Appendix C

Mobile Source Control Strategies

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[Note: The evaluation being conducted to develop this plan is an ongoing work in progress, and will continue to be revised and updated throughout the public process.]

Mobile sources – on-road and off-road combined – account for over 80% of the San Joaquin Valley's total NOx emissions in the 2012 to 2019 timeframe (see Appendix B). Mobile source emissions will decrease about 40% over this time period under already-adopted regulations and associated engine, fuel, and fleet improvements. However, the Valley's total vehicle miles traveled (VMT) are predicted to increase about 18% over the 2012-2019 time period, as the Valley continues to be the fastest growing population in the state and continues to serve as one of the state's major goods movement corridors.[1] VMT growth can offset some of regulations' full emissions reductions potential. Considering all of this in conjunction with the magnitude of the Valley's attainment challenges, it is clear that mobile source emissions reductions must be a key component of the District's strategies to attain EPA's health-based air quality standards. Additionally, mobile sources contribute significant diesel particulate matter and other toxic and ultra-fine emissions, particularly in urban and environmental justice communities. As such, mobile sources will be important sources to evaluate under the District's Risk-based Strategy.

However, the District does not have the authority to directly regulate the engines themselves. Under Clean Air Act (CAA) Section 209, states cannot generally adopt motor vehicle engine standards. The State of California is a noted exception, since California starting adopted engines standards before the federal government. The state codifies this authority in California Health and Safety Code Section 43013, then utilizes this authority through several iterations of its mobile source regulations.

The District is also prohibited from making land use decisions, although these decisions can impact the Valley's total VMT and, thus, mobile source emissions. Land use decisions are the jurisdiction of the Valley's eight counties and their Metropolitan Planning Organizations (MPOs).

Though the District cannot directly regulate engines themselves, there are a number of approaches the District can use to reduce emissions from mobile sources in the Valley:

- **Encourage California and/or federal agencies** to adopt stronger regulations for the mobile sources under their jurisdictions.
- **Adopt regulations related to usage.** This can include regulations that indirectly reduce on-road mobile emissions by encouraging reductions in VMT, or regulations on how certain off-road engines are used in the Valley ("in-use" regulations).

[1] CEPAM: 2009 Almanac – Population and Vehicle Trends Tool. www.arb.ca.gov/app/emsinv/trends/ems_trends.php

- **Develop and implement voluntary monetary incentive programs for mobile sources.** These programs may accelerate fleet turnover to achieve reductions beyond or in advance of regulations.
- **Support technology advancement.** The District can fund projects that demonstrate the effectiveness of new engine technologies. The District can also help establish infrastructure needed for alternative fuel vehicles, thus making these vehicles a more viable option for the Valley.
- **Pursue policy initiatives.** The District can use its legislative platform to pursue additional funding and federal actions related to mobile sources. The District is also a partner in the *Vision for Clean Air: 2012 to 2050*, an interagency policy collaboration will outlining a common ARB, South Coast, and Valley vision for strategies to meet federal air quality standards for ozone and PM2.5, the State's greenhouse gas goals, and reduced public exposure to toxics (such as diesel particulates). Meeting these long-term goals will depend on introduction and deployment of transformative measures and emerging technologies, including zero-emissions goods movement. Thus, the *Vision* document will evaluate potential policies, legislation, infrastructure, and efficiencies that might provide the groundwork for ensuring that South Coast, the Valley, and California as a whole are prepared to meet the demands of long-term goals. This is to be the starting point for identifying actions that need to begin in the short-term. These actions can also contribute to the more near-term air quality needs – including the *2012 PM2.5 Plan* – as well.
- **Outreach.** The District's *Healthy Air Living* outreach program encourages Valley residents and businesses to consider air quality as part of daily decision making. Reducing vehicle trips is a core component of this program. The District also addressed mobile sources in its *Fast Track* initiative.
- **Conformity.** For "transportation conformity," the District works with county MPOs to establish transportation conformity budgets. The District also works with federal agencies under "general conformity" as these agencies mitigate certain construction, indirect, and operational emissions from their projects.
- **Other interagency cooperation.** The District's *Guidelines for General Plans, Guidelines for Assessing and Mitigating Air Quality Impacts*, and related guidance are designed to help cities, counties, developers, and others consider opportunities to reduce emissions from construction equipment, indirect emissions resulting from increased VMT, and more as part of their processes.

Though this landscape can be complex, there are in fact many options at the District's disposal for addressing the Valley's mobile source emissions. With this Mobile Source Control Measures appendix, the District is in the process of evaluating every source of mobile source emissions in the Valley, from on-road mobile sources (including passenger cars, heavy duty trucks, buses, etc) to "other mobile" or off-road mobile sources (such as airplanes, trains, farm equipment, and more). In this June 2012 draft, the District is still in the early stages of mobile source control measure development. This summary of categories, existing efforts, and some future opportunities is intended serve as a starting point for additional evaluation and discourse. The District will provide an elaborated evaluation of mobile source control measures in future drafts.

PASSENGER CARS, LIGHT-DUTY TRUCKS, MEDIUM-DUTY VEHICLES, AND MOTORCYCLES

Category Overview

This category includes classes of vehicles used primarily for personal transportation. When the light-duty truck and medium-duty vehicle categories were first established, the majority of vehicles in the medium-duty vehicle category were primarily used for work purposes. The popularity and high sales volumes of full size pick-up trucks and SUVs have altered the light- and medium-duty truck use patterns. It is now common for trucks and SUVs to be used primarily for personal transportation.[2]

Passenger cars are vehicles designed primarily for transportation of persons and having a capacity of twelve or less. Light-duty trucks are trucks with a gross vehicle weight rating (GVWR) less than 5,750 lbs. Medium-duty vehicles have a GVWR between 5,751 lbs. and 8,500 lbs.

Existing Efforts

- **District Rule 9410: Employer Based Trip Reduction**—This rule achieves emission reductions by reducing vehicle miles traveled from private vehicles used by employees to commute to and from their worksites.
- **District Rule 9510: Indirect Source Review**—This rule achieves emission reductions from the construction and use of development projects through design features and on-site measures, and provides a mechanism for reducing emissions from the construction of and use of development projects through off-site measures.
- **Electric Vehicle Readiness Plan**—The District has identified funding for the development of a regional electric vehicle readiness plan and grants for charging and refueling infrastructure in the Valley for plug-in electric vehicles.
- **Drive Clean! Rebate Program**—This District program provides rebates for the purchase of eligible new, clean-air vehicles for residents and businesses of the San Joaquin Valley.
- **REMOVE II Program**—A suite of incentive programs administered by the District to encourage vanpooling, telecommuting, bicycle commuting, and alternative fuel adoption.
- **Polluting Automobile Scrap and Salvage Program**—Incentives targeted for the reduction of emissions from older high polluting vehicles through identification, repair, and replacement.
- **Smoking Vehicle Complaint Program**—This program was established to reduce visible exhaust from vehicles traveling in the valley, residents can call the District's toll-free number with a complaint about a smoking vehicle they have seen traveling the valley's roads and freeways.
- **Healthy Air Living™**—A comprehensive outreach initiative that aims to improve the health and quality of life of all Valley residents by encouraging people and

[2] California Air Resources Board [ARB]. (1999). *"Lev II" And "Cap 2000" Amendments To The California Exhaust And Evaporative Emission Standards And Test Procedures For Passenger Cars, Light-Duty Trucks And Medium-Duty Vehicles, And To The Evaporative Emission Requirements For Heavy-Duty Vehicles: Final Statement Of Reasons.* Retrieved from http://www.arb.ca.gov/msprog/levprog/levii/pstfrpt.pdf

businesses to make lasting changes in the way we live our lives, so that our air quality is positively affected.

- **Advanced Clean Cars Program**—A single package of standards adopted by Air Resources Board combining the control of smog, soot, global warming gases, and requirements for greater numbers of zero-emission vehicles.
- **Low Emission Vehicle II (LEV II) Standards**—Emission standards phased in through 2007 for all new vehicles sold in California, setting the base from which the Advanced Clean Cars Program will phase in newer standards.
- **Vision for Clean Air: 2012 to 2050—**The Air Resources Board, in collaboration with the Valley Air District and the South Coast Air District, is developing the Vision for Clean Air document to frame the long-term goals for 2050 (greenhouse gasses) and 2035 (75 ppb ozone), with the needs for mid-term 2023 (85 ppb ozone) and 2019 (PM2.5) emission reductions in both the trucking as well as the transportation sectors.
- **Smog Check Program**—Smog Check inspections are designed to identify and either repair or retire high polluting vehicles. The program is administered by the California Department of Consumer Affairs, Bureau of Automotive Repair.
- **California Reformulated Gasoline**—Regulations adopted by Air Resources Board established a comprehensive set of specifications to provide reductions of ozone and particulate matter precursor emissions and toxic air pollutants.
- **Clean Vehicle Rebate Program**—A statewide program funded by the Air Resources Board to promote the production and use of zero-emission vehicles, including electric, plug-in electric, and fuel cell vehicles.
- **Single occupant carpool lane stickers**—California law allows single-occupant use of High Occupancy Vehicle lanes by qualifying clean alternative fuel vehicles.
- **Federal Vehicle Tax Credits**—Tax incentives for the purchase of zero-emission and plug-in hybrid electric vehicles.

New Opportunities

The District is in the process of evaluating opportunities to reduce emissions from this source. These opportunities can be grouped into three categories: cleaner driving, reduction in vehicle miles traveled, and new technology development and adoption. In the category of cleaner driving, new opportunities include programs for congestion mitigation, such as traffic signal coordination, and public education about cleaner driving habits, also called *eco-driving*. The reduction-of-vehicle-miles-traveled category includes increases in alternative commuting, additional transit-oriented planning, and high-speed rail. Potential opportunities for new technology development and adoption include clean alternative fuels and improved accessibility to electrical infrastructure. The District will continue to evaluate emissions reductions opportunities for future plan drafts.

Draft Emission Inventory

Pollutant	2007	2012	2014	2015	2016	2017	2018	2019
	Annual Average - Tons per day							
PM2.5	1.94	1.94	1.96	1.99	2.02	2.06	2.10	2.15
NOx	51.15	36.10	29.87	27.30	25.05	23.00	21.27	19.83
SOx	0.38	0.42	0.43	0.44	0.45	0.46	0.47	0.48
	Winter Average - Tons per day							
PM2.5	1.94	1.94	1.96	1.99	2.02	2.06	2.10	2.15
NOx	56.06	39.55	32.72	29.91	27.44	25.20	23.30	21.73
SOx	0.37	0.40	0.42	0.42	0.43	0.44	0.45	0.46

C.1 HEAVY-DUTY TRUCKS

Category Overview

This source category includes on-road, diesel-fueled trucks with a gross vehicle weight rating (GVWR) over 14,000 pounds. Trucks in this category are primarily used for goods movement throughout the state, between ports and rail yards (drayage trucks), as well as for interstate transport. Industries using heavy-duty trucks include for-hire transportation, construction, manufacturing, retail and wholesale trade, and vehicle leasing and rental. Buses, including school buses that meet the GVWR limit, also fall under the state's Truck and Bus Regulation; however, they are not included here for purposes of programs and inventories.

Existing Efforts

- **CARB Truck and Bus Regulation**—Regulation to significantly reduce PM and NOx emissions from existing diesel vehicles operating in California. The regulation applies to privately or federally owned, diesel-fueled trucks and school buses with a gross vehicle weight rating (GVWR) greater than 14,000 pounds. Reductions are implemented through a compliance schedule based on the engine model year. By 2023, all trucks and buses must have engines certified to EPA's 2010 emission limits.
- **CARB Drayage Truck Regulation**—Regulation to significantly reduce PM and NOx emissions from existing diesel vehicles that transport cargo to and from California's ports and intermodal rail yards.
- **CARB Fleet Rule for Public Agencies and Utilities**—Regulation to reduce diesel PM from vehicle fleets operated by public agencies and utilities.
- **CARB Solid Waste Collection Vehicle Rule**—This 2003 regulation applies to model year 1960 to 2006 waste-collection vehicles weighing more than 14,000 pounds that collect waste for a fee. Such vehicles are required to install ARB-verified BACT devices to reduce diesel smoke emissions.
- **CARB Heavy-Duty Diesel Engine Software Upgrade Regulation (Chip Reflash)**— Low NOx software upgrade is computer programming which reduces excess emissions of oxides of nitrogen (NOx) in 1993-1998 model year heavy-duty trucks, school buses, and motor homes with engines manufactured by Caterpillar, Cummins, Detroit Diesel Corporation, Mack/Renault, Volvo and International. The software is required to be installed during rebuilds of the engines listed above; however, ARB encourages voluntary efforts to have the software installed prior to engine rebuild.
- **CARB Diesel-Fueled Commercial Motor Vehicle Idling Regulation**—Regulation to limit the time and location of diesel engine idling.
- **CARB Transport Refrigeration Unit (Reefer) Airborne Toxic Control Measure (ATCM)**—ARB requires all transport refrigeration units (TRU) and TRU gensets that operate in California, regardless of where they are based, to meet in-use performance standards for particulate matter for model year 2001 and older units, beginning December 31, 2008.
- **CARB Heavy-Duty Diesel Emission Control Labeling Program**—Requires that all diesel engines have legible emission control labels.

- **CARB Heavy-Duty Greenhouse Gas Regulation**—Adopted in 2008, this regulation requires heavy-duty trucks to improve fuel efficiency through improvements in tractor and trailer aerodynamics and the use of low-rolling resistance tires.
- **Vision for Clean Air: 2012 to 2050—**The Air Resources Board, in collaboration with the Valley Air District and the South Coast Air District, is developing the Vision for Clean Air document to frame the long-term goals for 2050 (greenhouse gasses) and 2035 (75 ppb ozone), with the needs for mid-term 2023 (85 ppb ozone) and 2019 (PM2.5) emission reductions in both the trucking as well as the transportation sectors.
- **District's Proposition 1B Goods Movement Emission Reduction Program**—Grant program to replace, retrofit, or repower on-road heavy-duty trucks.
- **District's On-Road Voucher Incentive Program**—Voucher program to replace or retrofit on-road medium-duty and heavy-duty trucks.
- **District's Heavy-Duty Truck Voucher Program**—Voucher program to replace or retrofit on-road heavy-duty trucks.
- **District's Short-Sea Shipping**—Incentives for moving shipping containers by barge, thus eliminating the need for heavy-duty trucks transporting containers from ports and intermodal rail yards.

New Opportunities

The District's initial review of opportunities for this source category include continuation of the Proposition 1B Goods Movement Emission Reduction Program, the District's Truck Replacement Program, and the Heavy-Duty Truck Voucher Program. Emissions from heavy duty trucks travelling on highways impact many Valley Environmental Justice communities, and, in line with the Risk-Based Strategy, the District will evaluate the benefit and potential prioritization of additional emission reduction options in this category. The District looks forward to discussing additional potential control measure opportunities for this source category throughout the public workshop process, and will continue to expand this evaluation in future plan drafts based on additional information and stakeholder input.

Draft Emission Inventory

Pollutant	2007	2012	2014	2015	2016	2017	2018	2019
	Annual Average - Tons per day							
PM2.5	6.91	4.84	2.84	2.41	2.23	2.11	2.11	2.11
NOx	229.67	143.23	125.95	113.15	102.51	94.79	87.92	82.52
SOx	0.26	0.25	0.27	0.28	0.29	0.31	0.31	0.32
	Winter Average - Tons per day							
PM2.5	6.95	4.84	2.84	2.42	2.23	2.12	2.12	2.12
NOx	233.38	145.95	128.24	115.17	104.28	96.38	89.36	83.83
SOx	0.26	0.25	0.27	0.28	0.29	0.30	0.31	0.32

C.2 BUSES

Category Overview

This source category includes diesel-fueled buses, including public or privately owned school buses, with a gross vehicle weight rating (GVWR) over 14,000 pounds. The number of buses that are in this source category is relatively small (less than 4,000 in 2011, EMFAC2011) compared to the number of heavy-duty trucks also meeting the 14,000 GVWR limit and covered by the State Truck and Bus Regulation. However, as the primary means of public transportation, including transportation of the Valley's children, minimizing emissions from this category is of high importance.

Existing Efforts

- **Small School District and County Office of Education Bus Replacement Program**—The California Department of Education administers this grant program, in which small school districts and county offices of education with an average daily attendance of fewer than 2,501 students may apply for funding to purchase new school buses to replace pre-1992 school buses.
- **Lower-Emission School Bus Program**—Local air districts administered the state-funded Lower-Emission School Bus grant program. This program provided funding to public school districts and joint powers authorities (JPAs) to replace model-year 1986, and older, school buses, or to retrofit school buses with a 1987 or newer model-year engine. While the state funding for this program has been expended, the District continues to secure additional funding to support the goals of this program and needs of Valley school districts.
- **Statewide School Bus Retrofit Program**—The District administers the Statewide School Bus Retrofit program to provide funding to public school districts, joint powers authorities, and private transportation providers, which contract with public school districts, to retrofit 1987-model year and newer school buses with an ARB-verified level-3 diesel retrofit.
- **Hybrid Truck and Bus Voucher Incentive Program (HVIP)**—The ARB provides vouchers to California fleets for the purchase of hybrid and zero-emission trucks and buses. The vouchers range from $10,000 to $30,000 and are awarded on a first-come-first-served basis.
- **Measure C School Bus Replacement Program**—Fresno County administers the Measure C School Bus Replacement program, which uses a local retail-transaction-and-use tax to fund school bus replacements for Fresno County school districts.
- **Vision for Clean Air: 2012 to 2050—**The Air Resources Board, in collaboration with the Valley Air District and the South Coast Air District, is developing the Vision for Clean Air document to frame the long-term goals for 2050 (greenhouse gasses) and 2035 (75 ppb ozone), with the needs for mid-term 2023 (85 ppb ozone) and 2019 (PM2.5) emission reductions in both the trucking as well as the transportation sectors.
- **District Rule 9310 (School Bus Fleets)**—The District approved Rule 9310 (School Bus Fleets) on September 21, 2006. The rule applies to diesel-fueled school buses with a gross vehicle weight rating of greater than 8,500 pounds.

Per the rule, all school buses manufactured prior to January 1, 1978, shall be replaced by January 1, 2016. School buses manufactured after January 1, 1978, shall either be replaced with a 2012 or new bus, or retrofitted or repowered with an engine manufactured on or after October 1, 2002.

- **State Truck and Bus Regulation**—The ARB approved the California Truck and Bus Regulation on December 12, 2008. This rule requires diesel-fueled school buses with a gross vehicle weight rating of greater than 14,000 pounds to meet specific particulate matter reductions. School buses manufactured prior to April 1, 1977, are to be taken out of service by January 1, 2012 and all other school buses are to have a retrofit device installed by specific compliance deadlines, with a final compliance deadline of January 1, 2014.
- **Airborne Toxic Control Measure**—The ARB approved the Airborne Toxic Control Measure to limit school bus idling and idling of all buses at or near schools. Idling is restricted within 100 feet of a school and operators are to turn off engines upon arrival and start the engine within 30 seconds of leaving. Operators are to limit idling to 5 minutes at all other locations. Exemptions apply for specific circumstances.
- **Fleet Rule for Transit Agencies**—The ARB adopted the Fleet Rule for Transit Agencies in 2000 in an effort to reduce both criteria pollutant emissions and exposure to toxic air contaminants from urban buses and transit fleet vehicles. The rule requires more stringent exhaust emission standards for new urban bus engines and transit fleet vehicles. The rule also encourages the operation and use of zero-emission buses (ZEB) in California urban bus fleets, with the goal of gradually developing a California transit fleet composed of 15% zero-emission buses.

New Opportunities

The District is in the process of evaluating opportunities to reduce emissions from this source. Thus far, these opportunities include continued funding for the replacement and retrofit of older school buses through local funding sources, additional voucher funding for hybrid and zero-emission buses that will be combined with the Hybrid Truck and Bus Voucher Incentive program, and funding for the replacement of expiring compressed natural gas (CNG) tanks in school buses. The District will continue to evaluate emissions reductions opportunities for future plan drafts.

Draft Emission Inventory

Pollutant	2007	2012	2014	2015	2016	2017	2018	2019
	Annual Average - Tons per day							
PM2.5	0.23	0.18	0.15	0.14	0.14	0.14	0.14	0.14
NOx	6.06	5.13	4.83	4.63	4.49	4.37	4.13	3.98
SOx	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	Winter Average - Tons per day							
PM2.5	0.23	0.18	0.15	0.14	0.14	0.14	0.14	0.14
NOx	6.20	5.25	4.95	4.74	4.59	4.48	4.23	4.08
SOx	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

C.3 AIRCRAFT AND AIRPORT GROUND SUPPORT EQUIPMENT

Category Overview

This category consists of the variety of aircraft and airport ground support equipment (GSE) utilized in their service. Aircraft can be powered by jet turbines or piston engines, and are categorized as commercial, civil, agricultural, or military. Emissions from GSE primarily come from baggage tugs, cargo tractors, or systems that provide power or air-conditioning to aircraft while on the ground.

Existing Efforts

- **Proposed Emissions standards by EPA for Aircraft Engines**—New emission standards and other regulatory requirements for aircraft turbofan and turbojet engines with rated thrusts greater than 26.7 kilonewtons.[3] These proposed emission standards will replace existing emission standards adopted in 2005.
- **CARB Off-Road Diesel Vehicle Regulation—**This regulation, as it applies to airport ground support equipment, imposes limits on idling, buying older off-road diesel vehicles, and the sale of off-road diesel vehicles. The regulation also stipulates the gradual requirement for fleet operators to progressively clean up their fleets by replacing older engines with newer engines and installing exhaust retrofits.
- **Federal Emission Standards for Nonroad Engines—**In response to environmental and public health concerns, the U.S. Environmental Protection Agency (EPA) has established emission standards for most categories of nonroad engines. These engines operate in a wide variety of applications, including airport ground support equipment.

New Opportunities

The District is in the process of evaluating opportunities to reduce emissions from this source. Potential emissions reduction opportunities identified thus far include electrification of ground support equipment. The District will continue to evaluate emissions reductions opportunities for future plan drafts.

[3] Control of Air Pollution From Aircraft and Aircraft Engines; Proposed Emission Standards and Test Procedures, 76 Fed. Reg. 144, pp. 45012–45052. (2011, July 27). (to be codified at 40 CFR Parts 87 and 1068)

Draft Emission Inventory

Pollutant	2007	2012	2014	2015	2016	2017	2018	2019
	Annual Average - Tons per day							
PM2.5	1.68	1.47	1.38	1.36	1.35	1.37	1.38	1.40
NOx	7.63	7.70	7.40	7.21	6.93	6.92	6.89	6.88
SOx	0.38	0.41	0.43	0.43	0.44	0.44	0.45	0.45
	Winter Average - Tons per day							
PM2.5	1.68	1.47	1.38	1.36	1.35	1.37	1.38	1.40
NOx	7.64	7.70	7.40	7.21	6.93	6.92	6.89	6.88
SOx	0.37	0.41	0.42	0.43	0.44	0.44	0.45	0.45

C.4 LOCOMOTIVES AND OFF-ROAD RAIL OPERATIONS

Category Overview

Locomotives can be divided into three groups: interstate line haul locomotives; medium horsepower locomotives that are mostly in California or regional service; and switch locomotives. This category also includes emissions from off-road equipment operated at railyards. This type of equipment includes cranes, yard tractors, and material handling equipment such as forklifts.

Interstate Line Haul Locomotive are generally newer (built 1995 and later) and high horsepower (greater than 4,000 hp) locomotives that typically operate over long distances and many states. Medium Horsepower (MHP) Locomotives are typically, older locomotives that may have once served in interstate line haul service, but are now used in regional service. Switch (Yard) Locomotives are typically used to push railcars together to form trains within railyards, but can also be used to power local and regional service trains.[4]

Existing Efforts

- **District Incentive Programs**—To date, the District has provided over $21.5 million in grant incentives to install idle limiting devices (ILD) on 16 locomotives and for the purchase of 17 clean technology switch locomotives. A new program with $2 million in funding to repower line-haul, medium horsepower or switch locomotives was opened April 2012.
- **2005 ARB statewide pollution reduction agreement with BNSF and UP**—the railroads have agreed to reduce locomotive idling time, install idle-limiting technology, repair excessively smoking locomotives, maximize use of ultra-low sulfur (15ppm) diesel fuel, conduct health risk assessments at major railyards and prepare a report on feasible mitigation plans.
- **2004 ARB Diesel Fuel Standards pertaining to intrastate locomotives**—adoption of new standards regulating the quality of diesel fuel used in intrastate locomotives, beginning 1/1/2007.
- **Measuring locomotive emissions using remote sensing**—AB 1222 implemented a pilot program to use remote sensing devices (RSD's) to measure diesel emissions from in-use locomotives, in order to compare the results to applicable federal certification standards.
- **2008 U.S.EPA Locomotive Regulation**—outlined new emission standards pertaining to line haul, passenger and switch locomotives resulting in Tier 4 emission levels by 2015.
- **2009 ARB locomotive and railyard emission reduction recommendation plan**—ideas to further implement emission reductions by repowering older switch and medium horsepower (MHP) locomotives, retrofiting older switch and medium horsepower (MHP) locomotives with diesel particulate filters and selective catalytic reduction technology, and accelerating the introduction of Tier 4 line haul and switch locomotives.

[4] California Air Resources Board [ARB]. (2009). Recommendations to Implement Further Locomotive and Railyard Emission Reductions. Retrieved from http://www.arb.ca.gov/railyard/ted/drftrec090909.pdf

- **2005 ARB Mobile Cargo Handling Equipment regulation**—requires emission reductions from diesel powered mobile equipment operating in ports and intermodal railyards. Pertains to intermodal container handling equipment, yard trucks and forklifts.
- **Vision for Clean Air: 2012 to 2050—**The Air Resources Board, in collaboration with the Valley Air District and the South Coast Air District, is developing the Vision for Clean Air document to frame the long-term goals for 2050 (greenhouse gasses) and 2035 (75 ppb ozone), with the needs for mid-term 2023 (85 ppb ozone) and 2019 (PM2.5) emission reductions in both the trucking as well as the transportation sectors.
- **Federal Emission Standards for Nonroad Engines—**In response to environmental and public health concerns, the U.S. Environmental Protection Agency (EPA) has established emission standards for most categories of nonroad engines. These engines operate in a wide variety of applications, including locomotives and cargo handling equipment.

New Opportunities

The District is in the process of evaluating opportunities to reduce emissions from this source. Potential emissions reduction opportunities identified thus far include providing grant funding toward the purchase of idle-limiting devices, diesel particulate filters (DPF) and selective catalytic reduction (SCR) technology (retrofit technology), and certified engine remanufacture or repower for both locomotives and head end power (HEP) units, as well as the purchase of new alternative technology locomotives. Emissions from railyards and rail lines impact many of the Valley's Environmental Justice communities, and, in line with the Risk-Based Strategy, the District will evaluate the benefit and potential prioritization of emission reduction options in this category. The District will also explore any opportunities to replace, repower, retrofit, and electrify cargo handling equipment such as cranes, yard trucks and forklifts operating in rail switch yards and intermodal facilities. The District will continue to evaluate emissions reductions opportunities for future plan drafts.

Draft Emission Inventory

Pollutant	2007	2012	2014	2015	2016	2017	2018	2019
	Annual Average - Tons per day							
PM2.5	0.55	0.53	0.53	0.53	0.53	0.53	0.53	0.53
NOx	20.89	19.76	19.90	19.99	20.10	20.21	20.34	20.47
SOx	0.06	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	Winter Average - Tons per day							
PM2.5	0.55	0.53	0.53	0.53	0.53	0.53	0.53	0.53
NOx	20.89	19.76	19.90	19.99	20.10	20.21	20.34	20.47
SOx	0.06	0.02	0.02	0.02	0.02	0.02	0.02	0.02

C.5 SHIPS, COMMERCIAL BOATS, AND OFF-ROAD PORT OPERATIONS

Category Overview

This category includes oceangoing chips, harbor craft such as tugboats, and the off-road equipment associated with port operations. The primary source of these emissions in the San Joaquin Valley is at the Port of Stockton, a bulk and break bulk cargo port with berthing space for 17 vessels, 1.1 million square feet of dockside transit sheds and shipside rail trackage, 7.7 million square feet of warehousing for both dry bulk and general cargoes, including steel. Each warehouse is also served by rail. The port operates three traveling, multi-purpose, 30-ton Bridge Cranes; a fleet of 30,000 to 60,000 lb. fork lift trucks; slings; spreader bars; coil rams; front-end loaders; hoppers and conveyor belts and other equipment are maintained for handling and storing steel products, other general cargoes and bulk materials.[5]

Existing Efforts

- **District Incentive Programs**—The District is currently working with the Port of Stockton to provide grant funding to repower and retrofit six diesel powered forklifts and retrofit one diesel powered wheel loader.
- **Commercial Harbor Craft Regulation**—Adopted by the California air Resources Board (ARB) in 2007 the regulation establishes in-use emission limits for both auxiliary and propulsion diesel engines on ferries, excursion vessels, tugboats, and towboats consistent with the United States Environmental Protection Agency (U.S. EPA) marine engine emission standards.
- **Ocean-Going Vessels Fuel Rule**—Adopted by ARB in 2008 this regulation is designed reduce particulate matter, oxides of nitrogen, and sulfur oxide emissions from ocean-going vessels by requiring the use of cleaner marine distillate fuels in any of the regulated California waters.
- **Equipment Electrification**—The Port of Stockton replaced four older gasoline powered trucks with electric vehicles, and utilizes an electric rather than diesel-powered dredge.
- **Federal Emission Standards for Nonroad Engines—**In response to environmental and public health concerns, the U.S. Environmental Protection Agency (EPA) has established emission standards for most categories of nonroad engines. These engines operate in a wide variety of applications, including marine and cargo handling equipment.

New Opportunities

The District is in the process of evaluating opportunities to reduce emissions from this source. Potential emissions reduction opportunities identified thus far include further electrification and additional grants funding for port related off-road equipment. The District will continue to evaluate emissions reductions opportunities for future plan drafts.

[5] Port of Stockton. (2012) Retrieved April 11, 2012, http://www.portofstockton.com/

Draft Emission Inventory

Pollutant	2007	2012	2014	2015	2016	2017	2018	2019
	Annual Average - Tons per day							
PM2.5	0.07	0.03	0.03	0.03	0.03	0.02	0.02	0.02
NOx	1.21	0.99	0.97	0.87	0.87	0.82	0.81	0.80
SOx	0.47	0.04	0.05	0.05	0.06	0.06	0.06	0.07
	Winter Average - Tons per day							
PM2.5	0.07	0.03	0.03	0.03	0.03	0.02	0.02	0.02
NOx	1.21	0.99	0.97	0.87	0.87	0.82	0.81	0.80
SOx	0.47	0.04	0.05	0.05	0.06	0.06	0.06	0.07

C.6 RECREATIONAL: BOATS, MOTOR HOMES, AND OFF-HIGHWAY VEHICLES

Category Overview

This category includes vehicles intended for consumer recreational activities. Major subcategories include boats and spark-ignition auxiliary marine engines (power generators, winches, or auxiliary propulsion engines for sail boats); Motor homes and associated auxiliary engines; and off-road motorcycles (dirt bikes) and all-terrain vehicles (ATVs); engines used in specialty vehicles and go-karts; Sand Cars (i.e., dune buggies, sand rails, etc.); and golf carts.

Existing Efforts

- **California Air Resources Board (ARB) Engine Regulations**—Engines for this category are regulated by ARB's Small Off Road Engine, Tier 4 Off-Road Compression Engine, Off-Road Spark-Ignition Engines, Equipment, and Vehicles regulations.
- **"Red Sticker" Registration**—2003 and newer off-highway vehicles with Engines that do not meet California engine standards may be registered as a special class with limits placed on their use during the summer months.
- **On-road Engine Regulations**—Motor homes must meet ARB on-road engine standards for their size class as medium- or heavy-duty vehicles.
- **Golf Cart Zero Emission Requirement**—Since January 1, 1997, new golf carts purchased for operation within federal ozone non-attainment areas must be zero-emission golf carts (e.g., electric).

New Opportunities

The District is in the process of evaluating opportunities to reduce emissions from this source. The District will continue to evaluate emissions reductions opportunities for future plan drafts.

Draft Emission Inventory

Pollutant	2007	2012	2014	2015	2016	2017	2018	2019
	Annual Average - Tons per day							
PM2.5	0.59	0.74	0.82	0.86	0.90	0.95	0.99	1.04
NOx	4.49	4.36	4.31	4.30	4.30	4.30	4.30	4.30
SOx	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	Winter Average - Tons per day							
PM2.5	0.25	0.31	0.33	0.35	0.36	0.38	0.40	0.41
NOx	2.40	2.27	2.20	2.18	2.16	2.15	2.13	2.12
SOx	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01

C.7 OTHER OFF-ROAD VEHICLES AND EQUIPMENT

Category Overview

This category includes all self-propelled off-road diesel vehicles over 25 horsepower and all two-engine vehicles, except two-engine sweepers. Examples of such vehicles are single-engine oil drilling and workover rigs; backhoes, excavators, loaders, forklifts, and other construction and mining equipment; and two-engine cranes or water-well drilling rigs. Diesel agricultural vehicles, locomotives, marine vehicles, and recreational vehicles are not included in this category.

Existing Efforts

- **In-Use Off-Road Diesel Vehicle Regulation—**CARB adopted the In-Use Off-Road Diesel Vehicle Regulation on July 26, 2007 to reduce diesel PM and NOx emissions from existing off-road heavy-duty diesel vehicles. This regulation imposes limits on idling, the buying of older off-road diesel vehicles, and the sale of off-road diesel vehicles. The regulation also stipulates the gradual requirement for fleet operators to progressively clean up their fleets by replacing older engines with newer engines and installing exhaust retrofits.
- **Heavy-Duty Engine Program—**The District's Heavy-Duty Engine program provides incentive funds for new reduced-emission technology for non-agricultural forklifts and other off-road vehicles such as non-agricultural tractors, backhoes, and excavators.
- **Federal Emission Standards for Nonroad Engines—**In response to environmental and public health concerns, the U.S. Environmental Protection Agency (EPA) has established emission standards for most categories of nonroad engines. These engines operate in a wide variety of applications, including construction and mining equipment.

New Opportunities

The District is in the process of evaluating opportunities to reduce emissions from off-road vehicles and equipment. Thus far, these opportunities include incentives for zero-emission forklifts; incentives electric-hybrid construction equipment, such as loaders; and incentives for re-powering specialized equipment, such as road-paving equipment . Staff understands this list is not exhaustive, and looks forward to collaborating with interested stakeholders to discuss potential control measure opportunities for this source category throughout the public workshop process.

Draft Emission Inventory

Pollutant	2007	2012	2014	2015	2016	2017	2018	2019
	Annual Average - Tons per day							
PM2.5	2.18	1.49	1.31	1.25	1.18	1.13	1.03	0.96
NOx	44.14	31.63	30.07	29.57	28.58	27.80	26.13	25.09
SOx	0.03	0.02	0.02	0.02	0.03	0.03	0.03	0.03
	Winter Average - Tons per day							
PM2.5	2.17	1.47	1.29	1.23	1.17	1.12	1.02	0.95
NOx	44.17	31.62	30.06	29.57	28.58	27.80	26.14	25.10
SOx	0.03	0.02	0.02	0.02	0.03	0.03	0.03	0.03

C.8 FARM EQUIPMENT

Category Overview

The Farm Equipment category includes wheel tractors, agricultural mowers, agricultural tractors, balers, combines, hydro-power units, sprayers, swathers, tillers, and other agricultural equipment. It includes equipment fueled by gas and diesel. It is also bifurcated by exhaust and evaporative emissions for each applicable piece of equipment.

There is some overlap of farm equipment with equipment used for construction. The California Air Resources Board (ARB) allows farm equipment to be used for construction ≤ 50% of its usage; if used for 51% or more then it must registered with DOORs. Farm equipment can be used for crop demolition; therefore as long as the equipment is considered to be used in an agricultural setting it is considered Farm Equipment. Many farmers use their equipment for more than one specific type of crop or service in their business; the NRCS does not assist custom farmers within their program because they require the replaced vehicle to be tied to a piece of property.

The largest contributor to the farm equipment category is tractors. The District's current tractor program focuses on diesel tractors and does not include gasoline equipment. The new tractor equipment can be up to 125% of the existing tractor's horsepower to be considered for funding in our program. The District also currently accepting diesel ag forklifts in the tractor program to be replaced. While tractors may be the largest contributor from this category, every option needs to be evaluated for additional potential opportunities.

Existing Efforts

- **District Tractor Replacement Program –** Provides incentive funds for replacement of older, high-emitting tractors with newer, cleaner tractors.
- **NRCS Environmental Quality Incentives Program (EQIP) –** Provides matching grants for conservation efforts, such as using market systems to reduce pollution and promoting carbon sequestration in soil. The engine replacement incentive program helps farmers replace uncontrolled or Tier 1 engines, rated at 50 or more brake horsepower, with new, California-certified engines or ARB-verified retrofit devices that meet the most current model year California emission standards. Each replacement or retrofit must reduce NO_X emissions by at least 15% (for each engine) and not increase net PM emissions. NRCS also encourages the use of electric technology as replacements for older engines.
- **Heavy Duty Engine Program – Off-Road Vehicle Repower and Ag Pump Repower**
    - **Off-Road Vehicle Repower -** This component provides incentives for engine replacement (repower) or retrofit of off-road self-propelled vehicles such as tractors, backhoes, and excavators.
    - **Ag Pump Repower -** This component provides incentives for engine replacement (repower) or new electric motor purchase of engines and/or electric motors used to power agricultural irrigation pumps.

- **Agricultural Electric Utility Terrain Vehicle (UTV) –** Provided rebate for electric UTVs used for farming purposes.
- **SJVAPCD Rule 4702 (Internal Combustion Engines) –** Limits the emissions of nitrogen oxides (NO_X), carbon monoxide (CO), volatile organic compounds (VOC), and sulfur oxides (SO_X) from internal combustion engines.
- **SJVAPCD Rule 4550 (Conservation Management Practices) –** Limits particulate emissions from agricultural operation sites using work practices.
- **Federal Emission Standards for Nonroad Engines—**In response to environmental and public health concerns, the U.S. Environmental Protection Agency (EPA) has established emission standards for most categories of nonroad engines. These engines operate in a wide variety of applications, including ag pumps and tractors.

New Opportunities

Initial review of opportunities includes:

- **Ag Electric UTV –** Reinstate with a greater amount of funding for replacements.
- **Ag pump electric motors –** Fund utility company line extensions for farmers who otherwise would not switch from diesel to electric due to high electrification costs.
- **Tractor replacement for gasoline fueled tractors**

Staff understands this list is not exhaustive, and looks forward to collaborating with interested stakeholders to discuss potential control measure opportunities for this source category throughout the public workshop process. An analysis of the feasibility of each opportunity as future control measures will be presented in later draft versions of this appendix.

Draft Emission Inventory

Pollutant	2007	2012	2014	2015	2016	2017	2018	2019
	Annual Average - Tons per day							
PM2.5	2.64	1.99	1.64	1.49	1.35	1.23	1.10	0.98
NOx	48.13	36.71	31.59	29.23	26.95	24.97	22.94	20.99
SOx	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
	Winter Average - Tons per day							
PM2.5	2.06	1.55	1.28	1.17	1.06	0.96	0.86	0.76
NOx	37.66	28.73	24.73	22.88	21.10	19.55	17.95	16.43
SOx	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03

C.9 TRANSPORTATION CONFORMITY

How MPOs Can Influence Motor Vehicle Emissions

The San Joaquin Valley has eight federally designated metropolitan planning organizations (MPOs), which represent the eight counties of the San Joaquin Valley Air Basin. Collectively, the San Joaquin Council of Governments, the Stanislaus Council of Governments, the Merced County Association of Governments, the Madera County Transportation Commission, the Council of Fresno County Governments, Kings County Association of Governments, the Tulare County Association of Governments, and the Kern Council of Governments work in concert with cities, public interest groups, the District, and state and federal agencies to create regional transportation plans (RTPs).

During the plan-making process, the MPOs and their consultants conduct a Reasonably Available Control Measure (RACM) analysis to determine whether the implementation of transportation control measures (TCMs) by all the MPOs in the Valley would further the attainment of the National Ambient Air Quality Standard (NAAQS) by a full year. TCMs are specific programs, from EPA's Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) legislation and the Conformity Implementation Rule, designed to reduce emissions from transportation sources by reducing vehicle use or changing traffic flow or congestion conditions. If the analysis determines that attainment will be advanced by at least a year, MPOs are required to implement the TCMs.

The MPOs and their member jurisdictions have guided motor vehicle use in the Valley by adopting RACMs for the following District-adopted air quality plans: the *2002/2005 Amended Rate of Progress Plan for San Joaquin Valley Ozone;* the *Amended 2003 PM10 Plan*; and the *2004 Extreme Ozone Attainment Demonstration Plan.* Of these, EPA has approved the TCMs for the *2003 PM10 Plan* and the *2004 Extreme Ozone Attainment Demonstration Plan* into the State Implementation Plan (SIP).

Overview of the Transportation Conformity Budget-Setting Process

The SIP establishes an emissions budget for each pollutant in a given attainment year, as well as reasonable further progress milestone years. The budget serves as a regulatory limit for on-road mobile source emissions. Transportation plans, programs, and projects are required to meet these emission budgets as a condition for receiving federal transportation funding.

The budgeted emissions are developed through information from MPOs and ARB. MPOs distribute the Vehicle Miles Traveled (VMT) data and speed-distribution information for roads in individual counties to ARB. ARB inputs that information into EMFAC, ARB's mobile source emissions factors modeling program. The EMFAC model divides on-road vehicles into thirteen classes, for example passenger cars, light- and heavy-duty trucks, buses, motor homes, and motorcycles. The model also accounts for vehicles that use gasoline, diesel fuel, and electricity as fuel sources. EMFAC outputs the base emissions level for the on-road sources in key budget years given the

projected population of vehicles, and then subtracts projected emissions reductions from ARB and District control measures. Once the finalized base emissions are completed for each county, the emissions levels are calculated into emissions budgets based on vehicle population per county.

Conformity Budgets

District staff is currently working with Valley MPOs to develop the transportation conformity budgets. The budgets will be presented to the public at the second plan workshop.

How Conformity Budgets Are Used

Transportation conformity budgets are the link between the MPOs' transit needs and projects and the District's mission to improve air quality. The plans and programs produced during the transportation planning process are required to conform to the conformity budget levels. In accordance with Clean Air Act requirements, the transportation conformity process ensures that transportation plans, programs, and projects will not create new violations of NAAQS; increase the frequency or severity of existing NAAQS violations; or delay the attainment of NAAQS in designated nonattainment or maintenance areas. For this plan, the District will calculate transportation conformity budgets for PM2.5 and NOx (a PM precursor) to ensure that transportation projects do not deter from the Valley's attainment of the federal PM2.5 NAAQS.

Reasonably Available Control Measure (RACM) Analysis

District staff is currently working with Valley MPOs to develop the RACM analysis. The RACMs will be discussed during the third plan workshop.