0.37	**0**	**0.04**	**0.39**	**0.43**	**0**	**0.26**	**0.08**	**0.34**	**0.06**	**0.17**	**0**	**0.23**	**98.61**
0.11	0	0	0.05	0.05	0	0	0.01	0.01	0.03	0	0	0.03	5.79
0	0	0	0	0	0	0	0	0	0	0	0	0	0.08
0	0	0	0	0	0	0	0	0	0	0	0	0	0.21
0.11	0	0	0.05	0.05	0	0	0.01	0.01	0.03	0	0	0.03	6.08
0	0	0	0	0	0	0	0	0.01	0	0	0	0.01	1.65
0	0	0	0	0	0	0	0	0.01	0	0.01	0	0.01	2.05
0.12	**0**	**0**	**0.05**	**0.05**	**0**	**0.01**	**0.01**	**0.02**	**0.03**	**0.01**	**0**	**0.04**	**9.78**
0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0.95
2.7	0.05	4.83	0	4.87	0.03	26.93	0	26.96	11.23	19.56	0	30.8	6307.62
30.72	0	0	34.65	34.65	0	0	6.79	6.79	0	0	0	0	3375.53

Title : **San Joaquin Valley (SJV); CY 2020 & 2023 Summer; By Subarea**
Version : **Emfac2007 V2.3 Nov 1 2006**
Scen Year: **2023 -- All model years in the range 1979 to 2023 selected**
Season : **Summer**
Area : **San Joaquin Valley Air Basin Grand**
I/M Stat : **See county detail**
Emissions: **Tons Per Day**

	LDA-NCAT	LDA-CAT	LDA-DSL	LDA-TOT	LDT1-NCAT	LDT1-CAT	LDT1-DSL	LDT1-TOT	LDT2-NCAT	LDT2-CAT	LDT2-DSL	LDT2-TOT	MDV-NCAT	MDV-CAT	MDV-DSL	MDV-TOT	LHDT1-NCAT	LHDT1-CAT	LHDT1-DSL
Vehicles	43	1490590	615	1491240	43	413799	7639	421481	43	696816	392	697252	67	391828	483	392378	0	60958	17367
VMT/1000	1	55126	13	55139	1	15730	179	15910	1	25930	9	25939	1	14601	13	14615	0	2478	676
Trips	159	9282500	3162	9285820	162	2553920	41390	2595470	162	4289880	1991	4292030	253	2415450	2698	2418410	0	2015670	218455
Reactive Organic Gas Emissions																			
Run Exh	0	1.04	0	1.04	0	0.4	0.01	0.41	0	0.96	0	0.97	0	0.73	0	0.73	0	0.25	0.12
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.08	0
Start Ex	0	0.97	0	0.97	0	0.33	0	0.33	0	0.83	0	0.83	0	0.64	0	0.64	0	0.46	0
Total Ex	0	2.01	0	2.01	0	0.73	0.01	0.74	0	1.79	0	1.79	0	1.36	0	1.37	0	0.79	0.12
Diurnal	0	1.54	0	1.54	0	0.54	0	0.54	0	1.22	0	1.22	0	0.66	0	0.67	0	0.01	0
Hot Soak	0	1.4	0	1.4	0	0.46	0	0.46	0	0.95	0	0.95	0	0.53	0	0.53	0	0.1	0
Running	0	2.49	0	2.49	0	1.48	0	1.48	0	3	0	3	0	1.62	0	1.62	0	1.09	0
Resting	0	0.98	0	0.98	0	0.35	0	0.35	0	0.84	0	0.84	0	0.48	0	0.48	0	0	0
Total	**0.01**	**8.41**	**0**	**8.42**	**0**	**3.56**	**0.01**	**3.58**	**0**	**7.79**	**0**	**7.8**	**0.01**	**4.65**	**0**	**4.66**	**0**	**1.99**	**0.12**
Carbon Monoxide Emissions																			
Run Exh	0.03	57.52	0.01	57.56	0.03	21.75	0.11	21.88	0.03	49.1	0.01	49.14	0.09	34.01	0.01	34.1	0	2.98	0.81
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.47	0.02
Start Ex	0	12.69	0	12.7	0	4.68	0	4.68	0	10.77	0	10.77	0.01	7.68	0	7.69	0	5.25	0
Total Ex	**0.03**	**70.22**	**0.01**	**70.25**	**0.03**	**26.43**	**0.11**	**26.57**	**0.03**	**59.87**	**0.01**	**59.91**	**0.1**	**41.69**	**0.01**	**41.79**	**0**	**8.69**	**0.83**
Oxides of Nitrogen Emissions																			
Run Exh	0	3.78	0.02	3.8	0	1.52	0.29	1.81	0	4.32	0.01	4.34	0	3.08	0.02	3.1	0	0.54	1.58
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05
Start Ex	0	0.9	0	0.9	0	0.32	0	0.32	0	1.05	0	1.05	0	0.74	0	0.74	0	2.95	0
Total Ex	**0**	**4.68**	**0.02**	**4.7**	**0**	**1.84**	**0.29**	**2.12**	**0**	**5.37**	**0.01**	**5.39**	**0**	**3.82**	**0.02**	**3.85**	**0**	**3.5**	**1.63**
Carbon Dioxide Emissions (000)																			
Run Exh	0	25.02	0	25.02	0	8.92	0.07	8.99	0	14.98	0	14.98	0	11.5	0	11.51	0	2.64	0.39
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.02	0
Start Ex	0	0.72	0	0.72	0	0.25	0	0.25	0	0.43	0	0.43	0	0.33	0	0.33	0	0.1	0
Total Ex	**0**	**25.74**	**0**	**25.74**	**0**	**9.17**	**0.07**	**9.24**	**0**	**15.41**	**0**	**15.41**	**0**	**11.83**	**0**	**11.83**	**0**	**2.76**	**0.39**
PM10 Emissions																			
Run Exh	0	0.72	0	0.72	0	0.23	0.01	0.24	0	0.84	0	0.84	0	0.49	0	0.49	0	0.04	0.03
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0.07	0	0.07	0	0.02	0	0.02	0	0.08	0	0.08	0	0.04	0	0.04	0	0	0
Total Ex	0	0.79	0	0.79	0	0.25	0.01	0.26	0	0.92	0	0.92	0	0.53	0	0.53	0	0.05	0.03
TireWear	0	0.49	0	0.49	0	0.14	0	0.14	0	0.23	0	0.23	0	0.13	0	0.13	0	0.03	0.01
BrakeWr	0	0.76	0	0.76	0	0.22	0	0.22	0	0.36	0	0.36	0	0.2	0	0.2	0	0.03	0.01
Total	**0**	**2.04**	**0**	**2.04**	**0**	**0.61**	**0.01**	**0.62**	**0**	**1.5**	**0**	**1.5**	**0**	**0.86**	**0**	**0.87**	**0**	**0.12**	**0.05**
Lead	**0**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOx	0	0.25	0	0.25	0	0.09	0	0.09	0	0.15	0	0.15	0	0.11	0	0.11	0	0.03	0
Fuel Consumption (000 gallons)																			
Gasoline	0.05	2646.77	0	2646.82	0.05	943.17	0	943.22	0.05	1587.48	0	1587.54	0.13	1218.15	0	1218.29	0	284.16	0
Diesel	0	0	0.44	0.44	0	0	6.15	6.15	0	0	0.3	0.3	0	0	0.44	0.44	0	0	35.08

LHDT1-TOT	LHDT2-NCAT	LHDT2-CAT	LHDT2-DSL	LHDT2-TOT	MHDT-NCAT	MHDT-CAT	MHDT-DSL	MHDT-TOT	HHDT-NCAT	HHDT-CAT	HHDT-DSL	HHDT-TOT	OBUS-NCAT	OBUS-CAT	OBUS-DSL	OBUS-TOT	SBUS-NCAT	SBUS-CAT	SBUS-DSL
78325	0	15193	12982	28175	0	8371	34566	42937	0	1345	83716	85061	0	801	1740	2540	0	592	4298
3154	0	622	504	1126	0	478	2285	2764	0	203	16387	16590	0	35	121	156	0	30	222
2234120	0	502392	163294	665685	0	382286	969220	1351510	0	61442	423644	485087	0	36567	48781	85348	0	2368	17190
0.37	0	0.03	0.09	0.12	0	0.04	0.34	0.38	0	0.15	6.14	6.28	0	0.01	0.02	0.03	0	0.05	0.1
0.08	0	0.02	0	0.02	0	0.02	0.01	0.03	0	0	1.2	1.2	0	0	0	0	0	0.01	0.01
0.46	0	0.1	0	0.1	0	0.2	0	0.2	0	0.09	0	0.09	0	0.04	0	0.04	0	0.01	0
0.91	0	0.15	0.09	0.24	0	0.26	0.35	0.61	0	0.24	7.34	7.58	0	0.05	0.02	0.07	0	0.06	0.11
0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.1	0	0.02	0	0.02	0	0.01	0	0.01	0	0	0	0	0	0	0	0	0	0	0
1.09	0	0.22	0	0.22	0	0.13	0	0.13	0	0.03	0	0.03	0	0.02	0	0.02	0	0.01	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.11	**0**	**0.4**	**0.09**	**0.48**	**0**	**0.41**	**0.35**	**0.76**	**0**	**0.27**	**7.34**	**7.61**	**0**	**0.08**	**0.02**	**0.09**	**0**	**0.07**	**0.11**
3.78	0	0.44	0.55	0.99	0	0.7	4	4.7	0	7.33	26.79	34.12	0	0.21	0.2	0.41	0	0.51	0.91
0.49	0	0.12	0.01	0.13	0	0.1	0.1	0.2	0	0	4.79	4.79	0	0.01	0	0.01	0	0.04	0.07
5.25	0	1.15	0	1.15	0	2.98	0	2.98	0	2.4	0	2.4	0	0.59	0	0.59	0	0.08	0
9.52	**0**	**1.71**	**0.56**	**2.27**	**0**	**3.78**	**4.1**	**7.88**	**0**	**9.73**	**31.58**	**41.31**	**0**	**0.81**	**0.21**	**1.02**	**0**	**0.64**	**0.97**
2.12	0	0.11	1.09	1.2	0	0.19	5.37	5.56	0	1.08	62.16	63.24	0	0.06	0.25	0.31	0	0.07	1.92
0.05	0	0	0.04	0.04	0	0	0.28	0.28	0	0	19.66	19.66	0	0	0.01	0.01	0	0	0.19
2.95	0	0.68	0	0.68	0	0.47	0	0.47	0	0.27	0	0.27	0	0.1	0	0.1	0	0.01	0
5.13	**0**	**0.79**	**1.13**	**1.92**	**0**	**0.66**	**5.65**	**6.31**	**0**	**1.35**	**81.82**	**83.16**	**0**	**0.16**	**0.27**	**0.43**	**0**	**0.08**	**2.11**
3.03	0	0.66	0.29	0.95	0	0.36	3.79	4.15	0	0.13	33.02	33.15	0	0.03	0.2	0.23	0	0.02	0.35
0.02	0	0	0	0.01	0	0	0.02	0.02	0	0	1.09	1.09	0	0	0	0	0	0	0.01
0.1	0	0.02	0	0.02	0	0.02	0	0.02	0	0	0	0	0	0	0	0	0	0	0
3.15	**0**	**0.69**	**0.29**	**0.98**	**0**	**0.38**	**3.81**	**4.19**	**0**	**0.13**	**34.1**	**34.24**	**0**	**0.03**	**0.2**	**0.23**	**0**	**0.03**	**0.36**
0.07	0	0.01	0.02	0.03	0	0.01	0.39	0.39	0	0	2.45	2.45	0	0	0.02	0.02	0	0	0.11
0	0	0	0	0	0	0	0	0	0	0	0.05	0.05	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.08	0	0.01	0.02	0.03	0	0.01	0.39	0.4	0	0	2.5	2.5	0	0	0.02	0.02	0	0	0.12
0.04	0	0.01	0.01	0.01	0	0.01	0.03	0.04	0	0	0.65	0.65	0	0	0	0	0	0	0
0.04	0	0.01	0.01	0.02	0	0.01	0.03	0.04	0	0.01	0.51	0.52	0	0	0	0	0	0	0
0.16	**0**	**0.03**	**0.03**	**0.06**	**0**	**0.02**	**0.45**	**0.47**	**0**	**0.01**	**3.66**	**3.67**	**0**	**0**	**0.02**	**0.02**	**0**	**0**	**0.12**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.03	0	0.01	0	0.01	0	0	0.04	0.04	0	0	0.33	0.33	0	0	0	0	0	0	0
284.16	0	71.24	0	71.24	0	39.6	0	39.6	0	15.2	0	15.2	0	3.01	0	3.01	0	2.76	0
35.08	0	0	26.23	26.23	0	0	342.61	342.61	0	0	3069.45	3069.45	0	0	18.16	18.16	0	0	32.78

SBUS-TOT	UB-NCAT	UB-CAT	UB-DSL	UB-TOT	MH-NCAT	MH-CAT	MH-DSL	MH-TOT	MCY-NCAT	MCY-CAT	MCY-DSL	MCY-TOT	ALL-TOT
4889	0	398	960	1358	0	29037	3812	32849	46868	81147	0	128015	3406510
252	0	58	145	203	0	372	46	419	440	841	0	1281	137546
19558	0	1594	3839	5433	0	2905	381	3286	93726	162278	0	256004	23697800
0.15	0	0.18	0.1	0.29	0	0.03	0	0.03	1.76	1.91	0	3.67	14.47
0.02	0	0	0	0	0	0	0	0	0	0	0	0	1.35
0.01	0	0.01	0	0.01	0	0	0	0	0.2	0.31	0	0.51	4.18
0.17	0	0.19	0.1	0.3	0	0.03	0	0.03	1.96	2.22	0	4.18	20
0	0	0	0	0	0	0.01	0	0.01	0.01	0.77	0	0.78	4.77
0	0	0	0	0	0	0	0	0	0	0.16	0	0.17	3.64
0.01	0	0.01	0	0.01	0	0	0	0	0.01	0.32	0	0.33	10.42
0	0	0	0	0	0	0	0	0	0	0.44	0	0.44	3.09
0.18	**0**	**0.2**	**0.1**	**0.3**	**0**	**0.04**	**0**	**0.05**	**1.98**	**3.91**	**0**	**5.89**	**41.92**
1.42	0	1.47	0.43	1.89	0	0.61	0.04	0.65	24.93	9.18	0	34.11	244.77
0.11	0	0	0	0	0	0	0	0	0	0	0	0	5.73
0.08	0	0.13	0	0.13	0	0.02	0	0.02	0.84	1.7	0	2.54	50.97
1.61	**0**	**1.59**	**0.43**	**2.02**	**0**	**0.63**	**0.04**	**0.67**	**25.77**	**10.88**	**0**	**36.65**	**301.46**
2	0	0.37	2.51	2.89	0	0.16	0.24	0.4	0.63	0.91	0	1.54	92.31
0.19	0	0	0	0	0	0	0	0	0	0	0	0	20.23
0.01	0	0.02	0	0.02	0	0	0	0	0.03	0.05	0	0.08	7.6
2.19	**0**	**0.39**	**2.51**	**2.91**	**0**	**0.17**	**0.24**	**0.4**	**0.66**	**0.96**	**0**	**1.62**	**120.14**
0.38	0	0.05	0.4	0.45	0	0.28	0.08	0.36	0.06	0.18	0	0.24	103.43
0.01	0	0	0	0	0	0	0	0	0	0	0	0	1.15
0	0	0	0	0	0	0	0	0	0.01	0.01	0	0.01	1.88
0.39	**0**	**0.05**	**0.4**	**0.45**	**0**	**0.28**	**0.08**	**0.36**	**0.06**	**0.18**	**0**	**0.25**	**106.46**
0.11	0	0	0.05	0.05	0	0	0.01	0.01	0.03	0	0	0.03	5.45
0	0	0	0	0	0	0	0	0	0	0	0	0	0.06
0	0	0	0	0	0	0	0	0	0	0	0	0	0.22
0.12	0	0	0.05	0.05	0	0	0.01	0.01	0.03	0	0	0.03	5.73
0	0	0	0	0	0	0	0	0.01	0	0	0	0.01	1.75
0	0	0	0	0	0	0.01	0	0.01	0	0.01	0	0.01	2.18
0.12	**0**	**0**	**0.05**	**0.05**	**0**	**0.01**	**0.01**	**0.02**	**0.03**	**0.01**	**0**	**0.05**	**9.66**
0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	1.02
2.76	0	5.23	0	5.23	0	28.91	0	28.91	11.3	21.33	0	32.63	6878.6
32.78	0	0	36.34	36.34	0	0	6.91	6.91	0	0	0	0	3574.88

Title : SJVAB Calendar Year 2020 and 2023 by MY
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2007/02/22 14:46:56
Scen Year: 2020 -- All model years in the range 1976 to 1979 selected
Season : Summer
Area : San Joaquin Valley Air Basin Averag
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 48 Fresno (SJV)
Emissions: Tons Per Day

	LDA-NCAT	LDA-CAT	LDA-DSL	LDA-TOT	LDT1-NCA	LDT1-CAT	LDT1-DSL	LDT1-TOT	LDT2-NCA	LDT2-CAT	LDT2-DSL	LDT2-TOT	MDV-NCA	MDV-CAT	MDV-DSL	MDV-TOT	LHDT1-NC	LHDT1-CA	LHDT1-DS
Vehicles	171	1996	50	2216	133	1097	22	1251	131	1086	20	1237	704	648	0	1353	32	189	1
VMT/1000	3	30	1	33	2	19	0	21	2	19	0	21	14	13	0	27	1	4	0
Trips	653	7649	192	8495	506	4202	83	4792	499	4160	78	4737	2656	2508	2	5166	1047	6250	18
Reactive Organic Gas Emissions																			
Run Exh	0.01	0.05	0	0.06	0.01	0.04	0	0.04	0.01	0.04	0	0.05	0.15	0.03	0	0.18	0	0.05	0
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0.02	0	0.02	0	0.01	0	0.01	0	0.01	0	0.01	0.02	0.01	0	0.03	0.01	0.01	0
Total Ex	0.01	0.07	0	0.08	0.01	0.05	0	0.06	0.01	0.05	0	0.06	0.17	0.04	0	0.21	0.01	0.05	0
Diurnal	0	0.04	0	0.05	0	0.03	0	0.03	0	0.03	0	0.03	0	0.03	0	0.03	0	0	0
Hot Soak	0	0.01	0	0.01	0	0.01	0	0.01	0	0.01	0	0.01	0	0.01	0	0.01	0	0	0
Running	0.01	0.07	0	0.08	0	0.02	0	0.03	0	0.02	0	0.03	0	0.03	0	0.03	0	0.02	0
Resting	0	0.02	0	0.03	0	0.02	0	0.02	0	0.02	0	0.02	0	0.02	0	0.02	0	0	0
Total	0.02	0.22	0	0.25	0.02	0.12	0	0.14	0.02	0.12	0	0.14	0.18	0.12	0	0.3	0.02	0.08	0
Carbon Monoxide Emissions																			
Run Exh	0.1	1.25	0	1.36	0.14	1.22	0	1.36	0.14	1.23	0	1.37	2.81	1.08	0	3.89	0.1	0.27	0
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0.01	0.22	0	0.23	0.01	0.2	0	0.21	0.01	0.19	0	0.21	0.24	0.14	0	0.38	0.05	0.15	0
Total Ex	0.12	1.47	0	1.59	0.15	1.42	0	1.57	0.15	1.42	0	1.57	3.05	1.22	0	4.26	0.15	0.42	0
Oxides of Nitrogen Emissions																			
Run Exh	0.01	0.07	0	0.08	0.01	0.05	0	0.06	0.01	0.06	0	0.07	0.14	0.05	0	0.19	0	0.02	0
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0	0	0.01	0	0.01	0
Total Ex	0.01	0.08	0	0.09	0.01	0.06	0	0.06	0.01	0.06	0	0.07	0.15	0.05	0	0.2	0	0.03	0
Carbon Dioxide Emissions (000)																			
Run Exh	0	0.02	0	0.02	0	0.01	0	0.01	0	0.01	0	0.01	0.01	0.01	0	0.02	0	0	0
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Ex	0	0.02	0	0.02	0	0.01	0	0.01	0	0.01	0	0.01	0.01	0.01	0	0.02	0	0	0
PM10 Emissions																			
Run Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TireWear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BrakeWr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOx	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fuel Consumption (000 gallons)																			
Gasoline	0.19	2.15	0	2.34	0.17	1.37	0	1.54	0.17	1.38	0	1.54	1.73	1.3	0	3.03	0.12	0.55	0
Diesel	0	0	0.03	0.03	0	0	0.01	0.01	0	0	0.01	0.01	0	0	0	0	0	0	0

Title : SJVAB Calendar Year 2020 and 2023 by MY

Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2007/02/22 14:46:56
Scen Year: 2023 -- Model year 1979 selected
Season : Summer
Area : San Joaquin Valley Air Basin Averag
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 48 Fresno (SJV)
Emissions: Tons Per Day

	LDA-NCAT	LDA-CAT	LDA-DSL	LDA-TOT	LDT1-NCA	LDT1-CAT	LDT1-DSL	LDT1-TOT	LDT2-NCA	LDT2-CAT	LDT2-DSL	LDT2-TOT	MDV-NCA	MDV-CAT	MDV-DSL	MDV-TOT	LHDT1-NC	LHDT1-CA	LHDT1-DS
Vehicles	43	491	15	549	24	260	6	290	24	267	11	302	34	250	0	284	0	53	0
VMT/1000	1	7	0	8	0	4	0	5	0	4	0	5	1	5	0	6	0	1	0
Trips	159	1826	57	2042	89	966	22	1077	91	992	40	1123	127	931	0	1058	0	1768	5
Reactive Organic Gas Emissions																			
Run Exh	0	0.01	0	0.01	0	0.01	0	0.01	0	0.01	0	0.01	0	0.01	0	0.01	0	0.01	0
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Ex	0	0.02	0	0.02	0	0.01	0	0.01	0	0.01	0	0.01	0	0.01	0	0.02	0	0.01	0
Diurnal	0	0.01	0	0.01	0	0.01	0	0.01	0	0.01	0	0.01	0	0.01	0	0.01	0	0	0
Hot Soak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Running	0	0.02	0	0.02	0	0.01	0	0.01	0	0.01	0	0.01	0	0.01	0	0.01	0	0.01	0
Resting	0	0.01	0	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0.01	0.05	0	0.06	0	0.03	0	0.03	0	0.03	0	0.03	0	0.03	0	0.04	0	0.02	0
Carbon Monoxide Emissions																			
Run Exh	0.03	0.29	0	0.32	0.02	0.17	0	0.19	0.02	0.18	0	0.2	0.06	0.41	0	0.45	0	0.07	0
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0.05	0	0.05	0	0.03	0	0.03	0	0.03	0	0.03	0	0.05	0	0.06	0	0.04	0
Total Ex	0.03	0.35	0	0.37	0.02	0.2	0	0.22	0.02	0.21	0	0.23	0.06	0.46	0	0.51	0	0.11	0
Oxides of Nitrogen Emissions																			
Run Exh	0	0.02	0	0.02	0	0.01	0	0.01	0	0.01	0	0.01	0	0.02	0	0.02	0	0	0
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Ex	0	0.02	0	0.02	0	0.01	0	0.01	0	0.01	0	0.02	0	0.02	0	0.02	0	0.01	0
Carbon Dioxide Emissions (000)																			
Run Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM10 Emissions																			
Run Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Ex	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TireWear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BrakeWr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOx	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fuel Consumption (000 gallons)																			
Gasoline	0.05	0.52	0	0.57	0.03	0.3	0	0.33	0.03	0.32	0	0.35	0.07	0.5	0	0.57	0	0.15	0
Diesel	0	0	0.01	0.01	0	0	0	0	0	0	0.01	0.01	0	0	0	0	0	0	0

LHDT1-TO	LHDT2-NC	LHDT2-CA	LHDT2-DS	LHDT2-TO	MHDT-NC	MHDT-CA	MHDT-DS	MHDT-TO	HHDT-NC	HHDT-CA	HHDT-DS	HHDT-TO	OBUS-NC	OBUS-CA	OBUS-DS	OBUS-TO	SBUS-NC	SBUS-CA	SBUS-DS
222	3	18	3	24	45	194	143	382	3	10	228	241	1	8	7	16	6	14	45
5	0	0	0	0	0	2	2	4	0	0	3	3	0	0	0	0	0	1	2
7315	110	596	39	745	2062	8841	4006	14908	133	443	1154	1730	47	379	195	622	22	55	180
0.05	0	0	0	0	0	0.01	0	0.02	0	0	0.01	0.01	0	0	0	0	0	0.01	0
0	0	0	0	0	0	0	0	0	0	0	0.01	0.01	0	0	0	0	0	0	0
0.01	0	0	0	0	0.02	0.02	0	0.03	0	0	0	0.01	0	0	0	0	0	0	0
-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
0.06	0	0	0	0.01	0.02	0.03	0	0.05	0	0.01	0.02	0.03	0	0	0	0	0	0.01	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.03	0	0	0	0	0.01	0.03	0	0.04	0	0	0	0.01	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
0.1	0	0.01	0	0.01	0.03	0.06	0	0.09	0	0.01	0.02	0.04	0	0	0	0	0	0.01	0
0.37	0.01	0.02	0	0.03	0.07	0.13	0.01	0.21	0.03	0.08	0.06	0.16	0	0.01	0	0.01	0.05	0.05	0.02
0	0	0	0	0	0	0	0	0	0	0	0.02	0.02	0	0	0	0	0	0	0
0.2	0	0.01	0	0.02	0.14	0.34	0	0.48	0.05	0.1	0	0.14	0	0.01	0	0.02	0	0	0
-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
0.57	0.01	0.04	0	0.05	0.21	0.47	0.01	0.69	0.08	0.17	0.08	0.33	0	0.02	0	0.03	0.05	0.06	0.02
0.02	0	0	0	0	0	0.01	0.04	0.05	0	0	0.06	0.07	0	0	0	0	0	0	0.05
0	0	0	0	0	0	0	0	0	0	0	0.03	0.03	0	0	0	0	0	0	0
0.01	0	0	0	0	0	0.02	0	0.03	0	0	0	0.01	0	0	0	0	0	0	0
-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
0.03	0	0	0	0	0	0.04	0.04	0.08	0	0.01	0.09	0.1	0	0	0	0	0	0.01	0.05
0.01	0	0	0	0	0	0	0	0	0	0	0.01	0.01	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
0.01	0	0	0	0	0	0	0	0.01	0	0	0.01	0.01	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0.01	0.01	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
0	0	0	0	0	0	0	0	0	0	0	0.01	0.01	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
0	0	0	0	0	0	0	0	0	0	0	0.01	0.01	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.68	0.01	0.05	0	0.06	0.12	0.28	0	0.4	0.02	0.04	0	0.06	0	0.01	0	0.01	0.03	0.07	0
0	0	0	0	0	0	0	0.26	0.26	0	0	0.78	0.78	0	0	0.01	0.01	0	0	0.34

LHDT1-TO	LHDT2-NC	LHDT2-CA	LHDT2-DS	LHDT2-TO	MHDT-NC	MHDT-CA	MHDT-DS	MHDT-TO	HHDT-NC	HHDT-CA	HHDT-DS	HHDT-TO	OBUS-NC	OBUS-CA	OBUS-DS	OBUS-TO	SBUS-NC	SBUS-CA	SBUS-DSL
54	0	5	2	7	0	58	41	99	0	4	59	63	0	2	2	4	0	6	10
1	0	0	0	0	0	1	0	1	0	0	1	1	0	0	0	0	0	0	1
1774	0	177	19	196	0	2646	1160	3806	0	177	297	474	0	98	63	161	0	22	41
0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0.01	0	0.01	0	0	0	0	0	0	0	0	0	0	0
-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
0.01	0	0	0	0	0	0.01	0	0.01	0	0	0.01	0.01	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.01	0	0	0	0	0	0.01	0	0.01	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
0.02	0	0	0	0	0	0.02	0	0.02	0	0	0.01	0.01	0	0	0	0	0	0	0
0.07	0	0.01	0	0.01	0	0.04	0	0.04	0	0.03	0.01	0.04	0	0	0	0	0	0.02	0
0	0	0	0	0	0	0	0	0	0	0	0.01	0.01	0	0	0	0	0	0	0
0.04	0	0	0	0	0	0.1	0	0.1	0	0.04	0	0.04	0	0	0	0	0	0	0
-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
0.11	0	0.01	0	0.01	0	0.14	0	0.14	0	0.07	0.02	0.09	0	0.01	0	0.01	0	0.02	0.01
0	0	0	0	0	0	0	0.01	0.02	0	0	0.02	0.02	0	0	0	0	0	0	0.01
0	0	0	0	0	0	0	0	0	0	0	0.01	0.01	0	0	0	0	0	0	0
0	0	0	0	0	0	0.01	0	0.01	0	0	0	0	0	0	0	0	0	0	0
-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
0.01	0	0	0	0	0	0.01	0.01	0.02	0	0	0.02	0.03	0	0	0	0	0	0	0.01
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.15	0	0.01	0	0.01	0	0.08	0	0.08	0	0.02	0	0.02	0	0	0	0	0	0.03	0
0	0	0	0	0	0	0	0.07	0.07	0	0	0.2	0.2	0	0	0	0	0	0	0.08

SBUS-TOT	UB-NCAT	UB-CAT	UB-DSL	UB-TOT	MH-NCAT	MH-CAT	MH-DSL	MH-TOT	MCY-NCAT	MCY-CAT	MCY-DSL	MCY-TOT	ALL-TOT
64	3	6	15	23	32	201	4	238	77	0	0	77	7344
3	0	1	2	3	0	2	0	2	0	0	0	0	124
257	12	22	58	92	3	20	0	24	153	0	0	153	49036
0.01	0	0.04	0	0.05	0	0.01	0	0.01	0	0	0	0	0.48
0	0	0	0	0	0	0	0	0	0	0	0	0	0.01
0	0	0	0	0	0	0	0	0	0	0	0	0	0.13
0.01	0	0.04	0	0.05	0	0.01	0	0.01	0	0	0	0	0.63
0	0	0	0	0	0	0	0	0	0	0	0	0	0.14
0	0	0	0	0	0	0	0	0	0	0	0	0	0.04
0	0	0	0	0	0	0	0	0	0	0	0	0	0.24
0	0	0	0	0	0	0	0	0	0	0	0	0	0.09
0.01	0	0.04	0	0.05	0	0.01	0	0.01	0.01	0	0	0.01	1.14
0.12	0.08	0.08	0.02	0.18	0.05	0.13	0	0.18	0.01	0	0	0.01	9.24
0	0	0	0	0	0	0	0	0	0	0	0	0	0.03
0.01	0	0	0	0	0	0	0	0	0	0	0	0	1.89
0.13	0.08	0.09	0.02	0.18	0.05	0.14	0	0.18	0.01	0	0	0.01	11.16
0.05	0	0.02	0.07	0.09	0	0.01	0	0.01	0	0	0	0	0.7
0	0	0	0	0	0	0	0	0	0	0	0	0	0.03
0	0	0	0	0	0	0	0	0	0	0	0	0	0.06
0.06	0	0.02	0.07	0.09	0	0.01	0	0.01	0	0	0	0	0.79
0	0	0	0.01	0.01	0	0	0	0	0	0	0	0	0.09
0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0.01	0.01	0	0	0	0	0	0	0	0	0.1
0	0	0	0	0	0	0	0	0	0	0	0	0	0.02
0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0.02
0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0.03
0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.11	0.05	0.1	0	0.15	0.03	0.17	0	0.2	0	0	0	0	10.13
0.34	0	0	0.66	0.66	0	0	0.01	0.01	0	0	0	0	2.11

SBUS-TOT	UB-NCAT	UB-CAT	UB-DSL	UB-TOT	MH-NCAT	MH-CAT	MH-DSL	MH-TOT	MCY-NCA	MCY-CAT	MCY-DSL	MCY-TOT	ALL-TOT
16	0	4	9	13	0	38	1	39	13	0	0	13	1733
1	0	1	1	2	0	0	0	0	0	0	0	0	30
63	0	17	37	54	0	4	0	4	26	0	0	26	11858
0	0	0.03	0	0.04	0	0	0	0	0	0	0	0	0.11
0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0.02
-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
0	0	0.03	0	0.04	0	0	0	0	0	0	0	0	0.13
0	0	0	0	0	0	0	0	0	0	0	0	0	0.03
0	0	0	0	0	0	0	0	0	0	0	0	0	0.01
0	0	0	0	0	0	0	0	0	0	0	0	0	0.06
0	0	0	0	0	0	0	0	0	0	0	0	0	0.02
-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
0	0	0.04	0	0.04	0	0	0	0	0	0	0	0	0.25
0.03	0	0.07	0.01	0.08	0	0.02	0	0.02	0	0	0	0	1.45
0	0	0	0	0	0	0	0	0	0	0	0	0	0.01
0	0	0	0	0	0	0	0	0	0	0	0	0	0.36
-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
0.03	0	0.07	0.01	0.08	0	0.02	0	0.02	0	0	0	0	1.82
0.01	0	0.01	0.05	0.06	0	0	0	0	0	0	0	0	0.18
0	0	0	0	0	0	0	0	0	0	0	0	0	0.01
0	0	0	0	0	0	0	0	0	0	0	0	0	0.02
-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
0.01	0	0.01	0.05	0.06	0	0	0	0	0	0	0	0	0.2
0	0	0	0	0.01	0	0	0	0	0	0	0	0	0.03
0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0
-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
0	0	0	0	0.01	0	0	0	0	0	0	0	0	0.03
0	0	0	0	0	0	0	0	0	0	0	0	0	0.01
0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0
-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
0	0	0	0	0	0	0	0	0	0	0	0	0	0.01
0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0
-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
0	0	0	0	0	0	0	0	0	0	0	0	0	0.01
0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.03	0	0.08	0	0.08	0	0.03	0	0.03	0	0	0	0	2.22
0.08	0	0	0.44	0.44	0	0	0	0	0	0	0	0	0.82

C.9 CONFORMITY BUDGETS WORKSHEETS

San Joaquin Valley MVEB Estimates

(tons per summer day)

CAC EMFAC 2007 run using UTD (SJV Air Basin by sub-area)

* Budget is established by rounding emissions total to the next highest tenth.

2008 Motor Vehicle Emissions Budgets

County	Fresno		Kern		Kings		Madera		Merced		San Joaquin		Stanislaus		Tulare	
	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx
Baseline EMFAC2007	18.56	63.19	18.01	101.82	3.83	19.86	4.41	15.63	7.39	38.52	13.82	42.71	10.40	28.70	10.46	24.98
Existing Measures:																
Local Reductions	0.00	0.68	0.00	0.48	0.00	0.11	0.00	0.11	0.00	0.19	0.00	0.52	0.00	0.40	0.00	0.32
State Reductions	0.00	4.07	0.01	7.50	0.00	1.49	0.00	1.00	0.00	2.85	0.00	2.34	0.00	1.65	0.00	1.35
New/Proposed Measures:																
Local Reductions	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
State Reductions	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**18.56**	**58.44**	**18.00**	**93.84**	**3.83**	**18.26**	**4.41**	**14.52**	**7.39**	**35.48**	**13.82**	**39.85**	**10.40**	**26.65**	**10.46**	**23.31**
Budget*	**18.6**	**58.5**	**18.1**	**93.9**	**3.9**	**18.3**	**4.5**	**14.6**	**7.4**	**35.5**	**13.9**	**39.9**	**10.5**	**26.7**	**10.5**	**23.4**

2011 Motor Vehicle Emissions Budgets

County	Fresno		Kern		Kings		Madera		Merced		San Joaquin		Stanislaus		Tulare	
	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx
Baseline EMFAC2007	15.62	51.87	15.76	86.69	3.34	17.28	3.69	13.14	6.20	31.38	12.13	37.28	9.00	24.06	9.26	22.41
Existing Measures:																
Local Reductions	0.00	0.39	0.00	0.28	0.00	0.06	0.00	0.06	0.00	0.12	0.00	0.31	0.00	0.23	0.00	0.19
State Reductions	0.01	3.59	0.01	6.98	0.00	1.41	0.00	0.93	0.01	2.53	0.01	2.29	0.01	1.52	0.01	1.32
New/Proposed Measures:																
Local Reductions	0.15	0.05	0.10	0.04	0.02	0.01	0.02	0.01	0.04	0.02	0.12	0.04	0.09	0.03	0.07	0.03
State Reductions	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**15.46**	**47.84**	**15.65**	**79.39**	**3.32**	**15.80**	**3.67**	**12.14**	**6.15**	**28.71**	**12.00**	**34.64**	**8.90**	**22.28**	**9.18**	**20.87**
Budget*	**15.5**	**47.9**	**15.7**	**79.4**	**3.4**	**15.9**	**3.7**	**12.2**	**6.2**	**28.8**	**12.1**	**34.7**	**9.0**	**22.3**	**9.2**	**20.9**

2014 Motor Vehicle Emissions Budgets

County	Fresno		Kern		Kings		Madera		Merced		San Joaquin		Stanislaus		Tulare	
	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx
Baseline EMFAC2007	13.04	40.67	13.56	70.77	2.75	13.53	3.08	10.67	5.07	24.61	10.19	30.08	7.54	18.71	7.76	17.84
Existing Measures:																
Local Reductions	0.00	0.23	0.00	0.16	0.00	0.04	0.00	0.04	0.00	0.07	0.00	0.19	0.00	0.14	0.00	0.11
State Reductions	0.01	3.20	0.01	6.52	0.00	1.28	0.00	0.87	0.01	2.27	0.01	2.13	0.01	1.35	0.01	1.18
New/Proposed Measures:																
Local Reductions	0.15	0.06	0.11	0.04	0.02	0.01	0.02	0.01	0.05	0.02	0.13	0.05	0.09	0.03	0.07	0.03
State Reductions	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**12.88**	**37.18**	**13.44**	**64.05**	**2.73**	**12.20**	**3.06**	**9.75**	**5.01**	**22.25**	**10.05**	**27.71**	**7.44**	**17.19**	**7.68**	**16.52**
Budget*	**12.9**	**37.2**	**13.5**	**64.1**	**2.8**	**12.3**	**3.1**	**9.8**	**5.1**	**22.3**	**10.1**	**27.8**	**7.5**	**17.2**	**7.7**	**16.6**

2017 Motor Vehicle Emissions Budgets

County	Fresno		Kern		Kings		Madera		Merced		San Joaquin		Stanislaus		Tulare	
	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx
Baseline EMFAC2007	11.18	32.41	11.67	55.71	2.31	10.52	2.60	8.59	4.21	19.24	8.64	23.57	6.50	14.76	6.70	14.35
Existing Measures:																
Local Reductions	0.00	0.36	0.00	0.26	0.00	0.06	0.00	0.06	0.00	0.11	0.00	0.31	0.00	0.21	0.00	0.17
State Reductions	0.01	2.93	0.01	5.93	0.00	1.15	0.00	0.80	0.00	2.05	0.01	1.92	0.01	1.20	0.01	1.08
New/Proposed Measures:																
Local Reductions	0.15	0.06	0.11	0.04	0.03	0.01	0.02	0.01	0.05	0.02	0.13	0.05	0.09	0.04	0.07	0.03
State Reductions	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**11.02**	**29.06**	**11.55**	**49.48**	**2.28**	**9.30**	**2.58**	**7.72**	**4.16**	**17.06**	**8.50**	**21.29**	**6.40**	**13.31**	**6.62**	**13.07**
Budget*	**11.1**	**29.1**	**11.6**	**49.5**	**2.3**	**9.4**	**2.6**	**7.8**	**4.2**	**17.1**	**8.6**	**21.3**	**6.5**	**13.4**	**6.7**	**13.1**

2020 Motor Vehicle Emissions Budgets

County	Fresno		Kern		Kings		Madera		Merced		San Joaquin		Stanislaus		Tulare	
	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx
Baseline EMFAC2007	9.64	25.94	10.36	44.65	2.00	8.49	2.28	7.23	3.63	15.70	7.49	18.57	5.70	11.86	5.96	11.88
Existing Measures:																
Local Reductions	0.00	0.34	0.00	0.24	0.00	0.06	0.00	0.06	0.00	0.11	0.00	0.30	0.00	0.20	0.00	0.16
State Reductions	0.00	2.74	0.00	5.41	0.00	1.07	0.00	0.78	0.00	1.92	0.00	1.72	0.00	1.10	0.00	1.01
New/Proposed Measures:																
Local Reductions	0.15	0.06	0.11	0.04	0.03	0.01	0.03	0.01	0.05	0.02	0.14	0.06	0.09	0.04	0.07	0.03
State Reductions	1.50	5.94	1.81	10.62	0.37	2.10	0.36	1.64	0.69	3.83	1.08	3.89	0.80	2.53	0.78	2.34
Total	**7.99**	**16.86**	**8.44**	**28.34**	**1.60**	**5.25**	**1.89**	**4.74**	**2.89**	**9.82**	**6.27**	**12.60**	**4.81**	**7.99**	**5.11**	**8.34**
Budget*	**8.0**	**16.9**	**8.5**	**28.4**	**1.7**	**5.3**	**1.9**	**4.8**	**2.9**	**9.9**	**6.3**	**12.7**	**4.9**	**8.0**	**5.2**	**8.4**

2023 Motor Vehicle Emissions Budgets

County	Fresno		Kern		Kings		Madera		Merced		San Joaquin		Stanislaus		Tulare	
	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx
Baseline EMFAC2007	9.08	22.89	9.44	37.62	1.81	7.29	2.11	6.38	3.32	13.80	7.20	16.67	5.23	10.19	5.44	10.24
Existing Measures:																
Local Reductions	0.00	0.31	0.00	0.22	0.00	0.05	0.00	0.05	0.00	0.10	0.00	0.29	0.00	0.18	0.00	0.15
State Reductions	0.01	2.71	0.00	5.27	0.00	1.07	0.00	0.81	0.00	1.96	0.01	1.68	0.00	1.09	0.00	1.01
New/Proposed Measures:																
Local Reductions	0.16	0.06	0.11	0.05	0.03	0.01	0.03	0.01	0.05	0.02	0.14	0.06	0.09	0.04	0.08	0.03
State Reductions	1.14	4.21	1.32	7.38	0.27	1.49	0.28	1.21	0.51	2.78	0.85	2.75	0.62	1.80	0.60	1.68
Total	**7.77**	**15.60**	**8.01**	**24.70**	**1.51**	**4.67**	**1.80**	**4.30**	**2.76**	**8.94**	**6.20**	**11.89**	**4.52**	**7.08**	**4.76**	**7.37**
Budget*	**7.8**	**15.7**	**8.1**	**24.8**	**1.6**	**4.7**	**1.9**	**4.4**	**2.8**	**9.0**	**6.3**	**11.9**	**4.6**	**7.1**	**4.8**	**7.4**