

## ARB Emission Reduction Programs in the Transportation Sector

ARB Program	Program Authority	Program Function	Program Status	Funding Source(s)	Program Expenditures	Program Goal
<b>Light-Duty Vehicle: Regulations and Other Programs</b>						
Vapor Recovery Regulations	<sup>1</sup> AB 1807 (Tanner), Chapter 1047, Statutes of 1983	Reduces criteria pollutant and toxic air contaminant emissions associated with the transfer and storage of gasoline.	Emissions from gasoline stations are now controlled by more than 95 percent.	Air Pollution Control Fund	Not Provided by ARB	Data Not Collected by ARB
On-Board Diagnostics	<sup>2</sup> Per ARB	On-board diagnostic (OBD) systems are used to maintain in use vehicles and engines at low emission levels throughout their life. OBD systems identify emission control system malfunctions in on-road vehicles and engines so repairs can be made through emission warranty programs and in-use inspection programs (e.g., Smog Check, heavy-duty fleet self-inspection program).	OBD regulations require vehicle and engine manufacturers to implement OBD systems on 1988 and newer light- and medium-duty vehicles and 2010 and newer heavy-duty on-road engines.	Motor Vehicle Account	Not Provided by ARB	Data Not Collected by ARB
Tire Inflation Regulation	<sup>3</sup> AB 32 (Nunez), Chapter 488, Statutes of 2006	Reduces GHG emissions from vehicles through increased vehicle fuel efficiency by ensuring tires are properly inflated.  Requires automotive service providers to check and inflate tires to recommended pressure rating for vehicles weighing up to 10,000 pounds.	Ongoing - Reduces statewide CO2 emissions by approximately one million metric tons per year.	Motor Vehicle Account	Not Provided by ARB	Data Not Collected by ARB
<b>Advanced Clean Cars (ACC) Program</b>				Motor Vehicle Account, Cost of Implementation Fee	Not Provided by ARB	Data Not Collected by ARB
1) Low Emission Vehicle (LEV) I, LEV II and LEV III Criteria Pollutant Regulations	<sup>4</sup> Federal Clean Air Act	Reduces criteria pollutant emissions (NOx, carbon monoxide, particulate matter, and non-methane organic gases).  Establishes performance standards for new light-duty vehicles for sale in California. LEV I (1994-2003), LEV II (2004-2014), LEV III (2015-2025).  An essential strategy for reducing ozone in California's severe nonattainment air basins (South Coast and San Joaquin Valley) under the Clean Air Act.	Annual attainment requirements for 1990-2025 model years.  Reduced criteria emissions from light-duty vehicles by 88 percent between 1994 and 2014. Additional 75 percent reduction expected between 2015 and 2025.		Not Provided by ARB	Data Not Collected by ARB
2) LEV II GHG (Pavley) and LEV III GHG Regulation	AB 32  <sup>5</sup> AB 1493 (Pavley), Chapter	Reduces GHG emissions from light-duty vehicles.  LEV II "Pavley" standards established GHG regulations for 2009-2016 model years, and LEV III established standards for	Annual attainment requirements 2009-2025 model years.		Not Provided by ARB	Data Not Collected by ARB

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	200, Statutes of 2002	<p>2017-2025 model year light-duty vehicles.</p> <p>LEV II “Pavley” standards, with increasing stringency to 2016 model year, call for a 17 percent overall reduction in climate change emissions from the light-duty fleet by 2020 and a 25 percent overall reduction by 2030. The LEV III GHG standards are projected to reduce the fleet emissions by 33 percent in 2050 <u>beyond</u> what would have occurred in LEV II Pavley.</p>				
3) Zero Emission Vehicle (ZEV) Regulation	6Per ARB	<p>Commercialization of battery electric and fuel cell vehicles.</p> <p>ZEV production requirements are based on automakers annual California sales.</p>	<p>Estimates that 15 percent of new cars sold in California by 2025 will be ZEVs.</p> <p>As of December 2015, there are 180,000 ZEVs on the road in California. This represents about 3.5 percent of new car sales today.</p> <p>Cumulative sales of 1.4 million between 2010 and 2025</p>		Not Provided by ARB	Data Not Collected by ARB
ZEV Action Plan Program (multi-agency effort)	EO-B-16-2012	<p>Enables ZEV sales and supports drivers in driving more zero emission miles per year.</p> <p>Numerous actions led by State agencies to support ZEV adoption.</p> <p>ARB targets (along with CEC): Infrastructure to support 1 million ZEVs by 2020.</p> <p>Goals include:</p> <ol style="list-style-type: none"> <li>1. Complete the needed infrastructure planning.</li> <li>2. Expand consumer awareness.</li> <li>3. Transform fleets.</li> <li>4. Grow jobs/investment in private sector.</li> </ol>	By 2025, 1.5 million ZEVs will be on the road, Californians will have easy access to fueling infrastructure, the ZEV industry will be a strong and sustainable part of California’s economy, and 1.5 billion gallons of petroleum fuels will be displaced annually by clean efficient vehicles.	<p>Motor Vehicle Account</p> <p>Cost of Implementation Fee</p>	Not Provided by ARB	Data Not Collected by ARB
<b>Light-Duty Vehicles: Incentive Programs</b>						

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<p>Clean Vehicle Rebate Project (CVRP)</p>	<p>Executive Order B-16-2012<sup>i</sup></p> <p><sup>7</sup>SB 1275 (de León), Chapter 530, Statutes of 2014</p> <p>AB 118 (Núñez), Chapter 750, Statutes of 2007</p>	<p>Increases the number of ZEVs on California's roadways:  1 million ZEVs by 2023 – SB 1275 goal  1.5 million ZEVs by 2025 EO-B-16-2012 goal</p> <p>Provides cash rebates to purchasers of qualifying ZEV's</p> <p>Higher rebates for lower income consumers and income cap launching March 2016.</p> <p>Rebates will be scaled back and ultimately phased out in future years as market reaches self-sustainability. Long-term CVRP plan under development</p>	<p>135,000 rebates for battery electric, plug-in hybrid, and fuel cell vehicles issued since 2010. Refer to: <a href="https://cleanvehiclerebate.org/eng/rebate-statistics">https://cleanvehiclerebate.org/eng/rebate-statistics</a> for CVRP statistics.</p> <p>Continuous goal to increase ZEV deployment totals.</p> <p>SB 1275 and EO-B-16-2012 set interim deployment targets for 2023 and 2025. ARB's 2013 Climate Change Scoping Plan and 2015 draft Mobile Source Strategy both point to the need for the light-duty vehicle fleet to be largely electrified by 2050, with ZEV sales of nearly 100 percent by that point.</p>	<p>GGRF</p> <p>Air Quality Improvement Fund (primarily smog abatement fee, which provides 99 percent of AQIF revenue, as well as vessel registration fee and specialty equipment plate fee)</p>	<p>\$290 Million to date.</p>	<p>Data Not Collected by ARB</p>
<p>Projects to increase advanced technology access in disadvantaged communities</p> <ol style="list-style-type: none"> <li>1. Enhanced Fleet Modernization Program Plus Up (EFMP Plus Up) (vehicle retirement and replacement)</li> <li>2. Car Sharing and Mobility Improvements</li> <li>3. Financing Assistance</li> </ol>	<p><sup>8</sup>Per ARB</p> <p>SB 1275</p>	<p>Efforts to focus incentive funding for disadvantaged communities</p> <p>SB 1275 sets goal to increase access to zero emission and near-zero emission vehicles for disadvantaged communities and lower-income consumers and directs ARB to fund disadvantaged community-focused programs.</p> <ol style="list-style-type: none"> <li>1. Increased incentives for lower-income vehicle owners living in or near disadvantaged communities in San Joaquin Valley and South Coast who retire an older, high emitting vehicle and purchase a new or used hybrid, plug-in hybrid, or zero emission vehicle.</li> <li>2. Funding to start or expand car share programs using advanced technology vehicles to increase mobility for residents of disadvantaged communities.</li> <li>3. Financing assistance for low-income consumers to purchase clean vehicles.</li> <li>4. Increased incentives for public fleets to purchase CVRP-eligible vehicles to increase use of these vehicles in and near</li> </ol>	<p>Continuous goal to increase access to ZEVs and zero emission transportation options for disadvantaged communities paralleling the overall fleet deployment goals lists above for CVRP.</p> <ol style="list-style-type: none"> <li>1. EFMP Plus Up: Programs in South Coast air district and San Joaquin Valley launched in summer 2015. Approximately 600 vehicles replaced to date.</li> <li>2. Car Sharing: Grants awarded to expand existing San Diego car share to serve Barrio Logan and Logan Heights communities and to start car share programs in Los Angeles and Sacramento. Will launch in 2016.</li> </ol>	<p>GGRF (for four ARB funding pilot programs including EFMP Plus Up)</p>	<p>\$9 million 2014-2015 funding cycle and \$10 million in 2015-2016 funding cycle from GGRF:</p> <ol style="list-style-type: none"> <li>1. \$12M for EFMP Plus Up</li> <li>2. \$3M for car sharing</li> <li>3. \$1M for financing assistance</li> <li>4. \$3 M for increased incentives for</li> </ol>	<p>Data Not Collected by ARB</p>

<sup>i</sup> Aims to achieve 1.5 million ZEVs on California's roads by 2025 and sets a GHG emissions reduction target of 80 percent below 1990 levels by 2050.

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4. Increased incentives for public fleets.		disadvantaged communities, thereby providing air quality benefits.	<p>3. Financing assistance: Grant award to provide assistance to lower-income residents in disadvantaged communities in Bay Area. Will launch in 2016.</p> <p>4. Increased incentives for public fleets launched through CVRP in February 2015. About two-thirds of funding has been reserved to date.</p> <p>ARB plans to expand these projects to other regions in future budget cycles.</p>		public fleets	
<b>Heavy-Duty Vehicles: Regulations and Other Programs</b>						
Truck and Bus Regulation	<sup>9</sup> Per ARB	<p>Reduces air toxics (diesel PM) and criteria pollutants.</p> <p>Reduces emissions of diesel PM, NOx and other criteria pollutants by ensuring that nearly every heavy-duty vehicle operated in California meets 2010 heavy-duty engine emission standards by 2023.</p> <p>PM filter requirements for heavier trucks and buses phased in beginning January 2012; engine replacement requirements for heavier and lighter trucks began phase-in January 2015. Flexibility options for low-use vehicles, vehicles operated in cleaner areas in California, and certain vocational options are being fully utilized and reported annually by fleet owners.</p>	<p>Newer trucks had to meet PM filter requirements by January 1, 2012.</p> <p>Truck replacement requirements for lighter trucks and older heavier trucks began on January 1, 2015.</p> <p>By January 1, 2023 nearly all trucks and buses will have to have 2010 model year engines or equivalent.</p>	Motor Vehicle Account	Not Provided by ARB	Data Not Collected by ARB
Drayage Truck Regulation	<sup>10</sup> Per ARB	<p>Reduces air toxics and criteria pollutant emissions.</p> <p>Reduces diesel PM and NOx emissions from diesel-fueled heavy-duty vehicles transporting goods to or from California's ports and rail yards. ARB cites 85 percent reduction of elemental carbon levels from 2005 levels near the Port of Los Angeles</p>	The regulation is fully implemented. All drayage trucks are required to meet or exceed 2007 model year engine emission standards. The requirements of the Drayage Truck Regulation sunset in 2023 and all trucks will fall under the Truck and Bus Regulation. Drayage trucks will then need to meet or exceed 2010 model year emission standards.	Motor Vehicle Account	Not Provided by ARB	Data Not Collected by ARB
Tractor Trailer GHG	EO R-11-015	Reduces carbon dioxide emissions by increasing fuel economy of	Regulation is nearing full	Motor Vehicle		Data Not

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Regulation	AB 32	<p>tractor trailers.</p> <p>Reduces carbon dioxide emissions from tractor-trailers by requiring the use of U.S. EPA SmartWay verified, fuel-saving, trailer and tractor aerodynamic technologies and low rolling resistance tires on long haul tractor-trailers</p> <p>Aerodynamic requirements began in 2010 for new tractors and trailers and 2013 for older ones.</p> <p>Low rolling resistance tires required for all tractors and newer trailers.</p>	implementation as all phase-in plans conclude in 2017 and low rolling resistance tire requirements take effect for older trailers. All long haul tractor-trailers traveling in California will be required to use U.S. EPA verified technologies. Local- and short-haul vehicles will continue to be exempted from some requirements; fleets must register these vehicles with ARB's reporting system.	Account		Collected by ARB
Transport Refrigeration Units (TRU) Regulation	<sup>11</sup> Per ARB	<p>Reduces air toxics and criteria pollutants from TRUs.</p> <p>Reduces emissions of diesel PM by ensuring diesel engines meet in-use performance standards by the end of the seventh year after the engine model year</p> <p>Requires replacement of TRUs with new models, retrofitting with PM filters, or using an alternative technology when the unit is 7 years old.</p> <p>Proposed future requirement (to be adopted in 2017 for implementation in 2020) limiting TRU operation at certain locations.</p>	Compliance phases began in 2008, when model year 2001 and older engines complied. Each year the next model year must comply, seven years after the engine model year. Compliance dates for 2008 and older engines have passed. Model year 2009 will comply by year-end.	Motor Vehicle Account	Not Provided by ARB	Data Not Collected by ARB
School Bus Idling	<sup>12</sup> SB 124 (Oropeza), Chapter 561, Statutes of 2009	<p>Reduces children's exposures to diesel PM and other toxic air contaminants, with associated reduction in health risk; saves fuel.</p> <p>Limits school bus idling to 5 minutes outside of school zone.</p>	SB 124 raised minimum penalty to \$300.	SB 124 raised minimum penalty to \$300	Not Provided by ARB	Data Not Collected by ARB
Commercial Vehicle Idling	<sup>12</sup> SB 124	<p>Reduces emissions of toxics and criteria pollutants by limiting idling of older diesel trucks. Reduces diesel PM, NOx, and other pollutants; saves fuel.</p> <p>Within California, limits idling to 5 minutes; limited exemptions for low NOx idle or clean auxiliary power systems, or safety inspections.</p> <p>Reduced exposure to diesel PM and other toxics; fuel savings.</p>	In effect 2005, (2008 for new trucks with anti-idling controls.)	Fine of \$300 to \$1000	Not Provided by ARB	Data Not Collected by ARB

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School Zone Idling	<sup>12</sup> SB 124	<p>School bus, transit bus, and commercial motor carriers prohibited from idling within 100 feet of a school zone, except disabled or exceptional needs passengers.</p> <p>Reduces public exposure, especially school age children’s exposure, to diesel PM and other toxic air contaminants in school zones by limiting unnecessary idling of specified vehicular sources.; saves fuel.</p> <p>Reduced exposure to diesel PM and other toxics, with associated reduction in cancer risk of &lt;1 to 10 in a million (higher value for nearby residents with longest exposure).</p>	In effect since July 2003.	SB 124 raised minimum penalty to \$300. Can be enforced by peace officers. ARB investigates phone complaints.	Not Provided by ARB	Data Not Collected by ARB
Phase 1 Medium- and Heavy-Duty Engine and Vehicle GHG Emission	<sup>13</sup> Federal Clean Air Act	<p>Substantially reduces NOx emissions from heavy-duty vehicles.</p> <p>Reduces GHG emissions from medium- and heavy duty engines and larger trucks, buses, and vans, in alignment with the federal Phase 1 Regulation adopted by the U.S. EPA and the NHTSA in 2011.</p> <p>The regulation establishes compliance requirements for diesel and gasoline engines, and trucks from Class 2b through Class 8. The regulation segregates truck compliance into three groupings: pickups and vans; vocational vehicles; and combination tractors</p>	The Phase 1 regulation will be fully implemented in 2018, and manufacturers are gearing up for necessary technology and design modifications anticipated with the federal adoption of the Phase 2 GHG standards in mid-2016, and ARB’s subsequent adoption of a California Phase 2 program in 2017.	Motor Vehicle Account	Not Provided by ARB	Data Not Collected by ARB
Phase 2 Medium- and Heavy-Duty Engine and Vehicle GHG Emission	<sup>14</sup> Federal Clean Air Act	<p>Further reduces GHG emissions from medium- and heavy-duty vehicles.</p> <p>Phase 2 standards expand the scope and stringency of the federal GHG standards set up in Phase 1.</p> <p>Applicable starting with the 2018 model year for trailers and with the 2021 model year for engines and vehicles, expands the scope and stringency of the federal GHG standards, and includes first-time requirements for certain trailer types.</p>	Staff will present a proposal for a California Phase 2 program to the Board in 2017, including potential California-only elements to assist California in meeting its unique climate goals and to pave the way to reduce GHG emissions even further.	Motor Vehicle Account	Not Provided by ARB	Data Not Collected by ARB
ARB Optional Low-NOx Standard	<sup>15</sup> Federal Clean Air Act and California Health and Safety Code	<p>Substantially decreases NOx emissions from heavy-duty vehicles.</p> <p>Optional NOx standards for heavy-duty engines that are 50 percent to 90 percent lower than the current NOx standard of 0.2 grams per brake horsepower-hour (g/bhp-hr)</p> <p>ARB is providing incentive funding to promote the purchase of</p>	Natural gas engines meeting a 0.02 g/bhp-hr NOx standard are likely to be certified in the 2017 time frame. Diesel engines meeting a 0.1 g/bhp-hr NOx standard are also expected to become commercially available in the near future,	Motor Vehicle Account	Not Provided by ARB	Data Not Collected by ARB

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		cleaner trucks with engines certified to the optional NOx standards.	potentially also in the 2017 time frame.			
California and Federal Mandatory Low-NOx Engine Standard	<sup>15</sup> Federal Clean Air Act and California Health and Safety Code	<p>ARB plans to develop lower NOx standards for heavy-duty truck engines that will be necessary for California to meet its air quality goals. Since most of the heavy-duty trucks that operate in California are purchased out of state, ARB also plans to work with the U.S. EPA to establish new federal low-NOx engine standards.</p> <p>ARB's comments to U.S. EPA on their Phase 2 GHG rulemaking emphasized the need for mandatory federal and California low-NOx standards.</p>	Timely action by both ARB and U.S. EPA is needed to adopt mandatory low NOx heavy-duty engine standards to achieve the needed NOx reduction by the 2031 ozone attainment deadline. ARB plans to adopt these requirements by 2019.	Motor Vehicle Account	Not Provided by ARB	Data Not Collected by ARB
Advanced Clean Transit	<sup>16</sup> Per ARB	<p>Reduces diesel PM and NOx from transit buses; demonstrates zero emission equipment.</p> <p>Adopted in 2000. Required new transit bus purchases to be diesel with particulate filter or natural gas; included a limited requirement for zero emission technology demonstration.</p> <p>Substantially increased the number of natural gas transit buses in the State (about 60 percent are natural gas), reduced emissions of diesel PM and associated health impacts; included demonstrations of fuel cell bus technology in limited number of transit fleets.</p>	Fleets continue to report and comply with the existing transit regulation. ARB is working with transit agencies developing future regulatory changes that could require the use of renewable natural gas and renewable diesel, and more advanced technology transit buses.	Motor Vehicle Account	Not Provided by ARB	Data Not Collected by ARB
<b>Heavy-Duty Vehicles: Incentive Programs</b>						
1. Carl Moyer	<sup>17</sup> Per ARB	<p>Funds cleaner-than-required engines and equipment to gain reductions beyond those required through regulation.</p> <p>State funds and fee revenue are distributed to local air districts.</p> <p>Since implementation began in 1998, the Moyer Program has provided about \$1 billion to clean up almost 50,000 engines, reducing approximately 174,600 tons of ozone precursors and 6,400 tons of diesel PM.</p>	Ongoing, as funds are appropriated and distributed annually.	Initially funded with budget appropriations; currently funded by a tire and smog abatement fee.	\$70 million in State funds, with a corresponding \$8 million air district match.	Data Not Collected by ARB
2. Goods Movement Emission Reduction Program (Proposition 1B)	<sup>18</sup> Per ARB	Funds cleaner than required equipment (trucks, locomotives, ships at berth, cargo handling equipment, harbor craft, transport refrigeration units) to gain reductions beyond those required by law or regulation.	Final award made in September 2015 to local agencies. Solicitations will be held and funds will be awarded to equipment owners..	Voter approved bond funding of \$1 billion.	\$240 million appropriation in FY2014-15	Data Not Collected by ARB

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		<p>Bond funds are awarded to local agencies (e.g., air districts and seaports) who in turn award funds to equipment owners on a competitive basis.</p> <p>Implemented since 2007, the Prop 1B has awarded \$940 million in grants including the final awards in September 2015. Projects completed through 2015 have resulted in reductions of over 80,000 tons of NOx and 2,200 tons of diesel PM.</p>				
3. Truck Loan Assistance Program	<p><sup>19</sup>AB 109 (Núñez), Chapter 313, Statutes of 2008</p> <p>AB 1338 (Budget), Chapter 760, Statutes of 2008</p>	<p>Creates financing opportunities for small-business truck owners affected by the Truck and Bus Regulation to upgrade with new trucks or retrofit with diesel exhaust control devices.</p> <p>AB 1338 prescribes the basic program criteria for providing financial assistance to owners and operators of on-road heavy-duty diesel fleets.</p> <p>Implemented in partnership with the State Treasurer’s Office California Pollution Control Financing Authority through its California Capital Access Program. State funds are deposited based on a percentage of each enrolled loan amount into a loan loss reserve account for each participating lender to cover potential losses resulting from loan defaults.</p> <p>Achieves emission reductions by allowing truck owners that fall below conventional lending criteria and are unable to qualify for traditional financing to secure financing needed to comply with the Truck and Bus Regulation.</p>	<p>As of December 31, 2015, about \$71 million in program funding has been expended to provide about \$575 million in financing for the purchase of nearly 9,500 cleaner trucks, exhaust retrofits, and trailers.</p> <p>Continuous goal through 2023 to increase compliance with the Truck and Bus Regulation through financing assistance.</p>	Air Quality Improvement Fund (AQIF is primarily funded by a smog abatement fee, but also includes vessel registration fee and specialty equipment plate fee).	\$10 million in 2014-2015 funding cycle and \$15 million in 2015-2016 funding cycle.	Data Not Collected by ARB
4. Hybrid and Zero Emission Truck and Bus Voucher Incentive Project (HVIP)	<p><sup>20</sup>SB 1204 (Lara)</p> <p>EO-B-16-2012</p> <p>AB 118</p>	<p>Facilitates the rapid commercialization of zero emission vehicles and decreases petroleum use.</p> <p>SB 1204 incentivizes the early commercial deployment of zero and near-zero emission technologies with priority given to projects that benefit disadvantaged communities.</p> <p>Achieves emission reductions and is intended to accelerate the deployment of advanced technology trucks and buses.</p> <p>Provides vouchers to reduce the purchase price of eligible zero emission and hybrid trucks and buses on a first-come, first-served basis.</p>	<p>Continuous goal to accelerate the commercial deployment of advanced technology heavy-duty vehicles</p> <p>Since inception in 2010, 2,415 vouchers have been funded to help offset the cost of 1,971 hybrid trucks and 444 zero emission vehicles.</p>	Initially funded through the Air Quality Improvement Fund. Currently funded by a combination of GGRF and AQIF.	\$10 million in 2014-2015 funding cycle and \$7 million in 2015-2016 funding cycle.	Data Not Collected by ARB

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5. Low Carbon Transportation: Heavy-Duty Truck, Bus, and Cargo Equipment Pilot Projects	<sup>21</sup> SB 1204 (Lara) EO-B-16-2012	<p>Achieves emission reductions and is intended to accelerate the deployment of zero emission trucks and buses.</p> <p>Facilitates the rapid commercialization of zero-emission vehicles, provides zero-emission vehicle infrastructure support, and decreases petroleum use.</p> <p>SB 1204 incentivizes the early commercial deployment of zero and near-zero emission technologies with priority given to projects that benefit disadvantaged communities.</p> <p>Accelerates deployment of early commercial zero emission heavy-duty technologies by funding zero and near-zero emission bus, truck and cargo handling vehicle deployment projects.</p>	Continuous goal to accelerate the early commercial deployment of advanced technology heavy-duty vehicles.	Greenhouse Gas Reduction Fund	\$25 million in 2014-2015 funding cycle.	Data Not Collected by ARB
6. Low Carbon Transportation: Freight Demonstration Projects	<sup>21</sup> SB 1204 (Lara) EO-B-16-2012	<p>Accelerates advanced emission reducing technology into the marketplace. Demonstrates emission reductions and fuel savings in operations and maintenance.</p> <p>Facilitates the rapid commercialization of zero-emission vehicles, provides zero emission vehicle infrastructure support, and decreases petroleum use.</p> <p>Achieves emission reductions and is intended to accelerate the commercialization and deployment of zero and near-zero emission heavy-duty vehicles and off-road equipment.</p>	<p>Continuous goal to demonstrate advanced technologies in the heavy-duty sector in order to ready them for acceleration into the commercial marketplace.</p> <p>Resulted in the funding of small- and large-scale projects demonstrating pre-commercial advanced freight technologies such as ports, distribution centers, warehouses, and other freight facilities.</p>	Air Quality Improvement Fund	\$50 million in 2014-2015 funding cycle.	Data Not Collected by ARB
<b>Ports and Vessels: Regulations and Other Programs</b>						
Ocean-Going Vessels At Berth Regulation	<sup>22</sup> Per ARB	Requires fleets of container, refrigerated cargo, and cruise ships to plug into shore-based electrical power rather than running their auxiliary diesel engines when at-berth at California ports, or use an alternative control technology to reduce emissions of diesel PM, NOx, and GHGs.	Reduces diesel and NOx emissions by 50 percent at-berth and eliminates GHG emissions from the ship while connected to shore power. At full implementation in 2020, regulated fleets will reduce their total auxiliary engine emissions by 80 percent.	Motor Vehicle Account	Not Provided by ARB	Data Not Collected by ARB
Ocean-Going Vessels Fuel Regulation	<sup>22</sup> Per ARB	Requires large vessels such as container ships, tankers, and cruise ships to use cleaner-burning low-sulfur distillate fuels when they operate within 24 nautical miles of the California coastline.	Vessels now emit 80 percent less diesel PM, 96 percent less sulfur oxides, and 5 percent less NOx	Motor Vehicle Account	Not Provided by ARB	Data Not Collected by ARB

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			between berth and 24 nautical miles.			
Ocean-Going Vessels On-Board Incineration Airborne Toxic Control Measure	<sup>23</sup> Per ARB	Reduces emissions of toxic air contaminants from the use of incinerators aboard ocean-going ships, including cruise ships.	This regulation has been fully implemented.	Motor Vehicle Account	Not Provided by ARB	Data Not Collected by ARB
Commercial Harbor Craft (CHC) Regulation	<sup>24</sup> Per ARB	Reduces emissions from diesel engines on CHC vessels operating within 24 nautical miles of the California coastline by requiring in-use diesel engines operating in certain vessel categories to meet current U.S. EPA Tier 3 marine or off-road engine standards	All engines subject to requirements are required to be upgraded by December 31, 2022. To date, over \$100 million in upgrades to approximately 1,300 marine engines have been completed	Motor Vehicle Account	Not Provided by ARB	Data Not Collected by ARB
Cargo Handling Equipment	<sup>25</sup> Per ARB	Reduces emissions from diesel engines in cargo handling equipment at California ports and intermodal rail yards by requiring the use of the cleanest technology for both new and in-use equipment.	Over 90 percent of in-use cargo equipment subject to the regulation has been upgraded. In 2017, ARB estimates emissions reductions of over 90 percent for diesel PM and 73 percent for NOx, compared with 2006 levels.	Motor Vehicle Account	Not Provided by ARB	Data Not Collected by ARB
<b>Off-Road Mobile Sources: Regulations and Other Programs</b>						
In-Use Off-Road Diesel Vehicle Regulation	<sup>26</sup> Per ARB	Reduces diesel particulate matter and NOx emissions from off-road heavy-duty diesel vehicles (e.g., bulldozers, forklifts, and backhoes) by ensuring that these fleets meet an average emission level comparable to current diesel engine emission standards by 2028.	Approximately 96 percent of large fleets are in compliance. Medium fleets are required to be in compliance beginning in 2017 and small fleets in 2019.	Motor Vehicle Account	Not Provided by ARB	Data Not Collected by ARB
Portable Engine Airborne Toxic Control Measure	<sup>27</sup> Per ARB	Controls diesel particulate matter emissions from diesel powered portable engines rated at 50 brake horsepower or greater in California by requiring fleets to meet a series of diesel particulate matter fleet average standards that become increasingly more stringent in 2013, 2017, and 2020.	2013 standards are currently being implemented and new standards are currently being developed by ARB	Motor Vehicle Account  Portable Equipment Registration Program	Not Provided by ARB	Data Not Collected by ARB
Off-Road Mobile Diesel Agricultural Equipment Strategies	<sup>26</sup> Per ARB	Reduces criteria pollutants by providing funding for equipment replacement.	ARB and San Joaquin Valley Air Pollution Control District are working through incentive programs, such as Carl Moyer and AQIP, to accelerate fleet turnover of off-road diesel mobile agricultural equipment. Other	Air Quality Improvement Fund  Carl Moyer	Not Provided by ARB	Data Not Collected by ARB

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			air districts could potentially be using portions of their Carl Moyer funding to assist with off-road diesel mobile agricultural fleet turnover.			
Forklifts: Large Spark Ignition Engine In-Use Fleet Rule	<sup>28</sup> Per ARB	Fleets with four or more forklifts must reduce their emissions by retiring, replacing, retrofitting, or repowering older equipment in order to meet a fleet-wide average standard.	The final in-use compliance date was January 1, 2013.	Motor Vehicle Account	Not Provided by ARB	Data Not Collected by ARB
ARB Diesel Fuel Regulation for Intrastate Locomotives	<sup>29</sup> Per ARB	Adopted in 2004, the ARB diesel fuel regulation for intrastate locomotives went into effect in 2007 and provides about 6 percent NOx and about 14 percent particulate matter reductions. This applies to both freight and passenger locomotives that operate solely within California.	The diesel fuel available within California for refueling locomotives complies with the regulation. In addition, Union Pacific (UP) and BNSF typically dispense ARB diesel fuel for more than 70 percent of the total fuel consumed in California by both their intrastate and interstate locomotives.	Motor Vehicle Account	Not Provided by ARB	Data Not Collected by ARB
ARB/Railroad Agreements: 1998 and 2005	<sup>28</sup> Per ARB	The 1998 Locomotive Fleet Average Agreement was designed to reduce UP and BNSF locomotive NOx emissions in the South Coast Air Basin between 2000 and 2010, by 67 percent. The 1998 Agreement also provides up to a 50 percent reduction in UP and BNSF locomotive particulate matter emissions in the South Coast Air Basin, and more than a 15 percent NOx reduction spillover benefit statewide. The 2005 Agreement provides up to a 20 percent reduction in locomotive particulate matter emissions in and around rail yards statewide.	ARB determined UP and BNSF were in compliance with the 1998 Agreement by 2010, and continued to be in compliance through 2014. ARB determined UP and BNSF were in compliance with three short-term measures required by the 2005 Agreement by 2008, including installation of idle reduction devices on locomotives.	Motor Vehicle Account	Not Provided by ARB	Data Not Collected by ARB
U.S. EPA Locomotive Regulations: 2008 and 1998	Federal Clean Air Act Section 209(e)	The national regulations are designed to reduce new and existing locomotive NOx, particulate matter, hydrocarbon, and carbon monoxide emissions. The 2008 regulations culminated in new Tier 4 emission standards (2015+) that are up to 90 percent cleaner than uncontrolled locomotives. The 1998 regulations culminated in new Tier 2 emission standards (2005-2011) that are up to 60 percent cleaner than uncontrolled locomotives.	New Tier 4 locomotives were introduced in 2015, new Tier 3 in 2012 to 2014, and new Tier 2 from 2005 to 2011. In the South Coast Air Basin, newer Tier 3 and Tier 2 locomotives are performing up to two-thirds of the work.	Motor Vehicle Account	Not Provided by ARB	Data Not Collected by ARB
<b>Fuels: Regulations and Other Programs</b>						
Cap-and-Trade Regulation (Fuels)	AB 32	Establishes a declining cap on facilities accounting for 85 percent of GHG emissions and currently covers about 450 facilities of which more than 50 are fuel suppliers.	A total of thirteen auctions have resulted in approximately \$3.5 billion being deposited in the GGRF to be appropriated to programs for GHG	Purchase allowances (or offsets) generating \$3.5	AB 32 Cost of Implementation Fee	Data Not Collected by ARB

## ARB Emission Reduction Programs in the Transportation Sector

			reduction programs.	billion.		
California Reformulated Gasoline (RFG) Program and Diesel Fuel Standards	<sup>30</sup> California Clean Air Act  Federal Clean Air Act	Required refineries to reformulate gasoline to eliminate lead from gasoline and reduce quantities of other toxic and smog-forming compounds.	Resulted in the significant reduction of sulfur compound emissions, NOx emissions, ozone-forming emissions, diesel PM, carbon monoxide, and other toxic compounds.	Motor Vehicle Account	Not Provided by ARB	Data Not Collected by ARB
Low Carbon Fuel Standard (LCFS)	AB 32	Reduces carbon intensity of transportation fuel pool in California at least 10 percent from 2010 baseline by 2020. Functions by implementing annual, fuel lifecycle-based declining carbon-intensity standards for gasoline, diesel, and their substitute fuels (e.g., biofuels, natural gas, renewable natural gas, electricity, and hydrogen). Low carbon fuel producers can generate credits that can be traded to petroleum refiners and other regulated entities needing credits to meet their compliance obligations.	Implementation began in 2011. Reduces GHG emissions associated with fuels by using a market-based credit trading system to incentivize increased import, production, and use of low carbon fuels. Regulated parties have overcomplied (generated excess credits) in every quarter since 2011 to current. Recently readopted to address procedural concerns raised in litigation (implementation of readopted LCFS began January 1, 2016).	AB 32 Cost of Implementation Fee	Not Provided by ARB	Data Not Collected by ARB
Alternative Diesel Fuel (ADF) Regulations	<sup>31</sup> California Clean Air Act  Federal Clean Air Act	Maintains current air quality and toxic air pollution protections as new and emerging nonhydrocarbon-based diesel fuel substitutes are introduced into California under the LCFS.	Implementation began January 1, 2016. Ongoing monitoring of biodiesel imports and in-State production and fuel sampling.	Motor Vehicle Account	Not Provided by ARB	Data Not Collected by ARB
<b>Land Use and Transportation Planning</b>						
Sustainable Community Strategies (SCS)	<sup>32</sup> Per ARB	Directs regions to integrate development patterns and transportation networks to achieve passenger vehicle GHG emissions reductions while addressing housing needs and other regional planning objectives.	Each metropolitan planning organization (MPO) must adopt an SCS showing how the region can reach the GHG reduction targets set by ARB. To date, all MPOs have adopted a regional transportation plan that includes an SCS.	Motor Vehicle Account	Not Provided by ARB	Data Not Collected by ARB
<b>ADDITIONAL PROGRAMS</b>						

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<p>Heavy-Duty Diesel Emission Control Label Inspection Program</p>	<p><sup>33</sup>Per ARB</p>	<p>Helps ensure that vehicles operating in California - including those in transit from Mexico, Canada, or any other state - are equipped with engines that meet California and/or federal emission standards.</p> <p>Protects air quality and public health due to exposure to toxic air contaminants by helping ensure that engines meet applicable model year emission standards, as demonstrated through compliance with engine labeling requirements.</p> <p>1974 and newer model year diesel-powered heavy-duty commercial vehicles operating in California must show evidence that the installed engines, at the time of manufacture, meet emission standards at least as stringent as applicable federal emission standards for the applicable model years.</p> <p>ARB bases its determination of whether an engine meets the above requirement during inspections under the HDVIP (described below) by inspecting the Emission Control Label (ECL) affixed to the vehicle's engine. The ECL must be legible, maintained at the location originally installed by the engine manufacturer, and correspond to the engine serial number stamped on the engine.</p>	<p>In effect since 2007, ongoing enforcement.</p>		<p>Not Provided by ARB</p>	<p>Data Not Collected by ARB</p>
<p>Heavy-Duty Inspection Programs</p>	<p><sup>34</sup>Per ARB</p>	<p>Controls excessive smoke emissions and tampering from heavy-duty diesel trucks and buses.</p> <p>HDVIP: Any heavy-duty vehicle (gross vehicle rating over 6,000 pounds) operating in California, including vehicles registered in other states and foreign countries, may be tested for excessive smoke and tampering. ARB inspectors conduct unannounced tests at various locations, such as CHP weigh stations, randomly selected roadside locations, fleet facilities, and border crossings.</p> <p>PSIP: Requires all California-based fleets of two or more heavy-duty vehicles (gross vehicle rating over 14,000 pounds; except for 1998 and older, the rating is over 6,000 pounds) to perform annual smoke opacity and tamper inspections of their fleets.</p>	<p>Ongoing.</p> <p>ARB is scheduled to consider a proposal for a comprehensive heavy-duty vehicle inspection and maintenance program in the ~2019 timeframe. If adopted and implemented, the revamped inspection and maintenance program would replace the current HDVIP and PSIP.</p>	<p>HDVIP: Minimum penalty for non-performance is \$300, up to \$1800 for a second level violation.</p> <p>PSIP: Maximum penalty of \$500 per vehicle for a PSIP violation.</p>	<p>Not Provided by ARB</p>	<p>Data Not Collected by ARB</p>

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		The HDVIP and PSIP inspections help ensure that vehicles operating in California meet reasonable standards of maintenance to help protect against excessive smoke emissions and criteria pollutant increases associated with malmaintenance and/or tampering.				
In-Use Solid Waste Collection Vehicles	<sup>35</sup> Per ARB	<p>Reduces PM and NOx emissions from in-use diesel powered garbage trucks.</p> <p>Reduces cancer-causing PM and smog-forming NOx emissions from trucks by requiring owners to use ARB-verified control technology that best reduces emissions, following a phased-in schedule through 2010.</p> <p>Requires installation of Best Available Control Technology (BACT) for all 1960 – 2006 model year engines.</p> <p>85 percent reduction in PM and NOx from affected in-use diesel powered vehicles.</p>	Required 100 percent compliance by December 31, 2010.	Motor Vehicle Account	Not Provided by ARB	Data Not Collected by ARB

1/ Based on EXPANDED LIST OF EARLY ACTION MEASURES TO REDUCE GREENHOUSE GAS EMISSIONS IN CALIFORNIA RECOMMENDED FOR BOARD CONSIDERATION, October 2007

<sup>1</sup> AB 1807 (Tanner), Chapter 1047, Statutes of 1983/Health and Safety Code Sections 39666, 41954, 41962

<sup>2</sup> Health & Safety Code Sections 39010, 39600, 39601, 43000.5, 43013, 43018, 43100, 43101, 43104, 43105, 43105.5, and 43106.

<sup>3</sup> Health and Safety Code Sections 38510 and 38560, Health and Safety Code Sections 39600 and 39601

<sup>4</sup> Health and Safety Code Sections, 39002, 39003, 39010, 39500, 39600, 39601, 40000, 43000, 43101, 43104, 43013, 43018, 43018.5, 43100, 43101, 43101.5, 43102, 43103, 43106 and 43204

<sup>5</sup> Health and Safety Code Sections, 39002, 39003, 39010, 39500, 39600, 39601, 40000, 43000, 43101, 43104, 43013, 43018, 43018.5, 43100, 43101, 43101.5, 43102, 43103, 43104, 43106 and 43204

<sup>6</sup> Health and Safety Code Sections 38562, 39002, 39003, 39600, 39601, 39667, 43000, 43009.5, 43013, 43018, 43018.5, 43100, 43101, 43101.5, 43102, 43104, 43105, 43106, 43204, 43205, 43205.5 and 43206

<sup>7</sup> SB 1275 (de Leon), Chapter 530, Statutes of 2014 /Health and Safety Code Sections 44258 and 44258.4/ GGRF: Health and Safety Code Section 39710 et seq./ AB 118 (Núñez), Chapter 750, Statutes of 2007: Health and Safety Code Section 44274 et seq.

<sup>8</sup> SB 1275 (de León):Health and Safety Code Sections 44258 and 44258.4/GGRF: Health and Safety Code Section 39710 et seq./EFMP:Health and Safety Code Section 44125

<sup>9</sup> Health & Safety Code Sections 39666, 39667, 43013, 43018

<sup>10</sup> Health and Safety Code Sections 39666, 39667, 43013, 43018

<sup>11</sup> Health and Safety Code Sections 39618, 43013, 43018

<sup>12</sup> SB 124 (Oropeza), Chapter 561, Statutes of 2009 - Codified ARBs ATCM: Health and Safety Code Section 39667

<sup>13</sup> Federal Clean Air Act Section 201

<sup>14</sup> Federal Clean Air Act Section 209

<sup>15</sup> Federal Clean Air Act Section 209 and California Health and Safety Code, Division 26, Part 5, Chapter 2

<sup>16</sup> Health and Safety Code 39600, 39601, 43013, 43018

<sup>17</sup> Health and Safety Code Section 44275 et. seq.

<sup>18</sup> Health and Safety Code Sections 39625-39627.5

<sup>19</sup> AB 109 (Núñez), Chapter 313, Statutes of 2008/AB 1338 (Budget), Chapter 760, Statutes of 2008

<sup>20</sup> SB 1204 (Lara), Chapter 524, Statutes of 2014/EO-B-16-2012/AB 118 (Núñez)/Health and Safety Code Section 44274, et. seq.

<sup>21</sup> SB 1204 (Lara), Chapter 524, Statutes of 2014/EO-B-16-2012

<sup>22</sup> Health and Safety Code Sections 39666, 43013, and 43018

<sup>23</sup> AB 471 (Simitian), Chapter 706, Statutes of 2004/SB 771 (Simitian), Chapter 588, Statutes of 2005

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<sup>24</sup> Health and Safety Code Sections 39600, 39601, and 43013(b)

<sup>25</sup> Health and Safety Code Sections 39600, 39601, 43013(a) and (b)

<sup>26</sup> Health and Safety Code Sections 39667, 43013, and 43018

<sup>27</sup> Health and Safety Code Sections 39600 and 39601

<sup>28</sup> Health and Safety Code Sections 43013 and 43018

<sup>29</sup> Health and Safety Code Section 43013

<sup>30</sup> Health and Safety Code Section 43013.1

<sup>31</sup> Health and Safety Code Sections 39600, 39601, 43013, 43018, 43101

<sup>32</sup> SB 375 (Steinberg), Chapter 728, Statutes of 2008

<sup>33</sup> AB 1009 (Pavley), Chapter 873, Statutes of 2004/Health and Safety Code Sections 39600, 39601, 43013, 43781, 44011.6

<sup>34</sup> SB 1997 (Presley), Chapter 1544, Statutes of 1988, Heavy-Duty Vehicle Inspection Program (HDVIP)/SB 2330 (Killea), Chapter 1453, Statutes of 1990, Periodic Smoke Inspection Program (PSIP)

<sup>35</sup> Diesel Risk Reduction Plan