

Table Appn A-16, duplicated below as Table A-2-1, presents the total program costs by category for 2018 and 2022.

Table A-2-1. CARB Program Costs

Sources	Cost of Program
On-Road	
2018	\$27,850,443
2022 estimate	\$37,299,493
Off-Road	
2018	\$4,673,315
2022 estimate	\$5,512,926
Evaporative Components	
2018	\$426,415
2022 estimate	\$536,228
Aftermarket Parts	
2018	\$3,253,911
2022 estimate	\$4,805,349
Retrofits	
2018	\$1,961,505
2022 estimate	\$1,270,099
At Berth Technologies	
2018	\$204,833
2022 estimate	\$212,270
TOTAL	
2018	\$38,370,422
2022 estimate	\$49,636,366

Existing Fees Collected

Since 1990, CARB has collected fees for a subset of on-road mobile sources (cars, trucks, and motorcycles) based on HSC 43019. The original fee cap, set at \$4.5 million, is adjusted annually by CPI. The regulations are housed in Title 13, CCR, Sections 1990-1994. The 2018 baseline uses the total fees collected in 2018. The estimated fee collected in 2022, and beyond, is calculated by increasing the 2018 total fees collected by a CPI of 2.8 percent per year between 2018 and 2031, an average figure estimated from recent inflation values.³ (Table A-2-2) These fees partially offset the existing program costs of the Mobile Source Certification and Compliance Program.

Existing Funding

The Mobile Source certification and compliance program is currently funded through existing funds. The funds that support this program primarily include the Air Pollution Control Fund

³ California Department of Finance. <http://www.dof.ca.gov/Forecasting/Economics/Indicators/Inflation/>. Accessed February 2020.

(APCF), Motor Vehicle Account (MVA), and the Vehicle Inspection and Repair Fund (VIRF). CARB has been collecting on-road fees historically for this program, as outlined above, which have been used, like the other funds, to offset the total cost of the program. The On-Road fees currently are deposited into the APCF. Penalty and injunctive monies from settlement of emissions violations with manufacturers are also deposited into APCF to cover the costs of implementing vehicle and engine regulations, and emissions certification and compliance. To the extent that the fees established under this regulation do not cover all the costs of these programs, penalty and injunctive monies, if available at appropriate levels, would continue to support the difference in fees relative to costs. The on-road fees and newly established fees going forward will be deposited into the Certification and Compliance Fund – 3359 in the 2020/2021 FY timeframe. The existing funding is summarized in Table A-2-2.

Table A-2-2. 2018 and 2022 Summary of the Existing Program Cost, Existing Fees Collected, and Existing Funding

Sources	Existing Program Cost	Existing Fees Collected	Existing Funding
On-Road			
2018	\$27,850,443	\$ 9,679,312	\$18,171,131
2022 estimate	\$37,299,493	\$10,809,783	\$25,391,521
Off-Road			
2018	\$4,673,315	\$0	\$4,673,315
2022 estimate	\$5,512,732	\$0	\$5,512,732
Evaporative Components			
2018	\$426,415	\$0	\$426,415
2022 estimate	\$536,228	\$0	\$536,228
Aftermarket Parts			
2018	\$3,253,911	\$0	\$3,253,911
2022 estimate	\$4,805,349	\$0	\$4,805,349
Retrofits			
2018	\$1,961,505	\$0	\$1,961,505
2022 estimate	\$1,270,099	\$0	\$1,270,099
At-Berth Technologies			
2018	\$204,833	\$0	\$204,833
2022 estimate	\$212,270	\$0	\$212,270
TOTAL			
2018	\$38,370,422	\$9,679,312	\$28,691,110
2022 estimate	\$49,636,366	\$10,809,783	\$38,826,583

Proposed Regulation

Through the workshop process with industry, CARB developed a proposed fee structure to cover the gap between existing program costs and existing fees collected for the Mobile Source Certification and Compliance Program, based on anticipated fiscal needs. The new

fee structure is based on an upfront fee due upon submittal of a manufacturer’s application for certification and approval of the product. See Appendix B for a detailed description on how the fees were developed for the proposed regulation. Most fee categories are based on CARBs average program cost per executive order (EO) issued in each EO series or approval category based on adjusted 2018 approvals. Lower cost subcategories use a percent reduction from the EO average cost. Three categories, C series, N series, and Fuel-fired heaters, were based on average engineer time to review and approve the certification. In addition, Locomotive, DE series, and AB series regulatory programs are more complex; therefore, the fee structure is based on staff time spent for specific activities.

The proposed certification fees are phased-in from 2022 through 2024. In general, the phase-in schedules allow full-cost fees for new applications to be phased-in at 50 percent of the fee in 2022, 75 percent of the fee in 2023, and 100 percent of the fee starting in 2024. On-Road Fees include a CPI adjustment of 2.8 percent per year between 2024 and 2031. The CPI figure utilized is an average of CPI over the past three years as projected by California’s Department of Finance.⁴

The total expected fees from the proposed regulation for 2022 through 2031 is shown in Table A-2-3. The proposed fee structure, number of actions per category, and fee totals that are used to estimate the total expected from the proposed regulation is shown in Table C-2 through Table C-7.

Table A-2-3. Total Expected Fees from the Proposed Regulation

	On-Road ¹	Off-Road ²	Aftermarket Parts	Retrofits	At-Berth	Totals
2022	\$17,209,641	\$2,989,754	\$857,826	\$816,832	\$194,494	\$22,068,547
2023	\$25,766,660	\$4,238,205	\$887,799	\$1,008,427	\$203,382	\$32,104,473
2024	\$33,915,080	\$5,486,656	\$917,771	\$1,200,988	\$212,270	\$41,732,765
2025	\$34,864,702	\$5,486,656	\$917,771	\$1,026,567	\$212,270	\$42,507,966
2026	\$35,840,914	\$5,486,656	\$917,771	\$958,049	\$212,270	\$43,415,660
2027	\$36,844,460	\$5,486,656	\$917,771	\$889,293	\$212,270	\$44,350,449
2028	\$37,876,104	\$5,486,656	\$917,771	\$829,553	\$212,270	\$45,322,355
2029	\$38,936,635	\$5,486,656	\$917,771	\$829,434	\$212,270	\$46,382,766
2030	\$40,026,861	\$5,486,656	\$917,771	\$829,434	\$212,270	\$47,472,992
2031	\$41,147,613	\$5,486,656	\$917,771	\$829,434	\$212,270	\$48,593,744
TOTAL	\$342,428,671	\$51,121,203	\$9,087,796	\$9,218,012	\$2,096,035	\$413,951,717

¹ The proposed certification fees are phased-in from 2022 through 2024. The proposed 2024 certification fees are increased by a 2.8% CPI per year between 2024 and 2031.

² Includes both the costs to certify off-road vehicles, engines, and equipment and the costs to certify the evaporative emission components that are used in those vehicles and equipment

⁴ <http://www.dof.ca.gov/Forecasting/Economics/Indicators/Inflation/>

Below Tables A-2-4 through A-2-9 provide the fee structure and fee totals:

Table A-2-4. Proposed On-Road Fees and Total Estimated 2024 Annual Fee Collected

EO Series	Application Fee					2024 Estimate Fee Collected
	New	Partial Carry Over ⁵	Carry Over ⁶	Small Volume CA sales Manufacturer	Zero-Emission	
A(LD)/P	\$46,509	\$23,254	\$11,627		\$11,627	\$21,428,988
A (HD engine)	\$121,265	\$60,632	\$30,316			\$6,427,052
A (HD Evaporative vehicle)	\$14,935		\$3,734			\$298,701
A (HD GHG Vehicle)	\$17,720		\$4,430	\$8,860	\$4,430	\$1,727,726
AT/AD (HD GHG Trailer/Aero)	\$3,936					\$562,800
Zero-Emission Powertrain	\$3,936					\$17,710
N (exempt engine)	\$98					\$1,464
Fuel-fire Heaters	\$293					\$586
M	\$17,447	\$8,723	\$4,362	\$13,085		\$3,450,053
All On-Road Applications						\$33,915,080

⁵ Partial Carry Over refers to a certification application submitted that is similar to an application submitted in the previous model year with only minor updates.

⁶ Carry Over refers to a certification application submitted that is the same as an application submitted in the previous model year with model year differences.

Table A-2-5. Proposed Off-Road Fees and Total Estimated 2024 Annual Income

EO Series	Application Fee					2024 Estimate Income
	New	Partial Carry Over	Carry over	Small Volume CA sales Manufacturer	Zero-Emission	
U-G					\$842	\$3,367
U-L: Exhaust	\$4,511	\$2,255	\$1,128	\$3,383	\$1,128	\$233,428
U-L: Evaporative	\$1,099	\$550	\$275	\$825		\$20,064
U-M	\$2,988	\$1,494	\$747	\$2,241	\$747	\$686,444
U-R	\$4,153	\$2,076	\$1,038			\$1,341,289
U-U: Exhaust	\$2,603	\$1,301	\$651		\$651	\$1,709,514
U-U: Evaporative	\$1,212	\$606	\$303			\$746,592
U-W: Exhaust	\$1,478	\$739	\$369	\$1,108	\$369	\$202,841
U-W: Evaporative	\$1,043	\$522	\$261	\$782		\$122,569
All Off-Road Applications						\$5,066,106

Table A-2-6. Proposed Evaporative Component Fees and Total Estimated 2024 Annual Income

EO Series	Application Fee			2024 Estimate Income
	New	No Change Renewal	Adding Models	
G	\$6,827	\$1,707	\$1,707	\$51,200
Q	\$4,753	\$1,188	\$1,188	\$357,652
RM	\$917		\$229	\$11,696
All Evaporative Component Applications				\$420,549

Table A-2-7. Proposed Aftermarket Parts Fees and Total Estimated 2024 Annual Income

EO Series	Application Fee				2024 Estimated Income
	New	Category 1 or Carry over	Small Business	Zero-Emission	
B	\$23,978		\$17,984	\$5,995	\$461,580
C	\$195				\$12,296
D and F	\$2,000	\$500	\$1,000		\$206,896
Dcat/dpf and K	\$10,000	\$2,500	\$5,000		\$170,000
Dft	\$2,000	\$500	\$1,000		\$67,000
All Aftermarket Part Applications					\$917,772

Table A-2-8. Proposed Retrofit Fees and Total Estimated 2024 Annual Income

EO Series	Application Type and Fee					2024 Estimate Income
	Initial Application Fee	Final Application Fee	EO Fee, Implementation and Warranty	In-Use Fee	Extension Fee	
DE Series	\$48,075	\$24,038	\$24,038	\$36,056	\$24,038	\$832,300
Small Business	\$36,056	\$18,028	\$18,028	\$27,042	\$18,028	
	Initial Application	Final Verification Letter				
Locomotive	\$18,434	\$73,738				\$368,688
All Retrofit Activities						\$1,200,988

Table A-2-9. Proposed At-Berth Technologies Fees and Total Estimated 2024 Annual Income

EO Series	Application Type and Fee					2024 Estimate Income
	Test Plan review	Application Fee	CEMS review	Design Change fee	Minor Amendment	
AB	\$10,158	\$25,394	\$254	\$10,158	\$2,032	\$212,270
Small Business	\$7,618	\$19,046	\$190	\$7,618	\$1,524	
All At-Berth Applications						\$212,270

3. Statement of the Need of the Proposed Regulation

Until recently, CARB's authority to collect fees to cover the cost of certification and compliance activities from regulated parties was significantly restricted to \$4.5 million by the statutory monetary cap. Current on-road manufacturers subject to certification fees account for only about one third of the products certified by CARB, and the fees, capped by California Health and Safety Code (HSC) Section 43019, do not even cover the costs of the the current on-road certification programs. Consequently, CARB has historically needed to rely on other funding sources such as the Air Pollution Control Fund (APCF), Motor Vehicle Account (MVA), and the Vehicle Inspection and Repair Fund (VIRF) to implement our mobile source certification and compliance programs. In 2018 and 2019, the Legislature provided CARB new authority to collect additional fees with the passing of new legislation (SB 854, AB 2381, and AB 854). The legislation also created a new fund, the Certification and Compliance Fund (CCF) for the deposit of existing and new mobile sources fees. These funds will directly support the Mobile Source Certification and Compliance programs, establishing a stable funding source.

The Proposed Regulation implements a new schedule of fees for mobile source certification and compliance under AB 2381, SB 85 and SB 854. Although the Proposed Regulation is not projected to have a 100 percent (full cost) recovery at this time, the projected fees are what CARB reasonably expects the market can bear based on manufacturer feedback and staff analysis (See Appendix B). CARB's goal is to establish a stable source of funds for the certification and compliance program, which is as close to 100 percent of the program costs as possible, through planning and development of our existing and future programs.

4. Major Regulation Determination

Per Department of Finance regulations (California Code of Regulations, title 1, sections 2000-2004), any agency that anticipates promulgating a regulation that will have an economic impact on California business enterprises and individuals in an amount exceeding \$50 million in any 12-month period between the date the regulation is filed with the California Secretary of State through 12 months after it is fully implemented (defined as major regulation) is required to submit a Standardized Regulatory Impact Assessment (SRIA). The Proposed Regulation and associated amendments would be fully implemented in 2024 and would result in an economic impact exceeding \$50 million starting in 2022, which triggers the threshold for a major regulation and the requirement for a SRIA. The projected economic impact of this rulemaking is in the approximate \$50-\$103 million range as shown in Section E, Table E-4-3.

5. Baseline Information

For this SRIA, the economic impacts of the Proposed Regulation are evaluated against the Business-As-Usual (BAU) scenario each year for the analysis period from 2022 to 2031. The BAU scenario is referred to as the "baseline." CARB's mobile source certification and compliance program cost analysis is based on existing programs and funding sources. The baseline business as usual (BAU) costs for 2022, which is the first year of the proposed certification fee increase, are estimated using California's mobile source certification and

compliance programs costs for 2018 and adjusting them upward based on anticipated cost increases. The baseline analysis includes the fiscal and private sector perspectives, as this rulemaking impacts both. All costs are in 2018 nominal dollars.

Existing Program Cost

To determine program costs, CARB followed the same cost collection methodology as that used by the United States Environmental Protection Agency (U.S. EPA),⁷ which identified the labor, operational, equipment, and facility costs to conduct the activities covered by their fees. The scope of this regulatory activity is limited to the mobile source categories listed in Table A-5-1. The certification and compliance activities include the evaluation of a certified vehicle, engine or component to ensure the product meets the emission requirements, is produced and distributed as certified, has durable emission control equipment, and meets warranty requirements. Fiscal costs were based on the essential activities related to the main certification and compliance activities to approve and confirm a product meets CARB's requirements. Accordingly, staff did not include resources to conduct enforcement, regulatory, or research activities per HSC 43019 and 43019.1. A detailed list of activities and the methodology to determine these costs are found in Appendix A.

Labor Costs

Labor Costs include both the direct labor to implement the activities (Direct Labor) and overhead costs that include administrative management, legal, and IT costs to run the agency (Indirect Labor). The Direct Labor cost includes each staff and first level manager that works within the Mobile Source Certification and Compliance Program activities. No second level managers or above were used in the calculation. Indirect Labor cost was calculated as 26 percent of the Direct Labor cost (see Appendix A for methodology).

Not all categories undergo the same workload effort and costs vary across categories. Table A-5-1 lists the types of engines, vehicles, and equipment by EO category, the EO Series, and the various activities currently conducted for each category under this regulatory effort. The shaded areas show those programs for which CARB has regulatory authority to conduct the activity. "X" designates the work activity for development of the baseline cost analysis. For those programs that are shown as shaded and without an X, there were no resources devoted to the labor to support those activities in the 2018 timeframe, and none projected for the 2022 timeframe.

⁷ The Motor Vehicle and Engine Compliance Program (MVECP) fees rule (69 Fed. Reg. 26222, May 11, 2004)

Table A-5-1. California Mobile Source Program Categories and Applicable CARB Certification and Compliance Programs

Engine, Vehicle or Component (EO Series)	Certification	On-Board Diagnostics	Audit	In-Use	Warranty
On-Road New Cars, Light/Medium-Duty Vehicles (A)	x	x	x	x	x
On-Road Heavy-Duty Engines and Vehicles (A)	x	x	x	x	x
On-Road Heavy-Duty Phase 2 GHG (A)	x		x		
Conversion of Vehicles to Gaseous Fuels: Alternative Fuel Retrofit Systems (B)	x				x
Federal AB 965 Cars and light trucks (P)					
On-Road HD Exempt (N)	x				
Fuel-fired Heaters	x				
Phase 2 GHG Trailer (AT) and components (AD)	x				
Zero-emission Powertrain (A)	x				
Street-Use Motorcycles (M)	x		x		x
Emission-Compliant ("Green Sticker") Off-Road Motorcycles & All-Terrain Vehicles: OFMC, ATV, OFRSV, OFRUV, SCAR (U-M)	x		x		x
Emission-Non-Compliant ("Red Sticker") Off-Road Motorcycles & All-Terrain Vehicles: OFMC, ATV (U-N)	x				
Electric Golf Carts (U-G)	x				
Off-Road Compression - Ignition Engines (U-R)	x		x	x	x
Off-Road Large Spark-Ignition Engines: LSI (U-L) - Exhaust	x		x		x
Off-Road Large Spark-Ignition Engines: LSI (U-L) - Evaporative	x				x
Spark - Ignition Marine Engines/Watercraft (U-W) - Exhaust	x	x	x		x
Spark - Ignition Marine Engines/Watercraft (U-W) - Evaporative	x		x		x
Small Off-Road Spark - Ignition Engines (U-U) - Exhaust	x		x		x
Small Off-Road Spark - Ignition Engines (U-U) - Evaporative	x		x		x

Sources Certification and Compliance activities, as determined by 2018 test plan data. Appendix A provides a list of the type of equipment and the cost of the equipment used for this analysis.

Facility Costs

Facility costs were determined by obtaining the rent and utility costs of each CARB laboratory. Facility costs for 2018 include the “space only” cost for CARB’s laboratory facilities in El Monte and Sacramento, as well as CARB’s Heavy-Duty Diesel Engine Test Facility at the Metropolitan Transportation Authority in Los Angeles. In 2022 and subsequent years, after CARB’s El Monte office relocates to Riverside, “space only” facility costs include CARB’s laboratory facility in Riverside and Sacramento. Laboratory space is determined on the space required to house the equipment and conduct the tests, therefore there are no projected space reductions resulting from staff modifications because of COVID-19. These costs were adjusted by percent time used for Mobile Sources Certification and Compliance activities, as determined by 2018 test plan data.

Existing Fees Collected

Since 1990, CARB has collected fees for on-road mobile sources (cars, trucks, and motorcycles) based on HSC 43019. The original fee cap, set at \$4.5 million, is adjusted annually by CPI. The regulations are housed in Title 13, CCR, Sections 1990-1994. The 2018 baseline uses the total fees collected in 2018. The estimated fee collected in 2022, and beyond, is calculated by increasing the 2018 total fees collected by a CPI of 2.8 percent per year between 2018 and 2031, an average figure estimated from recent inflation values.⁸

Existing Funding

The Mobile Source certification and compliance program is currently funded through existing funds. The funds that support this program primarily include the Air Pollution Control Fund (APCF), Motor Vehicle Account (MVA), and the Vehicle Inspection and Repair Fund (VIRF). CARB has been collecting on-road fees historically for this program, which have been used, like the other funds, to offset the total cost of the program. The On-Road fees currently are deposited into the APCF. The on-road fees and newly established fees going forward will be deposited into the Certification and Compliance Fund – 3359 in the 2020/2021 FY timeframe.

Summarized in Table A-5-2 are the fiscal costs for each Mobile Source Certification and Compliance category. A description of each category, specific methodology, and baseline costs for each category can be found in Appendix A.

⁸ California Department of Finance. <http://www.dof.ca.gov/Forecasting/Economics/Indicators/Inflation/>. Accessed February 2020.

5. Other Benefits – Fiscal Revenue

This rulemaking is the result of legislative directives to create a more fiscally sustainable funding solution for CARB’s Mobile Source Certification and Compliance programs that is based on greater recovery of costs from the businesses that benefit from receiving CARB certification for their products. The proposed regulation provides for new fees and increases existing fees, thereby reducing reliance on existing funds. The following provides a summary of the fiscal revenue to CARB and ultimately to the State of California. The revenue to the State of California with Proposed Regulation is shown in Table B-5-1. Table B-5-2 provides the fiscal savings per year by type of product purchased for 2022-2031.

Table B-5-1. Fiscal Revenue-Yearly Totals

Year	Total Certification and Compliance Fiscal Costs	Revenue ¹ to CARB with Proposed Regulation
2022	\$49,636,366	\$11,258,764
2023	\$50,680,751	\$20,992,016
2024	\$51,754,380	\$30,309,160
2025	\$52,689,411	\$30,764,500
2026	\$53,739,675	\$31,343,377
2027	\$54,821,450	\$31,940,142
2028	\$55,955,770	\$32,564,559
2029	\$57,188,234	\$33,267,752
2030	\$58,455,339	\$33,990,758
2031	\$59,757,924	\$34,734,007
TOTAL	\$544,679,301	\$291,165,036

¹ Revenue = Fee from proposed regulation minus fee from BAU scenario.

Table B-5-2. Fiscal Savings¹ per Year by Type of Product Purchased for 2022-2031

	On-Road ¹	Off-Road ²	Aftermarket Parts	Retrofits	At-Berth Technology	Totals
2022	\$6,399,858	\$2,989,754	\$857,826	\$816,832	\$194,494	\$11,258,764
2023	\$14,654,203	\$4,238,205	\$887,799	\$1,008,427	\$203,382	\$20,992,016
2024	\$22,491,475	\$5,486,656	\$917,771	\$1,200,988	\$212,270	\$30,309,160
2025	\$23,121,236	\$5,486,656	\$917,771	\$1,026,567	\$212,270	\$30,764,500
2026	\$23,768,631	\$5,486,656	\$917,771	\$958,049	\$212,270	\$31,343,377
2027	\$24,434,152	\$5,486,656	\$917,771	\$889,293	\$212,270	\$31,940,142
2028	\$25,118,309	\$5,486,656	\$917,771	\$829,553	\$212,270	\$32,564,559
2029	\$25,821,621	\$5,486,656	\$917,771	\$829,434	\$212,270	\$33,267,752
2030	\$26,544,627	\$5,486,656	\$917,771	\$829,434	\$212,270	\$33,990,758
2031	\$27,287,876	\$5,486,656	\$917,771	\$829,434	\$212,270	\$34,734,007
TOTAL	\$219,641,989	\$51,121,203	\$9,087,796	\$9,218,012	\$2,096,035	\$291,165,036

¹ Fiscal cost savings = fees collected under proposed regulation – fees collected under BAU scenario

² Includes both the costs to certify off-road vehicles, engines and equipment and the costs to certify the evaporative emission components that are used in those vehicles and equipment

C. DIRECT COSTS

The total cost of this regulatory item will be determined by the amount of application fees collected to cover CARB costs along with standard financing costs applicable to all of the product categories. Staff estimates that fees collected from the proposed regulation will amount to as much as approximately \$57 million in 2031. Purchasing behavior is assumed to remain the same for all categories. Under this assumption, staff assumes no emission benefits or increases as a result of the proposed regulation. The fees that are already required to be paid by the existing statute HSC 43019 have been excluded from the cost analysis and the alternatives analysis to avoid double-counting.

For this SRIA, the costs that are paid by manufacturers are assumed to be passed through to purchasers as part of the sales price of the vehicle or piece of equipment, with a few exceptions indicated by stakeholder feedback (marine and aftermarket parts). These passed on costs are distributed among individuals, business, and State and local government in the same proportions as product sales to these types of purchasers. Appendix C show the sales percentages for each type of purchaser, by category, that were used in this analysis. Appendix D shows the current and future sales projections for each category that were used in this analysis.

As previously mentioned, recent legislation changed CARB's authority to collect fees, removing the cap on existing fees and allowing fees to be collected on new categories with specific considerations. Through the workshop process with industry, CARB developed a proposed fee structure to cover the Direct Costs for this program, based on anticipated fiscal needs. The new fee structure is based on an upfront fee due upon submittal of a manufacturer's application for certification and approval of the product. Most fee categories are based on the average cost per EO in each EO series. Lower cost subcategories use a

percent reduction from the EO average cost. The Direct Costs were calculated using a case by case fee structure for each EO Series based on 2018 EO issuances (updated with FY 2018/2019 and 2019/2020 approved budget change proposal estimates), multiplied by the proposed fee, then totaled for each EO series and category listed below. All costs and expected revenue from this proposed regulation are estimated using a three-year phase-in of new fees. Amortization costs are included at a rate of 5 percent over an average loan period of five years. In general, the phase-in schedules allow full-cost fees for “new” applications (shown in Tables C-3 through C-8) in to be phased-in at 50 percent of the fee in 2022, 75 percent of the fee in 2023, and 100 percent of the fee starting in 2024. There is no phase-in of fees for the “reduced fee applications.”

Maximum base fee starts in 2024 after the phase-in schedule. On-Road Fees include a CPI adjustment, which was included in the calculations starting in 2025 (for model year 2026 applications). The CPI figure utilized is an average of CPI over the past three years as projected by California’s Department of Finance.⁹ Three categories, C series, N series, and Fuel-fired heaters, were based on average engineer time to review and approve the certification. In addition, Locomotive, DE series, and AB series regulatory programs are more complex; therefore, the fee structure is based on staff time spent for specific activities. All costs here have been assigned North American Industry Classification System (NAICS) codes and are analyzed in Section E.

The total expected revenue from the proposed regulation for 2022 through 2031 is shown in Table C-1. The proposed fee structure, number of actions per category, and fee totals that are used to estimate the total expected revenue from the proposed regulation is shown in Tables C-2 through C-7.

⁹ <http://www.dof.ca.gov/Forecasting/Economics/Indicators/Inflation/>

Table C-1. Fee Revenue from Proposed Regulation

	On-Road ¹	Off-Road ²	Aftermarket Parts	Retrofits	At-Berth	Totals
2022	\$17,209,641	\$2,989,754	\$857,826	\$816,832	\$194,494	\$22,068,547
2023	\$25,766,660	\$4,238,205	\$887,799	\$1,008,427	\$203,382	\$32,104,473
2024	\$33,915,080	\$5,486,656	\$917,771	\$1,200,988	\$212,270	\$41,732,765
2025	\$34,864,702	\$5,486,656	\$917,771	\$1,026,567	\$212,270	\$42,507,966
2026	\$35,840,914	\$5,486,656	\$917,771	\$958,049	\$212,270	\$43,415,660
2027	\$36,844,460	\$5,486,656	\$917,771	\$889,293	\$212,270	\$44,350,449
2028	\$37,876,104	\$5,486,656	\$917,771	\$829,553	\$212,270	\$45,322,355
2029	\$38,936,635	\$5,486,656	\$917,771	\$829,434	\$212,270	\$46,382,766
2030	\$40,026,861	\$5,486,656	\$917,771	\$829,434	\$212,270	\$47,472,992
2031	\$41,147,613	\$5,486,656	\$917,771	\$829,434	\$212,270	\$48,593,744
TOTAL	\$342,428,671	\$51,121,203	\$9,087,796	\$9,218,012	\$2,096,035	\$413,951,717

¹ The proposed certification fees are phased-in from 2022 through 2024. The proposed 2024 certification fees are increased by a 2.8% CPI per year between 2024 and 2031.

² Includes both the costs to certify off-road vehicles, equipment and equipment and the costs to certify the evaporative emission components that are used in those vehicles and equipment

Below Table C-2 through C-7 provide the fee structure and fee totals:

Table C-2. Proposed On-Road Fees and Total Estimated 2024 Annual Fee Collected

EO Series	Application Fee					2024 Estimate Fee Collected
	New	Partial Carry Over ¹⁰	Carry Over ¹¹	Small Volume CA sales Manufacturer	Zero-Emission	
A(LD)/P	\$46,509	\$23,254	\$11,627		\$11,627	\$21,428,988
A (HD	\$121,265	\$60,632	\$30,316			\$6,427,052
A (HD Evaporative vehicle)	\$14,935		\$3,734			\$298,701
A (HD GHG Vehicle)	\$17,720		\$4,430	\$8,860	\$4,430	\$1,727,726
AT/AD (HD GHG	\$3,936					\$562,800
Zero-Emission	\$3,936					\$17,710
N (exempt engine)	\$98					\$1,464
Fuel-fire Heaters	\$293					\$586
M	\$17,447	\$8,723	\$4,362	\$13,085		\$3,450,053
All On-Road Applications						\$33,915,080

¹⁰ Partial Carry Over refers to a certification application submitted that is similar to an application submitted in the previous model year with only minor updates.

¹¹ Carry Over refers to a certification application submitted that is the same as an application submitted in the previous model year with model year differences.

Table C-3. Proposed Off-Road Fees and Total Estimated 2024 Annual Fee Collected

EO Series	Application Fee					2024 Estimate Fee Collected
	New	Partial Carry Over	Carry over	Small Volume CA sales Manufacturer	Zero-Emission	
U-G					\$842	\$3,367
U-L: Exhaust	\$4,511	\$2,255	\$1,128	\$3,383	\$1,128	\$233,428
U-L:	\$1,099	\$550	\$275	\$825		\$20,064
U-M	\$2,988	\$1,494	\$747	\$2,241	\$747	\$686,444
U-R	\$4,153	\$2,076	\$1,038			\$1,341,289
U-U: Exhaust	\$2,603	\$1,301	\$651		\$651	\$1,709,514
U-U:	\$1,212	\$606	\$303			\$746,592
U-W: Exhaust	\$1,478	\$739	\$369	\$1,108	\$369	\$202,841
U-W:	\$1,043	\$522	\$261	\$782		\$122,569
All Off-Road Applications						\$5,066,106

Table C-4. Proposed Evaporative Component Fees and Total Estimated 2024 Annual Fee Collected

EO Series	Application Fee			2024 Estimate Fee Collected
	New	No Change Renewal	Adding Models	
G	\$6,827	\$1,707	\$1,707	\$51,200
Q	\$4,753	\$1,188	\$1,188	\$357,652
RM	\$917		\$229	\$11,696
All Evaporative Component Applications				\$420,549

Table C-5. Proposed Aftermarket Parts Fees and Total Estimated 2024 Annual Fee Collected

EO Series	Application Fee				2024 Estimate Fee Collected
	New	Category 1 or Carry over	Small Business	Zero-Emission	
B	\$23,978		\$17,984	\$5,995	\$461,580
C	\$195				\$12,296
D and F	\$2,000	\$500	\$1,000		\$206,896
Dcat/dpf and K	\$10,000	\$2,500	\$5,000		\$170,000
Dft	\$2,000	\$500	\$1,000		\$67,000
All Aftermarket Part					\$917,772

Table C-6. Proposed Retrofit Fees and Total Estimated 2024 Annual Fee Collected

EO Series	Application Type and Fee					2024 Estimated Fee Collected
	Initial Application Fee	Final Application Fee	EO Fee, Implementation and Warranty	In-Use Fee	Extension Fee	
DE Series	\$48,075	\$24,038	\$24,038	\$36,056	\$24,038	\$832,300
Small Business	\$36,056	\$18,028	\$18,028	\$27,042	\$18,028	
	Initial Application	Final Verification Letter				
Locomotive	\$18,434	\$73,738				\$368,688
All Retrofit						\$1,200,988

Table C-7. Proposed At-Berth Technology Fees and Total Estimated 2024 Annual Fee Collected

EO Series	Application Type and Fee					2024 Estimated Fee Collected
	Test Plan review	Application Fee	CEMS review	Design Change fee	Minor Amendment	
AB series	\$10,158	\$25,394	\$254	\$10,158	\$2,032	\$212,270
Small Business	\$7,618	\$19,046	\$190	\$7,618	\$1,524	
All At-Berth Applications						\$212,270

1. Direct Cost Inputs

The proposed certification fee increases would result in direct incremental costs to manufacturers that certify a mobile source product (i.e., vehicle, engine, or add-on component) for sale in California. Manufacturers have disclosed through discussions with CARB staff that, with the exception of marine watercraft and aftermarket parts, all new certification fees will be passed along to vehicle and equipment purchasers. (Manufacturers of aftermarket parts and marine watercraft have indicated to CARB that they do not plan to increase the price of their products to recoup any new certification fees.) Therefore, this analysis looks at the direct costs to California purchasers rather than to manufacturers, unless otherwise noted.

To assess the potential impact on the California economy, staff also evaluated the costs assuming that all of the increased costs in certifying a mobile source product will be passed on to the businesses and individuals purchasing the product, except for those categories for which manufacturers of the products have informed staff that they do not plan to pass these additional costs to consumers. This analysis is performed by comparing the baseline scenario with the proposed regulation, in which certification fees are increased for calendar years 2022 through 2031. All costs are presented in nominal dollars.

In some cases, the increased cost to California consumers is not a one-to-one correlation between the increased certification fee for a particular EO-series and the product that is ultimately purchased. This is because certain types of vehicles and equipment are built using emission control equipment from several different manufacturers. When this occurs, the added cost to a vehicle or piece of equipment under this proposed regulation will be their respective portion of multiple new certification fees, established by this proposed regulation. This cost analysis will identify those types of vehicles or equipment that incorporate multiple EOs.

For each mobile source category, the incremental costs per unit are calculated by dividing the total fee for that category equally over all new vehicles or equipment sold for that category. The total cost of the proposed regulation is then determined by applying a five percent additional financing cost over an average period of five years for those units that are expected to be purchased and financed by California businesses and individuals. Appendix C shows the percentage of units for each category of vehicles that are expected to be purchased by California businesses and by individuals, respectively. These percentages are then used to calculate the total cost of the proposed regulation, as shown in this example.

Example Calculation:

2022: Passenger Cars, Light-Duty Trucks, and Medium- Duty Vehicles

Total Fee: \$10,917,970

Purchaser	% of Sales ¹² (rounded)	Fee based on % of Sales	5% Financing Added	Cost of Proposed Regulation, Including Financing
Business	7.94%	\$867,128	Yes	\$910,484
Individual	91.34%	\$9,971,972	Yes	\$10,470,570
State Government	0.17%	\$18,625	No	\$18,625
Local Government	0.55%	\$60,246	No	\$60,246
Total Fee		\$10,917,970		
Total Cost of Proposed Regulation				\$11,459,925

a. Total Costs for Compliance with Certification Requirements for On-Road

As mentioned in Section A.2, "On-Road" consists of nine types of products based on their unique certification requirements, each of which is tied to one or more distinct EO-series and its associated fee. In order to determine the total cost of compliance for each type of vehicle, staff identified the number of EOs tied to each type of vehicle and the portion of the fees for each EO type that will apply to each type of vehicle. The Total Fee cost that will apply to each vehicle category is calculated using these assumptions. The fee per unit is then calculated by dividing the proposed Total Fee for this category by the vehicle population for the category. Tables C-1-1 through C-1-3 provide the total fees for the on-road category, the fees per unit for on-road vehicles and equipment, and the total cost for the Proposed Regulation.

Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles (PC, LDT, MDV)

This category of vehicle is certified using one A-series EO, which covers all emission certification requirements, including exhaust emission standards for both criteria pollutants and greenhouse gases and evaporative emission standards.

Heavy-Duty Vehicles that Use an Engine

For the purpose of this analysis, heavy-duty vehicles that use an engine are divided into two subcategories based on the number of A-series EOs that each receives: heavy-duty gasoline vehicles (HDV – gasoline), which receive three EOs, and heavy-duty vehicles other than gasoline vehicles (HDV – not gasoline), which receive two EOs.

Heavy-duty gasoline vehicles and heavy-duty vehicles other than gasoline both receive an A-series engine exhaust emission EO, which includes both criteria pollutants and greenhouse gasses, and an A-series tractor/vocational vehicle (greenhouse gas) EO. Staff estimated the portion of the proposed regulation Total Fees for these shared A-series EOs that is attributed to these two categories using the sales split of 18 percent heavy-duty gasoline vehicles and 82 percent heavy-duty vehicles other than gasoline.

¹² Data from California Department of Motor Vehicles database, accessed February, 2020.

The third A-series EO that heavy-duty gasoline vehicles receive is for certification to evaporative emission standards. Heavy-duty vehicles other than gasoline vehicles do not have evaporative emissions and, therefore, do not certify to these standards.

Heavy-Duty Electric Vehicles

Heavy-duty zero-emission vehicles can be certified using either the Zero-Emission Powertrain Test Procedure (HDV – ZEP Cert) or the conventional route, in which the vehicle is certified in its entirety (HD ZEV – not ZEP Cert).

HDV – ZEP Cert vehicles are certified using two A-series EOs, a ZEP EO, which replaces engine exhaust EO, and an “Enhanced Fuel Cell or Electric Vehicle (tractor/vocational)” EO that requires a certified zero-emission powertrain. HD ZEV – not ZEP Cert vehicles are certified using one A-series EO that covers the entire vehicle.

Other On-Road Mobile Source Categories

Other mobile source categories that require only one EO include:

1. Heavy-Duty Greenhouse Gas Trailer/Aerodynamics (HD Trailer), which requires one AT/AD-series EO.
2. Heavy-Duty Vehicles that Use Exempt Engines (HD – exempt), which requires one N-series EO.
3. Fuel-fired Heaters Used in Heavy-Duty Vehicles, which require one approval letter.
4. Street-Use Motorcycles, which require one M-series EO.

Table C-1-1. Total Fees for On-Road Category for Proposed Regulation

Year	PC, LDT, MDV	HDV - gasoline	HDV – not gasoline	HDV – ZEP Cert	HD ZEV – not ZEP Cert	HD Trailer	HD - exempt	Fuel-fired Heaters	Motorcycles
2022	\$10,917,970	\$868,130	\$2,865,839	\$101,882	\$84,171	\$281,400	\$732	\$293	\$2,089,223
2023	\$16,173,479	\$1,302,195	\$4,911,658	\$101,882	\$84,171	\$422,100	\$1,098	\$439	\$2,769,638
2024	\$21,428,988	\$1,724,269	\$6,560,868	\$101,882	\$84,171	\$562,800	\$1,464	\$586	\$3,450,053
2025	\$22,029,000	\$1,772,548	\$6,744,572	\$104,734	\$86,528	\$578,558	\$1,505	\$602	\$3,546,655
2026	\$22,645,812	\$1,822,180	\$6,933,420	\$107,667	\$88,951	\$594,758	\$1,547	\$619	\$3,645,961
2027	\$23,279,894	\$1,873,201	\$7,127,556	\$110,682	\$91,441	\$611,411	\$1,590	\$636	\$3,748,048
2028	\$23,931,731	\$1,925,650	\$7,327,127	\$113,781	\$94,002	\$628,531	\$1,635	\$654	\$3,852,993
2029	\$24,601,820	\$1,979,568	\$7,532,287	\$116,967	\$96,634	\$646,130	\$1,681	\$672	\$3,960,877
2030	\$25,290,671	\$2,034,996	\$7,743,191	\$120,242	\$99,340	\$664,221	\$1,728	\$691	\$4,071,782
2031	\$25,998,810	\$2,091,976	\$7,960,000	\$123,608	\$102,121	\$682,819	\$1,776	\$710	\$4,185,792
TOTAL	\$216,298,174	\$17,394,712	\$65,706,518	\$1,103,326	\$911,530	\$5,672,729	\$14,756	\$5,903	\$35,321,023

Table C-1-2. Fee per Unit for On-Road Vehicles and Equipment for Proposed Regulation

Year	PC, LDT, MDV	HDV - gasoline	HDV – not gasoline	HDV – ZEP Cert	HD ZEV – not ZEP Cert	HD Trailer	HD - exempt	Fuel-fired Heaters	Motorcycles
2022	\$6.13	\$106.78	\$76.40	\$943.35	\$2.87	\$40.00	\$48.80	\$0.01	\$60.71
2023	\$8.97	\$156.42	\$131.47	\$849.01	\$2.61	\$58.82	\$73.20	\$0.01	\$79.53
2024	\$11.75	\$202.27	\$166.81	\$771.83	\$2.90	\$76.88	\$97.60	\$0.01	\$97.90
2025	\$11.94	\$203.06	\$167.46	\$727.32	\$3.32	\$77.49	\$100.33	\$0.01	\$99.44
2026	\$12.12	\$203.85	\$168.12	\$690.17	\$3.79	\$78.10	\$103.14	\$0.01	\$101.02
2027	\$12.32	\$204.65	\$168.78	\$658.82	\$4.33	\$78.71	\$106.03	\$0.01	\$102.61
2028	\$12.51	\$205.45	\$169.43	\$632.12	\$4.94	\$79.33	\$109.00	\$0.01	\$104.24
2029	\$12.71	\$206.25	\$170.10	\$609.20	\$5.65	\$79.95	\$112.05	\$0.01	\$105.88
2030	\$12.91	\$207.05	\$170.76	\$589.42	\$6.45	\$80.57	\$115.19	\$0.01	\$107.56
2031	\$13.11	\$207.86	\$171.43	\$572.26	\$7.37	\$81.21	\$118.41	\$0.01	\$109.26

Table C-1-3. Total Cost of Proposed Regulation for On-Road Category

Year	Total Fees	Total Cost of Proposed Regulation ¹
2022	\$17,209,641	\$18,094,576
2023	\$25,766,660	\$27,092,372
2024	\$33,915,080	\$35,661,118
2025	\$34,864,702	\$36,659,629
2026	\$35,840,914	\$37,686,099
2027	\$36,844,460	\$38,741,310
2028	\$37,876,104	\$39,826,066
2029	\$38,936,635	\$40,941,196
2030	\$40,026,861	\$42,087,550
2031	\$41,147,613	\$43,266,001
TOTAL	\$342,428,671	\$360,055,915

¹ Total Cost = Total Fees plus 5% financing for businesses and individuals.

b. Total Costs for Compliance with Certification Requirements for Off-Road

The “off-road mobile source” category can be split into eight types of vehicles and equipment, based on their unique certification requirements, each of which is tied to one or more distinct EO-series and its associated fee. As with the On-Road category, in order to determine the total cost of compliance for each type of vehicle, staff identified the number of EOs tied to each type of vehicle and the portion of the fees for each EO type that will apply to each type of vehicle. The Total Fee cost that will apply to each vehicle category is calculated using these assumptions. The fee per unit is then calculated by dividing the proposed Total Fee for this category by the vehicle population for the category. Tables C-1-4 through C-1-6 provide the total fees for the off-road category, the fees per unit for off-road vehicles and equipment, and the total cost for the Proposed Regulation.

Off-Road Mobile Source Categories that Require One EO

Four of the seven off-road mobile source categories require only one EO. For these categories, 100 percent of the fee for the associated EO is allocated to that single category. These include:

1. Off-Highway Recreational Vehicles (OHRV), which require one combined exhaust and evaporative emission U-M series EO.
2. Electric Golf Carts, which require one "zero-emission vehicle" U-G series EO.
3. Equipment and Vehicles that use Off-Road Compression Ignition Engines (CI Equipment), which require one U-R series exhaust emission EO.
4. Portable Fuel Containers, which require one G-series EO.

Equipment that uses Multiple EOs

Three of the off-road mobile source categories receive separate EOs for certification to exhaust emission standards and certification to evaporative emission standards. These categories are also equipped with evaporative emission control system components that receive their own separate EOs.

The Total Fee for RM-series evaporative emission component EOs are included in the cost of spark-ignition marine watercraft. The Total Fees for Q-series evaporative emission control system component EOs are split between equipment that uses small off-road engines (SORE) and equipment that uses large spark-ignition (LSI) engines, using the sales split of 99 percent SORE and 1 percent LSI in 2018.

The Total Fees attributed to each of these categories, based on number of EOs, are calculated as follows:

1. Equipment that uses LSI Engines (LSI Equipment) includes the Total Fees for two equipment EOs (one U-L series engine exhaust EO and one U-L series evaporative emission EO) and includes one percent of the Total Fees for Q-series EO evaporative emission control system components.
2. Equipment that uses SORE (SORE Equipment) includes the Total Fees for two equipment EOs (one U-U series engine exhaust EO and one U-U series evaporative emission EO) and includes 99 percent of the Total Fees for Q-series EO evaporative emission control system components.
3. Spark-Ignition Marine Watercraft (SI Marine) includes the Total Fees for two equipment EOs (one U-W series engine exhaust EO and one U-W series evaporative emission EO) and 100 percent of the Total Fees for RM-series EO evaporative emission components.

Table C-1-4. Total Fees for Off-Road Category for Proposed Regulation

Year	OHRV	Electric Golf Carts	LSI Equipment	SORE Equipment	SI Marine	CI Equipment	Portable Fuel Containers
2022	\$394,388	\$3,367	\$137,301	\$1,457,548	\$205,765	\$764,078	\$27,307
2023	\$540,416	\$3,367	\$197,185	\$2,133,865	\$271,435	\$1,052,683	\$39,254
2024	\$686,444	\$3,367	\$257,068	\$2,810,182	\$360,498	\$1,341,289	\$51,200
2025	\$686,444	\$3,367	\$257,068	\$2,810,182	\$360,498	\$1,341,289	\$51,200
2026	\$686,444	\$3,367	\$257,068	\$2,810,182	\$360,498	\$1,341,289	\$51,200
2027	\$686,444	\$3,367	\$257,068	\$2,810,182	\$360,498	\$1,341,289	\$51,200
2028	\$686,444	\$3,367	\$257,068	\$2,810,182	\$360,498	\$1,341,289	\$51,200
2029	\$686,444	\$3,367	\$257,068	\$2,810,182	\$360,498	\$1,341,289	\$51,200
2030	\$686,444	\$3,367	\$257,068	\$2,810,182	\$360,498	\$1,341,289	\$51,200
2031	\$686,444	\$3,367	\$257,068	\$2,810,182	\$360,498	\$1,341,289	\$51,200
TOTAL	\$6,426,360	\$33,666	\$2,391,032	\$26,072,867	\$3,174,046	\$12,547,069	\$476,164

Table C-1-5. Fee per Unit for Off-Road Vehicles and Equipment for Proposed Regulation

Year	OHRV	Electric Golf Carts	LSI Equipment	SORE Equipment	SI Marine	CI Equipment	Portable Fuel Containers
2022	\$3.69	\$0.17	\$6.72	\$0.37	\$7.85	\$6.41	\$0.02
2023	\$4.96	\$0.17	\$9.57	\$0.53	\$10.24	\$8.79	\$0.03
2024	\$6.18	\$0.17	\$12.37	\$0.70	\$12.57	\$11.14	\$0.04
2025	\$6.07	\$0.17	\$12.27	\$0.69	\$12.42	\$11.09	\$0.04
2026	\$5.96	\$0.17	\$12.17	\$0.69	\$12.28	\$11.03	\$0.04
2027	\$5.85	\$0.17	\$12.07	\$0.69	\$12.14	\$10.98	\$0.04
2028	\$5.75	\$0.17	\$11.97	\$0.68	\$12.00	\$10.92	\$0.04
2029	\$5.64	\$0.17	\$11.88	\$0.68	\$11.86	\$10.87	\$0.04
2030	\$5.54	\$0.17	\$11.78	\$0.67	\$11.73	\$10.82	\$0.04
2031	\$5.44	\$0.17	\$11.68	\$0.67	\$11.59	\$10.76	\$0.04

Table C-1-6. Total Cost of Proposed Regulation for Off-Road Category

Year	Total Fees	Total Cost of Proposed Regulation ¹
2022	\$2,989,754	\$3,143,062
2023	\$4,238,205	\$4,455,765
2024	\$5,486,656	\$5,768,538
2025	\$5,486,656	\$5,768,538
2026	\$5,486,656	\$5,768,538
2027	\$5,486,656	\$5,768,538
2028	\$5,486,656	\$5,768,538
2029	\$5,486,656	\$5,768,538
2030	\$5,486,656	\$5,768,538
2031	\$5,486,656	\$5,768,538
TOTAL	\$51,121,203	\$53,746,575

¹ Total Cost = Total Fees plus 5% financing for businesses and individuals.

c. Total Costs for Compliance with Certification Requirements for Aftermarket Parts

For Aftermarket Parts, there is only one EO used to certify each category of part. Historically, a number of applications that are submitted to certify aftermarket parts do not get approved (issuance of an EO). The Total Costs for aftermarket parts shown in Table C-1-7 include the cost for applications that are never completed. The costs of these incomplete applications are not included in the Cost Per Unit values shown in Table C-1-8, because no products may be sold if an application is not completed. Table C-1-9 provides the total cost for the Proposed Regulation.

Table C-1-7. Total Fees for Aftermarket Parts by Category for Proposed Regulation

Year	Experimental Permits ¹	Fuel Tanks ²	Alt. Fuel Retrofits	Perf. Parts ³	Cat. Conv. & DPF ⁴	Motorcycle AMP ⁵
2022	\$12,296	\$67,000	\$401,635	\$206,896	\$113,333	\$56,667
2023	\$12,296	\$67,000	\$431,608	\$206,896	\$113,333	\$56,667
2024	\$12,296	\$67,000	\$461,580	\$206,896	\$113,333	\$56,667
2025	\$12,296	\$67,000	\$461,580	\$206,896	\$113,333	\$56,667
2026	\$12,296	\$67,000	\$461,580	\$206,896	\$113,333	\$56,667
2027	\$12,296	\$67,000	\$461,580	\$206,896	\$113,333	\$56,667
2028	\$12,296	\$67,000	\$461,580	\$206,896	\$113,333	\$56,667
2029	\$12,296	\$67,000	\$461,580	\$206,896	\$113,333	\$56,667
2030	\$12,296	\$67,000	\$461,580	\$206,896	\$113,333	\$56,667
2031	\$12,296	\$67,000	\$461,580	\$206,896	\$113,333	\$56,667
TOTAL	\$122,956	\$670,000	\$4,525,885	\$2,068,955	\$1,133,333	\$566,667

¹ Includes: \$10,346 for complete applications and \$1,950 for incomplete applications.

² Includes: \$61,000 for complete applications and \$6,000 for incomplete applications.

³ Includes: \$149,000 for complete applications and \$57,896 for incomplete applications.

⁴ Includes: \$63,333 for complete applications and \$50,000 for incomplete applications.

⁵ Includes: \$31,667 for complete applications and \$25,000 for incomplete applications.

Table C-1-8. Cost per Unit for Aftermarket Parts for Proposed Regulation¹

Year	Experimental Permits	Fuel Tanks	Alt. Fuel Retrofits	Performance Parts	Catalytic Conv. & DPF	Motorcycle AMP
2022	\$164.22	\$19.69	\$557.83	\$0.12	\$0.20	\$48.79
2023	\$164.22	\$17.12	\$599.45	\$0.12	\$0.20	\$48.79
2024	\$164.22	\$14.89	\$641.08	\$0.12	\$0.20	\$48.79
2025	\$164.22	\$12.95	\$641.08	\$0.12	\$0.20	\$48.79
2026	\$164.22	\$11.26	\$641.08	\$0.12	\$0.20	\$48.79
2027	\$164.22	\$9.79	\$641.08	\$0.12	\$0.20	\$48.79
2028	\$164.22	\$8.51	\$641.08	\$0.12	\$0.20	\$48.79
2029	\$164.22	\$7.40	\$641.08	\$0.12	\$0.20	\$48.79
2030	\$164.22	\$6.44	\$641.08	\$0.12	\$0.20	\$48.79
2031	\$164.22	\$5.60	\$641.08	\$0.12	\$0.20	\$48.79

¹ Does not include application fees for incomplete applications.

Table C-1-9. Total Cost of Proposed Regulation for Aftermarket Parts

Year	Total Fees ¹	Total Cost of Proposed Regulation ^{1,2}
2022	\$857,826	\$892,304
2023	\$887,799	\$923,775
2024	\$917,771	\$955,246
2025	\$917,771	\$955,246
2026	\$917,771	\$955,246
2027	\$917,771	\$955,246
2028	\$917,771	\$955,246
2029	\$917,771	\$955,246
2030	\$917,771	\$955,246
2031	\$917,771	\$955,246
TOTAL	\$9,087,796	\$9,458,050

¹ Includes fees for incomplete applications.

² Total Cost = Total Fees plus 5% financing for businesses and individuals, except that no financing costs were added to experimental permit.

d. Total Costs for Compliance with Certification Requirements for Retrofits

For Diesel Emission Control Strategies Retrofits, there is only one EO used to certify each category of part. Tables C-1-10 through C-1-12 provide the total fees for the retrofit category, the fees per unit for retrofit categories, and the total cost for the Proposed Regulation.

Table C-1-10. Total Fees for Retrofits by Category for Proposed Regulation

Year	CHC	Stationary CI	APU	TRU	RTG	On-Road	Off-Road	Locomotive
2022	\$0	\$94,940	\$185,869	\$291,060	\$446	\$4,457	\$55,716	\$184,344
2023	\$134,727	\$95,211	\$175,019	\$274,071	\$420	\$0	\$52,464	\$276,516
2024	\$153,105	\$108,748	\$198,894	\$311,457	\$477	\$0	\$59,620	\$368,688
2025	\$153,105	\$108,748	\$198,894	\$155,728	\$477	\$0	\$59,620	\$368,688
2026	\$153,105	\$108,748	\$198,894	\$77,864	\$477	\$0	\$59,620	\$368,688
2027	\$153,105	\$108,748	\$198,894	\$0	\$238	\$0	\$59,620	\$368,688
2028	\$153,105	\$108,748	\$198,894	\$0	\$119	\$0	\$59,620	\$368,688
2029	\$153,105	\$108,748	\$198,894	\$0	\$0	\$0	\$59,620	\$368,688
2030	\$153,105	\$108,748	\$198,894	\$0	\$0	\$0	\$59,620	\$368,688
2031	\$153,105	\$108,748	\$198,894	\$0	\$0	\$0	\$59,620	\$368,688
TOTAL	\$1,359,567	\$1,060,132	\$1,952,036	\$1,082,141	\$2,654	\$4,457	\$346,661	\$3,410,364

Table C-1-11. Cost per Unit for Retrofits for Proposed Regulation

Year	CHC	Stationary CI	APU	TRU	RTG	On-Road	Off-Road	Locomotive
2022	\$0.00	\$445.73	\$445.73	\$445.73	\$445.73	\$445.73	\$445.73	\$12,289.60
2023	\$419.71	\$417.59	\$419.71	\$419.71	\$419.71	\$0.00	\$419.71	\$18,434.40
2024	\$476.96	\$449.37	\$476.96	\$476.96	\$476.96	\$0.00	\$476.96	\$24,579.20
2025	\$476.96	\$424.80	\$476.96	\$0.00	\$476.96	\$0.00	\$476.96	\$24,579.20
2026	\$476.96	\$401.28	\$476.96	\$0.00	\$476.96	\$0.00	\$476.96	\$24,579.20
2027	\$476.96	\$381.57	\$476.96	\$0.00	\$0.00	\$0.00	\$476.96	\$24,579.20
2028	\$476.96	\$363.70	\$476.96	\$0.00	\$0.00	\$0.00	\$0.00	\$24,579.20
2029	\$476.96	\$346.33	\$476.96	\$0.00	\$0.00	\$0.00	\$0.00	\$24,579.20
2030	\$476.96	\$331.55	\$476.96	\$0.00	\$0.00	\$0.00	\$0.00	\$24,579.20
2031	\$476.96	\$317.98	\$476.96	\$0.00	\$0.00	\$0.00	\$0.00	\$24,579.20

Table C-1-12. Total Cost of Proposed Regulation for Retrofits

Year	Total Fees	Total Cost of Proposed Regulation ¹
2022	\$816,832	\$846,506
2023	\$1,008,427	\$1,047,550
2024	\$1,200,988	\$1,248,149
2025	\$1,026,567	\$1,065,006
2026	\$958,049	\$993,063
2027	\$889,293	\$920,618
2028	\$829,553	\$860,986
2029	\$829,434	\$860,986
2030	\$829,434	\$860,986
2031	\$829,434	\$860,986
TOTAL	\$9,218,012	\$9,564,836

¹ Total Cost = Total Fees plus 5% financing for businesses and individuals.

e. Total Costs for Compliance with Certification Requirements for At-Berth Technologies

California regulations require ocean-going vessels to reduce emissions from diesel auxiliary engines on container vessels, reefer vessels, and passenger cruise vessels, while berthing at a California port. At-berth, auxiliary engines are used by vessels to run power for lighting, ventilation, pumps, communication, heating, and other on-board equipment while a vessel is docked. Container, reefer, and cruise vessel fleets that visit specified California ports, as described below, are the regulated parties. The California ports included in the existing regulation are Ports of Los Angeles, Long Beach, Oakland, Richmond, San Diego, San Francisco, and Hueneme.

The existing regulation provides fleet operators two different pathway options to comply: the Reduced On-board Power Generation option or the Equivalent Emissions Reduction option.

The Equivalent Emissions Reduction pathway requires a percentage reduction of emissions below a fleet’s baseline levels. Fleets following this pathway can comply using shore power or a CARB approved alternative control technology, such as a barge-based capture and control system or a land-based emissions capture and control system.

For At-Berth Alternative Emission Control Technology, there is only one EO used to certify each system. Table C-1-13 shows the total fees, the fee per visit, and the total cost for the Proposed Regulation for At-Berth Technologies.

Table C-1-13. Fee per Visit, Total Fees, and Total Cost of Proposed Regulation for At-Berth Technologies

Year	Fee per Visit	Total Fees	Total Cost of Proposed Regulation ¹
2022	\$146.03	\$194,494	\$203,733
2023	\$146.03	\$203,382	\$213,043
2024	\$146.03	\$212,270	\$222,883
2025	\$146.03	\$212,270	\$222,883
2026	\$146.03	\$212,270	\$222,883
2027	\$146.03	\$212,270	\$222,883
2028	\$146.03	\$212,270	\$222,883
2029	\$146.03	\$212,270	\$222,883
2030	\$146.03	\$212,270	\$222,883
2031	\$146.03	\$212,270	\$222,883
TOTAL		\$2,096,035	\$2,195,596

¹ Total Cost = Total Fees plus 5% financing for businesses.

f. Total Costs of Compliance with the Proposed Regulation for All Mobile Source Categories

The total cost of compliance with the proposed regulation for all mobile source categories is presented in Table C-1-14. The second column, Total Fees, is the total of all certification fees that are expected to be paid by manufacturers for 2022 through 2031 under the proposed regulation. Total Fees are calculated based on the assumption that the fees for on-road mobile sources will increase by 2.8 percent per year (averaged CPI value) and all other fees remain unchanged from year to year. The second column, Total Cost of the Proposed Regulation, is the total actual cost that is expected to be paid by purchasers of mobile sources due to the increase in certification fees. These figures were generated from amortization tables assuming 5 percent interest over an average loan period of five years. As all items subject to the proposed regulation are financed in more than 95 percent of purchases (businesses and households), applying amortization costs provides a more realistic perspective on how the Proposed Regulation will impact the affected industries. Year 2022 shows only the payments due that year in the loan structure, about one-fifth of the total amount financed, and the yearly amounts increases per the amortization structure. The Grand Total of the column titled “Total

Cost of Proposed Regulation” is less than the total of the column titled “Total Fees” because the government will receive the fees upfront, the passed on fees to industries are paid in spread out financing installments and thus are delayed. No financing costs are added for either Local or State government purchases.

Table C-1-14. Total Cost of Compliance with the Proposed Regulation for All Mobile Source Categories

Year	Total Fees	Total Cost of Proposed Regulation ¹
2022	\$22,068,547	\$5,072,061
2023	\$32,104,473	\$12,462,167
2024	\$41,732,765	\$22,076,167
2025	\$42,507,966	\$31,869,218
2026	\$43,415,660	\$41,871,924
2027	\$44,350,449	\$47,048,595
2028	\$45,322,355	\$50,101,593
2029	\$46,382,766	\$51,254,773
2030	\$47,472,992	\$52,441,143
2031	\$48,593,744	\$53,646,610
TOTAL	\$413,951,717	\$367,844,249

¹ Total Cost = Total Fees plus 5% financing for businesses and individuals.

2. Direct Costs on Typical Businesses

Since the proposed amendments only increase certification fees that are paid upfront by manufacturers, there will be no ongoing costs associated with the proposed regulation. It is assumed in this analysis that for all product categories, except for aftermarket parts and marine watercraft, manufacturers will pass along 100 percent of the certification fee increases to purchasers of the products. Manufacturers of aftermarket parts and marine watercraft have indicated to CARB that they do not plan to increase the price of their products to recoup any new certification fees.

The cost impacts to a typical business under the proposed regulation would depend primarily on how many new vehicles or other products the business purchases per year and the purchase year. For each category, CARB estimated the total fees expected to be collected under the proposed regulation and then apportioned the total fees expected to be passed through each year between business, individuals, local government entities, and state government entities that purchase each product. Appendix C shows the percentage of sales for each category that are assumed to be purchased by California businesses.¹³ The total cost to all California businesses, presented in Table C-2-1, assumes that purchases are financed at a 5 percent financing rate.

¹³ The complete purchase splits are between business, individuals, local government entities, and state government entities are in Appendix C.

The estimated costs to businesses for aftermarket parts in Table C-2-1 include costs to businesses from purchasing aftermarket parts and from application fees estimated to be paid by California manufacturers of aftermarket parts for applications that are never finalized. Applications that are not finalized are the result of the manufacturer choosing to not continue with the process. Applications not finalized never result in products being sold, and costs are transferred to California business purchasers of aftermarket parts. Since 18 percent of manufacturers of aftermarket parts are California businesses, 18 percent of the fees from incomplete applications are estimated to be paid by California manufacturers of aftermarket parts (i.e., \$25,352 per year). All amortization figures were calculated using the same amortization structure explained in Section C.1. An average loan period of five years and a 5 percent interest rate were applied, as the vast majority of all items affected by the proposed regulation are financed.

Table C-2-1. Total Costs to California Businesses with the Proposed Regulation¹

Year	On-Road Vehicles	Off-Road Equipment ²	Aftermarket Parts ³	Retrofit	At-Berth	Totals	Total Costs with Amortization Costs
2022	\$4,468,981	\$1,404,081	\$472,268	\$801,568	\$194,008	\$7,340,906	\$1,695,564
2023	\$7,205,861	\$1,984,870	\$503,740	\$998,968	\$202,873	\$10,896,312	\$4,212,338
2024	\$9,555,577	\$2,565,658	\$535,211	\$1,192,857	\$211,739	\$14,061,042	\$7,460,084
2025	\$9,823,133	\$2,565,658	\$535,211	\$1,009,714	\$211,739	\$14,145,456	\$10,727,328
2026	\$10,098,181	\$2,565,658	\$535,211	\$937,771	\$211,739	\$14,348,560	\$14,041,484
2027	\$10,380,930	\$2,565,658	\$535,211	\$865,327	\$211,739	\$14,558,865	\$15,708,650
2028	\$10,671,596	\$2,565,658	\$535,211	\$838,441	\$211,739	\$14,822,646	\$16,615,535
2029	\$10,970,400	\$2,565,658	\$535,211	\$838,441	\$211,739	\$15,121,450	\$16,860,462
2030	\$11,277,572	\$2,565,658	\$535,211	\$838,441	\$211,739	\$15,428,622	\$17,156,841
2031	\$11,593,344	\$2,565,658	\$535,211	\$838,441	\$211,739	\$15,744,394	\$17,479,244
TOTAL	\$96,045,574	\$23,914,217	\$5,257,697	\$9,159,970	\$2,090,795	\$136,468,253	\$121,957,529

¹ Total Cost = Total Fees plus 5% financing. Financing is not applied to Experimental Permits (Aftermarket Parts EO), because the vehicles are retained by the manufacturers and are never sold to consumers.

² It is assumed that businesses do not purchase marine watercraft. So these costs are not changed if manufacturers of these products do not pass through fees to purchasers of the products.

³ If manufacturers of aftermarket parts do not pass through fees to purchasers of the products, the total cost to California businesses will be reduced to \$25,352 each year, for a total of \$253,522 for 2022-2031.

3. Direct Costs on Small Businesses

It is assumed in this analysis that for all product categories except for aftermarket parts and marine watercraft, manufacturers will pass along 100 percent of the certification fee increases to purchasers of the products. Since the proposed fees will cover certification of all new mobile sources, staff assumes that all California businesses will bear some of the costs of the proposed regulation and the direct costs on California small businesses will be proportional to

the percentage of California businesses that are small businesses. Staff used data compiled by the California Employment Development Department, which indicates that in 2019, approximate 98 percent of California businesses had fewer than 100 employees, to estimate the direct cost of this proposed regulation on California small businesses.¹⁴ For the At-Berth Alternative Emission Control Technology category, the cost to California small businesses is expected to be zero, because use of this technology is limited to major shipping companies and local governments. All amortization figures were calculated using the same amortization structure explained in Section C.1. An average loan period of five years and a 5 percent interest rate were applied, as the vast majority of all items affected by the proposed regulation are financed.

For aftermarket parts and marine watercraft, the direct cost on California small businesses was estimated based on the percentage of manufacturers for each of these categories that are California small businesses. Using the Dunn and Bradstreet database,¹⁵ staff estimated that 12 percent of manufacturers that certify and sell aftermarket parts in California are California small businesses and 7 percent of manufacturers that receive EOs for spark ignition marine watercraft (including those that certify engines, evaporative emission control systems, and evaporative emission components) are California small businesses.

As mentioned in Section C.2, there are only initial costs and no ongoing costs to the proposed regulation, because certification fees that are paid upfront by manufacturers. Tables C-3-1 through C-3-3 provides the total costs to California small business purchasers, the total costs to California small business manufacturers, and the total costs to all California small businesses under the Proposed Regulation.

¹⁴ https://www.labormarketinfo.edd.ca.gov/LMID/Size_of_Business_Data_for_CA.html

¹⁵ Dunn and Bradstreet. Data accessed during November 2019. www.dnbi.com

Table C-3-1. Total Costs to California Small Business Purchasers under the Proposed Regulation¹

Year	On-Road Vehicles	Off-Road Mobile Sources ²	Aftermarket Parts ³	Retrofits	At-Berth ⁴	Total	Amortized Total Costs
2022	\$4,499,404	\$1,375,999	\$0	\$785,536	\$0	\$6,660,939	\$1,538,509
2023	\$7,184,872	\$1,945,172	\$0	\$978,988	\$0	\$10,109,032	\$3,873,441
2024	\$9,490,919	\$2,514,345	\$0	\$1,169,000	\$0	\$13,174,264	\$6,916,364
2025	\$9,756,665	\$2,514,345	\$0	\$989,520	\$0	\$13,260,530	\$9,979,212
2026	\$10,029,851	\$2,514,345	\$0	\$919,016	\$0	\$13,463,212	\$13,088,875
2027	\$10,310,687	\$2,514,345	\$0	\$848,020	\$0	\$13,673,053	\$14,708,496
2028	\$10,599,387	\$2,514,345	\$0	\$821,672	\$0	\$13,935,404	\$15,592,292
2029	\$10,896,169	\$2,514,345	\$0	\$821,672	\$0	\$14,232,187	\$15,836,645
2030	\$11,201,262	\$2,514,345	\$0	\$821,672	\$0	\$14,537,280	\$16,131,542
2031	\$11,514,897	\$2,514,345	\$0	\$821,672	\$0	\$14,850,915	\$16,452,067
TOTAL	\$95,484,113	\$23,435,933	\$0	\$8,976,770	\$0	\$127,896,817	\$114,117,442

¹ Total Cost = Total Fees plus 5% financing. Financing is not applied to Experimental Permits (Aftermarket Parts EO), because the vehicles are retained by the manufacturers and are never sold to consumers.

² It is assumed that businesses do not purchase spark-ignition marine watercraft. So these costs are not changed if manufacturers of these products do not pass through fees to purchasers of the products.

³ It is assumed that manufacturers of aftermarket parts do not pass through fees to purchasers of the products. If manufacturers of aftermarket parts decide to pass through fees to purchasers, the costs per year in this column will be approximately 98 percent of the costs to business purchasers in Table C-2-1 and the yearly costs to aftermarket parts manufacturers in Table C-3-2 will be \$0.

⁴ Use of this technology is limited to major shipping companies and local governments, so it does not affect California small businesses.

Table C-3-2. Total Costs to California Small Business Manufacturers with the Proposed regulation¹

Year	Spark-Ignition Marine Watercraft ^{2,3}	Aftermarket Parts ⁴	Total	Amortized Total Costs
2022	\$15,305	\$102,939	\$118,244	\$27,311
2023	\$20,189	\$106,536	\$126,725	\$56,587
2024	\$25,074	\$110,133	\$135,207	\$87,811
2025	\$25,074	\$110,133	\$135,207	\$119,040
2026	\$25,074	\$110,133	\$135,207	\$150,270
2027	\$25,074	\$110,133	\$135,207	\$154,188
2028	\$25,074	\$110,133	\$135,207	\$156,147
2029	\$25,074	\$110,133	\$135,207	\$156,147
2030	\$25,074	\$110,133	\$135,207	\$156,147
2031	\$25,074	\$110,133	\$135,207	\$156,147
TOTAL	\$236,086	\$1,090,536	\$1,326,622	\$1,219,791

¹ For all categories except aftermarket parts and marine watercraft, it is assumed that manufacturers pass through fees to purchasers of the products. Therefore, costs to California small businesses for the other categories are ascribed to the purchaser rather than the manufacturer.

² Spark-ignition marine watercraft are a subset of the Off-Road Mobile Source category.

³ It is assumed that 7 percent of manufacturers that receive EOs for spark-ignition marine watercraft are California small businesses.

⁴ It is assumed that 12 percent of manufacturers that receive EOs for aftermarket parts are California small businesses and 12 percent of manufacturers that submit applications to certify aftermarket parts, but never complete them, are California small businesses.

Table C-3-3. Total Costs to All California Small Businesses with the Proposed Regulation¹

Year	Total Cost	Total Amortized Cost
2022	\$6,659,381	\$1,538,149
2023	\$10,112,630	\$3,873,912
2024	\$13,183,017	\$6,918,857
2025	\$13,265,742	\$9,982,909
2026	\$13,464,784	\$13,092,934
2027	\$13,670,883	\$14,712,415
2028	\$13,929,388	\$15,593,990
2029	\$14,222,217	\$15,834,019
2030	\$14,523,244	\$16,124,470
2031	\$14,832,701	\$16,440,424
TOTAL	\$127,863,987	\$114,112,077

¹ Includes small business purchasers and small business manufacturers.

4. Direct Costs to Individuals

The direct costs to individuals are assumed to be only initial purchase costs that are due to increased costs of vehicles and equipment purchased by individuals. A five percent financing cost over an average loan period of five years is applied to purchasing costs by individuals, consistent with Section C.1. There are no ongoing costs to individuals.

The most important factor for assessing the impact on individuals is the increased cost per vehicle or piece of equipment due to the proposed regulation. (See Tables C-1-2, C-1-5, C-1-8, C-1-11, and C-1-13.)

The direct cost to individuals is calculated by multiplying the Total Fee (Table C-1-14) for a category by the percentage of the vehicle/equipment/ or use of the product affected by the fee that is purchased or used by individuals. Appendix C shows the percentage of sales for each category that are assumed to be purchased by individuals. An additional five percent financing cost is then applied to all purchases by individuals. The Cost per Household is calculated by dividing the Total Cost by 12,965,400 California households.¹⁶ As the total impact throughout the lifetime of the Proposed Regulation is \$22.32 with a yearly average of \$2.23, and there is an even impact of costs and policies throughout the Californian economy, (to businesses and households alike), the Proposed Regulation appears to not produce any disparate impacts. Table C-4-1 provides total costs to individuals with the Proposed Regulation.

¹⁶ 2020 World Population Review. California Population 2020. Available at: <https://worldpopulationreview.com/states/california-population> . Accessed: 10/28/20.

Table C-4-1. Total Costs to Individuals with the Proposed Regulation¹

Year	On-Road Vehicles	Off-Road Equipment ²	Aftermarket Parts ³	Retrofits	At-Berth	Total ⁴	Cost per Household	Amortized cost per Household
2022	\$13,264,571	\$1,720,832	\$300,272	\$11,842	\$0	\$15,297,516	\$1.18	\$0.27
2023	\$19,338,905	\$2,444,998	\$300,272	\$11,150	\$0	\$22,095,325	\$1.70	\$0.67
2024	\$25,394,361	\$3,169,164	\$300,272	\$12,671	\$0	\$28,876,468	\$2.23	\$1.18
2025	\$26,105,403	\$3,169,164	\$300,272	\$12,671	\$0	\$29,587,510	\$2.28	\$1.71
2026	\$26,836,355	\$3,169,164	\$300,272	\$12,671	\$0	\$30,318,462	\$2.34	\$2.25
2027	\$27,587,773	\$3,169,164	\$300,272	\$12,671	\$0	\$31,069,880	\$2.40	\$2.53
2028	\$28,360,230	\$3,169,164	\$300,272	\$0	\$0	\$31,829,666	\$2.45	\$2.70
2029	\$29,154,317	\$3,169,164	\$300,272	\$0	\$0	\$32,623,752	\$2.52	\$2.77
2030	\$29,970,638	\$3,169,164	\$300,272	\$0	\$0	\$33,440,073	\$2.58	\$2.84
2031	\$30,809,815	\$3,169,164	\$300,272	\$0	\$0	\$34,279,251	\$2.64	\$2.91
TOTAL	\$256,822,367	\$29,519,138	\$3,002,720	\$73,678	\$0	\$289,417,904	\$22.32	\$19.82

¹ Total Cost = Total Fees plus 5% financing.

² If manufacturers of marine watercraft do not pass through fees to purchasers of the products, these costs will be \$215,983 lower in 2022, \$284,915 lower in 2023, and \$353,846 lower each year from 2024 through 2031 than the numbers presented in this table.

³ If manufacturers of aftermarket parts do not pass through fees to purchasers of the products, these costs will not be borne by individual purchasers.

⁴ If manufacturers of both marine watercraft and aftermarket parts do not pass through fees to purchasers of the products, these costs will be \$516,255 lower in 2022, \$585,187 lower in 2023, and \$654,118 lower each year from 2024 through 2031 than the numbers presented in this table.

D. FISCAL IMPACTS

The fiscal costs for local and state government are calculated based on the percentage of the vehicle/equipment/ or use of the product affected by the fee that is purchased or used by each government entity. Appendix C shows the percentage of sales for each category that are assumed to be purchased by each of these government entities. For costs that local and state agencies will pay, it is assumed that neither local nor state governments finance their purchases, which is consistent with the assumptions made in the SRIA for the Heavy-Duty Omnibus Rulemaking.¹⁷ No state implementation costs were identified from the analysis.

1. Local government

The fiscal impact (costs) to Local government is calculated by multiplying the Total Fee (Table C-1-14) for a category by the percentage of the vehicle/equipment/ or use of the product affected by the fee that is purchased or used by Local governments, as shown in the tables above. Table D-1-1 and Table D-1-2 provide the costs to local government due to increased cost of purchases and the change in sale tax revenue.

¹⁷ See Appendix C-1 of the Heavy-Duty Omnibus Rulemaking Initial Statement of Reasons – Original SRIA Submitted to DOF. June 23, 2020. <https://ww3.arb.ca.gov/regact/2020/hdomnibuslownox/appc1.pdf>. Accessed 8/27/2020.

Table D-1-1. Costs to Local Government with the Proposed Regulation

Year	On-Road Vehicles	Off-Road Equipment	Aftermarket Parts ¹	Retrofits	At-Berth	Total
2022	\$292,960	\$12,273	\$1,220	\$27,648	\$9,725	\$343,825
2023	\$438,450	\$17,403	\$1,220	\$32,208	\$10,169	\$499,450
2024	\$566,036	\$22,534	\$1,220	\$36,675	\$10,613	\$637,078
2025	\$581,885	\$22,534	\$1,220	\$36,675	\$10,613	\$652,927
2026	\$598,178	\$22,534	\$1,220	\$36,675	\$10,613	\$669,220
2027	\$614,927	\$22,534	\$1,220	\$36,675	\$10,613	\$685,969
2028	\$632,145	\$22,534	\$1,220	\$20,805	\$10,613	\$687,317
2029	\$649,845	\$22,534	\$1,220	\$20,805	\$10,613	\$705,017
2030	\$668,041	\$22,534	\$1,220	\$20,805	\$10,613	\$723,213
2031	\$686,746	\$22,534	\$1,220	\$20,805	\$10,613	\$741,918
TOTAL	\$5,729,214	\$209,944	\$12,200	\$289,776	\$104,802	\$6,345,936

¹ If manufacturers of aftermarket parts do not pass through fees to purchasers of the products, these costs will not be borne by local government purchasers.

Sales taxes are levied in California to fund a variety of programs at the state and local level. For this analysis, the CARB staff assumed an average of 4.56 percent local sales tax revenues based on how the state sales tax is apportioned plus an average of local additional sales taxes.¹⁸ This leads to a year over year net increase in local sales tax revenue totaling \$214.3 million over the modeled lifetime.

Table D-1-2. Change in Local Government Sales Tax Revenue with the Proposed Regulation Compared to BAU Scenario

Year	Change in Local Government Sales Tax Revenue (\$)
2022	\$236,945
2023	\$582,240
2024	\$1,031,557
2025	\$1,489,411
2026	\$1,957,129
2027	\$2,199,431
2028	\$2,342,528
2029	\$2,396,839
2030	\$2,452,747
2031	\$2,509,615
Total	\$17,198,442

¹⁸ California Department of Tax and Fee Administration. Tax Rates by County and City. <https://cdtfa.ca.gov/formspubs/cdtfa95.pdf>. Accessed June, 2020

2. State Government

a. Revenue to CARB

The overall fiscal impact of the proposed regulation is projected to be added revenues to the State in the range of \$10 to \$20 million each year during the phase-in of the proposed fees (2022 and 2023) and approximately \$30 million each year from 2024 through 2031, with a total revenue of almost \$300 million during this timeframe. In order to estimate these revenue, staff estimated the additional fees that are expected to be collected by CARB each year under the proposed regulation compared to the BAU scenario (Table D-2-2). Then staff estimated the passed on cost of the proposed regulation's requirements each year to all State agencies including CARB (Table D-2-3). The additional fees collected minus the additional purchase price of vehicles and equipment by State agencies gives the revenue to the State.

Under the BAU scenario, the certification fees collected from manufacturers will be increasingly insufficient to cover costs to CARB. Table D-2-1 shows the estimated total certification and compliance costs for 2022 through 2031, the expected fees that will be collected under the BAU scenario, and the additional costs to CARB that will not be covered by the collected fees. As discussed in Section A.5.a, certification and compliance costs that are not covered by fees must be covered by other sources of funding, such as the Air Pollution Control Fund, the Motor Vehicle Account, and the Vehicle Inspection and Repair Fund.

Table D-2-1. Revenues to CARB for 2022 through 2031 for BAU Scenario

Year	Total Certification and Compliance Fiscal Costs	Expected Fees Collected for BAU Scenario ¹⁹	Program funding from Existing Budgeted Sources (APCF, MVA, VIRF and others)
2022	\$49,636,366	\$10,809,783	\$38,826,583
2023	\$50,680,751	\$11,112,456	\$39,568,295
2024	\$51,754,380	\$11,423,605	\$40,330,775
2025	\$52,689,411	\$11,743,466	\$40,945,945
2026	\$53,739,675	\$12,072,283	\$41,667,392
2027	\$54,821,450	\$12,410,307	\$42,411,143
2028	\$55,955,770	\$12,757,795	\$43,197,975
2029	\$57,188,234	\$13,115,014	\$44,073,220
2030	\$58,455,339	\$13,482,234	\$44,973,105
2031	\$59,757,924	\$13,859,737	\$45,898,187
TOTAL	\$544,679,301	\$122,786,682	\$421,892,620

Table D-2-2 shows the estimated certification and compliance costs for 2022 through 2031, the expected fees that will be collected with the proposed regulation and under

¹⁹ The total fees expected to be collected in 2022 through 2031 assumes that the 2018 certification fees are increased by a 2.8% CPI per year between 2018 and 2031. Fees for all other categories do not change.

the BAU scenario, and the revenue to CARB due to the proposed regulation. The last column shows the revenue to CARB with the proposed regulation, as compared to the business as usual scenario.

Table D-2-2. Revenue to CARB for 2022 through 2031 with the Proposed Regulation²⁰

Year	Total Certification and Compliance Costs	Expected Fees Collected with Proposed Regulation	Expected Fees Collected under BAU Scenario	Additional Fees Collected (Revenue to CARB) with Proposed Regulation
2022	\$49,636,366	\$22,068,547	\$10,809,783	\$11,258,764
2023	\$50,680,751	\$32,104,473	\$11,112,456	\$20,992,016
2024	\$51,754,380	\$41,732,765	\$11,423,605	\$30,309,160
2025	\$52,689,411	\$42,507,966	\$11,743,466	\$30,764,500
2026	\$53,739,675	\$43,415,660	\$12,072,283	\$31,343,377
2027	\$54,821,450	\$44,350,449	\$12,410,307	\$31,940,142
2028	\$55,955,770	\$45,322,355	\$12,757,796	\$32,564,559
2029	\$57,188,234	\$46,382,766	\$13,115,014	\$33,267,752
2030	\$58,455,339	\$47,472,992	\$13,482,234	\$33,990,758
2031	\$59,757,924	\$48,593,744	\$13,859,737	\$34,734,007
TOTAL	\$544,679,301	\$413,951,717	\$122,786,682	\$291,165,036

b. Revenue to State Government

Sales taxes are levied in California to fund a variety of programs at the state and local level. For this analysis, state sales tax was assumed to remain constant until 2040 with 3.53 percent being for state programs and the general fund. This leads to a net increase in state sales tax revenue starting in 2023 of approximately \$201,423.10. Over the modeled life of the regulation, the state will gain \$14 million in sales tax revenue compared to the baseline scenario.

²⁰ The total fees expected to be collected in 2022 through 2031 assumes that the proposed 2022 certification fees for on-road vehicles and equipment only are increased by a 2.8% CPI per year between 2022 and 2031. Fees for all other categories do not change.

Table D-2-3. Change in State Sales Tax Revenues for Proposed Regulation

Calendar Year	Revenue (\$)
2022	\$199,697
2023	\$490,660
2024	\$869,183
2025	\$1,254,755
2026	\$1,648,581
2027	\$1,852,397
2028	\$1,972,600
2029	\$2,018,003
2030	\$2,064,713
2031	\$2,112,174
Total	\$14,482,764

c. Costs Incurred by All State Agencies, Including CARB

The only costs incurred by State government are due to increased costs of vehicles and equipment purchased by State agencies as shown in Table D-2-4.

Table D-2-4. Costs Incurred by All State Agencies with the Proposed Regulation

Year	On-Road Vehicles	Off-Road Equipment	Aftermarket Parts ¹	Retrofits	At-Berth	Total
2022	\$68,064	\$5,876	\$3,050	\$5,449	\$0	\$82,438
2023	\$109,155	\$8,494	\$3,050	\$5,224	\$0	\$125,924
2024	\$145,143	\$11,113	\$3,050	\$5,945	\$0	\$165,252
2025	\$149,207	\$11,113	\$3,050	\$5,945	\$0	\$169,316
2026	\$153,385	\$11,113	\$3,050	\$5,945	\$0	\$173,493
2027	\$157,680	\$11,113	\$3,050	\$5,945	\$0	\$177,788
2028	\$162,095	\$11,113	\$3,050	\$1,740	\$0	\$177,998
2029	\$166,634	\$11,113	\$3,050	\$1,740	\$0	\$182,537
2030	\$171,300	\$11,113	\$3,050	\$1,740	\$0	\$187,203
2031	\$176,096	\$11,113	\$3,050	\$1,740	\$0	\$191,999
TOTAL	\$1,458,760	\$103,275	\$30,500	\$41,413	\$0	\$1,633,948

¹ If manufacturers of aftermarket parts do not pass through fees to purchasers of the products, these costs will not be borne by State government purchasers.

d. Total Fiscal Impacts on State Government Due to the Proposed Regulation

Table D-2-5 shows the complete fiscal impact of this Proposed Regulation upon the State of California.

Table D-2-5. Total Fiscal Impact on State Government Due to the Proposed Regulation

Year	Increase in Revenue to CARB (\$ gain)	Increase in Sales Tax Revenue (\$ gain)	Costs from State Purchases (\$ loss)	Total Fiscal Impact of Proposed Regulation
2022	\$11,258,764	\$199,697	-\$82,438	\$11,376,023
2023	\$20,992,016	\$490,660	-\$125,924	\$21,356,753
2024	\$30,309,160	\$869,183	-\$165,252	\$31,013,091
2025	\$30,764,500	\$1,254,755	-\$169,316	\$31,849,939
2026	\$31,343,377	\$1,648,581	-\$173,493	\$32,818,465
2027	\$31,940,142	\$1,852,397	-\$177,788	\$33,614,751
2028	\$32,564,559	\$1,972,600	-\$177,998	\$34,359,161
2029	\$33,267,752	\$2,018,003	-\$182,537	\$35,103,218
2030	\$33,990,758	\$2,064,713	-\$187,203	\$35,868,268
2031	\$34,734,007	\$2,112,174	-\$191,999	\$36,654,183
TOTAL	\$291,165,036	\$14,482,764	-\$1,633,948	\$304,013,852

E. MACROECONOMIC IMPACTS

1. Methods for Determining Economic Impacts

This section describes the estimated total impact of the Proposed Regulation on the California economy. The Proposed Regulation would result in changes in expenditures by businesses in order to comply with its requirements. These changes in expenditures would affect employment, output, and investment in business sectors, classified by the North American Industry Classification System (NAICS) that supply goods and services in support of the industries impacted by the proposed regulation.

These impacts lead to additional induced effects, like changes in personal income that affect consumer expenditures across other spending categories. The incremental total economic impacts of the Proposed Regulation are simulated relative to the baseline scenario using the cost data and assumptions described in Section C. The analysis focuses on the incremental changes in major macroeconomic indicators from 2022 to 2031 including employment, output growth, and gross state product (GSP). The years of the analysis were chosen to frame the simulation of the Proposed Regulation through 12 months post full implementation 2022 to 2031, the final year of analysis.

CARB staff used Regional Economic Models, Inc. (REMI) Policy Insight Plus Version 2.4.1 to estimate the macroeconomic impacts of the Proposed Regulation and its associated

amendments and its projected impacts on the California economy. REMI is a structural economic forecasting and policy analysis model that integrates input-output, computable general equilibrium, econometric and economic geography methodologies.²¹ REMI Policy Insight Plus provides year-by-year estimates of the total impacts of the Proposed Regulation, pursuant to the requirements of SB 617 and the California Department of Finance.^{22,23} CARB uses the REMI single-region, 160-sector model with the model reference case adjusted to reflect the Department of Finance conforming forecasts.

Several adjustments were made to the model reference case to reflect the impacts of COVID-19 and to reflect the Department of Finance conforming forecasts. First, the REMI model's National Control was updated with a short-term national forecast based on the U.S. Economic Outlook for 2020-2022 from the University of Michigan's Research Seminar in Quantitative Economics (RSQE)²⁴ release on April 9th, 2020, which was made available in the latest REMI model. Second, the National and Regional Controls in REMI were updated to reflect the most recent California Department of Finance conforming forecasts which include population projections dated January 2020, U.S. real GDP forecasts, and California civilian employment growth numbers dated May 2020. Because the Department of Finance forecasts only extend to 2023, CARB staff made the assumption that post-2023, U.S. income and employment would continue to grow at the same rate as projected in the RSQE forecast, while California civilian employment would continue to recover at the rate forecasted by the Department of Finance, until it returned to baseline levels.

2. Inputs of the Assessment

The estimated economic impact of the Proposed Regulation incorporates modeling assumptions based on relevant data. This section provides a summary of the assumptions and inputs used to determine the suite of policy variables that best reflect the macroeconomic impacts of the Proposed Regulation. The direct costs estimated in Section C are translated into REMI policy variables and used as inputs for the macroeconomic analysis.²⁵

The Proposed Regulation would impose direct costs on manufacturers who would be required to absorb or pass on costs to final purchasers, as described above in Section C. While these costs are directly incurred by manufacturers, many of those manufacturers are not located in California. Staff assumes that manufacturers would pass these costs on to their customers in the form of increased prices of products, unless stakeholder feedback indicated that the manufacturers would absorb the cost. Where possible, costs for industries that indicated that

²¹ For further information and model documentation see: <https://www.remi.com/model/pi/>

²² (CLI, 2019b) SB-617 State government: financial and administrative accountability (Calderon; Chapter 496, Statutes of 2011), California Legislative Information, accessed November 2019.

http://leginfo.ca.gov/faces/billNavClient.xhtml?bill_id=201120120SB617

²³ (DGS, 2019) State Administrative Manual, 6600: Standardized Regulatory Impact Assessment For Major Regulations - Order of Adoption, California Department of General Services, accessed November 2019.

https://www.dgsapps.dgs.ca.gov/documents/sam/SamPrint/new/sam_master/sam_master_File/chap6000/6600.pdf

²⁴ This update assumes that the economic contraction is severe but that aggressive federal response to the pandemic maintains the possibility of a vigorous recovery: <https://lsa.umich.edu/econ/rsqe.html>.

²⁵ Refer to Section G: Macroeconomic Appendix for a full list of REMI inputs for this analysis.

they would absorb costs have been portrayed under Product Cost variable. For the other industries that indicated that they would pass on costs to end-users, their costs have been allocated to the Consumer Price variable, as shown in Table E-2-1.

In addition to impacts on California businesses, the consumption changes due to requirements affecting products of the impacted categories would change the amount of revenue generated in state and local taxes. The total change in certification and compliance fee revenue and taxes paid by businesses in the affected industry are modeled as increased revenue for the state and local governments.

Table E-2-1. Sources of Changes in Production Cost and Final Demand by Industry

Source of Cost or Savings	Form of Final Cost Transmission	Industries with Impacts (NAICS)
Fees imposed by EO on various categories of products	Production Cost	3363 Motor Vehicle Parts Manufacturing
		3336 Engine, Turbine and Transmission Manufacturing
		3361 Motor Vehicle Manufacturing
		3369 Other Transportation Equipment Manufacturing
	Consumer Price	3361 Motor Vehicle Manufacturing (Household impacts)
		3363 Motor Vehicle Parts Manufacturing (Household impacts)
		3369 Other Transportation Equipment Manufacturing (Household impacts)
		3336 Engine, Turbine and Transmission Manufacturing (Household impacts)
		All Industries for businesses impacts only
	Revenue collected from Fees in Proposed Regulation	State Revenue

In addition to these changes in production costs and final demand for businesses, there would also be economic impacts as a result of the fiscal effects, primarily from changes in sales tax revenue, as described in Section D. The corresponding change in government revenues are modeled as a change in state and local government spending, assuming this revenue increase is not offset elsewhere.

3. Assumptions and Limitations of the Model

As discussed above in Section B.1.a., because the Proposed Regulation would slightly increase new prices, it is possible it could encourage California individuals to hold onto their existing products slightly longer or purchase out-of-state in lieu of new products in California. Other assumptions applied to the analysis can be found in Section C.1.

4. Results of the Assessment

The results from the REMI model provide estimates of the impact of the Proposed Regulation on the California economy. These results represent the annual incremental change from the implementation of the Proposed Regulation relative to the baseline scenario. The California economy is forecasted to grow post-2020 through the duration of the regulatory horizon. Therefore, negative impacts reported here should be interpreted as a slowing of growth and positive impacts as an acceleration of growth resulting from the Proposed Regulation. The results are reported here in tables for every other year from 2022 through 2031.

a. California Employment Impacts

Table E-4-1 presents the impact of the Proposed Regulation on total employment in California across all industries. Employment comprises estimates of the number of jobs, full-time plus part-time, by place of work for all industries. Full-time and part-time jobs are counted at equal weight. Employees, sole proprietors, and active partners are included, but unpaid family workers and volunteers are not included. The employment impacts represent the net change in employment, which consist of positive impacts for some industries and negative impacts for others. The Proposed Regulation is estimated to result in a positive job growth from 2022 to 2024 then negative job growth from 2026 to 2031. These changes in employment represent less than 0.01 percent of baseline California employment. Across the California economy, the REMI simulation shows slight job losses over the years of analysis. While the decline is mostly steady, it jumps from the years of 2024 to 2026 and the rate of decline is projected to slow in 2028 and onwards.

Table E-4-1. Total California Employment Impacts of the Proposed Regulation

	2022	2024	2026	2028	2030	2031
California Employment	21,758,096	23,202,144	24,350,566	24,712,180	24,751,236	24,765,385
% Change	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Change in Total Jobs	+345	+418	+102	-21	-14	0

The total employment impacts shown above are net changes at the industry level. Table E-4-2 shows the changes in employment by industries that are directly impacted by the Proposed Regulation. As the requirements of the Proposed Regulation are implemented, the industries experiencing increases in production costs or increases in final demand would see a reduction in employment growth.

As shown in Section C, the On-Road category, which impacts new cars, light duty trucks and medium duty vehicles bears the highest cost in this proposed rulemaking. These products and industries, such as motor vehicles, are centrally systemic to the functioning of the broader economy. Consequently, there are employment impacts to the industries systemically connected to the impacted industries.

Table E-4-2. Employment Impacts Due to the Proposed Regulation by Primary Industries

		2022	2024	2026	2028	2030	2031
Motor Vehicle Manufacturing (3361)	% Change	0.00%	-0.02%	-0.03%	-0.04%	-0.04%	-0.04%
	Change in Jobs	--1	-3	-6	-7	-8	-8
Motor Vehicle Parts Manufacturing (3363)	% Change	0.00%	-0.01%	-0.02%	-0.02%	-0.02%	-0.02%
	Change in Jobs	0	-1	-2	-2	-3	-3
Other Transportation Equipment Manufacturing (3369)	% Change	0.00%	-0.01%	-0.02%	-0.03%	-0.03%	-0.02%
	Change in Jobs	0	0	0	-1	-1	-1
Engine Manufacturing (3336)	% Change	0.00%	0.00%	-0.01%	-0.01%	-0.01%	-0.01%
	Change in Jobs	0	0	-1	-1	-1	-1
Motor Vehicle Body and Trailer Manufacturing (3362)	% Change	0.00%	-0.01%	-0.02%	-0.03%	-0.03%	-0.02%
	Change in Jobs	0	-1	-2	-2	-2	-2
Automotive Equipment Rental and Leasing (5321)	% Change	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Change in Jobs	+0	+0	-1	-1	-1	--1
Construction (23)	% Change	+0.00%	+0.00%	+0.00%	+0.00%	+0.00%	+0.00%
	Change in Jobs	+39	+39	-20	-39	-25	-15
Wholesale and retail trade (42-45)	% Change	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Change in Jobs	13	-12	-65	-83	-81	-79
Transportation (48)	% Change	-0.00%	-0.00%	-0.00%	-0.00%	-0.00%	-0.00%
	Change in Jobs	+16	+14	-5	-12	-12	-12

b. California Business Impacts

Gross output is used as a measure for business impacts because it represents an industry's sales or receipts and tracks the total quantity of goods or services produced in a given time period. Output growth is the sum of output in each private industry and state and local government as it contributes to California's GSP, and is affected by production cost and demand changes. As production cost increases or demand decreases, output is expected to contract, but as production costs decline or demand increases, industry would likely experience output growth.

The REMI analysis of the Proposed Regulation projects a decrease in statewide output growth of approximately \$16 million in 2026 and a decrease of approximately \$17 million in 2031 or less than 0.01 percent of baseline output for the period of analysis, as shown in Table E-4-3. The trend in output changes is illustrated by major sector in Table E-4-3.

Table E-4-3. Change in California Output Growth by Industry Due to the Proposed Regulation

Year of Anticipated Impacts		2022	2024	2026	2028	2030	2031
California Economy	Output (2018M\$)	4,273,543	4,599,788	4,931,131	5,095,673	5,231,786	5,305,162
	% Change	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Change in output (2018M\$)	+57.99	+67.58	+9.15	-16.04	-17.77	-16.52
State & Local Government	% Change	+0.01%	+0.01%	+0.01%	+0.01%	+0.01%	+0.01%
	Change in output (2018M\$)	+27.92	+48.00	+42.39	+38.97	+38.28	+38.32
3361 Motor Vehicle Manufacturing	% change	0.00%	-0.02%	-0.03%	-0.04%	-0.04%	-0.04%
	Change in output (2018M\$)	-0.72	-3.85	-7.70	-9.51	-10.18	-10.46
3363 Motor Vehicle Parts Manufacturing	% change	-0.00%	-0.01%	-0.02%	-0.02%	-0.02%	-0.02%
	Change in output (2018M\$)	-0.09	--0.60	-1.28	-1.63	-1.72	-1.75
3369 Other Transportation Equipment Manufacturing	% change	0.00%	-0.01%	-0.02%	-0.03%	-0.03%	-0.03%
	Change in output (2018M\$)	-0.05	-0.28	-0.54	-0.63	-0.64	--0.64
3336 Engine Manufacturing	% change	0.00%	0.00%	-0.01%	-0.01%	-0.01%	-0.01%
	Change in output (2018M\$)	-0.03	-0.19	-0.45	-0.64	-0.72	-0.75
3362 Motor Vehicle Body and Trailer manufacturing	% change	0.00%	-0.01%	-0.02%	-0.03%	-0.03%	-0.03%
	Change in output (2018M\$)	-0.04	-0.19	-0.34	-0.37	-0.36	-0.36
5321 Automotive rental and Leasing	% change	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Change in output (2018M\$)	+0.05	-0.04	-0.22	-0.25	-0.24	-0.24
23 Construction	% change	+0.00%	+0.00%	+0.00%	+0.00%	0.00%	0.00%
	Change in output (2018M\$)	+5.71	+5.72	-2.87	-5.83	-3.85	-2.36
	% change	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Year of Anticipated Impacts		2022	2024	2026	2028	2030	2031
43-44 Retail and Wholesale Trade	Change in output (2028M\$)	2.45	-1.15	-10.62	-14.51	-14.89	-14.9

c. Impacts on Investments in California

Private domestic investment consists of purchases of residential and nonresidential structures and of equipment and software by private businesses and nonprofit institutions. It is used as a proxy for impacts on investments in California because it provides an indicator of the future productive capacity of the economy.

The relative changes to growth in private investment for the Proposed Regulation are shown in Table E-4-4 and show a decrease of private investment of approximately \$13 million in 2026 and \$13 million in 2031 or less than 0.02 percent of baseline investment.

Table E-4-4. Change in Gross Domestic Private Investment Growth Due to the Proposed Regulation

Year of Change	2022	2024	2026	2028	2030	2031
Private Investment (2018M\$)	320,692	365,140	421,114	440,243	452,647	458,895
% Change	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Change (2018M\$)	+4.19	+0.60	-12.69	-17.66	-15.33	-13.35

d. Impacts on Individuals in California

The Proposed Regulation would impose some direct costs on individuals in California, by increases in Consumer Prices. However, the costs incurred by affected businesses and increased spending by the public sector would ripple through the economy and affect individuals.

One measure of this impact is the change in real personal income. Table E-4-5 shows annual change in real personal income across all individuals in California. Total personal income growth increases by approximately \$24 million in 2026 and \$10 million in 2031 as a result of the Proposed Regulation, representing less than 0.01 percent of the baseline. Per capita personal income growth decreases by approximately \$0.61 dollars in 2026 and decreases by \$0.26 in 2031.

Table E-4-5. Change in Personal Income Growth Due to the Proposed Regulation

Year of Change	2022	2024	2026	2028	2030	2031
Personal Income (2018M\$)	2,727,348	3,000,967	3,342,232	3,651,081	3,938,735	4,085,162
% Change	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Change (2018M\$)	+31.33	+47.17	+23.95	+10.68	+9.13	+10.05
Personal Income per capita (2018M\$)	69,932	76,948	85,698	93,617	100,993	104,748
% Change	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Change (2018M\$)	0.80	1.21	0.61	0.27	0.23	0.26

e. Impacts on Gross State Product

GSP is the market value of all goods and services produced in California and is one of the primary indicators used to gauge the health of an economy. GSP is one of the variables output by the REMI model, which was utilized to analyze the Proposed Regulation’s impact on California’s economy. Under the Proposed Regulation, GSP growth is anticipated to increase by approximately \$8 million in 2026 and decrease by approximately \$7 million in 2031 as shown in Table E-4-6. These changes do not exceed 0.01 percent of baseline GSP.

Table E-4-6. Change in Gross State Product Due to the Proposed Regulation

Year of Change	2022	2024	2026	2028	2030	2031
GSP (2018M\$)	2,508,636	2,706,746	2,911,072	3,022,932	3,117,421	3,166,160
% Change	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Change (2018M\$)	+33.68	+40.10	+7.72	-6.40	-7.17	-6.36

f. Creation or Elimination of Businesses

Although the REMI model cannot directly estimate the creation or elimination of businesses, the changes in jobs and output for the California economy described above can be used to understand some potential impacts. In this case, the trend of increasing prices and production costs for the impacted industry has a minor negative impact on employment and output.

Gross output is used as a measure for business impacts because it represents an industry's sales or receipts and tracks the quantity of goods or services produced in a given time period. Output growth is the sum of output in each private industry and state and local government as it contributes to California's GSP, and is affected by production cost and demand changes. As production cost increases or demand decreases, output is expected to contract, but as production costs decline or demand increases, industry would likely experience output growth.

The REMI analysis of the Proposed Regulation projects an increase in statewide output growth of approximately \$58 million in 2022 and a decrease of approximately \$16 million in 2031 as shown in Table E-4-3. The trend in output changes is illustrated by major sector in Table E-4-3.

g. Incentives for Innovation

Some zero-emission products and industries to a far lesser extent by the proposed fee structure, per direction from SB 854.

h. Competitive Advantage or Disadvantage

Fees are applied on an equal basis to EOs within a given category, which are required for any entity to make sales of the products in the EO classification in the State of California, regardless of where the company is headquartered. Therefore, there would be no particular advantage given to Californian or non-Californian businesses.

5. Summary and Agency Interpretation of the Assessment Results

The results of the macroeconomic analysis of the Proposed Regulation are summarized in Table E-5-1. From the perspective of the California economy, the change in the growth of jobs, state GSP, and output is projected to not exceed 0.01 percent of the baseline. The Proposed Regulation shows some slight decreases in growth in the affected industries and employment. As shown in Table E-5-1, CARB estimates that the Proposed Regulation is unlikely to have a significant impact on the economy of California.

Table E-5-1. Summary of Macroeconomic Impacts of the Proposed Regulation

	Year of Change	2022	2024	2026	2028	2030	2031
GSP	% Change	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Change (2018M\$)	+33.68	+40.10	+7.72	-6.40	-7.17	-6.36
Personal Income	% Change	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Change (2018M\$)	+31.33	+47.17	+23.95	+10.68	+9.13	+10.05
Employment	% Change	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Change in Jobs	+345	+418	+102	-21	-14	0
Output	% Change	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Change (2018M\$)	+57.99	+67.58	+9.15	-16.04	-17.77	-16.52
Private Investment	% Change	-0.01%	-0.01%	-0.01%	0.00%	0.00%	0.00%
	Change (2018M\$)	+4.19	+0.60	-12.69	-17.66	-15.33	-13.35

F. ALTERNATIVES TO THE PROPOSED REGULATION

1. Alternative 1 – Set Fee Equal to Total Cost: Do Not Provide Discounts

Alternative 1 would establish fees that are equal to 100 percent of certification and compliance costs to CARB. This alternative was selected to maximize the fiscal savings to the State, which would eliminate the need for additional funding to be diverted from other sources to cover the cost of CARB’s certification and compliance activities.

Currently for FY 2019-20 & FY 2020-21, CARB collected a little more than \$10 million per year for ongoing compliance efforts in the newly established Certification and Compliance Fund (CCF). Total compliance efforts, department-wide, have been estimated by CARB at approximately \$50 million. Staff evaluated assessing fees to cover the total cost of the program implementation of each category with no fee discounts.

a. Costs

Under Alternative 1, the total fees collected for all mobile source categories would be \$130,127,617 higher over the 2022 through 2031 timeframe than will be collected under the proposed regulation. When a 5 percent financing cost is added for purchases by businesses and individuals, the total added cost of Alternative 1 compared to the proposed regulation is \$136,539,291. These costs are broken down per year in Tables F-1-1 and F-1-2.

Table F-1-1. Total Fees Collected Under Alternative 1 Compared to Total Fees Collected Under Proposed Regulation

Year	Total Fees for Alternative 1	Total Fees for Proposed Regulation	Additional Total Fees Collected Under Alternative 1 compared to Proposed Regulation
2022	\$49,636,366	\$22,068,547	\$27,567,819
2023	\$50,680,751	\$32,104,473	\$18,576,279
2024	\$51,754,380	\$41,732,765	\$10,021,615
2025	\$52,689,411	\$42,507,966	\$10,181,445
2026	\$53,739,675	\$43,415,660	\$10,324,016
2027	\$54,821,450	\$44,350,449	\$10,471,000
2028	\$55,955,770	\$45,322,355	\$10,633,416
2029	\$57,188,234	\$46,382,766	\$10,805,468
2030	\$58,455,339	\$47,472,992	\$10,982,347
2031	\$59,757,924	\$48,593,744	\$11,164,180
TOTAL	\$544,679,301	\$413,951,717	\$130,727,584

Table F-1-2. Total Cost of Alternative 1 Compared to Total Cost of Proposed Regulation¹

Year	Total Cost of Alternative 1	Total Cost of Proposed Regulation	Additional Total Cost of Alternative 1 compared to Proposed Regulation ¹	Amortized Costs of Alternative 1 compared to BAU
2022	\$52,141,974	\$23,180,180	\$28,961,794	\$12,043,482
2023	\$53,241,715	\$33,732,504	\$19,509,211	\$24,340,976
2024	\$54,370,238	\$43,855,334	\$10,514,904	\$36,899,131
2025	\$55,353,268	\$44,670,703	\$10,682,565	\$49,684,341
2026	\$56,457,326	\$45,625,229	\$10,832,097	\$62,724,560
2027	\$57,594,236	\$46,607,995	\$10,986,240	\$63,983,896
2028	\$58,789,978	\$47,633,120	\$11,156,858	\$65,265,404
2029	\$60,085,593	\$48,748,250	\$11,337,343	\$66,585,507
2030	\$61,417,485	\$49,894,603	\$11,522,881	\$67,986,189
2031	\$62,786,670	\$51,073,055	\$11,713,615	\$69,448,108
TOTAL	\$572,238,483	\$435,020,973	\$137,217,509	(\$518,961,594)

¹ Total Cost = Total Fees plus 5% financing for businesses and individuals.

i. Total Costs for Compliance with Certification Requirements for On-Road Vehicles and Equipment for Alternative 1

Table F-1-3 shows the total fees by category for on-road vehicles and equipment under Alternative 1. Table F-1-4 shows the fee per unit for on-road vehicles and equipment under Alternative 1. Table F-1-5 shows the total fee per year for on-road vehicles and equipment under Alternative 1 compared to the proposed regulation. Table F-1-6

shows the total cost per year for on-road vehicles and equipment under Alternative 1 compared to the proposed regulation.

Table F-1-3. Total Fees for On-Road Category for Alternative 1

Year	PC, LDT, MDV	HDV - gasoline	HDV – not gasoline	HDV - ZEP Cert	HD ZEV – not ZEP Cert	HD Trailer	HD - exempt	Fuel-fired Heaters	Motorcycles
2022	\$22,649,847	\$1,857,466	\$7,101,040	\$351,888	\$744,251	\$562,800	\$1,464	\$586	\$4,030,151
2023	\$23,284,043	\$1,909,475	\$7,299,869	\$361,741	\$765,090	\$578,558	\$1,505	\$602	\$4,142,995
2024	\$23,935,996	\$1,962,940	\$7,504,266	\$371,869	\$786,513	\$594,758	\$1,547	\$619	\$4,258,999
2025	\$24,606,204	\$2,017,903	\$7,714,385	\$382,282	\$808,535	\$611,411	\$1,590	\$636	\$4,378,251
2026	\$25,295,178	\$2,074,404	\$7,930,388	\$392,986	\$831,174	\$628,531	\$1,635	\$654	\$4,500,842
2027	\$26,003,443	\$2,132,487	\$8,152,439	\$403,989	\$854,447	\$646,130	\$1,681	\$672	\$4,626,865
2028	\$26,731,539	\$2,192,197	\$8,380,707	\$415,301	\$878,371	\$664,221	\$1,728	\$691	\$4,756,418
2029	\$27,480,022	\$2,253,578	\$8,615,367	\$426,929	\$902,966	\$682,819	\$1,776	\$710	\$4,889,597
2030	\$28,249,463	\$2,316,679	\$8,856,597	\$438,883	\$928,249	\$701,938	\$1,826	\$730	\$5,026,506
2031	\$29,040,448	\$2,381,546	\$9,104,582	\$451,172	\$954,240	\$721,593	\$1,877	\$751	\$5,167,248

Table F-1-4. Fee per Unit for On-Road Category for Alternative 1

Year	PC, LDT, MDV	HDV - gasoline	HDV – not gasoline	HDV – ZEP Cert	HD ZEV – not ZEP Cert	HD Trailer	HD - exempt	Fuel-fired Heaters	Motorcycles
2022	\$12.72	\$228.48	\$189.32	\$3,258.22	\$33.83	\$79.99	\$97.60	\$0.01	\$117.12
2023	\$12.92	\$229.37	\$190.06	\$3,014.51	\$34.78	\$80.62	\$100.33	\$0.01	\$118.97
2024	\$13.12	\$230.26	\$190.80	\$2,817.19	\$35.75	\$81.25	\$103.14	\$0.01	\$120.85
2025	\$13.33	\$231.16	\$191.54	\$2,654.73	\$36.75	\$81.89	\$106.03	\$0.01	\$122.76
2026	\$13.54	\$232.07	\$192.29	\$2,519.14	\$37.78	\$82.53	\$109.00	\$0.02	\$124.70
2027	\$13.76	\$232.97	\$193.04	\$2,404.70	\$38.84	\$83.18	\$112.05	\$0.02	\$126.67
2028	\$13.97	\$233.88	\$193.80	\$2,307.23	\$39.93	\$83.83	\$115.19	\$0.02	\$128.68
2029	\$14.20	\$234.80	\$194.55	\$2,223.59	\$41.04	\$84.49	\$118.41	\$0.02	\$130.71
2030	\$14.42	\$235.71	\$195.31	\$2,151.39	\$42.19	\$85.15	\$121.73	\$0.02	\$132.78
2031	\$14.65	\$236.64	\$196.08	\$2,088.76	\$43.37	\$85.82	\$125.14	\$0.02	\$134.88

Table F-1-5. Total Fees Collected Under Alternative 1 Compared to Total Fees Collected Under Proposed Regulation for On-Road Vehicles and Equipment

Year	Alternative 1 On-road Total Fees	Total On-Road Fees for Proposed Regulation	Additional On-Road Total Fees Collected Under Alternative 1 compared to Proposed Regulation
2022	\$37,299,493	\$17,209,641	\$20,089,852
2023	\$38,343,878	\$25,766,660	\$12,577,219
2024	\$39,417,507	\$33,915,080	\$5,502,427
2025	\$40,521,197	\$34,864,702	\$5,656,495
2026	\$41,655,791	\$35,840,914	\$5,814,877
2027	\$42,822,153	\$36,844,460	\$5,977,693
2028	\$44,021,173	\$37,876,104	\$6,145,069
2029	\$45,253,766	\$38,936,635	\$6,317,131
2030	\$46,520,872	\$40,026,861	\$6,494,010
2031	\$47,823,456	\$41,147,613	\$6,675,843

Year	Alternative 1 On-road Total Fees	Total On-Road Fees for Proposed Regulation	Additional On-Road Total Fees Collected Under Alternative 1 compared to Proposed Regulation
TOTAL	\$423,679,286	\$342,428,671	\$81,250,615

Table F-1-6. Total Cost of Alternative 1 Compared to Total Cost of Proposed Regulation for On-Road Vehicles and Equipment¹

Year	Total On-Road Cost of Alternative 1	Total On-Road Cost of Proposed Regulation	Additional On-Road Total Cost of Alternative 1 compared to Proposed Regulation
2022	\$39,206,598	\$18,094,576	\$21,112,022
2023	\$40,304,383	\$27,092,372	\$13,212,011
2024	\$41,432,905	\$35,661,118	\$5,771,788
2025	\$42,593,027	\$36,659,629	\$5,933,398
2026	\$43,785,632	\$37,686,099	\$6,099,533
2027	\$45,011,629	\$38,741,310	\$6,270,320
2028	\$46,271,955	\$39,826,066	\$6,445,889
2029	\$47,567,570	\$40,941,196	\$6,626,374
2030	\$48,899,462	\$42,087,550	\$6,811,912
2031	\$50,268,646	\$43,266,001	\$7,002,646
TOTAL	\$445,341,806	\$360,055,915	\$85,285,890

¹ Total Cost = Total Fees plus 5% financing for businesses and individuals.

ii. Total Costs for Compliance with Certification Requirements for Off-Road Mobile Sources for Alternative 1

Table F-1-7 shows the total fees by category for off-road vehicles and equipment under Alternative 1. Table F-1-8 shows the fee per unit for off-road vehicles and equipment under Alternative 1. Table F-1-9 shows the total fee per year for off-road vehicles and equipment under Alternative 1 compared to the proposed regulation. Table F-1-10 shows the total cost per year for off-road vehicles and equipment under Alternative 1 compared to the proposed regulation.

Table F-1-7. Total Fees for Off-Road Vehicles and Equipment by Category for Alternative 1

Year	OHRV	Electric Golf Carts	LSI Equipment	SORE Equipment	SI Marine	CI Equipment	Portable Fuel Containers
2022	\$721,551	\$13,466	\$282,608	\$3,046,161	\$394,225	\$1,557,224	\$61,441
2023	\$721,551	\$13,466	\$282,608	\$3,046,161	\$394,225	\$1,557,224	\$61,441
2024	\$721,551	\$13,466	\$282,608	\$3,046,161	\$394,225	\$1,557,224	\$61,441
2025	\$721,551	\$13,466	\$282,608	\$3,046,161	\$394,225	\$1,557,224	\$61,441
2026	\$721,551	\$13,466	\$282,608	\$3,046,161	\$394,225	\$1,557,224	\$61,441
2027	\$721,551	\$13,466	\$282,608	\$3,046,161	\$394,225	\$1,557,224	\$61,441
2028	\$721,551	\$13,466	\$282,608	\$3,046,161	\$394,225	\$1,557,224	\$61,441

Year	OHRV	Electric Golf Carts	LSI Equipment	SORE Equipment	SI Marine	CI Equipment	Portable Fuel Containers
2029	\$721,551	\$13,466	\$282,608	\$3,046,161	\$394,225	\$1,557,224	\$61,441
2030	\$721,551	\$13,466	\$282,608	\$3,046,161	\$394,225	\$1,557,224	\$61,441
2031	\$721,551	\$13,466	\$282,608	\$3,046,161	\$394,225	\$1,557,224	\$61,441

Table F-1-8. Fee per Unit for Off-Road Vehicles and Equipment for Alternative 1

Year	OHRV	Electric Golf Carts	LSI Equipment	SORE Equipment	SI Marine	CI Equipment	Portable Fuel Containers
2022	\$6.74	\$0.69	\$13.82	\$0.77	\$15.04	\$13.07	\$0.05
2023	\$6.62	\$0.69	\$13.71	\$0.76	\$14.87	\$13.00	\$0.05
2024	\$6.50	\$0.69	\$13.60	\$0.76	\$14.70	\$12.94	\$0.05
2025	\$6.38	\$0.69	\$13.49	\$0.75	\$14.53	\$12.87	\$0.05
2026	\$6.27	\$0.69	\$13.38	\$0.75	\$14.36	\$12.81	\$0.05
2027	\$6.15	\$0.69	\$13.27	\$0.74	\$14.20	\$12.75	\$0.05
2028	\$6.04	\$0.69	\$13.16	\$0.74	\$14.04	\$12.68	\$0.05
2029	\$5.93	\$0.69	\$13.06	\$0.73	\$13.88	\$12.62	\$0.05
2030	\$5.82	\$0.69	\$12.95	\$0.73	\$13.72	\$12.56	\$0.05
2031	\$5.71	\$0.69	\$12.85	\$0.73	\$13.56	\$12.49	\$0.05

Table F-1-9. Total Fees Collected Under Alternative 1 Compared to Total Fees Collected Under Proposed Regulation for Off-Road Vehicles and Equipment

Year	Alternative 1 Off-road Total Fees	Total Off-Road Fees for Proposed Regulation	Additional Off-Road Total Fees Collected Under Alternative 1 compared to Proposed Regulation
2022	\$6,049,154	\$2,989,754	\$3,059,400
2023	\$6,049,154	\$4,238,205	\$1,810,950
2024	\$6,049,154	\$5,486,656	\$562,499
2025	\$6,049,154	\$5,486,656	\$562,499
2026	\$6,049,154	\$5,486,656	\$562,499
2027	\$6,049,154	\$5,486,656	\$562,499
2028	\$6,049,154	\$5,486,656	\$562,499
2029	\$6,049,154	\$5,486,656	\$562,499
2030	\$6,049,154	\$5,486,656	\$562,499
2031	\$6,049,154	\$5,486,656	\$562,499
TOTAL	\$60,491,543	\$51,121,203	\$9,370,340

Table F-1-10. Total Cost of Alternative 1 Compared to Total Cost of Proposed Regulation for Off-Road Vehicles and Equipment¹

Year	Total Off-Road Cost of Alternative 1	Total Off-Road Cost of Proposed Regulation	Additional Off-Road Total Cost of Alternative 1 compared to Proposed Regulation
2022	\$6,359,590	\$3,143,062	\$3,216,528
2023	\$6,359,590	\$4,455,765	\$1,903,824
2024	\$6,359,590	\$5,768,468	\$591,121
2025	\$6,359,590	\$5,768,468	\$591,121
2026	\$6,359,590	\$5,768,468	\$591,121
2027	\$6,359,590	\$5,768,468	\$591,121
2028	\$6,359,590	\$5,768,468	\$591,121
2029	\$6,359,590	\$5,768,468	\$591,121
2030	\$6,359,590	\$5,768,468	\$591,121
2031	\$6,359,590	\$5,768,468	\$591,121
TOTAL	\$63,595,895	\$53,746,575	\$9,849,321

¹ Total Cost = Total Fees plus 5% financing for businesses and individuals.

iii. Total Costs for Compliance with Certification Requirements for Aftermarket Parts for Alternative 1

Table F-1-11 shows the total fee by category for aftermarket parts under Alternative 1. Table F-1-12 shows the fee per unit for aftermarket parts under Alternative 1. Table F-1-13 shows the total fee per year for aftermarket parts under Alternative 1 compared to the proposed regulation. Table F-1-14 shows the total cost per year for aftermarket parts under Alternative 1 compared to the proposed regulation.

Table F-1-11. Total Fees for Aftermarket Parts by Category for Alternative 1

Year	Experimental Permits	Fuel Tanks	Alt. Fuel Retrofits	Perf. Parts	Cat. Conv. & DPF	Motorcycle AMP
2022	\$112,050	\$304,937	\$575,477	\$3,091,197	\$481,126	\$240,563
2023	\$112,050	\$304,937	\$575,477	\$3,091,197	\$481,126	\$240,563
2024	\$112,050	\$304,937	\$575,477	\$3,091,197	\$481,126	\$240,563
2025	\$112,050	\$304,937	\$575,477	\$3,091,197	\$481,126	\$240,563
2026	\$112,050	\$304,937	\$575,477	\$3,091,197	\$481,126	\$240,563
2027	\$112,050	\$304,937	\$575,477	\$3,091,197	\$481,126	\$240,563
2028	\$112,050	\$304,937	\$575,477	\$3,091,197	\$481,126	\$240,563
2029	\$112,050	\$304,937	\$575,477	\$3,091,197	\$481,126	\$240,563
2030	\$112,050	\$304,937	\$575,477	\$3,091,197	\$481,126	\$240,563
2031	\$112,050	\$304,937	\$575,477	\$3,091,197	\$481,126	\$240,563

Table F-1-12. Fee per Unit for Aftermarket Parts for Alternative 1

Year	Experimental Permits	Fuel Tanks	Alt. Fuel Retrofits	Perf. Parts	Cat. Conv. & DPF	Motorcycle AMP
2022	\$1,778.57	\$98.45	\$799.27	\$2.58	\$1.52	\$370.67
2023	\$1,778.57	\$85.61	\$799.27	\$2.58	\$1.52	\$370.67
2024	\$1,778.57	\$74.44	\$799.27	\$2.58	\$1.52	\$370.67
2025	\$1,778.57	\$64.73	\$799.27	\$2.58	\$1.52	\$370.67
2026	\$1,778.57	\$56.29	\$799.27	\$2.58	\$1.52	\$370.67
2027	\$1,778.57	\$48.95	\$799.27	\$2.58	\$1.52	\$370.67
2028	\$1,778.57	\$42.56	\$799.27	\$2.58	\$1.52	\$370.67
2029	\$1,778.57	\$37.01	\$799.27	\$2.58	\$1.52	\$370.67
2030	\$1,778.57	\$32.18	\$799.27	\$2.58	\$1.52	\$370.67
2031	\$1,778.57	\$27.98	\$799.27	\$2.58	\$1.52	\$370.67

Table F-1-13. Total Fees Collected Under Alternative 1 Compared to Total Fees Collected Under Proposed Regulation for Aftermarket Parts

Year	Alternative 1 Aftermarket Parts Total Fees	Total Aftermarket Parts Fees for Proposed Regulation	Additional Aftermarket Parts Total Fees Collected Under Alternative 1 compared to Proposed Regulation
2022	\$4,805,349	\$857,826	\$3,947,523
2023	\$4,805,349	\$887,799	\$3,917,551
2024	\$4,805,349	\$917,771	\$3,887,578
2025	\$4,805,349	\$917,771	\$3,887,578
2026	\$4,805,349	\$917,771	\$3,887,578
2027	\$4,805,349	\$917,771	\$3,887,578
2028	\$4,805,349	\$917,771	\$3,887,578
2029	\$4,805,349	\$917,771	\$3,887,578
2030	\$4,805,349	\$917,771	\$3,887,578
2031	\$4,805,349	\$917,771	\$3,887,578
TOTAL	\$48,053,494	\$9,087,796	\$38,965,698

Table F-1-14. Total Cost of Alternative 1 Compared to Total Cost of Proposed Regulation for Aftermarket Parts¹

Year	Total Aftermarket Parts Cost of Alternative 1	Total Aftermarket Parts Cost of Proposed Regulation	Additional Aftermarket Parts Total Cost of Alternative 1 compared to Proposed Regulation
2022	\$5,035,745	\$892,304	\$4,143,442
2023	\$5,035,745	\$923,775	\$4,111,970
2024	\$5,035,745	\$955,246	\$4,080,499
2025	\$5,035,745	\$955,246	\$4,080,499
2026	\$5,035,745	\$955,246	\$4,080,499
2027	\$5,035,745	\$955,246	\$4,080,499
2028	\$5,035,745	\$955,246	\$4,080,499
2029	\$5,035,745	\$955,246	\$4,080,499
2030	\$5,035,745	\$955,246	\$4,080,499
2031	\$5,035,745	\$955,246	\$4,080,499
TOTAL	\$50,357,453	\$9,458,050	\$40,899,402

¹ Total Cost = Total Fees plus 5% financing for businesses and individuals.

iv. Total Costs for Compliance with Certification Requirements for Retrofits for Alternative 1

Table F-1-15 shows the total fees by category for retrofits under Alternative 1. Table F-1-16 shows the fee per unit for retrofits under Alternative 1. Table F-1-17 shows the total fee per year for retrofits under Alternative 1 compared to the proposed regulation. Table F-1-18 shows the total cost per year for retrofits under Alternative 1 compared to the proposed regulation.

Table F-1-15. Total Fees for Retrofits by Category for Alternative 1

Year	CHC	Stationary CI	APU	TRU	RTG	On-Road	Off-Road	Locomotive
2022	\$0	\$135,307	\$264,896	\$414,813	\$635	\$6,352	\$79,405	\$368,688
2023	\$165,818	\$117,777	\$215,408	\$337,318	\$517	\$0	\$64,571	\$368,688
2024	\$165,818	\$117,777	\$215,408	\$337,318	\$517	\$0	\$64,571	\$368,688
2025	\$165,818	\$117,777	\$215,408	\$168,659	\$517	\$0	\$64,571	\$368,688
2026	\$165,818	\$117,777	\$215,408	\$84,329	\$517	\$0	\$64,571	\$368,688
2027	\$165,818	\$117,777	\$215,408	\$0	\$258	\$0	\$64,571	\$368,688
2028	\$165,818	\$117,777	\$215,408	\$0	\$129	\$0	\$0	\$368,688
2029	\$165,818	\$117,777	\$215,408	\$0	\$0	\$0	\$0	\$368,688
2030	\$165,818	\$117,777	\$215,408	\$0	\$0	\$0	\$0	\$368,688
2031	\$165,818	\$117,777	\$215,408	\$0	\$0	\$0	\$0	\$368,688

Table F-1-16. Fee per Unit for Retrofits for Alternative 1

Year	CHC	Stationary CI	APU	TRU	RTG	On-Road	Off-Road	Locomotive
2022	\$0.00	\$635.24	\$635.24	\$635.24	\$635.24	\$635.24	\$635.24	\$24,579.41
2023	\$516.57	\$516.57	\$516.57	\$516.57	\$516.57	\$0.00	\$516.57	\$24,579.41
2024	\$516.57	\$486.68	\$516.57	\$516.57	\$516.57	\$0.00	\$516.57	\$24,579.41
2025	\$516.57	\$460.07	\$516.57	\$0.00	\$516.57	\$0.00	\$516.57	\$24,579.41
2026	\$516.57	\$434.60	\$516.57	\$0.00	\$516.57	\$0.00	\$516.57	\$24,579.41
2027	\$516.57	\$413.25	\$516.57	\$0.00	\$0.00	\$0.00	\$516.57	\$24,579.41
2028	\$516.57	\$393.90	\$516.57	\$0.00	\$0.00	\$0.00	\$0.00	\$24,579.41
2029	\$516.57	\$375.09	\$516.57	\$0.00	\$0.00	\$0.00	\$0.00	\$24,579.41
2030	\$516.57	\$359.08	\$516.57	\$0.00	\$0.00	\$0.00	\$0.00	\$24,579.41
2031	\$516.57	\$344.38	\$516.57	\$0.00	\$0.00	\$0.00	\$0.00	\$24,579.41

Table F-1-17. Total Fees Collected Under Alternative 1 Compared to Total Fees Collected Under Proposed Regulation for Retrofits

Year	Alternative 1 Retrofit Total Fees	Total Retrofit Fees for Proposed Regulation	Additional Retrofit Total Fees Collected Under Alternative 1 compared to Proposed Regulation
2022	\$1,270,099	\$816,832	\$453,267
2023	\$1,270,099	\$1,008,427	\$261,672
2024	\$1,270,099	\$1,200,988	\$69,111
2025	\$1,101,440	\$1,026,567	\$74,874
2026	\$1,017,111	\$958,049	\$59,062
2027	\$932,523	\$889,293	\$43,230
2028	\$867,823	\$829,553	\$38,270
2029	\$867,694	\$829,434	\$38,260
2030	\$867,694	\$829,434	\$38,260
2031	\$867,694	\$829,434	\$38,260
TOTAL	\$10,332,278	\$9,218,012	\$1,114,266

Table F-1-18. Total Cost of Alternative 1 Compared to Total Cost of Proposed Regulation for Retrofits ¹

Year	Total Retrofit Cost of Alternative 1	Total Retrofit Cost of Proposed Regulation	Additional Retrofit Total Cost of Alternative 1 compared to Proposed Regulation
2022	\$1,317,688	\$846,506	\$471,182
2023	\$1,319,645	\$1,047,550	\$272,095
2024	\$1,319,645	\$1,248,149	\$71,496
2025	\$1,142,553	\$1,065,006	\$77,547
2026	\$1,054,007	\$993,063	\$60,945
2027	\$964,919	\$920,618	\$44,301
2028	\$900,336	\$860,986	\$39,349
2029	\$900,336	\$860,986	\$39,349
2030	\$900,336	\$860,986	\$39,349
2031	\$900,336	\$860,986	\$39,349
TOTAL	\$10,719,800	\$9,564,836	\$1,154,964

¹ Total Cost = Total Fees plus 5% financing for businesses and individuals.

v. Total Costs for Compliance with Certification Requirements for At-Berth Technology for Alternative 1

Table F-1-19 shows the fee per visit for At-Berth technology under Alternative 1. Table F-1-20 shows the total fee per year for At-Berth technology under Alternative 1 compared to the proposed regulation. Table F-1-21 shows the total cost per year for At-Berth technology under Alternative 1 compared to the proposed regulation.

Table F-1-19. Fee per Visit, Total Fees, and Total Cost of Alternative 1 for At-Berth Technology

Year	Fee per Visit	Total Fees	Total Cost of Proposed Regulation ¹
2022	\$147.89	\$212,270	\$222,353
2023	\$147.89	\$212,270	\$222,353
2024	\$147.89	\$212,270	\$222,353
2025	\$147.89	\$212,270	\$222,353
2026	\$147.89	\$212,270	\$222,353
2027	\$147.89	\$212,270	\$222,353
2028	\$147.89	\$212,270	\$222,353
2029	\$147.89	\$212,270	\$222,353
2030	\$147.89	\$212,270	\$222,353
2031	\$147.89	\$212,270	\$222,353

¹ Total Cost = Total Fees plus 5% financing for businesses and individuals.

Table F-1-20. Total Fees Collected Under Alternative 1 Compared to Total Fees Collected Under Proposed Regulation for At-Berth Technology

Year	Alternative 1 At-Berth Total Fees	Total At-Berth Fees for Proposed Regulation	Additional At-Berth Total Fees Collected Under Alternative 1 compared to Proposed Regulation
2022	\$212,270	\$194,494	\$17,776
2023	\$212,270	\$203,382	\$8,888
2024	\$212,270	\$212,270	\$0
2025	\$212,270	\$212,270	\$0
2026	\$212,270	\$212,270	\$0
2027	\$212,270	\$212,270	\$0
2028	\$212,270	\$212,270	\$0
2029	\$212,270	\$212,270	\$0
2030	\$212,270	\$212,270	\$0
2031	\$212,270	\$212,270	\$0
TOTAL	\$2,122,700	\$2,096,035	\$26,665

Table F-1-21. Total Cost of At-Berth Technology Compared to Total Cost of Proposed Regulation for At-Berth Technology ¹

Year	Total At-Berth Cost of Alternative 1	Total At-Berth Cost of Proposed Regulation	Additional At-Berth Cost of Alternative 1 compared to Proposed Regulation
2022	\$222,353	\$203,733	\$18,620
2023	\$222,353	\$213,043	\$9,310
2024	\$222,353	\$222,353	\$0
2025	\$222,353	\$222,353	\$0
2026	\$222,353	\$222,353	\$0
2027	\$222,353	\$222,353	\$0
2028	\$222,353	\$222,353	\$0
2029	\$222,353	\$222,353	\$0
2030	\$222,353	\$222,353	\$0
2031	\$222,353	\$222,353	\$0
TOTAL	\$2,223,528	\$2,195,596	\$27,932

¹ Total Cost = Total Fees plus 5% financing for businesses and individuals.

b. Benefits

The benefit of Alternative 1 is that the total mobile source certification fees collected from manufacturers would equal the total cost to CARB for certification and compliance activities. As shown in Table F-1-1, this Alternative would generate revenue to the State of \$130,727,584 over the 2022-2031 timeframe. As there are no emission benefits accrued under this alternative, there are no benefits besides fiscal revenue.

c. Economic Impacts

Alternative 1 would impose the same standards as the Proposed Regulation but with greater scope in collecting fees compared to the Proposed Regulation. The larger scope of collecting fees would increase the total revenue or fiscal revenue of the government of California during the 2022 through 2031 time period. Table F-1-22 shows the impact on select macroeconomic indicators in the economy. The analysis of Alternative 1 shows that the major macroeconomic indicators would increase from 2022 to 2024 and decrease from 2026 to 2031. The economic impacts of Alternative 1 are greater compared with the Proposed Rulemaking and Alternative 2 during the period of analysis. Overall, Alternative 1 would have greater impacts to the Californian economy than the impacts of Alternative 2 and the Proposed Regulation.

Table F-1-22. Summary of Macroeconomic Impacts of the Alternative 1

	Year of Change	2022	2024	2026	2028	2030	2031
GSP	% Change	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Change (2018M\$)	+74	+29	-22	-31	-48	-55
Personal Income	% Change	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Change (2018M\$)	+69	+43	-116.61	-11	-30	-37
Employment	% Change	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Change in Jobs	+759	+313	-163	-220	-341	-381
Output	% Change	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Change (2018M\$)	+126.93	+44.08	-47.48	-63.37	-63.37	-110.47
Private Investment	% Change	+0.00%	+0.00%	-0.01%	-0.01%	-0.01%	-0.01%
	Change (2018M\$)	+8.46	-8.87	--31.12	-31.93	-32.64	--32.56

d. Cost-Effectiveness

Neither this proposed regulation nor either of the Alternatives (Alternative 1 and Alternative 2) change the stringency of current emission standards, have emission impacts nor do any of these create new emission standards. Therefore, this assessment is not applicable to this proposed regulation or to either of the Alternatives.

e. Reason for Rejecting

On June 27, 2018, new legislation (SB 854) was passed by the legislature and signed by the Governor, which allows CARB to adopt a schedule of fees to cover all or part of CARB’s reasonable costs associated with certification, audit, and compliance of off-road or non-vehicular engines and equipment, aftermarket parts, and emission control components sold in the State (limited to activities covered by HSC sections 38560, 43013 and 43018, on-road aftermarket parts under Vehicle Code section 27156(h)). This legislation provides CARB the authority to assess fees to cover their reasonable costs on all off-road and other mobile sources programs not currently covered under the existing fee regulation authority (HSC 43019). SB 854 provided criteria to consider when determining the fee. When assessing a fee, SB 854 states that CARB shall work with impacted industries and consider all of the following:

- Potential impacts on manufacturers that may result from the fee.

- Size of the manufacturer compared to the industry average served by the product on which the fee will be assessed.
- Number of certifications requested and consistency with prior year certifications by the manufacturer.
- Complexity of the regulated category for which a certification is requested.
- A product's potential impact on emissions, and the complexity of the evaluation required, including, for an aftermarket part, determining there is no risk to the environment when the aftermarket part is in actual use.
- Anticipated change in the number of certifications issued annually.
- Potential impacts for enacting a partial fee that does not fully cover the state board's costs for activities associated with certification, including the impacts on the processing time for certification.

CARB's fee proposed regulation has been discussed with the industry through the workshop process to fund up to about \$50 million of these programs with the new Certification and Compliance Fund. This is an achievement for the department because this regulatory effort has been historically funded through existing funding (which currently includes only about \$10 million in fees). Although we may not have a 100% (full-cost) recovery at the time, this is what CARB reasonably expects that the market can bear based on their feedback from industry and staff's analysis. CARB will strive for getting this program to as close to net-zero (fees collected equal program costs) as possible in the future through planning and development of our existing and future programs, without compromising the current or future level of operations.

CARB rejects Alternative 1 because it does not adequately consider the potential impacts on manufacturers, especially California's small business, as required by statute (listed above). Alternative 1 does not take into consideration the impact of fees for products that have cleaner emissions and zero emissions, less complex certification and compliance requirements and reviews, and the impact on affected businesses. Alternative 1 does not mitigate manufacturer impacts due to price competition in the market or low product sales volume or cost. Manufacturers stated they would be forced to absorb the cost of the fee (not pass the cost to the consumer) and may limit product offerings in California. This could lead to the increased use of older products and deterioration of CARB's emission goals.

2. Alternative 2 – Adopt Same Fees as U.S. EPA

Alternative 2 would align CARB's certification fees and fee structure with that currently used by U.S. EPA.²⁶ This Alternative was selected based on suggestion from the regulated

²⁶ https://iaspub.epa.gov/otaqpub/display_file.jsp?docid=46428&flag=1

industry. Currently, U.S. EPA has fees for certification of on-road light-duty vehicles, heavy-duty vehicles, motorcycles, off-road motorcycles, forklifts, off-road engines, marine watercraft, and evaporative components (Table F-2-1). Although aftermarket parts are sold nationally, U.S. EPA does not certify them and thus does not charge certification fees for this mobile source category. There are also no federal certification fees for either Retrofits or At-Berth Technology, since these categories only apply to emission control technologies that are sold to meet the requirements of California-specific regulations.

Table F-2-1. U.S. EPA and Proposed CARB Fees (\$/Application)

EO Series	U.S. EPA	Proposed Application Fee				
		New	Partial Carry Over ²⁷	Carry over ²⁸	Small Volume CA sales Manufacturer	Zero-Emission
On-Road						
A(LD)/P	\$27,347	\$46,509	\$23,254	\$11,627		\$11,627
A (HD engine)	\$56,299	\$121,265	\$60,632	\$30,316		
A (HD Evaporative vehicle)	\$563	\$14,935		\$3,734		
A (HD GHG Vehicle)		\$17,720		\$4,430	\$8,860	\$4,430
AT/AD (GHG Trailer/Aero)		\$3,936				
Zero-Emission Powertrain		\$3,936				
N (exempt engine)		\$98				
Fuel-fire Heaters		\$293				
M	\$1,852	\$17,447	\$8,723	\$4,362	\$13,085	
Off-Road						
U-G						\$842
U-L: Exhaust	\$563	\$4,511	\$2,255	\$1,128	\$3,383	
U-L: Evaporative	\$397	\$1,099	\$550	\$275	\$825	
U-M	\$563	\$2,988	\$1,494	\$747	\$2,241	\$747

²⁷ Partial Carry Over refers to a certification application submitted that is similar to an application submitted in the previous model year with only minor updates.

²⁸ Carry Over refers to a certification application submitted that is the same as an application submitted in the previous model year with model year differences.

EO Series	U.S. EPA	Proposed Application Fee				
		New	Partial Carry Over ²⁷	Carry over ²⁸	Small Volume CA sales Manufacturer	Zero-Emission
U-R	\$2940	\$4,153	\$2,076	\$1,038		
U-U: Exhaust	\$563	\$2,603	\$1,301	\$651		\$651
U-U: Evaporative	\$397	\$1,212	\$606	\$303		
U-W: Exhaust	\$563	\$1,043	\$522	\$261	\$782	
U-W Evaporative	\$397					
Evaporative Components			No Change Renewal	Adding Models		
G		\$6,827	\$1,707	\$1,707		
Q	\$397	\$4,753	\$1,188	\$1,188		
RM	\$397	\$917		\$229		
Aftermarket Parts		New	Category 1 or Carry over	Small Business	Zero-Emission	
B		\$23,978		\$17,984	\$5,995	
C		\$195				
D and F		\$2,000	\$500	\$1,000		
Dcat/dpf and K		\$10,000	\$2,500	\$5,000		
Dft		\$2,000	\$500	\$1,000		
Retrofits		Initial Application Fee	Final Application Fee	EO Fee, Implementation and Warranty	In-Use Fee	Extension Fee
DE Series		\$48,075	\$24,038	\$24,038	\$36,056	\$24,038
Small Business		\$36,056	\$18,028	\$18,028	\$27,042	\$18,028
		Initial Application	Final Verification Letter			
Locomotive		\$18,434	\$73,738			
		Test Plan review	Application Fee	CEMS review	Design Change fee	Minor Amendment
At-Berth		\$10,158	\$25,394	\$254	\$10,158	\$2,032

EO Series	U.S. EPA	Proposed Application Fee				
		New	Partial Carry Over ²⁷	Carry over ²⁸	Small Volume CA sales Manufacturer	Zero-Emission
Small business		\$7,618	\$19,046	\$190	\$7,618	\$1,524

a. Costs

Under Alternative 2, the total fees collected for all mobile source categories would be \$202,043,766 lower over the 2022 through 2031 timeframe than will be collected under the proposed regulation. This deficit would need to be funded by diverting funds from other existing funds. When a 5 percent financing cost is added for purchases by businesses and individuals, the total cost of Alternative 2 is \$213,510,097 lower than the cost of the proposed regulation. These costs are broken down per year in Tables F-2-2 and F-2-3.

Table F-2-2. Total Fees Collected Under Alternative 2 Compared to Total Fees Collected Under Proposed Regulation

Year	Total Fees for Alternative 2	Total Fees for Proposed Regulation	Additional Total Fees Collected Under Alternative 2 compared to Proposed Regulation
2022	\$19,096,937	\$22,068,547	-\$2,971,609
2023	\$19,565,683	\$32,104,473	-\$12,538,790
2024	\$20,047,553	\$41,732,765	-\$21,685,212
2025	\$20,542,916	\$42,507,966	-\$21,965,050
2026	\$21,052,148	\$43,415,660	-\$22,363,512
2027	\$21,575,640	\$44,350,449	-\$22,774,810
2028	\$22,113,789	\$45,322,355	-\$23,208,566
2029	\$22,667,006	\$46,382,766	-\$23,715,760
2030	\$23,235,713	\$47,472,992	-\$24,237,279
2031	\$23,820,345	\$48,593,744	-\$24,773,400
TOTAL	\$213,717,730	\$413,951,717	-\$200,233,988

Table F-2-3. Total Cost of Alternative 2 Compared to Total Cost of Proposed Regulation¹

Year	Total Cost of Alternative 2	Total Cost of Proposed Regulation	Additional Total Cost of Alternative 2 compared to Proposed Regulation ²	Total Amortized Cost of Alternative 2 Compared to the BAU
2022	\$19,948,166	\$23,180,180	-\$3,232,013	(\$4,607,523.61)
2023	\$20,440,746	\$33,732,504	-\$13,291,758	(\$9,328,820.80)
2024	\$20,947,118	\$43,855,334	-\$22,908,216	(\$14,167,077.15)
2025	\$21,467,669	\$44,670,703	-\$23,203,034	(\$19,125,567.66)
2026	\$22,002,795	\$45,625,229	-\$23,622,434	(\$24,207,658.79)
2027	\$22,552,904	\$46,607,995	-\$24,055,091	(\$24,809,287.63)
2028	\$23,118,417	\$47,633,120	-\$24,514,704	(\$25,427,762.15)
2029	\$23,699,763	\$48,748,250	-\$25,048,487	(\$26,063,553.77)
2030	\$24,297,388	\$49,894,603	-\$25,597,216	(\$26,717,147.54)
2031	\$24,911,746	\$51,073,055	-\$26,161,309	(\$27,389,041.91)
TOTAL	\$223,386,711	\$435,020,973	-\$211,634,262	(\$201,843,441.02)

¹ Total Cost = Total Fees plus 5% financing for businesses and individuals.

² Negative costs are revenue to purchasers.

i. Total Costs for Compliance with Certification Requirements for On-Road Vehicles and Equipment for Alternative 2

Table F-2-4 shows the total fee by category for on-road vehicles and equipment under Alternative 2. Table F-2-5 shows the fee per unit for on-road vehicles and equipment under Alternative 2. Table F-2-6 shows the total fee per year for on-road vehicles and equipment under Alternative 2 compared to the proposed regulation. Table F-2-7 shows the total cost per year for on-road vehicles and equipment under Alternative 2 compared to the proposed regulation.

Table F-2-4. Total Fees for On-Road Vehicles and Equipment by Category for Alternative 2

Year	PC, LDT, MDV	HDV - gasoline	HDV – not gasoline	HDV - ZEP Cert	HD ZEV – not ZEP Cert	HD Trailer	HD - exempt	Fuel-fired Heaters	Motorcycles
2022	\$13,317,989	\$548,352	\$2,446,755	\$0	\$0	\$0	\$0	\$0	\$427,812
2023	\$13,690,893	\$563,706	\$2,515,264	\$0	\$0	\$0	\$0	\$0	\$439,791
2024	\$14,074,238	\$579,490	\$2,585,691	\$0	\$0	\$0	\$0	\$0	\$452,105
2025	\$14,468,316	\$595,716	\$2,658,090	\$0	\$0	\$0	\$0	\$0	\$464,764
2026	\$14,873,429	\$612,396	\$2,732,517	\$0	\$0	\$0	\$0	\$0	\$477,777
2027	\$15,289,885	\$629,543	\$2,809,027	\$0	\$0	\$0	\$0	\$0	\$491,155
2028	\$15,718,002	\$647,170	\$2,887,680	\$0	\$0	\$0	\$0	\$0	\$504,907
2029	\$16,158,106	\$665,291	\$2,968,535	\$0	\$0	\$0	\$0	\$0	\$519,045
2030	\$16,610,533	\$683,919	\$3,051,654	\$0	\$0	\$0	\$0	\$0	\$533,578
2031	\$17,075,628	\$703,069	\$3,137,101	\$0	\$0	\$0	\$0	\$0	\$548,518

Table F-2-5. Fee per Unit for On-Road Vehicles and Equipment for Alternative 2

Year	PC, LDT, MDV	HDV - gasoline	HDV – not gasoline	HDV – ZEP Cert	HD ZEV – not ZEP Cert	HD Trailer	HD - exempt	Fuel-fired Heaters	Motorcycles
2022	\$7.48	\$67.45	\$65.23	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$12.43
2023	\$7.60	\$67.71	\$65.49	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$12.63
2024	\$7.72	\$67.98	\$65.74	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$12.83
2025	\$7.84	\$68.24	\$66.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$13.03
2026	\$7.96	\$68.51	\$66.26	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$13.24
2027	\$8.09	\$68.78	\$66.52	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$13.45
2028	\$8.22	\$69.05	\$66.78	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$13.66
2029	\$8.35	\$69.32	\$67.04	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$13.88
2030	\$8.48	\$69.59	\$67.30	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$14.09
2031	\$8.61	\$69.86	\$67.56	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$14.32

Table F-2-6. Total Fees Collected Under Alternative 2 Compared to Total Fees Collected Under Proposed Regulation for On-Road

Year	Alternative 2 On-road Total Fees	Total On-Road Fees for Proposed Regulation	Additional On-Road Total Fees Collected Under Alternative 2 compared to Proposed Regulation
2022	\$16,740,908	\$17,209,641	-\$468,733
2023	\$17,209,653	\$25,766,660	-\$8,557,006
2024	\$17,691,524	\$33,915,080	-\$16,223,556
2025	\$18,186,886	\$34,864,702	-\$16,677,816
2026	\$18,696,119	\$35,840,914	-\$17,144,795
2027	\$19,219,611	\$36,844,460	-\$17,624,849
2028	\$19,757,760	\$37,876,104	-\$18,118,345
2029	\$20,310,977	\$38,936,635	-\$18,625,659
2030	\$20,879,684	\$40,026,861	-\$19,147,177
2031	\$21,464,315	\$41,147,613	-\$19,683,298
TOTAL	\$190,157,437	\$342,428,671	-\$152,271,234

Table F-2-7. Total Cost of Alternative 2 Compared to Total Cost of Proposed Regulation for On-Road Vehicles and Equipment¹

Year	Total On-Road Cost of Alternative 2	Total On-Road Cost of Proposed Regulation	Additional On-Road Total Cost of Alternative 2 compared to Proposed Regulation ²
2022	\$17,592,137	\$18,094,576	-\$502,439
2023	\$18,084,717	\$27,092,372	-\$9,007,655
2024	\$18,591,089	\$35,661,118	-\$17,070,029
2025	\$19,111,639	\$36,659,629	-\$17,547,990
2026	\$19,646,765	\$37,686,099	-\$18,039,333
2027	\$20,196,875	\$38,741,310	-\$18,544,435
2028	\$20,762,387	\$39,826,066	-\$19,063,679
2029	\$21,343,734	\$40,941,196	-\$19,597,462
2030	\$21,941,359	\$42,087,550	-\$20,146,191
2031	\$22,555,717	\$43,266,001	-\$20,710,284
TOTAL	\$199,826,419	\$360,055,915	-\$160,229,496

¹ Total Cost = Total Fees plus 5% financing for businesses and individuals.

² Negative costs are revenue to purchasers.

ii. Total Costs for Compliance with Certification Requirements for Off-Road Mobile Sources for Alternative 2

Table F-2-8 shows the total fees by category for off-road vehicles and equipment under Alternative 2. Table F-2-9 shows the fee per unit for off-road vehicles and equipment under Alternative 2. Table F-2-10 shows the total fee per year for off-road vehicles and equipment under Alternative 2 compared to the proposed regulation. Table F-2-11 shows the total cost per year for off-road vehicles and equipment under Alternative 2 compared to the proposed regulation.

Table F-2-8. Total Fees for Off-Road Vehicles and Equipment by Category for Alternative 2

Year	OHRV	Electric Golf Carts	LSI Equipment	SORE Equipment	SI Marine	CI Equipment	Portable Fuel Containers
2022	\$135,965	\$0	\$42,788	\$854,071	\$175,505	\$1,102,500	\$0
2023	\$135,965	\$0	\$42,788	\$854,071	\$175,505	\$1,102,500	\$0
2024	\$135,965	\$0	\$42,788	\$854,071	\$175,505	\$1,102,500	\$0
2025	\$135,965	\$0	\$42,788	\$854,071	\$175,505	\$1,102,500	\$0
2026	\$135,965	\$0	\$42,788	\$854,071	\$175,505	\$1,102,500	\$0
2027	\$135,965	\$0	\$42,788	\$854,071	\$175,505	\$1,102,500	\$0
2028	\$135,965	\$0	\$42,788	\$854,071	\$175,505	\$1,102,500	\$0
2029	\$135,965	\$0	\$42,788	\$854,071	\$175,505	\$1,102,500	\$0
2030	\$135,965	\$0	\$42,788	\$854,071	\$175,505	\$1,102,500	\$0

Year	OHRV	Electric Golf Carts	LSI Equipment	SORE Equipment	SI Marine	CI Equipment	Portable Fuel Containers
2031	\$135,965	\$0	\$42,788	\$854,071	\$175,505	\$1,102,500	\$0

Table F-2-9. Fee per Unit for Off-Road Vehicles and Equipment for Alternative 2

Year	OHRV	Electric Golf Carts	LSI Equipment	SORE Equipment	SI Marine	CI Equipment	Portable Fuel Containers
2022	\$1.27	\$0.00	\$2.09	\$0.21	\$6.70	\$9.25	\$0.00
2023	\$1.25	\$0.00	\$2.08	\$0.21	\$6.62	\$9.21	\$0.00
2024	\$1.22	\$0.00	\$2.06	\$0.21	\$6.54	\$9.16	\$0.00
2025	\$1.20	\$0.00	\$2.04	\$0.21	\$6.47	\$9.11	\$0.00
2026	\$1.18	\$0.00	\$2.03	\$0.21	\$6.39	\$9.07	\$0.00
2027	\$1.16	\$0.00	\$2.01	\$0.21	\$6.32	\$9.02	\$0.00
2028	\$1.14	\$0.00	\$1.99	\$0.21	\$6.25	\$8.98	\$0.00
2029	\$1.12	\$0.00	\$1.98	\$0.21	\$6.18	\$8.93	\$0.00
2030	\$1.10	\$0.00	\$1.96	\$0.20	\$6.11	\$8.89	\$0.00
2031	\$1.08	\$0.00	\$1.94	\$0.20	\$6.04	\$8.85	\$0.00

Table F-2-10. Total Fees Collected Under Alternative 2 Compared to Total Fees Collected Under Proposed Regulation for Off-Road Vehicles and Equipment

Year	Alternative 2 Off-road Total Fees	Total Off-Road Fees for Proposed Regulation	Additional Off-Road Total Fees Collected Under Alternative 2 compared to Proposed Regulation
2022	\$2,241,155	\$2,989,754	-\$748,600
2023	\$2,241,155	\$4,238,205	-\$1,997,050
2024	\$2,241,155	\$5,486,656	-\$3,245,501
2025	\$2,241,155	\$5,486,656	-\$3,245,501
2026	\$2,241,155	\$5,486,656	-\$3,245,501
2027	\$2,241,155	\$5,486,656	-\$3,245,501
2028	\$2,241,155	\$5,486,656	-\$3,245,501
2029	\$2,241,155	\$5,486,656	-\$3,245,501
2030	\$2,241,155	\$5,486,656	-\$3,245,501
2031	\$2,241,155	\$5,486,656	-\$3,245,501
TOTAL	\$22,411,545	\$51,121,203	-\$28,709,658

Table F-2-11. Total Cost of Alternative 2 Compared to Total Cost of Proposed Regulation for Off-Road Vehicles and Equipment¹

Year	Total Off-Road Cost of Alternative 2	Total Off-Road Cost of Proposed Regulation	Additional Off-Road Total Cost of Alternative 2 compared to Proposed Regulation
2022	\$2,356,029	\$3,143,062	-\$787,032
2023	\$2,356,029	\$4,455,765	-\$2,099,736
2024	\$2,356,029	\$5,768,468	-\$3,412,439
2025	\$2,356,029	\$5,768,468	-\$3,412,439
2026	\$2,356,029	\$5,768,468	-\$3,412,439
2027	\$2,356,029	\$5,768,468	-\$3,412,439
2028	\$2,356,029	\$5,768,468	-\$3,412,439
2029	\$2,356,029	\$5,768,468	-\$3,412,439
2030	\$2,356,029	\$5,768,468	-\$3,412,439
2031	\$2,356,029	\$5,768,468	-\$3,412,439
TOTAL	\$23,560,292	\$53,746,575	-\$30,186,282

¹ Total Cost = Total Fees plus 5% financing for businesses and individuals.

² Negative costs are revenue to purchasers.

iii. Total Costs for Compliance with Certification Requirements for Aftermarket Parts for Alternative 2

As mentioned in the introductory paragraph of Section F.2, U.S. EPA does not charge certification fees for aftermarket parts. Consequently, under Alternative 2, the fee per unit for all aftermarket parts would be \$0, and the total fee by category for all aftermarket parts would also be \$0. Table F-2-12 shows the total fee per year for aftermarket parts under Alternative 2 compared to the proposed regulation. Table F-2-13 shows the total cost per year for aftermarket parts under Alternative 2 compared to the proposed regulation.

Table F-2-12. Total Fees Collected Under Alternative 2 Compared to Total Fees Collected Under Proposed Regulation for Aftermarket Parts

Year	Alternative 2 Aftermarket Parts Total Fees	Total Aftermarket Parts Fees for Proposed Regulation	Additional Aftermarket Parts Total Fees Collected Under Alternative 2 compared to Proposed Regulation
2022	\$0	\$857,826	-\$857,826
2023	\$0	\$887,799	-\$887,799
2024	\$0	\$917,771	-\$917,771
2025	\$0	\$917,771	-\$917,771
2026	\$0	\$917,771	-\$917,771
2027	\$0	\$917,771	-\$917,771
2028	\$0	\$917,771	-\$917,771
2029	\$0	\$917,771	-\$917,771
2030	\$0	\$917,771	-\$917,771
2031	\$0	\$917,771	-\$917,771
TOTAL	\$0	\$9,087,796	-\$9,087,796

Table F-2-13. Total Cost of Alternative 2 Compared to Total Cost of Proposed Regulation for Aftermarket Parts¹

Year	Total Aftermarket Parts Cost of Alternative 2	Total Aftermarket Parts Cost of Proposed Regulation	Additional Aftermarket Parts Total Cost of Alternative 2 compared to Proposed Regulation ²
2022	\$0	\$892,304	-\$892,304
2023	\$0	\$923,775	-\$923,775
2024	\$0	\$955,246	-\$955,246
2025	\$0	\$955,246	-\$955,246
2026	\$0	\$955,246	-\$955,246
2027	\$0	\$955,246	-\$955,246
2028	\$0	\$955,246	-\$955,246
2029	\$0	\$955,246	-\$955,246
2030	\$0	\$955,246	-\$955,246
2031	\$0	\$955,246	-\$955,246
TOTAL	\$0	\$9,458,050	-\$9,458,050

¹ Total Cost = Total Fees plus 5% financing for businesses and individuals.

² Negative costs are revenue to purchasers.

iv. Total Costs for Compliance with Certification Requirements for Retrofits for Alternative 2

For Alternative 2, both the fee per unit and the total fee by category for all Retrofits would be \$0, since these retrofit systems are not certified by U.S. EPA. Table F-2-14

shows the total fee per year for Retrofits under Alternative 2 compared to the proposed regulation. Table F-2-15 shows the total cost per year for Retrofits under Alternative 2 compared to the proposed regulation.

Table F-2-14. Total Fees Collected Under Alternative 2 Compared to Total Fees Collected Under Proposed Regulation for Retrofits

Year	Alternative 2 Retrofit Total Fees	Total Retrofit Fees for Proposed Regulation	Additional Retrofit Total Fees Collected Under Alternative 2 compared to Proposed Regulation
2022	\$0	\$816,832	-\$816,832
2023	\$0	\$1,008,427	-\$1,008,427
2024	\$0	\$1,200,988	-\$1,200,988
2025	\$0	\$1,026,567	-\$1,026,567
2026	\$0	\$958,049	-\$958,049
2027	\$0	\$889,293	-\$889,293
2028	\$0	\$829,553	-\$829,553
2029	\$0	\$829,434	-\$829,434
2030	\$0	\$829,434	-\$829,434
2031	\$0	\$829,434	-\$829,434
TOTAL	\$0	\$9,218,012	-\$9,218,012

Table F-2-15. Total Cost of Alternative 2 Compared to Total Cost of Proposed Regulation for Retrofits¹

Year	Total Retrofit Cost of Alternative 2	Total Retrofit Cost of Proposed Regulation	Additional Retrofit Total Cost of Alternative 2 compared to Proposed Regulation ²
2022	\$0	\$846,506	-\$846,506
2023	\$0	\$1,047,550	-\$1,047,550
2024	\$0	\$1,248,149	-\$1,248,149
2025	\$0	\$1,065,006	-\$1,065,006
2026	\$0	\$993,063	-\$993,063
2027	\$0	\$920,618	-\$920,618
2028	\$0	\$860,986	-\$860,986
2029	\$0	\$860,986	-\$860,986
2030	\$0	\$860,986	-\$860,986
2031	\$0	\$860,986	-\$860,986
TOTAL	\$0	\$9,564,836	-\$9,564,836

¹ Total Cost = Total Fees plus 5% financing for businesses and individuals.

² Negative costs are revenue to purchasers.

v. **Total Costs for Compliance with Certification Requirements for At-Berth Technology (Bonnetts) for Alternative 2**

For Alternative 2, both the fee per unit and the total fee by category for all At-Berth Technology would be \$0, since these systems are not certified by U.S. EPA. Table F-2-16 shows the total fee per year for At-Berth Technology under Alternative 2 compared to the proposed regulation. Table F-2-17 shows the total cost per year for At-Berth Technology under Alternative 2 compared to the proposed regulation.

Table F-2-16. Total Fees Collected Under Alternative 2 Compared to Total Fees Collected Under Proposed Regulation for At-Berth Technology

Year	Alternative 2 At-Berth Total Fees	Total At-Berth Fees for Proposed Regulation	Additional At-Berth Total Fees Collected Under Alternative 2 compared to Proposed Regulation
2022	\$0	\$194,494	-\$194,494
2023	\$0	\$203,382	-\$203,382
2024	\$0	\$212,270	-\$212,270
2025	\$0	\$212,270	-\$212,270
2026	\$0	\$212,270	-\$212,270
2027	\$0	\$212,270	-\$212,270
2028	\$0	\$212,270	-\$212,270
2029	\$0	\$212,270	-\$212,270
2030	\$0	\$212,270	-\$212,270
2031	\$0	\$212,270	-\$212,270
TOTAL	\$0	\$2,096,035	-\$2,096,035

Table F-2-17. Total Cost of Alternative 2 Compared to Total Cost of Proposed Regulation for At-Berth Technology¹

Year	Total At-Berth Cost of Alternative 2	Total At-Berth Cost of Proposed Regulation	Additional At-Berth Total Cost of Alternative 2 compared to Proposed Regulation ²
2022	\$0	\$203,733	-\$203,733
2023	\$0	\$213,043	-\$213,043
2024	\$0	\$222,353	-\$222,353
2025	\$0	\$222,353	-\$222,353
2026	\$0	\$222,353	-\$222,353
2027	\$0	\$222,353	-\$222,353
2028	\$0	\$222,353	-\$222,353
2029	\$0	\$222,353	-\$222,353
2030	\$0	\$222,353	-\$222,353
2031	\$0	\$222,353	-\$222,353
TOTAL	\$0	\$2,195,596	-\$2,195,596

¹ Total Cost = Total Fees plus 5% financing for businesses and individuals.

² Negative costs are revenue to purchasers.

b. Benefits

The benefit of Alternative 2 would be lower overall costs for purchasers of mobile sources, both on a per unit fee and on a total cost basis. As Shown in Table F-2-2, this Alternative would create a fiscal loss to the State of \$202,043,766 over the 2022-2031 timeframe compared to the Proposed Regulation. As there are no emission benefits under this alternative, the revenue would constitute the benefits of this Alternative.

c. Economic Impacts

Alternative 2 would implement a smaller scope of fee collection in 2022 and 2031 compared to the Proposed Regulation and Alternative 1. The total cost of Alternative 2 (approximately \$202 million as shown in Table F-2-3) would be 54 percent lower than the Proposed Regulation (\$368 million) over the years between 2022 and 2031. Table F-2-18 shows the impact on select macroeconomic indicators in the economy. The analysis of Alternative 2 shows that the major macroeconomic indicators would decrease until the year of 2026. By 2031, the major macroeconomic indicators show lesser economic impacts from Alternative 2 compared with both the Proposed Regulation and Alternative 1's results, which both show far greater economic impacts. Overall, Alternative 1 would have greater economic impacts to the Californian economy than the Proposed Regulation and Alternative 2.

Table F-2-18. Summary of Macroeconomic Impacts of Alternative 2

	Year of Change	2022	2024	2026	2028	2030	2031
GSP	% Change	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Change (2018M\$)	+29.23	+14.99	-0.14	-2.55	-2.07	-1.58
Personal Income	% Change	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Change (2018M\$)	+27.14	+19.99	+8.05	+5.22	+5.60	+6.29
Employment	% Change	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Change in Jobs	+298.90	+157.57	+10.70	-5.54	+4.80	+12.07
Output	% Change	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Change (2018M\$)	+50.27	+24.52	-2.87	-7.00	2.85	-5.52
Private Investment	% Change	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Change (2018M\$)	+3.69	-1.33	-7.97	-8.33	-6.54	-5.56

d. Cost-Effectiveness

Neither this proposed regulation nor either of the Alternatives (Alternative 1 and Alternative 2) change the stringency of current emission standards, have emission impacts nor do any of these create new emission standards. Therefore, this assessment is not applicable to this proposed regulation or to either of the Alternatives.

e. Reason for Rejecting

Alternative 2 will fund up to \$18 million per year as calculated for 2024. Total mobile sources certification and compliance efforts, department-wide, have been estimated by CARB at close to \$50 million annually. CARB's fee proposed regulation will fund up to about \$40 million of these programs with the new Certification and Compliance Fund. U.S. EPA's fee program is based on a 2004 rulemaking. Since 2004 a significant number of new regulatory efforts and higher emission standards have been added to California's program to meet our clean air goals. California's efforts to meet the ambient air quality standards has led to a more stringent program from the federal level. U.S. EPA's program utilizes CARB's on-board diagnostics and aftermarket parts programs for their certification and compliance efforts. In addition, CARB's proposed regulation collects fees from additional categories (aftermarket parts, some off-road categories, and retrofits) not included in U.S. EPA fee structure. These issues result in a significant difference in workload effort and costs between CARB's and U.S. EPA's programs. Using U.S. EPA's fee structure would lead to the collection of \$18 million per year in fees, a deficit of about \$30 million per year in from the proposed regulation.

CARB rejects Alternative 2 because the U.S EPA fee structure and program does not adequately reflect CARB's workload effort and does not sufficiently cover CARB's reasonable costs. This alternative does not collect reasonable costs as required by statute. As with Alternative 1, it does not take into consideration the impact of fees for products that have cleaner emissions and zero-emissions and the impact on the affected businesses.

LIST OF ACRONYMS AND ABBREVIATIONS

AB;	Assembly Bill
AB 965:	California Assembly Bill 965 (Stats. 1981, Ch. 1185)
AETS:	Automotive Emission Test Specialist (California State Civil Service Job Classification)
AETS Sup:	Automotive Emission Test Supervisor (California State Civil Service Job Classification)
AGPA:	Associate Governmental Program Analyst (California State Civil Service Job Classification)
AMP:	Aftermarket Parts
APCF:	Air Pollution Control Fund
APS:	Air Pollution Specialist (California State Civil Service Job Classification)
APU:	Auxiliary power unit
ARE:	Air Resources Engineer (California State Civil Service Job Classification)
ARFR:	Air Resources Field Representative (California State Civil Service Job Classification)
ARS:	Air Resources Supervisor (California State Civil Service Job Classification)
ART:	Air Resources Technician (California State Civil Service Job Classification)
ATV:	All-terrain vehicle
BAU:	Business as usual
CARB:	California Air Resources Board
CCF:	Certification and Compliance Fund
CCR:	California Code of Regulations
CEQA:	California Environmental Quality Act
CHC:	Commercial harbor craft
CHE:	Cargo Handling Equipment
CI:	Compression ignition (e.g., diesel engine)
CPI:	Consumer Price Index
DPF:	Diesel particulate filter
EO:	Executive Order
FFH:	Fuel-fired heater
GHG:	Greenhouse gas
HD:	Heavy-duty
HSC:	California Health and Safety Code
LD:	Light-duty
LSI:	Large spark-ignition engine
MC:	Motorcycle
MD:	Medium-duty
MECA:	Manufacturers of Emission Controls Association; Member companies include leading manufacturers of emission control and efficiency technologies for all mobile sources.
MIC:	Motorcycle Industry Council
MVA:	Motor Vehicle Account
NAICS:	North American Industry Classification System

NOx:	Oxides of nitrogen
OBD:	On-board diagnostics
OEM:	Original equipment manufacturer
OFMC:	Off-road motorcycle
OFRSV:	Offroad sport vehicle
OFRUV:	Offroad utility vehicle
OHRV:	Off-highway recreational vehicles
PFC:	Portable fuel container
PM:	Particulate matter
REMI:	Regional Economic Models, Inc.
RSQE:	University of Michigan's Research Seminar in Quantitative Economics
RTG:	Rubber tired gantry
SAPS:	Staff Air Pollution Specialist (California State Civil Service Job Classification)
SB:	Senate Bill
SCAR:	Sand car
SEMA:	Specialty Equipment Market Association; Member companies include manufacturers, distributors, resellers, and promoters of automotive specialty-equipment parts and accessories.
SI:	Spark ignition (e.g., gasoline engine)
SORE:	Small off-road engine
SRIA:	Standardized Regulatory Impact Assessment
SS:	Stationary compression ignition engines
VIRF:	Vehicle Inspection and Repair Fund
TRU:	Transport refrigeration unit
U.S. EPA:	United States Environmental Protection Agency
VC:	Vehicle Code
ZEPCert:	Zero-Emission Powertrain (ZEP) test procedure certification
ZEV:	Zero-emission vehicle

APPENDIX A: CALCULATION OF BASELINE COSTS

CARB Mobile Source Certification and Compliance Program baseline analysis relies on existing program and funding source information. The baseline business as usual (BAU) costs for 2022, which is the first year of the proposed certification fee increase, are estimated using California’s mobile source certification and compliance programs costs for 2018 and adjusting them to reflect changes as described below. All costs are in 2018\$.

To determine fiscal costs, CARB followed the same cost collection methodology as conducted by U.S. EPA²⁹ in 2004 for their mobile source fee development. This appendix outlines the regulatory scope, existing activities in the Mobile Source Certification and Compliance Program, and calculation methodology to determine the baseline costs for this regulatory activity.

Regulatory Scope

The scope of this regulatory activity is based on existing on-road fee sources covered by Health and Safety Code (HSC) section 43019 and new categories allowed by the new legislation (SB 854). SB854 allows CARB to adopt a schedule of fees to cover CARB’s reasonable costs associated with certification, audit, and compliance of off-road or non-vehicular engines and equipment, aftermarket parts, and emission control components sold in the State (limited to activities covered by HSC sections 38560, 43013 and 43018, on-road aftermarket parts under Vehicle Code section 27156(h)).

The scope of activities allowed under this authority is broad; therefore, this regulatory activity is limited to the following Executive Order (EO) series certification (Table Appn A-1) and approval categories (descriptions follow):

Table Appn A-1. Executive Order (EO) Series Description

EO Number Series	Topic	EO Number Series	Topic
A	New Cars, Kit Cars, Replica Cars, Light/Medium/Heavy-Duty Vehicles/Engines	U-U	New Small Off-Road Engines/Equipment
A	Phase 2 GHG Vehicle / Zero-emission Powertrain	U-W	New Spark - Ignition Marine Engines/Watercraft
N	New On-Road Heavy-Duty Exempt Engines	G	Portable Fuel Containers (PFCs)
P	New Federal AB965 Cars & Light-Duty Trucks	RM	Evaporative components for Spark-Ignited Marine Water Craft
-	Fuel-fired Heaters	RV	Evaporative components for Off-Highway Recreational Vehicle

²⁹ The Motor Vehicle and Engine Compliance Program (MVECP) fees rule (69 Fed. Reg. 26222, May 11, 2004)

EO Number Series	Topic	EO Number Series	Topic
M	New Street-Use Motorcycles	Q	Small Off-Road Engines - Evaporative Components
AT	GHG Trailer	B	Alternative Fuel Retrofits
AD	GHG Aerodynamic Components	C	Experimental Permits
U-G	Electric Golf Carts	D/F	Aftermarket Part Exemptions
U-L	New Off-Road Large Spark-Ignition (LSI) Engines/Equipment	K	Aftermarket Critical Emission Control Parts for Highway Motorcycles.
U-M	New Emission Compliant ("Green Sticker") Off-Road Motorcycles, All-Terrain/Utility/Sport Vehicles, Sandcars	DE	Verification of Diesel Emission Control Strategies (APU, On/Off Road, SS, Harbor Craft, TRU, RTG) for In-Use Diesel Engine Regulations
U-N	New Emission Non-Compliant ("Red Sticker") Off-Road Motorcycles & All-Terrain Vehicles	-	Locomotive Retrofit and Repowering
U-R	New Off-Road Compression - Ignition Engines	AB	Alternative Control Technologies (e.g., Bonnets) verification/approval for At-Berth regulation

For this SRIA, CARB identified 33 different categories of activities, 31 of which are assigned a distinct Executive Order series. These activities are grouped into six separate categories:

- On-Road Vehicles, Engines, and Equipment (On-Road),
- Off-Road Vehicles, Engines, and Equipment (Off-Road),
- Evaporative Components,
- Aftermarket Parts,
- Retrofits, and
- At-Berth Alternative Emission Control Technologies (At-Berth)

The activities included in each category are outlined below, including a brief description of each:

On-Road

- o On-Road New Cars, Light/Medium Vehicles ("A" EO series)

This category includes passenger cars, kit cars, replica cars, pickup trucks, sport utility vehicles, and vans.

- On-Road Heavy-Duty Engines and Vehicles (“A” EO series)

This category includes city transit buses, mobile cranes, cement mixers, refuse trucks, tractors designed to pull trailers, dry vans and other equipment.

- Phase 2 Greenhouse Gas Vehicles, Trailers and Aerodynamic Devices (“A”, “AT”, and “AD” EO Series)

Heavy-duty tractors, vocational vehicles, trailers (AT EO series) and aerodynamic devices (AD EO series) will meet new greenhouse gas requirements starting with 2021 model year. These new requirements include, but not limited to, air conditioner leakage, labels, warranty, and tire specifications.

- Zero-Emission Powertrain (“A” EO series)

This is an optional certification process for battery-electric and fuel-cell powertrains used in on- and off-road vehicles and equipment. This certification is required for grant funding eligibility.

- Federal AB 965 Cars and light trucks (“P” EO series)

The P-series EO allows for new light-duty cars and trucks that meet federal emission standards to be sold in California provided offsets by the “credits” generated by the CARB-certified vehicles certified below the applicable California standards are available. Light-duty manufacturers have not used this option since 2000, but P series EOs will be included in this regulation, because provisions remain available for use.

- On-Road HD Exempt (“N” EO series)

The N-series EO provides an exemption in cases where a vehicle manufacturer requests to use a federally certified engine in a heavy-duty vehicle. The request is typically for use of an off-road engine in a specific on-road vehicle, because a suitable on-road certified engine is not available. It is important to note that each EO is for only one particular vehicle and engine (one EO for each unique vehicle VIN and engine serial number). While CARB can issue up to 100 each calendar year, CARB rarely issues more than 15-20 a year. Historically, it has been primarily makers of all-terrain cranes and street sweepers that have applied for N-series EOs but there are no limitations on the type of vehicle applications that can be approved.

- Fuel-fired Heaters

Fuel-fired heaters are auxiliary engines used in heavy-duty vehicles instead of the main engine to keep engine coolant warm or for cabin heating.

- o Street-Use Motorcycles (“M” EO series)

Street-use motorcycles are two- and three-wheeled motor vehicles designed to be used on public highways.

Off-Road

- o Off-Highway Recreational Vehicles (green sticker [“U-M” EO series] and red sticker [“U-N” EO series] all-terrain vehicles and off-road motorcycles)

Off-Highway Recreational Vehicles that meet emission standards are eligible a green sticker registration from the California Department of Motor Vehicles. There are no operational limitations for vehicles that receive the green sticker. Beginning with the 2003 model year, Off-Road Motorcycles and All-Terrain Vehicles that do not meet emission standards receive a red sticker registration from the California Department of Motor Vehicles. During peak ozone season, the red sticker limits operation at certain off-highway recreational vehicle parks located in non-attainment areas. The red sticker operational allowance ceases for 2022 and later model years.

- o Electric Golf Carts (“U-G” EO series)

An electric golf cart is an electric cart used for carrying golfers and their equipment over a golf course. In federal ozone non-attainment areas in California, only electric golf carts can operate and must be CARB certified.

- o Large Off-Road Spark-Ignition Engines (“U-L” EO series)

The large off-road spark-ignition category consists of off-road spark-ignition engines that produce greater than 19 kilowatts net power (greater than 25 horsepower). It includes forklifts, portable generators, large turf care equipment, irrigation pumps, welders, air compressors, scrubber/sweepers, airport service vehicles, and a wide array of other agricultural, construction, and general industrial equipment. Two (2) certifications or EOs are issued; one for the engine family meeting exhaust emission standards; and one for the equipment family meeting evaporative emission standards.

- o Small Off-Road Engines (“U-U” EO series)

Small off-road engines (SORE) are spark-ignition engines that produce 19 kilowatts of power (25 horsepower) or less. Engines in this category are primarily used in lawn and garden equipment as well as other outdoor power equipment and specialty vehicles. Two (2) certifications or EOs are issued; one for the engine family meeting the exhaust emission standards, and one for the equipment family meeting the evaporative emission standards. In addition, SORE evaporative emission regulations include a provision for variances from regulatory requirements. Such variances are granted through the issuance of EOs.

- o Spark-Ignition Marine Engines/Watercraft ("U-W" EO series)

Recreational boats including personal watercraft, ski boats, inboards, and outboards that are equipped with a gasoline engine comprise the spark-ignition marine engines/watercraft category. Two (2) certifications or EOs are issued; one for the engine family meeting the exhaust emission standards, and one for the watercraft family meeting the evaporative emission standards.

- o Off-Road Compression Ignition Engines ("U-R" EO series)

This category consists of new compression-ignition engines (a.k.a. diesel engines) found in a wide variety of off-road applications such as farming, construction, and industrial equipment. Some familiar examples include tractors, excavators, dozers, scrapers, portable generators, transport refrigeration units (TRUs), irrigation pumps, welders, compressors, scrubbers, and sweepers.

Evaporative Components

- o Evaporative Emission Control System Components - Small Off-Road Engines ("Q" EO series)

Most small off-road engines (SORE) use certified components in their evaporative emission control systems. Fuel lines, fuel tanks and carbon canisters may be certified for use on SORE.

- o Evaporative Emission Control System Components - Spark-Ignited Marine Water Craft ("RM" EO series)

Recreational boats including personal watercraft, ski boats, inboards, and outboards that are equipped with a gasoline engine may use pre-certified evaporative components. This includes fuel tanks, fuel hoses, carbon canisters and pressure relief valves.

- o Evaporative Emission Control System Components - Off-Highway Recreational Vehicles ("RV" EO series)

Off-Highway Recreational Vehicles equipped with gasoline spark-ignition engines may use pre-certified evaporative components. This includes fuel tanks, fuel hoses, and carbon canisters. New regulations allow for the certification of these components starting with the 2020 model year.

- o Portable Fuel Containers ("G" EO series)

Portable Fuel Containers, or PFCs, also known as gas cans, are used to fill a variety of equipment including lawnmowers, vehicles and personal watercraft. Each container design is evaluated to ensure that spillage and evaporative emissions are minimized or

eliminated through the implementation of low permeation materials and automatically-closing spouts. PFCs are certified for sale in California through EOs. In addition, PFC regulations include a provision for variances from regulatory requirements. Such variances are granted through issuance of EOs.

Aftermarket Parts

Aftermarket parts are add-on and modified parts that include any component or device used on a vehicle/engine that was not part of that vehicle/engine when it was originally California certified. Examples vary from a simple air intake kit, modifications to the exhaust system, or modifications made to the original engine block to increase displacement. Such modifications have the potential to compromise the effectiveness of the vehicle's/engine's emission control systems and emission levels. Accordingly, CARB has regulations that prohibit the sale, offer for sale, or installation of aftermarket parts, unless such parts have been exempted by CARB from the provisions of VC Section 27156 (California Anti-Tampering Law). An Executive Order provides CARB's determination that the use of the aftermarket part will not negatively impact the performance of the emission control system on applicable vehicles/engines. These include:

- o Alternative Fuel Retrofits ("B" EO Series)

Alternative Fuel Retrofits are kits that convert an originally-certified gasoline or diesel car or truck to an alternative fuel, such as natural gas. Certification is issued by CARB once the manufacturer demonstrates compliance with the emissions, warranty, and durability requirements.

- o Experimental Permits ("C" EO series)

Section 43014 of the California Health and Safety Code grants CARB the authority to "issue permits for the testing of experimental motor vehicle pollution control devices installed in used motor vehicles, or for the testing of experimental or prototype motor vehicles which appear to have very low emission characteristics." These permits are usually good for one year, and may be renewed at the request of the applicant.

- o Aftermarket Parts ("D" and "F" EO series)

Any add-on or modified component or device used on a vehicle or engine that was not part of that vehicle or engine when it was originally certified for sale in California and affects emissions is referred to as an aftermarket part. Parts in this category are sometimes called performance parts. This category includes a wide variety of parts which vary from a simple air intake kit, modifications made to the original engine block to increase displacement, auxiliary or replacement fuel tanks, and innovative technologies that modify the originally certified engine configuration.

- o Aftermarket Catalytic Converters (“D_{Cat}” EO series)

California regulations allow new aftermarket catalytic converters to be used on older vehicles operating within California provided that they comply with established performance requirements and are exempted from California’s anti-tampering laws. These performance requirements balance the continued need for controlling emissions from motor vehicles as they age against the cost of replacing catalytic converters on vehicles that often have a limited remaining lifetime and relatively low marketplace value.

- o Aftermarket Parts – Diesel Particulate Filters (“D_{dpf}” EO series)

A diesel particulate filter (DPF) is a device designed to remove diesel particulate matter or soot from the exhaust gas of a diesel engine. Manufacturers of aftermarket DPFs for 2007-2009 model year diesel engines can obtain an exemption from the California anti-tampering law with approval through CARB per the evaluation procedure specified in title 13, California Code of Regulations (CCR), section 2222(k).

- o Motorcycle Aftermarket Parts (“K” series EO)

Highway motorcycle owners commonly customize their motorcycles upon purchase. One of the more popular modifications is replacement of the original exhaust system with aftermarket exhaust systems or parts. Many of these systems contain critical emission controls, and as with other aftermarket part certifications, the equipment must obtain an exemption from the California Anti-Tampering law to allow the sale and installation of aftermarket critical emission control parts on previously certified motorcycles.

Retrofit

This group includes any device, system, or strategy employed on an in-use diesel vehicle or piece of equipment that is intended to reduce emissions of particulate matter (PM) and/or oxides of nitrogen (NO_x) from the engine exhaust. Examples of retrofits include, but are not limited to, particulate filters, diesel oxidation catalysts, selective catalytic reduction systems, fuel additives used in combination with particulate filters, alternative diesel fuels, and combinations of the above.

- o Diesel Emission Control Strategy (“DE” EO Series)

Diesel Emission Control Strategies are verified under Title 13, CCR, sections 2700 et. seq. Each verification limits the approval to an engine or equipment category along with specific engine characteristics and operating parameters (“DE” EO series) and incorporates an exemption from the California anti-tampering law. The engine categories include:

- SS - Stationary Compression Ignition Engines are stationary diesel engines used in both agricultural industrial operations. SS retrofit sales are driven by CARB’s Air

Toxic Control Measures for Compression Ignition Engines, local air district requirements, or by other voluntary or mitigation actions taken by owners to reduce diesel PM emissions and in some cases, NOx emissions, on such engines.

- TRU - Transport Refrigeration Units are powered by diesel internal combustion engines and are designed to refrigerate or heat perishable goods that are transported by various means. TRUs are found on refrigerated vans, trucks, trailers, and railcars. Significant numbers of these units congregate at distribution centers, truck stops, and other facilities, emitting diesel PM, a toxic air contaminant, creating a health risk for those that live nearby. TRU retrofit sales are driven by CARB's In-Use Transport Refrigeration Unit requirements³⁰.
- RTG – A Rubber Tired Gantry Crane is a specific type of crane used at ports and rail yards to move shipping containers between trucks, trains, and other equipment. RTG retrofit sales are driven by CARB's In-Use Cargo Handling Equipment (CHE) regulation³¹ and are not expected to continue now that the requirements of the regulation have been met.
- CHC - Commercial Harbor Craft: There are several types of harbor craft in California, including fishing vessels, ferries, excursion vessels, tug boats, tow boats, crew and supply boats, barges, dredges, and other vessel types. CHC retrofit sales are driven by the Commercial Harbor Craft In-Use regulations.³²
- ON – On-Road: On-Road retrofits are limited to on-road heavy-duty diesel vehicles greater than 14,000 pounds gross vehicle weight rating. On-Road retrofit sales are driven by a series of on-road in-use fleet regulations that were initiated in 2000. Sales are declining and expected to be very low by 2023 due to the sunset of in-use fleet requirements.³³

³⁰ “Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (TRU) and TRU Generator Sets, and Facilities Where TRUs Operate” available at: [https://govt.westlaw.com/calregs/Document/I927B9BE01FCC11E29FC09C10E8606469?viewType=FullText&listSource=Search&originationContext=Search+Result&transitionType=SearchItem&contextData=\(sc.Search\)&navigationPath=Search%2fv1%2fresults%2fnavigation%2fi0ad7140a0000017574d2d7b569f3723c%3fNav%3dREGULATION_PUBLICVIEW%26fragmentIdentifier%3dI927B9BE01FCC11E29FC09C10E8606469%26startIndex%3d1%26transitionType%3dSearchItem%26contextData%3d%2528sc.Default%2529%26originationContext%3dSearch%2520Result&list=REGULATION_PUBLICVIEW&rank=1&t_T1=13&t_T2=2477&t_S1=CA+ADC+s](https://govt.westlaw.com/calregs/Document/I927B9BE01FCC11E29FC09C10E8606469?viewType=FullText&listSource=Search&originationContext=Search+Result&transitionType=SearchItem&contextData=(sc.Search)&navigationPath=Search%2fv1%2fresults%2fnavigation%2fi0ad7140a0000017574d2d7b569f3723c%3fNav%3dREGULATION_PUBLICVIEW%26fragmentIdentifier%3dI927B9BE01FCC11E29FC09C10E8606469%26startIndex%3d1%26transitionType%3dSearchItem%26contextData%3d%2528sc.Default%2529%26originationContext%3dSearch%2520Result&list=REGULATION_PUBLICVIEW&rank=1&t_T1=13&t_T2=2477&t_S1=CA+ADC+s)

³¹ “Regulation for Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards”, 2011, available at: <https://govt.westlaw.com/calregs/Document/I6B85127003A011E29D3D8A7B1E4D1070?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=%28sc.Default%29>

³² “Amendments to the Regulation to Reduce Emissions from Diesel Engines on Commercial Harbor Craft Operated within California Waters and 24 Nautical Miles of the California Baseline,” 2011, available at: <https://ww2.arb.ca.gov/our-work/programs/commercial-harbor-craft/chc-regulatory-documents>

³³ “Regulation to Reduce Emissions of Diesel Particulate Matter, Oxides of Nitrogen and Other Criteria Pollutants, from In-Use Heavy-Duty Diesel-Fueled Vehicles., available at: [https://govt.westlaw.com/calregs/Document/I927B9BE01FCC11E29FC09C10E8606469?viewType=FullText&listSource=Search&originationContext=Search+Result&transitionType=SearchItem&contextData=\(sc.Search\)&navigationPath=Search%2fv1%2fresults%2fnavigation%2fi0ad7140a0000017574d2d7b569f3723c%3fNav%3dREGULATION_PUBLICVIEW%26fragmentIdentifier%3dI927B9BE01FCC11E29FC09C10E8606469%26startIndex%3d1%2](https://govt.westlaw.com/calregs/Document/I927B9BE01FCC11E29FC09C10E8606469?viewType=FullText&listSource=Search&originationContext=Search+Result&transitionType=SearchItem&contextData=(sc.Search)&navigationPath=Search%2fv1%2fresults%2fnavigation%2fi0ad7140a0000017574d2d7b569f3723c%3fNav%3dREGULATION_PUBLICVIEW%26fragmentIdentifier%3dI927B9BE01FCC11E29FC09C10E8606469%26startIndex%3d1%2)

- OFF – Off-Road: Off-road retrofits are installed on a wide variety of off-road heavy-duty diesel equipment ranging from irrigation pumps to large construction equipment. Off-road retrofit have been used to meet the requirements of equipment regulated under the the In-Use Off-Road Diesel-Fueled Fleets (Off-Road Diesel Regulation) that apply to (existing) off-road heavy-duty diesel vehicles used in construction, mining, industrial operations and other industries, and the Portable Equipment Airborne Toxic Control Measure that regulates portable diesel engines rated 50 horsepower, and others. Sales of these retrofits are to declining as the requirements get more stringent and expected to very low by 2028.
- APU - Auxiliary Power Unit retrofits are used reduce PM emissions on auxiliary power units that are used on heavy-duty vehicles to reduce idling.

- o Locomotives

Locomotive emissions are federally regulated but in efforts to reduce the emissions from these sources, grant programs are used to encourage the addition of retrofits or engine up grades. CARB provides approval letters for locomotive upgrades that meet lower emission standards, which makes them eligible to obtain grant funding under certain programs. The number of engine upgrades or retrofits installed are primarily driven by CARB incentives funds, which is about 15 activities a year.

At-Berth

At-Berth Alternative Emission Control Technologies include emissions capture and control technologies (a.k.a. hood or bonnet) certified under the “AB” EO series that collect emissions from auxiliary diesel engines operated on ocean-going vessels at-berth in a California Port. The diesel auxiliary engines are used on container ships, passenger ships, and refrigerated-cargo ships while berthing at a California Port. These systems will also be used on tanker vessels and auto carriers (also called roll on roll off vessels) to comply with the newly Board approved At Berth Regulation. The regulations³⁴ require CARB to approve the technology before it is put into service.

Existing Activities in the Mobile Source Certification and Compliance Program

Program costs were based on the essential activities to implement the Mobile Source Certification and Compliance Program, therefore, they do not include resources to conduct enforcement, regulatory, or research activities. The certification and compliance activities include the evaluation of a certified vehicle, engine or component to ensure the product

[6transitionType%3dSearchItem%26contextData%3d%2528sc.Default%2529%26originationContext%3dSearch%2520Result&list=REGULATION_PUBLICVIEW&rank=1&t_T1=13&t_T2=2477&t_S1=CA+ADC+s](https://ww3.arb.ca.gov/regact/2007/shorepwr07/shorepwr07.htm)

³⁴ “Airborne Toxic Control Measure for Auxiliary Diesel Engines Operated on Ocean-Going Vessels At Berth in a California Port,” 2007, available at: <https://ww3.arb.ca.gov/regact/2007/shorepwr07/shorepwr07.htm> and “Control Measure for Ocean-Going Vessels At Berth,” final approval expected late 2020, available at: <https://ww3.arb.ca.gov/regact/2019/ogvatberth2019/fro.pdf>

meets the applicable certification requirements, is produced and distributed as certified, has durable emission control equipment, and meets warranty requirements.

Certification and On-Board Diagnostics (OBD): Certification involves review of manufacturers' submissions to show compliance with emissions, OBD and other requirements per CARB regulations and procedures. CARB evaluates manufacturer applications for completeness, all testing data, technical data and descriptions of auxiliary emission control devices³⁵ (AECD) and OBD, and durability data, useful life compliance, and warranty requirements to determine compliance. The OBD and AECD review processes are complex because manufacturers provide detailed descriptions of emission control systems and their operation to show compliance with the regulations and CARB verifies designs are emission compliant over typical product operation. As part of the OBD and AECD reviews, CARB ensures no defeat devices³⁶ are present that would cause emission increases in real world operation.

Presale Confirmation, Assembly Line Testing, and Manufacturer Facilities: Before issuance of the EO, a product can undergo confirmation or assembly line testing to confirm the manufacturers' products are compliant. For confirmation testing, CARB retests the same product tested by the manufacturer using the same procedures, but may use its own or a separate testing facility. Assembly line emission testing confirms the product coming off the assembly line is the same as was described in the manufacturers application and meets emission requirements before they are sold to consumers. These activities are regulated by Title 13, California Code of Regulations, as to the number of products and type of tests performed. Defeat device testing may be performed using non-traditional (certification) testing cycles prior to sale to identify operating conditions under which the effectiveness of the emission control systems has been inappropriately reduced. Also, CARB audits manufacturing testing facilities to ensure testing quality control and assurance protocols are followed, and review testing results.

³⁵ *Auxiliary Emission Control Device* (AECD) means any [element of design](#) which senses temperature, vehicle speed, engine RPM, transmission gear, manifold vacuum, or any other parameter for the purpose of activating, modulating, delaying, or deactivating the operation of any part of the [emission control system](#).

³⁶ *Defeat device* means an AECD that reduces the effectiveness of the [emission control system](#) under conditions which may reasonably be expected to be encountered in normal vehicle operation and use, unless:

- (1) Such conditions are substantially included in the Federal emission test procedure;
- (2) The need for the AECD is justified in terms of protecting the vehicle against damage or accident;
- (3) The AECD does not go beyond the requirements of engine starting; or
- (4) The AECD applies only for **emergency vehicles** and the need is justified in terms of preventing the vehicle from losing speed, torque, or power due to abnormal conditions of the [emission control system](#), or in terms of preventing such abnormal conditions from occurring, during operation related to emergency response. Examples of such abnormal conditions may include excessive exhaust backpressure from an overloaded particulate trap, and running out of [diesel exhaust fluid](#) for engines that rely on urea-based selective catalytic reduction.

Post-sale In-Use Testing: To ensure emission controls continue to function for the useful life of the engine, in-use emission testing is performed by the manufacturer and CARB. CARB reviews manufacturer testing (“audit”) and conducts emission tests (“in-use”) on products within their useful life to ensure the product continues to meet emission standards. Testing products to determine compliance with the standards as outlined by regulation. For example, for a single heavy-duty on-road engine family, CARB regulations require a series of tests to be performed on ten engines that are the certified configuration and have a good maintenance history. Post sale defeat device testing is also performed with non-traditional testing cycles to identify any operating conditions under which the effectiveness of the emission control systems are reduced by software algorithms or other on-board devices like switches or sensors.

Warranty: Manufacturers are required to provide repair and replacement of defective emissions related parts free of charge to consumers during the warranty period. The manufacturer reports the number of warranted parts identified as defective and replaced under warranty. If warranty rates exceed regulatory limits, the manufacturer may be required to implement corrective action in the form of a recall or extended warranty. CARB ensures the warranty coverage is implemented by manufacturers correctly both for individual consumer issues, and when warranty rates exceed regulatory limits, for all consumers through the recall program.

Not all categories undergo the same workload effort. Table Appn A-2 lists the equipment certification category and their corresponding activities currently conducted and analyzed by this regulatory effort.

Table Appn A-2. California Mobile Source Program Categories and Applicable CARB Certification and Compliance Programs

Engine, Vehicle or Component (EO Series)	Certification	On-Board Diagnostics	Audit	In-Use	Warranty
On-Road New Cars, Light/Medium-Duty Vehicles (A)	x	x	x	x	x
On-Road Heavy-Duty Engines and Vehicles (A)	x	x	x	x	x
On-Road Heavy-Duty Phase 2 GHG (A)	x		x		
Conversion of Vehicles to Gaseous Fuels: Alternative Fuel Retrofit Systems (B)	x				x
Federal AB 965 Cars and light trucks (P)					
On-Road HD Exempt (N)	x				
Fuel-fired Heaters	x				
Phase 2 GHG Trailer (AT) and components (AD)	x				
Zero-emission Powertrain (A)	x				
Street-Use Motorcycles (M)	x		x		x
Emission-Compliant ("Green Sticker") Off-Road Motorcycles & All-Terrain Vehicles: OFMC, ATV, OFRSV, OFRUV, SCAR (U-M)	x		x		x
Emission-Non-Compliant ("Red Sticker") Off-Road Motorcycles & All-Terrain Vehicles: OFMC, ATV (U-N)	x				
Electric Golf Carts (U-G)	x				
Off-Road Compression - Ignition Engines (U-R)	x		x	x	x
Off-Road Large Spark-Ignition Engines: LSI (U-L) - Exhaust	x		x		x
Off-Road Large Spark-Ignition Engines: LSI (U-L) - Evaporative	x				x
Spark - Ignition Marine Engines/Watercraft (U-W) - Exhaust	x	x	x		x
Spark - Ignition Marine Engines/Watercraft (U-W) - Evaporative	x		x		x
Small Off-Road Spark - Ignition Engines (U-U) - Exhaust	x		x		x
Small Off-Road Spark - Ignition Engines (U-U) - Evaporative	x		x		x
Small Off-Road Engine Evaporative Emission Control System Components (Q)	x		x		x

Engine, Vehicle or Component (EO Series)	Certification	On-Board Diagnostics	Audit	In-Use	Warranty
Spark-ignited Marine Water Craft Evaporative Component (RM)	x				
Off Highway Recreational Vehicle Evaporative Component (RV)	x				
Portable Fuel Containers: PFCs (G)	x		x		x
Experimental Permits (C)	x				
Aftermarket Part Exemptions (D/F)	x		x		x
Aftermarket Part Motorcycle (K)	x		x		x
Diesel Emission Control Strategies: On-road, Off-road, RTG cranes, TRU, CHC, APU, and SS (DE)	x			x	x
Alternative Control Technologies (e.g., Bonnets) verification/approval for At-Berth regulation (AB)	x			x	

Methodology to Determine Existing Program Costs

Fiscal costs include labor, operational, equipment, and facility costs to conduct the described activities. Below is a description of each cost category.

Labor Costs

Total labor Costs include both the direct labor to implement the activities (Direct Labor) and overhead costs that include administrative management, legal, and IT costs to run the agency (Indirect Labor).

a. Direct Labor

The Direct Labor cost includes each staff and first level manager that work within the Mobile Source Certification and Compliance Program activities. No second level managers or above were used in the calculation. A staff survey was conducted to determine the percent time spent in each activity for 2018. The percent time was summed into a person year (PY) activity level for each staff position and category within the scope of this regulatory activity. The 2022 values include fiscal year (FY) 2018/2019 and 2019/2020 Department of Finance approved budget change approvals in addition to the 2018 baseline.

Each staff PY time was multiplied by the Fiscal Year Labor Budget class cost, which is a mid-range salary for each class and includes benefits and operating expense and equipment. Each was summed for each category to obtain the Direct Labor cost for that category. Each staff's class cost was adjusted by time base, if not employed full time. Each first level manager class cost was discounted by 15 percent for administrative work.

Fiscal Year Labor Budget class cost is calculated annually through an administrative process which annualizes the California Department of Human Resources monthly salary by position class, adds an average of 53 percent of the salary cost for benefits, and adds an average of 20 percent of the salary cost for operating expenses and equipment for each class. Each class has its own benefit and operating expenses and equipment determination. The values used to determine 2018 and 2022 labor costs are found in Table Appn A-3. Statewide labor costs were cut roughly 9.23 percent across most bargaining units as a result of negotiations in response to the COVID-19 pandemic's anticipated impact on the state budget. However, most agreements are temporary and are anticipated to have minimal impact during the effective dates of the Proposed Regulation.

Table Appn A-3. Fiscal Year Mid-Range Cost by Class³⁷

Class Title	2018/2019 FY	2019/2020 FY
ARE	\$188,000	\$195,000
ARS I	\$217,000	\$225,000
ART II	\$87,000	\$89,000
SAPS	\$202,000	\$208,000
APS	\$179,000	\$185,000
ARFR II	\$120,000	\$122,000
ARFR III	\$131,000	\$135,000
Student	\$68,000	\$70,000
Student Engineer	\$77,000	\$79,000
AGPA	\$126,000	\$130,000
HD Truck Driver	\$98,000	\$98,000
AETS Sup	\$122,000	\$126,000
AETS II	\$102,000	\$87,000
AETS III	\$110,000	\$106,000
AETS I	\$87,000	\$113,000

b. Indirect Labor

Indirect labor includes the management, administrative, legal, and IT costs to run the agency. The indirect labor percentage was calculated directly for the agency using Division, Executive Office, and Chair Office management, Administrative Services Division, Legal Office, and IT services staffing divided by the total agency labor force. The overhead labor for Indirect Labor was calculated as 26 percent of the Direct Labor cost for CARB.

Operational Costs

Operational Costs are the direct costs to conduct the program activity. Examples include test gases, fuel, small equipment, travel, purchasing of equipment to test, and other activities. The 2018 baseline operational costs were obtained by reviewing the 2018/2019

³⁷ Please refer to Acronym list at the end of this document

and 2019/2020 Fiscal Year budget contracts and budgets, obtaining annual fuel and gas costs, and surveying staff for travel and other direct expenses related to this regulatory activity. The 2022 operational costs were only modified using budget change proposals approved through the 2019/2020 budget cycle and modifications to 2019/2020 FY contract costs for equipment purchases for testing. Only contracts directly applicable to certification and compliance activity were used. General expenses and travel were not included.

Many of the contracts related to testing included all testing for enforcement, research, and certification and compliance activities. To separate out all costs not related to certification and compliance, staff reviewed existing test plans which are developed for each testing activity. A test plan describes the scope of the testing and the information to be collected. Staff reviewed each test plan used in 2018 and identified the number of test plans related to certification and compliance for each source category. A percentage was determined for each category and the contract totals, where applicable, were adjusted by percent used for Mobile Sources Certification and Compliance activities, as determined by 2018 test plan data.

Equipment Costs

Equipment costs were based on the 2016 and new Riverside Laboratory equipment survey and direct contract line items. Equipment costs for 2018 include CARB’s laboratory facilities in El Monte and Sacramento, as well as CARB’s Heavy-Duty Diesel Test Facility at the Metropolitan Transportation Authority in Los Angeles. The 2018 cost may be underestimated because equipment in the facility is old and replacement was delayed due to the move to the new Riverside laboratories. In 2021, CARB’s El Monte office relocates to the Riverside Facility. Equipment costs are based on the Southern California Consolidation Project estimates. Total 2022 equipment costs include CARB’s laboratory facility in Riverside and Sacramento. The total equipment cost was adjusted by percent time used for Mobile Sources Certification and Compliance activities, as determined by test plan data. Some percent values were adjusted for changes in testing to be conducted at the Riverside facility. Tables Appn A-4 and Appn A-5 list the type of equipment and cost calculations.

Table Appn A-4. 2016 El Monte Laboratory Equipment

Item	Acquired Date	Manufacturer
Gas Dilution System	1/10/1998	Enviroics
VTS Test Host Server	4/1/2009	Dell
Gas Dilution System	1/10/1998	Enviroics
Hydrogen Generator	1/10/2007	Matheson
ICP-MS	1/10/2003	Thermo Electron
GC/MS	1/10/2007	Thermo Electron
GC/MS	1/10/2007	Thermo Electron
Furnace	1/10/2009	Fisher
Accelerated Solvent Extractor	1/10/2011	Dionex

Item	Acquired Date	Manufacturer
OC/EC Analyzer	1/10/2002	Atmoslytic
OC/EC Analyzer	6/22/2010	Atmoslytic
Microbalance 1	1/10/2010	Mettler-Toledo
Microbalance 2	1/10/2010	Mettler-Toledo
Microbalance 3	1/10/2010	Mettler-Toledo
Buchi Extractor	1/10/2009	Buchi
HPLC w/Fraction Collector	5/21/2008	Agilent
MTL FWS w/microbalance	1/20/2010	MTL
MTL FWS w/microbalance	1/10/2011	MTL
IC	1/10/2010	Dionex
SMPS	1/10/2011	TSI
CPC	1/10/2011	TSI
Aerosol Generator	1/10/2011	Grimm
Soot Generator	1/10/2011	Palas
Optical Transmissometer	1/10/2011	Magee
micro-aethalometer	1/10/2010	Magee
micro-aethalometer	1/10/2010	Magee
nano-Moudi	1/10/2010	MSP
Micro Soot Sensor	11/2/2011	AVL
XRF	1/10/2012	PANalytical
SVOC (GC-GC-MS)	1/10/2012	LECOS
Autosampler for LECOS GC-GC-MS	1/10/2013	Gerstel
Buchi Concentrator	1/10/2010	Buchi
Labconco Concentrator	1/10/2005	Labconco
Labconco Concentrator	4/1/2014	Labconco
Grabner RVP	1/9/2014	Grabner
ERAVAP RVP	1/9/2008	Compass
ERASPEC	5/1/2014	Compass
Optidist #1	1/9/2009	PAC
Optidist #2	1/9/2010	PAC
CNG/LNG GC	1/9/2009	Varian
Red Dye Analyzer	3/19/2012	PAC
XRF for MGO	1/9/2008	Oxford
Antek Sulfur Analyzer	1/9/2008	PAC
Cosa Sulfur Analyzer	1/9/2009	Cosa
CHN Analyzer	8/9/2011	Perkin Elmer
CHN Analyzer	9/1/2011	Perkin Elmer
Selerity 3000 SFC	1/9/2005	Selerity
Selerity 4000 SFC	1/9/2009	Selerity
Oxygenates GC	6/1/2013	Bruker

Item	Acquired Date	Manufacturer
Aromatics GC #1	1/9/2008	Varian
Aromatics GC #2	1/9/2011	Bruker
Density Meter	1/9/2009	Anton Paar
PIONA+ GC	1/9/2011	Bruker
Ice Maker	4/16/2015	Hoshizaki
Hydrogen Generator	1/10/2007	Matheson
Hydrogen Generator	1/10/2008	Matheson
Hydrogen Generator	1/10/2010	Matheson
Hydrogen Generator	1/10/2010	Matheson
Hydrogen Generator	1/10/2013	Matheson
Density Meter #2	11/25/2014	Anton Paar
Jasco SFC	3/1/2016	Jasco
SCOPE, Test Analyzer System(TAS) Service/ Inspection System	1/12/1998	Sun
Low Pressure Evaporative System Leak Tester	1/10/2007	Environ Sys
Mitchell repaire information subscription	1/10/2009	ShopKey
Refrigerant Recovery, Recycling, Recharging Unit	1/10/2008	Robinar
Scale and Indicator Terminal	1/10/2008	Mettler-Toledo
Test Analyzer System/ASM Dyno	1/10/2007	Worldwide Environ
Test Analyzer System/ASM Dyno	1/10/2007	Worldwide Environ
Vehicle Mover	1/10/2009	Stringo
Modis-Diagnostics & OBD II, CAN Scan tool	1/10/2006	Snap On
Modis-Diagnostics & OBD II, CAN Scan tool	1/10/2006	Snap On
Scanner	1/10/1999	Snap On
Scanner	1/10/2001	Snap On
Mastertech-hand held scan tool	1/10/2004	Vetronics
Vehicle Lift	8/22/2013	Mohawk
Vehicle Lift	1/10/2010	Hydraulic Auto Lift
Drum Lift	1/10/2011	Crown
Drum Lift	1/10/1990	Big Joe
Motoscan Motorcycle scan tool with all adapters	1/10/2011	Strategic Tools

Item	Acquired Date	Manufacturer
Dry Blast	12/17/2014	Trinco
Metal Container	12/17/2014	AAA Containers
Battery Tender/Charger, 12 volt 2 amp, 10 Bank	9/5/2012	Battery Tender
Drill Press	12/17/2014	Atlas
Pressure Washer	1/10/2010	Honda
Computer Balancer	1/10/2001	Kinetik
Brake Lathe	12/17/2014	Ammco
Tool Box	1/10/2010	Water Loo
Tool Cart	12/17/2014	US General
Tire Changer	1/10/2007	Panther
Underground Storage Tanks	1/10/1999	Modern Welding
Fuel Dispensers	1/10/2011	Wayne Reliance
EVR Monitoring System	1/10/2000	Veeder-Root
EVR II	1/10/2008	Healy
Motorcycle Lift	1/10/2011	Ranger
Motorcycle Jack, 1500 lb.	1/10/2011	Ranger
Hand-held LEL detector	1/10/2011	Industrial Sci
Battery Load/ Starting & Charging System Tester	12/18/2014	Snap On
Floor Jack	12/19/2014	Sears
Battery Charger, 10/2 Amp 6/12 volt	12/19/2014	Dayton
Battery Tender, 12 volt 1.25 amp, 4 Bank	9/5/2012	Battery Tender
Battery Tender, 13volt 1.25amp	9/5/2012	Battery Tender
Battery Tender, 6 volt 1.25 amp, 10 Bank	9/5/2012	Battery Tender
Floor Jack	12/19/2014	Hein Warner
Diesel Injector Test Kit	10/2/2012	Rocken Tech
Time and Date Stamp	12/19/2014	Croprint
Magnum Pro Tool Chest	12/19/2014	Water Loo
Locking Tool Cabinet for Modus Equipment	12/19/2014	Snap On
Locking Tool Cabinet for Modus Equipment	12/19/2014	Snap On
Gas Dilution System	1/10/1998	
Gas Dilution System	1/10/2002	Environics
Gas Dilution System	1/10/2013	Environics
Hydrogen Generator	1/10/2008	Matheson

Item	Acquired Date	Manufacturer
Hydrogen Generator	1/10/2008	Matheson
Hydrogen Generator	1/10/2008	Matheson
Hydrogen Generator	1/10/2007	Matheson
Hydrogen Generator	1/10/2008	Matheson
Hydrogen Generator	1/10/2007	Matheson
Hydrogen Generator	1/10/2012	Matheson
Alcohol Analyzer #1-Gas Chromatograph (GC-FID) with autosampler	1/10/2002	Varian
Carbonyls Analyzer/Identifier-Liquid Chromatograph (LC-MS)	1/10/2002	Thermo-Finnigan
Carbonyls Analyzer (#1)-Liquid Chromatograph (HPLC)	1/10/2000	Waters
Carbonyls Analyzer (#2)-Liquid Chromatograph (HPLC)	1/10/2006	Waters
PDFID Analyzer-Gas Chromatograph (GC-FID)	1/10/2002	Varian
VOC Analyzer #1 (GC9)-Gas Chromatographs (GC-FID)	1/10/2002	Varian
VOC Analyzer #2 (GC10)-Gas Chromatographs (GC-FID)	1/10/2002	Varian
VOC Analyzer #3 (GC11)-Gas Chromatographs (GC-FID)	1/10/2002	Varian
Greenhouse Gases Analyzer-Gas Chromatograph (GC-ECD)	1/10/2004	Varian
Volatile Nitrogen Compound Analyzer-Gas Chromatograph (GC-NPD)	1/10/2008	Varian
Greenhouse Gases Analyzer (FTIR)	1/10/2010	Thermal Scientific
VOC Analyzer/Identification Instrument (GC/MS)	1/10/2008	Thermal Scientific
Alcohol Analyzer #2-Gas Chromatograph (GC-FID) with autosampler	1/10/2009	Agilent
Ammonia Analyzer (RT-FTIR)	1/10/2007	AVL
Nitrogen Dioxide (NO2) Analyzer	1/10/2012	Los Gatos Research
Labile VOC Analyzer	1/10/2012	Ionicon

Item	Acquired Date	Manufacturer
Nitrous Oxide/Carbon Monoxide (N2O/CO) Analyzer with external pump	1/10/2013	Los Gatos Research
Greenhouse Gases (CH4/CO2) Analyzer	10/8/2014	Los Gatos Research
NOx Analyzer	4/9/2014	Teledyne
Anemometer	1/10/2007	
ANEMOMETER	1/10/2007	
ANEMOMETER	1/10/2012	
Anemometer	8/2/2012	Pacer
Balomometer	1/10/2001	Alnor
CFO KIT	1/10/2008	Horiba
CFO KIT	1/10/2001	Horiba
CFO KIT	1/10/2001	Horiba
Anemometer	1/10/2007	Alnor
Anemometer	1/10/2009	Kanomax
Anemometer	1/10/2009	Omega
Anemometer	1/10/2001	Omega
Anemometer	11/18/2010	Pacer
CFO KIT	2/2/2001	Horiba
CFO KIT	1/10/2003	Horiba
CFO KIT	1/10/2013	Horiba
CLAMP ON CURRENT TRANSFORMER	1/10/2006	Hioki
CLAMP ON TRANSFORMER SENSOR	1/10/2006	Hioki
DIGITAL MULTIMETER	1/10/2001	Fluke
DIGITAL MULTIMETER	1/10/2006	Fluke
DIGITAL MULTIMETER	1/10/2001	HP
FLOWMETER	1/10/2009	CME
FLOWMETER	1/10/2006	CME
FLOWMETER	1/10/2006	CME
FLOWMETER	1/10/2009	CME
FLOWMETER	1/10/2001	CME
FLOWMETER	1/10/2002	CME
FLOWMETER	12/1/2012	CME
FLOWMETER	1/10/2005	CME
FLOWMETER	1/10/2009	CME
FLOWMETER	1/10/2000	Humonics
GAS DIVIDER	1/10/2002	Horiba
GAS DIVIDER	1/10/2011	STEC - HORIBA

Item	Acquired Date	Manufacturer
GAS DIVIDER	1/10/2007	STEC - HORIBA
GAS DIVIDER	11/26/2013	STEC - HORIBA
HYGOMETER	1/10/2001	General Eastern
HYGOMETER	1/10/2002	General Eastern
HYGROMETER	1/10/2007	General Eastern
STROBE LIGHT	1/10/2011	Ametek
STROBE LIGHT	1/10/2008	Electromatic
STROBE LIGHT	1/10/2001	Shimpo
STROBE LIGHT	1/10/2008	Shimpo
HYGROMETER	1/10/2001	General Eastern
HYGROMETER	1/10/2006	General Eastern
HYGROMETER	1/10/2013	General Eastern
HYGROMETER	1/10/2013	General Eastern
THERMOMETER	11/21/2011	Fluke
HYGROMETER	1/10/2013	General Eastern
HYGROMETER	1/10/2008	Vaisala
THERMOMETER	1/10/2008	Fluke
THERMOMETER	1/10/2003	Omega
MANOMETER	1/10/2001	Dwyer
MANOMETER	1/10/2002	Setra
THERMOMETER	1/10/2001	Omega
MINI WIND TUNNEL	8/6/2012	Omega
THERMOMETER	1/10/2010	Omega
PRESSURE GAUGE	1/10/2010	Ashcroft
PRESSURE GAUGE	1/10/2006	Cecomp
THERMOMETER	1/10/2001	Tegam
PRESSURE GAUGE	1/10/2006	Druck
THERMOMETER	1/10/2006	Tegam
PRESSURE GAUGE	1/10/2009	Druck
PRESSURE GAUGE	1/10/2009	Druck
THERMOMETER	1/10/2011	Tegam
PRESSURE GAUGE	1/10/2007	Setra
PRESSURE GAUGE	1/10/2009	Setra
THERMOMETER	1/10/2008	Tegam
PRESSURE GAUGE	1/10/2008	Setra
PRESSURE GAUGE	1/10/2008	Setra
THERMOMETER	1/10/2008	Tegam
THERMOMETER	11/14/2012	Tegam
THERMOMETER	11/14/2012	Tegam
THERMOMETER	11/14/2012	Tegam

Item	Acquired Date	Manufacturer
THERMOMETER	10/16/2013	Tegam
THERMOMETER	10/16/2013	Tegam
THERMOMETER	10/16/2013	Tegam
THERMOMETER	10/16/2013	Tegam
THERMOMETER	10/16/2013	Tegam
LAPTOP	12/5/2014	HP
LAPTOP	12/5/2014	HP
LAPTOP	12/5/2014	HP
LAPTOP	12/5/2014	HP
Impinger System	6/30/2007	Horiba
VV/VT-SHED 1	1/1/1991	Webber EMI
VV/VT-SHED 2	1/1/1992	Webber EMI
Alcohol Impingers	4/17/2009	APS
Motor Exhaust Gas Analyzer	1/1/2002	Horiba
Flame Ionization Chemiluminescent Analyzer	1/1/2002	Horiba
VV/VT SHED 3	1/1/2002	Webber EMI
CVS - Venturi System	6/1/2003	Horiba
Exhaust Sampling Unit - CVS Control	6/1/2003	Horiba
CVS Computer	6/1/2003	Horiba
Bag Sampling Unit	6/1/2003	Horiba
GC Bag Sampler	6/1/2003	Horiba
Particulate Sampler	5/1/2009	Horiba
Particulate Sampler	10/1/2011	Horiba
HFID	3/1/2008	Horiba
Mexa Instrument Bench	9/1/1999	Horiba
Mexa Analyzer Computer	4/1/2005	Horiba
Impinger Cart	3/1/1990	Horiba
Diesel Mixing Tee	5/1/2009	Horiba
Low Loss Remote Mixing Tee	5/1/2009	Horiba
PM Tunnel Sampler	5/1/2009	Horiba
48" Roll Dynamometer	3/1/1994	Horiba
Dyno Controller	3/1/1994	Horiba
Dyno Controller	3/1/1994	Horiba
Dyno Computer	3/1/1994	Horiba
Solid Particle Counting System	5/1/2010	Horiba
Engine Exhaust Particle Sizer	2/1/2008	TSI
Ultrafine Condensation Particle Counter	2/1/2008	TSI

Item	Acquired Date	Manufacturer
Aethalometer - Black Carbon Monitor	10/1/2010	Magee
Power HiTester	10/1/2002	Hioki
Power Analyzer	12/10/2010	Hioki
Bag Baker - CVS Bags	8/1/2008	Neptec
Bag Baker - GC Bags	1/1/1999	Grieve
Dew Point Meter	4/1/1999	General Eastern
Canister Loading Bench(system C2k-520	12/1/2006	APS
Canister Loading Bench(system C2k-520	12/1/2006	APS
Purge air conditioner	12/1/2006	APS
Cylinder cabinet	12/1/2006	APS
VTS Rack	1/10/2000	VTS Rack
Anemometer	1/10/2007	Neptec
Full Flow Particulate Sampling System	1/1/2008	AVL
Temperature/Dewpoint Meter	1/1/2000	General Eastern
Barometer	1/1/2004	Setra
Engine Exhaust Particle Sizer Spectrometer	1/1/2006	TSI
DNMHC Analyzer	1/1/2008	Thermal Scientific
Impinger System	1/1/2002	Horiba
4WD Dynamometer	1/1/2011	AVL
Heated FID	1/1/2010	AVL
Particle Counter	1/1/2012	AVL
DVR	1/1/2010	Stand-alone
Monitor	1/1/2010	Panasonic
Instrument Bench	1/1/2005	AVL
VTS Rack	1/10/2000	VTS Rack
Particle Counter	1/1/2012	AVL
48-inch Roll Electric Chassis Dynamometer	1/10/1998	Clayton
Dynamometer controller	1/10/2005	Realtime
CVS	1/10/2003	Horiba
Full Flow Particulate Sampling System	1/10/2009	AVL
Temperature/Dewpoint Meter	1/10/2000	General Eastern

Item	Acquired Date	Manufacturer
Engine Exhaust Particle Sizer Spectrometer	1/10/2009	TSI
Zero Air Generator	1/10/2008	AADCO
Impinger System	1/10/2002	Horiba
UCPC	1/10/2012	TSI
Heated FID	1/10/2010	AVL
Dell Optiplex	1/10/2010	AVL
Micro Soot Sensor	1/10/2012	AVL
Micro Soot Sensor	1/10/2012	AVL
Dell with Proprietary AVL Software	1/10/2012	AVL
DVR	1/10/2010	Stand-alone
Monitor	1/10/2010	Panasonic
Instrument Bench	1/10/2003	AVL
VTS Rack	1/10/2000	VTS Rack
HP Probook	7/4/2005	HP
HP Probook	1/10/2012	HP
Dell with Proprietary AVL Software	1/10/2012	AVL
Monitor	1/10/2010	Panasonic
DVR	1/10/2010	Stand-alone
SULEV Instrument Bench	1/10/2012	Horiba
CVS 1065 Upgrade	1/10/2012	Horiba
General Eastern Dewpoint	1/10/2005	General Eastern
Horiba CVS	1/10/2002	Horiba
Instrument Bench	1/10/2002	AVL
Dell Computer	1/10/2006	Maha
Maha 48-inch Roll 4WD Electric Chassis Dynamometer	1/10/2006	Maha
VTS Rack	1/10/2000	VTS Rack
Real Time 20-inch Roll Electric Chassis Dynamometer with ARTIC-2 Dynamometer Control System	1/10/2007	Realtime
CVS	1/10/2007	Horiba
Magtrol 5 HP Engine Dynamometer	1/10/2003	DyneSystems
Midwest 30 HP Engine Dynamometer	1/10/2003	DyneSystems

Item	Acquired Date	Manufacturer
Midwest 50 HP Engine Dynamometer	1/10/2006	DyneSystems
PC	1/10/2006	HP
Temperature/Dewpoint Meter	1/10/2005	General Eastern
Temperature/Dewpoint Meter	1/10/2003	General Eastern
Full Flow Particulate Sampling System	1/10/2011	AVL
Tunnel Heating for 1065 Requirement	1/10/2012	Horiba
CVS Upgrade	1/10/2012	Horiba
Instrument Bench	1/10/2012	Horiba
Black Carbon Monitor	1/10/2012	AethLabs
Black Carbon Monitor	1/10/2012	AethLabs
Particle Bound PAH Monitor	1/10/2012	Echochem
Particle Bound PAH Monitor	1/10/2012	Echochem
Camera	1/10/2008	CVC
Monitor	1/10/2008	Vernex
VTS Rack	1/10/2000	VTS Rack
VTS Rack	1/10/2000	VTS Rack
Canister Bench	9/11/2006	APS
Alcohol Impingers	4/17/2009	APS
SHED Simulator	6/25/2005	APS
Compressor	1/1/2007	
Compressor	1/1/2007	Atlas Copo
Instrument Bench	1/1/2002	AVL
HC Analyzer	1/1/1998	CAI
Lab Water Purification System	1/1/2010	Cascada
Vehicle Mover	1/1/2000	Crown
Pnuematic Pressure Calibrator	5/25/2010	Druck
Motor Exhaust Gas Analyzer	1/1/2002	Horiba
Flame Ionization Chemiluminescent Analyzer	1/1/2002	Horiba
Motor Exhaust Gas Analyzer	1/1/2002	Horiba
Flame Ionization Chemiluminescent Analyzer	1/1/2002	Horiba
Motor Exhaust Gas Analyzer	1/1/2002	Horiba

Item	Acquired Date	Manufacturer
Flame Ionization Chemiluminescent Analyzer	1/1/2002	Horiba
Bag Sampling Unit	1/1/2003	Horiba
Impringer System	6/30/2007	Horiba
Portable Chassis Dynamometer	1/1/2009	Mustang
Compressor	1/1/2004	Quincy Compressor
Scale	3/28/2013	Sartorius
Robot Driver	1/1/2005	Soltect
Vehicle Mover	1/1/2007	Stringo
Methane Analyzer	1/1/2008	Thermal Scientific
Running Loss SHED	1/1/1993	Webber EMI
Proportional Speed Fan	1/1/2011	Webber EMI
Fuel Conditioning Cart	1/1/2006	Webber EMI
48" Roll Dynamometer	1/5/2004	AVL
CVS	1/1/2001	AVL
Particulate Sampler	1/1/2001	AVL
HFID	1/1/2001	AVL
HFID Laptop	1/1/2002	AVL
SPC-472	1/1/2006	AVL
SPC computer	1/1/2006	AVL
SPC Computer Monitor	1/1/2009	AVL
Soot Sensor	1/1/2009	AVL
Soot Sensor Conditioning Unit	1/1/2009	AVL
Solid Partical Counting System	1/2/2009	Horiba
SPCS computer	1/3/2009	Horiba
Mexa Instrument Bench	1/4/2009	Horiba
Mexa 7200 computer	6/1/1995	Horiba
Mexa 7200 monitor	6/1/1995	Horiba
Bag Mini Diluter	1/1/2009	Horiba
Air/Fuel Ratiio Analyzer	3/1/2000	Horiba
Quad Sampler	6/1/2011	Horiba
Dynamometer	6/1/1995	Burke
Dynamometer Computer	6/2/1995	Burke
Dynamometer Monitor	6/3/1995	Burke
Condensation Particle Counter 1	6/24/2005	Grimm
Condensation Particle Counter 1 Laptop	6/24/2005	Grimm

Item	Acquired Date	Manufacturer
Condensation Particle Counter 2	6/1/2009	Grimm
Condensation Particle Counter 2 Laptop	6/1/2006	Grimm
Sample Collection System	1/10/2009	APS
Optica Temp/Pressure Meter	1/1/2002	General Eastern
Optica Temp/Pressure Meter	12/1/2007	General Eastern
Diesel E-Flow	1/1/2001	General Eastern
Cooling fan	1/1/2000	Hartzell
Cooling fan	1/1/2009	Hartzell
Active Air Supply	1/1/2009	Matter
Raw Gas Dilution	1/1/2009	Matter
Photoelectric Aerosol Sensor	3/1/2002	Echochem
Digital Pressure gauge	5/1/2007	Setra
Digital Manometer	11/1/2001	Setra
Absolute Pressure Gauge	2/1/2001	Setra
Pressure Transducer	2/1/2001	Setra
EEPS	11/1/2005	TSI
EEPS Laptop	11/1/2005	TSI
Ultrafine CPC	3/1/2005	TSI
Engine Exhaust Particle Counter	3/1/2005	TSI
Filtered Air Supply	3/1/2005	TSI
Constant Output Atomizer	3/1/2005	TSI
Zero Air Generator	6/1/2002	AADCO
Sattelite Pro Laptop	6/1/2001	Toshiba
Digital Temperature Gauge	4/1/2001	Omega
CFO Kit	3/1/2001	Horiba
Digital Multi Meter	2/1/2001	Fluke
Digital Multi Meter	2/1/2000	Fluke
Digital Multi Meter	2/1/2001	Fluke
Digital Multi Meter	2/1/2001	Fluke
Tool Chest	2/1/2001	Snap On
Tool Chest	3/1/2001	Water Loo
DC Particle Sensor	8/1/2001	Matter
Walkie Talkie	6/1/2009	EF Johnson
Walkie Talkie	6/2/2009	EF Johnson
Walkie Talkie	6/3/2009	EF Johnson
Walkie Talkie Charger	6/4/2009	EF Johnson
Walkie Talkie Charger	6/5/2009	EF Johnson
Walkie Talkie Charger	6/6/2009	EF Johnson

Item	Acquired Date	Manufacturer
Caliper	1/1/2001	Brown & Sharp
Label Maker	3/1/2001	Brother
Film Flow Meter	1/1/2000	Humonics
Digital Manometer	3/1/2001	Dwyer
Digital Multi Meter	2/1/2001	HP
CD Writer	4/1/2000	HP
Laptop	2/1/2001	Compac
Laptop	2/1/2002	Compac
Digital Camera	4/1/2006	Canon
Flow Meter	3/29/2001	CME
Flow Meter	3/30/2001	CME
Flow Meter	3/31/2001	CME
Flow Meter	4/1/2001	CME
Refridgerator	3/1/2008	Horiba
Ultra Sonic Cleaner	5/1/2005	Omegasonics
Pump	4/1/2011	Gast
Pressure Gauge	3/1/2009	Ashcroft
Pressure Gauge	3/2/2009	Marsh
Digital Pressure Guage	3/3/2009	Cecomp
VTS Rack	1/10/2000	VTS Rack

Table Appn A-5. Testing Equipment Costs for 2018 and 2022

MS Certification and Compliance Fee - Program Test Equipment Cost Analysis														
	Total by Branch/ECARS Non-Lab						Total by Branch/ECARS El Monte Labs				Total by Branch/ MLD			All Divisi
	OBD		IUPB			Total	LDSB	HSLETB	CAERB	Total	ECCB	FETRB		
	LD	HD	LD In-Use	HD In-Use	Warranty						SHED	MTA	PEMS	
2018														
Total Test Equipment Sacramento - El Monte	\$10,450	\$8,550	\$11,182	\$186,253	\$55,088	\$271,523	\$445,130	\$19,377,795	\$5,588,925	\$25,411,850	\$540,000	\$2,089,567	\$3,605,402	\$31,918
salvage											\$40,000			
*Annual amount - 10 yr Amortization	\$1,045	\$855	\$1,118	\$18,625	\$5,509	\$27,152	\$44,513	\$1,937,780	\$558,893	\$2,541,185	\$50,000	\$208,957	\$360,540	\$3,187,8
Total Annual for MSCC Fee	\$1,045	\$855	\$1,118	\$18,625	\$2,754	\$24,398	\$25,818	\$1,123,912	\$324,158	\$1,473,887	\$50,000	\$0	\$152,148	\$1,700,4
2022														
Total Test Equipment Sacramento - Riverside	\$10,450	\$8,550	\$11,182	\$186,253	\$55,088	\$271,523		\$54,089,391	\$8,055,000	\$62,144,391	\$540,000	\$33,277,511	\$5,500,000	\$101,693
salvage											\$40,000			
*Annual amount - 10 yr Amortization	\$1,045	\$855	\$1,118	\$18,625	\$5,509	\$27,152		\$5,408,939	\$805,500	\$6,214,439	\$50,000	\$3,327,751	\$550,000	\$10,119
Total Annual for MSCC Fee	\$1,045	\$855	\$1,118	\$18,625	\$2,754	\$24,398		\$4,164,883	\$620,235	\$4,785,118	\$50,000	\$0	\$232,100	\$5,091,6

Facility Costs

Facility costs were determined by obtaining the rent, utility, and general maintenance costs of each CARB facility that housed a laboratory. No structural cost were included. The 2018 facility costs evaluated the CARB’s laboratory facilities in El Monte and Sacramento, as well as CARB’s Heavy-Duty Diesel Test Facility at the Metropolitan Transportation Authority in Los Angeles for 2018. In 2022 and subsequent years, after CARB’s El Monte office relocates to Riverside, “space only” facility costs include CARB’s laboratory facility in Riverside and Sacramento. The facility costs were calculated using laboratory space square footage divided by the total building space to determine the total cost for the laboratory usage. Laboratory space is used only to house the equipment and conduct the tests, therefore there are no space reductions resulting from staff modifications because of COVID-19. The facility cost for each source category was determined by percent time used for Mobile Sources Certification and Compliance activities, as determined by 2018 test plan data 2020 testing estimates.

Tables Appn A-6 through Appn A-17 provide a summary of the costs for each program categories for 2018 and 2022. Table Appn A-18 provides total program costs.

Table Appn A-6. 2018 Certification and Compliance Costs for On-Road Mobile Sources

Engine, Vehicle or Component (EO classification)	# of PYs in 2018	Labor Costs (2018\$)	Operational Costs (2018\$)	Equipment Costs 2018\$	Facility Costs (2018\$)	Total 2018 Cost	# of Aps/EOs in 2018	2018 Cost/EO-Approval
On-Road New Cars, Light-Duty Trucks, Medium-Duty Vehicles	67.7	\$14,718,475	\$2,127,942	\$1,256,252	\$541,791	\$18,644,461	487/487	\$38,284
On-Road Heavy-Duty Engines and Vehicles	25.1	\$5,614,683	\$741,504	\$63,827	\$109,988	\$6,530,001	199/199 ²	\$32,814 ¹
Federal AB 965 Cars and Light-Duty Trucks, On-Road Heavy-Duty Exempt	<0.1	\$7,062	\$0	\$0	\$0	\$7,062	15/15	\$471
Street-Use Motorcycles	9.5	\$2,029,200	\$239,124	\$203,295	\$197,300	\$2,668,919	231/1231	\$11,554

¹ Average of engine, vehicle evaporative, and GHG Phase 1 certification activities.

² Applications and EOs for engine, evaporative and Phase 1 GHG vehicle certifications are grouped in one number for this table. Table Appn A-7 provides a breakdown due to additional resources for Phase 2 GHG Regulation BCP.

Total Cost of Certification 2018:

\$27,850,443

Table Appn A-7. 2022 Certification and Compliance Costs for On-Road Mobile Sources

Engine, Vehicle or Component (EO classification)	# of PYs in 2022	Labor Costs (2018\$)	Operational Costs (2018\$)	Equipment Costs (2018\$)	Facility Costs (2018\$)	Total 2022 Cost	# of EOs in 2022	2022 Cost/EO-Approval
On-Road New Cars, Light-Duty Trucks, Medium-Duty Vehicles ^{1,2}	69.5	\$15,712,494	\$3,698,700	\$2,841,576	\$454,785	\$22,649,847	487	\$46,509
On-Road Heavy-Duty Engines ^{1,2}	25.6	\$4,902,066	\$1,164,985	\$87,130	\$272,871	\$6,427,052	53	\$121,265
On-Road Heavy-Duty Vehicle Evaporative	1.7	\$298,701	-	-	-	\$298,701	20	\$14,935
Phase 2 GHG Vehicules ¹	4.5	\$2,162,403	-	-	-	\$2,162,403	126	\$17,162
Phase 2 GHG Trailer and Components ¹	2	\$562,800	-	-	-	\$562,800	143	\$3,936
Zero-Emission Powertrains	.3	\$70,350	-	-	-	\$70,350	18	\$3,908
Street-Use Motorcycles	9.5	\$2,099,591	\$258,687	\$1,429,321	\$242,552	\$4,030,151	231	\$17,447

¹ Increase compared to 2018 due to additional PYs and certification activities from heavy-duty greenhouse gas Phase 2 regulation. Each certification category listed.

² Fuel-fired heaters, N and P series costs are incorporated into the appropriate A series activities.

Total Cost of Certification 2022: **\$36,201,304**

Table Appn A-8. 2018 Certification and Compliance Costs for Off-Road Mobile Sources

Engine, Vehicle or Component (EO classification)	# of PYs in 2018	Labor Costs (2018\$)	Operational Costs (2018\$)	Equipment Costs (2018\$)	Facility Costs (2018\$)	Total 2018 Cost	# of APs/EOs in 2018	2018 Cost/EO-Approval
Off-Road Motorcycle (U-M, green sticker)	2.5	\$575,284	\$31,878	\$0	\$0	\$607,162	211/211	\$2878
Off-Road Motorcycle (U-N, red sticker)	0.3	\$75,757	\$0	\$0	\$0	\$75,757	61/61	\$1,242
Electric Golf Carts (U-G)	0.1	\$12,984	\$0	\$0	\$0	\$12,984	4/4	\$3,246
Large Off-Road Spark-Ignition Engines (U-L, exhaust)	1.1	\$225,498	\$15,939	\$0	\$0	\$241,437	57/57	\$4,236
Large Off-Road Spark-Ignition Engines (U-L, evaporative)	0.1	\$20,183	\$0	\$0	\$0	\$20,183	19/19	\$1,062
Off-Road Compression Ignition Engines (U-R)	6.1	\$1,284,137	\$63,756	\$0	\$0	\$1,347,894	375/375	\$3,594
Small Off-Road Engines (U-U, exhaust)	5.9	\$1,193,054	\$31,878	\$25,412	\$10,999	\$1,261,343	689/689	\$1,831
Small Off-Road Engines (U-U, evaporative)	3.3	\$661,581	\$38,222	\$46,050	\$26,928	\$772,781	657/657	\$1,176
Spark-Ignition Marine Engines (U-W, exhaust)	0.9	\$176,873	\$15,939	\$0	\$0	\$192,812	140/140	\$1,377
Spark-Ignition Marine Watercraft (U-W, evaporative)	0.7	\$140,962	\$0	\$0	\$0	\$140,962	140/140	\$1,007

Total Cost of Certification 2018:

\$4,673,315

Table Appn A-9. 2022 Certification and Compliance Costs for Off-Road Mobile Sources

Engine, Vehicle or Component (EO classification)	# of PYs in 2022	Labor Costs (2018\$)	Operational Costs (2018\$)	Equipment Costs (2018\$)	Facility Costs (2018\$)	Total 2022 Cost	# of EOs in 2022	2022 Cost/EO-Approval
Off-Road Motorcycle (U-M)	2.8	\$674,264	\$47,287	\$0	\$0	\$721,551	242	\$2,988
Electric Golf Carts (U-G)	0.1	\$13,466	\$0	\$0	\$0	\$13,466	3	\$3,367
Large Off-Road Spark-Ignition Engines (U-L, exhaust)	1.1	\$233,465	\$23,644	\$0	\$0	\$257,109	57	\$4,511
Large Off-Road Spark-Ignition Engines (U-L, evaporative)	0.1	\$20,888	\$0	\$0	\$0	\$20,888	19	\$1,099
Off-Road Compression Ignition Engines (U-R)	6.9	\$1,462,650	\$94,574	\$0	\$0	\$1,557,224	375	\$4,153
Small Off-Road Engines (U-U, exhaust)	5.9	\$1,235,365	\$47,287	\$435,011	\$75,797	\$1,793,460	689	\$2,603
Small Off-Road Engines (U-U, evaporative)	3.3	\$684,891	\$38,222	\$46,050	\$26,928	\$796,090	657	\$1,212
Spark-Ignition Marine Engines (U-W,exhaust)	0.9	\$183,261	\$23,644	\$0	\$0	\$206,905	140	\$1,478
Spark-Ignition Marine Watercraft (U-W, evaporative)	0.7	\$146,039	\$0	\$0	\$0	\$146,039	140	\$1,043

Total Cost of Certification 2022:

\$5,512,732

Table Appn A-10. 2018 Certification and Compliance Costs for Evaporative Components

Engine, Vehicle or Component (EO classification)	# of PYs in 2018	Labor Costs (2018\$)	Operational Costs (2018\$)	Equipment Costs (2018\$)	Facility Costs (2018\$)	Total 2018 Cost	# of APs/EOs in 2018	2018 Cost/EO-Approval
Portable Containers	0.2	\$53,068	\$2,200	\$2,650	\$1,550	\$59,467	9/9	\$6,607
SORE Evaporative Components	1.6	\$350,541	\$1,079	\$1,300	\$760	\$353,681	97/97	\$3,646
Marine Evaporative Components	0.1	\$13,267	\$0	\$0	\$0	\$13,267	15/15	\$884

Total Cost of Certification 2018: \$426,415

Table Appn A-11. 2022 Certification and Compliance Costs for Evaporative Components

Engine, Vehicle or Component (EO classification)	# of PYs in 2022	Labor Costs (2018\$)	Operational Costs (2018\$)	Equipment Costs (2018\$)	Facility Costs (2018\$)	Total 2022 Cost	# of EOs in 2022	2022 Cost/EO-Approval
Portable Containers	0.2	\$55,042	\$2,200	\$2,650	\$1,550	\$61,441	9	\$6,827
SORE Evaporative Components	1.6	\$362,689	\$1,079	\$1,300	\$760	\$365,828	97	\$3,771
Marine Watercraft/OHRV ¹ Evaporative Components	0.1	\$13,760	\$0	\$0	\$0	\$13,760	15	\$917

¹ OHRV regulations adopted in March 2019 and effective with 2020 model year.

Total Cost of Certification 2022: \$441,029

Table Appn A-12. 2018 Certification and Compliance Costs for Aftermarket Parts

Engine, Vehicle or Component (EO classification)	# of PYs in 2018	Labor Costs (2018\$)	Operational Costs (2018\$)	Equipment Costs (2018\$)	Facility Costs (2018\$)	Total 2018 Cost	# of APs/EOs in 2018	2018 Cost/EO-Approval
Alternative Fuel Retrofits (B)	1.1	\$297,533	\$37,243	\$25,412	\$10,999	\$371,186	24/24	\$15,466
Experimental Permits (C)	0.3	\$31,130	\$0	\$0	\$0	\$31,130	53/53	\$587
Aftermarket Parts (D) – Other than Below	10	\$1,874,515	\$37,243	\$25,412	\$10,999	\$1,948,169	182/131	\$14,872
Fuel Tanks	0.7	\$180,803	\$37,243	\$25,412	\$10,999	\$254,457	55/50	\$5,089
Aftermarket Catalytic (D _{Cat} , D _{dpf} , and K)	2.3	\$575,316	\$37,243	\$25,412	\$10,999	\$648,969	30 ¹ /15	\$43,265

¹ The D_{dpf} category received 4 applications in 2018. Due to the limited scope of the regulation it is not expected to receive any applications in 2022.

Total Cost of Certification 2018: \$3,253,911

Table Appn A-13. 2022 Certification and Compliance Costs for Aftermarket Parts

Engine, Vehicle or Component (EO classification)	# of PYs in 2022	Labor Costs (2018\$)	Operational Costs (2018\$)	Equipment Costs (2018\$)	Facility Costs (2018\$)	Total 2022 Cost	# of APs/EOs in 2022	2022 Cost/EO-Approval
Alternative Fuel Retrofits (B)	1.8	\$464,481	\$37,482	\$62,144	\$11,370	\$575,447	24	\$22,430
Experimental Permits (C)	0.5	\$112,050	\$0	\$0	\$0	\$112,050	53	\$2,114
Aftermarket Parts (D) – (other than below) ¹	14	\$2,980,201	\$37,482	\$62,144	\$11,370	\$3,091,197	182/131	\$16,985/\$23,597
Fuel Tanks (D and F)	0.7	\$193,942	\$37,482	\$62,144	\$11,370	\$304,937	55/50	\$5,544/\$6,099
Aftermarket Catalytic (D _{Cat} , D _{dpf} , and K)	2.2	\$610,693	\$37,482	\$62,144	\$11,370	\$721,689	30 ² /15	\$24,056/\$48,113

¹ Position increase due to a Department of Finance approve budget change proposal

² The D_{dpf} category received 4 applications in 2018. Due to the limited scope of the regulation it is not expected to receive any applications in 2022 but were included in this analysis.

Total Cost of Certification 2022:

\$4,805,349

Table Appn A-14. 2018 Certification and Compliance Costs for Retrofits

Engine, Vehicle or Component (EO classification)	# of PYs for 2018	Labor Costs (2018\$)	Operational Costs (2018\$)	Equipment Costs (2018\$)	Facility Costs (2018\$)	Total 2018 Cost	# of Activities ¹ in 2018	2018 Cost/EO-Activity
Diesel Emission Control Strategies (DE)	8.2	\$1,599,292	\$5,000	\$0	\$0	\$1,604,292	29	\$55,320
Diesel Emission Control Strategies - Locomotives	1.6	\$352,213	\$5,000	\$0	\$0	\$357,213	4	\$89,303

¹ Activities include updates, new applications, and EO issuances

Total Cost of Certification 2018:

\$1,961,505

Table Appn A-15. 2022 Certification and Compliance Costs for Retrofits

Engine, Vehicle or Component (EO classification)	# of PYs for 2022	Labor Costs (2018\$)	Operational Costs (2018\$)	Equipment Costs (2018\$)	Facility Costs 2018\$	Total 2022 Cost	# of Activities ¹ in 2022	2022 Cost/EO-Activity
Diesel Emission Control Strategies ²	4.1	\$1,040,698	\$5,000	\$0	\$0	\$901,408	29	\$31,083
Diesel Emission Control Strategies - Locomotives	1.6	\$363,691	\$5,000	\$0	\$0	\$368,691	4	\$92,173

¹ Activities include updates, new applications, and EO issuances

² Resource directed to Aftermarket Program EO series B and C and other programs outside the scope of this regulation development due to the decline in the programs

Total Cost of Certification 2022:

\$1,270,099

Table Appn A-16. 2018 Certification and Compliance Costs for At-Berth Technologies

Engine, Vehicle or Component (EO classification)	# of PYs in 2018	Labor Costs (2018\$)	Operational Costs (2018\$)	Equipment Costs (2018\$)	Facility Costs (2018\$)	Total 2018 Cost	# of EOs in 2018	2018 Cost/EO-Approval
At-Berth Alternative Emission Control Technology-Bonnets (AB)	0.9	\$199,833	\$5,000	\$0	\$0	\$204,833	1	\$204,833

Total Cost of Certification 2018:

\$204,833

Table Appn A-17. 2022 Certification and Compliance Costs for At-Berth Technologies

Engine, Vehicle or Component (EO classification)	# of PYs in 2018	Labor Costs (2018\$)	Operational Costs (2018\$)	Equipment Costs (2018\$)	Facility Costs (2018\$)	Total 2018 Cost	# of EOs in 2018	2018 Cost/EO-Approval
At-Berth Alternative Emission Control Technology-Bonnets (AB)	0.9	\$207,270	\$5,000	\$0	\$0	\$212,270	1	\$212,270

Total Cost of Certification 2022: \$212,270

Table Appn A-18. 2018 Summary of Existing and Estimate 2022 Program Cost

Sources	Cost of Program
On-Road	
2018	\$27,850,443
2022 estimate	\$36,201,304
Off-Road	
2018	\$4,673,315
2022 estimate	\$5,512,732
Evaporative Components	
2018	\$426,415
2022 estimate	\$441,030
Aftermarket Parts	
2018	\$3,253,911
2022 estimate	\$4,805,349
Retrofits	
2018	\$1,961,505
2022 estimate	\$1,270,099
At Berth Technologies	
2018	\$204,833
2022 estimate	\$212,270

APPENDIX B: FEE DEVELOPMENT

This regulatory item focuses on creating a fee program that will result in the certification program to be as self-sustaining to the full extent possible as allowed by AB 2381, SB 85 and SB 854.

SB 854 was passed by the legislature and signed by the Governor, which allows CARB to adopt a schedule of fees to cover all or part of CARB's reasonable costs associated with certification (including requests received for variances), audit, and compliance of off-road or non-vehicular engines and equipment, aftermarket parts, and emission control components sold in the State (limited to activities covered by HSC sections 38560, 43013 and 43018, on-road aftermarket parts under Vehicle Code section 27156(h)). This legislation provides CARB the authority to assess fees to cover their reasonable costs, with specific considerations, on all off-road and other mobile sources programs not currently covered under the existing fee regulation authority (HSC 43019). When assessing a fee, SB 854 directed CARB to work with impacted industries and consider all of the following:

- Potential impacts on manufacturers that may result from the fee.
- Size of the manufacturer compared to the industry average served by the product on which the fee will be assessed.
- Number of certifications requested and consistency with prior year certifications by the manufacturer.
- Complexity of the regulated category for which a certification is requested.
- A product's potential impact on emissions, and the complexity of the evaluation required, including, for an aftermarket part, determining there is no risk to the environment when the aftermarket part is in actual use.
- Anticipated change in the number of certifications issued annually.
- Potential impacts for enacting a partial fee that does not fully cover the state board's costs for activities associated with certification, including the impacts on the processing time for certification.

SB 85 was passed by the legislature and signed by the Governor, which allows CARB, by regulation, to develop a schedule of annual fees for the certification, audit, and compliance of motor vehicles and engines sold in the state to cover the state board's reasonable costs of implementing the certification, audit, and compliance program.

To develop the fees for this regulatory activity, staff started by determining the reasonable costs for specific certification and approval categories as described in Appendix A. Staff used

the cost collection methodology used by U.S. EPA³⁸ in 2004 for their mobile source fee development for this process.

Staff considered the criteria outlined in SB 854:

Complexity of the Regulated Category

More complex categories with more regulatory requirements generally had more resources directed to the category, and others are less. Some applicants require more oversight, and other require less. Some categories have more workload activities than other categories (See Table Appn A-2.) To address the complexity of each category, staff determined the reasonable costs by breaking up each fee category by the executive order series category or certification type. Staff averaged the application variations by averaging the costs per by executive orders (EO) issued for that category in 2018. (Base year cost was 2018).

For less complicated applications, such as model year renewals or simple permits, a discounted rate was determined based on the amount of or reduction in staff time to complete the process.

Number of Certifications Requested and Consistency with Prior Year issued per year

Staff reviewed the EO history in each category. EOs issued per year have gradually increased over time since 2000. However, for the past 3 years, the number of EOs issued have remained consistent. For this analysis, staff assumed the number will remain the same for 2022, the first year of the fees program. For new programs not in effect in 2018, such as the Phase 2 Heavy-Duty Greenhouse Gas program, staff used the number of EOs determined through the development of each regulation. Since the fee is applied at the time of application, staff compared the number of applications received with the number of EOs issued in each category. In most categories, the number of EOs issued and the number of applications were similar. For the Aftermarket Parts program, the number of applications were 25 to 50 percent higher than issued EOs therefore application number was used for this analysis. For the Retrofit program, a mature program that is waning, the application and EO numbers are low. For these two categories, the fee was adjusted based on application or program activity.

³⁸ The Motor Vehicle and Engine Compliance Program (MVECP) fees rule (69 Fed. Reg. 26222, May 11, 2004)

Size of Manufacturer

In most categories, as directed by statute, special fee categories were added to support small business or companies with low sales in California to address effects on business.

A product's potential impact on emissions

Staff provided discounts to products that provided air quality benefits, such as an electric car.

Potential impacts on manufacturers

Staff worked closely with manufacturers to develop the following fee schedule. Workshops and several one-on-one meetings occurred to discuss product pricing, product pricing elasticity, business effects, and product availability as a result of the fee.

Potential impacts for enacting a partial fee

Through balancing the above factors, the proposed regulation and schedule of fees comes close, but does not fully cover the state board's costs for activities associated with certification. The certification program has previously relied on existing funding from sources other than entities that are granted a certification and it is expected to continue to do so. Staff expects minimal or no impact on the processing time for certifications because of this funding structure.

Tables Appn B-1 through Appn B-6 provide the fees identified for this analysis.

Table Appn B-1. Proposed On-Road Fees

EO Series	Application Fee				
	New	Partial Carry Over	Carry over	Small Volume CA sales Manufacturer	Zero-Emission
A(LD)/P	\$46,509	\$23,254	\$11,627		\$11,627
A (HD engine)	\$121,265	\$60,632	\$30,316		
A (HD Evaporative	\$14,935		\$3,734		
A (HD GHG	\$17,720		\$4,430	\$8,860	\$4,430
AT/AD (HD GHG Trailer/Aero)	\$3,936				
Zero-Emission Powertrain	\$3,936				
N (exempt	\$98				
Fuel-fire Heaters	\$293				
M (Motorcycle)	\$17,447	\$8,723	\$4,362	\$13,085	

Table Appn B-2. Proposed Off-Road Fees

EO Series	Application Fee				
	New	Partial Carry Over	Carry over	Small Volume CA sales Manufacturer	Zero-Emission
U-G					\$842
U-L: Exhaust	\$4,511	\$2,255	\$1,128	\$3,383	
U-L: Evaporative	\$1,099	\$550	\$275	\$825	
U-M	\$2,988	\$1,494	\$747	\$2,241	\$747
U-R	\$4,153	\$2,076	\$1,038		
U-U: Exhaust	\$2,603	\$1,301	\$651		\$651
U-U: Evaporative	\$1,212	\$606	\$303		
U-W: Exhaust	\$1,478	\$739	\$369	\$1,108	
U-W: Evaporative	\$1,043	\$522	\$261	\$782	

Table Appn B-3. Proposed Evaporative Component Fees

EO Series	Application Fee		
	New	No Change Renewal	Adding Models
G	\$6,827	\$1,707	\$1,707
Q	\$4,753	\$1,188	\$1,188
RM	\$917		\$229

Table Appn B-4. Proposed Aftermarket Parts Fees

EO Series	Application Fee			
	New	Category 1 or Carry over	Small Business	Zero-Emission
B	\$23,978		\$17,984	\$5,995
C	\$195			
D and F	\$2,000	\$500	\$1,000	
Dcat/dpf and K	\$10,000	\$2,500	\$5,000	
Dft	\$2,000	\$500	\$1,000	

Table Appn B-5. Proposed Retrofit Fees

EO Series	Application Type and Fee				
	Initial Application Fee	Final Application Fee	EO Fee, Implementation and Warranty	In-Use Fee	Extension Fee
DE Series	\$48,075	\$24,038	\$24,038	\$36,056	\$24,038
Small Business	\$36,056	\$18,028	\$18,028	\$27,042	\$18,028
	Initial Application	Final Verification Letter			
Locomotive	\$18,434	\$73,738			

Table Appn B-6. Proposed At-Berth Technology Fees

EO Series	Application Type and Fee				
	Test Plan review	Application Fee	CEMS review	Design Change fee	Minor Amendment
AB	\$10,158	\$25,394	\$254	\$10,158	\$2,032
Small Business	\$7,618	\$19,046	\$190	\$7,618	\$1,524

APPENDIX C: PURCHASE SPLITS

The following tables show the percentage splits between business purchasers, individual purchasers, local government purchasers, and State government purchasers for each type of mobile source included in this proposed regulation.

Table Appn C-1. On-Road Percent Purchase Splits

Category	Businesses (%)	Individuals (%)	Local Gov't (%)	State Gov't (%)
Passenger Cars, Light-Duty Trucks, Medium-Duty Vehicles ^{39,40}	7.94%	91.34%	0.55%	0.17%
Heavy-Duty Gasoline Vehicles ^{39,40}	39.27%	57.68%	5.74%	1.45%
Heavy-Duty Vehicle (with an engine) Other than Gasoline ^{39,40}	91.78%	2.79%	4.34%	1.24%
Heavy-Duty Vehicles that use ZEP test procedure ⁴¹	73%	0%	27%	0%
Heavy-Duty ZEVs other than HDV - ZEP Cert ⁴²	73%	0%	27%	0%
Heavy-Duty Greenhouse Gas Trailer/Aerodynamics ⁴³	100%	0%	0%	0%
Heavy-Duty Vehicles that use Exempt Engines ⁴⁴	34%	0%	66%	0%
Fuel-fired Heaters used in Heavy-Duty Vehicles ⁴⁵	100%	0%	0%	0%
Street-Use Motorcycles ^{39,40}	0%	99.57%	0.37%	0.06%

³⁹ Data from California Department of Motor Vehicles database, accessed February, 2020.

⁴⁰ Bahreinian, Aniss, Jesse Gage, Elena Giyenko, Sudhakar Konala, Bob McBride, Mark Palmere, and Ysbrand van der Werf. 2019. Revised Transportation Energy Demand Forecast, 2019-2030. California Energy Commission. Publication Number: CEC-XXX-201X-XXX. (4/15/20 personal communication for Pre-publication DRAFT report).

⁴¹ See Appendix C – “Economic Analysis For the Proposed Zero-Emission Airport Shuttle Regulation.” December 31, 2018. https://ww3.arb.ca.gov/regact/2019/asb/appc.pdf?_ga=2.42799973.1516358679.1597432500-175292052.1588026090 . Accessed 8/27/2020.

⁴² Assumed to be the same as Heavy-Duty Vehicles that use ZEP test procedure.

⁴³ See Appendix H: “Further Detail on Cost and Economic Analysis” for the Phase 2 and Tractor-Trailer Amendments Regulation. December 19, 2017. <https://ww3.arb.ca.gov/regact/2018/phase2/apph.pdf> . Accessed 9/1/2020.

⁴⁴ Purchase assumptions are calculated based on average percentage splits between EOs issued for All Terrain Cranes and EOs issued for Street Sweepers over the last six years. Manufacturers of these products have disclosed to CARB that All Terrain Cranes are typically sold to businesses and Street Sweepers are typically sold to local governments.

⁴⁵ The nature of using diesel truck is for business purpose. Fuel-fire heater may reduce idling time (preheating) and also may be used for cabin heating.

Table Appn C-2. Off-Road Percent Purchase Splits

Category	Businesses (%)	Individuals (%)	Local Gov't (%)	State Gov't (%)
Off-Highway Recreational Vehicles ⁴⁶	0%	99.93%	0%	0.07%
Electric Golf Carts ⁴⁷	75.50%	4.90%	18.67%	0.88%
Equipment that uses LSI Engines ⁴⁸	90.81%	0.00%	6.94%	1.15%
Equipment that uses SORE ⁴⁹	33%	67%	0.14%	0.26%
Spark-Ignition Marine Watercraft ⁵⁰	0%	99.97%	0.0006%	0.03%
Equipment that uses Off-Road CI Engines ⁵¹	94.95%	5.05%	0.0106%	0.0196%
Portable Fuel Containers ⁵²	12.87%	87.11%	0.0138%	0.0007%

⁴⁶ CARB estimates that the percentage of OHRVs purchased by businesses is negligible. There are utility vehicles that look similar to OHRV but are slower and have greater cargo capacity, which geared more for commercial / industrial applications. These commercial vehicles are certified in the SORE or LSI categories, depending on engine power.

⁴⁷ Purchase splits are based on information provided by manufacturers that estimates the sales splits between California businesses, individuals, state and local government, and golf courses. Sales to private and municipal golf courses are estimated using the total number of golf courses in California, available at: <https://www.google.com/search?q=How+many+golf+courses+are+in+California%3F&sa=X&ved=2ahUKEwiCleC8ubjoAhVWgp4KHOiLBm4Qzmd6BAgNECE&biw=2049&bih=948> and the number of municipal golf courses in California, available at: <https://www.ngf.org/news/2018/06/municipal-golfs-high-water-mark/>

⁴⁸ (Table VII-2) See Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Public Hearing to Consider the Proposed Amendments to the Large Spark-Ignition Engine Fleet Requirements Regulation. May 31, 2016. <https://ww3.arb.ca.gov/regact/2016/sparkignition2016/largesparkisor.pdf>. Accessed 3/4/2020.

⁴⁹ Source: Form 399 for the Public Hearing to Consider Proposed Amendments to the Evaporative Emission Requirements for Small Off-Road Engines; <https://ww3.arb.ca.gov/regact/2016/sore2016/sore2016.htm>; and OFFROAD2007 Model, available at <https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory/msei-modeling-tools>

⁵⁰ CARB estimates that the percentage of spark-ignition marine watercraft purchased by businesses is negligible. Businesses that use watercraft (fishing, tourism, etc.) are more likely to use larger diesel powered vessels.

⁵¹ Source: OFFROAD2007 Model, available at <https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory/msei-modeling-tools>; Lawn & garden equipment assumes same business/individual/state government/local government purchase splits as SORE equipment.

⁵² Sales splits calculated by CARB using the following sources. The number of California household and business are taken from U.S. Census Bureau – Quick Facts California, available at: <https://www.census.gov/quickfacts/CA> . Accessed 3/28/20; The number of local government units are taken from U.S. Census Bureau table https://www2.census.gov/programs-surveys/gus/tables/2017/cog2017_cg1700org02.zip . Accessed 3/28/20; The number of State agencies are taken from the California State Agency Listing, available at <https://www.ca.gov/agenciesall/> . Accessed 3/28/20. Number of portable fuel containers purchased by different entities are taken from the study: Social Science Research Center at CSU, Fullerton. Survey of Small Off-Road Engines (SORE) Operating within California: Results from Surveys with Four Statewide Populations. May 15, 2019. (Web Link: <https://ww3.arb.ca.gov/msprog/offroad/sore/AbstractExecutiveSummary.pdf> . Last accessed July 2020).

Table Appn C-3. Aftermarket Parts Percent Purchase Splits

Category	Businesses (%)	Individuals (%)	Local Gov't (%)	State Gov't (%)
Alternative Fuel Retrofits ⁵³	100%	0%	0%	0%
Fuel Tanks ⁵⁴	18%	74%	2%	5%
Catalytic Converters and Diesel Particulate Filters ⁵⁵	5%	95%	0%	0%
Experimental Permits ⁵⁶	100%	0%	0%	0%
Motorcycle Aftermarket Parts ⁵⁷	0%	100%	0%	0%
Performance Parts and Innovative Technologies ⁵⁸	0%	100%	0%	0%

⁵³ Source: manufacturer survey

⁵⁴ Source: manufacturer survey

⁵⁵ Source: CARB estimate based on inquiries from purchasers. No EOs have been issued for Diesel Particulate Filters.

⁵⁶ Experimental permits are issued to automakers, so they can legally operate developmental vehicles on the road to gain real world experience. These vehicles are not sold to consumers.

⁵⁷ Source: CARB estimate based on intended purpose of parts, which are to improve performance.

⁵⁸ Source: CARB estimate based on intended purpose of performance parts, which is to improve performance. No EOs have been issued for Innovative Technologies.

Table Appn C-4. Retrofit Percent Purchase Splits

Category	Businesses (%)	Individuals (%)	Local Gov't (%)	State Gov't (%)
Auxiliary Power Units ⁵⁹	100%	0%	0%	0%
Commercial Harbor Craft ⁶⁰	96%	0%	4%	0%
Locomotives ⁶¹	100%	0%	0%	0%
Off-Road ⁶²	42.95%	20.24%	26.62%	7.05%
On-Road ⁶³	0%	0%	0%	0%
Rubber Tired Gantry ⁶⁴	100%	0%	0%	0%
Stationary Compression-Ignition Engines ⁶⁵	77.2%	0%	13.5%	1.6%
Transport Refrigeration Units ⁶⁶	100%	0%	0%	0%

Table Appn C-5. At-Berth Percent Visits Splits

Category	Businesses (%)	Individuals (%)	Local Gov't (%)	State Gov't (%)
At-Berth Technology ⁶⁷	95%	0%	5%	0%

⁵⁹ Source: "Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling" webpage. <https://ww2.arb.ca.gov/our-work/programs/atcm-to-limit-vehicle-idling> . Accessed 3/12/20.

⁶⁰ Source: "Technical Support Document: Initial Statement of Reasons for Proposed Rulemaking for the Proposed Regulation for Commercial Harbor Craft." September 2007. <https://ww3.arb.ca.gov/regact/2007/chc07/tsd.pdf>. Accessed 3/11/20.

⁶¹ Locomotives: California incentive program funded locomotives are estimated to be about 15 units per year on average since 2010. CARB staff estimates this trend will continue through 2031. Data sourced from CARB staff review of incentive transactions (Carl Moyer and Prop 1B). Staff analysis suggests all locomotive sales in CA occur due to incentives.

⁶² Source: CARB Verified Diesel Emission Control Systems (VDECS) database (purchases made in all years).

⁶³ Source: "Truck and Bus Regulation" webpage. <https://ww2.arb.ca.gov/our-work/programs/truck-and-bus-regulation>. Accessed 3/12/20.; Source: CARB estimate based on reported information

⁶⁴ Source: CARB estimate based on reported information

⁶⁵ Source: "Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Airborne Toxic Control Measure for Stationary Compression-Ignition Engines." September 2003. <https://ww3.arb.ca.gov/regact/statde/isor.pdf> . Accessed 3/11/20.

⁶⁶ Source: "Staff Report: Initial Statement of Reasons for the Proposed Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (TRU) and TRU Generator Sets, and Facilities where TRUs Operate." October 28, 2003. <https://ww3.arb.ca.gov/regact/trude03/revisor.pdf> . Accessed 3/11/2020.

⁶⁷ At-Berth Alternative Emission Control Technology. Source: Based on reported ship visits combined with growth factors determined from http://www.dof.ca.gov/Forecasting/Economics/Major_Regulations/Major_Regulations_Table/documents/SRIA_with_Appendices-

APPENDIX D: VEHICLE AND EQUIPMENT CURRENT AND PROJECTED FUTURE SALES

Per unit vehicle costs for the proposed regulation and for the two Alternatives that were considered are calculated based on 2018 production or new vehicle sales numbers (if available) for each category. For some categories, historical data is used to estimate a percentage growth per year that is then used to project future sales. For other categories in which future sales are primarily driven by the adoption of new regulations or the sunseting of existing regulation, future sales are estimated based on CARB estimates as to what the future impacts of those regulations will be. These future sales projections are in Tables Appn D-1 through Appn D-5. Products are analyzed according to the Legal Baseline, under current regulations and laws. However, there are products that may be affected by future rulemaking efforts that may affect the fees assessed to product categories over time.

Table Appn D-1. Sales of New On-Road Vehicles and Equipment

	L/MD ⁶⁸	HDG ⁶⁹	HD _o G ⁷⁰	HDZEP ⁷¹	HDZEV ⁷²	Trailer ⁷³	Exempt ⁷⁴	FFH ⁷⁵	MC ⁷⁶
2018	1,697,767	7,394	34,114	0	0	6,500	15	36,000	32,808
2022	1,780,738	8,130	37,509	108	22,000	7,036	15	39,582	34,411
2023	1,802,107	8,325	38,409	120	22,000	7,177	15	40,532	34,824
2024	1,823,732	8,525	39,331	132	22,000	7,320	15	41,505	35,242
2025	1,845,617	8,729	40,275	144	22,000	7,466	15	42,501	35,665
2026	1,867,764	8,939	41,241	156	22,000	7,616	15	43,521	36,093
2027	1,890,178	9,153	42,231	168	22,000	7,768	15	44,566	36,526
2028	1,912,860	9,373	43,245	180	22,000	7,923	15	45,635	36,964
2029	1,935,814	9,598	44,283	192	22,000	8,082	15	46,731	37,408
2030	1,959,044	9,828	45,345	204	22,000	8,244	15	47,852	37,857
2031	1,982,552	10,064	46,434	216	22,000	8,408	15	49,001	38,311

⁶⁸ Passenger Cars, Light-Duty Trucks, Medium-Duty Vehicles: 1.2% per year sales increase: Source: Data from California Department of Motor Vehicles database, accessed February, 2020.

⁶⁹ Heavy-Duty Gasoline Vehicles: 2.4% per year sales increase: Source: Data from California Department of Motor Vehicles database, accessed February, 2020.

⁷⁰ Heavy-Duty Vehicle (with an engine) Other than Gasoline: 2.4% per year sales increase: Source: Data from California Department of Motor Vehicles database, accessed February, 2020.

⁷¹ Heavy-Duty Vehicles that use ZEP test procedure: Source: "Staff Report: Initial Statement of Reasons for Zero-Emission Powertrain Certification Regulation." December 31, 2018.

https://ww3.arb.ca.gov/regact/2019/zeperc/isor.pdf?_ga=2.118321676.405845639.1599769688-2116452653.1597169257. Accessed 9/10/2020. Future sales are expected to be higher than projected in this

table pending finalization of the Advanced Clean Truck regulation, available at: <https://ww2.arb.ca.gov/our-work/programs/advanced-clean-trucks> and Governor Newsom's Executive Order N-79-20, available at <https://www.gov.ca.gov/wp-content/uploads/2020/09/9.23.20-EO-N-79-20-Climate.pdf>

⁷² Heavy-Duty ZEVs other than HDV – ZEP Cert: Source: Sales estimates are based on discussions with manufacturers considering current regulatory requirements. Future sales are expected to be higher than projected in this table pending finalization of the Advanced Clean Truck regulation, available at: <https://ww2.arb.ca.gov/our-work/programs/advanced-clean-trucks> and Governor Newsom's Executive Order N-79-20, available at <https://www.gov.ca.gov/wp-content/uploads/2020/09/9.23.20-EO-N-79-20-Climate.pdf>

⁷³ Heavy-Duty Greenhouse Gas Trailer/Aerodynamics: 2% per year sales increase: Source: Discussions with manufacturers.

⁷⁴ Heavy-Duty Vehicles that use Exempt Engines: no yearly change in sales: Manufacturers may request an exemption to be able to use off-road engines instead of on-road engines in specialty vehicles, such as large all-terrain cranes or street sweepers, if on-road equivalent engines are not available.

⁷⁵ Fuel-Fired Heaters used in Heavy-Duty Vehicles: 2.4% per year sales increase: Source: CARB assumes the growth rate for fuel-fired heaters will be the same as the growth rate for heavy-duty vehicles.

⁷⁶ Street-Use Motorcycles: 1.2% per year sales increase: Source: Data from California Department of Motor Vehicles database, accessed February, 2020.

Table Appn D-2. Sales of New Off-Road Vehicles, Engines and Equipment

	OHRV ⁷⁷	E. Golf Cart ⁷⁸	LSI ⁷⁹	SORE ⁸⁰	SI Marine ⁸¹	Off-Road CI ⁸²	PFC ⁸³
2018	99,374	19,515	19,785	3,881,466	25,027	116,806	1,336,536
2022	106,976	19,515	20,442	3,975,463	26,209	119,160	1,336,536
2023	108,966	19,515	20,610	3,999,316	26,513	119,756	1,336,536
2024	110,993	19,515	20,779	4,023,312	26,820	120,355	1,336,536
2025	113,057	19,515	20,949	4,047,451	27,131	120,956	1,336,536
2026	115,160	19,515	21,121	4,071,736	27,446	121,561	1,336,536
2027	117,302	19,515	21,294	4,096,167	27,764	122,169	1,336,536
2028	119,484	19,515	21,469	4,120,744	28,086	122,780	1,336,536
2029	121,706	19,515	21,645	4,145,468	28,412	123,394	1,336,536
2030	123,970	19,515	21,822	4,170,341	28,742	124,011	1,336,536
2031	126,276	19,515	22,001	4,195,363	29,075	124,631	1,336,536

⁷⁷ Off-Highway Recreational Vehicles: 1.86% per year sales increase: Source: Off-highway emission inventory model: RV2018. https://ww3.arb.ca.gov/msei/pc2014_technical_document.pdf

⁷⁸ Electric Golf Carts: no yearly change in sales: Source: Production data reported to CARB.

⁷⁹ Equipment that uses LSI Engines: 0.82% per year sales increase: Source: OFFROAD2007 Model. https://ww3.arb.ca.gov/msei/offroad/downloads/models/offroad2007_1215_exe.zip

⁸⁰ Equipment that uses SORE: 0.6% per year sales increase: Source: SORE2020 Model. https://ww2.arb.ca.gov/sites/default/files/2020-09/SORE2020_Technical_Documentation_2020_09_09_Final_Cleaned_ADA.pdf

⁸¹ Spark-Ignition Marine Watercraft: 1.16% per year sales increase: Source: PC2014 Technical Document. https://ww3.arb.ca.gov/msei/pc2014_technical_document.pdf.

⁸² Equipment that uses Off-Road CI Engines: 0.5% per year sales increase: Source: Off-Road Diesel Equipment Models. Available at: <https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory/road-documentation/msei-documentation-road>

⁸³ Portable Fuel Containers: no yearly change in sales: Source: Reports submitted to CARB.

Table Appn D-3. Sales of New Aftermarket Parts

	Alt. Fuel Retrofits ⁸⁴	Aux. Fuel Tanks ⁸⁵	Cat. Conv. & DPF ⁸⁶	Exp. Permits ⁸⁷	Motorcycle AMP ⁸⁸	Perf. Parts & IT ⁸⁹
2018	720	1,771	316,796	63	649	1,200,000
2022	720	3,097	316,796	63	649	1,200,000
2023	720	3,562	316,796	63	649	1,200,000
2024	720	4,096	316,796	63	649	1,200,000
2025	720	4,711	316,796	63	649	1,200,000
2026	720	5,418	316,796	63	649	1,200,000
2027	720	6,230	316,796	63	649	1,200,000
2028	720	7,165	316,796	63	649	1,200,000
2029	720	8,239	316,796	63	649	1,200,000
2030	720	9,475	316,796	63	649	1,200,000
2031	720	10,897	316,796	63	649	1,200,000

⁸⁴ Alternative Fuel Retrofits: no yearly change in sales: Source: reported sales data. Manufacturer sales data indicates that, on average, each EO is used for 3 years, and 30 systems are sold per EO. In 2018, 24 B-series EOs were issued.

⁸⁵ Fuel Tanks: 15% per year sales increase: Source: manufacturer survey.

⁸⁶ Catalytic Converters and Diesel Particulate Filters: no yearly change in sales: Source: CARB estimate of yearly trend using MECA data.

⁸⁷ Experimental Permits: no yearly change in sales: Source: CARB data.

⁸⁸ Motorcycle Aftermarket Parts: no yearly change in sales: Source: manufacturer survey.

⁸⁹ Performance Parts and Innovative Technologies: no yearly change in sales: Source: SEMA data.

Table Appn D-4. Sales of Retrofits

	APU ⁹⁰	CHC ⁹¹	Locomotive ⁹²	Off-Road ⁹³	On-Road ⁹⁴	RTG ⁹⁵	Stationary CI ⁹⁶	TRU ⁹⁷
2018	417	0	15	125	394	1	144	653
2022	417	0	15	125	10	1	213	653
2023	417	321	15	125	0	1	228	653
2024	417	32	15	125	0	1	242	653
2025	417	321	15	125	0	1	256	0
2026	417	321	15	125	0	1	271	0
2027	417	321	15	125	0	0	285	0
2028	417	321	15	0	0	0	299	0
2029	417	321	15	0	0	0	314	0
2030	417	321	15	0	0	0	328	0
2031	417	321	15	0	0	0	342	0

⁹⁰ Auxiliary Power Units: no yearly change in sales: 2018 number and trends are based on sales reported to CARB. Source: See "Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling" webpage. <https://ww2.arb.ca.gov/our-work/programs/atcm-to-limit-vehicle-idling> . Accessed 3/12/20.

⁹¹ Commercial Harbor Craft: Source: Based off need to upgrade 4,500 engines by from 2023 to 2037. Sourced from CARB Off-Road Emissions Inventory. <https://ww2.arb.ca.gov/emission-inventory-data>

⁹² Locomotives: California incentive program funded locomotives are estimated to be about 15 units per year on average since 2010. CARB staff estimates this trend will continue through 2031. Data sourced from CARB staff review of incentive transactions (Carl Moyer and Prop 1B). Staff analysis suggests all locomotive sales in CA occur due to incentives.

⁹³ Source: CARB Verified Diesel Emission Control Systems (VDECS) database (purchases made in all years).

⁹⁴ On-Road: CARB estimates based on "Truck and Bus Regulation" webpage. <https://ww2.arb.ca.gov/our-work/programs/truck-and-bus-regulation> . Accessed 3/12/20.

⁹⁵ Rubber Tired Gantry: Source: Sales data obtained from verification warranty reporting. Based on 2018 sales and forecast to 2026 when expected CARB rule requiring Zero-Emission equipment phases in.

⁹⁶ Stationary Compression-Ignition Engines: Source: Based on manufacturer reported data for 2010 -2018 sales and best fit trends until 2031. Sales sourced from verification warranty reporting.

⁹⁷ Transport Refrigeration Units: Source: Based on avg. sales from 2013-18 until 2024 due to new TRU regulation. Sales sourced from verification warranty reporting.

Table Appn D-5. Controlled Vessel Visits of At-Berth Technology Locations

	At-Berth ⁹⁸
2018	85
2022	68
2023	71
2024	73
2025	1,338
2026	1,377
2027	1,855
2028	1,892
2029	2,513
2030	2,558
2031	2,608

⁹⁸ At-Berth Alternative Emission Control Technology. Source: Based on reported ship visits combined with growth factors determined from http://www.dof.ca.gov/Forecasting/Economics/Major_Regulations/Major_Regulations_Table/documents/SRIA_with_Appendices-